




## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

To: Edward J. DeMarco, Acting Director  
From: Steve A. Linick, Inspector General   
Subject: Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
Date: November 2, 2012

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Please find attached a staff memorandum report detailing concerns about financial losses that Fannie Mae and Freddie Mac (the Enterprises) may have sustained due to manipulation of the London Interbank Offered Rate (LIBOR). As you know, the Department of Justice announced on June 27, 2012, an agreement with Barclays Bank Plc (Barclays) in which the bank admitted to manipulating LIBOR for its own advantage over a period of years. Federal, state, and foreign government investigations into possible LIBOR manipulation are ongoing, as are a number of high-profile civil suits predicated upon such manipulation.

FHFA-OIG's interest in the consequences of possible LIBOR manipulation upon the Enterprises stems directly from its core mission to prevent and detect fraud and abuse in FHFA's programs and operations. Members of my staff began their work on this topic within days of the Department of Justice's announcement of its agreement with Barclays. On September 6 and 11, they shared their preliminary analysis with members of your senior staff and, at about the same time, with both Enterprises.

The enclosed memorandum report outlines my staff's LIBOR loss estimates and offers recommendations for Agency action to recover any such losses on behalf of the Enterprises. In light of the fact that my staff has preliminarily estimated that the Enterprises may have suffered more than \$3 billion in such losses, I believe this matter warrants the Agency's attention. I would appreciate if the Agency could provide written comments to OIG's recommendations by November 16, 2012. Please do not hesitate to contact me if you have any questions about this matter.



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Federal Housing Finance Agency

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**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (LIBOR) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and U.S. authorities, including the Department of Justice (DOJ), Barclays Bank Plc (Barclays) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, [“The LIBOR Mess: How Did It Happen – And What Lies Ahead?”](#) July 18, 2012.

Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## **Background**

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises over \$187 billion.<sup>9</sup>

As part of their business, the Enterprises have always held substantial quantities of floating-rate assets on which interest is recalculated and paid each month or quarter based on currently prevailing short-term rates. Such investments are popular because, as compared to assets that pay a fixed interest rate throughout their terms, floating-rate assets greatly reduce bondholders’ market risk that their investments’ value may decline due to adverse interest rate movements. The Enterprises’ two primary categories of floating-rate investments include:

- Floating rate bonds. Many securities are structured in this fashion. For example, according to its public financial statements, Freddie Mac alone held approximately \$299 billion of floating rate securities upon entering conservatorship.<sup>10</sup>
- Interest rate swaps. Because American homeowners tend to prefer predictable mortgage payments, the Enterprises’ mortgage portfolios generally contain more fixed-rate loans

than floating-rate loans. As a result, the value of those portfolios may vary as interest rates fluctuate. However, the Enterprises also invest in interest-rate swaps, contracting with large financial institutions for the obligation to pay them fixed-rate interest streams in exchange for the right to receive corresponding floating-rate ones.<sup>b</sup> These swaps effectively offset the mortgage loans' fluctuations in value, resulting in stable combined portfolio valuations even if interest rates rise or fall. We estimate that the Enterprises received floating-rate interest payments on a net total of \$373 billion in face, or "notional" amount of interest rate swaps upon entering conservatorship.

The interest due for such floating rate obligations is recalculated for each payment period by reference to the current value of LIBOR.

### Analysis

As a first step in our analysis, we compared the historical data on two floating rate indices:

- 1-month<sup>11</sup> LIBOR rates; and
- The Federal Reserve's published Eurodollar deposit rates (Fed ED) for 1-month<sup>12</sup> obligations. Like LIBOR, this data series is designed to measure short-term bank borrowing costs via polling of financial institutions. However, the Federal Reserve measure polls a broader range of institutions and is rarely referenced in floating rate financial obligations.

Our examination of daily records for 1-month Fed ED and 1-month LIBOR indicates that the two rates remained very close from the earliest point we reviewed, the beginning of 2000, until mid-2007. During that period, the largest divergence between the two indexes appeared shortly after September 11, 2001, when LIBOR *exceeded* Fed ED by as much as 0.41%. Indeed, on average the two measures remained within 0.06% of each other during that period, with LIBOR falling below Fed ED on less than one business day of each nine. The close correspondence of these two measures conformed to the expectations of market observers. As a former Federal Reserve economist said, "Effectively, these two rates should be the same as they are the same instrument."<sup>13</sup>

However, beginning in early 2007 emerging declines in home prices had begun to place strains on the financial system. New Century Financial, a leading home loan originator, filed for bankruptcy in April.<sup>14</sup> Adding to the stress were media reports of precipitous decay in two high-profile mortgage-backed securities hedge funds sponsored by Bear Stearns, a leading U.S.

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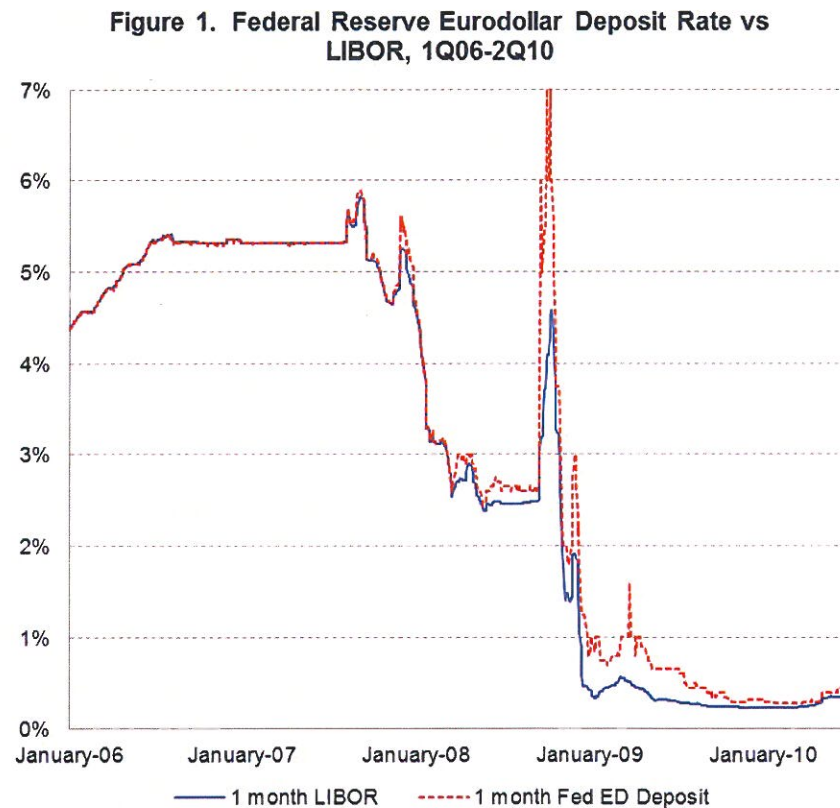
<sup>b</sup> While the Enterprises may enter into both pay-floating rate and receive-floating rate swaps, in order to offset the risk of their (principally fixed-rate) mortgage assets, historically their overall net investment in interest rate swaps has been to receive floating-rate payments.



investment bank. These began to emerge in mid-June,<sup>15</sup> followed promptly by the funds' bankruptcy filings at the end of July.<sup>16</sup>

As the financial crisis began to metastasize, LIBOR and Fed ED began to diverge substantially, eventually by as much as three percentage points at the end of September 2008. Moreover, in a marked contrast with previous behavior, LIBOR began to fall below Fed ED consistently. Figure 1 illustrates the recent divergence of these two measures, beginning in mid-2007.

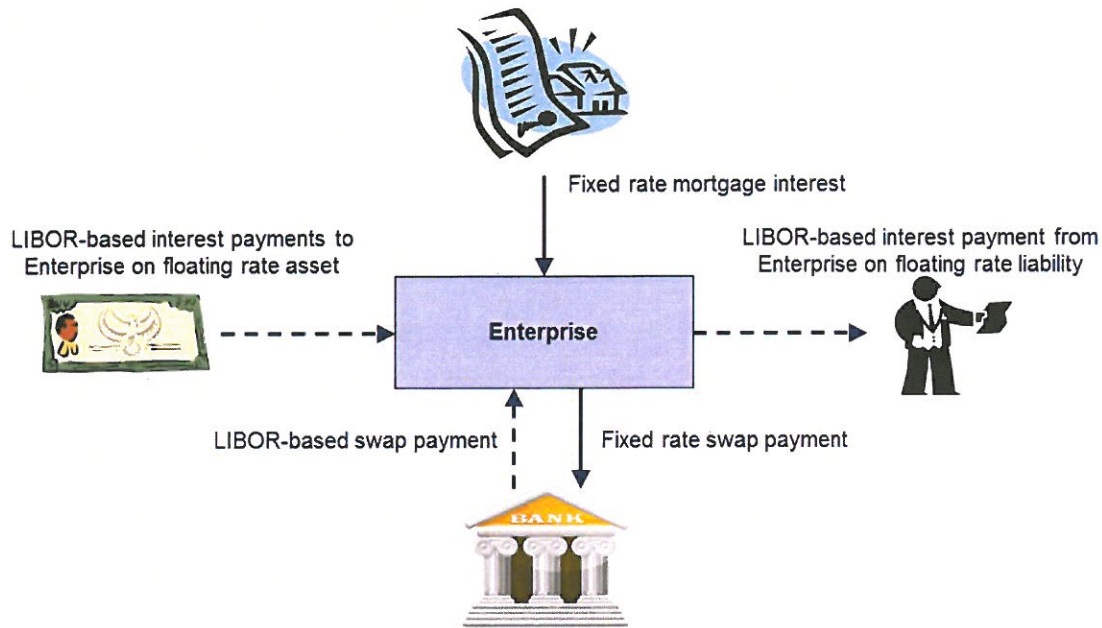
This anomaly has been cited in civil complaints as evidence of financial institutions' LIBOR manipulation.<sup>17</sup> Moreover, it is consistent with DOJ's statement of facts regarding Barclays' admitted LIBOR manipulation, which reads in part:



... between approximately August 2007 and January 2009, in response to initial and ongoing press speculation that Barclays's high U.S. Dollar LIBOR submissions at the time might reflect liquidity problems at Barclays, members of Barclays management directed that Barclays's Dollar LIBOR submissions be lowered. This management instruction often resulted in Barclays's submission of false rates that did not reflect its perceived cost of obtaining interbank funds.<sup>18</sup>

Because the Enterprises receive LIBOR-based floating rate payments on their floating rate bonds and interest rate swaps, the principal effect on them of any downward manipulation of LIBOR would be reduced interest payments with respect to their holdings of floating rate securities and interest rate swaps. (This is partially offset by lower borrowing costs on the Enterprises' own floating-rate liabilities, a factor we have considered in our estimation of Enterprise losses.)

**Figure 2. LIBOR-Based Payments to and From the Enterprises**



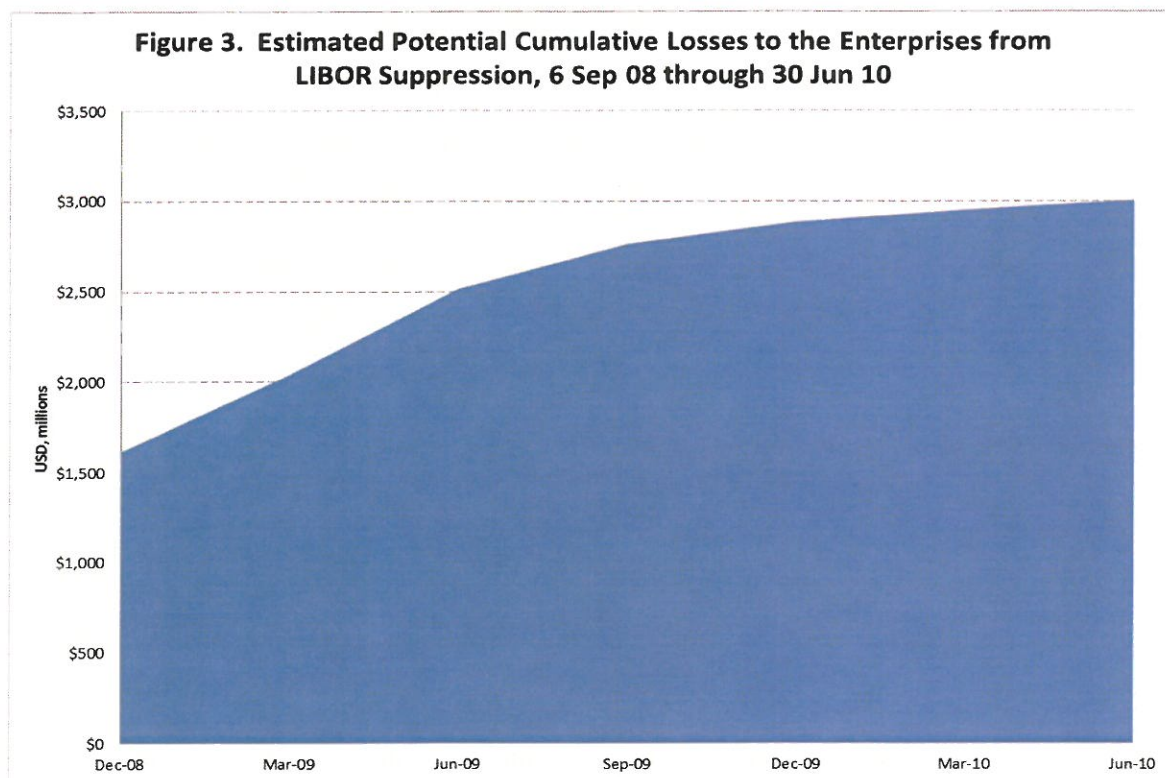
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>
- Second, we reviewed the Enterprises’ publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

<sup>d</sup> Further details on our methodology are available in the Appendix.



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both participate in setting LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.



A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup> However, our review of a small sample of offering documents for the Enterprises' floating-rate

investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations and/or is a named defendant in existing civil actions.<sup>23</sup>

## Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.

Figure 4.

Major Derivatives Dealers		Top Private Label MBS Underwriters 2007	
	LIBOR Contributor		LIBOR Contributor
Bank of America	✓	Lehman Brothers	
Barclays	✓	Bear Stearns	
BNP Paribas		Deutsche Bank	✓
Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
UBS	✓		
Wachovia			



- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded then, in light of its obligations as their conservator, FHFA should have in place a plan by which to affect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

- [1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#). According to the Federal Reserve, this information is provided by the British Bankers' Association. The Federal Reserve describes LIBOR as "the most widely used 'benchmark' or reference rate for short term interest rates."
- [1-Month Eurodollar Deposit Rate \(London\)\(DED1\)](#). This information is compiled by the Federal Reserve itself, working with Bloomberg and ICAP Plc, a bond brokerage firm.

We also compiled similar samples for 3-month rates in each case. Comparisons of both the 1-month and 3-month indices revealed significant rate discrepancies between LIBOR and the Federal Reserve index, beginning in 2007. The Bloomberg story cited in the body of the report includes the former Federal Reserve economist's quote that "effectively, these two rates should be the same as they are the same instrument." Several civil lawsuits, including those brought by [Charles Schwab](#) and the [City of Baltimore](#), cite the emergence of these discrepancies as evidence of malfeasance.

Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the U.S. Commodity Futures Trading Commission, cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of LIBOR.

However, because of differences in currency or maturity of the other indicators compared to the Federal Reserve Eurodollar deposit rate, we chose the Federal Reserve index as the simplest and best benchmark for comparison. For the purposes of this analysis, it served as a proxy for the appropriate LIBOR setting. Thus, we assumed that observed differences between LIBOR and the Federal Reserve Eurodollar deposit rate could indicate the timing and extent of potential manipulation by LIBOR poll participants.

## Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

- Data on derivatives investments from Table 38, page 109. We calculated Freddie Mac's net receive-LIBOR interest rate swap investment as:
  - Pay-fixed (i.e. Freddie Mac receives LIBOR), *plus*
  - Basis (i.e. Freddie Mac and its counterparty exchange different sets of floating rate interest payments. Generally, these involve the Enterprise's payments of frequently used ARM indices, such as the Cost of Funds Index or the 12-month Constant Maturity Treasury rate, in exchange for LIBOR-based payments); *less*
  - Receive-fixed (i.e. Freddie Mac pays LIBOR).
- Data on Freddie Mac's variable-rate mortgage-related securities from information on the Enterprise's Mortgage-Related Investments Portfolio, Table 24, page 93.
  - We assumed that essentially all variable-rate MBS holdings calculated interest payments by reference to LIBOR.
  - Fannie Mae did not publish explicit information on its variable rate MBS, but did provide figures for all MBS held by its Capital Markets Group. To estimate Fannie Mae's variable-rate MBS investment holdings, we assumed that Fannie Mae's Capital Markets Group held the same proportion of variable rate securities held by Freddie Mac in its Mortgage-Related Investments Portfolio.
- Data on Freddie Mac's long-term debt liabilities, including variable-rate liabilities, in Table 8.3, page 224.
  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.



- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises. Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).



## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)," July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)," September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)," January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSE](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSE). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.

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<sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, [“Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge”](#), July 30, 2012.

<sup>20</sup> Federal Reserve Bank of New York, [“An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting,”](#) March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, [“Mortgage-Backed Securities,”](#) League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, [“FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac.”](#)

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to U.S. dollar LIBOR. Wall Street Journal, [“New York Lender Files LIBOR Lawsuit”](#), July 30, 2012, and Thomson Reuters, [“In re LIBOR-Based Financial Instruments Antitrust Litigation,”](#) April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, [“State Regulators Widen LIBOR Investigation,”](#) August 15, 2012, and BusinessWeek, [“US LIBOR Probers Said to Seek London Trader Interviews,”](#) September 27, 2012.

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  - Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.



We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

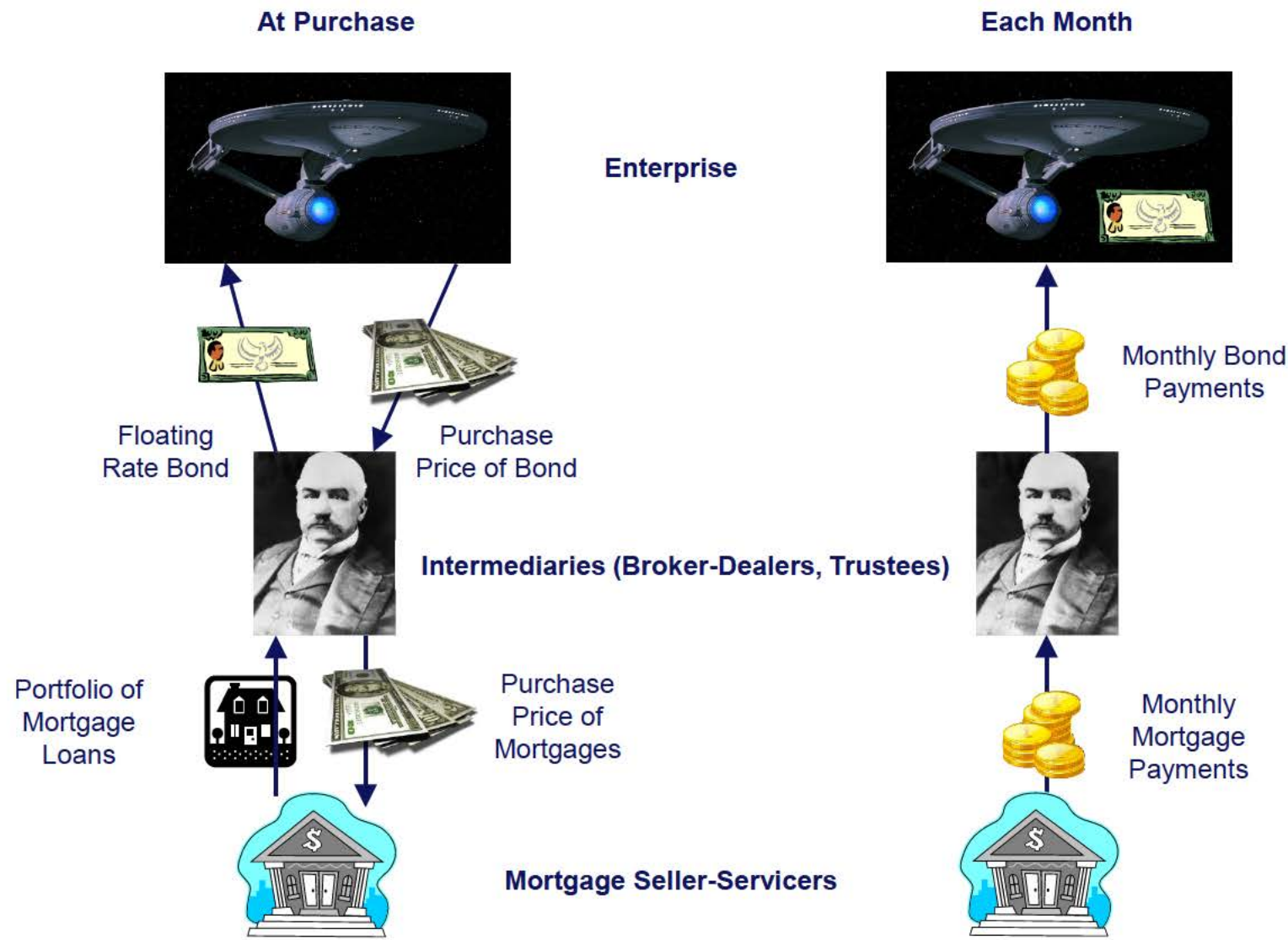
### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this "rough and ready" analysis does indicate that the accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises. Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

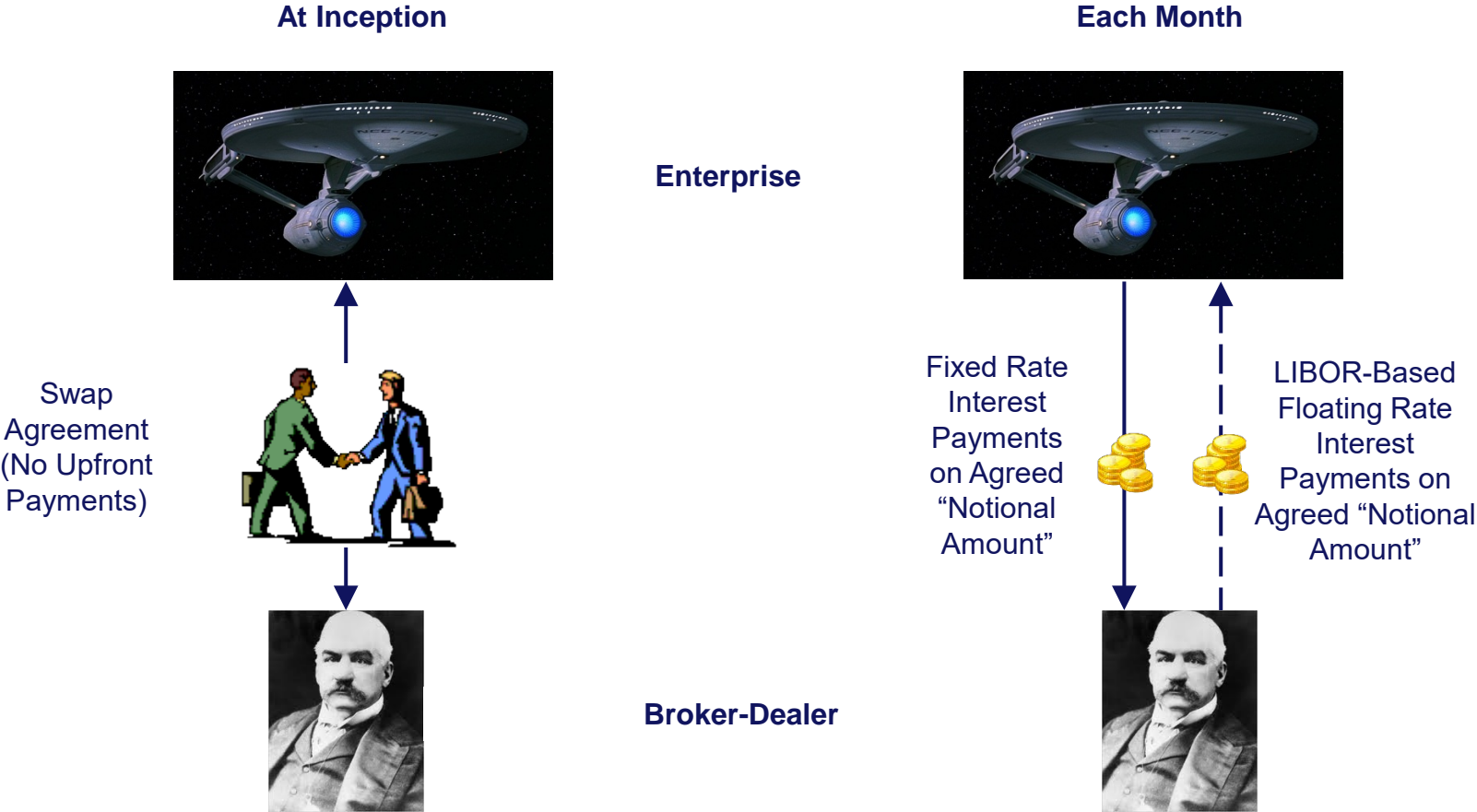
For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

Loan amount	\$ 200,000.00	
Date of rate lock	3/10/2006	
5/1 ARM rate, 30 year maturity	6.03%	
Margin	2.78%	
Reset Date	3/10/2011	
1 year MTA	0.31%	
Reset interest rate	3.09%	
12 month T bill	0.24%	
2 year T note	0.67%	
3 year T note	1.20%	
1 year forward Treasury rate	1.11%	
2 year forward Treasury rate	2.29%	
1 year forward reset	3.89%	
2 year forward reset	5.07%	
<b>5 year IO period monthly payment</b>	<b>\$1,005.00</b>	
<b>Initial amortizing payment</b>	<b>\$958.02</b>	<b>(\$46.98)</b>
<b>Principal payment component</b>	<b>\$442.69</b>	
<b>Projected amortizing payment 1 yr forward</b>	<b>\$1,068.95</b>	\$63.95
<b>Projected amortizing payment 2 yr forward</b>	<b>\$1,228.33</b>	\$223.33

# Variable Rate Bond



# Interest Rate Swap





	ON	SW	2W	1M	2M	3M	4M	5M	
12/31/2010	0.24	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/30/2010	0.24	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/29/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/28/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/27/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/24/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/23/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/22/2010	0.23	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/21/2010	0.22	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/20/2010	0.22	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/17/2010	0.22	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/16/2010	0.22	0.235	0.235	0.235	0.26	0.29	0.33	0.38	
12/15/2010	0.22	0.235	0.235	0.235	0.25	0.281	0.325	0.376	
12/14/2010	0.22	0.235	0.235	0.235	0.25	0.281	0.325	0.376	
12/13/2010	0.22	0.235	0.235	0.235	0.25	0.278	0.325	0.377	
12/10/2010	0.225	0.235	0.235	0.235	0.247	0.273	0.323	0.375	
12/9/2010	0.225	0.235	0.235	0.235	0.247	0.273	0.323	0.375	
12/8/2010	0.225	0.235	0.235	0.235	0.247	0.273	0.323	0.375	
12/7/2010	0.23	0.235	0.235	0.235	0.247	0.273	0.323	0.375	
12/6/2010	0.23	0.235	0.235	0.235	0.247	0.273	0.323	0.376	
12/3/2010	0.235	0.235	0.235	0.235	0.247	0.273	0.324	0.377	
12/2/2010	0.235	0.235	0.235	0.235	0.247	0.273	0.324	0.378	
12/1/2010	0.235	0.235	0.235	0.235	0.245	0.268	0.324	0.378	
11/30/2010	0.235	0.23	0.231	0.235	0.245	0.268	0.324	0.378	
11/29/2010	0.225	0.23	0.231	0.235	0.245	0.267	0.322	0.375	
11/26/2010	0.225	0.23	0.231	0.235	0.245	0.267	0.322	0.375	
11/25/2010	0.225	0.23	0.231	0.235	0.243	0.262	0.319	0.37	
11/24/2010	0.225	0.23	0.231	0.235	0.238	0.252	0.309	0.36	
11/23/2010	0.225	0.23	0.231	0.235	0.238	0.252	0.309	0.36	
11/22/2010	0.225	0.23	0.231	0.235	0.238	0.252	0.309	0.36	
11/19/2010	0.225	0.23	0.231	0.235	0.238	0.252	0.309	0.36	
11/18/2010	0.225	0.23	0.231	0.235	0.238	0.252	0.309	0.36	
11/17/2010	0.225	0.23	0.231	0.237	0.238	0.252	0.309	0.36	
11/16/2010	0.225	0.23	0.231	0.237	0.238	0.252	0.309	0.36	
11/15/2010	0.23	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/12/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/11/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/10/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/9/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/8/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/5/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/4/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/3/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/2/2010	0.225	0.23	0.231	0.232	0.233	0.247	0.304	0.355	
11/1/2010	0.225	0.231	0.232	0.233	0.234	0.248	0.305	0.356	
10/29/2010	0.225	0.231	0.232	0.234	0.235	0.249	0.306	0.357	
10/28/2010	0.225	0.231	0.232	0.234	0.235	0.25	0.307	0.359	
10/27/2010	0.225	0.231	0.232	0.234	0.235	0.25	0.307	0.36	
10/26/2010	0.225	0.231	0.232	0.234	0.235	0.25	0.307	0.36	
10/25/2010	0.225	0.242	0.241	0.234	0.233	0.249	0.307	0.36	
10/22/2010	0.225	0.242	0.241	0.234	0.233	0.249	0.307	0.36	
10/21/2010	0.225	0.242	0.241	0.234	0.233	0.249	0.307	0.36	
10/20/2010	0.225	0.242	0.241	0.234	0.233	0.249	0.307	0.361	
10/19/2010	0.225	0.242	0.241	0.234	0.233	0.249	0.307	0.361	

10/18/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/15/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/14/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/13/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/12/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/11/2010	0.23	0.242	0.241	0.234	0.233	0.249	0.307	0.361
10/8/2010	0.23	0.242	0.241	0.235	0.234	0.25	0.308	0.362
10/7/2010	0.23	0.242	0.241	0.235	0.235	0.251	0.31	0.364
10/6/2010	0.23	0.242	0.241	0.235	0.235	0.252	0.311	0.366
10/5/2010	0.23	0.242	0.241	0.235	0.235	0.252	0.312	0.368
10/4/2010	0.23	0.242	0.241	0.235	0.235	0.252	0.313	0.369
10/1/2010	0.25	0.242	0.242	0.236	0.236	0.253	0.314	0.37
9/30/2010	0.22	0.242	0.242	0.236	0.236	0.253	0.314	0.37
9/29/2010	0.23	0.242	0.242	0.236	0.236	0.253	0.316	0.372
9/28/2010	0.23	0.242	0.242	0.236	0.236	0.25	0.317	0.373
9/27/2010	0.233	0.242	0.242	0.236	0.236	0.25	0.318	0.374
9/24/2010	0.233	0.242	0.242	0.236	0.236	0.25	0.319	0.375
9/23/2010	0.233	0.242	0.242	0.236	0.236	0.25	0.319	0.375
9/22/2010	0.233	0.242	0.242	0.236	0.237	0.251	0.32	0.377
9/21/2010	0.233	0.242	0.242	0.237	0.238	0.253	0.325	0.382
9/20/2010	0.233	0.242	0.242	0.237	0.238	0.253	0.326	0.384
9/17/2010	0.233	0.242	0.242	0.237	0.238	0.253	0.326	0.384
9/16/2010	0.23	0.242	0.242	0.237	0.238	0.253	0.327	0.385
9/15/2010	0.23	0.242	0.242	0.237	0.238	0.253	0.328	0.386
9/14/2010	0.23	0.242	0.242	0.237	0.238	0.254	0.33	0.389
9/13/2010	0.23	0.242	0.242	0.237	0.239	0.255	0.332	0.394
9/10/2010	0.23	0.242	0.242	0.237	0.239	0.256	0.333	0.395
9/9/2010	0.23	0.242	0.242	0.237	0.239	0.257	0.335	0.397
9/8/2010	0.23	0.242	0.242	0.237	0.239	0.257	0.335	0.397
9/7/2010	0.23	0.242	0.242	0.237	0.24	0.259	0.337	0.399
9/6/2010	0.23	0.242	0.242	0.237	0.241	0.261	0.339	0.401
9/3/2010	0.23	0.242	0.242	0.238	0.243	0.264	0.343	0.406
9/2/2010	0.23	0.242	0.242	0.239	0.244	0.265	0.344	0.407
9/1/2010	0.23	0.242	0.242	0.24	0.245	0.266	0.345	0.408
8/31/2010	0.23	0.242	0.242	0.24	0.248	0.269	0.348	0.411
8/30/2010	0.23	0.242	0.242	0.242	0.252	0.274	0.353	0.42
8/27/2010	0.23	0.242	0.242	0.242	0.252	0.274	0.353	0.42
8/26/2010	0.225	0.238	0.237	0.237	0.247	0.269	0.353	0.425
8/25/2010	0.225	0.238	0.238	0.238	0.25	0.274	0.36	0.435
8/24/2010	0.228	0.241	0.241	0.241	0.253	0.279	0.363	0.436
8/23/2010	0.228	0.242	0.242	0.242	0.257	0.288	0.372	0.445
8/20/2010	0.228	0.243	0.243	0.243	0.262	0.298	0.382	0.455
8/19/2010	0.228	0.249	0.248	0.248	0.272	0.313	0.397	0.47
8/18/2010	0.228	0.25	0.25	0.25	0.275	0.323	0.404	0.482
8/17/2010	0.228	0.25	0.251	0.252	0.278	0.33	0.41	0.488
8/16/2010	0.23	0.252	0.253	0.255	0.284	0.339	0.417	0.502
8/13/2010	0.23	0.254	0.255	0.259	0.288	0.343	0.421	0.506
8/12/2010	0.23	0.255	0.258	0.262	0.291	0.347	0.425	0.506
8/11/2010	0.23	0.257	0.261	0.266	0.297	0.354	0.437	0.521
8/10/2010	0.23	0.26	0.265	0.27	0.305	0.365	0.449	0.533
8/9/2010	0.235	0.273	0.273	0.275	0.31	0.376	0.459	0.543
8/6/2010	0.235	0.274	0.274	0.276	0.312	0.381	0.464	0.548
8/5/2010	0.235	0.274	0.274	0.278	0.314	0.385	0.468	0.552
8/4/2010	0.235	0.275	0.275	0.28	0.317	0.39	0.471	0.553
8/3/2010	0.235	0.277	0.277	0.277	0.324	0.4	0.481	0.563

8/2/2010	0.235	0.277	0.28	0.28	0.333	0.41	0.492	0.575
7/30/2010	0.235	0.28	0.282	0.283	0.339	0.419	0.501	0.583
7/29/2010	0.237	0.283	0.285	0.289	0.346	0.427	0.51	0.592
7/28/2010	0.24	0.289	0.291	0.293	0.35	0.435	0.518	0.6
7/27/2010	0.24	0.293	0.293	0.298	0.359	0.446	0.527	0.608
7/26/2010	0.24	0.298	0.3	0.303	0.367	0.454	0.534	0.614
7/23/2010	0.24	0.298	0.305	0.305	0.37	0.457	0.537	0.617
7/22/2010	0.24	0.298	0.305	0.306	0.374	0.463	0.543	0.617
7/21/2010	0.25	0.3	0.306	0.307	0.377	0.469	0.548	0.617
7/20/2010	0.26	0.304	0.308	0.31	0.383	0.477	0.557	0.627
7/19/2010	0.26	0.305	0.309	0.312	0.385	0.48	0.56	0.632
7/16/2010	0.26	0.305	0.31	0.313	0.39	0.49	0.57	0.6423
7/15/2010	0.26	0.305	0.31	0.313	0.397	0.505	0.577	0.636
7/14/2010	0.26	0.305	0.31	0.313	0.397	0.51	0.58	0.639
7/13/2010	0.26	0.305	0.31	0.313	0.397	0.51	0.58	0.64
7/12/2010	0.26	0.305	0.31	0.313	0.397	0.507	0.567	0.626
7/9/2010	0.26	0.305	0.31	0.313	0.397	0.507	0.567	0.626
7/8/2010	0.26	0.307	0.312	0.316	0.4	0.51	0.57	0.63
7/7/2010	0.26	0.307	0.312	0.317	0.401	0.519	0.579	0.639
7/6/2010	0.26	0.307	0.312	0.317	0.401	0.519	0.579	0.639
7/5/2010	0.26	0.308	0.313	0.318	0.402	0.52	0.58	0.64
7/2/2010	0.26	0.308	0.313	0.318	0.402	0.529	0.587	0.643
7/1/2010	0.26	0.308	0.313	0.318	0.402	0.529	0.587	0.643
6/30/2010	0.26	0.308	0.313	0.318	0.402	0.529	0.588	0.645
6/29/2010	0.26	0.308	0.313	0.318	0.402	0.529	0.588	0.646
6/28/2010	0.26	0.308	0.313	0.318	0.402	0.53	0.59	0.648
6/25/2010	0.26	0.308	0.313	0.318	0.402	0.53	0.592	0.65
6/24/2010	0.26	0.308	0.313	0.318	0.402	0.53	0.592	0.65
6/23/2010	0.27	0.309	0.314	0.319	0.403	0.531	0.593	0.651
6/22/2010	0.27	0.309	0.314	0.319	0.403	0.531	0.593	0.651
6/21/2010	0.282	0.309	0.314	0.319	0.404	0.532	0.594	0.653
6/18/2010	0.282	0.309	0.314	0.319	0.404	0.533	0.595	0.654
6/17/2010	0.282	0.309	0.314	0.319	0.405	0.534	0.596	0.656
6/16/2010	0.292	0.31	0.315	0.32	0.405	0.534	0.596	0.657
6/15/2010	0.292	0.31	0.315	0.32	0.405	0.534	0.596	0.658
6/14/2010	0.292	0.31	0.315	0.32	0.405	0.534	0.596	0.658
6/11/2010	0.292	0.31	0.315	0.32	0.405	0.534	0.596	0.658
6/10/2010	0.292	0.31	0.315	0.32	0.405	0.529	0.596	0.659
6/9/2010	0.292	0.31	0.315	0.32	0.405	0.53	0.597	0.661
6/8/2010	0.292	0.31	0.315	0.32	0.405	0.53	0.597	0.661
6/7/2010	0.292	0.31	0.315	0.32	0.405	0.53	0.598	0.663
6/4/2010	0.292	0.315	0.325	0.33	0.415	0.53	0.595	0.657
6/3/2010	0.292	0.315	0.325	0.337	0.415	0.53	0.595	0.659
6/2/2010	0.292	0.315	0.325	0.337	0.415	0.53	0.595	0.659
6/1/2010	0.292	0.315	0.325	0.337	0.415	0.53	0.597	0.662
5/31/2010	0.29	0.315	0.325	0.335	0.41	0.535	0.595	0.66
5/28/2010	0.29	0.315	0.325	0.335	0.41	0.535	0.595	0.66
5/27/2010	0.29	0.315	0.325	0.335	0.41	0.54	0.6	0.662
5/26/2010	0.295	0.315	0.325	0.345	0.42	0.545	0.6	0.662
5/25/2010	0.295	0.327	0.33	0.352	0.426	0.555	0.61	0.667
5/24/2010	0.29	0.322	0.325	0.347	0.413	0.535	0.58	0.63
5/21/2010	0.29	0.322	0.323	0.345	0.41	0.52	0.565	0.61
5/20/2010	0.29	0.322	0.323	0.343	0.41	0.5	0.55	0.595
5/19/2010	0.29	0.322	0.322	0.341	0.406	0.48	0.52	0.572
5/18/2010	0.29	0.322	0.322	0.34	0.4	0.47	0.51	0.56

5/17/2010	0.29	0.32	0.32	0.334	0.394	0.46	0.494	0.547
5/14/2010	0.29	0.32	0.32	0.332	0.388	0.443	0.478	0.531
5/13/2010	0.29	0.32	0.32	0.33	0.382	0.437	0.47	0.522
5/12/2010	0.29	0.32	0.32	0.33	0.38	0.434	0.467	0.522
5/11/2010	0.29	0.32	0.32	0.33	0.38	0.43	0.464	0.519
5/10/2010	0.29	0.32	0.32	0.33	0.38	0.43	0.465	0.52
5/7/2010	0.29	0.32	0.32	0.33	0.38	0.43	0.47	0.53
5/6/2010	0.27	0.274	0.274	0.274	0.32	0.365	0.41	0.46
5/5/2010	0.26	0.26	0.26	0.265	0.295	0.34	0.39	0.44
5/4/2010	0.252	0.246	0.247	0.251	0.281	0.329	0.378	0.424
5/3/2010	0.242	0.242	0.242	0.248	0.277	0.325	0.37	0.415
4/30/2010	0.242	0.242	0.242	0.248	0.277	0.325	0.37	0.415
4/29/2010	0.242	0.242	0.242	0.246	0.274	0.315	0.36	0.4
4/28/2010	0.242	0.242	0.239	0.243	0.269	0.295	0.344	0.388
4/27/2010	0.232	0.239	0.234	0.239	0.261	0.284	0.33	0.369
4/26/2010	0.232	0.239	0.234	0.239	0.259	0.282	0.326	0.365
4/23/2010	0.232	0.239	0.234	0.239	0.257	0.28	0.324	0.363
4/22/2010	0.232	0.239	0.234	0.237	0.255	0.278	0.32	0.358
4/21/2010	0.242	0.242	0.234	0.237	0.255	0.276	0.316	0.353
4/20/2010	0.242	0.242	0.233	0.236	0.253	0.273	0.313	0.35
4/19/2010	0.242	0.242	0.233	0.235	0.253	0.273	0.313	0.35
4/16/2010	0.242	0.242	0.243	0.245	0.258	0.278	0.318	0.355
4/15/2010	0.25	0.243	0.242	0.25	0.264	0.285	0.325	0.355
4/14/2010	0.221	0.236	0.238	0.25	0.264	0.285	0.325	0.354
4/13/2010	0.221	0.236	0.238	0.25	0.263	0.283	0.323	0.352
4/12/2010	0.221	0.236	0.238	0.25	0.262	0.282	0.322	0.352
4/9/2010	0.221	0.236	0.238	0.25	0.26	0.28	0.32	0.35
4/8/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.32	0.35
4/7/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.32	0.35
4/6/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.32	0.35
4/5/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.318	0.348
4/2/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.318	0.348
4/1/2010	0.221	0.236	0.238	0.251	0.261	0.282	0.318	0.348
3/31/2010	0.221	0.236	0.237	0.251	0.261	0.282	0.318	0.348
3/30/2010	0.221	0.236	0.237	0.251	0.261	0.282	0.317	0.347
3/29/2010	0.22	0.235	0.236	0.25	0.26	0.281	0.316	0.346
3/26/2010	0.22	0.235	0.236	0.25	0.26	0.28	0.315	0.345
3/25/2010	0.223	0.235	0.236	0.248	0.255	0.275	0.31	0.345
3/24/2010	0.223	0.235	0.236	0.247	0.253	0.273	0.307	0.34
3/23/2010	0.223	0.235	0.236	0.246	0.252	0.272	0.306	0.34
3/22/2010	0.223	0.23	0.236	0.245	0.25	0.27	0.305	0.34
3/19/2010	0.223	0.23	0.235	0.243	0.249	0.267	0.296	0.329
3/18/2010	0.223	0.23	0.235	0.24	0.246	0.261	0.289	0.32
3/17/2010	0.223	0.23	0.235	0.237	0.244	0.259	0.287	0.32
3/16/2010	0.223	0.23	0.235	0.235	0.242	0.257	0.285	0.325
3/15/2010	0.185	0.22	0.225	0.23	0.24	0.255	0.285	0.325
3/12/2010	0.175	0.21	0.22	0.23	0.24	0.255	0.285	0.325
3/11/2010	0.175	0.21	0.22	0.23	0.24	0.255	0.285	0.325
3/10/2010	0.175	0.21	0.22	0.23	0.24	0.255	0.285	0.325
3/9/2010	0.18	0.21	0.22	0.23	0.24	0.255	0.285	0.325
3/8/2010	0.185	0.21	0.22	0.23	0.24	0.255	0.285	0.325
3/5/2010	0.18	0.205	0.215	0.225	0.235	0.25	0.28	0.319
3/4/2010	0.18	0.205	0.215	0.225	0.235	0.25	0.28	0.319
3/3/2010	0.175	0.205	0.215	0.225	0.235	0.25	0.28	0.319
3/2/2010	0.175	0.205	0.215	0.225	0.235	0.25	0.28	0.319



3/1/2010	0.17	0.205	0.215	0.225	0.235	0.25	0.28	0.32
2/26/2010	0.17	0.21	0.22	0.23	0.24	0.25	0.28	0.32
2/25/2010	0.17	0.21	0.22	0.23	0.24	0.25	0.28	0.32
2/24/2010	0.17	0.21	0.22	0.23	0.24	0.25	0.28	0.32
2/23/2010	0.17	0.21	0.22	0.23	0.24	0.25	0.28	0.32
2/22/2010	0.175	0.21	0.22	0.23	0.24	0.252	0.28	0.325
2/19/2010	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.33
2/18/2010	0.175	0.21	0.22	0.23	0.24	0.25	0.27	0.32
2/17/2010	0.175	0.21	0.22	0.23	0.24	0.25	0.27	0.32
2/16/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/15/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/12/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/11/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/10/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/9/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/8/2010	0.175	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/5/2010	0.19	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/4/2010	0.19	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/3/2010	0.19	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/2/2010	0.19	0.21	0.22	0.23	0.24	0.245	0.27	0.32
2/1/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/29/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/28/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/27/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/26/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.315
1/25/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.315
1/22/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.315
1/21/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/20/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/19/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/18/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/15/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/14/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/13/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/12/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/11/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.27	0.32
1/8/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.28	0.33
1/7/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.28	0.33
1/6/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.285	0.335
1/5/2010	0.18	0.21	0.22	0.23	0.24	0.245	0.285	0.335
1/4/2010	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.342
1/1/2010	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.342
12/31/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.342
12/30/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.342
12/29/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.342
12/28/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.34
12/25/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.34
12/24/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.34
12/23/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.34
12/22/2009	0.18	0.21	0.22	0.23	0.24	0.245	0.29	0.34
12/21/2009	0.18	0.21	0.22	0.23	0.24	0.245	0.285	0.34
12/18/2009	0.18	0.21	0.22	0.23	0.238	0.245	0.282	0.339
12/17/2009	0.18	0.21	0.22	0.23	0.238	0.247	0.287	0.346
12/16/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.35
12/15/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.285	0.35

12/14/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.285	0.35
12/11/2009	0.18	0.21	0.22	0.23	0.24	0.249	0.287	0.347
12/10/2009	0.18	0.21	0.22	0.23	0.24	0.249	0.288	0.348
12/9/2009	0.18	0.21	0.22	0.23	0.24	0.249	0.288	0.348
12/8/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.35
12/7/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.37
12/4/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.29	0.37
12/3/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.284	0.366
12/2/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.27	0.35
12/1/2009	0.18	0.21	0.22	0.23	0.24	0.25	0.28	0.36
11/30/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.29	0.37
11/27/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.285	0.37
11/26/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.37
11/25/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.37
11/24/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.37
11/23/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.38
11/20/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.38
11/19/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.28	0.38
11/18/2009	0.175	0.21	0.22	0.23	0.24	0.25	0.29	0.39
11/17/2009	0.175	0.21	0.22	0.23	0.25	0.24	0.31	0.41
11/16/2009	0.175	0.21	0.22	0.23	0.25	0.24	0.31	0.41
11/13/2009	0.175	0.21	0.22	0.23	0.25	0.26	0.32	0.42
11/12/2009	0.18	0.21	0.22	0.23	0.25	0.26	0.32	0.42
11/11/2009	0.18	0.21	0.22	0.23	0.25	0.26	0.32	0.42
11/10/2009	0.18	0.21	0.22	0.23	0.25	0.26	0.32	0.42
11/9/2009	0.177	0.21	0.22	0.23	0.25	0.26	0.32	0.42
11/6/2009	0.177	0.21	0.22	0.23	0.25	0.26	0.33	0.43
11/5/2009	0.177	0.21	0.22	0.23	0.25	0.26	0.323	0.429
11/4/2009	0.18	0.21	0.22	0.23	0.25	0.26	0.33	0.44
11/3/2009	0.17	0.21	0.22	0.23	0.25	0.26	0.33	0.44
11/2/2009	0.17	0.21	0.225	0.235	0.255	0.265	0.34	0.45
10/30/2009	0.18	0.22	0.235	0.243	0.265	0.275	0.34	0.449
10/29/2009	0.18	0.225	0.235	0.243	0.265	0.275	0.34	0.454
10/28/2009	0.18	0.225	0.235	0.243	0.252	0.261	0.335	0.454
10/27/2009	0.19	0.235	0.24	0.243	0.252	0.261	0.34	0.464
10/26/2009	0.185	0.225	0.235	0.245	0.252	0.261	0.34	0.464
10/23/2009	0.19	0.235	0.24	0.245	0.252	0.261	0.34	0.464
10/22/2009	0.19	0.235	0.24	0.245	0.252	0.264	0.345	0.467
10/21/2009	0.19	0.235	0.24	0.245	0.254	0.265	0.345	0.465
10/20/2009	0.19	0.235	0.24	0.245	0.254	0.265	0.345	0.465
10/19/2009	0.19	0.235	0.24	0.245	0.245	0.267	0.35	0.465
10/16/2009	0.19	0.235	0.24	0.245	0.245	0.267	0.35	0.47
10/15/2009	0.19	0.235	0.24	0.245	0.245	0.267	0.35	0.47
10/14/2009	0.19	0.235	0.24	0.245	0.245	0.267	0.35	0.47
10/13/2009	0.19	0.235	0.24	0.245	0.245	0.267	0.35	0.47
10/12/2009	0.19	0.235	0.24	0.24	0.245	0.265	0.36	0.48
10/9/2009	0.19	0.235	0.24	0.24	0.245	0.265	0.36	0.48
10/8/2009	0.2	0.235	0.24	0.24	0.245	0.265	0.36	0.48
10/7/2009	0.2	0.235	0.24	0.24	0.245	0.265	0.36	0.485
10/6/2009	0.21	0.245	0.24	0.24	0.245	0.265	0.36	0.49
10/5/2009	0.2	0.24	0.24	0.24	0.24	0.265	0.365	0.495
10/2/2009	0.19	0.235	0.24	0.24	0.24	0.265	0.365	0.495
10/1/2009	0.21	0.24	0.24	0.24	0.24	0.265	0.37	0.505
9/30/2009	0.21	0.24	0.24	0.24	0.24	0.27	0.38	0.515
9/29/2009	0.21	0.24	0.24	0.24	0.24	0.27	0.38	0.515

9/28/2009	0.22	0.24	0.24	0.24	0.24	0.27	0.39	0.53
9/25/2009	0.22	0.24	0.24	0.24	0.24	0.27	0.39	0.53
9/24/2009	0.22	0.24	0.24	0.24	0.24	0.27	0.395	0.535
9/23/2009	0.22	0.24	0.24	0.24	0.24	0.27	0.415	0.545
9/22/2009	0.22	0.24	0.24	0.24	0.24	0.275	0.405	0.545
9/21/2009	0.22	0.24	0.24	0.24	0.24	0.275	0.415	0.55
9/18/2009	0.22	0.24	0.24	0.24	0.24	0.28	0.42	0.56
9/17/2009	0.22	0.24	0.24	0.24	0.24	0.28	0.43	0.58
9/16/2009	0.22	0.24	0.24	0.24	0.24	0.28	0.43	0.58
9/15/2009	0.22	0.24	0.24	0.24	0.245	0.287	0.42	0.58
9/14/2009	0.22	0.24	0.24	0.24	0.245	0.29	0.43	0.59
9/11/2009	0.22	0.242	0.242	0.242	0.247	0.292	0.43	0.59
9/10/2009	0.22	0.245	0.245	0.245	0.245	0.29	0.425	0.59
9/9/2009	0.22	0.247	0.247	0.247	0.247	0.292	0.435	0.595
9/8/2009	0.23	0.25	0.25	0.25	0.25	0.28	0.43	0.59
9/7/2009	0.23	0.25	0.25	0.25	0.25	0.295	0.445	0.61
9/4/2009	0.23	0.25	0.25	0.25	0.25	0.3	0.45	0.615
9/3/2009	0.23	0.25	0.25	0.25	0.25	0.31	0.46	0.63
9/2/2009	0.23	0.25	0.25	0.25	0.25	0.31	0.47	0.64
9/1/2009	0.23	0.25	0.25	0.25	0.24	0.31	0.49	0.63
8/31/2009	0.22	0.25	0.25	0.25	0.26	0.32	0.5	0.66
8/28/2009	0.22	0.25	0.25	0.25	0.26	0.32	0.5	0.66
8/27/2009	0.22	0.25	0.25	0.25	0.26	0.34	0.52	0.69
8/26/2009	0.22	0.25	0.25	0.25	0.27	0.36	0.55	0.71
8/25/2009	0.23	0.25	0.25	0.25	0.27	0.37	0.56	0.73
8/24/2009	0.23	0.25	0.25	0.25	0.28	0.38	0.57	0.74
8/21/2009	0.23	0.25	0.25	0.25	0.29	0.4	0.57	0.74
8/20/2009	0.23	0.25	0.25	0.25	0.29	0.41	0.59	0.75
8/19/2009	0.23	0.25	0.25	0.25	0.3	0.45	0.63	0.79
8/18/2009	0.23	0.25	0.25	0.25	0.31	0.46	0.64	0.81
8/17/2009	0.23	0.25	0.25	0.25	0.31	0.46	0.64	0.81
8/14/2009	0.23	0.25	0.25	0.25	0.31	0.46	0.64	0.81
8/13/2009	0.23	0.25	0.25	0.25	0.34	0.5	0.66	0.84
8/12/2009	0.24	0.25	0.25	0.25	0.34	0.5	0.66	0.84
8/11/2009	0.25	0.25	0.25	0.25	0.34	0.5	0.67	0.85
8/10/2009	0.25	0.25	0.25	0.25	0.34	0.51	0.69	0.87
8/7/2009	0.25	0.25	0.25	0.25	0.34	0.51	0.68	0.86
8/6/2009	0.25	0.25	0.25	0.25	0.34	0.52	0.69	0.87
8/5/2009	0.25	0.25	0.25	0.25	0.34	0.52	0.69	0.87
8/4/2009	0.24	0.25	0.25	0.25	0.34	0.52	0.69	0.87
8/3/2009	0.23	0.25	0.25	0.25	0.34	0.52	0.68	0.87
7/31/2009	0.23	0.25	0.25	0.25	0.35	0.53	0.69	0.88
7/30/2009	0.23	0.26	0.26	0.26	0.36	0.54	0.7	0.89
7/29/2009	0.23	0.26	0.26	0.26	0.36	0.54	0.7	0.89
7/28/2009	0.23	0.26	0.26	0.26	0.36	0.54	0.71	0.89
7/27/2009	0.22	0.26	0.26	0.26	0.37	0.55	0.72	0.91
7/24/2009	0.22	0.26	0.26	0.26	0.37	0.55	0.72	0.91
7/23/2009	0.23	0.26	0.26	0.26	0.37	0.55	0.72	0.91
7/22/2009	0.23	0.26	0.26	0.26	0.37	0.55	0.72	0.91
7/21/2009	0.23	0.26	0.26	0.26	0.37	0.55	0.72	0.91
7/20/2009	0.23	0.26	0.26	0.26	0.37	0.55	0.73	0.92
7/17/2009	0.24	0.26	0.26	0.26	0.37	0.555	0.72	0.91
7/16/2009	0.24	0.26	0.26	0.26	0.375	0.565	0.735	0.93
7/15/2009	0.24	0.26	0.26	0.26	0.375	0.565	0.735	0.93
7/14/2009	0.245	0.26	0.26	0.26	0.375	0.56	0.74	0.94

7/13/2009	0.245	0.26	0.26	0.26	0.375	0.555	0.73	0.92
7/10/2009	0.245	0.265	0.265	0.265	0.38	0.55	0.725	0.92
7/9/2009	0.25	0.265	0.27	0.27	0.39	0.565	0.74	0.93
7/8/2009	0.26	0.28	0.285	0.3	0.4	0.58	0.76	0.945
7/7/2009	0.26	0.28	0.285	0.3	0.41	0.595	0.77	0.95
7/6/2009	0.265	0.28	0.285	0.3	0.415	0.605	0.78	0.96
7/3/2009	0.265	0.285	0.29	0.3	0.42	0.61	0.79	0.97
7/2/2009	0.265	0.285	0.295	0.305	0.425	0.635	0.815	0.995
7/1/2009	0.27	0.29	0.295	0.31	0.435	0.645	0.825	1.01
6/30/2009	0.27	0.29	0.295	0.31	0.435	0.645	0.84	1.03
6/29/2009	0.27	0.295	0.3	0.31	0.44	0.65	0.845	1.025
6/26/2009	0.27	0.3	0.3	0.305	0.44	0.645	0.84	1.015
6/25/2009	0.27	0.3	0.3	0.31	0.45	0.65	0.85	1.03
6/24/2009	0.275	0.3	0.3	0.31	0.46	0.655	0.86	1.05
6/23/2009	0.28	0.3	0.3	0.31	0.46	0.66	0.87	1.06
6/22/2009	0.27	0.3	0.31	0.32	0.47	0.66	0.88	1.06
6/19/2009	0.27	0.29	0.31	0.32	0.47	0.66	0.9	1.08
6/18/2009	0.27	0.29	0.31	0.32	0.47	0.66	0.89	1.07
6/17/2009	0.27	0.29	0.31	0.32	0.47	0.66	0.9	1.07
6/16/2009	0.26	0.29	0.31	0.32	0.47	0.66	0.9	1.07
6/15/2009	0.27	0.29	0.31	0.32	0.48	0.67	0.91	1.08
6/12/2009	0.26	0.29	0.3	0.32	0.49	0.67	0.92	1.1
6/11/2009	0.26	0.29	0.3	0.32	0.5	0.68	0.93	1.13
6/10/2009	0.26	0.29	0.3	0.32	0.5	0.69	0.94	1.14
6/9/2009	0.27	0.3	0.31	0.33	0.51	0.69	0.96	1.15
6/8/2009	0.26	0.29	0.31	0.33	0.51	0.7	0.98	1.18
6/5/2009	0.26	0.29	0.31	0.32	0.5	0.68	0.94	1.13
6/4/2009	0.26	0.29	0.31	0.32	0.5	0.68	0.93	1.11
6/3/2009	0.26	0.29	0.31	0.32	0.51	0.69	0.95	1.14
6/2/2009	0.26	0.29	0.31	0.32	0.52	0.7	0.97	1.17
6/1/2009	0.26	0.3	0.31	0.32	0.53	0.7	0.97	1.17
5/29/2009	0.26	0.29	0.3	0.32	0.53	0.71	0.98	1.17
5/28/2009	0.25	0.29	0.3	0.33	0.53	0.73	1	1.19
5/27/2009	0.26	0.29	0.3	0.32	0.53	0.73	1.01	1.21
5/26/2009	0.23	0.28	0.3	0.31	0.52	0.71	0.98	1.17
5/25/2009	0.22	0.28	0.3	0.31	0.52	0.7	0.98	1.17
5/22/2009	0.22	0.28	0.3	0.31	0.52	0.7	0.98	1.17
5/21/2009	0.22	0.28	0.3	0.3	0.54	0.71	0.97	1.14
5/20/2009	0.22	0.28	0.3	0.3	0.58	0.77	1.03	1.2
5/19/2009	0.22	0.28	0.3	0.31	0.6	0.8	1.06	1.24
5/18/2009	0.22	0.28	0.31	0.32	0.64	0.85	1.11	1.28
5/15/2009	0.23	0.29	0.32	0.33	0.67	0.88	1.15	1.31
5/14/2009	0.22	0.3	0.32	0.34	0.7	0.91	1.17	1.33
5/13/2009	0.22	0.3	0.32	0.34	0.72	0.94	1.18	1.35
5/12/2009	0.23	0.3	0.33	0.35	0.76	0.96	1.2	1.38
5/11/2009	0.23	0.3	0.33	0.35	0.76	0.96	1.2	1.39
5/8/2009	0.23	0.31	0.34	0.37	0.78	0.98	1.22	1.41
5/7/2009	0.24	0.32	0.35	0.39	0.81	1.01	1.24	1.44
5/6/2009	0.25	0.33	0.36	0.4	0.82	1.02	1.26	1.46
5/5/2009	0.24	0.32	0.36	0.4	0.83	1.04	1.28	1.49
5/4/2009	0.22	0.32	0.36	0.43	0.855	1.05	1.28	1.495
5/1/2009	0.22	0.32	0.36	0.43	0.855	1.05	1.28	1.495
4/30/2009	0.23	0.32	0.36	0.43	0.86	1.06	1.3	1.51
4/29/2009	0.22	0.32	0.37	0.45	0.87	1.09	1.33	1.54
4/28/2009	0.21	0.32	0.37	0.45	0.88	1.1	1.33	1.54



4/27/2009	0.2	0.32	0.37	0.45	0.88	1.1	1.33	1.54
4/24/2009	0.2	0.32	0.38	0.46	0.9	1.14	1.37	1.57
4/23/2009	0.19	0.32	0.38	0.46	0.91	1.14	1.38	1.58
4/22/2009	0.19	0.32	0.38	0.47	0.92	1.15	1.39	1.61
4/21/2009	0.21	0.33	0.39	0.47	0.92	1.16	1.4	1.6
4/20/2009	0.22	0.35	0.4	0.48	0.92	1.16	1.41	1.6
4/17/2009	0.25	0.36	0.41	0.47	0.915	1.15	1.385	1.575
4/16/2009	0.26	0.365	0.41	0.465	0.905	1.145	1.38	1.56
4/15/2009	0.26	0.36	0.41	0.455	0.9	1.135	1.37	1.55
4/14/2009	0.26	0.36	0.41	0.45	0.89	1.12	1.36	1.54
4/13/2009	0.28	0.38	0.42	0.46	0.89	1.13	1.37	1.55
4/10/2009	0.28	0.38	0.42	0.46	0.89	1.13	1.37	1.55
4/9/2009	0.28	0.38	0.42	0.46	0.89	1.13	1.37	1.55
4/8/2009	0.27	0.38	0.42	0.47	0.9	1.15	1.39	1.56
4/7/2009	0.27	0.38	0.42	0.47	0.91	1.15	1.39	1.56
4/6/2009	0.28	0.38	0.43	0.48	0.91	1.16	1.4	1.57
4/3/2009	0.275	0.39	0.44	0.485	0.91	1.16	1.4	1.565
4/2/2009	0.28	0.42	0.46	0.5	0.92	1.18	1.4	1.57
4/1/2009	0.31	0.43	0.46	0.5	0.93	1.19	1.41	1.57
3/31/2009	0.48	0.44	0.47	0.51	0.94	1.2	1.42	1.59
3/30/2009	0.29	0.45	0.48	0.52	0.95	1.22	1.43	1.6
3/27/2009	0.27	0.46	0.48	0.52	0.96	1.22	1.44	1.61
3/26/2009	0.28	0.46	0.48	0.53	0.97	1.23	1.46	1.63
3/25/2009	0.29	0.47	0.48	0.53	0.97	1.23	1.45	1.62
3/24/2009	0.29	0.47	0.48	0.53	0.97	1.23	1.45	1.62
3/23/2009	0.3	0.48	0.48	0.53	0.97	1.23	1.45	1.61
3/20/2009	0.29	0.4	0.46	0.53	0.97	1.23	1.45	1.61
3/19/2009	0.3	0.4	0.46	0.53	0.97	1.23	1.45	1.6
3/18/2009	0.31	0.41	0.48	0.55	1.01	1.3	1.54	1.7
3/17/2009	0.31	0.41	0.48	0.55	1.01	1.31	1.56	1.72
3/16/2009	0.32	0.41	0.5	0.55	1.01	1.31	1.57	1.72
3/13/2009	0.315	0.41	0.45	0.55	1.015	1.32	1.58	1.725
3/12/2009	0.32	0.41	0.45	0.55	1.015	1.32	1.59	1.725
3/11/2009	0.33	0.405	0.45	0.565	1.02	1.335	1.6	1.75
3/10/2009	0.33	0.42	0.46	0.58	1.02	1.34	1.62	1.78
3/9/2009	0.33	0.41	0.45	0.57	1.01	1.32	1.6	1.76
3/6/2009	0.32	0.4	0.44	0.55	0.99	1.29	1.55	1.69
3/5/2009	0.31	0.39	0.42	0.52	0.98	1.28	1.54	1.67
3/4/2009	0.32	0.39	0.42	0.51	0.98	1.28	1.53	1.66
3/3/2009	0.31	0.39	0.42	0.51	0.97	1.27	1.52	1.65
3/2/2009	0.31	0.38	0.42	0.5	0.97	1.27	1.52	1.65
2/27/2009	0.43	0.39	0.43	0.51	0.97	1.27	1.52	1.65
2/26/2009	0.28	0.38	0.41	0.505	0.96	1.26	1.52	1.65
2/25/2009	0.26	0.38	0.41	0.48	0.96	1.26	1.5	1.63
2/24/2009	0.25	0.37	0.4	0.47	0.95	1.25	1.49	1.61
2/23/2009	0.25	0.37	0.42	0.47	0.95	1.25	1.49	1.61
2/20/2009	0.275	0.36	0.41	0.47	0.95	1.25	1.485	1.615
2/19/2009	0.3	0.37	0.41	0.47	0.95	1.25	1.485	1.62
2/18/2009	0.315	0.365	0.415	0.47	0.95	1.25	1.475	1.62
2/17/2009	0.31	0.365	0.41	0.465	0.95	1.25	1.47	1.605
2/16/2009	0.31	0.36	0.41	0.465	0.955	1.25	1.465	1.6
2/13/2009	0.31	0.37	0.41	0.46	0.95	1.24	1.45	1.58
2/12/2009	0.29	0.36	0.41	0.45	0.94	1.23	1.44	1.57
2/11/2009	0.3	0.36	0.41	0.45	0.94	1.23	1.45	1.57
2/10/2009	0.31	0.36	0.41	0.45	0.93	1.22	1.43	1.54

2/9/2009	0.3	0.36	0.405	0.445	0.935	1.225	1.43	1.555
2/6/2009	0.3	0.36	0.4	0.44	0.95	1.23	1.45	1.57
2/5/2009	0.32	0.36	0.4	0.44	0.95	1.24	1.46	1.61
2/4/2009	0.31	0.35	0.39	0.43	0.95	1.24	1.46	1.6
2/3/2009	0.31	0.35	0.39	0.45	0.96	1.24	1.46	1.61
2/2/2009	0.29	0.33	0.38	0.44	0.95	1.24	1.47	1.6
1/30/2009	0.33	0.32	0.37	0.42	0.91	1.18	1.38	1.51
1/29/2009	0.23	0.31	0.36	0.41	0.9	1.18	1.36	1.5
1/28/2009	0.22	0.31	0.36	0.41	0.91	1.18	1.35	1.49
1/27/2009	0.22	0.31	0.35	0.41	0.91	1.19	1.37	1.52
1/26/2009	0.23	0.3	0.34	0.41	0.92	1.19	1.37	1.53
1/23/2009	0.23	0.3	0.33	0.4	0.91	1.18	1.36	1.5
1/22/2009	0.22	0.3	0.33	0.39	0.9	1.17	1.34	1.48
1/21/2009	0.23	0.26	0.3	0.36	0.88	1.14	1.31	1.45
1/20/2009	0.17	0.25	0.3	0.37	0.89	1.15	1.31	1.44
1/19/2009	0.17	0.245	0.29	0.36	0.88	1.14	1.3	1.43
1/16/2009	0.17	0.25	0.3	0.37	0.9	1.16	1.32	1.46
1/15/2009	0.14	0.25	0.3	0.34	0.85	1.1	1.25	1.38
1/14/2009	0.11	0.25	0.28	0.34	0.85	1.1	1.23	1.35
1/13/2009	0.11	0.25	0.28	0.34	0.86	1.12	1.24	1.36
1/12/2009	0.11	0.25	0.28	0.35	0.9	1.16	1.27	1.39
1/9/2009	0.1	0.25	0.3	0.36	0.97	1.27	1.37	1.49
1/8/2009	0.1	0.27	0.31	0.39	1.05	1.36	1.47	1.59
1/7/2009	0.11	0.27	0.32	0.4	1.08	1.4	1.52	1.65
1/6/2009	0.14	0.29	0.33	0.43	1.1	1.42	1.54	1.67
1/5/2009	0.12	0.28	0.33	0.43	1.11	1.43	1.57	1.69
1/2/2009	0.12	0.35	0.38	0.43	1.1	1.43	1.57	1.67
1/1/2009	0.13	0.37	0.4	0.44	1.1	1.42	1.56	1.65
12/31/2008	0.13	0.37	0.4	0.44	1.1	1.42	1.56	1.65
12/30/2008	0.12	0.4	0.42	0.45	1.12	1.43	1.58	1.68
12/29/2008	0.12	0.4	0.44	0.46	1.14	1.46	1.61	1.72
12/26/2008	0.17	0.49	0.49	0.47	1.15	1.47	1.6	1.71
12/25/2008	0.17	0.49	0.49	0.47	1.15	1.47	1.6	1.71
12/24/2008	0.17	0.49	0.49	0.47	1.15	1.47	1.6	1.71
12/23/2008	0.12	0.54	0.49	0.46	1.16	1.47	1.61	1.72
12/22/2008	0.12	0.25	0.51	0.46	1.16	1.47	1.61	1.72
12/19/2008	0.13	0.26	0.55	0.47	1.18	1.49	1.62	1.72
12/18/2008	0.12	0.26	0.63	0.54	1.24	1.54	1.66	1.77
12/17/2008	0.13	0.29	0.64	0.6	1.29	1.59	1.7	1.82
12/16/2008	0.18	0.33	0.93	0.92	1.58	1.84	1.96	2.08
12/15/2008	0.15	0.33	0.43	0.98	1.64	1.88	2	2.13
12/12/2008	0.1	0.35	0.5	1.07	1.675	1.91	2	2.11
12/11/2008	0.08	0.3	0.55	1.21	1.75	2	2.1	2.21
12/10/2008	0.1	0.4	0.62	1.41	1.9	2.1	2.2	2.32
12/9/2008	0.08	0.6	0.85	1.7	2	2.17	2.28	2.41
12/8/2008	0.15	0.75	1	1.85	2.04	2.19	2.33	2.47
12/5/2008	0.22	0.95	1.19	1.87	2.04	2.19	2.31	2.42
12/4/2008	0.45	1.05	1.25	1.88	2.04	2.18	2.31	2.42
12/3/2008	0.85	1.19	1.29	1.89	2.06	2.2	2.33	2.45
12/2/2008	1.03	1.21	1.32	1.91	2.06	2.21	2.34	2.45
12/1/2008	1.15	1.23	1.34	1.91	2.07	2.22	2.36	2.49
11/28/2008	1.15	1.22	1.33	1.92	2.06	2.22	2.34	2.47
11/27/2008	1	1.2	1.3	1.93	2.05	2.2	2.34	2.46
11/26/2008	1	1.2	1.28	1.44	2.05	2.17	2.3	2.43
11/25/2008	1	1.2	1.28	1.44	2.05	2.2	2.36	2.51

11/24/2008	0.85	1.1	1.22	1.42	2.03	2.16	2.31	2.45
11/21/2008	0.6	1.05	1.15	1.4	2.02	2.15	2.29	2.44
11/20/2008	0.45	1.02	1.13	1.4	2.01	2.14	2.28	2.42
11/19/2008	0.45	0.95	1.15	1.43	2.06	2.19	2.33	2.46
11/18/2008	0.4	0.95	1.15	1.47	2.11	2.23	2.36	2.48
11/17/2008	0.4	0.95	1.13	1.49	2.13	2.25	2.4	2.55
11/14/2008	0.4	1	1.15	1.5	2.13	2.25	2.41	2.58
11/13/2008	0.4	0.9	1.1	1.44	2.05	2.17	2.35	2.51
11/12/2008	0.38	0.82	1.05	1.44	2.04	2.15	2.28	2.38
11/11/2008	0.38	0.82	1.05	1.5	2.05	2.19	2.32	2.44
11/10/2008	0.38	0.9	1.11	1.55	2.12	2.25	2.38	2.5
11/7/2008	0.35	0.9	1.15	1.67	2.16	2.3	2.4	2.5
11/6/2008	0.35	0.95	1.2	1.8	2.25	2.37	2.51	2.61
11/5/2008	0.35	0.95	1.25	1.91	2.38	2.5	2.62	2.72
11/4/2008	0.35	0.95	1.35	2.17	2.6	2.7	2.8	2.9
11/3/2008	0.4	1.1	1.5	2.35	2.72	2.85	2.94	3.02
10/31/2008	0.35	1.25	1.5	2.6	2.98	3.02	3.08	3.1
10/30/2008	0.65	1.5	2	2.9	3.2	3.2	3.24	3.25
10/29/2008	1.1	2.05	2.35	3.14	3.25	3.4	3.4	3.4
10/28/2008	1.18	2.2	2.45	3.18	3.33	3.45	3.46	3.47
10/27/2008	1.25	2.25	2.5	3.23	3.37	3.5	3.5	3.5
10/24/2008	1.3	2.25	2.55	3.26	3.39	3.55	3.55	3.55
10/23/2008	1.2	2.25	2.55	3.25	3.38	3.6	3.6	3.6
10/22/2008	1.2	2.25	2.75	3.3	3.4	3.55	3.53	3.51
10/21/2008	1.25	2.5	2.9	3.55	3.75	3.85	3.8	3.78
10/20/2008	1.75	3	3.3	3.8	3.95	4.08	4	3.9
10/17/2008	1.65	3.25	3.7	4.2	4.33	4.43	4.32	4.22
10/16/2008	1.95	3.6	4	4.32	4.42	4.52	4.4	4.3
10/15/2008	2	4	4.1	4.35	4.45	4.53	4.41	4.31
10/14/2008	2	4.1	4.3	4.45	4.52	4.58	4.4	4.32
10/13/2008	2	4.55	4.55	4.53	4.65	4.75	4.58	4.5
10/10/2008	2	4.75	4.7	4.65	4.73	4.85	4.66	4.55
10/9/2008	5	4.75	4.6	4.5	4.58	4.75	4.62	4.5
10/8/2008	5.5	4.3	4.25	4.2	4.4	4.5	4.35	4.25
10/7/2008	3.5	4.05	4.08	4.15	4.21	4.28	4.2	4.1
10/6/2008	2.5	4.05	4.05	4.11	4.21	4.3	4.2	4.1
10/3/2008	1.75	4	4.03	4.05	4.21	4.35	4.2	4.15
10/2/2008	2.5	4.1	4.1	3.99	4.05	4.15	4.1	4.08
10/1/2008	3.6	4.2	4.15	4	4.05	4.1	4.07	4.07
9/30/2008	6	4.05	4.05	3.85	3.9	4	4	4
9/29/2008	2.4	3.9	3.85	3.71	3.73	3.85	3.83	3.83
9/26/2008	2	4	3.85	3.71	3.73	3.75	3.8	3.83
9/25/2008	2.35	4	3.85	3.71	3.72	3.74	3.82	3.92
9/24/2008	2.8	3.95	3.75	3.39	3.4	3.41	3.53	3.63
9/23/2008	2.95	4	3.8	3.19	3.19	3.2	3.29	3.38
9/22/2008	2.75	4	3.5	3.12	3.15	3.18	3.26	3.34
9/19/2008	3.4	3.9	3.8	3.18	3.2	3.2	3.25	3.36
9/18/2008	3.5	4.5	4.5	3.2	3.2	3.2	3.35	3.4
9/17/2008	4.5	4.5	4	3.1	3.07	3.05	3.16	3.24
9/16/2008	6	3	3	2.8	2.78	2.88	2.97	3
9/15/2008	3	2.6	2.55	2.53	2.69	2.82	2.94	2.97
9/12/2008	2.14	2.35	2.39	2.49	2.69	2.82	2.96	3.01
9/11/2008	2.14	2.34	2.38	2.485	2.69	2.82	2.96	3.01
9/10/2008	2.12	2.33	2.38	2.49	2.69	2.82	2.96	3.01
9/9/2008	2.13	2.35	2.38	2.485	2.685	2.815	2.95	3.01

9/8/2008	2.13	2.37	2.41	2.485	2.685	2.815	2.96	3.03
9/5/2008	2.13	2.39	2.42	2.485	2.685	2.815	2.95	3.01
9/4/2008	2.15	2.38	2.42	2.49	2.685	2.815	2.95	3.02
9/3/2008	2.15	2.38	2.42	2.485	2.685	2.815	2.95	3.02
9/2/2008	2.16	2.38	2.42	2.485	2.68	2.81	2.95	3.03
9/1/2008	2.25	2.39	2.42	2.485	2.68	2.81	2.95	3.02
8/29/2008	2.25	2.39	2.43	2.485	2.68	2.81	2.95	3.02
8/28/2008	2.18	2.4	2.43	2.485	2.68	2.81	2.95	3.02
8/27/2008	2.13	2.43	2.45	2.47	2.68	2.81	2.91	3.02
8/26/2008	2.12	2.42	2.44	2.47	2.68	2.81	2.91	3.02
8/25/2008	2.1	2.41	2.44	2.47	2.68	2.81	2.91	3.02
8/22/2008	2.1	2.41	2.44	2.47	2.68	2.81	2.91	3.02
8/21/2008	2.09	2.43	2.435	2.475	2.685	2.815	2.9	3.01
8/20/2008	2.09	2.37	2.44	2.475	2.685	2.815	2.91	3.02
8/19/2008	2.16	2.38	2.44	2.47	2.68	2.81	2.91	3.02
8/18/2008	2.2	2.39	2.45	2.47	2.68	2.815	2.915	3.025
8/15/2008	2.25	2.39	2.44	2.465	2.675	2.81	2.91	3.02
8/14/2008	2.17	2.39	2.44	2.465	2.675	2.805	2.9	3
8/13/2008	2.17	2.4	2.43	2.465	2.675	2.805	2.9	3
8/12/2008	2.16	2.39	2.43	2.46	2.67	2.805	2.905	3.01
8/11/2008	2.16	2.4	2.44	2.46	2.67	2.8	2.9	3
8/8/2008	2.14	2.41	2.44	2.46	2.67	2.8	2.9	2.995
8/7/2008	2.19	2.41	2.45	2.46	2.67	2.8	2.9	3
8/6/2008	2.2	2.41	2.44	2.46	2.665	2.8	2.895	3
8/5/2008	2.2	2.41	2.44	2.46	2.665	2.8	2.9	3.01
8/4/2008	2.18	2.405	2.435	2.46	2.665	2.8	2.895	3.01
8/1/2008	2.2	2.42	2.45	2.46	2.66	2.79	2.89	3
7/31/2008	2.35	2.45	2.45	2.46	2.655	2.78	2.88	2.99
7/30/2008	2.33	2.45	2.45	2.465	2.665	2.8	2.9	3.03
7/29/2008	2.28	2.45	2.45	2.46	2.665	2.8	2.9	3.01
7/28/2008	2.16	2.4	2.43	2.46	2.66	2.795	2.91	3.02
7/25/2008	2.12	2.4	2.43	2.46	2.66	2.795	2.895	3.005
7/24/2008	2.1	2.39	2.42	2.46	2.67	2.795	2.915	3.04
7/23/2008	2.1	2.4	2.42	2.46	2.67	2.8	2.92	3.06
7/22/2008	2.1	2.37	2.43	2.46	2.67	2.8	2.9	3.02
7/21/2008	2.1	2.37	2.43	2.46	2.67	2.8	2.91	3.03
7/18/2008	2.1	2.38	2.43	2.46	2.66	2.79	2.89	3
7/17/2008	2.12	2.38	2.44	2.455	2.66	2.785	2.89	2.99
7/16/2008	2.19	2.39	2.44	2.46	2.66	2.785	2.885	2.98
7/15/2008	2.31	2.4	2.43	2.46	2.66	2.79	2.89	2.985
7/14/2008	2.2	2.41	2.43	2.46	2.66	2.79	2.9	3
7/11/2008	2.15	2.42	2.44	2.46	2.66	2.79	2.9	3.01
7/10/2008	2.18	2.43	2.44	2.46	2.66	2.785	2.89	2.99
7/9/2008	2.35	2.45	2.46	2.46	2.66	2.79	2.895	3
7/8/2008	2.35	2.46	2.46	2.46	2.66	2.79	2.89	2.99
7/7/2008	2.38	2.45	2.45	2.46	2.66	2.79	2.89	3
7/4/2008	2.44	2.46	2.46	2.46	2.66	2.79	2.89	3
7/3/2008	2.44	2.45	2.46	2.46	2.66	2.79	2.9	3.01
7/2/2008	2.43	2.46	2.46	2.46	2.66	2.79	2.9	3.01
7/1/2008	2.55	2.46	2.46	2.46	2.655	2.785	2.91	3.01
6/30/2008	3.7	2.45	2.46	2.47	2.65	2.785	2.9	3.01
6/27/2008	2.5	2.47	2.47	2.47	2.66	2.79	2.9	3.01
6/26/2008	2.19	2.68	2.6	2.48	2.665	2.8	2.91	3.03
6/25/2008	2.11	2.65	2.58	2.48	2.68	2.81	2.93	3.06
6/24/2008	2.09	2.68	2.62	2.485	2.68	2.81	2.93	3.07



6/23/2008	2.08	2.69	2.63	2.48	2.675	2.805	2.92	3.06
6/20/2008	2.07	2.69	2.61	2.48	2.675	2.805	2.92	3.06
6/19/2008	2.06	2.29	2.61	2.48	2.67	2.8	2.915	3.06
6/18/2008	2.08	2.3	2.6	2.48	2.67	2.8	2.93	3.07
6/17/2008	2.13	2.31	2.6	2.52	2.71	2.85	2.98	3.12
6/16/2008	2.39	2.32	2.6	2.53	2.735	2.87	3	3.155
6/13/2008	2.1	2.3	2.57	2.5	2.69	2.85	2.99	3.15
6/12/2008	2.12	2.29	2.39	2.49	2.67	2.805	2.93	3.05
6/11/2008	2.1	2.28	2.4	2.48	2.665	2.81	2.94	3.06
6/10/2008	2.1	2.28	2.35	2.46	2.65	2.8	2.925	3.05
6/9/2008	2.1	2.32	2.36	2.42	2.57	2.7	2.795	2.885
6/6/2008	2.09	2.3	2.35	2.42	2.58	2.705	2.81	2.905
6/5/2008	2.12	2.35	2.38	2.42	2.565	2.675	2.77	2.85
6/4/2008	2.21	2.36	2.38	2.42	2.56	2.67	2.765	2.835
6/3/2008	2.3	2.38	2.4	2.42	2.56	2.67	2.76	2.825
6/2/2008	2.28	2.36	2.36	2.405	2.54	2.65	2.74	2.82
5/30/2008	2.56	2.39	2.41	2.45	2.58	2.68	2.76	2.84
5/29/2008	2.58	2.405	2.42	2.47	2.58	2.68	2.77	2.85
5/28/2008	2.43	2.35	2.37	2.39	2.54	2.65	2.73	2.79
5/27/2008	2.16	2.3	2.34	2.38	2.535	2.64	2.72	2.79
5/26/2008	2.11	2.3	2.35	2.39	2.545	2.645	2.72	2.79
5/23/2008	2.11	2.3	2.35	2.39	2.545	2.645	2.72	2.79
5/22/2008	2.1	2.28	2.34	2.39	2.545	2.635	2.695	2.76
5/21/2008	2.1	2.28	2.35	2.39	2.54	2.635	2.68	2.74
5/20/2008	2.1	2.3	2.36	2.42	2.565	2.66	2.71	2.77
5/19/2008	2.13	2.37	2.42	2.44	2.59	2.67	2.74	2.8
5/16/2008	2.15	2.39	2.43	2.48	2.615	2.71	2.78	2.84
5/15/2008	2.27	2.39	2.44	2.5	2.635	2.74	2.81	2.89
5/14/2008	2.17	2.39	2.44	2.5	2.635	2.74	2.81	2.89
5/13/2008	2.19	2.4	2.45	2.515	2.62	2.68	2.74	2.79
5/12/2008	2.18	2.39	2.44	2.525	2.625	2.69	2.76	2.8
5/9/2008	2.12	2.42	2.46	2.55	2.635	2.7	2.74	2.77
5/8/2008	2.13	2.47	2.5	2.59	2.67	2.73	2.78	2.81
5/7/2008	2.15	2.53	2.57	2.61	2.7	2.735	2.78	2.83
5/6/2008	2.35	2.58	2.62	2.67	2.725	2.78	2.81	2.85
5/5/2008	2.45	2.59	2.64	2.7	2.74	2.79	2.83	2.85
5/2/2008	2.45	2.59	2.64	2.7	2.74	2.79	2.83	2.85
5/1/2008	2.45	2.62	2.67	2.74	2.765	2.8	2.84	2.87
4/30/2008	2.69	2.68	2.73	2.8	2.85	2.86	2.9	2.94
4/29/2008	2.4	2.65	2.73	2.82	2.87	2.88	2.92	2.96
4/28/2008	2.38	2.75	2.78	2.86	2.89	2.91	2.96	3.01
4/25/2008	2.35	2.78	2.8	2.89	2.92	2.93	2.97	3.03
4/24/2008	2.37	2.82	2.84	2.9	2.91	2.915	2.955	2.99
4/23/2008	2.45	2.83	2.85	2.91	2.92	2.93	2.97	3.01
4/22/2008	2.6	2.815	2.84	2.9	2.91	2.92	2.96	2.99
4/21/2008	2.61	2.81	2.84	2.9	2.91	2.92	2.95	2.98
4/18/2008	2.6	2.79	2.81	2.87	2.89	2.91	2.94	2.99
4/17/2008	2.65	2.8	2.8	2.81	2.82	2.825	2.84	2.86
4/16/2008	2.6	2.73	2.73	2.73	2.73	2.73	2.73	2.73
4/15/2008	2.55	2.72	2.72	2.71	2.71	2.71	2.71	2.71
4/14/2008	2.37	2.73	2.705	2.705	2.705	2.705	2.7	2.69
4/11/2008	2.35	2.74	2.72	2.7	2.705	2.705	2.71	2.71
4/10/2008	2.31	2.73	2.72	2.7	2.695	2.695	2.685	2.675
4/9/2008	2.52	2.75	2.72	2.71	2.71	2.71	2.7	2.69
4/8/2008	2.58	2.77	2.74	2.7	2.71	2.695	2.685	2.675

4/7/2008	2.6	2.8	2.77	2.72	2.71	2.7	2.69	2.68
4/4/2008	2.5	2.8	2.8	2.72	2.72	2.71	2.7	2.7
4/3/2008	2.7	2.8	2.78	2.73	2.72	2.71	2.71	2.71
4/2/2008	2.8	2.9	2.85	2.69	2.69	2.69	2.68	2.66
4/1/2008	2.8	2.9	2.8	2.69	2.68	2.67	2.63	2.61
3/31/2008	3	2.92	2.82	2.69	2.69	2.68	2.65	2.62
3/28/2008	2.8	2.85	2.75	2.7	2.69	2.69	2.66	2.64
3/27/2008	2.85	2.9	2.85	2.69	2.69	2.68	2.66	2.63
3/26/2008	2.6	2.8	2.75	2.67	2.67	2.67	2.65	2.63
3/25/2008	2.55	2.7	2.65	2.64	2.64	2.64	2.59	2.58
3/24/2008	2.4	2.62	2.6	2.59	2.59	2.62	2.59	2.57
3/21/2008	2.4	2.62	2.6	2.59	2.59	2.62	2.59	2.57
3/20/2008	2.4	2.62	2.6	2.59	2.59	2.62	2.59	2.57
3/19/2008	2.45	2.58	2.58	2.57	2.59	2.62	2.565	2.53
3/18/2008	3.25	2.55	2.53	2.535	2.535	2.535	2.495	2.445
3/17/2008	3.25	2.55	2.55	2.55	2.56	2.57	2.485	2.42
3/14/2008	3.06	2.77	2.77	2.75	2.76	2.755	2.715	2.685
3/13/2008	3.07	2.85	2.84	2.8	2.795	2.805	2.765	2.73
3/12/2008	3.07	2.95	2.9	2.85	2.85	2.845	2.83	2.805
3/11/2008	3.09	3.02	2.88	2.86	2.86	2.85	2.82	2.775
3/10/2008	3.08	3.08	3.03	2.91	2.91	2.9	2.865	2.82
3/7/2008	3.08	3.1	3.05	2.98	2.97	2.92	2.88	2.83
3/6/2008	3.08	3.1	3.07	3.05	3.02	2.98	2.95	2.91
3/5/2008	3.13	3.12	3.1	3.07	3.03	2.99	2.95	2.92
3/4/2008	3.15	3.12	3.1	3.075	3.04	3	2.95	2.9
3/3/2008	3.15	3.13	3.115	3.08	3.03	2.99	2.92	2.88
2/29/2008	3.15	3.12	3.11	3.1	3.06	3.04	2.99	2.95
2/28/2008	3.06	3.14	3.12	3.115	3.08	3.07	3.04	2.99
2/27/2008	3.06	3.14	3.13	3.115	3.085	3.08	3.06	3.04
2/26/2008	3.06	3.13	3.12	3.11	3.09	3.08	3.07	3.06
2/25/2008	3.06	3.13	3.115	3.11	3.09	3.08	3.07	3.05
2/22/2008	3.09	3.13	3.12	3.11	3.08	3.07	3.04	3.02
2/21/2008	3.09	3.14	3.12	3.12	3.09	3.08	3.07	3.05
2/20/2008	3.13	3.1	3.1	3.1	3.07	3.06	3.05	3.02
2/19/2008	3.13	3.1	3.1	3.1	3.07	3.07	3.03	3
2/18/2008	3.18	3.1	3.1	3.1	3.06	3.06	3.03	2.99
2/15/2008	3.18	3.1	3.1	3.1	3.06	3.06	3.03	2.99
2/14/2008	3.09	3.1	3.1	3.1	3.07	3.05	3.03	2.98
2/13/2008	3.07	3.09	3.09	3.1	3.08	3.05	3.02	2.97
2/12/2008	3.05	3.09	3.09	3.11	3.08	3.05	3.03	2.99
2/11/2008	3.05	3.09	3.11	3.13	3.09	3.06	3.04	3
2/8/2008	3.05	3.12	3.12	3.14	3.11	3.085	3.06	3.03
2/7/2008	3.05	3.12	3.14	3.14	3.12	3.09	3.07	3.03
2/6/2008	3.18	3.17	3.17	3.17	3.14	3.12	3.07	3.03
2/5/2008	3.25	3.24	3.23	3.21	3.17	3.15	3.14	3.13
2/4/2008	3.22	3.18	3.18	3.18	3.14	3.13	3.13	3.115
2/1/2008	3.15	3.15	3.15	3.14	3.11	3.09	3.08	3.05
1/31/2008	3.15	3.13	3.13	3.14	3.12	3.11	3.085	3.065
1/30/2008	3.38	3.25	3.25	3.25	3.24	3.235	3.22	3.2
1/29/2008	3.56	3.33	3.3	3.26	3.25	3.235	3.22	3.19
1/28/2008	3.58	3.37	3.32	3.29	3.27	3.25	3.23	3.21
1/25/2008	3.59	3.4	3.35	3.31	3.31	3.31	3.3	3.29
1/24/2008	3.58	3.4	3.3	3.29	3.28	3.21	3.21	3.2
1/23/2008	3.57	3.49	3.47	3.37	3.35	3.33	3.28	3.22
1/22/2008	4.28	4.16	4.02	3.77	3.76	3.74	3.67	3.6

1/21/2008	4.28	4.27	4.02	3.89	3.87	3.845	3.805	3.74
1/18/2008	4.28	4.27	4.13	3.925	3.905	3.89	3.85	3.8
1/17/2008	4.29	4.29	4.15	3.96	3.95	3.92	3.89	3.85
1/16/2008	4.3	4.29	4.25	3.99	3.96	3.94	3.9	3.85
1/15/2008	4.28	4.29	4.3	4.02	4	3.99	3.92	3.87
1/14/2008	4.28	4.3	4.3	4.08	4.075	4.07	3.98	3.92
1/11/2008	4.28	4.3	4.28	4.24	4.25	4.25	4.19	4.11
1/10/2008	4.28	4.32	4.34	4.31	4.34	4.37	4.3	4.24
1/9/2008	4.27	4.33	4.35	4.37	4.41	4.44	4.37	4.31
1/8/2008	4.28	4.35	4.38	4.4	4.46	4.5	4.43	4.37
1/7/2008	4.27	4.36	4.38	4.42	4.5	4.545	4.51	4.44
1/4/2008	4.32	4.46	4.48	4.5	4.57	4.61	4.54	4.48
1/3/2008	4.37	4.47	4.49	4.53	4.6	4.64	4.54	4.48
1/2/2008	4.48	4.55	4.55	4.57	4.63	4.67	4.61	4.57
1/1/2008	5	4.47	4.47	4.59	4.63	4.68	4.63	4.6
12/31/2007	5	4.47	4.47	4.59	4.63	4.68	4.63	4.6
12/28/2007	4.5	4.55	4.55	4.61	4.67	4.73	4.67	4.63
12/27/2007	4.43	5	4.95	4.83	4.83	4.82	4.77	4.72
12/26/2007	4.31	5.05	4.99	4.85	4.85	4.84	4.81	4.77
12/25/2007	4.31	5.05	4.99	4.85	4.85	4.84	4.81	4.77
12/24/2007	4.31	5.05	4.99	4.85	4.85	4.84	4.81	4.77
12/21/2007	4.28	5	5	4.86	4.86	4.86	4.77	4.73
12/20/2007	4.28	4.34	5	4.88	4.89	4.88	4.82	4.76
12/19/2007	4.32	4.35	5.03	4.92	4.9	4.9	4.84	4.79
12/18/2007	4.38	4.37	5.05	4.93	4.92	4.91	4.89	4.85
12/17/2007	4.43	4.35	5.07	4.96	4.96	4.94	4.89	4.85
12/14/2007	4.3	4.34	4.95	4.95	4.97	4.97	4.93	4.885
12/13/2007	4.3	4.33	4.34	5.02	4.99	4.97	4.89	4.8
12/12/2007	4.31	4.35	4.35	5.09	5.08	5.05	4.98	4.94
12/11/2007	4.4	4.45	4.45	5.17	5.11	5.08	4.98	4.91
12/10/2007	4.52	4.58	4.58	5.2	5.13	5.11	5.02	4.96
12/7/2007	4.53	4.65	4.65	5.19	5.14	5.11	5.01	4.92
12/6/2007	4.63	4.84	4.84	5.21	5.14	5.12	5.01	4.91
12/5/2007	4.68	4.83	4.83	5.23	5.15	5.12	5.01	4.89
12/4/2007	4.7	4.85	4.85	5.22	5.14	5.13	5.01	4.87
12/3/2007	4.69	4.85	4.85	5.22	5.13	5.12	5	4.88
11/30/2007	4.67	4.82	4.82	5.18	5.12	5.12	5.02	4.89
11/29/2007	4.68	4.85	4.85	5.16	5.07	5.07	4.99	4.88
11/28/2007	4.75	4.8	4.8	4.8	5.06	5.06	5.01	4.91
11/27/2007	4.73	4.78	4.78	4.79	5.04	5.04	4.98	4.87
11/26/2007	4.65	4.75	4.75	4.78	5.03	5.025	4.97	4.86
11/23/2007	4.63	4.74	4.74	4.77	5	5	4.96	4.89
11/22/2007	4.62	4.74	4.76	4.77	4.99	4.99	4.943	4.897
11/21/2007	4.62	4.72	4.73	4.79	5.01	5.01	4.95	4.9
11/20/2007	4.62	4.7	4.73	4.75	4.986	4.96	4.94	4.87
11/19/2007	4.62	4.68	4.7	4.74	4.94	4.94	4.92	4.85
11/16/2007	4.75	4.7	4.69	4.69	4.92	4.93	4.93	4.82
11/15/2007	4.87	4.65	4.64	4.64	4.87	4.87	4.86	4.807
11/14/2007	4.68	4.64	4.62	4.64	4.86	4.86	4.84	4.77
11/13/2007	4.62	4.62	4.63	4.64	4.85	4.85	4.82	4.75
11/12/2007	4.56	4.6	4.62	4.64	4.86	4.86	4.83	4.8
11/9/2007	4.56	4.59	4.62	4.66	4.86	4.86	4.86	4.78
11/8/2007	4.54	4.59	4.61	4.66	4.88	4.88	4.88	4.83
11/7/2007	4.65	4.63	4.63	4.65	4.88	4.88	4.88	4.85
11/6/2007	4.62	4.63	4.65	4.67	4.88	4.89	4.91	4.88

11/5/2007	4.62	4.63	4.64	4.66	4.86	4.87	4.86	4.82
11/2/2007	4.58	4.62	4.64	4.67	4.85	4.85	4.85	4.82
11/1/2007	4.63	4.63	4.65	4.67	4.85	4.86	4.85	4.84
10/31/2007	5	4.7	4.7	4.71	4.87	4.88	4.86	4.83
10/30/2007	4.88	4.68	4.7	4.71	4.85	4.9	4.86	4.83
10/29/2007	4.77	4.75	4.75	4.75	4.8	4.95	4.91	4.86
10/26/2007	4.78	4.79	4.79	4.8	4.85	4.93	4.88	4.83
10/25/2007	4.76	4.8	4.8	4.8	4.89	4.96	4.91	4.86
10/24/2007	4.77	4.83	4.84	4.85	4.95	5.02	4.97	4.91
10/23/2007	4.82	4.84	4.86	4.88	4.97	5.04	5	4.96
10/22/2007	4.82	4.84	4.88	4.9	5	5.06	5	4.96
10/19/2007	4.8	4.85	4.89	4.94	5.04	5.13	5.08	5.04
10/18/2007	4.82	4.87	4.94	5	5.07	5.16	5.13	5.105
10/17/2007	4.86	4.89	4.94	5.02	5.09	5.19	5.16	5.14
10/16/2007	4.87	4.9	4.95	5.03	5.1	5.2	5.16	5.14
10/15/2007	4.85	4.9	4.94	5.03	5.11	5.19	5.17	5.15
10/12/2007	4.83	4.9	4.97	5.06	5.13	5.21	5.17	5.15
10/11/2007	4.83	4.9	4.97	5.08	5.15	5.235	5.225	5.22
10/10/2007	4.82	4.97	5.03	5.11	5.16	5.24	5.23	5.22
10/9/2007	4.78	4.98	5.05	5.12	5.16	5.24	5.22	5.21
10/8/2007	4.8	5.03	5.05	5.12	5.16	5.24	5.23	5.22
10/5/2007	4.8	5.05	5.08	5.115	5.16	5.22	5.19	5.18
10/4/2007	4.85	5.03	5.05	5.12	5.16	5.23	5.19	5.18
10/3/2007	5	5.05	5.08	5.12	5.16	5.23	5.19	5.17
10/2/2007	5.05	5.05	5.08	5.12	5.165	5.23	5.19	5.17
10/1/2007	5	5.05	5.07	5.12	5.16	5.22	5.17	5.15
9/28/2007	5.32	5.05	5.08	5.15	5.17	5.25	5.16	5.15
9/27/2007	4.85	5.02	5.08	5.17	5.17	5.18	5.167	5.135
9/26/2007	4.83	5.03	5.08	5.18	5.17	5.15	5.167	5.135
9/25/2007	4.83	5.05	5.08	5.15	5.17	5.18	5.167	5.135
9/24/2007	4.83	5.07	5.08	5.13	5.17	5.2	5.167	5.135
9/21/2007	4.9	5.05	5.05	5.13	5.18	5.21	5.165	5.135
9/20/2007	4.91	5.03	5.03	5.13	5.17	5.2	5.14	5.09
9/19/2007	4.96	5	5.1	5.15	5.2	5.24	5.18	5.17
9/18/2007	5.32	5.2	5.28	5.49	5.54	5.58	5.5	5.44
9/17/2007	5.27	5.1	5.2	5.48	5.56	5.59	5.5	5.45
9/14/2007	5.1	5.32	5.38	5.62	5.65	5.65	5.53	5.47
9/13/2007	5.12	5.25	5.3	5.75	5.7	5.67	5.59	5.51
9/12/2007	5.12	5.4	5.45	5.77	5.71	5.7	5.59	5.51
9/11/2007	5.25	5.62	5.65	5.78	5.72	5.69	5.59	5.5
9/10/2007	5.32	5.65	5.68	5.79	5.71	5.69	5.59	5.5
9/7/2007	5.35	5.65	5.7	5.82	5.73	5.7	5.63	5.55
9/6/2007	5.45	5.65	5.7	5.82	5.73	5.7	5.61	5.53
9/5/2007	5.45	5.6	5.65	5.83	5.75	5.72	5.65	5.57
9/4/2007	5.5	5.68	5.68	5.75	5.71	5.68	5.62	5.55
9/3/2007	5.55	5.6	5.6	5.68	5.64	5.6	5.55	5.48
8/31/2007	5.55	5.6	5.6	5.68	5.64	5.6	5.55	5.48
8/30/2007	5.53	5.6	5.6	5.62	5.6	5.57	5.52	5.45
8/29/2007	5.55	5.55	5.51	5.51	5.51	5.51	5.47	5.39
8/28/2007	5.32	5.45	5.42	5.5	5.5	5.5	5.46	5.39
8/27/2007	5.18	5.45	5.45	5.5	5.5	5.5	5.45	5.38
8/24/2007	5.18	5.45	5.45	5.5	5.5	5.5	5.45	5.38
8/23/2007	5.35	5.45	5.45	5.5	5.5	5.5	5.47	5.4
8/22/2007	5.32	5.38	5.42	5.49	5.485	5.48	5.44	5.34
8/21/2007	5.35	5.4	5.42	5.49	5.49	5.49	5.42	5.32



8/20/2007	5.35	5.43	5.46	5.5	5.49	5.48	5.42	5.32
8/17/2007	5.28	5.35	5.4	5.5	5.49	5.48	5.41	5.3
8/16/2007	5.1	5.35	5.4	5.53	5.51	5.49	5.45	5.36
8/15/2007	5.25	5.4	5.45	5.54	5.52	5.5	5.48	5.41
8/14/2007	5.4	5.53	5.53	5.57	5.53	5.51	5.48	5.42
8/13/2007	5.6	5.65	5.62	5.6	5.58	5.55	5.5	5.45
8/10/2007	5.5	5.6	5.5	5.52	5.52	5.5	5.45	5.36
8/9/2007	6	5.75	5.625	5.48	5.45	5.42	5.41	5.36
8/8/2007	5.35	5.33	5.34	5.345	5.36	5.37	5.36	5.335
8/7/2007	5.3	5.32	5.32	5.33	5.34	5.345	5.319	5.285
8/6/2007	5.3	5.315	5.315	5.315	5.33	5.325	5.3	5.26
8/3/2007	5.32	5.325	5.325	5.33	5.347	5.36	5.34	5.325
8/2/2007	5.32	5.32	5.32	5.328	5.345	5.36	5.34	5.325
8/1/2007	5.375	5.32	5.32	5.32	5.34	5.35	5.335	5.32
7/31/2007	5.375	5.32	5.32	5.32	5.34	5.35	5.34	5.33
7/30/2007	5.35	5.32	5.32	5.32	5.34	5.345	5.33	5.315
7/27/2007	5.3	5.32	5.32	5.32	5.34	5.35	5.335	5.32
7/26/2007	5.3	5.32	5.32	5.32	5.34	5.36	5.355	5.36
7/25/2007	5.3	5.32	5.32	5.32	5.34	5.36	5.36	5.365
7/24/2007	5.3	5.315	5.32	5.32	5.34	5.36	5.36	5.365
7/23/2007	5.3	5.315	5.32	5.32	5.34	5.36	5.36	5.365
7/20/2007	5.3	5.313	5.32	5.32	5.34	5.36	5.368	5.376
7/19/2007	5.3	5.315	5.32	5.32	5.34	5.357	5.365	5.375
7/18/2007	5.3	5.315	5.32	5.32	5.34	5.357	5.365	5.375
7/17/2007	5.3	5.31	5.315	5.32	5.34	5.36	5.365	5.375
7/16/2007	5.325	5.315	5.32	5.32	5.34	5.36	5.365	5.375
7/13/2007	5.3	5.317	5.32	5.32	5.34	5.36	5.365	5.375
7/12/2007	5.32	5.35	5.34	5.32	5.34	5.36	5.369	5.378
7/11/2007	5.3	5.315	5.32	5.32	5.34	5.355	5.36	5.37
7/10/2007	5.3	5.315	5.315	5.32	5.34	5.36	5.365	5.375
7/9/2007	5.3	5.315	5.315	5.32	5.34	5.36	5.37	5.38
7/6/2007	5.3	5.32	5.32	5.32	5.34	5.36	5.37	5.38
7/5/2007	5.325	5.32	5.32	5.32	5.34	5.36	5.365	5.375
7/4/2007	5.325	5.32	5.32	5.32	5.34	5.36	5.36	5.37
7/3/2007	5.325	5.32	5.32	5.32	5.34	5.36	5.36	5.37
7/2/2007	5.37	5.32	5.32	5.32	5.34	5.36	5.365	5.37
6/29/2007	5.5	5.32	5.32	5.32	5.34	5.36	5.365	5.375
6/28/2007	5.375	5.335	5.325	5.32	5.34	5.36	5.365	5.37
6/27/2007	5.34	5.34	5.33	5.32	5.34	5.36	5.36	5.365
6/26/2007	5.3	5.32	5.32	5.32	5.34	5.36	5.36	5.365
6/25/2007	5.3	5.32	5.32	5.32	5.34	5.36	5.36	5.37
6/22/2007	5.3	5.33	5.32	5.32	5.34	5.36	5.37	5.38
6/21/2007	5.31	5.32	5.32	5.32	5.34	5.36	5.375	5.385
6/20/2007	5.31	5.32	5.32	5.32	5.34	5.36	5.37	5.38
6/19/2007	5.31	5.318	5.321	5.32	5.34	5.36	5.377	5.388
6/18/2007	5.31	5.32	5.32	5.32	5.34	5.36	5.375	5.39
6/15/2007	5.31	5.32	5.32	5.32	5.34	5.36	5.38	5.395
6/14/2007	5.31	5.32	5.32	5.32	5.34	5.36	5.375	5.39
6/13/2007	5.305	5.32	5.32	5.32	5.34	5.362	5.38	5.395
6/12/2007	5.305	5.32	5.32	5.32	5.34	5.36	5.375	5.39
6/11/2007	5.33	5.34	5.33	5.32	5.34	5.36	5.372	5.383
6/8/2007	5.305	5.32	5.32	5.32	5.34	5.36	5.375	5.39
6/7/2007	5.305	5.32	5.32	5.32	5.34	5.36	5.37	5.38
6/6/2007	5.305	5.315	5.32	5.32	5.34	5.36	5.37	5.38
6/5/2007	5.305	5.315	5.32	5.32	5.34	5.36	5.37	5.385

6/4/2007	5.305	5.315	5.32	5.32	5.34	5.36	5.37	5.38
6/1/2007	5.37	5.32	5.32	5.32	5.34	5.36	5.368	5.375
5/31/2007	5.36	5.32	5.32	5.32	5.34	5.36	5.368	5.375
5/30/2007	5.36	5.32	5.32	5.32	5.34	5.36	5.368	5.375
5/29/2007	5.36	5.32	5.32	5.32	5.34	5.36	5.368	5.377
5/28/2007	5.305	5.32	5.32	5.32	5.34	5.36	5.37	5.375
5/25/2007	5.305	5.32	5.32	5.32	5.34	5.36	5.37	5.375
5/24/2007	5.305	5.3195	5.32	5.32	5.34	5.36	5.365	5.37
5/23/2007	5.305	5.316	5.32	5.32	5.34	5.36	5.365	5.37
5/22/2007	5.305	5.315	5.32	5.32	5.34	5.36	5.365	5.365
5/21/2007	5.305	5.314	5.32	5.32	5.34	5.36	5.365	5.37
5/18/2007	5.305	5.314	5.32	5.32	5.34	5.36	5.36	5.36
5/17/2007	5.305	5.314	5.32	5.32	5.34	5.357	5.36	5.355
5/16/2007	5.3	5.315	5.32	5.32	5.34	5.36	5.36	5.355
5/15/2007	5.3	5.315	5.32	5.32	5.34	5.36	5.365	5.365
5/14/2007	5.3	5.314	5.319	5.32	5.34	5.36	5.36	5.36
5/11/2007	5.3	5.314	5.32	5.32	5.34	5.357	5.36	5.35
5/10/2007	5.3	5.315	5.319	5.32	5.34	5.357	5.36	5.36
5/9/2007	5.3	5.31	5.32	5.32	5.34	5.355	5.36	5.36
5/8/2007	5.3	5.31	5.32	5.32	5.34	5.355	5.36	5.36
5/7/2007	5.31	5.315	5.32	5.32	5.34	5.355	5.36	5.36
5/4/2007	5.31	5.315	5.32	5.32	5.34	5.355	5.36	5.36
5/3/2007	5.31	5.315	5.32	5.32	5.34	5.352	5.355	5.355
5/2/2007	5.31	5.315	5.32	5.32	5.34	5.352	5.355	5.355
5/1/2007	5.35	5.32	5.32	5.32	5.34	5.352	5.35	5.35
4/30/2007	5.35	5.325	5.315	5.32	5.34	5.355	5.355	5.355
4/27/2007	5.29	5.32	5.32	5.32	5.34	5.352	5.355	5.355
4/26/2007	5.29	5.32	5.32	5.32	5.34	5.35	5.35	5.35
4/25/2007	5.29	5.32	5.32	5.32	5.34	5.355	5.34	5.35
4/24/2007	5.29	5.32	5.32	5.32	5.34	5.355	5.35	5.35
4/23/2007	5.29	5.31	5.32	5.32	5.34	5.355	5.355	5.36
4/20/2007	5.28	5.31	5.32	5.32	5.34	5.355	5.35	5.35
4/19/2007	5.3	5.32	5.32	5.32	5.34	5.355	5.345	5.35
4/18/2007	5.33	5.32	5.32	5.32	5.34	5.355	5.35	5.36
4/17/2007	5.41	5.34	5.32	5.32	5.34	5.359	5.363	5.366
4/16/2007	5.33	5.32	5.32	5.32	5.34	5.355	5.36	5.37
4/13/2007	5.325	5.32	5.32	5.32	5.34	5.355	5.36	5.37
4/12/2007	5.34	5.32	5.32	5.32	5.34	5.355	5.355	5.36
4/11/2007	5.335	5.32	5.32	5.32	5.34	5.355	5.355	5.36
4/10/2007	5.33	5.315	5.315	5.32	5.34	5.355	5.355	5.36
4/9/2007	5.31	5.315	5.315	5.32	5.34	5.35	5.34	5.34
4/6/2007	5.31	5.315	5.315	5.32	5.34	5.35	5.34	5.34
4/5/2007	5.31	5.315	5.315	5.32	5.34	5.35	5.34	5.34
4/4/2007	5.305	5.31	5.315	5.32	5.34	5.35	5.34	5.34
4/3/2007	5.31	5.315	5.32	5.32	5.34	5.35	5.34	5.34
4/2/2007	5.35	5.315	5.315	5.32	5.34	5.345	5.335	5.335
3/30/2007	5.475	5.33	5.33	5.32	5.34	5.35	5.335	5.335
3/29/2007	5.35	5.34	5.325	5.32	5.34	5.345	5.33	5.33
3/28/2007	5.3	5.325	5.325	5.32	5.34	5.35	5.335	5.335
3/27/2007	5.3	5.33	5.325	5.32	5.34	5.345	5.335	5.335
3/26/2007	5.3	5.33	5.32	5.32	5.34	5.345	5.335	5.33
3/23/2007	5.3	5.32	5.32	5.32	5.335	5.345	5.325	5.325
3/22/2007	5.3	5.309	5.32	5.32	5.34	5.345	5.325	5.32
3/21/2007	5.3	5.308	5.31	5.32	5.33	5.345	5.33	5.315
3/20/2007	5.305	5.31	5.32	5.32	5.34	5.35	5.347	5.343

3/19/2007	5.305	5.31	5.32	5.32	5.34	5.35	5.345	5.34
3/16/2007	5.35	5.31	5.32	5.32	5.34	5.35	5.34	5.33
3/15/2007	5.33	5.31	5.32	5.32	5.34	5.35	5.338	5.327
3/14/2007	5.29	5.31	5.32	5.32	5.335	5.35	5.33	5.32
3/13/2007	5.3	5.295	5.31	5.32	5.34	5.354	5.346	5.338
3/12/2007	5.35	5.32	5.32	5.32	5.335	5.355	5.353	5.35
3/9/2007	5.34	5.33	5.32	5.32	5.33	5.34	5.327	5.313
3/8/2007	5.29	5.3	5.31	5.32	5.33	5.34	5.322	5.303
3/7/2007	5.28	5.3	5.3	5.32	5.33	5.34	5.323	5.307
3/6/2007	5.3	5.29	5.3	5.32	5.33	5.34	5.327	5.313
3/5/2007	5.29	5.29	5.3	5.315	5.325	5.33	5.306	5.282
3/2/2007	5.3	5.308	5.31	5.32	5.33	5.345	5.33	5.315
3/1/2007	5.3	5.308	5.31	5.32	5.335	5.345	5.34	5.33
2/28/2007	5.3	5.31	5.311	5.32	5.335	5.34	5.34	5.33
2/27/2007	5.3	5.31	5.32	5.32	5.345	5.36	5.37	5.37
2/26/2007	5.3	5.31	5.32	5.32	5.345	5.36	5.37	5.37
2/23/2007	5.3	5.31	5.31	5.32	5.345	5.36	5.37	5.375
2/22/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.375
2/21/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.375
2/20/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.375
2/19/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.375
2/16/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.375
2/15/2007	5.32	5.3	5.31	5.32	5.345	5.36	5.37	5.375
2/14/2007	5.295	5.305	5.31	5.32	5.345	5.36	5.375	5.385
2/13/2007	5.285	5.3	5.305	5.32	5.345	5.36	5.375	5.39
2/12/2007	5.29	5.3	5.3	5.325	5.345	5.36	5.375	5.385
2/9/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.385
2/8/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.37	5.385
2/7/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.375	5.385
2/6/2007	5.3	5.305	5.31	5.325	5.345	5.36	5.375	5.385
2/5/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.375	5.385
2/2/2007	5.29	5.3	5.31	5.32	5.345	5.36	5.375	5.39
2/1/2007	5.35	5.32	5.32	5.32	5.345	5.36	5.373	5.387
1/31/2007	5.35	5.32	5.32	5.32	5.345	5.36	5.373	5.387
1/30/2007	5.29	5.295	5.303	5.32	5.345	5.36	5.375	5.39
1/29/2007	5.32	5.325	5.325	5.32	5.345	5.36	5.373	5.385
1/26/2007	5.29	5.305	5.31	5.32	5.345	5.36	5.375	5.39
1/25/2007	5.29	5.3	5.31	5.32	5.345	5.36	5.375	5.385
1/24/2007	5.285	5.3	5.305	5.32	5.345	5.36	5.38	5.39
1/23/2007	5.29	5.305	5.31	5.32	5.345	5.36	5.37	5.38
1/22/2007	5.29	5.305	5.31	5.32	5.345	5.36	5.37	5.385
1/19/2007	5.32	5.329	5.325	5.32	5.345	5.36	5.37	5.38
1/18/2007	5.29	5.3	5.31	5.32	5.345	5.36	5.375	5.385
1/17/2007	5.31	5.31	5.31	5.32	5.345	5.36	5.375	5.385
1/16/2007	5.31	5.31	5.32	5.32	5.345	5.36	5.37	5.385
1/15/2007	5.34	5.32	5.32	5.32	5.345	5.362	5.37	5.377
1/12/2007	5.34	5.32	5.32	5.32	5.345	5.362	5.37	5.377
1/11/2007	5.34	5.32	5.32	5.32	5.345	5.36	5.365	5.37
1/10/2007	5.34	5.32	5.32	5.32	5.345	5.36	5.365	5.37
1/9/2007	5.34	5.33	5.33	5.32	5.345	5.36	5.365	5.37
1/8/2007	5.29	5.295	5.303	5.32	5.345	5.36	5.363	5.367
1/5/2007	5.3	5.305	5.31	5.32	5.345	5.355	5.35	5.35
1/4/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.36	5.36
1/3/2007	5.3	5.31	5.315	5.32	5.345	5.36	5.36	5.365
1/2/2007	5.3	5.305	5.31	5.32	5.345	5.36	5.36	5.365

1/1/2007	5.3	5.29	5.31	5.325	5.345	5.36	5.363	5.367
12/29/2006	5.3	5.29	5.31	5.325	5.345	5.36	5.363	5.367
12/28/2006	5.32	5.32	5.32	5.33	5.34	5.36	5.36	5.36
12/27/2006	5.29	5.365	5.35	5.35	5.35	5.36	5.355	5.355
12/26/2006	5.29	5.37	5.35	5.35	5.35	5.36	5.355	5.355
12/22/2006	5.29	5.37	5.35	5.35	5.35	5.36	5.355	5.355
12/21/2006	5.29	5.365	5.355	5.35	5.35	5.36	5.36	5.365
12/20/2006	5.29	5.305	5.35	5.35	5.35	5.36	5.36	5.365
12/19/2006	5.29	5.30438	5.35	5.35	5.35	5.36	5.355	5.355
12/18/2006	5.29	5.305	5.35	5.35	5.35	5.365	5.355	5.36
12/15/2006	5.285	5.305	5.35	5.35	5.35	5.365	5.37	5.375
12/14/2006	5.285	5.305	5.35	5.35	5.35	5.365	5.365	5.37
12/13/2006	5.285	5.3	5.31	5.35	5.35	5.36	5.36	5.355
12/12/2006	5.29	5.305	5.31	5.35	5.36	5.36	5.36	5.36
12/11/2006	5.29	5.3	5.31	5.35	5.355	5.3625	5.36	5.36
12/8/2006	5.29	5.3	5.31	5.35	5.35	5.355	5.345	5.33
12/7/2006	5.29	5.3	5.305	5.35	5.35	5.35	5.335	5.32
12/6/2006	5.29	5.3	5.305	5.35	5.35	5.35	5.33	5.31
12/5/2006	5.29	5.3	5.305	5.35	5.335	5.345	5.325	5.305
12/4/2006	5.29	5.3	5.31	5.35	5.35	5.35	5.33	5.3
12/1/2006	5.29	5.305	5.30977	5.35	5.355	5.365	5.35	5.33
11/30/2006	5.29	5.30274	5.30813	5.355	5.355	5.365	5.355	5.345
11/29/2006	5.29	5.30688	5.3125	5.355	5.36	5.37	5.36	5.35
11/28/2006	5.29	5.305	5.31	5.32	5.355	5.37	5.37	5.36
11/27/2006	5.29	5.30688	5.31	5.32	5.36	5.365	5.365	5.36
11/24/2006	5.29	5.305	5.31	5.32	5.36	5.37	5.37	5.36
11/23/2006	5.33	5.33	5.33	5.32	5.36	5.37	5.37	5.37
11/22/2006	5.33	5.33	5.33	5.32	5.36	5.37	5.37	5.37
11/21/2006	5.32	5.328	5.32	5.32	5.36	5.37	5.37	5.37
11/20/2006	5.29	5.3	5.31	5.32	5.36	5.375	5.385	5.385
11/17/2006	5.29	5.3	5.31	5.32	5.36	5.375	5.385	5.385
11/16/2006	5.29	5.3	5.31	5.32	5.36	5.375	5.385	5.385
11/15/2006	5.29	5.3	5.30508	5.32	5.36	5.375	5.38	5.375
11/14/2006	5.29	5.30125	5.30563	5.32	5.36	5.375	5.385	5.385
11/13/2006	5.29	5.305	5.31	5.32	5.36	5.375	5.38	5.375
11/10/2006	5.29	5.305	5.31	5.32	5.36	5.375	5.385	5.375
11/9/2006	5.29	5.305	5.31	5.32	5.36	5.38	5.395	5.4
11/8/2006	5.29	5.305	5.31	5.32	5.36	5.37535	5.385	5.38
11/7/2006	5.29	5.305	5.31	5.32	5.36	5.37531	5.385	5.39
11/6/2006	5.29	5.305	5.31	5.32	5.36	5.38	5.395	5.4
11/3/2006	5.29	5.305	5.31	5.32	5.36	5.37	5.37	5.365
11/2/2006	5.29	5.31	5.32	5.32	5.36	5.365	5.365	5.36
11/1/2006	5.285	5.305	5.31	5.32	5.36	5.37	5.38	5.38
10/31/2006	5.31	5.31	5.31	5.32	5.36	5.37	5.38	5.385
10/30/2006	5.29	5.305	5.31	5.32	5.36	5.375	5.39	5.395
10/27/2006	5.28	5.31	5.31	5.32	5.35	5.375	5.395	5.405
10/26/2006	5.28	5.31	5.31	5.32	5.35	5.375	5.395	5.405
10/25/2006	5.28	5.31	5.32	5.325	5.355	5.385	5.405	5.42
10/24/2006	5.275	5.305	5.315	5.32	5.35	5.38	5.4	5.415
10/23/2006	5.29	5.305	5.31	5.32	5.35	5.375	5.395	5.41
10/20/2006	5.29	5.305	5.31	5.32	5.35	5.375	5.395	5.405
10/19/2006	5.28	5.3	5.31	5.32	5.35	5.375	5.39	5.405
10/18/2006	5.29	5.31	5.31	5.32	5.35	5.375	5.395	5.41
10/17/2006	5.29	5.31	5.31	5.32	5.35	5.375	5.39	5.4
10/16/2006	5.29	5.31	5.31	5.32	5.35	5.375	5.39	5.405

10/13/2006	5.29	5.30563	5.31	5.325	5.35	5.375	5.385	5.395
10/12/2006	5.29	5.31	5.31	5.32	5.35	5.375	5.385	5.395
10/11/2006	5.29	5.31	5.32	5.325	5.355	5.375	5.38	5.395
10/10/2006	5.3	5.31	5.315	5.32	5.35	5.37	5.38	5.39
10/9/2006	5.29	5.305	5.31	5.32	5.35	5.37	5.365	5.37
10/6/2006	5.29	5.305	5.31	5.32	5.35	5.37	5.365	5.37
10/5/2006	5.29	5.31	5.31	5.32	5.35	5.36	5.36	5.37
10/4/2006	5.3	5.31	5.31	5.325	5.35	5.37	5.37	5.375
10/3/2006	5.3	5.31	5.31	5.325	5.36	5.365	5.365	5.37
10/2/2006	5.31	5.31	5.31	5.325	5.35	5.365	5.37	5.38
9/29/2006	5.37	5.32	5.32	5.325	5.35	5.373	5.373	5.373
9/28/2006	5.345	5.34	5.33	5.325	5.35	5.373	5.372	5.371
9/27/2006	5.335	5.34	5.33	5.325	5.35	5.37	5.372	5.373
9/26/2006	5.32	5.34	5.33	5.325	5.35	5.365	5.363	5.362
9/25/2006	5.315	5.34	5.33	5.328	5.35	5.37	5.371	5.372
9/22/2006	5.27	5.31	5.32	5.325	5.355	5.375	5.37	5.375
9/21/2006	5.28	5.32	5.325	5.33	5.36	5.39	5.4	5.41
9/20/2006	5.285	5.31	5.32	5.33	5.355	5.385	5.4	5.41
9/19/2006	5.29	5.31	5.325	5.33	5.36	5.39	5.41	5.43
9/18/2006	5.29	5.31	5.325	5.33	5.36	5.39	5.41	5.425
9/15/2006	5.34	5.32	5.33	5.33	5.36	5.39	5.405	5.42
9/14/2006	5.3	5.32	5.33	5.33	5.36	5.39	5.395	5.4
9/13/2006	5.31	5.32	5.33	5.33	5.36	5.39	5.403	5.417
9/12/2006	5.26	5.3	5.328	5.33	5.36	5.39	5.405	5.42
9/11/2006	5.29	5.31	5.32	5.33	5.36	5.39	5.4	5.41
9/8/2006	5.29	5.31	5.32	5.33	5.36	5.39	5.4	5.41
9/7/2006	5.3	5.31	5.32	5.33	5.36	5.39	5.405	5.415
9/6/2006	5.3	5.31	5.32	5.33	5.36	5.39	5.4	5.41
9/5/2006	5.29	5.31	5.32	5.33	5.36	5.39	5.4	5.41
9/4/2006	5.315	5.295	5.295	5.31	5.34	5.37	5.385	5.395
9/1/2006	5.315	5.295	5.295	5.31	5.34	5.37	5.385	5.395
8/31/2006	5.34	5.32	5.32	5.335	5.365	5.395	5.41	5.42
8/30/2006	5.28	5.29	5.3	5.325	5.365	5.4	5.42	5.435
8/29/2006	5.3	5.31	5.32	5.335	5.375	5.41	5.425	5.445
8/28/2006	5.3	5.32	5.33	5.33	5.365	5.4	5.42	5.44
8/25/2006	5.3	5.32	5.33	5.33	5.365	5.4	5.42	5.44
8/24/2006	5.29	5.31	5.32	5.33	5.365	5.4	5.42	5.44
8/23/2006	5.28	5.3	5.31	5.325	5.365	5.4	5.42	5.44
8/22/2006	5.29	5.3	5.31	5.325	5.365	5.4	5.42	5.44
8/21/2006	5.28	5.29	5.3	5.325	5.365	5.4	5.42	5.435
8/18/2006	5.29	5.3	5.31	5.325	5.365	5.395	5.425	5.44
8/17/2006	5.29	5.3	5.3	5.325	5.365	5.39	5.41	5.43
8/16/2006	5.29	5.3	5.31	5.33	5.37	5.41	5.435	5.46
8/15/2006	5.3	5.32	5.32	5.33	5.385	5.425	5.45	5.48
8/14/2006	5.3	5.32	5.32	5.33	5.38	5.415	5.445	5.48
8/11/2006	5.3	5.31	5.32	5.335	5.385	5.405	5.43	5.455
8/10/2006	5.3	5.31	5.32	5.33	5.37	5.405	5.42	5.435
8/9/2006	5.28	5.29	5.3	5.33	5.37	5.405	5.42	5.44
8/8/2006	5.3	5.35	5.35	5.37	5.41	5.445	5.465	5.48
8/7/2006	5.3	5.34	5.34	5.37	5.41	5.44	5.46	5.475
8/4/2006	5.3	5.37	5.39	5.42	5.46	5.495	5.52	5.535
8/3/2006	5.3	5.35	5.375	5.405	5.445	5.48	5.5	5.515
8/2/2006	5.29	5.34	5.36	5.39	5.435	5.47	5.485	5.495
8/1/2006	5.3	5.33	5.35	5.39	5.43	5.4625	5.48563	5.5
7/31/2006	5.38	5.35	5.36	5.39	5.43	5.46	5.478	5.497



7/28/2006	5.29	5.325	5.355	5.405	5.45	5.485	5.51	5.53
7/27/2006	5.29	5.325	5.35	5.4	5.45	5.485	5.505	5.515
7/26/2006	5.3	5.32	5.35	5.4	5.45	5.5	5.525	5.545
7/25/2006	5.28	5.315	5.34	5.395	5.45	5.49	5.51	5.53
7/24/2006	5.275	5.31	5.335	5.4	5.445	5.49	5.515	5.535
7/21/2006	5.275	5.31	5.33	5.39	5.445	5.485	5.505	5.525
7/20/2006	5.32	5.32	5.35	5.4	5.46	5.515	5.543	5.572
7/19/2006	5.33	5.32	5.35	5.388	5.458	5.518	5.549	5.581
7/18/2006	5.3	5.31	5.32	5.37	5.44	5.495	5.525	5.55
7/17/2006	5.325	5.315	5.325	5.37	5.435	5.485	5.51	5.535
7/14/2006	5.35	5.33	5.34	5.37	5.44	5.5	5.527	5.553
7/13/2006	5.35	5.33	5.34	5.37	5.44	5.503	5.538	5.574
7/12/2006	5.33	5.34	5.34	5.36	5.44	5.5	5.537	5.573
7/11/2006	5.3	5.315	5.32	5.355	5.44	5.5	5.54	5.58
7/10/2006	5.29	5.3	5.31	5.35	5.44	5.5	5.545	5.575
7/7/2006	5.3	5.315	5.32	5.35	5.445	5.51	5.545	5.585
7/6/2006	5.3	5.32	5.325	5.355	5.45	5.51	5.555	5.595
7/5/2006	5.3	5.3	5.31	5.335	5.425	5.49	5.525	5.565
7/4/2006	5.38	5.34	5.33	5.335	5.42	5.48	5.513	5.547
7/3/2006	5.38	5.34	5.33	5.335	5.42	5.48	5.513	5.547
6/30/2006	5.43	5.33	5.33	5.33	5.42	5.475	5.51	5.545
6/29/2006	5.18	5.33	5.33	5.35	5.44	5.5	5.545	5.585
6/28/2006	5.1	5.375	5.36	5.35	5.425	5.4925	5.53	5.57
6/27/2006	5.09	5.375	5.36	5.35	5.425	5.495	5.535	5.575
6/26/2006	5.075	5.35	5.35	5.345	5.42	5.49	5.53	5.57
6/23/2006	5.05	5.35	5.35	5.345	5.42	5.48	5.52	5.565
6/22/2006	5.05	5.3	5.3	5.34	5.4	5.46	5.495	5.535
6/21/2006	5.03	5.19	5.29	5.3	5.38	5.445	5.48	5.52
6/20/2006	5.04	5.15	5.25	5.3	5.37	5.435	5.48	5.52
6/19/2006	5.04	5.12	5.25	5.28	5.36	5.42	5.47	5.51
6/16/2006	5.065	5.11	5.18	5.265	5.355	5.415	5.453	5.492
6/15/2006	5.13	5.11	5.18	5.255	5.33	5.395	5.43	5.465
6/14/2006	5.11	5.085	5.14	5.205	5.275	5.34	5.37	5.4
6/13/2006	5.11	5.1	5.14	5.2	5.27	5.325	5.357	5.388
6/12/2006	5.08	5.08	5.14	5.18	5.255	5.315	5.35	5.38
6/9/2006	5.04	5.075	5.085	5.175	5.245	5.305	5.34	5.37
6/8/2006	5.04	5.065	5.08	5.17	5.25	5.305	5.335	5.365
6/7/2006	5.04	5.07	5.08	5.15	5.22	5.285	5.315	5.355
6/6/2006	5.04	5.05	5.06	5.143	5.21	5.275	5.305	5.335
6/5/2006	5.04	5.05	5.06	5.13	5.19	5.235	5.265	5.3
6/2/2006	5.05	5.05	5.06	5.135	5.215	5.275	5.315	5.35
6/1/2006	5.08	5.08	5.08	5.13	5.21	5.275	5.32	5.355
5/31/2006	5.1	5.065	5.075	5.11	5.18	5.235	5.27	5.3
5/30/2006	5.06	5.07	5.08	5.11	5.17	5.235	5.265	5.295
5/29/2006	5.03	5.06	5.07	5.095	5.165	5.225	5.26	5.29
5/26/2006	5.03	5.06	5.07	5.095	5.165	5.225	5.26	5.29
5/25/2006	5.07	5.088	5.09	5.09	5.15	5.23	5.26	5.29
5/24/2006	5.04	5.06	5.07	5.085	5.155	5.215	5.25	5.28
5/23/2006	5.05	5.06	5.07	5.08	5.15	5.21	5.25	5.28
5/22/2006	5.05	5.06	5.06	5.08	5.15	5.205	5.235	5.27
5/19/2006	5.02	5.06	5.07	5.08	5.143	5.195	5.232	5.266
5/18/2006	5.03	5.06	5.07	5.08	5.14	5.19	5.228	5.27
5/17/2006	5.03	5.05	5.07	5.08	5.13	5.173	5.205	5.24
5/16/2006	5.04	5.05	5.06	5.08	5.13	5.1675	5.2075	5.2475
5/15/2006	5.025	5.06	5.07	5.08	5.13	5.17	5.21	5.25

5/12/2006	5.025	5.065	5.07	5.085	5.13	5.17	5.21	5.25
5/11/2006	5.025	5.06	5.06	5.085	5.13	5.17	5.215	5.26
5/10/2006	5	5.06	5.07	5.08	5.12	5.165	5.205	5.24
5/9/2006	5	5.06	5.07	5.085	5.125	5.165	5.205	5.245
5/8/2006	5	5.06	5.07	5.08	5.12	5.16	5.2	5.23
5/5/2006	4.98	5.05	5.06	5.075	5.115	5.17	5.21	5.25
5/4/2006	4.95	5.03	5.05	5.07	5.11	5.16	5.2	5.235
5/3/2006	4.9	5.01	5.03	5.055	5.095	5.15	5.185	5.22
5/2/2006	4.87	4.97	5.01	5.055	5.095	5.145	5.18	5.215
5/1/2006	4.94	4.93	4.97	5.035	5.08	5.125	5.16	5.195
4/28/2006	4.94	4.93	4.97	5.035	5.08	5.125	5.16	5.195
4/27/2006	4.825	4.9	4.95	5.02	5.08	5.15	5.195	5.245
4/26/2006	4.81	4.87	4.94	5	5.06	5.125	5.175	5.22
4/25/2006	4.8	4.85	4.9	4.99	5.05	5.11	5.15	5.19
4/24/2006	4.83	4.83	4.89	4.97	5.04	5.105	5.147	5.188
4/21/2006	4.79	4.84	4.86	4.955	5.035	5.095	5.135	5.175
4/20/2006	4.81	4.83	4.85	4.95	5.03	5.09	5.125	5.165
4/19/2006	4.82	4.82	4.83	4.925	5.01	5.075	5.105	5.14
4/18/2006	4.82	4.82	4.84	4.92	5.01	5.08	5.12125	5.16875
4/17/2006	4.83	4.835	4.84	4.91	5.005	5.075	5.125	5.17
4/14/2006	4.83	4.835	4.84	4.91	5.005	5.075	5.125	5.17
4/13/2006	4.83	4.835	4.84	4.91	5.005	5.075	5.125	5.17
4/12/2006	4.81	4.82	4.835	4.905	5	5.07	5.115	5.16
4/11/2006	4.8	4.82	4.825	4.88	4.975	5.05	5.1	5.145
4/10/2006	4.8	4.82	4.83	4.86	4.98	5.05	5.1	5.16
4/7/2006	4.8	4.815	4.82	4.855	4.965	5.03	5.07	5.115
4/6/2006	4.8	4.815	4.815	4.845	4.95	5.025	5.07	5.12
4/5/2006	4.8	4.81	4.81	4.84	4.94	5.015	5.055	5.105
4/4/2006	4.79	4.81	4.81	4.84	4.94	5.01	5.06	5.11
4/3/2006	4.8	4.82	4.82	4.83	4.93	5	5.045	5.095
3/31/2006	4.9	4.825	4.825	4.83	4.93	5	5.045	5.1
3/30/2006	4.8	4.82	4.82	4.82	4.92	4.985	5.03	5.075
3/29/2006	4.8	4.85	4.8375	4.825	4.91	4.98	5.03	5.075
3/28/2006	4.8	4.85	4.85	4.82	4.9	4.96	5	5.035
3/27/2006	4.8	4.85	4.85	4.825	4.9	4.96	4.995	5.03
3/24/2006	4.7	4.825	4.82	4.82	4.9	4.963	5.005	5.048
3/23/2006	4.7	4.825	4.82	4.82	4.89	4.96	5	5.04
3/22/2006	4.65	4.75	4.77	4.81	4.875	4.955	4.993	5.032
3/21/2006	4.615	4.72	4.74	4.8	4.865	4.94	4.977	5.013
3/20/2006	4.6	4.68	4.72	4.795	4.86	4.938	4.97	5.003
3/17/2006	4.58	4.64	4.7	4.785	4.85	4.93	4.965	5
3/16/2006	4.58	4.61	4.67	4.775	4.858	4.93	4.972	5.013
3/15/2006	4.62	4.56	4.62	4.755	4.83	4.918	4.96	5.003
3/14/2006	4.57	4.55	4.62	4.755	4.825	4.915	4.968	5.022
3/13/2006	4.585	4.56	4.62	4.75	4.82	4.91	4.963	5.017
3/10/2006	4.54	4.565	4.59	4.735	4.81	4.9	4.95	5
3/9/2006	4.57	4.555	4.62	4.715	4.8	4.893	4.944	4.994
3/8/2006	4.54	4.56	4.575	4.7	4.78	4.88	4.93	4.98
3/7/2006	4.54	4.565	4.575	4.69	4.77	4.87	4.92	4.97
3/6/2006	4.54	4.56	4.57	4.69	4.76	4.86	4.91	4.96
3/3/2006	4.55	4.56	4.57	4.67	4.76	4.85	4.9	4.95
3/2/2006	4.56	4.56	4.57	4.66	4.75	4.84	4.89	4.94
3/1/2006	4.54	4.55	4.56	4.64	4.735	4.83	4.88	4.93
2/28/2006	4.62	4.56	4.58	4.635	4.73	4.825	4.885	4.94
2/27/2006	4.55	4.56	4.57	4.63	4.73	4.82	4.885	4.935

2/24/2006	4.54	4.56	4.57	4.61	4.73	4.81	4.875	4.92
2/23/2006	4.58	4.56	4.57	4.58	4.71	4.8	4.857	4.913
2/22/2006	4.55	4.56	4.57	4.575	4.7	4.78	4.855	4.92
2/21/2006	4.55	4.56	4.57	4.57	4.695	4.775	4.845	4.895
2/20/2006	4.55	4.56	4.565	4.57	4.69	4.77	4.84	4.905
2/17/2006	4.55	4.56	4.565	4.57	4.69	4.77	4.84	4.895
2/16/2006	4.55	4.56	4.565	4.57	4.69	4.77	4.84	4.905
2/15/2006	4.585	4.56	4.56	4.57	4.68	4.75	4.81	4.87
2/14/2006	4.585	4.56	4.56	4.57	4.68	4.75	4.81	4.87
2/13/2006	4.55	4.56	4.565	4.57	4.68	4.75	4.825	4.89
2/10/2006	4.585	4.56	4.56	4.57	4.68	4.745	4.805	4.865
2/9/2006	4.555	4.56	4.56	4.57	4.66	4.74	4.798	4.857
2/8/2006	4.56	4.55	4.56	4.57	4.655	4.725	4.78	4.835
2/7/2006	4.6	4.55	4.56	4.57	4.65	4.72	4.778	4.835
2/6/2006	4.6	4.55	4.56	4.57	4.65	4.715	4.768	4.822
2/3/2006	4.57	4.55	4.56	4.573	4.64	4.71	4.76	4.81
2/2/2006	4.57	4.55	4.56	4.573	4.64	4.71	4.76	4.81
2/1/2006	4.55	4.56	4.57	4.575	4.63	4.69	4.74	4.78
1/31/2006	4.565	4.545	4.55	4.57	4.63	4.68	4.725	4.77
1/30/2006	4.565	4.545	4.55	4.57	4.63	4.68	4.723	4.767
1/27/2006	4.46	4.54	4.54	4.57	4.61	4.665	4.707	4.748
1/26/2006	4.46	4.54	4.54	4.56	4.6	4.658	4.697	4.736
1/25/2006	4.38	4.5	4.51	4.54	4.575	4.638	4.675	4.713
1/24/2006	4.35	4.46	4.49	4.535	4.575	4.63	4.667	4.703
1/23/2006	4.34	4.41	4.46	4.53	4.57	4.623	4.658	4.694
1/20/2006	4.28	4.4	4.46	4.52	4.56	4.62	4.66	4.7
1/19/2006	4.32	4.35	4.38	4.515	4.555	4.615	4.655	4.695
1/18/2006	4.32	4.3	4.38	4.49	4.545	4.603	4.642	4.681
1/17/2006	4.395	4.3	4.38	4.485	4.54	4.603	4.642	4.681
1/16/2006	4.335	4.306	4.36	4.47	4.525	4.6	4.645	4.69
1/13/2006	4.335	4.306	4.36	4.47	4.525	4.6	4.645	4.69
1/12/2006	4.32	4.31	4.36	4.45	4.525	4.6	4.645	4.69
1/11/2006	4.31	4.31	4.36	4.443	4.51	4.58	4.627	4.673
1/10/2006	4.32	4.3	4.36	4.44	4.505	4.568	4.613	4.659
1/9/2006	4.33	4.31	4.38	4.44	4.505	4.563	4.607	4.651
1/6/2006	4.32	4.3	4.36	4.42	4.49	4.55	4.593	4.637
1/5/2006	4.33	4.3	4.36	4.42	4.49	4.55	4.592	4.633
1/4/2006	4.36	4.3	4.38	4.4	4.485	4.545	4.59	4.635
1/3/2006	4.36	4.3	4.38	4.4	4.49	4.55	4.605	4.66
1/2/2006	4.35	4.31	4.31	4.39	4.48	4.54	4.595	4.645

6M	7M	8M	9M	10M	11M	12M
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.49	0.531	0.568	0.624	0.682	0.75
0.44	0.491	0.532	0.569	0.625	0.683	0.751
0.44	0.491	0.532	0.569	0.625	0.683	0.751
0.44	0.491	0.532	0.569	0.625	0.683	0.751
0.44	0.491	0.532	0.569	0.625	0.683	0.751
0.438	0.489	0.53	0.566	0.622	0.68	0.748
0.437	0.488	0.529	0.564	0.62	0.678	0.746
0.438	0.489	0.531	0.566	0.622	0.68	0.748
0.436	0.487	0.529	0.563	0.619	0.677	0.744
0.436	0.487	0.529	0.563	0.619	0.677	0.744
0.436	0.487	0.529	0.563	0.619	0.677	0.744
0.434	0.484	0.526	0.559	0.615	0.673	0.74
0.435	0.485	0.528	0.561	0.617	0.675	0.742
0.437	0.487	0.531	0.565	0.621	0.68	0.747
0.438	0.489	0.533	0.568	0.624	0.683	0.75
0.438	0.489	0.533	0.568	0.624	0.683	0.75
0.438	0.489	0.533	0.568	0.634	0.693	0.76
0.435	0.486	0.53	0.565	0.631	0.69	0.757
0.435	0.486	0.53	0.565	0.631	0.69	0.757
0.43	0.482	0.524	0.56	0.626	0.685	0.752
0.419	0.471	0.509	0.545	0.611	0.67	0.737
0.419	0.47	0.508	0.543	0.609	0.668	0.735
0.419	0.47	0.508	0.543	0.609	0.668	0.735
0.419	0.47	0.508	0.543	0.609	0.668	0.735
0.419	0.47	0.509	0.544	0.61	0.669	0.736
0.419	0.47	0.509	0.544	0.612	0.659	0.726
0.419	0.47	0.509	0.544	0.612	0.659	0.726
0.419	0.475	0.519	0.554	0.627	0.674	0.741
0.419	0.475	0.519	0.544	0.607	0.654	0.721
0.419	0.475	0.519	0.544	0.607	0.653	0.72
0.419	0.475	0.519	0.544	0.607	0.653	0.72
0.419	0.475	0.519	0.544	0.607	0.653	0.72
0.418	0.473	0.516	0.541	0.604	0.65	0.717
0.418	0.473	0.516	0.541	0.604	0.65	0.717
0.418	0.473	0.517	0.542	0.605	0.651	0.718
0.418	0.473	0.517	0.542	0.605	0.651	0.718
0.418	0.473	0.517	0.542	0.605	0.651	0.718
0.418	0.473	0.517	0.542	0.605	0.651	0.718
0.419	0.474	0.519	0.544	0.607	0.653	0.72
0.421	0.476	0.521	0.546	0.609	0.655	0.722
0.409	0.477	0.522	0.547	0.61	0.656	0.723
0.409	0.477	0.522	0.547	0.61	0.656	0.722
0.409	0.477	0.522	0.547	0.61	0.656	0.722
0.409	0.477	0.522	0.547	0.611	0.657	0.723
0.409	0.477	0.522	0.547	0.611	0.657	0.723
0.41	0.478	0.523	0.548	0.612	0.658	0.724
0.41	0.478	0.523	0.548	0.612	0.658	0.724

0.41	0.478	0.523	0.548	0.612	0.658	0.724
0.41	0.478	0.523	0.547	0.611	0.657	0.723
0.41	0.478	0.523	0.546	0.61	0.656	0.722
0.41	0.478	0.523	0.546	0.61	0.656	0.722
0.41	0.478	0.523	0.546	0.61	0.656	0.722
0.41	0.478	0.523	0.546	0.61	0.656	0.723
0.411	0.479	0.524	0.547	0.611	0.657	0.724
0.414	0.482	0.527	0.55	0.614	0.66	0.727
0.417	0.486	0.531	0.554	0.619	0.666	0.733
0.42	0.489	0.535	0.559	0.624	0.671	0.739
0.421	0.49	0.536	0.56	0.625	0.672	0.741
0.422	0.491	0.537	0.561	0.626	0.673	0.742
0.422	0.491	0.537	0.561	0.626	0.673	0.742
0.424	0.494	0.54	0.564	0.629	0.677	0.746
0.425	0.495	0.541	0.565	0.63	0.678	0.748
0.426	0.496	0.542	0.566	0.631	0.679	0.749
0.427	0.497	0.543	0.567	0.632	0.68	0.75
0.427	0.497	0.543	0.567	0.632	0.68	0.75
0.429	0.498	0.544	0.568	0.633	0.681	0.751
0.434	0.505	0.553	0.579	0.645	0.695	0.767
0.436	0.507	0.555	0.581	0.647	0.697	0.769
0.436	0.507	0.555	0.581	0.647	0.697	0.769
0.438	0.509	0.557	0.584	0.65	0.7	0.772
0.439	0.511	0.559	0.586	0.652	0.703	0.775
0.443	0.516	0.565	0.593	0.659	0.711	0.783
0.45	0.524	0.575	0.605	0.673	0.726	0.799
0.451	0.525	0.576	0.606	0.674	0.727	0.8
0.453	0.527	0.579	0.61	0.678	0.731	0.804
0.453	0.527	0.579	0.6	0.668	0.721	0.794
0.454	0.528	0.58	0.601	0.669	0.722	0.795
0.456	0.53	0.582	0.604	0.672	0.725	0.798
0.464	0.539	0.592	0.614	0.682	0.736	0.809
0.467	0.542	0.595	0.617	0.685	0.739	0.813
0.468	0.543	0.596	0.618	0.686	0.74	0.814
0.471	0.546	0.599	0.621	0.689	0.743	0.817
0.483	0.559	0.612	0.635	0.704	0.759	0.834
0.483	0.559	0.612	0.635	0.704	0.759	0.834
0.488	0.564	0.617	0.64	0.71	0.765	0.84
0.5	0.575	0.627	0.65	0.72	0.775	0.85
0.499	0.574	0.626	0.649	0.72	0.774	0.85
0.51	0.585	0.638	0.662	0.733	0.788	0.864
0.52	0.595	0.648	0.672	0.74	0.795	0.871
0.54	0.61	0.658	0.681	0.749	0.805	0.881
0.555	0.621	0.669	0.693	0.762	0.818	0.895
0.562	0.628	0.678	0.703	0.774	0.83	0.907
0.576	0.643	0.693	0.714	0.786	0.843	0.92
0.58	0.645	0.694	0.715	0.787	0.843	0.92
0.58	0.645	0.694	0.715	0.787	0.843	0.92
0.6	0.66	0.709	0.725	0.797	0.853	0.931
0.615	0.675	0.725	0.741	0.814	0.87	0.948
0.63	0.69	0.73	0.751	0.824	0.88	0.963
0.635	0.696	0.736	0.757	0.83	0.886	0.969
0.639	0.7	0.74	0.761	0.834	0.89	0.973
0.639	0.7	0.74	0.761	0.833	0.887	0.968
0.649	0.71	0.752	0.774	0.847	0.902	0.983

0.662	0.723	0.765	0.787	0.86	0.916	0.998
0.67	0.731	0.773	0.795	0.868	0.924	1.006
0.679	0.74	0.782	0.804	0.877	0.934	1.016
0.691	0.752	0.794	0.816	0.889	0.947	1.03
0.697	0.758	0.8	0.822	0.894	0.952	1.035
0.699	0.76	0.803	0.826	0.899	0.957	1.04
0.701	0.76	0.803	0.823	0.896	0.954	1.037
0.701	0.76	0.803	0.823	0.896	0.954	1.037
0.701	0.76	0.803	0.823	0.896	0.954	1.037
0.712	0.772	0.816	0.836	0.91	0.969	1.053
0.72	0.78	0.825	0.845	0.92	0.98	1.065
0.73	0.79	0.83	0.852	0.927	0.985	1.069
0.734	0.794	0.833	0.882	0.93	0.988	1.072
0.738	0.798	0.838	0.887	0.937	0.997	1.082
0.74	0.8	0.84	0.89	0.94	1	1.085
0.723	0.783	0.823	0.882	0.937	0.991	1.086
0.723	0.783	0.823	0.882	0.937	0.991	1.086
0.73	0.79	0.83	0.89	0.945	1	1.095
0.737	0.797	0.837	0.894	0.953	1.008	1.108
0.737	0.797	0.837	0.896	0.955	1.01	1.11
0.74	0.8	0.84	0.9	0.96	1.015	1.115
0.743	0.803	0.848	0.911	0.968	1.023	1.122
0.743	0.803	0.848	0.912	0.969	1.024	1.123
0.745	0.805	0.85	0.914	0.971	1.026	1.125
0.743	0.802	0.85	0.916	0.973	1.029	1.128
0.745	0.804	0.853	0.919	0.976	1.033	1.133
0.748	0.807	0.856	0.922	0.979	1.037	1.138
0.748	0.807	0.855	0.921	0.977	1.034	1.134
0.747	0.806	0.854	0.92	0.976	1.033	1.133
0.746	0.804	0.851	0.916	0.971	1.027	1.126
0.749	0.808	0.856	0.921	0.976	1.032	1.132
0.75	0.809	0.857	0.922	0.977	1.033	1.134
0.753	0.813	0.862	0.928	0.985	1.042	1.124
0.754	0.814	0.863	0.929	0.986	1.044	1.127
0.756	0.816	0.865	0.931	0.989	1.047	1.13
0.755	0.814	0.862	0.927	0.985	1.043	1.126
0.754	0.813	0.861	0.926	0.984	1.042	1.125
0.755	0.815	0.864	0.93	0.988	1.046	1.129
0.759	0.82	0.87	0.937	0.996	1.054	1.137
0.759	0.82	0.87	0.937	0.996	1.054	1.137
0.761	0.825	0.878	0.949	1.008	1.066	1.149
0.751	0.815	0.868	0.939	0.998	1.057	1.14
0.754	0.82	0.875	0.947	1.006	1.065	1.148
0.749	0.812	0.869	0.95	1.009	1.069	1.154
0.754	0.817	0.874	0.955	1.014	1.074	1.159
0.755	0.818	0.875	0.956	1.004	1.075	1.16
0.755	0.818	0.875	0.956	1.004	1.075	1.16
0.763	0.821	0.88	0.962	1.01	1.081	1.166
0.763	0.823	0.884	0.968	1.017	1.088	1.174
0.768	0.828	0.89	0.976	1.026	1.097	1.183
0.715	0.775	0.835	0.92	0.97	1.04	1.125
0.69	0.75	0.81	0.885	0.935	1.01	1.09
0.67	0.73	0.79	0.86	0.91	0.985	1.065
0.652	0.712	0.772	0.841	0.896	0.975	1.055
0.64	0.7	0.76	0.83	0.885	0.965	1.045



0.628	0.699	0.75	0.818	0.883	0.963	1.043
0.61	0.681	0.732	0.799	0.864	0.944	1.024
0.601	0.669	0.717	0.783	0.846	0.925	1.003
0.601	0.67	0.719	0.786	0.851	0.931	1.011
0.598	0.668	0.718	0.785	0.85	0.93	1.01
0.6	0.67	0.72	0.79	0.86	0.94	1.02
0.61	0.68	0.74	0.82	0.89	0.98	1.06
0.53	0.6	0.66	0.74	0.81	0.9	0.99
0.51	0.58	0.64	0.72	0.8	0.89	0.98
0.494	0.567	0.631	0.703	0.785	0.887	0.974
0.48	0.55	0.61	0.68	0.76	0.86	0.945
0.48	0.55	0.61	0.68	0.76	0.86	0.945
0.46	0.53	0.6	0.67	0.76	0.86	0.945
0.451	0.514	0.592	0.673	0.764	0.862	0.947
0.432	0.495	0.571	0.651	0.742	0.84	0.925
0.428	0.49	0.566	0.645	0.736	0.834	0.918
0.425	0.485	0.56	0.638	0.728	0.826	0.909
0.417	0.476	0.547	0.623	0.712	0.809	0.891
0.41	0.469	0.54	0.615	0.703	0.8	0.882
0.404	0.461	0.531	0.604	0.689	0.785	0.866
0.404	0.458	0.527	0.599	0.683	0.777	0.856
0.404	0.46	0.53	0.605	0.69	0.785	0.865
0.404	0.463	0.533	0.608	0.693	0.791	0.872
0.404	0.464	0.534	0.609	0.695	0.793	0.875
0.402	0.462	0.532	0.607	0.692	0.788	0.868
0.402	0.462	0.532	0.607	0.692	0.788	0.869
0.4	0.46	0.53	0.605	0.69	0.785	0.865
0.405	0.465	0.535	0.61	0.692	0.79	0.87
0.405	0.468	0.541	0.619	0.703	0.802	0.88
0.405	0.47	0.545	0.625	0.71	0.81	0.89
0.396	0.459	0.527	0.603	0.684	0.779	0.861
0.396	0.459	0.527	0.603	0.684	0.779	0.861
0.396	0.459	0.527	0.603	0.684	0.779	0.861
0.394	0.464	0.536	0.607	0.698	0.794	0.876
0.392	0.462	0.533	0.604	0.694	0.789	0.869
0.391	0.461	0.532	0.602	0.692	0.787	0.867
0.39	0.46	0.53	0.6	0.69	0.785	0.865
0.39	0.46	0.53	0.6	0.69	0.785	0.865
0.387	0.457	0.527	0.596	0.685	0.775	0.854
0.387	0.457	0.527	0.596	0.685	0.775	0.854
0.39	0.46	0.53	0.6	0.69	0.78	0.86
0.38	0.447	0.518	0.584	0.669	0.758	0.838
0.37	0.435	0.5	0.563	0.648	0.737	0.817
0.37	0.435	0.5	0.565	0.65	0.74	0.82
0.375	0.446	0.512	0.578	0.663	0.753	0.84
0.375	0.445	0.51	0.575	0.66	0.75	0.84
0.375	0.445	0.51	0.575	0.66	0.75	0.84
0.375	0.445	0.51	0.575	0.66	0.75	0.84
0.375	0.445	0.505	0.57	0.65	0.74	0.83
0.375	0.445	0.505	0.57	0.65	0.74	0.83
0.375	0.45	0.51	0.58	0.66	0.75	0.84
0.368	0.441	0.496	0.566	0.645	0.73	0.82
0.368	0.441	0.496	0.566	0.645	0.73	0.82
0.368	0.441	0.496	0.566	0.645	0.73	0.82
0.368	0.441	0.496	0.566	0.647	0.735	0.825

0.37	0.446	0.501	0.571	0.652	0.74	0.83
0.37	0.445	0.5	0.57	0.65	0.73	0.82
0.37	0.445	0.5	0.57	0.65	0.73	0.82
0.375	0.455	0.52	0.59	0.67	0.75	0.84
0.38	0.46	0.525	0.6	0.68	0.76	0.85
0.385	0.465	0.53	0.61	0.69	0.77	0.86
0.39	0.47	0.54	0.62	0.7	0.78	0.87
0.375	0.45	0.52	0.6	0.68	0.75	0.84
0.375	0.45	0.52	0.6	0.68	0.75	0.835
0.38	0.455	0.53	0.61	0.69	0.75	0.835
0.38	0.455	0.53	0.61	0.69	0.75	0.835
0.38	0.455	0.535	0.61	0.69	0.76	0.845
0.38	0.455	0.535	0.615	0.695	0.77	0.855
0.38	0.45	0.53	0.605	0.685	0.76	0.84
0.38	0.45	0.53	0.605	0.685	0.76	0.84
0.38	0.45	0.53	0.6	0.68	0.75	0.83
0.38	0.45	0.53	0.61	0.685	0.75	0.83
0.38	0.45	0.53	0.61	0.69	0.75	0.83
0.38	0.45	0.53	0.61	0.69	0.75	0.83
0.38	0.45	0.53	0.61	0.69	0.75	0.83
0.38	0.45	0.53	0.61	0.69	0.75	0.83
0.38	0.45	0.53	0.61	0.69	0.75	0.83
0.385	0.46	0.54	0.615	0.695	0.76	0.84
0.385	0.46	0.54	0.62	0.7	0.77	0.85
0.385	0.455	0.54	0.61	0.69	0.755	0.84
0.38	0.45	0.53	0.6	0.68	0.74	0.83
0.38	0.455	0.54	0.62	0.7	0.77	0.86
0.38	0.45	0.53	0.61	0.69	0.76	0.85
0.39	0.46	0.55	0.63	0.71	0.79	0.88
0.39	0.46	0.555	0.63	0.71	0.795	0.885
0.39	0.46	0.555	0.63	0.71	0.795	0.885
0.39	0.46	0.555	0.63	0.71	0.795	0.885
0.39	0.46	0.555	0.635	0.715	0.8	0.89
0.395	0.465	0.565	0.645	0.725	0.815	0.905
0.395	0.465	0.565	0.64	0.72	0.81	0.9
0.395	0.465	0.565	0.64	0.72	0.81	0.9
0.4	0.47	0.57	0.65	0.74	0.82	0.91
0.41	0.485	0.6	0.68	0.77	0.85	0.95
0.41	0.48	0.59	0.67	0.76	0.84	0.94
0.42	0.49	0.595	0.68	0.77	0.85	0.95
0.42	0.49	0.595	0.69	0.78	0.86	0.96
0.43	0.5	0.615	0.715	0.81	0.9	0.995
0.43	0.5	0.615	0.715	0.805	0.895	0.99
0.43	0.5	0.615	0.715	0.805	0.895	0.99
0.43	0.5	0.615	0.715	0.805	0.895	0.99
0.435	0.52	0.62	0.72	0.815	0.91	1.01
0.43	0.51	0.61	0.71	0.8	0.89	0.99
0.43	0.51	0.61	0.71	0.8	0.89	0.99
0.43	0.51	0.61	0.71	0.8	0.89	0.99
0.43	0.51	0.61	0.71	0.8	0.88	0.98
0.435	0.515	0.615	0.71	0.8	0.88	0.98
0.43	0.51	0.61	0.7	0.79	0.87	0.96
0.433	0.522	0.62	0.701	0.796	0.873	0.962
0.441	0.53	0.629	0.712	0.808	0.888	0.978
0.45	0.54	0.64	0.73	0.83	0.91	1
0.45	0.54	0.63	0.72	0.82	0.91	1

0.45	0.54	0.63	0.72	0.81	0.905	0.995
0.456	0.547	0.637	0.727	0.814	0.907	0.997
0.458	0.55	0.64	0.73	0.817	0.907	0.997
0.46	0.553	0.643	0.733	0.823	0.913	1.003
0.47	0.56	0.65	0.74	0.83	0.92	1.01
0.49	0.59	0.68	0.78	0.87	0.96	1.055
0.49	0.59	0.68	0.77	0.85	0.94	1.035
0.49	0.59	0.675	0.77	0.85	0.94	1.035
0.46	0.56	0.65	0.74	0.82	0.91	1
0.48	0.58	0.67	0.76	0.84	0.92	1.01
0.49	0.59	0.68	0.76	0.85	0.93	1.02
0.48	0.58	0.67	0.75	0.84	0.92	1.01
0.47	0.57	0.66	0.745	0.835	0.915	1
0.47	0.57	0.66	0.745	0.835	0.915	1
0.47	0.57	0.66	0.76	0.85	0.93	1.02
0.48	0.58	0.67	0.77	0.85	0.94	1.03
0.48	0.57	0.66	0.76	0.845	0.935	1.02
0.48	0.58	0.66	0.77	0.85	0.94	1.03
0.49	0.59	0.68	0.79	0.88	0.97	1.06
0.51	0.6	0.69	0.8	0.89	0.97	1.06
0.51	0.61	0.71	0.81	0.91	0.99	1.09
0.52	0.61	0.71	0.81	0.9	0.99	1.09
0.52	0.62	0.71	0.82	0.91	1	1.1
0.52	0.63	0.72	0.83	0.92	1.01	1.11
0.53	0.64	0.74	0.84	0.94	1.03	1.13
0.53	0.64	0.74	0.85	0.95	1.04	1.14
0.54	0.66	0.77	0.88	0.98	1.08	1.18
0.537	0.661	0.77	0.879	0.975	1.069	1.17
0.55	0.67	0.79	0.9	1	1.1	1.2
0.55	0.66	0.78	0.89	0.99	1.09	1.18
0.56	0.67	0.79	0.91	1.01	1.11	1.2
0.555	0.665	0.79	0.905	1.01	1.105	1.205
0.555	0.66	0.785	0.9	1.005	1.1	1.2
0.55	0.66	0.78	0.9	1	1.095	1.195
0.565	0.685	0.805	0.925	1.03	1.13	1.235
0.575	0.69	0.81	0.93	1.04	1.145	1.245
0.575	0.69	0.815	0.93	1.03	1.135	1.235
0.58	0.695	0.815	0.93	1.03	1.13	1.23
0.58	0.705	0.83	0.94	1.045	1.14	1.24
0.58	0.705	0.83	0.945	1.05	1.145	1.245
0.6	0.72	0.845	0.965	1.075	1.17	1.27
0.595	0.72	0.845	0.96	1.065	1.165	1.27
0.59	0.72	0.84	0.96	1.06	1.155	1.26
0.59	0.72	0.835	0.955	1.055	1.15	1.255
0.595	0.72	0.835	0.96	1.07	1.165	1.27
0.61	0.735	0.855	0.98	1.09	1.185	1.29
0.61	0.73	0.85	0.965	1.07	1.16	1.26
0.61	0.73	0.845	0.96	1.06	1.15	1.25
0.615	0.735	0.845	0.96	1.06	1.155	1.25
0.62	0.735	0.85	0.965	1.065	1.16	1.25
0.625	0.735	0.855	0.96	1.06	1.16	1.26
0.625	0.735	0.85	0.955	1.055	1.155	1.25
0.64	0.75	0.86	0.98	1.08	1.18	1.28
0.65	0.775	0.89	1.005	1.115	1.21	1.32
0.65	0.76	0.87	0.99	1.09	1.19	1.3

0.66	0.78	0.89	1.01	1.11	1.205	1.32
0.66	0.78	0.89	1.01	1.11	1.205	1.32
0.665	0.785	0.895	1.015	1.115	1.21	1.325
0.68	0.805	0.91	1.035	1.135	1.235	1.35
0.685	0.81	0.925	1.045	1.145	1.255	1.37
0.69	0.815	0.935	1.06	1.16	1.275	1.39
0.7	0.82	0.94	1.07	1.17	1.28	1.4
0.72	0.84	0.96	1.08	1.19	1.3	1.42
0.71	0.83	0.94	1.06	1.17	1.28	1.39
0.7	0.83	0.94	1.065	1.165	1.275	1.38
0.71	0.835	0.945	1.065	1.165	1.28	1.385
0.71	0.835	0.94	1.06	1.16	1.275	1.38
0.715	0.835	0.945	1.065	1.17	1.285	1.39
0.72	0.84	0.95	1.065	1.17	1.285	1.39
0.72	0.85	0.965	1.085	1.195	1.31	1.425
0.735	0.86	0.98	1.095	1.205	1.315	1.425
0.745	0.87	0.99	1.1	1.21	1.325	1.43
0.755	0.885	0.995	1.115	1.225	1.33	1.43
0.76	0.89	1	1.115	1.22	1.325	1.42
0.77	0.89	1.01	1.125	1.22	1.325	1.42
0.78	0.91	1.03	1.14	1.23	1.33	1.43
0.78	0.91	1.03	1.14	1.23	1.33	1.43
0.8	0.93	1.04	1.15	1.25	1.34	1.45
0.81	0.94	1.05	1.16	1.26	1.35	1.45
0.82	0.94	1.05	1.16	1.25	1.35	1.45
0.84	0.95	1.07	1.19	1.29	1.38	1.48
0.83	0.94	1.07	1.18	1.27	1.37	1.46
0.85	0.96	1.08	1.21	1.3	1.38	1.48
0.87	0.98	1.08	1.2	1.28	1.37	1.46
0.9	1.01	1.12	1.24	1.32	1.41	1.5
0.89	0.99	1.1	1.21	1.3	1.38	1.47
0.9	1.01	1.12	1.23	1.31	1.4	1.48
0.93	1.04	1.15	1.27	1.36	1.45	1.55
0.93	1.04	1.15	1.27	1.36	1.45	1.55
0.96	1.08	1.2	1.32	1.41	1.51	1.61
0.98	1.1	1.23	1.36	1.45	1.56	1.66
0.97	1.08	1.2	1.32	1.41	1.5	1.6
0.97	1.09	1.21	1.33	1.42	1.51	1.61
0.97	1.09	1.2	1.32	1.41	1.5	1.6
0.97	1.08	1.2	1.32	1.41	1.51	1.6
0.97	1.08	1.19	1.3	1.39	1.48	1.57
0.99	1.09	1.21	1.32	1.41	1.51	1.61
1	1.11	1.22	1.33	1.41	1.52	1.61
0.99	1.1	1.21	1.32	1.41	1.5	1.59
0.99	1.1	1.2	1.31	1.4	1.48	1.57
1.02	1.13	1.23	1.34	1.42	1.51	1.61
1.02	1.13	1.23	1.34	1.42	1.51	1.61
1.02	1.12	1.21	1.32	1.41	1.49	1.58
1.02	1.12	1.21	1.31	1.39	1.47	1.56
1.02	1.13	1.21	1.32	1.4	1.48	1.57
1.03	1.14	1.23	1.34	1.42	1.51	1.6
1.025	1.14	1.23	1.33	1.41	1.505	1.59
1.05	1.15	1.24	1.35	1.425	1.515	1.61
1.05	1.15	1.24	1.35	1.435	1.525	1.615
1.06	1.165	1.245	1.35	1.435	1.525	1.615

1.035	1.14	1.22	1.32	1.395	1.475	1.56
1.03	1.135	1.215	1.305	1.38	1.47	1.55
1.05	1.145	1.225	1.33	1.4	1.49	1.58
1.075	1.17	1.25	1.34	1.43	1.515	1.6
1.085	1.185	1.26	1.36	1.44	1.525	1.61
1.1	1.2	1.28	1.37	1.445	1.535	1.62
1.115	1.215	1.29	1.38	1.455	1.55	1.63
1.14	1.235	1.315	1.42	1.49	1.58	1.675
1.155	1.25	1.33	1.425	1.51	1.595	1.685
1.185	1.275	1.355	1.455	1.54	1.63	1.72
1.195	1.28	1.355	1.45	1.53	1.615	1.705
1.165	1.26	1.335	1.43	1.51	1.595	1.69
1.18	1.28	1.37	1.45	1.54	1.63	1.73
1.2	1.29	1.38	1.47	1.56	1.645	1.74
1.22	1.32	1.41	1.5	1.59	1.68	1.77
1.23	1.33	1.42	1.51	1.6	1.69	1.78
1.25	1.36	1.46	1.56	1.65	1.76	1.86
1.22	1.32	1.41	1.51	1.6	1.69	1.79
1.23	1.34	1.43	1.53	1.62	1.71	1.8
1.23	1.34	1.43	1.53	1.62	1.71	1.8
1.23	1.34	1.43	1.52	1.61	1.7	1.8
1.25	1.35	1.44	1.53	1.63	1.73	1.82
1.29	1.39	1.49	1.6	1.69	1.79	1.9
1.3	1.4	1.5	1.59	1.68	1.77	1.87
1.32	1.43	1.53	1.63	1.73	1.83	1.93
1.35	1.46	1.55	1.65	1.75	1.85	1.95
1.28	1.36	1.43	1.5	1.57	1.65	1.72
1.25	1.32	1.38	1.45	1.51	1.58	1.66
1.28	1.35	1.41	1.48	1.54	1.61	1.68
1.3	1.38	1.44	1.51	1.57	1.64	1.71
1.29	1.37	1.43	1.5	1.56	1.62	1.69
1.3	1.38	1.43	1.5	1.56	1.63	1.7
1.31	1.39	1.45	1.52	1.59	1.65	1.72
1.35	1.42	1.49	1.56	1.62	1.68	1.75
1.27	1.35	1.41	1.48	1.53	1.59	1.66
1.26	1.33	1.39	1.46	1.51	1.57	1.64
1.26	1.33	1.39	1.46	1.51	1.57	1.64
1.23	1.29	1.35	1.41	1.45	1.51	1.57
1.3	1.36	1.41	1.47	1.52	1.58	1.64
1.34	1.4	1.45	1.51	1.56	1.63	1.69
1.39	1.45	1.5	1.56	1.61	1.67	1.73
1.42	1.48	1.54	1.6	1.65	1.71	1.77
1.44	1.5	1.55	1.62	1.66	1.72	1.78
1.47	1.53	1.58	1.65	1.7	1.76	1.82
1.5	1.56	1.61	1.68	1.73	1.79	1.86
1.5	1.56	1.61	1.68	1.73	1.79	1.85
1.52	1.58	1.64	1.7	1.75	1.82	1.88
1.55	1.61	1.67	1.74	1.78	1.84	1.91
1.57	1.63	1.68	1.74	1.79	1.85	1.91
1.6	1.66	1.71	1.78	1.83	1.9	1.96
1.595	1.65	1.705	1.77	1.82	1.88	1.935
1.595	1.65	1.705	1.77	1.82	1.88	1.935
1.61	1.67	1.73	1.79	1.84	1.9	1.96
1.64	1.71	1.77	1.83	1.88	1.94	2
1.64	1.7	1.74	1.8	1.85	1.91	1.97

1.65	1.71	1.76	1.82	1.87	1.94	2
1.68	1.75	1.8	1.87	1.92	1.98	2.04
1.7	1.76	1.81	1.88	1.93	1.98	2.05
1.73	1.79	1.84	1.91	1.96	2.02	2.08
1.73	1.79	1.84	1.9	1.96	2.01	2.06
1.72	1.77	1.82	1.88	1.94	2	2.06
1.69	1.74	1.785	1.84	1.895	1.95	1.995
1.675	1.715	1.765	1.82	1.86	1.905	1.95
1.67	1.72	1.765	1.81	1.855	1.895	1.94
1.66	1.705	1.75	1.795	1.84	1.875	1.915
1.68	1.72	1.76	1.8	1.85	1.9	1.95
1.68	1.72	1.76	1.8	1.85	1.9	1.95
1.68	1.72	1.76	1.8	1.85	1.9	1.95
1.69	1.73	1.76	1.8	1.85	1.89	1.95
1.7	1.74	1.77	1.8	1.86	1.91	1.97
1.72	1.76	1.79	1.83	1.89	1.94	1.99
1.71	1.75	1.785	1.82	1.87	1.92	1.97
1.72	1.76	1.79	1.83	1.87	1.92	1.97
1.72	1.75	1.78	1.82	1.87	1.91	1.96
1.74	1.77	1.8	1.84	1.88	1.92	1.97
1.75	1.79	1.82	1.86	1.9	1.94	1.99
1.76	1.79	1.83	1.86	1.91	1.96	2.01
1.79	1.83	1.86	1.9	1.95	2	2.05
1.78	1.82	1.86	1.9	1.95	2	2.04
1.78	1.82	1.86	1.9	1.95	2	2.04
1.76	1.8	1.83	1.87	1.92	1.97	2.02
1.75	1.79	1.82	1.86	1.91	1.96	2.01
1.74	1.78	1.81	1.85	1.9	1.95	2
1.86	1.91	1.96	2.01	2.07	2.13	2.18
1.89	1.94	2	2.05	2.1	2.16	2.21
1.88	1.93	1.99	2.05	2.1	2.16	2.21
1.895	1.95	2	2.055	2.11	2.17	2.22
1.89	1.94	2	2.055	2.11	2.17	2.22
1.915	1.97	2.02	2.08	2.14	2.2	2.255
1.96	2.02	2.08	2.14	2.19	2.25	2.3
1.93	2	2.05	2.11	2.17	2.22	2.27
1.85	1.9	1.95	2	2.05	2.09	2.14
1.83	1.88	1.94	1.99	2.04	2.09	2.14
1.82	1.86	1.9	1.95	2	2.05	2.11
1.81	1.86	1.91	1.96	2.01	2.06	2.11
1.8	1.85	1.9	1.95	2.01	2.06	2.11
1.8	1.85	1.9	1.96	2.01	2.06	2.12
1.8	1.86	1.91	1.97	2.03	2.08	2.13
1.78	1.83	1.88	1.93	1.98	2.03	2.08
1.75	1.79	1.84	1.88	1.93	1.98	2.03
1.76	1.81	1.86	1.91	1.97	2.02	2.07
1.765	1.815	1.865	1.92	1.97	2.02	2.07
1.8	1.855	1.905	1.96	2.01	2.06	2.11
1.8	1.855	1.9	1.955	2.01	2.06	2.11
1.77	1.83	1.885	1.94	1.99	2.045	2.1
1.77	1.83	1.88	1.94	2	2.05	2.1
1.74	1.79	1.84	1.89	1.93	1.99	2.04
1.72	1.77	1.82	1.87	1.92	1.96	2.01
1.73	1.78	1.83	1.88	1.93	1.98	2.03
1.69	1.74	1.79	1.83	1.88	1.93	1.98



1.7	1.75	1.8	1.845	1.89	1.945	1.99
1.75	1.79	1.84	1.88	1.93	1.98	2.03
1.78	1.84	1.89	1.94	1.99	2.04	2.1
1.77	1.83	1.88	1.93	1.99	2.04	2.09
1.78	1.83	1.89	1.94	1.99	2.03	2.09
1.77	1.82	1.88	1.93	1.98	2.03	2.08
1.65	1.7	1.76	1.81	1.86	1.91	1.96
1.63	1.68	1.73	1.78	1.83	1.88	1.92
1.63	1.69	1.74	1.79	1.84	1.88	1.92
1.66	1.72	1.78	1.84	1.89	1.93	1.97
1.67	1.73	1.79	1.85	1.89	1.93	1.97
1.64	1.69	1.75	1.8	1.84	1.88	1.92
1.63	1.69	1.75	1.81	1.85	1.89	1.93
1.57	1.62	1.68	1.73	1.77	1.81	1.85
1.56	1.61	1.67	1.72	1.76	1.8	1.85
1.55	1.61	1.67	1.72	1.76	1.8	1.84
1.6	1.66	1.73	1.78	1.82	1.86	1.9
1.51	1.57	1.62	1.67	1.71	1.74	1.78
1.47	1.53	1.58	1.63	1.67	1.7	1.74
1.48	1.53	1.59	1.64	1.68	1.72	1.76
1.51	1.55	1.59	1.64	1.68	1.71	1.75
1.6	1.64	1.69	1.73	1.76	1.8	1.83
1.7	1.75	1.79	1.84	1.87	1.91	1.94
1.76	1.81	1.85	1.9	1.94	1.97	2
1.78	1.83	1.88	1.93	1.98	2.02	2.06
1.81	1.87	1.93	1.98	2.03	2.08	2.13
1.76	1.81	1.86	1.91	1.95	1.99	2.03
1.65	1.75	1.81	1.9	1.93	1.96	2
1.65	1.75	1.81	1.9	1.93	1.96	2
1.77	1.82	1.86	1.91	1.94	1.98	2.01
1.82	1.88	1.93	1.98	2.01	2.04	2.07
1.82	1.88	1.93	1.98	2.01	2.05	2.08
1.82	1.88	1.93	1.98	2.01	2.05	2.08
1.82	1.88	1.93	1.98	2.01	2.05	2.08
1.84	1.9	1.95	2	2.04	2.07	2.1
1.84	1.88	1.925	1.96	1.99	2.03	2.06
1.83	1.88	1.93	1.98	2.01	2.04	2.07
1.88	1.92	1.96	2.01	2.04	2.07	2.1
1.91	1.95	1.98	2.02	2.05	2.07	2.09
2.17	2.21	2.25	2.29	2.32	2.34	2.37
2.23	2.28	2.32	2.35	2.38	2.42	2.45
2.22	2.26	2.29	2.31	2.34	2.37	2.4
2.32	2.35	2.38	2.41	2.44	2.48	2.51
2.43	2.46	2.49	2.52	2.55	2.59	2.62
2.52	2.55	2.57	2.6	2.63	2.66	2.69
2.62	2.66	2.7	2.73	2.77	2.8	2.83
2.56	2.59	2.61	2.63	2.66	2.68	2.7
2.52	2.54	2.55	2.57	2.59	2.61	2.63
2.56	2.58	2.6	2.62	2.65	2.67	2.7
2.56	2.58	2.6	2.62	2.65	2.68	2.7
2.62	2.65	2.67	2.7	2.725	2.75	2.78
2.59	2.62	2.65	2.69	2.72	2.75	2.77
2.57	2.6	2.63	2.66	2.7	2.73	2.76
2.55	2.57	2.59	2.61	2.64	2.67	2.7
2.63	2.67	2.7	2.74	2.78	2.82	2.86

2.6	2.63	2.65	2.68	2.71	2.74	2.77
2.58	2.6	2.62	2.65	2.68	2.71	2.74
2.56	2.58	2.6	2.61	2.63	2.66	2.69
2.6	2.62	2.64	2.66	2.7	2.73	2.76
2.61	2.63	2.67	2.69	2.72	2.75	2.78
2.72	2.74	2.76	2.78	2.81	2.84	2.88
2.75	2.78	2.82	2.85	2.88	2.93	2.95
2.67	2.7	2.72	2.75	2.77	2.79	2.81
2.53	2.55	2.57	2.6	2.62	2.64	2.68
2.55	2.57	2.59	2.6	2.625	2.655	2.68
2.63	2.66	2.69	2.72	2.74	2.77	2.8
2.65	2.69	2.72	2.76	2.78	2.8	2.82
2.73	2.74	2.76	2.77	2.79	2.81	2.84
2.8	2.83	2.87	2.9	2.93	2.95	2.98
3	3.02	3.03	3.05	3.07	3.09	3.12
3.1	3.11	3.13	3.15	3.17	3.19	3.21
3.14	3.15	3.16	3.17	3.18	3.19	3.2
3.26	3.27	3.28	3.29	3.3	3.3	3.31
3.4	3.4	3.4	3.4	3.4	3.4	3.4
3.48	3.49	3.5	3.51	3.51	3.51	3.51
3.5	3.5	3.5	3.5	3.5	3.5	3.5
3.55	3.55	3.55	3.55	3.54	3.53	3.53
3.6	3.6	3.6	3.6	3.6	3.6	3.6
3.49	3.48	3.48	3.48	3.46	3.45	3.44
3.75	3.74	3.73	3.73	3.72	3.72	3.71
3.85	3.8	3.75	3.73	3.73	3.73	3.73
4.15	4.11	4.08	4.05	4.02	3.99	3.97
4.21	4.16	4.11	4.06	4.03	4	3.98
4.25	4.2	4.15	4.11	4.09	4.07	4.05
4.23	4.18	4.13	4.08	4.07	4.06	4.05
4.4	4.33	4.27	4.2	4.18	4.17	4.15
4.45	4.4	4.35	4.3	4.28	4.26	4.25
4.4	4.38	4.36	4.35	4.33	4.31	4.3
4.06	4.02	3.98	3.95	3.93	3.91	3.9
4	3.98	3.96	3.95	3.93	3.91	3.9
4	3.98	3.96	3.95	3.93	3.91	3.9
4.1	4.09	4.08	4.08	4.08	4.08	4.08
4	4	4	4	4	4	4
4.07	4.07	4.07	4.07	4.07	4.07	4.07
4	4	4	4	4	4	4
3.83	3.83	3.83	3.83	3.83	3.83	3.83
3.86	3.86	3.86	3.86	3.86	3.86	3.86
3.98	3.98	3.98	3.98	3.98	3.98	3.98
3.72	3.72	3.73	3.73	3.73	3.74	3.75
3.48	3.49	3.51	3.52	3.53	3.54	3.55
3.43	3.46	3.47	3.48	3.49	3.5	3.51
3.45	3.45	3.45	3.45	3.45	3.45	3.45
3.42	3.41	3.4	3.38	3.36	3.34	3.33
3.28	3.27	3.26	3.25	3.25	3.25	3.25
3.02	2.99	2.97	2.96	2.96	2.96	2.96
3	3	3	3	3	3	3
3.09	3.095	3.095	3.1	3.105	3.115	3.12
3.08	3.085	3.085	3.085	3.095	3.106	3.115
3.08	3.085	3.09	3.09	3.1	3.11	3.12
3.09	3.09	3.095	3.1	3.12	3.135	3.15

3.12	3.14	3.15	3.16	3.18	3.2	3.22
3.1	3.1	3.1	3.11	3.11	3.115	3.12
3.11	3.115	3.12	3.13	3.15	3.16	3.18
3.1	3.107	3.112	3.12	3.135	3.15	3.16
3.12	3.13	3.14	3.15	3.175	3.2	3.22
3.11	3.12	3.13	3.14	3.16	3.17	3.19
3.12	3.135	3.145	3.15	3.165	3.185	3.2
3.12	3.135	3.145	3.15	3.16	3.175	3.19
3.12	3.14	3.155	3.16	3.18	3.205	3.23
3.115	3.13	3.145	3.155	3.17	3.19	3.205
3.12	3.13	3.145	3.155	3.17	3.19	3.21
3.12	3.13	3.145	3.155	3.17	3.19	3.21
3.1	3.115	3.125	3.13	3.145	3.16	3.175
3.125	3.145	3.16	3.175	3.19	3.215	3.235
3.13	3.155	3.17	3.185	3.2	3.22	3.24
3.135	3.16	3.18	3.2	3.22	3.245	3.265
3.13	3.15	3.17	3.19	3.21	3.24	3.26
3.09	3.115	3.14	3.155	3.175	3.2	3.23
3.09	3.11	3.13	3.15	3.17	3.195	3.22
3.105	3.13	3.155	3.185	3.21	3.245	3.275
3.09	3.11	3.13	3.155	3.18	3.21	3.235
3.09	3.11	3.13	3.145	3.165	3.195	3.22
3.1	3.13	3.16	3.185	3.21	3.24	3.275
3.1	3.12	3.14	3.165	3.19	3.22	3.255
3.11	3.135	3.16	3.19	3.215	3.245	3.275
3.095	3.12	3.145	3.165	3.19	3.22	3.245
3.07	3.09	3.11	3.13	3.15	3.18	3.21
3.08	3.095	3.13	3.16	3.185	3.22	3.25
3.12	3.15	3.17	3.195	3.22	3.25	3.29
3.12	3.15	3.17	3.2	3.225	3.255	3.29
3.135	3.16	3.18	3.21	3.24	3.27	3.31
3.115	3.135	3.165	3.185	3.21	3.24	3.275
3.155	3.195	3.225	3.255	3.295	3.335	3.375
3.18	3.22	3.26	3.3	3.34	3.37	3.41
3.14	3.17	3.2	3.23	3.27	3.3	3.33
3.15	3.18	3.21	3.25	3.28	3.32	3.36
3.1	3.12	3.145	3.175	3.2	3.225	3.26
3.09	3.1	3.12	3.14	3.16	3.18	3.21
3.07	3.075	3.08	3.095	3.105	3.12	3.145
3.09	3.1	3.12	3.14	3.16	3.18	3.2
3.12	3.13	3.16	3.18	3.21	3.23	3.27
3.12	3.14	3.16	3.18	3.21	3.23	3.26
3.1	3.11	3.13	3.15	3.18	3.2	3.22
3.12	3.14	3.16	3.19	3.21	3.23	3.26
3.1	3.11	3.13	3.15	3.17	3.19	3.22
3.11	3.14	3.17	3.2	3.23	3.26	3.29
3.11	3.15	3.17	3.19	3.26	3.28	3.3
3.13	3.15	3.18	3.21	3.25	3.28	3.32
3.14	3.17	3.2	3.24	3.28	3.31	3.35
3.12	3.15	3.18	3.21	3.25	3.28	3.31
3.12	3.16	3.19	3.23	3.27	3.3	3.34
3.16	3.19	3.23	3.26	3.3	3.34	3.38
3.13	3.185	3.24	3.295	3.345	3.395	3.44
3.17	3.23	3.29	3.35	3.41	3.46	3.51
3.19	3.26	3.33	3.4	3.46	3.51	3.56

3.18	3.25	3.32	3.38	3.44	3.49	3.54
3.18	3.25	3.32	3.38	3.44	3.5	3.55
3.175	3.25	3.32	3.39	3.46	3.53	3.6
3.2	3.29	3.37	3.44	3.525	3.6	3.68
3.26	3.35	3.44	3.52	3.59	3.66	3.74
3.295	3.4	3.48	3.555	3.655	3.73	3.8
3.3	3.4	3.49	3.59	3.67	3.75	3.83
3.18	3.28	3.36	3.42	3.5	3.575	3.64
3.185	3.26	3.34	3.405	3.485	3.555	3.63
3.19	3.27	3.34	3.405	3.49	3.56	3.635
2.995	3.045	3.095	3.135	3.19	3.24	3.295
3	3.055	3.11	3.165	3.22	3.275	3.33
2.95	2.995	3.04	3.085	3.135	3.185	3.23
2.91	2.95	2.99	3.03	3.07	3.12	3.16
2.9	2.94	2.98	3.015	3.06	3.11	3.155
2.9	2.94	2.99	3.03	3.08	3.12	3.16
2.94	2.99	3.03	3.07	3.11	3.16	3.2
2.94	2.99	3.04	3.095	3.145	3.195	3.235
2.88	2.92	2.96	3	3.04	3.08	3.12
2.86	2.9	2.94	2.98	3.01	3.05	3.08
2.87	2.9	2.94	2.975	3.01	3.05	3.085
2.87	2.9	2.94	2.975	3.01	3.05	3.085
2.82	2.85	2.89	2.92	2.95	2.99	3.02
2.8	2.92	2.86	2.89	2.91	2.95	2.97
2.825	2.84	2.88	2.915	2.94	2.97	3
2.85	2.87	2.91	2.94	2.97	3	3.03
2.905	2.93	2.97	3	3.03	3.07	3.1
2.98	3.03	3.075	3.11	3.14	3.19	3.22
2.97	3.01	3.06	3.1	3.13	3.17	3.21
2.845	2.87	2.91	2.935	2.95	2.975	2.99
2.85	2.865	2.89	2.915	2.93	2.955	2.97
2.8	2.81	2.83	2.845	2.865	2.885	2.905
2.84	2.85	2.88	2.9	2.92	2.95	2.975
2.865	2.87	2.9	2.935	2.955	2.985	3.015
2.91	2.92	2.94	2.97	2.99	3.02	3.05
2.89	2.9	2.92	2.95	2.97	2.99	3.01
2.89	2.9	2.92	2.95	2.97	2.99	3.01
2.9	2.91	2.93	2.95	2.98	3	3.02
2.98	3	3.02	3.04	3.06	3.08	3.1
3.01	3.02	3.04	3.06	3.08	3.1	3.12
3.05	3.07	3.09	3.125	3.14	3.17	3.19
3.08	3.11	3.14	3.17	3.2	3.22	3.24
3.03	3.04	3.05	3.055	3.06	3.07	3.075
3.06	3.07	3.08	3.09	3.1	3.11	3.12
3.03	3.04	3.05	3.06	3.07	3.075	3.08
3.02	3.02	3.02	3.025	3.03	3.03	3.03
3.05	3.05	3.05	3.06	3.07	3.075	3.08
2.88	2.88	2.88	2.88	2.88	2.88	2.89
2.73	2.72	2.71	2.71	2.71	2.71	2.71
2.7	2.67	2.65	2.64	2.63	2.625	2.62
2.68	2.64	2.61	2.59	2.58	2.57	2.56
2.7	2.67	2.65	2.63	2.63	2.625	2.62
2.665	2.62	2.59	2.58	2.57	2.56	2.55
2.68	2.65	2.63	2.62	2.61	2.6	2.59
2.66	2.63	2.61	2.6	2.595	2.59	2.59

2.66	2.63	2.6	2.58	2.57	2.57	2.57
2.7	2.68	2.67	2.66	2.65	2.65	2.65
2.7	2.67	2.66	2.65	2.65	2.65	2.65
2.64	2.61	2.58	2.56	2.555	2.55	2.545
2.59	2.55	2.52	2.49	2.48	2.47	2.46
2.58	2.54	2.51	2.49	2.48	2.47	2.46
2.61	2.57	2.54	2.52	2.51	2.5	2.5
2.6	2.57	2.54	2.52	2.51	2.5	2.49
2.61	2.58	2.55	2.53	2.51	2.51	2.5
2.57	2.54	2.52	2.51	2.51	2.51	2.51
2.55	2.51	2.47	2.44	2.43	2.41	2.4
2.55	2.51	2.47	2.44	2.43	2.41	2.4
2.55	2.51	2.47	2.44	2.43	2.41	2.4
2.5	2.46	2.42	2.375	2.355	2.34	2.33
2.39	2.34	2.31	2.265	2.245	2.225	2.205
2.35	2.3	2.25	2.2	2.18	2.16	2.14
2.65	2.6	2.58	2.54	2.53	2.515	2.5
2.7	2.64	2.6	2.56	2.54	2.52	2.5
2.78	2.74	2.72	2.68	2.67	2.66	2.645
2.74	2.7	2.66	2.61	2.59	2.575	2.56
2.77	2.73	2.69	2.64	2.62	2.6	2.58
2.77	2.72	2.67	2.62	2.6	2.58	2.56
2.87	2.82	2.77	2.74	2.71	2.68	2.67
2.87	2.81	2.76	2.72	2.69	2.67	2.65
2.85	2.8	2.75	2.73	2.69	2.67	2.65
2.82	2.77	2.72	2.66	2.64	2.62	2.59
2.9	2.84	2.8	2.76	2.73	2.71	2.69
2.94	2.89	2.84	2.81	2.78	2.77	2.75
3	2.95	2.91	2.87	2.85	2.83	2.82
3.05	3.01	2.98	2.95	2.93	2.92	2.91
3.03	3	2.97	2.95	2.93	2.92	2.91
2.97	2.93	2.89	2.86	2.84	2.82	2.81
3.05	3.02	2.99	2.97	2.96	2.96	2.95
2.99	2.95	2.91	2.88	2.86	2.85	2.84
2.95	2.9	2.85	2.83	2.79	2.77	2.76
2.94	2.89	2.84	2.79	2.76	2.74	2.73
2.94	2.89	2.84	2.79	2.76	2.74	2.73
2.94	2.88	2.83	2.79	2.76	2.74	2.73
2.92	2.87	2.82	2.77	2.74	2.72	2.7
2.93	2.88	2.83	2.79	2.76	2.74	2.72
2.93	2.88	2.83	2.8	2.76	2.74	2.7
3	2.95	2.9	2.86	2.84	2.81	2.79
2.99	2.94	2.89	2.83	2.8	2.77	2.74
2.99	2.93	2.87	2.82	2.79	2.76	2.72
3.12	3.07	3.02	2.97	2.94	2.92	2.89
3.1	3.06	3.02	2.97	2.94	2.92	2.9
3.02	2.97	2.92	2.87	2.85	2.83	2.81
3.04	2.99	2.94	2.9	2.88	2.865	2.85
3.18	3.13	3.09	3.045	3.025	3.005	2.985
3.17	3.12	3.07	3.02	3	2.98	2.96
3.19	3.14	3.09	3.04	3.02	3	2.97
3.28	3.23	3.18	3.15	3.13	3.11	3.09
3.13	3.06	3.01	2.96	2.92	2.89	2.86
3.13	3.03	2.96	2.9	2.86	2.82	2.79
3.46	3.35	3.29	3.22	3.16	3.12	3.08

3.675	3.661	3.545	3.445	3.397	3.346	3.295
3.72	3.64	3.58	3.52	3.46	3.42	3.38
3.77	3.7	3.65	3.59	3.54	3.51	3.47
3.76	3.68	3.62	3.55	3.5	3.46	3.41
3.77	3.69	3.64	3.57	3.52	3.48	3.44
3.81	3.72	3.66	3.6	3.55	3.51	3.47
4.03	3.94	3.88	3.81	3.76	3.73	3.68
4.15	4.06	4	3.93	3.88	3.83	3.78
4.21	4.12	4.06	3.98	3.93	3.88	3.83
4.28	4.2	4.14	4.07	4.01	3.96	3.91
4.37	4.28	4.2	4.12	4.06	4	3.94
4.39	4.3	4.24	4.17	4.11	4.06	4.01
4.39	4.3	4.22	4.16	4.1	4.05	3.99
4.51	4.43	4.37	4.3	4.24	4.19	4.14
4.53	4.45	4.39	4.33	4.27	4.22	4.17
4.53	4.45	4.39	4.33	4.27	4.22	4.17
4.58	4.49	4.43	4.38	4.32	4.27	4.23
4.66	4.58	4.52	4.46	4.4	4.36	4.32
4.71	4.64	4.57	4.5	4.45	4.4	4.35
4.71	4.64	4.57	4.5	4.45	4.4	4.35
4.71	4.64	4.57	4.5	4.45	4.4	4.35
4.68	4.58	4.51	4.44	4.38	4.33	4.28
4.7	4.6	4.52	4.47	4.4	4.35	4.31
4.73	4.64	4.57	4.51	4.45	4.4	4.36
4.79	4.7	4.63	4.58	4.52	4.47	4.43
4.81	4.73	4.67	4.61	4.55	4.5	4.46
4.84	4.77	4.7	4.63	4.58	4.525	4.475
4.76	4.67	4.59	4.54	4.48	4.42	4.38
4.89	4.8	4.72	4.66	4.59	4.53	4.48
4.86	4.77	4.7	4.65	4.59	4.54	4.49
4.91	4.82	4.75	4.69	4.62	4.56	4.52
4.85	4.76	4.68	4.61	4.54	4.48	4.43
4.83	4.74	4.65	4.57	4.5	4.43	4.37
4.81	4.72	4.63	4.54	4.47	4.4	4.34
4.81	4.71	4.61	4.54	4.47	4.4	4.34
4.8	4.69	4.6	4.52	4.44	4.37	4.32
4.81	4.71	4.63	4.55	4.48	4.42	4.37
4.81	4.73	4.64	4.57	4.51	4.45	4.4
4.84	4.77	4.68	4.6	4.53	4.47	4.41
4.79	4.71	4.63	4.56	4.49	4.43	4.37
4.8	4.72	4.64	4.57	4.51	4.45	4.41
4.87	4.79	4.71	4.63	4.57	4.51	4.45
4.85	4.773	4.697	4.62	4.563	4.507	4.45
4.835	4.76	4.69	4.615	4.56	4.51	4.46
4.81	4.76	4.68	4.61	4.57	4.52	4.47
4.79	4.74	4.67	4.61	4.56	4.51	4.47
4.76	4.7	4.62	4.57	4.52	4.47	4.43
4.76	4.71	4.65	4.6	4.55	4.51	4.47
4.73	4.69	4.64	4.59	4.56	4.53	4.5
4.69	4.65	4.59	4.55	4.52	4.48	4.45
4.75	4.7	4.64	4.59	4.55	4.51	4.47
4.72	4.68	4.62	4.58	4.54	4.51	4.48
4.77	4.73	4.68	4.64	4.61	4.58	4.55
4.81	4.77	4.73	4.69	4.66	4.63	4.6
4.84	4.81	4.77	4.73	4.71	4.68	4.65



4.77	4.73	4.69	4.65	4.62	4.59	4.56
4.77	4.75	4.72	4.69	4.66	4.64	4.62
4.83	4.81	4.79	4.77	4.755	4.74	4.73
4.78	4.75	4.72	4.69	4.67	4.65	4.63
4.77	4.73	4.7	4.67	4.65	4.63	4.61
4.8	4.75	4.7	4.67	4.65	4.63	4.61
4.77	4.73	4.7	4.67	4.64	4.62	4.59
4.79	4.74	4.71	4.68	4.65	4.63	4.61
4.83	4.8	4.77	4.73	4.7	4.68	4.66
4.89	4.85	4.82	4.78	4.76	4.74	4.71
4.89	4.84	4.8	4.76	4.73	4.7	4.68
4.96	4.92	4.9	4.86	4.83	4.81	4.79
5.02	4.98	4.96	4.92	4.9	4.87	4.85
5.09	5.06	5.04	5.01	4.99	4.97	4.95
5.11	5.08	5.07	5.04	5.02	5	4.98
5.12	5.09	5.08	5.06	5.04	5.03	5.01
5.1	5.07	5.05	5.02	4.99	4.97	4.95
5.17	5.15	5.13	5.1	5.08	5.06	5.04
5.2	5.18	5.16	5.13	5.11	5.09	5.07
5.18	5.15	5.13	5.1	5.08	5.06	5.04
5.21	5.17	5.14	5.11	5.08	5.06	5.05
5.15	5.11	5.08	5.05	5.01	4.99	4.97
5.14	5.1	5.07	5.03	5	4.98	4.95
5.14	5.09	5.05	5.01	4.97	4.94	4.91
5.15	5.11	5.07	5.04	5.01	4.98	4.96
5.12	5.06	5.02	4.98	4.95	4.92	4.89
5.14	5.08	5.04	5	4.98	4.96	4.95
5.1	5.045	5.005	4.97	4.942	4.923	4.9
5.1	5.045	5.005	4.97	4.942	4.923	4.9
5.1	5.045	5.005	4.97	4.942	4.923	4.9
5.1	5.045	5.005	4.97	4.942	4.923	4.9
5.1	5.06	5.02	4.97	4.95	4.92	4.9
5.05	4.99	4.94	4.9	4.87	4.84	4.82
5.11	5.05	5	4.96	4.93	4.9	4.87
5.4	5.31	5.25	5.21	5.16	5.12	5.09
5.39	5.29	5.23	5.18	5.13	5.09	5.06
5.43	5.34	5.26	5.21	5.16	5.11	5.08
5.48	5.38	5.3	5.24	5.18	5.13	5.09
5.49	5.38	5.3	5.23	5.17	5.12	5.08
5.47	5.36	5.27	5.2	5.14	5.09	5.04
5.43	5.32	5.24	5.17	5.11	5.06	5.02
5.51	5.42	5.35	5.29	5.24	5.2	5.17
5.48	5.4	5.32	5.27	5.22	5.18	5.15
5.54	5.47	5.4	5.35	5.3	5.26	5.23
5.51	5.44	5.37	5.31	5.26	5.22	5.19
5.45	5.4	5.34	5.31	5.27	5.24	5.21
5.45	5.4	5.34	5.31	5.27	5.24	5.21
5.41	5.35	5.29	5.25	5.21	5.18	5.15
5.35	5.3	5.24	5.2	5.156	5.13	5.1
5.35	5.3	5.25	5.21	5.18	5.16	5.14
5.33	5.29	5.24	5.21	5.18	5.16	5.13
5.33	5.29	5.24	5.21	5.18	5.16	5.13
5.36	5.32	5.28	5.26	5.23	5.2	5.17
5.27	5.23	5.17	5.13	5.1	5.07	5.05
5.26	5.2	5.14	5.1	5.05	5.02	5

5.24	5.19	5.13	5.08	5.04	5	4.97
5.21	5.16	5.11	5.06	5.02	5	4.97
5.3	5.26	5.185	5.13	5.1	5.09	5.04
5.36	5.32	5.26	5.22	5.19	5.16	5.14
5.36	5.335	5.295	5.26	5.23	5.21	5.19
5.405	5.365	5.32	5.285	5.265	5.245	5.23
5.3	5.26	5.21	5.18	5.15	5.12	5.1
5.33	5.31	5.28	5.26	5.24	5.22	5.205
5.31	5.3	5.28	5.26	5.245	5.235	5.22
5.255	5.24	5.215	5.195	5.175	5.16	5.15
5.22	5.195	5.17	5.145	5.125	5.11	5.095
5.3	5.285	5.26	5.24	5.23	5.22	5.205
5.305	5.29	5.275	5.26	5.25	5.24	5.23
5.275	5.26	5.24	5.215	5.2	5.185	5.17
5.315	5.305	5.29	5.275	5.265	5.255	5.245
5.295	5.285	5.275	5.26	5.25	5.24	5.23
5.3	5.29	5.28	5.27	5.255	5.245	5.23
5.36	5.36	5.36	5.355	5.355	5.35	5.345
5.365	5.37	5.37	5.37	5.37	5.365	5.36
5.37	5.375	5.38	5.38	5.38	5.38	5.38
5.365	5.365	5.37	5.37	5.365	5.365	5.365
5.384	5.389	5.394	5.4	5.4	5.403	5.405
5.38	5.39	5.395	5.395	5.4	5.405	5.405
5.38	5.385	5.395	5.4	5.405	5.41	5.41
5.385	5.39	5.4	5.405	5.405	5.41	5.415
5.385	5.395	5.405	5.41	5.415	5.42	5.425
5.385	5.395	5.405	5.41	5.42	5.425	5.435
5.388	5.393	5.399	5.405	5.408	5.412	5.415
5.375	5.38	5.385	5.385	5.385	5.39	5.39
5.39	5.4	5.41	5.42	5.425	5.435	5.44
5.395	5.405	5.415	5.425	5.435	5.445	5.455
5.39	5.4	5.41	5.42	5.43	5.435	5.445
5.385	5.39	5.4	5.405	5.41	5.415	5.415
5.375	5.38	5.385	5.39	5.39	5.395	5.395
5.375	5.38	5.385	5.39	5.39	5.395	5.395
5.375	5.38	5.385	5.39	5.39	5.395	5.395
5.375	5.38	5.385	5.39	5.39	5.395	5.395
5.385	5.39	5.4	5.405	5.41	5.415	5.425
5.375	5.38	5.385	5.39	5.395	5.4	5.405
5.37	5.37	5.375	5.375	5.375	5.375	5.375
5.37	5.37	5.375	5.375	5.375	5.38	5.38
5.375	5.38	5.385	5.39	5.39	5.395	5.4
5.39	5.4	5.41	5.42	5.425	5.435	5.445
5.395	5.405	5.415	5.425	5.435	5.444	5.455
5.39	5.4	5.41	5.42	5.425	5.43	5.44
5.4	5.415	5.429	5.44	5.45	5.461	5.474
5.4	5.42	5.43	5.44	5.45	5.46	5.475
5.41	5.43	5.45	5.465	5.48	5.495	5.51
5.405	5.42	5.435	5.45	5.465	5.48	5.49
5.41	5.43	5.45	5.465	5.48	5.495	5.51
5.4	5.415	5.43	5.44	5.45	5.46	5.47
5.395	5.408	5.42	5.433	5.443	5.453	5.463
5.405	5.42	5.435	5.445	5.46	5.47	5.485
5.39	5.4	5.415	5.425	5.43	5.44	5.445
5.395	5.405	5.415	5.43	5.435	5.445	5.455
5.395	5.405	5.415	5.425	5.435	5.445	5.45

5.395	5.405	5.415	5.425	5.435	5.445	5.45
5.39	5.386	5.389	5.415	5.393	5.393	5.425
5.383	5.386	5.389	5.393	5.393	5.393	5.393
5.383	5.385	5.388	5.39	5.388	5.387	5.385
5.385	5.388	5.39	5.393	5.392	5.391	5.39
5.38	5.385	5.385	5.385	5.385	5.38	5.38
5.38	5.385	5.385	5.385	5.385	5.38	5.38
5.375	5.38	5.38	5.38	5.38	5.375	5.37
5.374	5.373	5.37	5.37	5.366	5.36	5.356
5.37	5.375	5.37	5.37	5.37	5.36	5.355
5.37	5.375	5.375	5.375	5.375	5.37	5.365
5.355	5.36	5.345	5.34	5.335	5.325	5.315
5.355	5.36	5.35	5.345	5.335	5.325	5.315
5.355	5.355	5.345	5.335	5.335	5.32	5.31
5.365	5.365	5.36	5.35	5.35	5.335	5.325
5.365	5.365	5.355	5.35	5.345	5.33	5.32
5.35	5.35	5.33	5.32	5.315	5.3	5.285
5.36	5.365	5.36	5.355	5.35	5.34	5.325
5.36	5.36	5.35	5.34	5.33	5.315	5.3
5.36	5.36	5.35	5.34	5.33	5.315	5.3
5.36	5.36	5.35	5.34	5.34	5.325	5.315
5.36	5.36	5.35	5.34	5.34	5.325	5.315
5.35	5.35	5.34	5.325	5.315	5.3	5.28
5.355	5.355	5.345	5.335	5.325	5.315	5.295
5.34	5.335	5.325	5.305	5.295	5.28	5.255
5.35	5.35	5.345	5.33	5.32	5.31	5.29
5.35	5.35	5.345	5.33	5.32	5.31	5.29
5.345	5.34	5.33	5.31	5.3	5.28	5.26
5.335	5.33	5.32	5.295	5.28	5.265	5.245
5.34	5.335	5.325	5.305	5.295	5.28	5.255
5.35	5.345	5.34	5.32	5.31	5.295	5.275
5.34	5.34	5.335	5.315	5.3	5.29	5.265
5.335	5.325	5.32	5.3	5.28	5.265	5.245
5.35	5.345	5.345	5.325	5.315	5.305	5.28
5.37	5.367	5.363	5.36	5.35	5.34	5.33
5.37	5.375	5.38	5.37	5.365	5.36	5.345
5.365	5.365	5.365	5.355	5.345	5.34	5.325
5.36	5.36	5.36	5.345	5.335	5.33	5.315
5.355	5.355	5.355	5.34	5.33	5.32	5.305
5.36	5.355	5.355	5.345	5.335	5.33	5.315
5.325	5.31	5.305	5.285	5.265	5.25	5.23
5.325	5.31	5.305	5.285	5.265	5.25	5.23
5.325	5.31	5.305	5.285	5.265	5.25	5.23
5.325	5.31	5.305	5.285	5.265	5.25	5.23
5.33	5.315	5.305	5.285	5.265	5.25	5.23
5.325	5.3	5.29	5.27	5.25	5.235	5.215
5.325	5.305	5.295	5.275	5.25	5.235	5.22
5.32	5.3	5.285	5.265	5.24	5.22	5.2
5.325	5.3	5.285	5.265	5.24	5.225	5.205
5.325	5.3	5.285	5.27	5.245	5.23	5.21
5.32	5.3	5.285	5.275	5.245	5.225	5.21
5.315	5.29	5.275	5.26	5.235	5.215	5.2
5.315	5.285	5.27	5.25	5.22	5.2	5.185
5.31	5.29	5.27	5.26	5.24	5.225	5.21
5.34	5.327	5.313	5.3	5.282	5.263	5.245

5.335	5.322	5.308	5.295	5.277	5.258	5.24
5.32	5.302	5.283	5.265	5.245	5.225	5.205
5.315	5.293	5.272	5.25	5.23	5.21	5.19
5.3	5.303	5.307	5.22	5.21	5.21	5.15
5.33	5.311	5.292	5.273	5.255	5.238	5.22
5.348	5.335	5.323	5.31	5.297	5.283	5.27
5.3	5.275	5.25	5.225	5.205	5.185	5.165
5.285	5.262	5.238	5.215	5.195	5.175	5.155
5.29	5.268	5.247	5.225	5.205	5.185	5.165
5.3	5.277	5.253	5.23	5.213	5.197	5.18
5.258	5.233	5.209	5.185	5.165	5.145	5.125
5.31	5.29	5.27	5.26	5.24	5.225	5.21
5.325	5.315	5.295	5.285	5.265	5.25	5.235
5.325	5.315	5.295	5.285	5.27	5.25	5.235
5.375	5.375	5.37	5.365	5.365	5.35	5.345
5.375	5.375	5.37	5.365	5.365	5.35	5.345
5.385	5.39	5.39	5.39	5.39	5.385	5.38
5.385	5.39	5.385	5.39	5.385	5.375	5.375
5.38	5.39	5.385	5.385	5.385	5.375	5.365
5.38	5.39	5.385	5.385	5.385	5.375	5.365
5.38	5.385	5.38	5.38	5.375	5.365	5.355
5.38	5.385	5.38	5.38	5.375	5.365	5.355
5.385	5.395	5.395	5.395	5.395	5.385	5.38
5.4	5.41	5.415	5.42	5.425	5.42	5.42
5.4	5.415	5.415	5.42	5.43	5.425	5.425
5.395	5.41	5.415	5.42	5.42	5.42	5.42
5.395	5.405	5.405	5.405	5.405	5.4	5.395
5.395	5.405	5.405	5.405	5.405	5.4	5.395
5.395	5.405	5.41	5.41	5.41	5.41	5.41
5.395	5.405	5.405	5.405	5.41	5.405	5.405
5.395	5.405	5.41	5.41	5.41	5.41	5.405
5.405	5.415	5.42	5.425	5.43	5.43	5.43
5.4	5.403	5.407	5.41	5.41	5.41	5.41
5.4	5.407	5.413	5.42	5.423	5.427	5.43
5.405	5.413	5.422	5.43	5.437	5.443	5.45
5.398	5.405	5.413	5.42	5.423	5.427	5.43
5.4	5.41	5.42	5.425	5.43	5.435	5.435
5.395	5.402	5.41	5.41	5.415	5.415	5.415
5.4	5.41	5.415	5.415	5.42	5.42	5.42
5.39	5.4	5.405	5.405	5.405	5.405	5.4
5.395	5.4	5.41	5.41	5.41	5.415	5.41
5.39	5.39	5.39	5.39	5.39	5.39	5.39
5.39	5.4	5.405	5.405	5.41	5.41	5.41
5.385	5.385	5.39	5.385	5.38	5.38	5.37
5.385	5.385	5.39	5.385	5.38	5.38	5.375
5.385	5.383	5.38	5.38	5.375	5.37	5.365
5.385	5.383	5.38	5.38	5.375	5.37	5.365
5.375	5.368	5.362	5.355	5.343	5.332	5.32
5.375	5.368	5.362	5.355	5.343	5.332	5.32
5.375	5.37	5.365	5.36	5.35	5.34	5.33
5.37	5.36	5.35	5.34	5.328	5.317	5.305
5.34	5.32	5.31	5.29	5.27	5.26	5.24
5.355	5.345	5.34	5.325	5.31	5.3	5.29
5.365	5.355	5.355	5.345	5.335	5.325	5.315
5.365	5.365	5.365	5.36	5.35	5.345	5.335

5.37	5.367	5.363	5.36	5.352	5.343	5.335
5.37	5.367	5.363	5.36	5.352	5.343	5.335
5.36	5.355	5.355	5.345	5.33	5.32	5.31
5.355	5.345	5.335	5.325	5.31	5.295	5.28
5.355	5.335	5.33	5.32	5.3	5.285	5.27
5.355	5.335	5.33	5.32	5.3	5.285	5.27
5.365	5.355	5.345	5.335	5.315	5.3	5.29
5.365	5.355	5.345	5.335	5.315	5.3	5.285
5.365	5.345	5.335	5.325	5.305	5.29	5.28
5.365	5.35	5.34	5.33	5.31	5.295	5.285
5.38	5.365	5.355	5.35	5.33	5.315	5.3
5.375	5.36	5.35	5.345	5.32	5.3	5.285
5.35	5.325	5.305	5.285	5.255	5.23	5.21
5.35875	5.34	5.325	5.315	5.29	5.265	5.25
5.36	5.34	5.325	5.31	5.285	5.265	5.25
5.325	5.295	5.27	5.255	5.225	5.2	5.18
5.31	5.28	5.25	5.23	5.2	5.17	5.15
5.3	5.27	5.235	5.21	5.18	5.15	5.125
5.29	5.255	5.225	5.195	5.165	5.135	5.11
5.29	5.26	5.225	5.2	5.165	5.14	5.115
5.325	5.305	5.285	5.27	5.25	5.225	5.205
5.34	5.325	5.305	5.29	5.275	5.25	5.235
5.345	5.33	5.31	5.295	5.28	5.255	5.24
5.355	5.345	5.33	5.32	5.305	5.285	5.27
5.355	5.35	5.335	5.325	5.315	5.3	5.285
5.36	5.355	5.335	5.325	5.315	5.295	5.28
5.37	5.36	5.35	5.34	5.327	5.313	5.3
5.37	5.36	5.35	5.34	5.327	5.313	5.3
5.37	5.36	5.35	5.34	5.326	5.312	5.298
5.385	5.39	5.375	5.37	5.365	5.345	5.335
5.385	5.39	5.375	5.37	5.365	5.345	5.335
5.385	5.39	5.375	5.37	5.365	5.345	5.335
5.37	5.37	5.355	5.345	5.335	5.315	5.3
5.38	5.385	5.375	5.365	5.36	5.345	5.33
5.37	5.37	5.355	5.34	5.335	5.315	5.3
5.375	5.375	5.36	5.35	5.34	5.32	5.305
5.4	5.405	5.4	5.395	5.39	5.385	5.375
5.375	5.375	5.365	5.355	5.345	5.33	5.315
5.39	5.395	5.39	5.385	5.38	5.37	5.36
5.4	5.405	5.4	5.395	5.39	5.385	5.375
5.355	5.345	5.33	5.315	5.3	5.28	5.265
5.345	5.34	5.325	5.305	5.29	5.27	5.25
5.37	5.37	5.36	5.345	5.335	5.32	5.3
5.385	5.385	5.38	5.37	5.365	5.355	5.345
5.4	5.4	5.4	5.395	5.39	5.385	5.37
5.41	5.415	5.42	5.415	5.415	5.41	5.4
5.41	5.415	5.42	5.415	5.415	5.41	5.4
5.43	5.44	5.445	5.445	5.445	5.445	5.44
5.42	5.43	5.44	5.44	5.44	5.44	5.435
5.415	5.425	5.43	5.43	5.43	5.43	5.425
5.41	5.415	5.42	5.415	5.41	5.41	5.4
5.405	5.405	5.41	5.405	5.4	5.395	5.385
5.41	5.41	5.415	5.41	5.405	5.405	5.395
5.4	5.405	5.41	5.4	5.4	5.395	5.385
5.41	5.415	5.42	5.42	5.415	5.415	5.41

5.4	5.4	5.405	5.4	5.395	5.395	5.385
5.4	5.4	5.41	5.405	5.4	5.4	5.39
5.395	5.39	5.39	5.38	5.375	5.37	5.36
5.39	5.385	5.385	5.375	5.365	5.36	5.35
5.36	5.34	5.33	5.3125	5.29	5.275	5.255
5.36	5.34	5.33	5.3125	5.29	5.275	5.255
5.35	5.335	5.325	5.3	5.275	5.26	5.24
5.37	5.36	5.35	5.335	5.32	5.305	5.29
5.365	5.35	5.34	5.325	5.305	5.29	5.275
5.375	5.365	5.36	5.35	5.335	5.325	5.315
5.373	5.362	5.351	5.34	5.325	5.31	5.295
5.37	5.36	5.35	5.34	5.327	5.313	5.3
5.375	5.367	5.358	5.35	5.337	5.323	5.31
5.36	5.347	5.333	5.32	5.303	5.287	5.27
5.373	5.362	5.351	5.34	5.323	5.307	5.29
5.375	5.36	5.355	5.35	5.33	5.32	5.31
5.42	5.42	5.425	5.43	5.425	5.42	5.42
5.42	5.42	5.42	5.42	5.415	5.41	5.405
5.44	5.45	5.455	5.46	5.46	5.46	5.465
5.44	5.445	5.45	5.46	5.46	5.46	5.46
5.435	5.437	5.438	5.44	5.437	5.433	5.43
5.405	5.411	5.417	5.423	5.415	5.408	5.4
5.43	5.428	5.427	5.425	5.42	5.415	5.41
5.435	5.437	5.438	5.44	5.437	5.433	5.43
5.42	5.42	5.415	5.415	5.41	5.4	5.395
5.42	5.42	5.415	5.415	5.41	5.4	5.395
5.425	5.425	5.42	5.42	5.415	5.405	5.405
5.42	5.42	5.42	5.42	5.415	5.405	5.4
5.415	5.41	5.41	5.41	5.4	5.39	5.385
5.405	5.41	5.405	5.405	5.4	5.39	5.385
5.405	5.41	5.405	5.405	5.4	5.39	5.385
5.43	5.435	5.43	5.43	5.425	5.415	5.41
5.45	5.465	5.465	5.465	5.475	5.46	5.46
5.46	5.47	5.475	5.475	5.485	5.475	5.47
5.455	5.465	5.47	5.47	5.475	5.465	5.465
5.455	5.465	5.47	5.47	5.475	5.465	5.465
5.46	5.47	5.475	5.48	5.485	5.475	5.475
5.46	5.47	5.475	5.48	5.485	5.475	5.475
5.455	5.465	5.47	5.475	5.485	5.475	5.475
5.455	5.465	5.465	5.465	5.475	5.46	5.465
5.465	5.475	5.48	5.485	5.495	5.485	5.485
5.445	5.46	5.46	5.46	5.465	5.46	5.455
5.48	5.495	5.5	5.51	5.515	5.51	5.51
5.515	5.53	5.54	5.55	5.56	5.565	5.565
5.5	5.52	5.53	5.54	5.55	5.55	5.55
5.475	5.49	5.495	5.5	5.51	5.51	5.51
5.445	5.46	5.465	5.47	5.475	5.475	5.47
5.455	5.47	5.475	5.48	5.485	5.485	5.485
5.495	5.505	5.51	5.51	5.515	5.515	5.515
5.485	5.5	5.505	5.505	5.51	5.51	5.505
5.55	5.56	5.57	5.57	5.575	5.575	5.575
5.525	5.535	5.54	5.545	5.545	5.545	5.545
5.51	5.52	5.525	5.525	5.525	5.525	5.525
5.51	5.52	5.525	5.53	5.535	5.53463	5.535
5.515	5.52	5.525	5.53	5.533	5.537	5.54

5.55	5.56	5.565	5.575	5.58	5.585	5.59
5.535	5.545	5.56	5.565	5.575	5.58	5.58
5.565	5.585	5.6	5.61	5.62	5.63	5.635
5.55	5.565	5.58	5.585	5.595	5.605	5.605
5.555	5.57	5.585	5.595	5.605	5.615	5.62
5.54	5.555	5.57	5.58	5.585	5.59	5.595
5.6	5.613	5.627	5.64	5.647	5.653	5.66
5.613	5.63	5.648	5.665	5.678	5.69	5.703
5.575	5.595	5.615	5.625	5.64	5.655	5.66
5.555	5.57	5.59	5.6	5.61	5.62	5.63
5.58	5.595	5.61	5.625	5.635	5.645	5.655
5.61	5.63	5.65	5.67	5.683	5.697	5.71
5.61	5.627	5.643	5.66	5.673	5.687	5.7
5.61	5.63	5.65	5.67	5.69	5.7	5.71
5.61	5.635	5.655	5.675	5.69	5.705	5.715
5.62	5.65	5.675	5.695	5.71	5.73	5.74
5.625	5.66	5.68	5.7	5.72	5.735	5.75
5.595	5.615	5.635	5.655	5.675	5.69	5.7
5.58	5.597	5.613	5.63	5.643	5.657	5.67
5.58	5.597	5.613	5.63	5.643	5.657	5.67
5.58	5.6	5.62	5.64	5.653	5.667	5.68
5.625	5.655	5.68	5.705	5.72	5.74	5.755
5.615	5.6425	5.6675	5.69	5.71	5.73	5.735
5.625	5.655	5.68	5.705	5.725	5.74	5.755
5.62	5.65	5.675	5.7	5.725	5.745	5.755
5.61	5.64	5.66	5.685	5.71	5.73	5.74
5.575	5.6	5.62	5.64	5.655	5.675	5.685
5.57	5.59	5.61	5.63	5.65	5.66	5.68
5.56	5.585	5.605	5.625	5.645	5.655	5.665
5.55	5.57	5.59	5.61	5.635	5.645	5.665
5.53	5.55	5.57	5.59	5.603	5.617	5.63
5.5	5.52	5.54	5.56	5.573	5.587	5.6
5.43	5.447	5.463	5.48	5.49	5.5	5.51
5.42	5.437	5.453	5.47	5.48	5.49	5.5
5.42	5.43	5.44	5.46	5.48	5.49	5.505
5.4	5.42	5.44	5.455	5.465	5.475	5.485
5.395	5.415	5.43	5.445	5.455	5.465	5.475
5.39	5.41	5.43	5.445	5.455	5.47	5.48
5.37	5.395	5.41	5.425	5.435	5.445	5.46
5.32	5.34	5.355	5.37	5.38	5.39	5.4
5.38	5.405	5.425	5.445	5.46	5.475	5.49
5.39	5.41	5.435	5.46	5.47	5.48	5.505
5.335	5.355	5.375	5.395	5.41	5.42	5.435
5.325	5.345	5.365	5.385	5.393	5.406	5.415
5.325	5.345	5.36	5.38	5.395	5.405	5.415
5.325	5.345	5.36	5.38	5.395	5.405	5.415
5.32	5.338	5.355	5.373	5.383	5.394	5.405
5.31	5.33	5.35	5.365	5.38	5.39	5.4
5.32	5.34	5.36	5.38	5.39	5.405	5.415
5.3	5.321	5.341	5.355	5.37	5.38	5.39
5.303	5.324	5.348	5.365	5.378	5.39	5.403
5.3	5.32	5.34	5.36	5.38	5.398	5.41
5.265	5.29	5.31	5.33	5.35	5.37	5.38
5.275	5.3	5.3225	5.34	5.36	5.375	5.39
5.275	5.305	5.33	5.35	5.365	5.38	5.395



5.28	5.305	5.33	5.345	5.365	5.385	5.4
5.295	5.325	5.355	5.375	5.405	5.415	5.43
5.2725	5.3	5.33	5.35	5.365	5.385	5.4
5.28	5.305	5.335	5.355	5.38	5.395	5.41
5.26	5.29	5.325	5.335	5.35	5.37	5.38
5.29	5.32	5.35	5.37	5.39	5.41	5.425
5.275	5.3	5.33	5.35	5.37	5.39	5.4
5.255	5.285	5.31	5.33	5.35	5.37	5.38
5.255	5.285	5.305	5.325	5.345	5.36	5.375
5.23	5.253	5.277	5.3	5.312	5.323	5.335
5.23	5.253	5.277	5.3	5.312	5.323	5.335
5.295	5.325	5.35	5.375	5.395	5.41	5.425
5.255	5.285	5.315	5.335	5.35	5.36	5.38
5.225	5.25	5.275	5.295	5.315	5.325	5.335
5.23	5.255	5.28	5.305	5.32	5.335	5.35
5.21	5.24	5.26	5.28	5.295	5.305	5.32
5.2	5.225	5.245	5.265	5.28	5.29	5.305
5.185	5.21	5.22	5.235	5.25	5.265	5.27
5.22	5.245	5.27	5.285	5.3	5.325	5.33
5.225	5.255	5.285	5.305	5.325	5.34	5.35
5.225	5.255	5.285	5.305	5.325	5.34	5.35
5.225	5.255	5.285	5.305	5.325	5.34	5.35
5.21	5.235	5.26	5.285	5.305	5.32	5.33
5.2	5.23	5.26	5.285	5.305	5.325	5.34
5.21	5.24	5.27	5.295	5.32	5.34	5.355
5.165	5.195	5.22	5.245	5.265	5.28	5.29
5.16	5.195	5.22	5.24	5.26	5.275	5.29
5.15	5.185	5.21	5.23	5.25	5.265	5.275
5.165	5.195	5.225	5.255	5.275	5.295	5.315
5.14	5.17	5.2	5.23	5.25	5.27	5.29
5.14	5.17	5.2	5.225	5.245	5.265	5.28
5.112	5.14	5.17	5.2	5.21688	5.23438	5.25
5.11	5.14	5.17	5.195	5.215	5.23	5.245
5.07	5.095	5.115	5.14	5.155	5.17	5.185
5.06	5.085	5.11	5.125	5.14	5.155	5.165
5.09	5.115	5.14	5.165	5.182	5.198	5.215
5.08	5.103	5.127	5.15	5.163	5.177	5.19
5.07	5.093	5.117	5.14	5.155	5.17	5.185
5.05	5.07	5.09	5.11	5.122	5.133	5.145
5.035	5.055	5.075	5.095	5.107	5.118	5.13
5.035	5.055	5.075	5.095	5.105	5.115	5.125
5.055	5.08	5.105	5.13	5.145	5.16	5.175
5.045	5.069	5.092	5.115	5.13	5.145	5.16
5.075	5.107	5.138	5.17	5.19	5.21	5.23
5.07	5.104	5.138	5.173	5.193	5.213	5.233
5.05	5.085	5.12	5.145	5.165	5.185	5.2
5.045	5.083	5.115	5.15	5.165	5.18	5.195
5.035	5.07	5.105	5.13	5.16	5.175	5.19
5.03	5.065	5.1	5.13	5.16	5.18	5.19
5.01	5.045	5.08	5.11	5.135	5.155	5.175
5.005	5.035	5.065	5.1	5.12	5.14	5.16
4.99	5.02	5.05	5.08	5.1	5.12	5.135
4.98	5.008	5.037	5.065	5.083	5.102	5.12
5.0025	5.04	5.065	5.095	5.115	5.135	5.155
5.005	5.045	5.075	5.1	5.12	5.14	5.16

4.99	5.025	5.055	5.085	5.105	5.125	5.145
4.97	5.001	5.032	5.063	5.082	5.101	5.12
4.975	5.015	5.045	5.075	5.095	5.115	5.135
4.95	4.99	5.02	5.05	5.07	5.09	5.105
4.95	4.99	5.02	5.05	5.07	5.09	5.11
4.945	4.98	5.011	5.035	5.055	5.075	5.095
4.95	4.99	5.02	5.05	5.07	5.09	5.11
4.93	4.963	4.997	5.03	5.05	5.07	5.09
4.93	4.963	4.997	5.03	5.05	5.07	5.09
4.945	4.98	5.01	5.045	5.07	5.09	5.11
4.925	4.958	4.992	5.025	5.047	5.068	5.09
4.915	4.947	4.978	5.01	5.028	5.047	5.065
4.89	4.92	4.95	4.98	4.997	5.013	5.03
4.893	4.926	4.959	4.993	5.012	5.031	5.05
4.875	4.905	4.935	4.965	4.982	4.998	5.015
4.86	4.888	4.915	4.943	4.961	4.979	4.998
4.865	4.888	4.915	4.943	4.961	4.979	4.998
4.825	4.85	4.88	4.9	4.92	4.94	4.95
4.815	4.842	4.868	4.895	4.912	4.928	4.945
4.81	4.837	4.863	4.89	4.904	4.918	4.932
4.795	4.815	4.842	4.865	4.882	4.898	4.915
4.775	4.798	4.822	4.845	4.86	4.875	4.89
4.75	4.77	4.79	4.81	4.823	4.837	4.85
4.74	4.76	4.78	4.8	4.812	4.823	4.835
4.73	4.748	4.767	4.785	4.796	4.807	4.818
4.74	4.76	4.78	4.8	4.81	4.82	4.835
4.735	4.755	4.775	4.795	4.807	4.818	4.83
4.72	4.738	4.755	4.773	4.783	4.794	4.805
4.72	4.74	4.76	4.78	4.793	4.807	4.82
4.735	4.758	4.782	4.805	4.82	4.835	4.85
4.735	4.758	4.782	4.805	4.82	4.835	4.85
4.735	4.76	4.785	4.81	4.827	4.843	4.86
4.72	4.747	4.773	4.88	4.817	4.833	4.85
4.705	4.725	4.745	4.765	4.78	4.795	4.81
4.695	4.717	4.738	4.76	4.775	4.79	4.805
4.68	4.703	4.727	4.75	4.763	4.777	4.79
4.675	4.697	4.718	4.74	4.753	4.767	4.78
4.68	4.703	4.727	4.75	4.763	4.777	4.79
4.715	4.742	4.768	4.795	4.813	4.832	4.85
4.7	4.73	4.76	4.78	4.8	4.82	4.83



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# **Fundamentals of Derivative Financial Products**

## **A Short Primer**

**March 27, 2012**

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# The Problem: Business Risks

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*“In this world nothing can be said to be certain, except death and taxes.” Benjamin Franklin, letter to Jean-Baptiste Leroy, November 13, 1789*

- Many organizations face financial risks inherent to their businesses
  - Farmers: what price will I receive for the coming year's crop?
  - Airlines: what price must I pay for jet fuel during the coming holiday travel season?
- The Enterprises face a number of such risks
  - Interest rate risk
  - Prepayment risk
  - Credit and counterparty risk

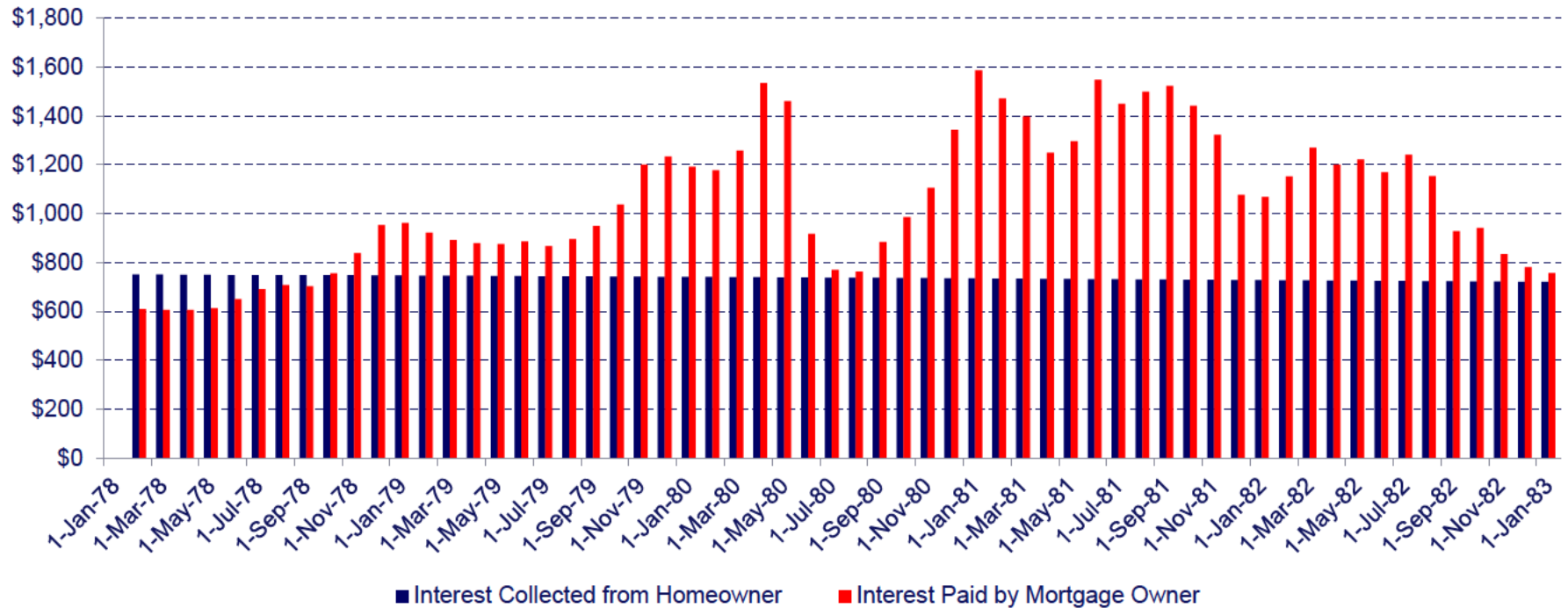
## Example: Interest Rate Risk

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- To a large extent, the Enterprises borrow at short-term interest rates pegged to a well-known index, such as the London Interbank Offered Rate (LIBOR)
- Borrowing costs are calculated by looking up the value of the index at short intervals and adding a predetermined margin to calculate the interest payment
- For example, a \$1,000 bond pays interest quarterly at 3-month LIBOR + 10
  - On March 22, the value of 3-month LIBOR was 0.47%. So, if calculated today, the subsequent quarter's interest would be based on a rate of 0.57%, and equal about \$1.43.
  - If on June 22 the published value of 3-month LIBOR has risen to 0.90%, the next quarter's interest would be calculated based on a rate of 1.00%, and equal about \$2.50.
- However, homeowners usually prefer mortgages with rates that remain fixed for the life of the loan
- How does paying short-term rates and receiving long-term rates set the Enterprises up for problems?
  - In the winter of 1978, John Ross Ewing, Jr. got a \$100,000 mortgage on his ranch, South Park, near Dallas. His rate was 9.02%, fixed for 30 years. Despite an unfortunate shooting incident in 1980, he made all his payments in full and on time, so default risk was never a problem.
  - The loan was sold to Fannie Mae, which borrowed the money to purchase it at LIBOR flat, or 7.32% initially. The rate reset each month.

# When Bad Things Happen to Good Loans\*

- As short-term interest rates skyrocketed over the next few years, Fannie Mae paid more interest on the borrowed money than it was collecting from J.R. In fact, it ended up losing about \$19,000 on a \$100,000 mortgage over the next five years.
- So, the expected profit from this loan turned out to be “all hat and no cattle.”
- This very problem brought tremendous financial stress to Fannie Mae and many thrifts of the era.



Source: Board of Governors of the Federal Reserve System

\* Apologies to Rabbi Kushner

# The Financial Alchemy of Derivatives

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- Derivatives are a class of financial product that can be used to modulate such financial risks
- Distinguishing characteristic: they are valued by reference to the value of other assets or indices, such as stock prices or interest rates
- Two fundamental types of derivatives
- At a specified time in the future and a price specified today:
  - Forward or futures contracts commit two parties to exchange an asset
  - Option agreements bind their sellers to offer an asset, which the buyer may accept or decline
- This quality of predetermining an asset price at a set point in the future can be used to manage business risks
- Interesting facts:
  - There were derivatives merchants in ancient Athens
  - Grain futures figure prominently in John Steinbeck's *East of Eden*

# What is a Forward Contract?

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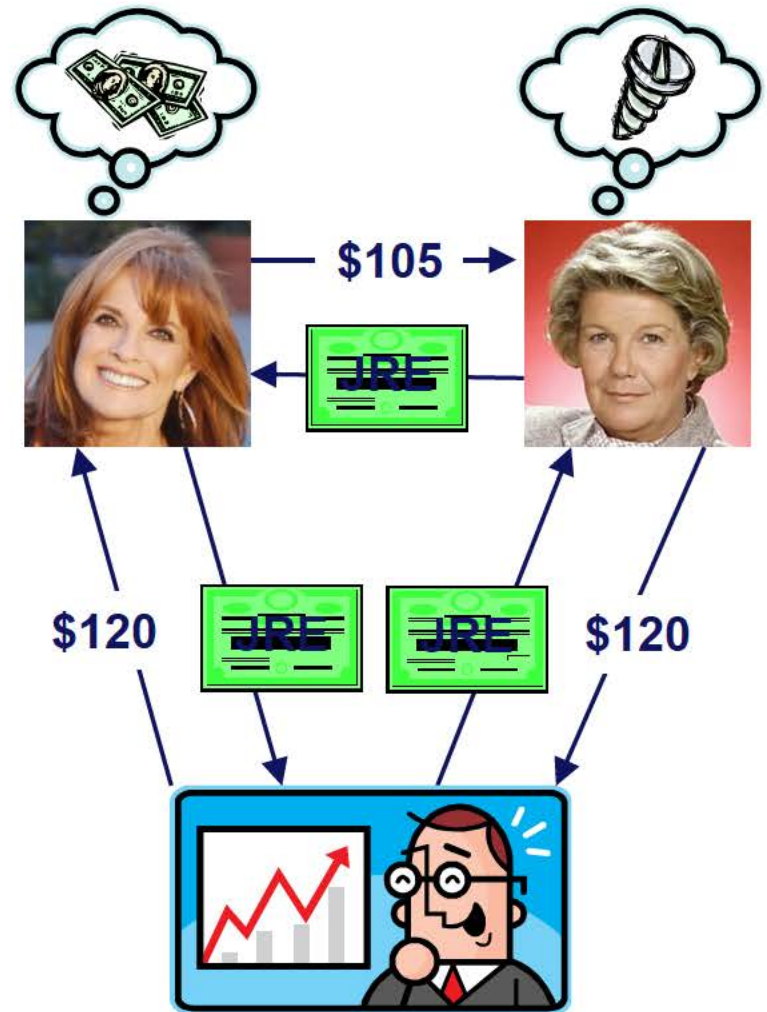
- Simple example: A forward contract on the stock of Ewing Oil Company (JRE)
- Today, a share of JRE trades “on the spot” (i.e. to change hands promptly) at \$100.
- Sue Ellen, a market participant, enters into a forward contract on JRE with another, Miss Ellie.
  - The two agree today that Sue Ellen will buy a share of JRE from Miss Ellie tomorrow at a “forward price” of \$105.
  - Tomorrow arrives. Both women look at the ticker, and JRE is trading at \$120.





# What Is It Worth?

- The two women conclude this episode with distinctly different emotional states.
  - Sue Ellen is delighted: her forward is worth \$15, or the difference between where she can buy her share of JRE, and where she can sell it.
  - Miss Ellie is equally dismayed: she loses \$15, reflecting where she can buy JRE and where she must sell it to Sue Ellen.
- Between today and tomorrow, the value of the forward contract would change as the “spot” price of JRE varied, but the forward price remained at \$105.
- Note that, *as long as both women are good for the money*, today they have locked in a sale price for JRE tomorrow. The forward contract eliminates that uncertainty today.
- Sue Ellen has made her money without actually having to pony up cash for the share of JRE.



# What is an Option?

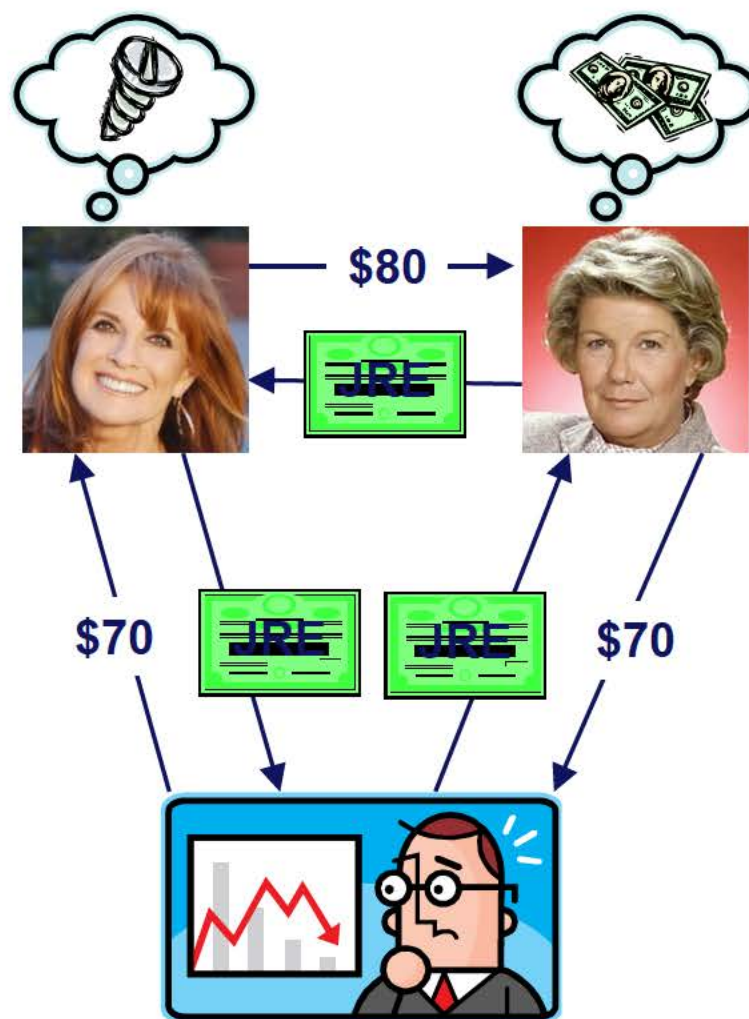
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- Simple example: An option agreement on the stock of Ewing Oil Company (JRE).
- Today, a share of JRE trades “on the spot” at \$100.
- Sue Ellen sells Miss Ellie a put option, or the right to sell a share of JRE tomorrow, at a specified “strike price” of \$80. Accordingly, Miss Ellie pays her an option premium of \$2 today. Sue Ellen spends the money on a drink.
- In addition to puts, there are calls, which confer a right to *buy* at a specified price.
- Miss Ellie has essentially paid Sue Ellen to accept some financial risks of her JRE share.



# What Is It Worth?

- If tomorrow the price of JRE has fallen to \$70, Miss Ellie can exercise her option, “putting” her share of JRE to Sue Ellen for the now above-market price of \$80. The put’s value is therefore \$10. Accordingly, Miss Ellie ends up with a net profit of \$8 (\$10 less the \$2 premium).
- If tomorrow the price of JRE rises instead to \$110, Miss Ellie’s option is worthless (why sell her share of JRE at \$80 when she can sell it at \$110?), and expires unused. She is out \$2, the cost of her bet that JRE would fall below \$80.
- Between today and tomorrow, the value of an option depends on the expected probability that it can be profitably exercised by expiration.
- Note that Miss Ellie has profited from JRE’s fall, with her risk of loss limited to the option’s price.





# Derivatives In the Mortgage Market

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- In the mortgage market, derivatives appear principally in two places:
  - Prepayment rights
    - Customary homeowners' prepayment rights constitute a form of interest rate option
    - Lenders effectively sell borrowers a put option on interest rates, which is transferred to the Enterprises
    - This exposes the Enterprises to the obligation to buy mortgages below their market value if rates fall
  - TBA market
    - Many Agency MBS trade on a “to be announced” basis, prior to actual issuance
    - This constitutes a type of forward contract
    - Ability to sell home mortgage loans into TBA securities permits lenders to offer 30- to 90-day “rate locks” to homeowners

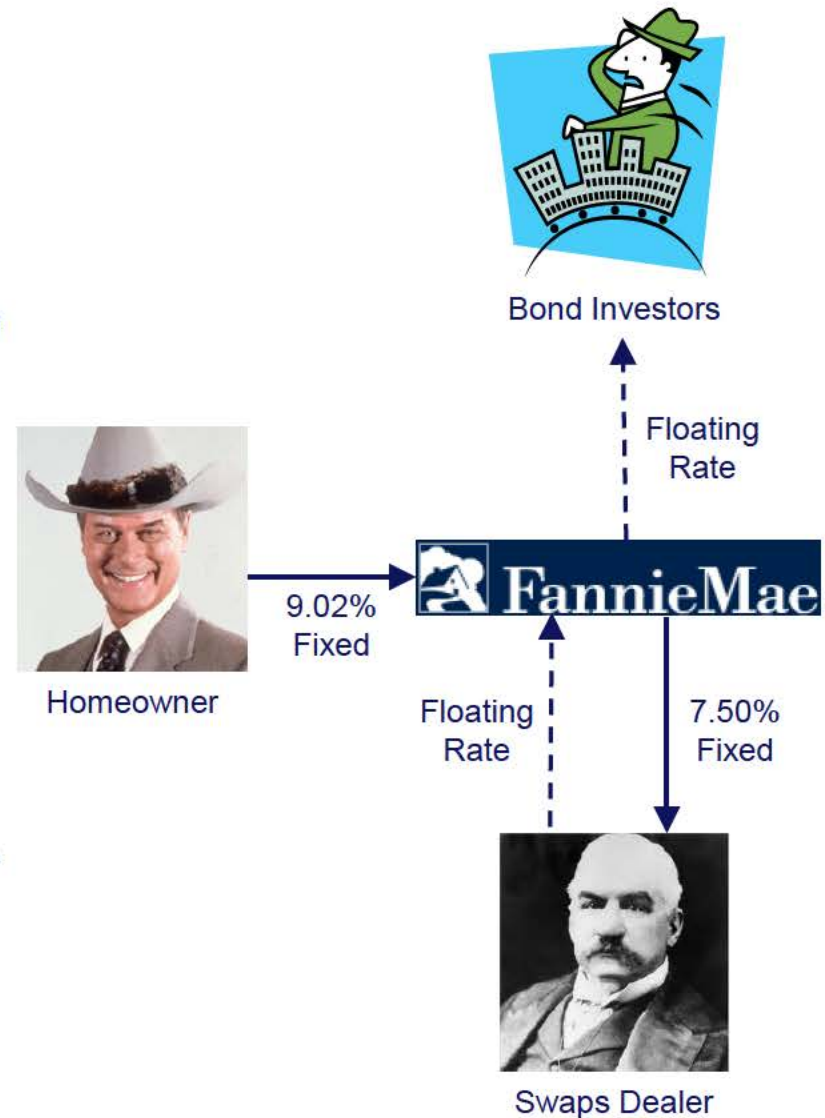
# Derivatives as Risk Management Tools

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- The Enterprises also use derivatives for risk management:
  - Interest rate swap agreements
    - Essentially bundles of forward agreements on individual interest payments
    - Permit “locking in” of future payments on floating rate debt
    - Effectively convert fixed rate to floating, or vice versa
    - Used to manage the risk of costly fluctuations between the cost of borrowing and income from the Enterprises’ mortgage portfolios
  - Interest rate options
    - The Enterprises can buy or sell call and put options to offset and manage their inherent risks from homeowner prepayment options
    - Additionally, as circumstances warrant, they may issue option-embedded bonds to optimize their reception in the fixed income markets
  - Additional, smaller-scale use of foreign currency swaps and credit default swaps, an insurance-like product used to hedge against asset or business partner default risks

## Example: Interest Rate Swap

- Let's go back to our original example of a 1978 \$100,000 fixed rate mortgage loan
  - To fund this loan, Fannie Mae, borrowed the money from floating rate bond investors
  - Tremendous potential for mismatch between incoming cash flows at a fixed rate and outgoing cash flows at a floating rate
- Today, Fannie Mae would enter into an interest rate swap to manage this risk
  - Receives floating rate payments from a swaps dealer
  - Pays a market-determined fixed rate
- Floating rate payments offset, leaving Fannie Mae with a fixed margin on its home loan
- Unfortunately for Fannie Mae, swaps did not exist until 1981; first widespread use in 1990s



# Advantages of Derivative Products

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- Intrinsic part of Enterprises' business
  - To manage their own risks, homeowners customarily enter into derivative contracts (rate locks, prepayment rights) when they sign up the mortgage
  - Derivatives therefore unavoidable part of Enterprises' mortgage investments
- Derivatives market permits Enterprises to isolate or modulate these risks
  - Enterprises can identify specific risks they wish to accept for compensation (*i.e.* default risk in exchange for guarantee fees) and offload the ones they don't (*e.g.* interest rate risk)
- Low or minimal cash outlays upfront
  - Forwards and swaps can be entered into with just a signature
  - Options allow opportunity to speculate on/protect against unlikely but disruptive events at reasonable cost
  - However, collateral requirements typically do apply past a certain point

# Drawbacks of Derivative Products

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- Complex to understand, manage and report
  - Mathematically sophisticated valuation methodologies and behavior
  - Requires skilled personnel to evaluate and oversee
  - GAAP reporting may not align with companion investment (FAS 133 issues)
- Inherent counterparty credit risk
  - Dependent on counterparty's ability to make good on its obligations
  - Interdependency concerns figured prominently in 2008 bailout decisions
- May result in “snowballing” of liabilities
  - Market participants face highest demands for collateral when their financial condition is likely weakest



# Non-Responsive

**Comment [FOU1]:** LIBOR moved 29 basis points in one day.

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**Figure 1**

30 Year Loan

1-Jul-12 Closing Date  
 1-Jul-42 Maturity Date  
 4.00% Fixed Rate

**Figure 2**

5 Year Loan

1-Jul-12 Closing Date  
 1-Jul-17 Maturity Date  
 4.00% Fixed Rate

**Figure 3**

5 Year Swap (right

1-Jul-12  
 1-Jul-17  
 4.00%  
 100

Market Yield	Price	Market Yield	Price	Market Yield
1.0%	177.4231247	1.0%	114.5602937	1.0%
1.5%	160.039595	1.5%	111.9566124	1.5%
2.0%	144.7929111	2.0%	109.426919	2.0%
2.5%	131.3954389	2.5%	106.9687427	2.5%
3.0%	119.6004413	3.0%	104.5797072	3.0%
3.5%	109.1960227	3.5%	102.2575262	3.5%
4.0%	100	4.0%	100	4.0%
4.5%	91.85555573	4.5%	97.80501163	4.5%
5.0%	84.62754897	5.0%	95.67052333	5.0%
5.5%	78.19938224	5.5%	93.59457329	5.5%
6.0%	72.4703377	6.0%	91.57527243	6.0%
6.5%	67.35331023	6.5%	89.6108014	6.5%



Figure 3

Figure 4

axis)                      Loan and Swap

Closing Date  
Maturity Date  
Fixed Rate  
Notional

Price		Date	<u>Conventional</u>	Date	<u>3 Month</u>
			<u>Mortgage Rates,</u> <u>Federal Reserve Data</u>		<u>LIBOR</u>
-14.56029372	100	1Q00	8.24%	1-Jan-78	7.32%
-11.95661243	100	2Q00	8.29%	1-Feb-78	7.28%
-9.426919017	100	3Q00	7.91%	1-Mar-78	7.29%
-6.968742743	100	4Q00	7.38%	1-Apr-78	7.38%
-4.579707187	100	1Q01	6.95%	1-May-78	7.82%
-2.257526188	100	2Q01	7.16%	1-Jun-78	8.33%
0	100	3Q01	6.82%	1-Jul-78	8.52%
2.194988372	100	4Q01	7.07%	1-Aug-78	8.48%
4.329476671	100	1Q02	7.01%	1-Sep-78	9.12%
6.405426713	100	2Q02	6.65%	1-Oct-78	10.12%
8.424727571	100	3Q02	6.09%	1-Nov-78	11.51%
10.3891986	100	4Q02	6.05%	1-Dec-78	11.62%
		1Q03	5.75%	1-Jan-79	11.16%
		2Q03	5.23%	1-Feb-79	10.79%
		3Q03	6.15%	1-Mar-79	10.64%
		4Q03	5.88%	1-Apr-79	10.60%
		1Q04	5.45%	1-May-79	10.74%
		2Q04	6.29%	1-Jun-79	10.52%
		3Q04	5.75%	1-Jul-79	10.87%
		4Q04	5.75%	1-Aug-79	11.53%
		1Q05	5.93%	1-Sep-79	12.61%
		2Q05	5.58%	1-Oct-79	14.59%
		3Q05	5.77%	1-Nov-79	15.00%
		4Q05	6.27%	1-Dec-79	14.51%
		1Q06	6.32%	1-Jan-80	14.33%
		2Q06	6.68%	1-Feb-80	15.32%
		3Q06	6.40%	1-Mar-80	18.71%
		4Q06	6.14%	1-Apr-80	17.81%
		1Q07	6.16%	1-May-80	11.20%
		2Q07	6.66%	1-Jun-80	9.41%
		3Q07	6.38%	1-Jul-80	9.33%
		4Q07	6.10%	1-Aug-80	10.82%
		1Q08	5.97%	1-Sep-80	12.07%
		2Q08	6.32%	1-Oct-80	13.55%

3Q08	6.04%	1-Nov-80	16.46%
4Q08	5.33%	1-Dec-80	19.47%
1Q09	5.00%	1-Jan-81	18.07%
2Q09	5.42%	1-Feb-81	17.18%
3Q09	5.06%	1-Mar-81	15.36%
4Q09	4.93%	1-Apr-81	15.95%
1Q10	4.97%	1-May-81	19.06%
2Q10	4.74%	1-Jun-81	17.86%
3Q10	4.35%	1-Jul-81	18.49%
4Q10	4.71%	1-Aug-81	18.79%
		1-Sep-81	17.80%
		1-Oct-81	16.34%
		1-Nov-81	13.32%
		1-Dec-81	13.24%
		1-Jan-82	14.29%
		1-Feb-82	15.75%
		1-Mar-82	14.90%
		1-Apr-82	15.18%
		1-May-82	14.53%
		1-Jun-82	15.45%
		1-Jul-82	14.37%
		1-Aug-82	11.57%
		1-Sep-82	11.74%
		1-Oct-82	10.43%
		1-Nov-82	9.77%
		1-Dec-82	9.47%

Figure 5

Figure 6

<a href="#">Conventional Mortgage Rates, Federal Reserve Data</a>	Date	<a href="#">Fannie Mae 1-4 Family MBS Outstanding, Year End</a>	<a href="#">Freddie Mac 1-4 Family MBS Outstanding, Year End</a>		<a href="#">Fannie Mae</a>
9.02%	1972		331	Interest Rate Swaps	456.6
9.16%	1973		617	Call and Put Options	98
9.20%	1974		608	Forward Agreements	1.2
9.36%	1975		1,349	Other	26.3
9.58%	1976		2,282		
9.71%	1977		5,621		
9.74%	1978		9,657		
9.79%	1979		12,149		
9.76%	1980		13,471		
9.86%	1981	717	19,501		
10.11%	1982	14,450	42,560		
10.35%	1983	25,121	57,273		
10.39%	1984	35,965	70,253		
10.41%	1985	54,036	99,515		
10.43%	1986	95,791	166,667		
10.50%	1987	137,988	205,977		
10.69%	1988	172,331	219,988		
11.04%	1989	219,577	266,060		
11.09%	1990	291,194	308,369		
11.09%	1991	362,667	351,906		
11.30%	1992	435,979	401,525		
11.64%	1993	486,804	442,612		
12.83%	1994	520,763	487,725		
12.90%	1995	569,724	512,238		
12.88%	1996	633,209	551,513		
13.04%	1997	687,981	576,846		
15.28%	1998	804,204	643,465		
16.33%	1999	924,941	744,619		
14.26%	2000	1,016,398	816,602		
12.71%	2001	1,238,125	940,933		
12.19%	2002	1,478,610	1,072,990		
12.56%					
13.20%					
13.79%					

14.21%  
14.79%  
14.90%  
15.13%  
15.40%  
15.58%  
16.40%  
16.70%  
16.83%  
17.29%  
18.16%  
18.45%  
17.83%  
16.92%  
17.40%  
17.60%  
17.16%  
16.89%  
16.68%  
16.70%  
16.82%  
16.27%  
15.43%  
14.61%  
13.83%  
13.62%



Freddie Mac

548.6

114.2

41.3

31

# Non-Responsive

# Non-Responsive

Pool Supplement  
(To PC Offering Circular Dated March 24, 2009)

F R E D D I E  
M A C

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FREDDIE MAC \_\_\_\_\_  
Mortgage Participation Certificates  
Adjustable-rate Mortgages with Interest Only Periods

Capitalized terms used in this Pool Supplement (other than capitalized terms that are defined in this document) have the same meanings as in Freddie Mac's Mortgage Participation Certificates Offering Circular dated March 24, 2009, as it may be supplemented from time to time (the "PC Offering Circular"). This Pool Supplement incorporates by reference the PC Offering Circular.

The PCs may not be suitable investments for you. You should not purchase PCs unless you have carefully considered and are able to bear the associated prepayment, interest rate, yield and market risks of investing in PCs, as described in the PC Offering Circular. This Pool Supplement supplements the PC Master Trust Agreement dated as of March 24, 2009 and constitutes the Pool Supplement within the meaning of that Trust Agreement for the PC Pool described herein.

You should purchase the PCs only if you have read and understood this Pool Supplement, the PC Offering Circular, any related Additional Supplement and any documents that we have incorporated by reference in the PC Offering Circular.

We guarantee the payment of interest and principal on the PCs as described in the PC Offering Circular. You can find a description of the applicable PC Coupon in the PC Offering Circular under "Description of the PCs - Payment of Interest". For an initial period of time, we will pay scheduled installments of interest at the PC Coupon rate. After this initial period, we will pay scheduled installments of principal together with interest at the PC Coupon rate. Principal and interest payments on the PCs are not guaranteed by and are not debts or obligations of the United States or any federal agency or instrumentality other than Freddie Mac. The PCs are not tax-exempt securities. Because of applicable securities law exemptions, Freddie Mac has not registered the PCs with any federal or state securities commission. No securities commission has reviewed this Pool Supplement.

The PC Pool number in the pool statistics of this Pool Supplement identifies the pool of Mortgages to which the PCs relate. The pool statistics of this Pool Supplement contain statistical information about the PC Pool, including a PC Prefix that identifies the specific type of mortgages in the PC Pool. Certain information in this Pool Supplement is updated monthly on our

We also provide information ("Loan Level Disclosures") relating to each of the Mortgages backing this PC Pool as of the time of issuance of the PC and, for PCs issued on or after December 1, 2005, monthly updates of that information. You can find the Loan Level Disclosures relating to this PC Pool at [http://www.freddiemac.com/mbs/html/sd\\_pc\\_reports.html](http://www.freddiemac.com/mbs/html/sd_pc_reports.html). Sellers of the Mortgages furnish us with data for the Loan Level Disclosures and represent to us that such data are true, complete and accurate. We may not have independently verified the accuracy of such data. None of Freddie Mac or its affiliates has made or will make any representation or warranty as to the accuracy or completeness of the Loan Level Disclosures or of the information contained in this Pool Supplement and any related Additional Supplement. In addition, we are not obligated to update the Loan Level Disclosures.

2

Pool Supplement dated September 16, 2009

PC Type.....	1YR LIB,10YR II HYBRID ARMS,VAR CAPS
PC Pool Number.....	1J2092
CUSIP Number.....	3128NJKD0
PC Coupon.....	3.961%
Original Principal Amount.....	\$862,000.00
PC Issue Date.....	09/01/2009
First Payment Date.....	11/15/2009
Final Payment Date.....	10/15/2039

Seller.....	NATIONAL CITY BANK
WAC.....	4.361%
AOLS.....	\$215,500
WAOLS.....	\$249,378
WALA.....	0

WAOLT..... 360  
 WARM..... 360  
 WAOCS..... 746  
 WAOLTV..... 75  
 WAOCLTV..... 75  
 WAODTI..... 33  
 WAMTAM..... 121.89  
 Initial Interest Period..... 10  
 Third Party Origination..... 0.000%  
 Legend.....

PC Pool Number 1J2092

3

# UNKNOWN ORIGINAL CREDIT SCORE, ORIGINAL LTV, ORIGINAL CLTV, AND ORIGINAL DTI

	% of UPB	# of Loans	% of Loans	
Unknown Credit Score	0.00%	0	0.00%	
Unknown LTV	0.00%	0	0.00%	
Unknown CLTV	0.00%	0	0.00%	
Unknown DTI	0.00%	0	0.00%	

## ARM SPECIFIC INFORMATION

Initial Fixed Rate Period..... 3  
 Adjustment Period..... 12  
 Index..... 1 YR LIBOR - WSJ  
 Lookback Period..... 45  
 Next Adjustment Date..... 09/01/2012  
 Weighted Average Months to Adjust (WAMTA)..... 36.890  
 Initial Cap (Increase)..... 2.000%  
 Initial Cap (Decrease)..... 2.000%  
 Periodic Cap..... 2.000%  
 Convertible..... N  
 PC Margin..... 1.850%  
 Weighted Average Margin..... 2.250%  
 PC Lifetime Ceiling..... 9.961%  
 Weighted Average Lifetime Ceiling..... 10.361%  
 PC Lifetime Floor..... 0.000%  
 Weighted Average Lifetime Floor..... 0.000%

Prepayment Penalty Mortgages..... N  
 Reduced Minimum Servicing..... N

PC Pool Number 1J2092

4

#### INITIAL INTEREST FIRST P&I PAYMENT DATE

Initial Interest	Aggregate UPB	% of UPB	# of Loans	% of Loans
First P&I Payment Date				
10/01/2019	\$ 92,000.00	10.67%	1	25.00%
11/01/2019	770,000.00	89.33%	3	75.00%

Initial Interest	WAC	Note Rate	WARM	Remaining	WALA	Loan Age
First P&I Payment Date		Low-High	Maturity	Low-High		
(continued)						
10/01/2019	4.250%	4.250- 4.250%	359	359-359	1	1-001
11/01/2019	4.375%	3.750- 4.750%	360	360-360	0	0-000

#### HIGH AND LOW MORTGAGE DATA

Remaining	Note Rate	Margin	Lifetime Ceiling	Lifetime Floor
Maturity	Low-High	Low-High	Low-High	Low-High
Low-High				
359-360	3.750% - 4.750%	2.250% - 2.250%	9.750% - 10.750%	0.000% - 0.000%

PC Pool Number 1J2092

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#### ARM PC COMPONENT LEVEL DATA

Component	Component	Component	# of	Component	Component
Coupon	Initial UPB	Loans	Coupon	Coupon	
Adjustment	Interest		Low-High		
Date	First P&I				
	Payment				

Date						
09/01/2012	\$	92,000.00	1	3.850%	3.850% - 3.850%	
10/01/2019		92,000.00	1	3.850%	3.850% - 3.850%	
10/01/2012		770,000.00	3	3.975%	3.350% - 4.350%	
11/01/2019		770,000.00	3	3.975%	3.350% - 4.350%	

Component	Component	Component	Component	Component	Component	
Coupon	Initial	Margin	Margin	Lifetime	Lifetime Ceiling	
Adjustment	Interest		Low-High	Ceiling	Low-High	
Date	First P & I					
	Payment					
	Date					
(continued)	(continued)					
09/01/2012		1.850%	1.850% - 1.850%	9.850%	9.850% - 9.850%	
10/01/2019		1.850%	1.850% - 1.850%	9.850%	9.850% - 9.850%	
10/01/2012		1.850%	1.850% - 1.850%	9.975%	9.350% - 10.350%	
11/01/2019		1.850%	1.850% - 1.850%	9.975%	9.350% - 10.350%	

Component	Component	Component	Component	
Coupon	Initial	Lifetime	Lifetime	
Adjustment	Interest	Floor	Floor	
Date	First P & I		Low-High	
	Payment			
	Date			
(continued)	(continued)			
09/01/2012		0.000%	0.000% - 0.000%	
10/01/2019		0.000%	0.000% - 0.000%	
10/01/2012		0.000%	0.000% - 0.000%	
11/01/2019		0.000%	0.000% - 0.000%	

PC Pool Number 1J2092

6

## QUARTILE DISTRIBUTION

	Original	Remaining	Loan Age	Loan	
	Loan Size	Maturity	Term		
Quartile 1	\$ 92,000-	180,000	359-360	0-000	360-360
Quartile 2	180,000-	290,000	360-360	0-000	360-360
Quartile 3	290,000-	300,000	360-360	0-000	360-360
Quartile 4	300,000-	300,000	360-360	0-001	360-360

Original	Original	Original	Original
----------	----------	----------	----------



	Credit Score	LTV		CLTV		DTI	
Quartile 1	638-762	69-069	69-069	20-020			
Quartile 2	762-762	69-077	69-077	20-032			
Quartile 3	762-788	77-080	77-080	32-042			
Quartile 4	788-788	80-080	80-080	42-055			

LOAN PURPOSE

Type	% of UPB	# of Loans	% of Loans
Purchase	65.20%	3	75.00%
Cash-Out Refinance	34.80%	1	25.00%
No Cash-Out Refinance	0.00%	0	0.00%
Refinance NotSpecified	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

NUMBER OF UNITS

# of Units	% of UPB	# of Loans	% of Loans
1	100.00%	4	100.00%
2-4	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

PC Pool Number 1J2092

NUMBER OF BORROWERS

# of Borrowers	% of UPB	# of Loans	% of Loans
1	65.20%	3	75.00%
> 1	34.80%	1	25.00%

## OCCUPANCY TYPE

Type	% of UPB	# of Loans	% of Loans
Owner Occupied	66.36%	3	75.00%
Second Home	33.64%	1	25.00%
Investment Property	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## FIRST PAYMENT DISTRIBUTION

Not Paying % of UPB	Not Paying # of Loans	Not Paying % of Loans
0.00%	0	0.00%

PC Pool Number 1J2092

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## FIRST-TIME HOMEBUYER DISTRIBUTION

Type	% of UPB	# of Loans	% of Loans
First-Time Homebuyer	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## MORTGAGE INSURANCE DISTRIBUTION

Type	% of UPB	# of Loans	% of Loans
Loans with MI	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## ASSETS DOCUMENTATION DISTRIBUTION

Type	% of UPB	# of Loans	% of Loans
Assets Verified/ Waived	100.00%	4	100.00%
Assets Not Verified/ Not Waived	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## EMPLOYMENT DOCUMENTATION DISTRIBUTION

Type	% of UPB	# of Loans	% of Loans
Employment Verified/ Waived	100.00%	4	100.00%
Employment Not Verified/ Not Waived	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## INCOME DOCUMENTATION DISTRIBUTION

Type	% of UPB	# of Loans	% of Loans
Income Verified/ Waived	100.00%	4	100.00%
Income Not Verified/ Not Waived	0.00%	0	0.00%
Unknown	0.00%	0	0.00%

## THIRD PARTY ORIGINATION (TPO) DISTRIBUTION

Type	Aggregate UPB	% of UPB	# of Loans	% of Loans
Retail	862,000.00	100.00%	4	100.00%

Broker	0.00	0.00%	0	0.00%
Correspondent	0.00	0.00%	0	0.00%
TPO	0.00	0.00%	0	0.00%
Not Specified				
Unknown	0.00	0.00%	0	0.00%

PC Pool Number 1J2092

9

### LOAN ORIGINATION DISTRIBUTION

Year	Aggregate UPB	% of UPB	# of Loans	% of Loans
2009	\$ 862,000.00	100.00%	4	100.00%

### GEOGRAPHIC DISTRIBUTION

State	Aggregate UPB	% of UPB	# of Loans	% of Loans
Wisconsin	\$ 572,000.00	66.36%	3	75.00%
Missouri	290,000.00	33.64%	1	25.00%

### SERVICER DISTRIBUTION

Servicer	% of UPB	# of Loans	% of Loans
NATLCITYBANK OH 44114	100.00%	4	100.00%

Servicer (continued)	WAC	Note Rate	WALA	Loan Age	WARM	Remaining
	Low-High	Low-High	Low-High	Maturity		
NATLCITYBANK	4.361%	3.750- 4.750%	0	0-001	360	359-360

### SELLER DISTRIBUTION

Seller	% of UPB	# of Loans	% of Loans
--------	----------	------------	------------

NATLCITYBANK		OH 44114		100.00%	4	100.00%					
Seller		WAC	Note Rate		WALA	Loan Age	WARM	Remaining			
(continued)			Low-High			Low-High	Maturity				
						Low-High					
NATLCITYBANK			4.361%	3.750- 4.750%	0	0-001	360	359-360			

As of July 2012

Fannie Mae Top Ten Derivative Counterparties Freddie Mac Top Ten Derivative C

Counterparty	Notional Amount, \$ billions	Counterparty	Notional Amount, \$ billions
Bank of America	\$87.3	Barclays	97.2
Deutsche Bank	\$63.8	Deutsche Bank	94.7
Goldman Sachs	\$62.3	Bank of America	71.6
Citibank	\$61.4	Goldman Sachs	61
BNP Paribas	\$60.9	Credit Suisse	54.6
Credit Suisse	\$59.7	JPMorganChase	54.4
UBS	\$55.3	UBS	53
Barclays	\$47.4	Morgan Stanley	42.6
JPMorganChase	\$43.1	RBS	41.8
Morgan Stanley	\$33.8	BNP Paribas	39.7
RBS	\$0.0	Citibank	0
TOTAL	\$575.0	TOTAL	\$610.6

counterparties

Counterparty	Notional Amount, \$ billions	<a href="#">LIBOR Contributor</a>	Publicly Reported Actions to Date
Bank of America	158.9	TRUE	Subpoena from NYS Attorney General; named defendant in civil action(s)
Deutsche Bank	158.5	TRUE	Subpoena from NYS Attorney General; named defendant in civil action(s)
Barclays	144.6	TRUE	Settlement with US and UK authorities; replacement of CEO; subpoena from NYS Attorney General; named defendant in civil action(s)
Goldman Sachs	123.3	FALSE	
Credit Suisse	114.3	TRUE	named defendant in civil action(s)
UBS	108.3	TRUE	Subpoena from NYS Attorney General; named defendant in civil action(s)
BNP Paribas	100.6	FALSE	
JPMorganChase	97.5	TRUE	Subpoena from NYS Attorney General; named defendant in civil action(s)
Morgan Stanley	76.4	FALSE	
Citibank	61.4	TRUE	Subpoena from NYS Attorney General; named defendant in civil action(s)
<b>TOTAL</b>	<b>\$ 1,143.80</b>		

Sources: [NYS Attorney General subpoenas](#)  
[Baltimore civil action](#)  
[Berkshire Bank civil action](#)  
[Barclays fine and CEO firing](#)

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## **FHFA's Oversight of Freddie Mac's Investment in Inverse Floaters**

**Brown Bag Lunch Lecture**

**December 18, 2012**

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# What Was All the Fuss About?

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## January 30, 2012 NPR/ProPublica article, “Freddie Mac Betting Against Struggling Homeowners”

- Key assertion was that, through inverse floater investments, Freddie Mac positioned itself to benefit from homeowners’ inability to refinance their mortgages
- In fact, because of much tighter lending standards, home refinancing rates have been low despite the lowest mortgage rates in anybody’s memory
- FHFA-OIG was asked to investigate the story

# Risks of the Mortgage Business

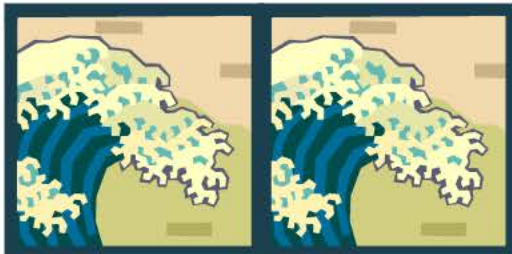
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Owning portfolios of mortgage loans, as Freddie Mac does, inherently carries two principal risks even if repayment is assured:



Interest rates rise: a loan paying 5% is less attractive in a world of 7% returns, and its price will drop accordingly

Anybody investing in home mortgages will lose money if...



Interest rates fall: homeowners tend to prepay their loans. In a 3% world, a loan paying 5% could be prepaid at face value, depriving the owner of the excess return s/he would otherwise enjoy

# Creating An Inverse Floater

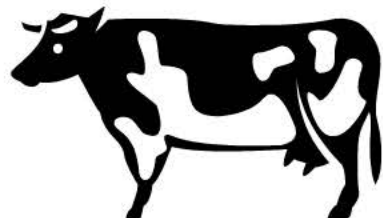
Freddie Mac divided the homeowners' principal and interest payments from each portfolio and distributed them as customized securities.



When it could obtain attractive prices, Freddie Mac carved out high-demand, low-risk investments to sell to third parties...



...and retained the lower-demand, higher-risk residual securities itself. Inverse floaters fell into this category.



Mortgage lenders sell their loans to Freddie Mac...



...and grouped into portfolios.





# Distribution of Portfolio Interest Payments

Portfolio of Home Mortgages

Year	1	2	3	4
Principal Balance	\$100.00	\$100.00	\$100.00	\$100.00
Rate	5.0%	5.0%	5.0%	5.0%
<b>Interest</b>	<b>\$5.00</b>	<b>\$5.00</b>	<b>\$5.00</b>	<b>\$5.00</b>

A hypothetical \$100 portfolio of home mortgages would produce \$5.00 of annual interest payments. The value of this portfolio will rise and fall with interest rate movements.

This portfolio could support roughly \$80 of floating rate bonds. Interest on the floating rate bond would vary with a short-term index such as LIBOR. Because the bond always pays the going rate of interest, its price remains relatively stable – a very attractive feature to many investors.



Floating Rate Bond – Sold to Third Party

Year	1	2	3	4
Face Value	\$80.00	\$80.00	\$80.00	\$80.00
Index Rate	3.0%	6.0%	4.0%	2.0%
<b>Interest</b>	<b>\$2.40</b>	<b>\$4.80</b>	<b>\$3.20</b>	<b>\$1.60</b>



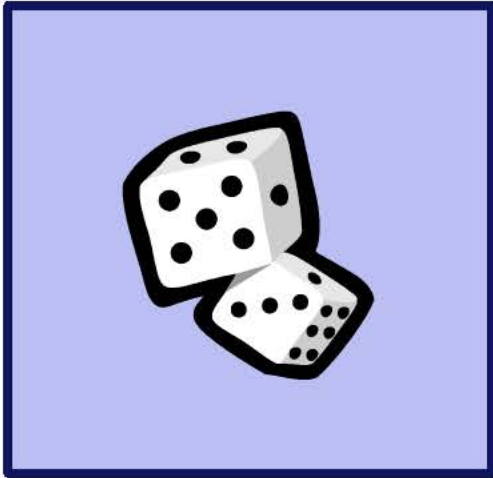
Inverse Floater – Kept by Enterprise

Year	1	2	3	4
Face Value	\$20.00	\$20.00	\$20.00	\$20.00
<b>Interest</b>	<b>\$2.60</b>	<b>\$0.20</b>	<b>\$1.80</b>	<b>\$3.20</b>

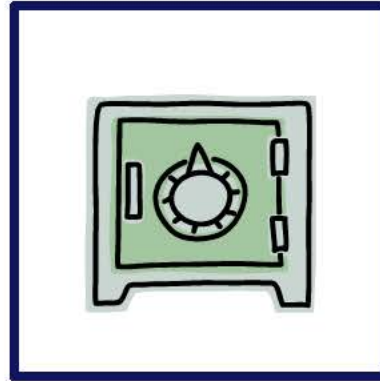
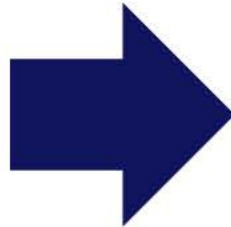
The rest of the mortgage payments go to the inverse floater. In this example, returns to this asset go *up* as interest rates go *down*, complementary to returns on the floating rate bond.

## Recap of Inverse Floaters

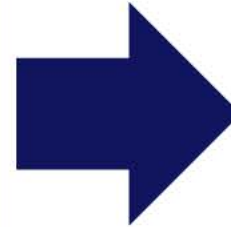
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Risks inherent to holding or guaranteeing mortgage assets, such as interest rate and prepayment risk, could be distilled...



...into a floating rate bond relatively free of interest rate or prepayment risk that could command a premium price from third party investors....



...and inverse floaters, which concentrated the same risks from those mortgage assets into a smaller, more cost-effective package.

## Focus on the Question

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“FHFA-OIG uncovered no evidence that FHFA or Freddie Mac obstructed homeowners’ abilities to refinance their mortgages in an effort to influence the yields of the inverse floating-rate bonds . . . .”

**- Contrast -**

“FHFA-OIG uncovered no evidence that Freddie Mac retained inverse floating-rate bonds to benefit from a decrease in interest rates or in prepayments from homeowners.”

## “Any and All” Document Collection

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***What we wanted to write:*** “Neither FHFA nor Freddie Mac obstructed homeowners’ abilities to refinance their mortgages in an effort to influence the yields of the inverse floating-rate bonds . . . .”

***What we wrote:*** “FHFA-OIG uncovered no evidence that FHFA or Freddie Mac obstructed homeowners’ abilities to refinance their mortgages in an effort to influence the yields of the inverse floating-rate bonds . . . .”

## **Evasive and Prepared Interviewees**

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### **Questions:**

- Did FHFA instruct Freddie Mac to stop doing inverse floater transactions?
- Did FHFA ask Freddie Mac to stop doing inverse floater transactions?
- Is Freddie Mac still at liberty to do inverse floater transactions?

### **Answer We Did Not Get:**

- FHFA and Freddie Mac reached an agreement whereby Freddie Mac agreed not to do transactions that result in inverse floaters.

# The Importance of Interviewing Sources

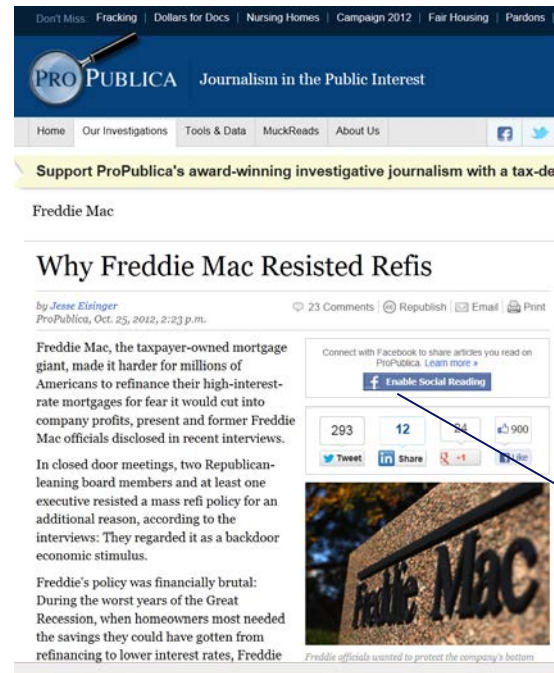
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# ...But Be Cynical About Your Sources

■ Pre-HARP → HARP → Pre HARP 2.0 → HARP 2.0

Inverse  
Floaters





**FEDERAL HOUSING FINANCE AGENCY  
OFFICE OF INSPECTOR GENERAL**

**FHFA's Oversight of Freddie Mac's Investment in  
Inverse Floaters**



SURVEY NO.: SUR-2011-025-01

DATED: Month XX, 2012



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# **Inverse Floaters and FHFA Oversight**

## **A Primer**

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**March 2, 2012**

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# Why Have I Heard So Much About Inverse Floaters Lately?

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January 30, 2012 NPR/ProPublica article, “Freddie Mac Betting Against Struggling Homeowners”

- Key assertion was that, through inverse floater investments, Freddie Mac positioned itself to benefit from homeowners’ inability to refinance their mortgages
- In fact, because of much tighter lending standards, home refinancing rates have been low despite the lowest mortgage rates in anybody’s memory
- The story has caught the attention of many in Congress
  - X Senators and Y Representatives have issued public statements or signed open letters to FHFA
  - FHFA-OIG has been asked to investigate the story



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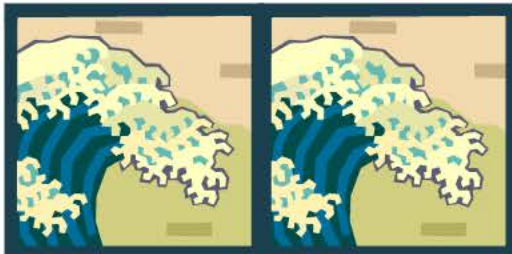
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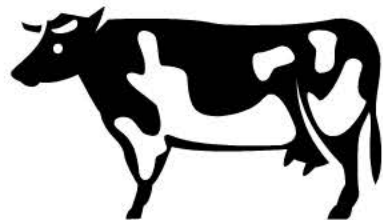
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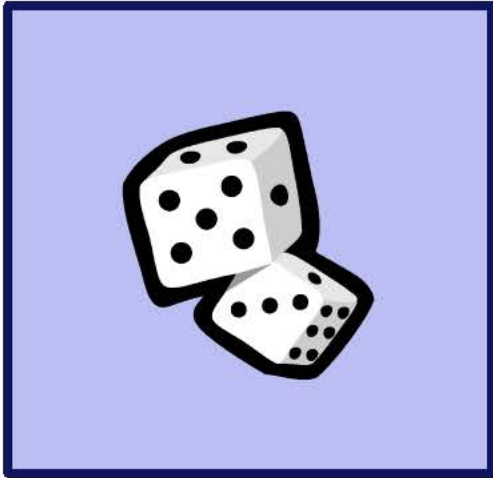
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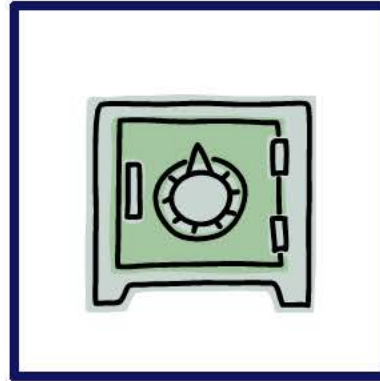
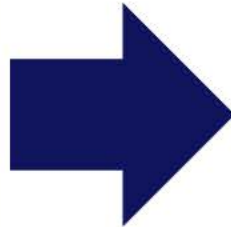
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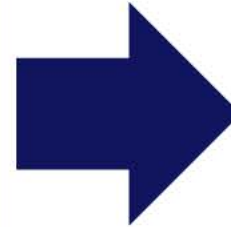
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...into a floating rate bond relatively free of interest rate or prepayment risk that could command a premium price from third party investors....



...and inverse floaters, which concentrated the same risks from those mortgage assets into a smaller, more cost-effective package.

# FHFA-OIG Examination

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**FHFA-OIG has begun an examination of Freddie Mac's inverse floater investments**

- **Examining the facts and circumstances of such investments**
  - **Drivers of the decision to invest in inverse floaters**
  - **Whether they were retained in the course of business, or purchased in the market**
  - **Whether they were “bets”, or were hedged against interest rate and prepayment risks**
  - **Evidence, if any, of collusion between trading desk and single family housing business**
  - **Nature and extent of compliance and risk management measures**
  - **Relevant management issues facing Freddie Mac's capital markets business**
  - **FHFA oversight actions**

## Contact Information

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**Hotline (800) 793-7724**  
**[www.fhfaoig.gov](http://www.fhfaoig.gov)**

**Steve A. Linick**  
**Commanding Officer**

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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

December ~~17~~xxxx, 2012

The Honorable Charles Grassley, Ranking Member  
The Honorable Mark Kirk  
United States Senate  
Committee on the Judiciary  
Washington, DC 20510-6275

Dear Ranking Member Grassley and Senator Kirk:

(b) (5)

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(b) (5)



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Federal Housing Finance Agency

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~~December xxx~~ December xx, 2012

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(b) (5)

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Sincerely,

Steve A. Linick  
Inspector General

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**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

December xx, 2012

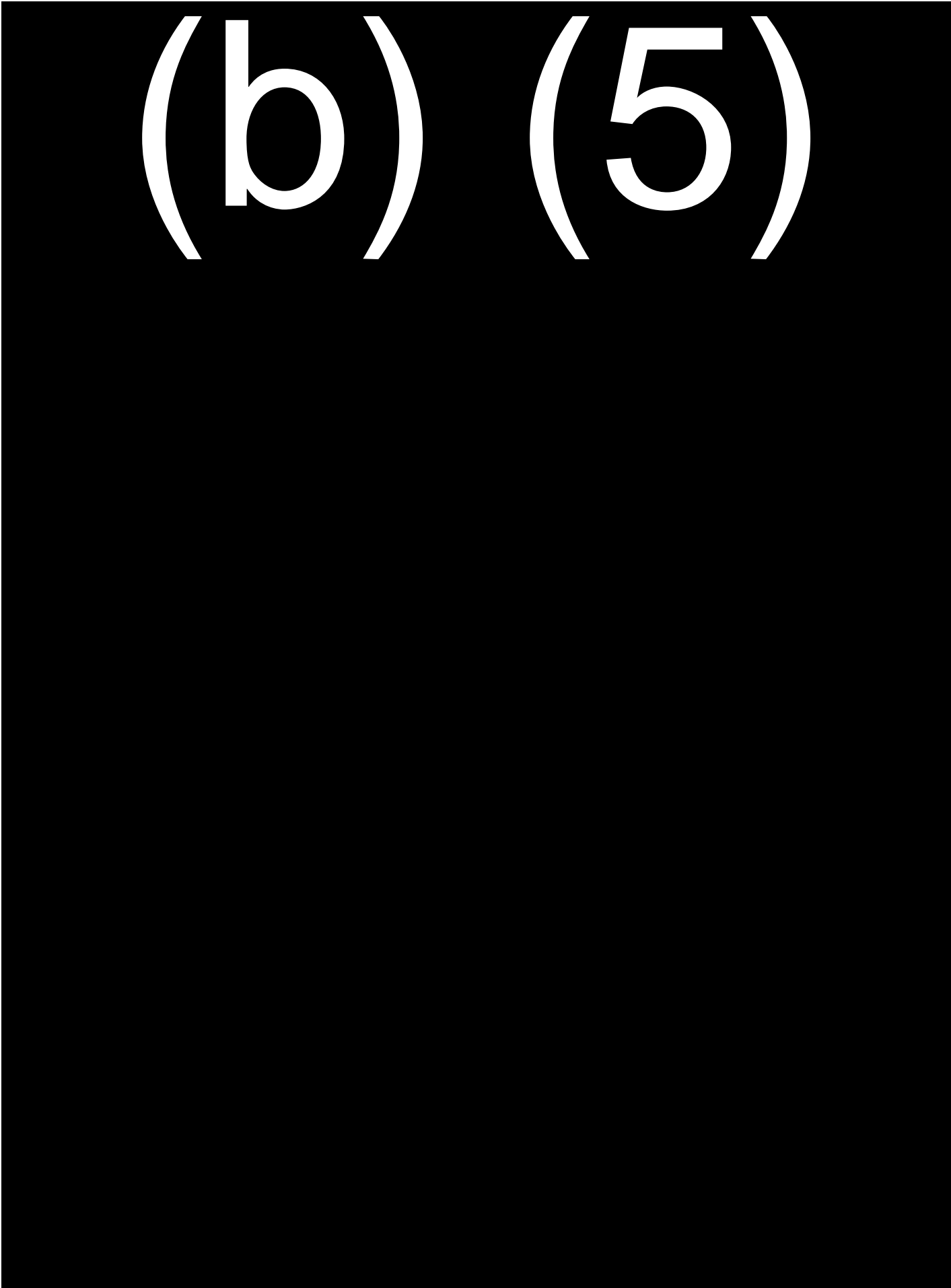
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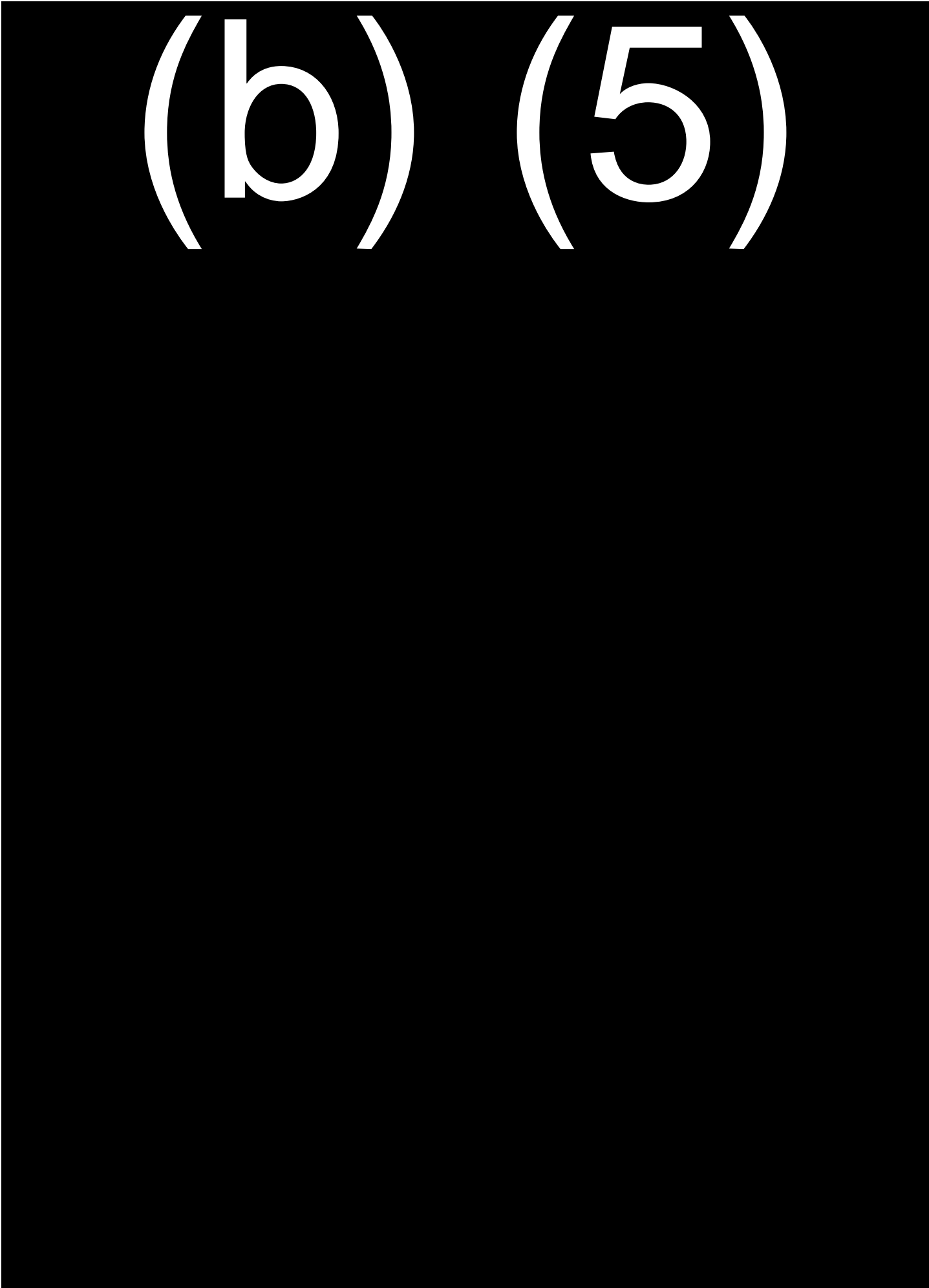


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Sincerely,

Steve A. Linick  
Inspector General

## Endnotes

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<sup>1</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.

<sup>2</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2



**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

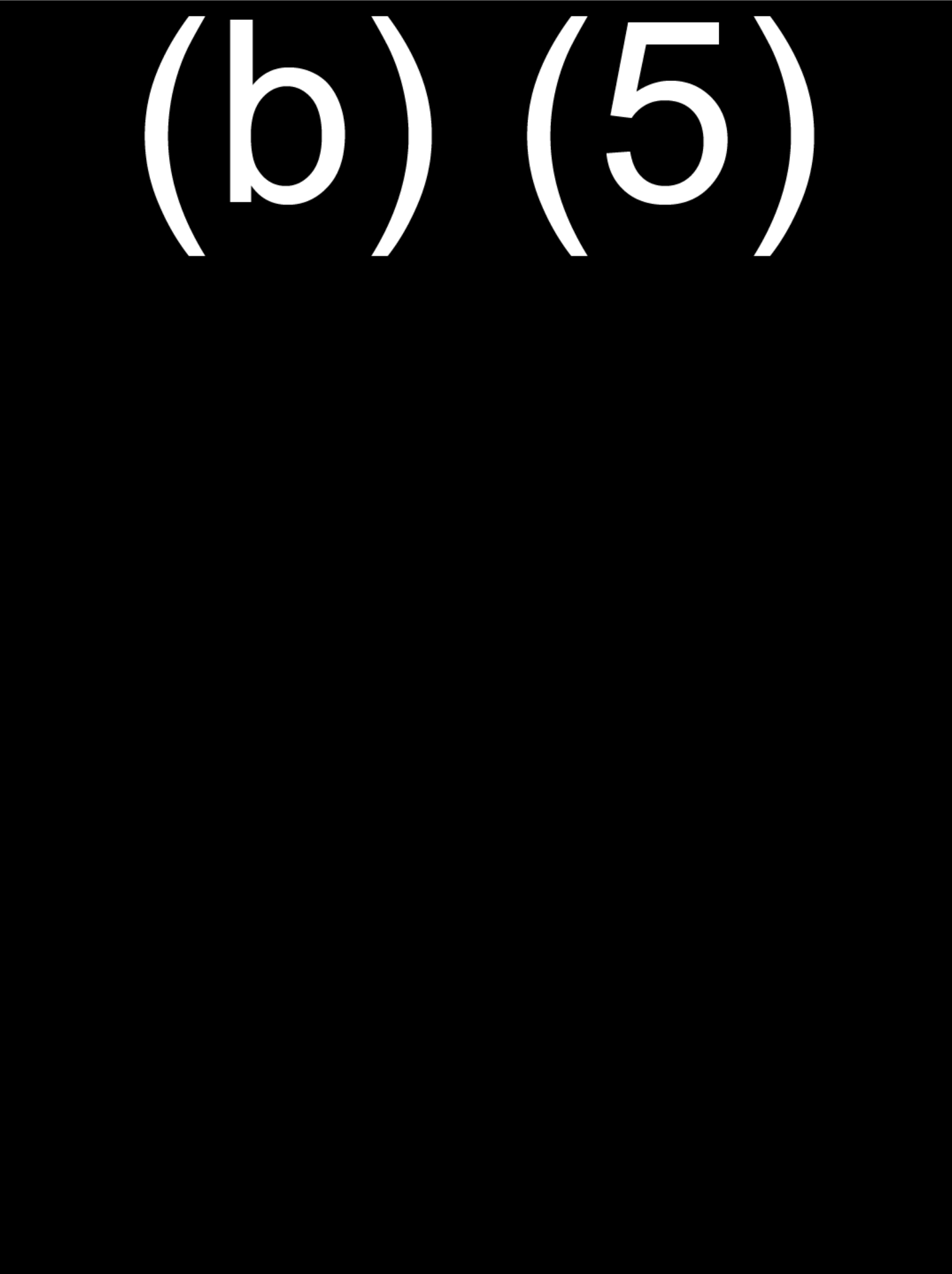
December 17, 2012

The Honorable Charles Grassley, Ranking Member  
The Honorable Mark Kirk  
United States Senate  
Committee on the Judiciary  
Washington, DC 20510-6275

Dear Senators Grassley and Kirk,

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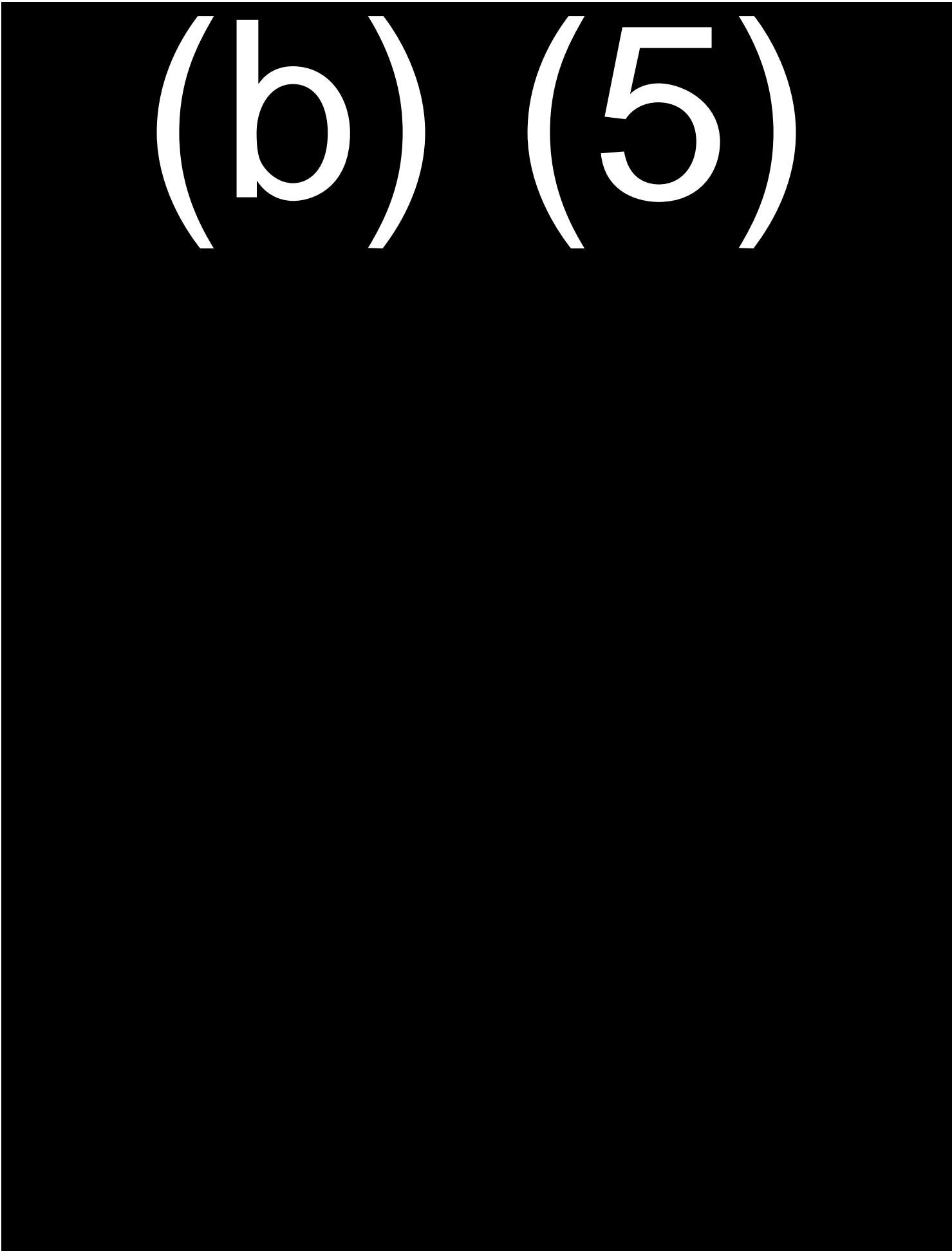
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## Endnotes

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<sup>1</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.

<sup>2</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>3</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, “[Mortgage-Backed Securities](#).” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>4</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”



**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

December 17, 2012

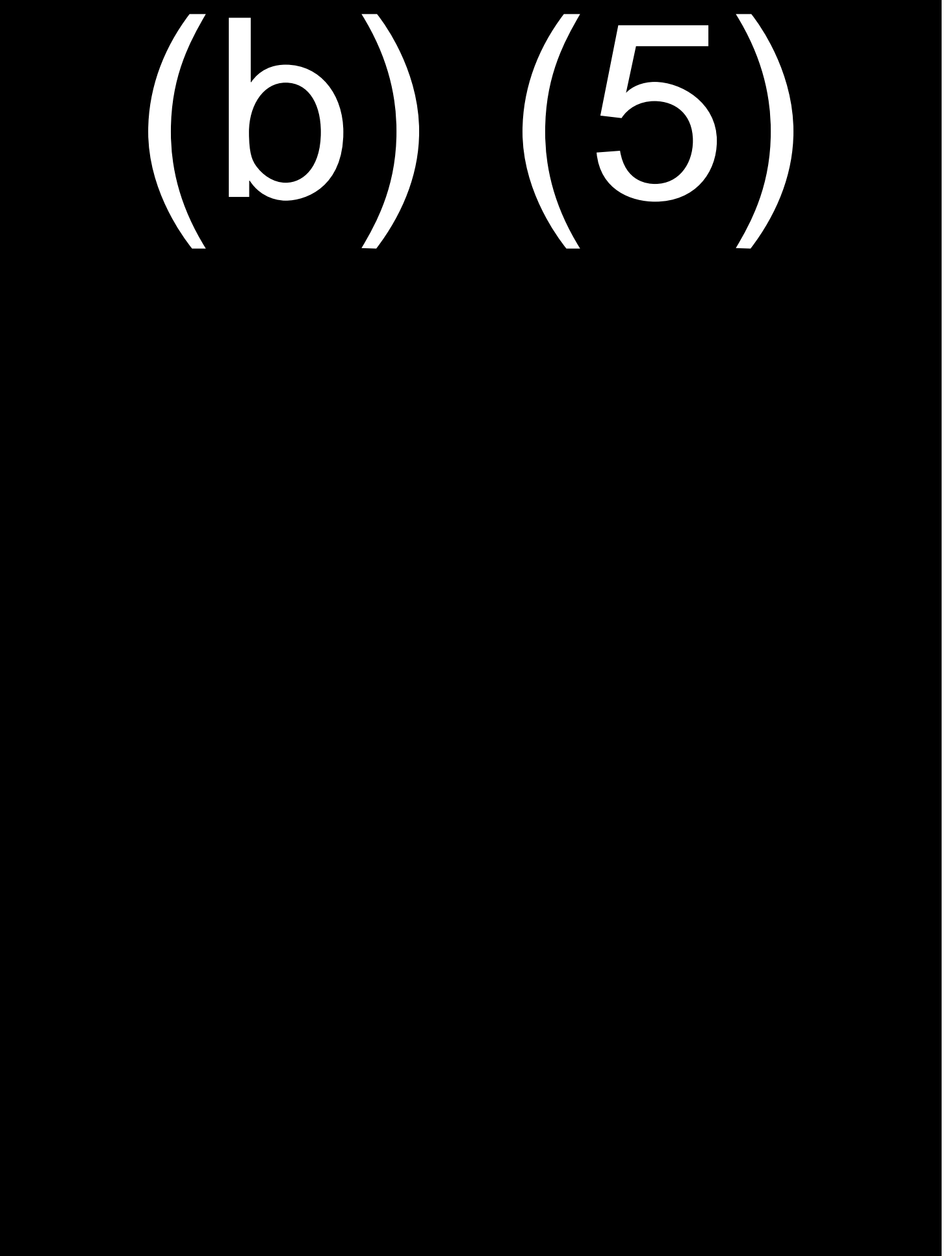
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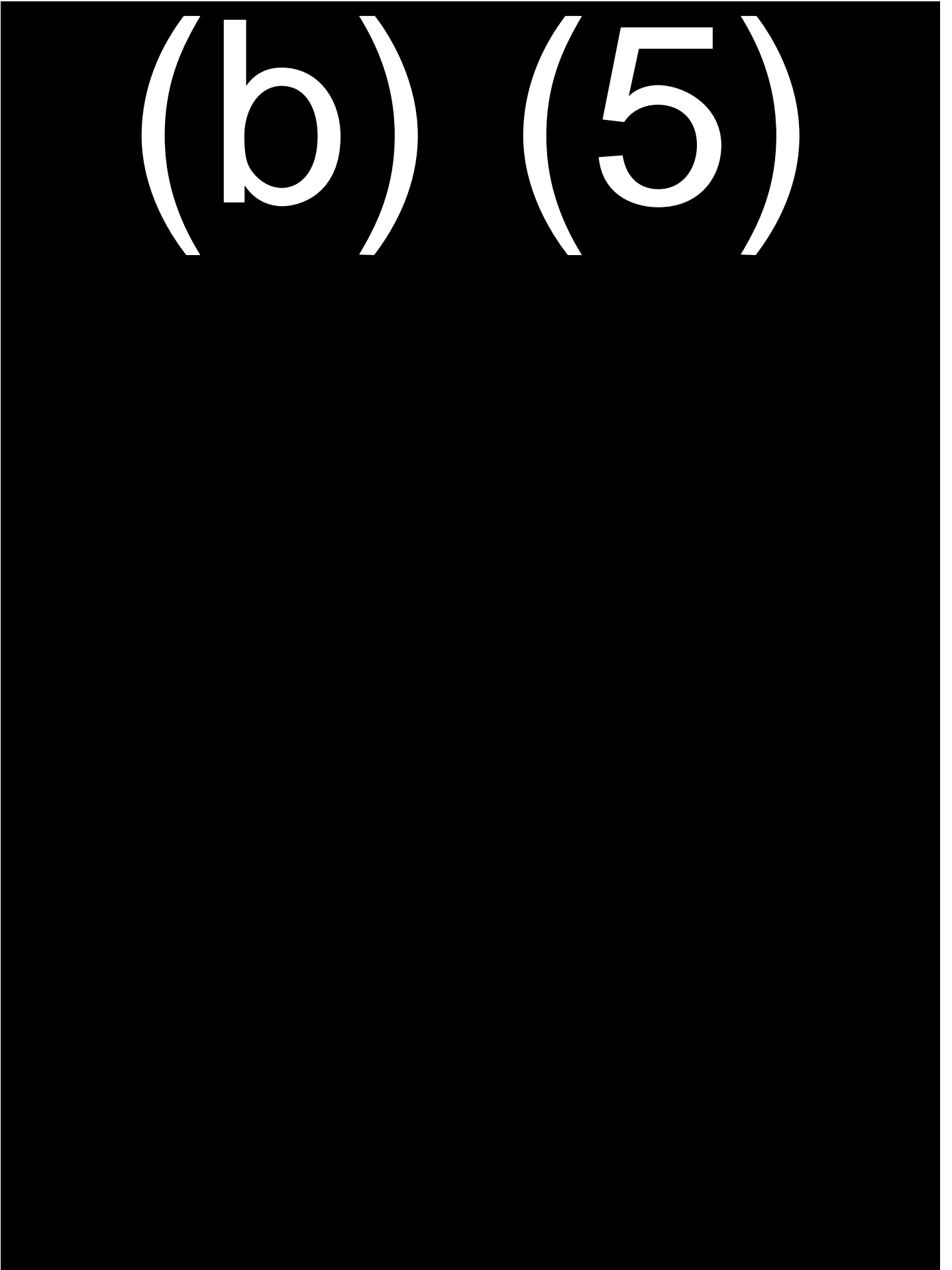
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## Endnotes

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<sup>1</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.

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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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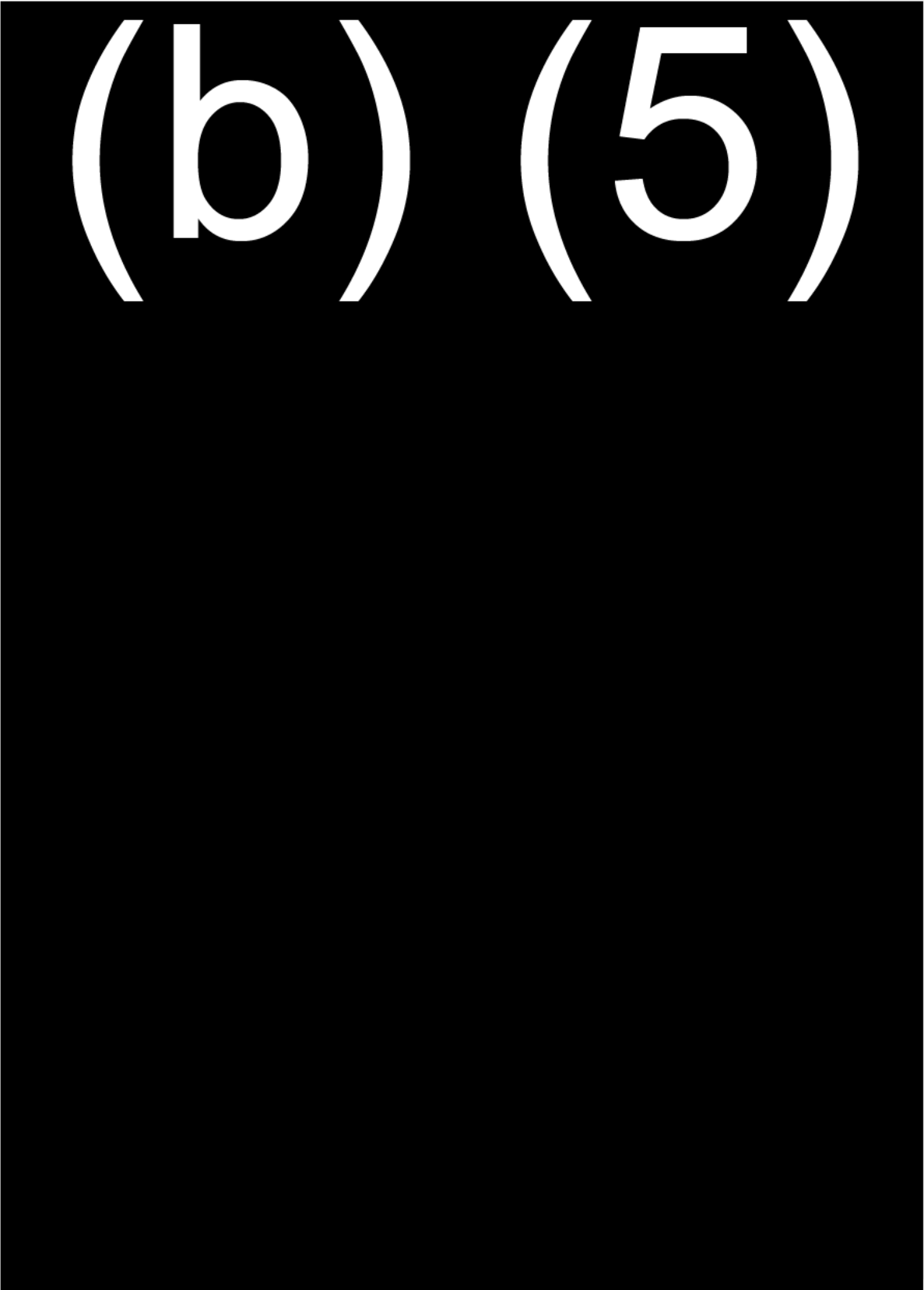
400 7th Street, S.W., Washington DC 20024

**To:** Edward DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October 12, 2012

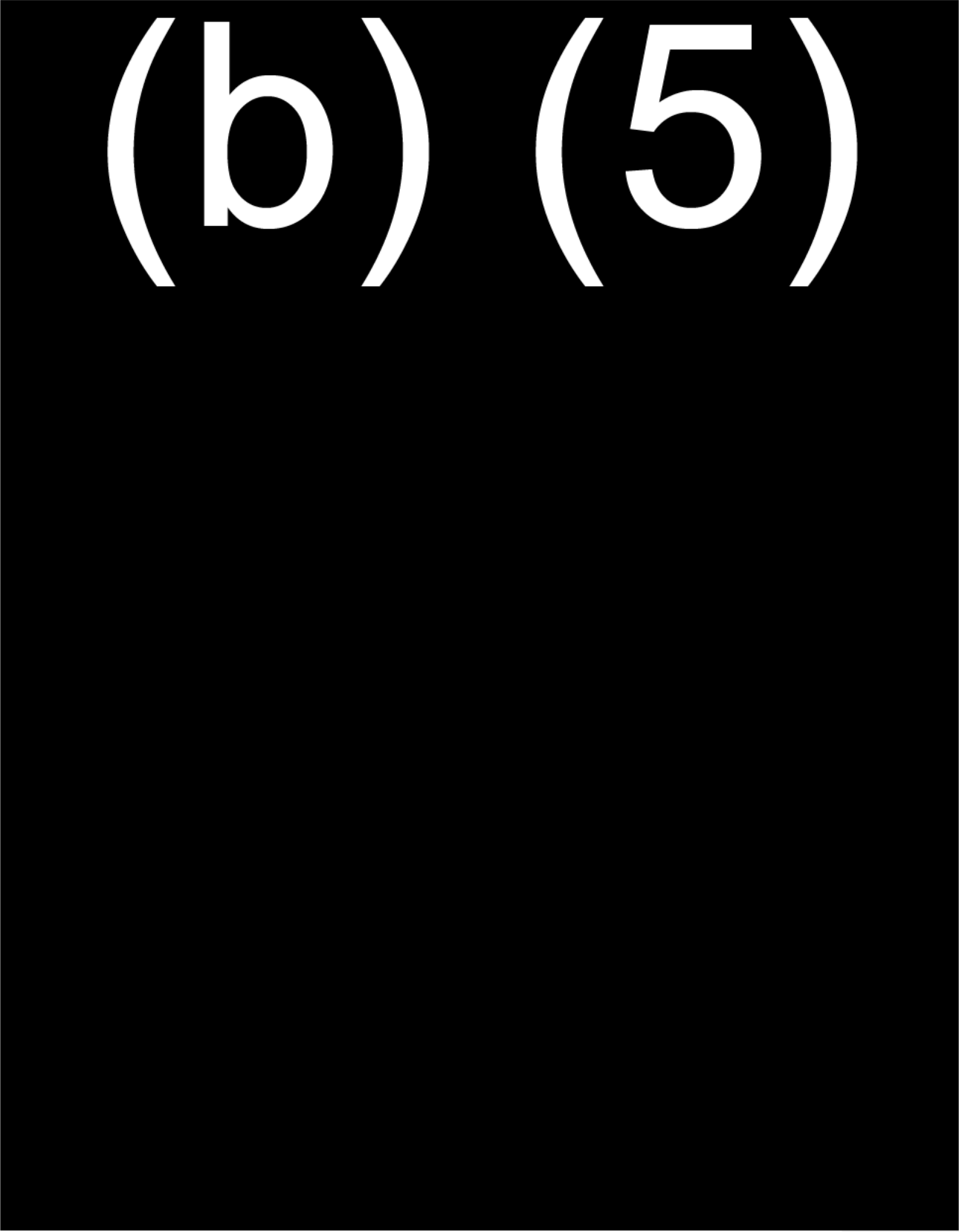
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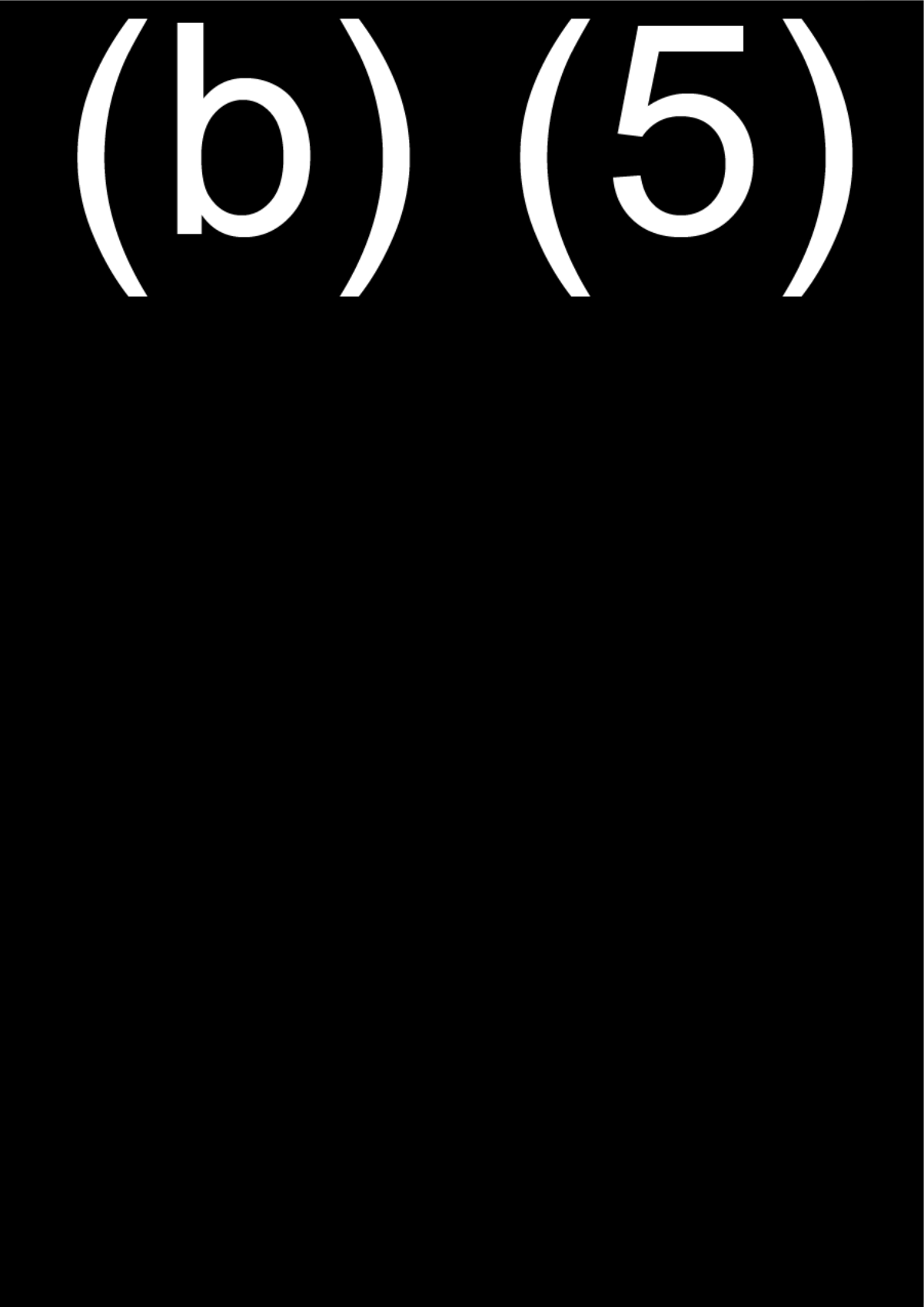


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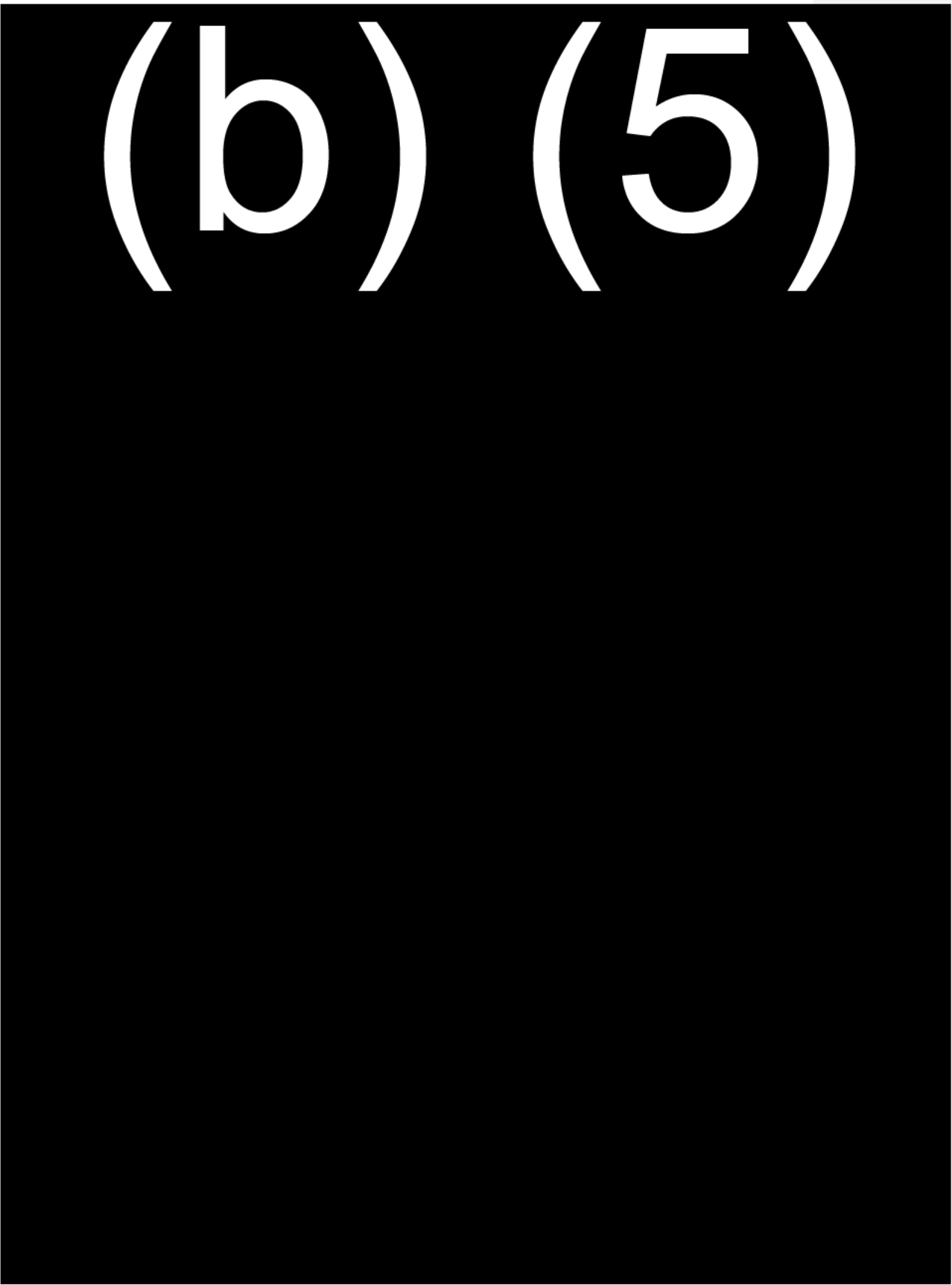
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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis,  
Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Via:** Richard Parker, Deputy Inspector General, Office of Policy, Oversight and Review  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation

**Date:** October 19, 2012

---

The London Interbank Offered Rate ("LIBOR") is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments, and has been described as "the most important figure in finance."<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

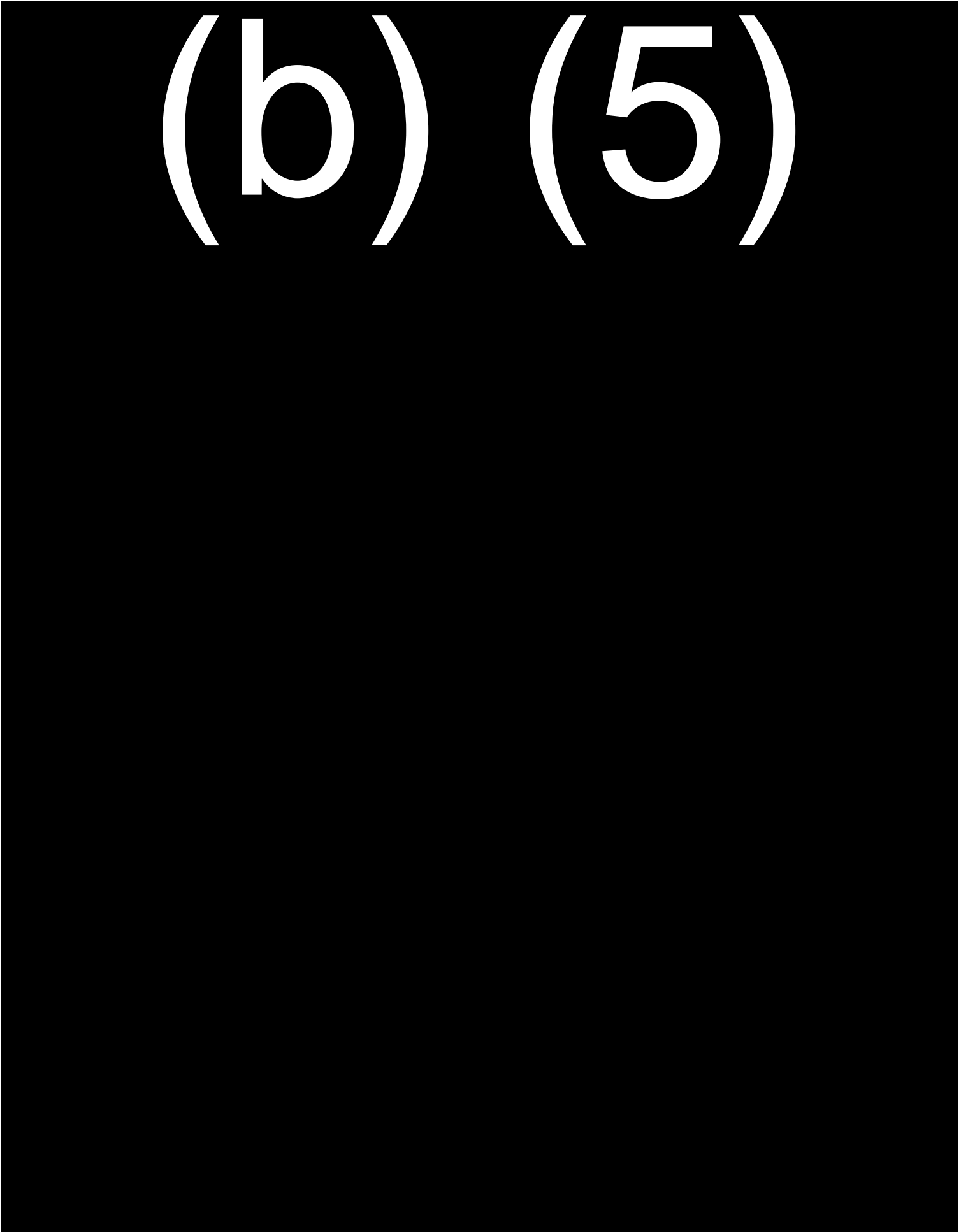
In a June 2012 settlement with British and US authorities, including the Department of Justice ("DOJ"), Barclays Bank Plc ("Barclays") admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

---

<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry's stability during the financial crisis. As one academic observer noted, "Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their

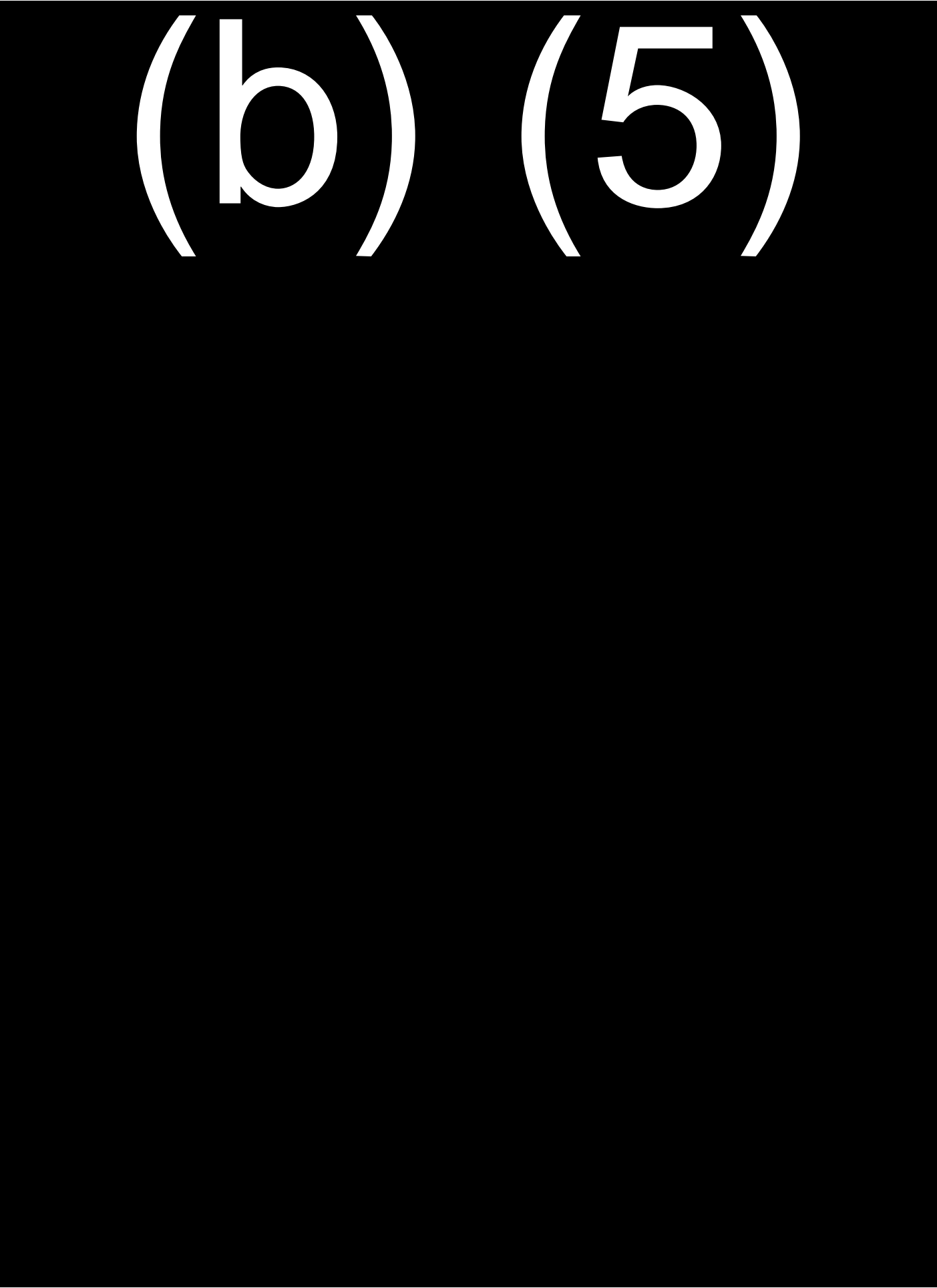
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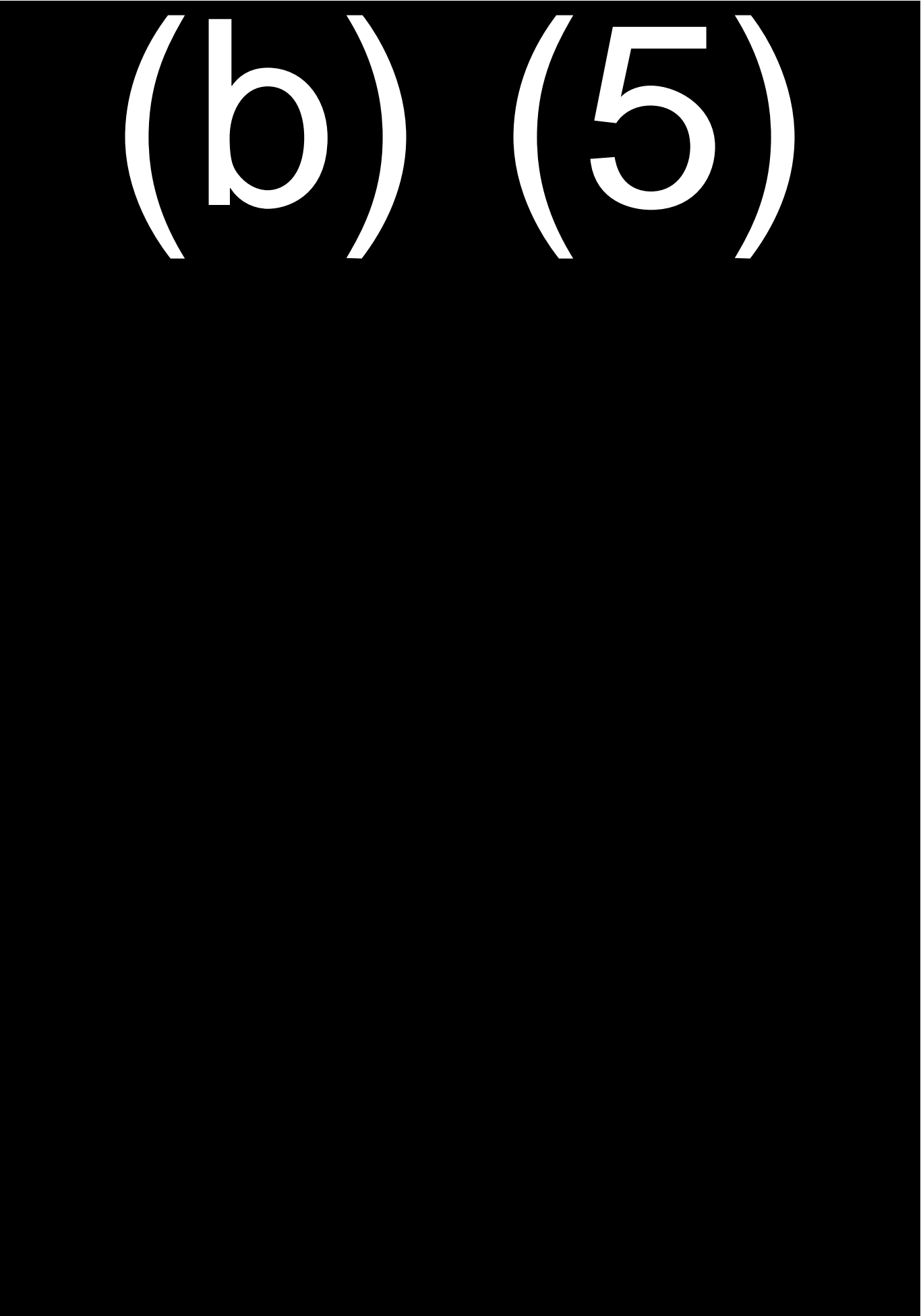
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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis,  
Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Via:** Richard Parker, Deputy Inspector General, Office of Policy, Oversight and Review  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation

**Date:** October 22, 2012

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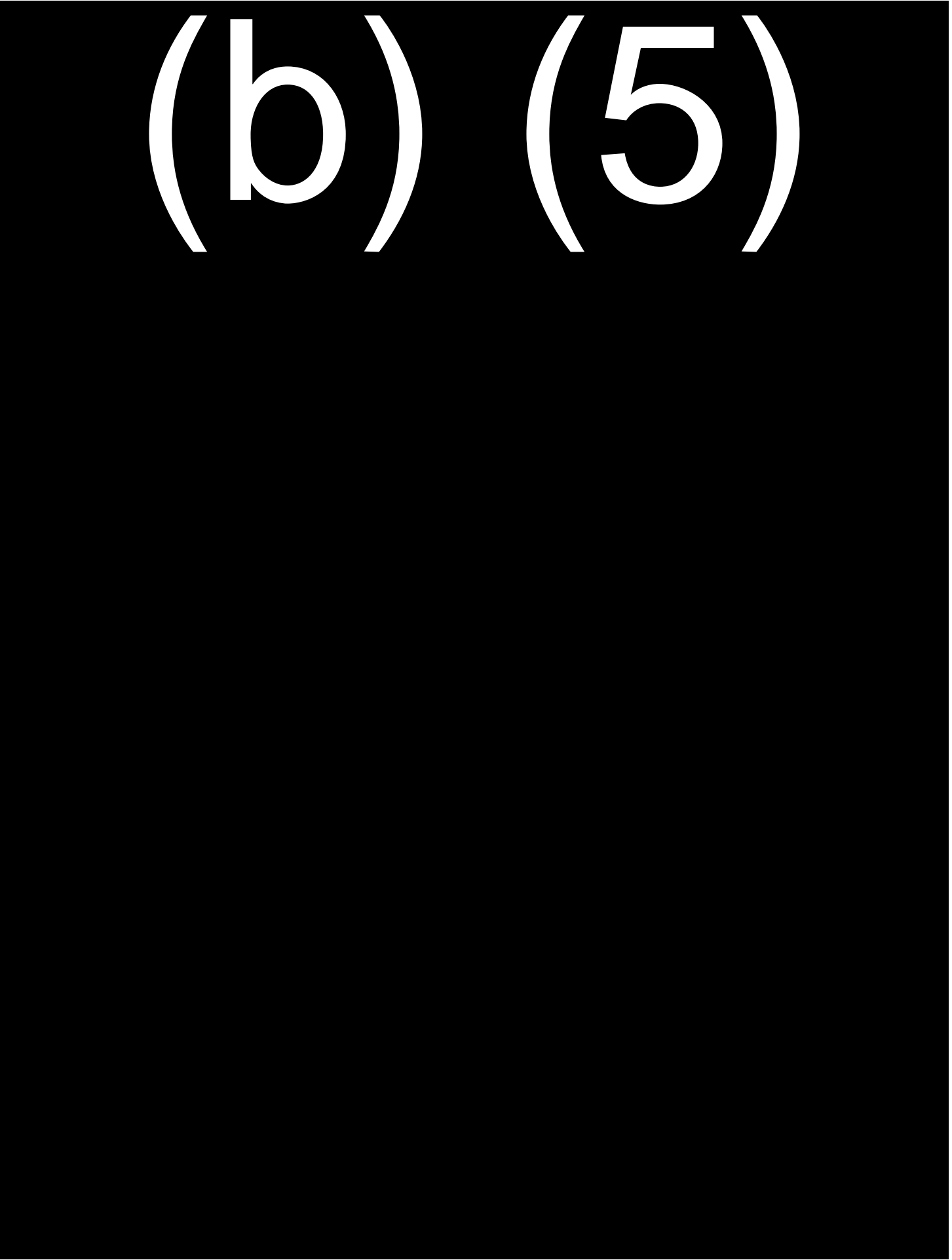
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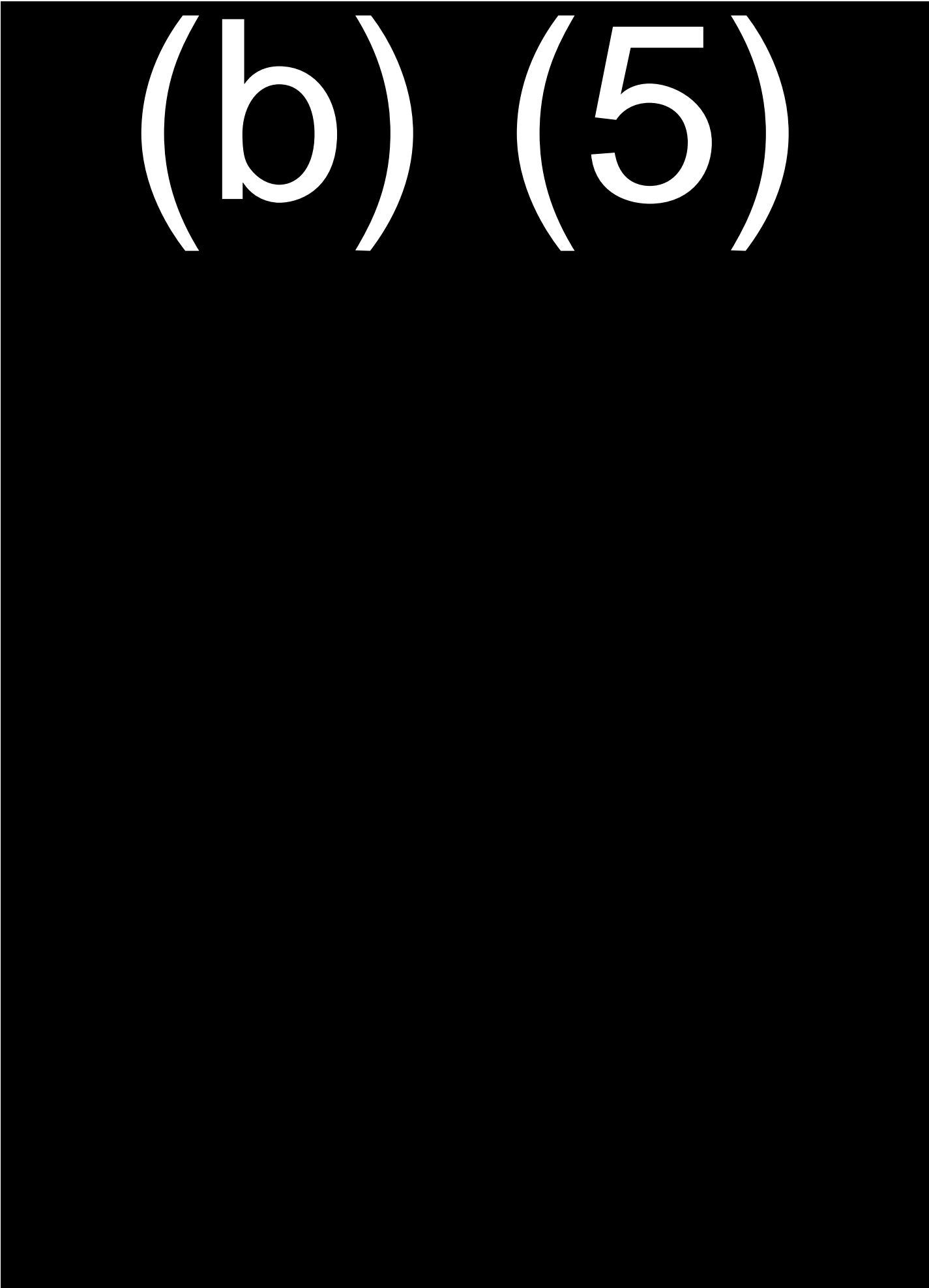
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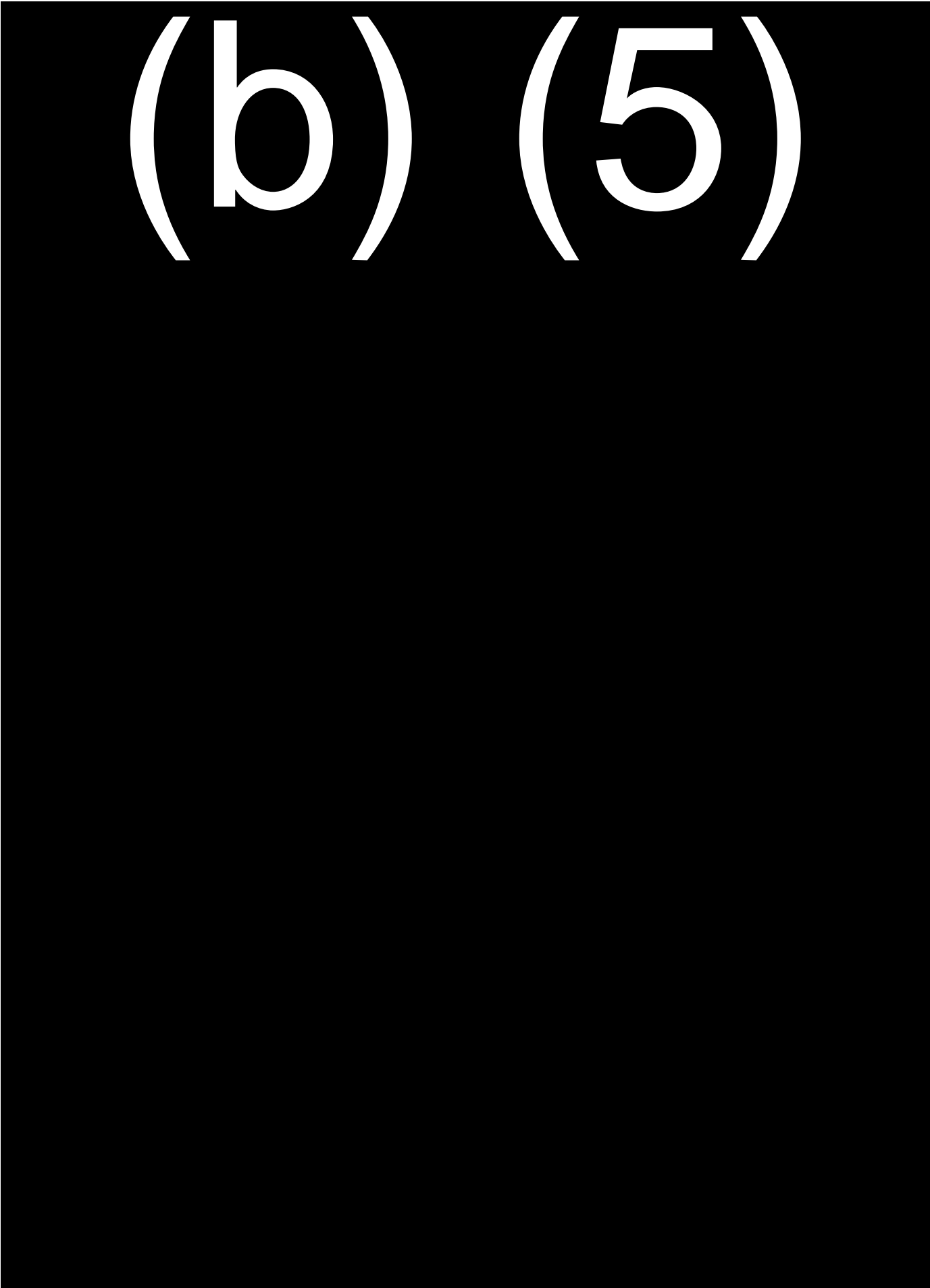
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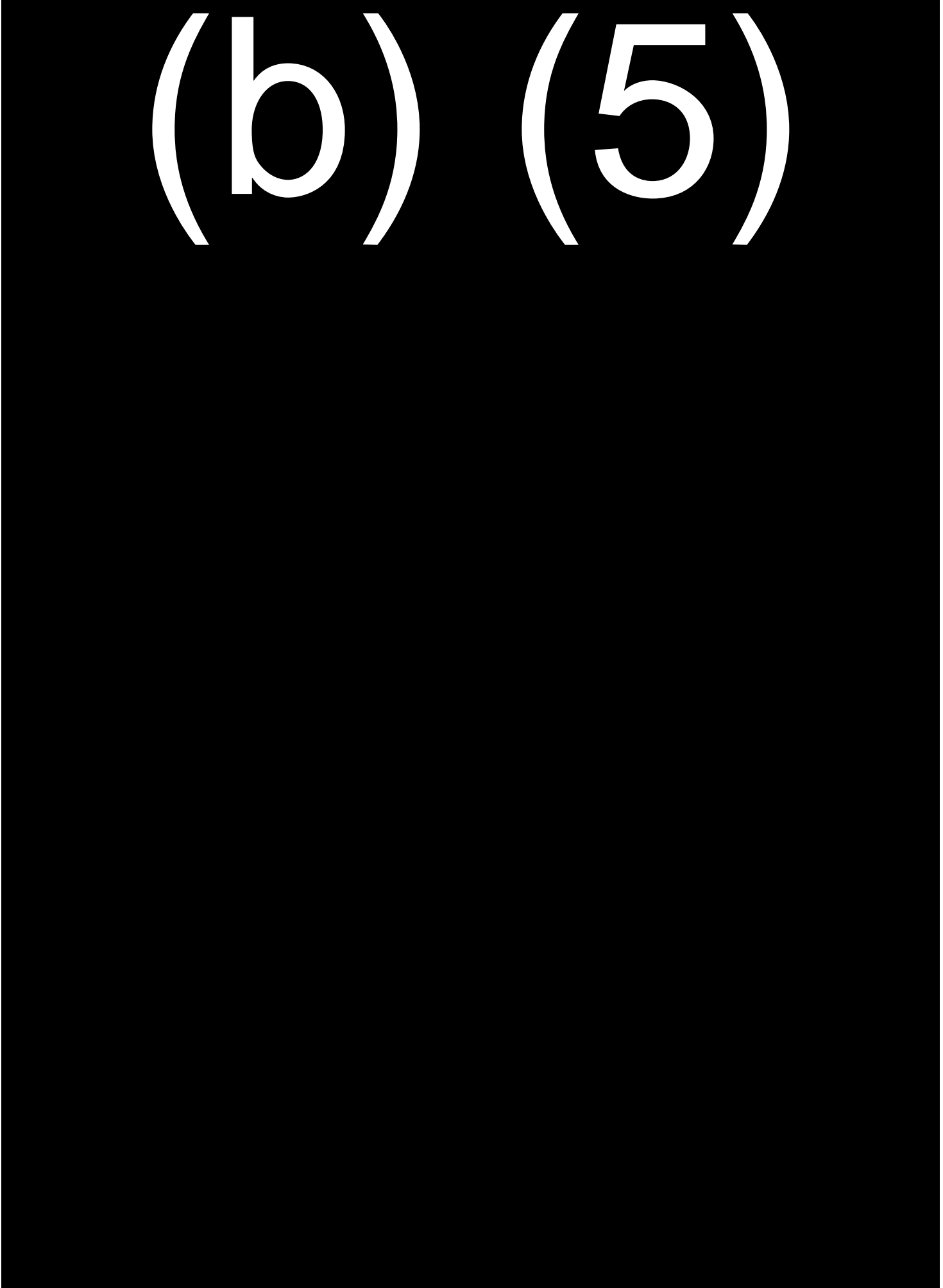
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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

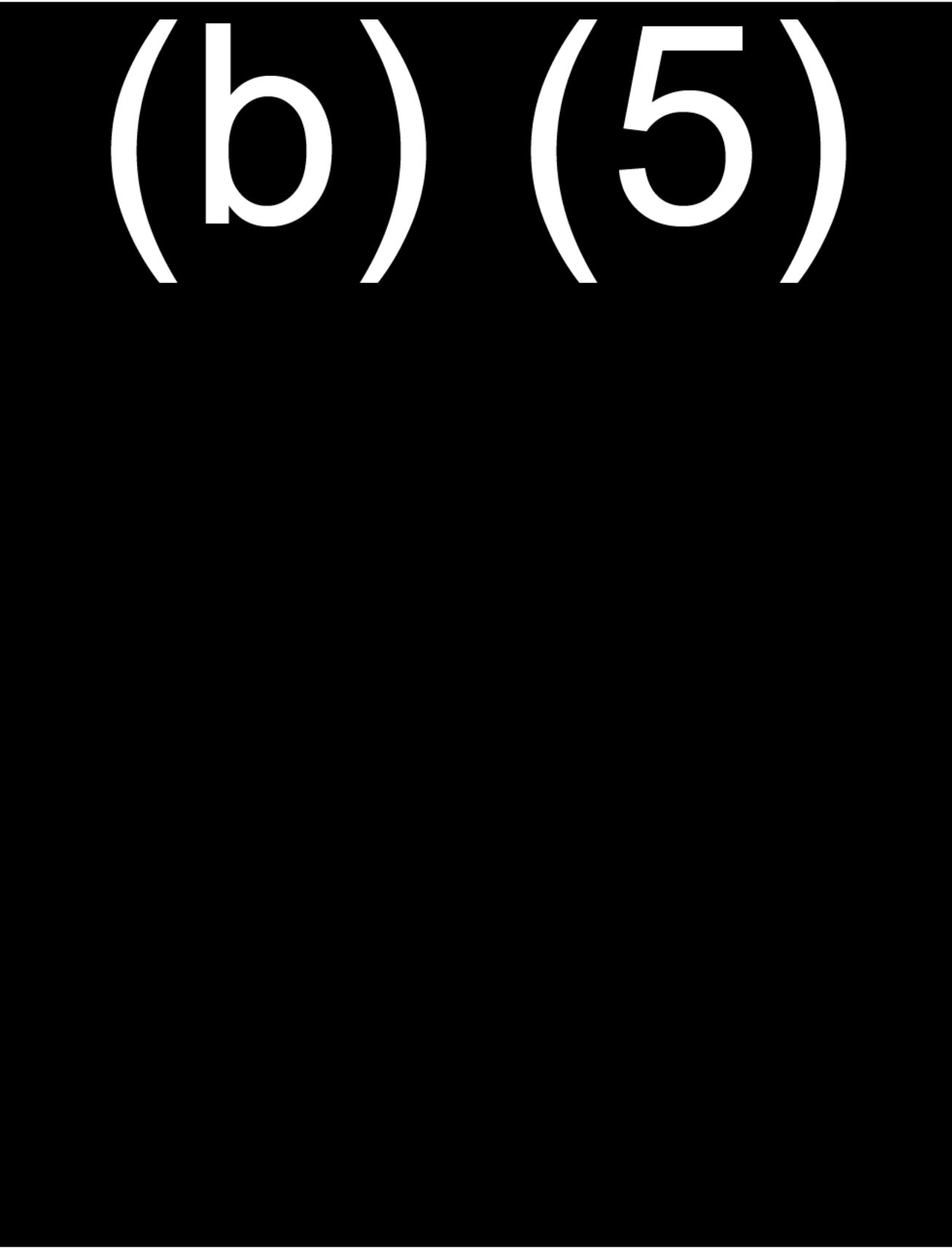
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**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October 9, 2012

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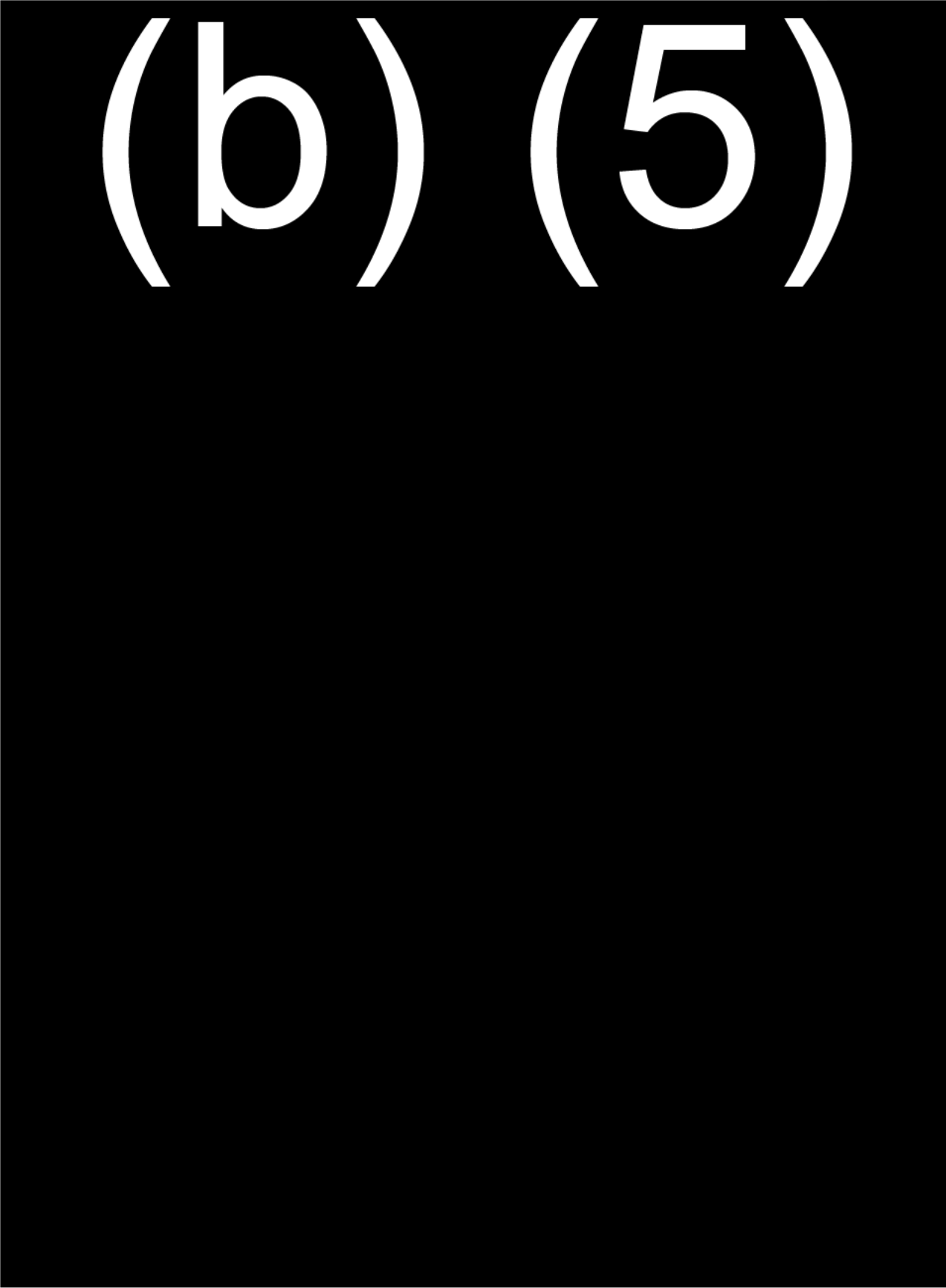
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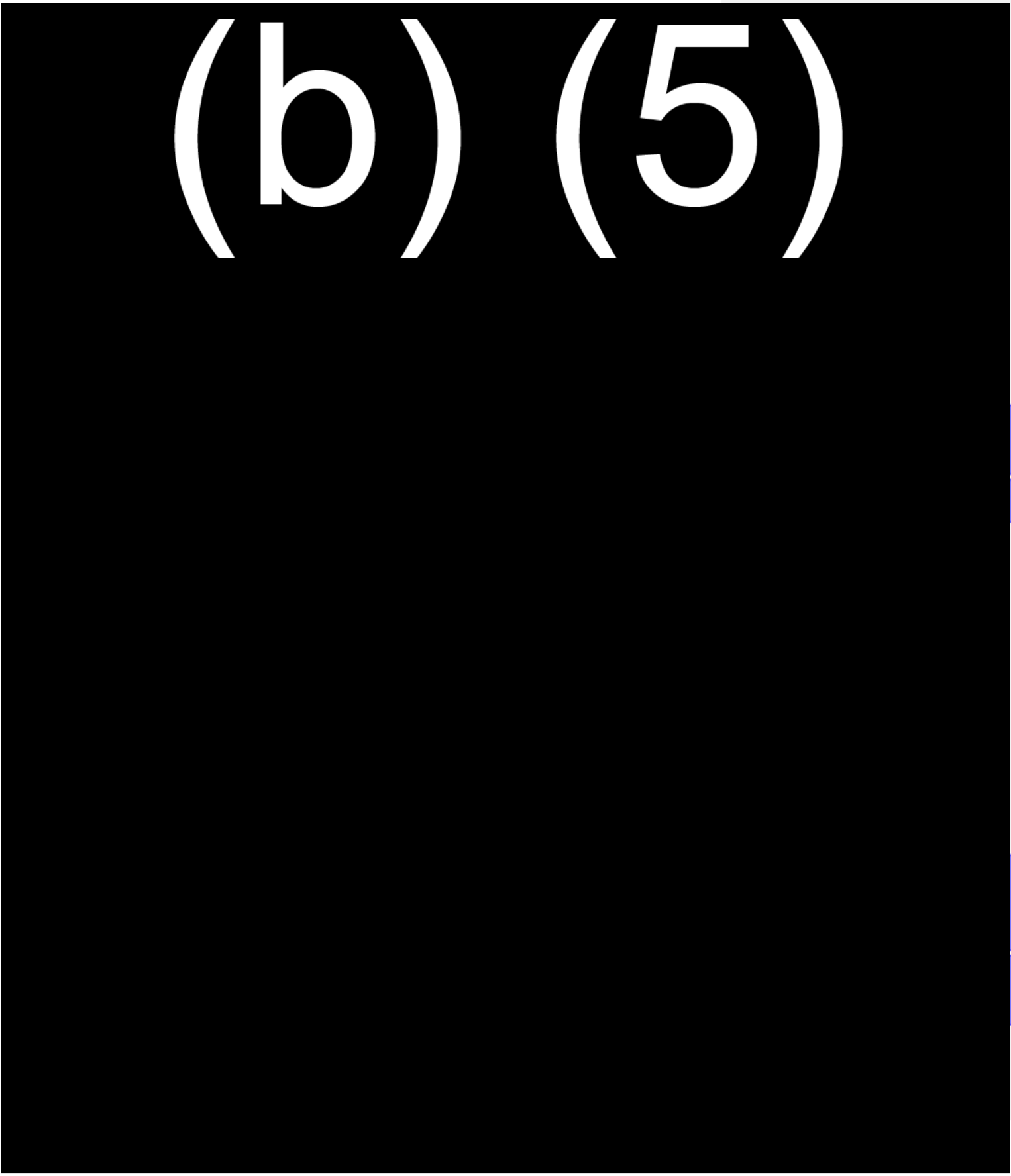
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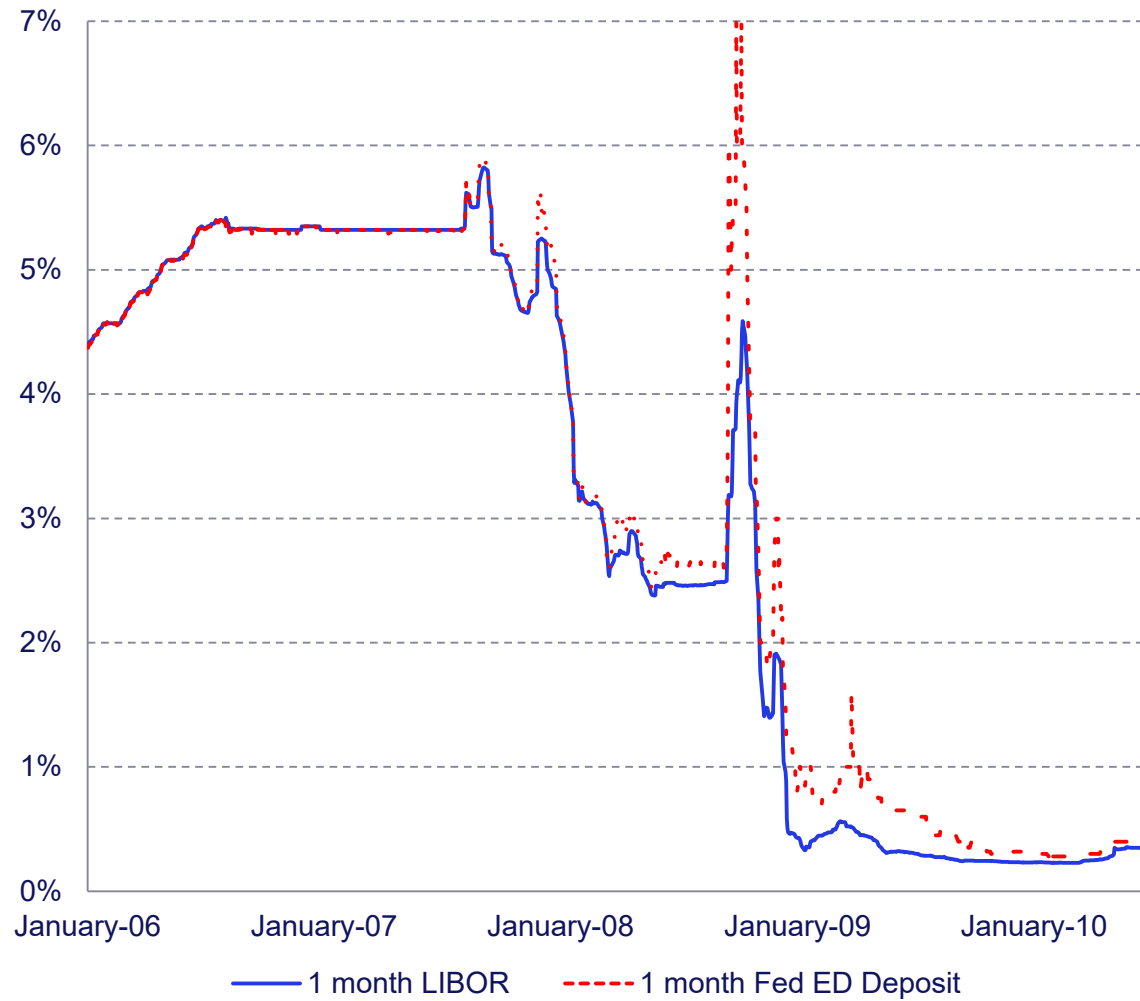
## Counterparty Risk White Paper Proposal

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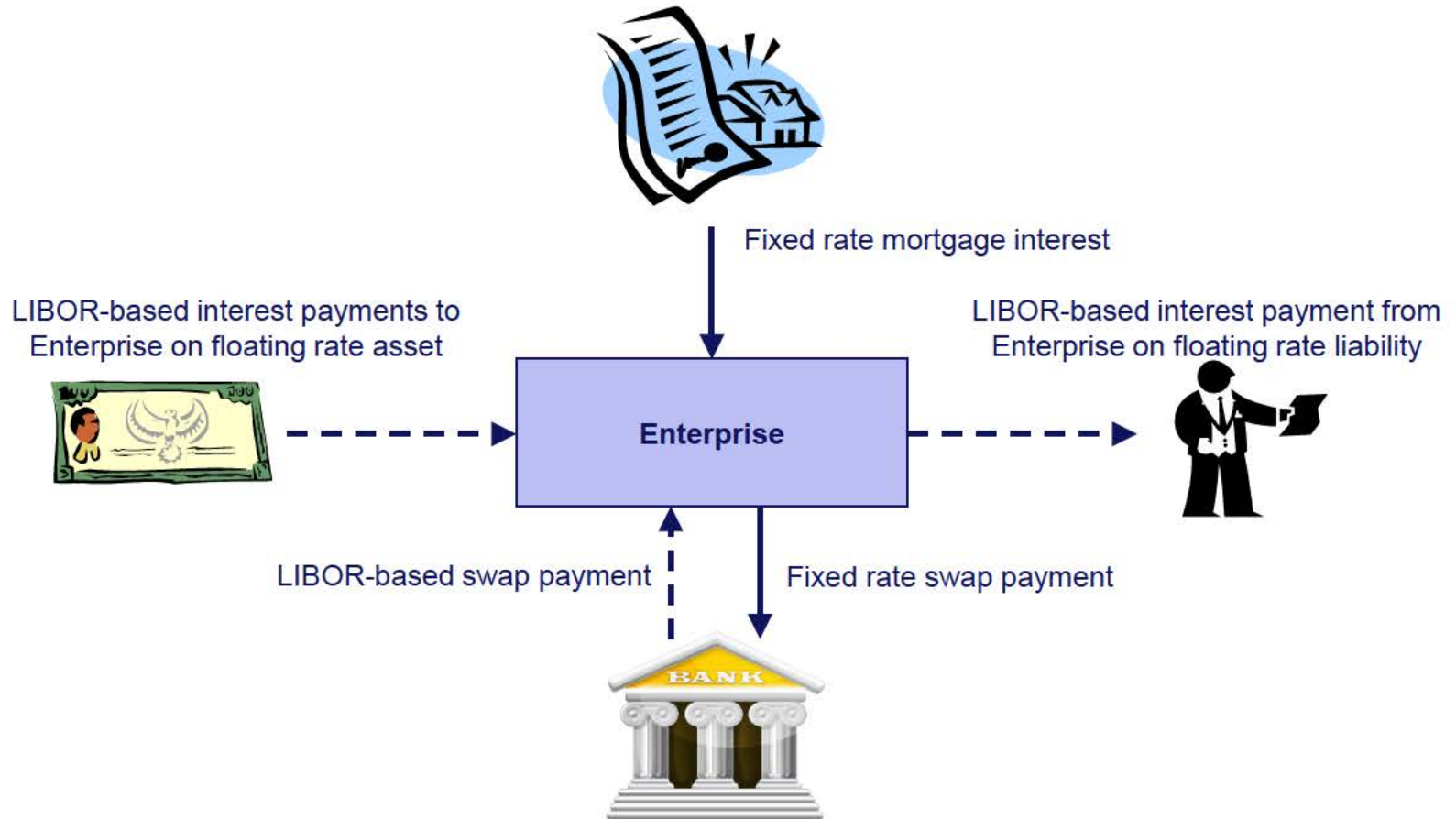
May 17, 2012

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**Figure 1. Federal Reserve Eurodollar Deposit Rate vs LIBOR, 1Q06-2Q10**

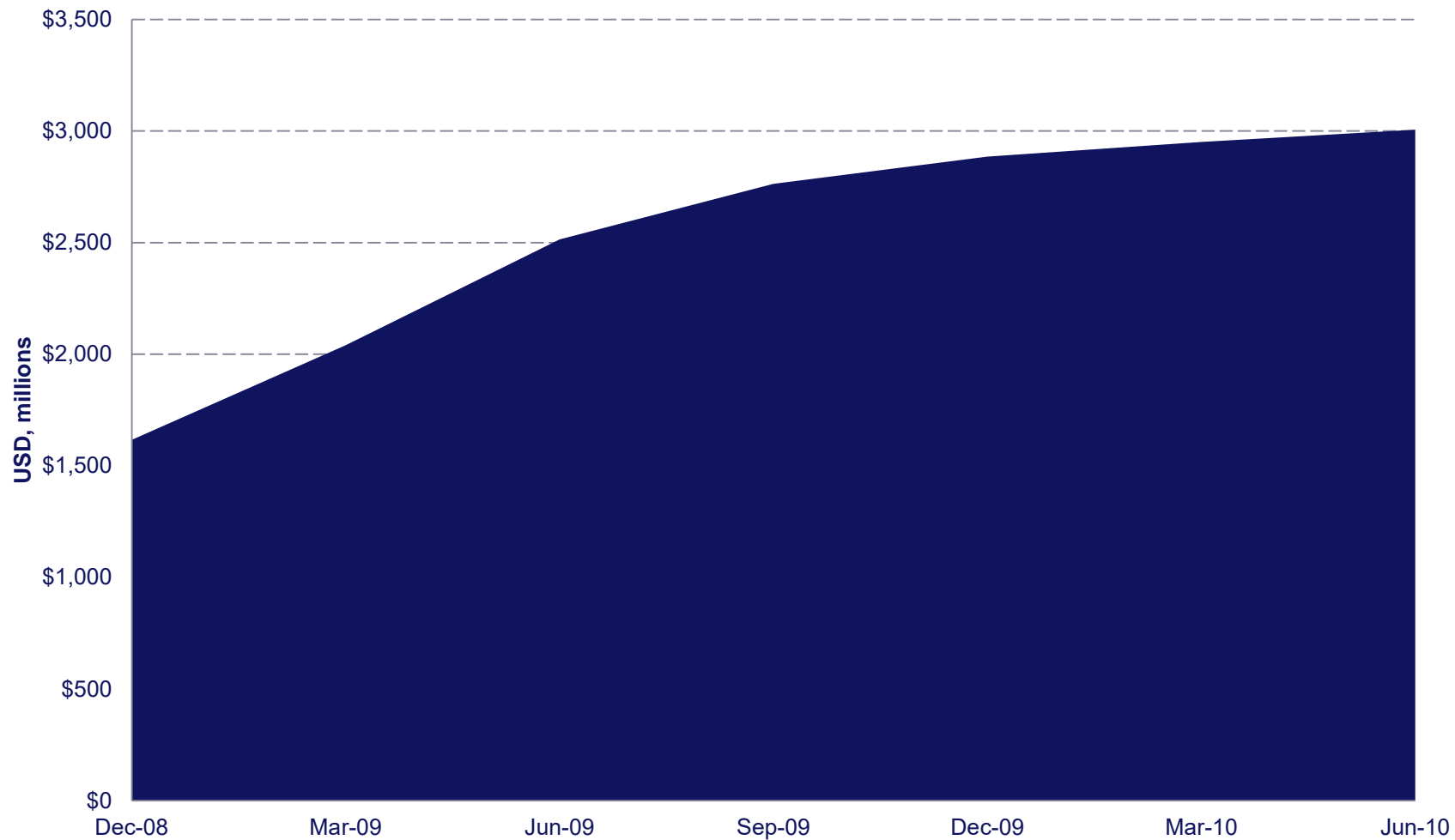


**Figure 2. LIBOR-Based Payments to and From the Enterprises**



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**Estimated Potential Cumulative Losses to the Enterprises from LIBOR  
Suppression, 6 Sep 08 through 30 Jun 10**



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### Major Derivatives Dealers

	LIBOR Contributor
Bank of America	✓
Barclays	✓
BNP Paribas	
Citibank	✓
Credit Suisse	✓
Deutsche Bank	✓
Goldman Sachs	
HSBC Group	✓
JPMorganChase	✓
Morgan Stanley	
RBS	✓
Societe Generale	✓
UBS	✓
Wachovia	

### Top Private Label MBS Underwriters 2007

	LIBOR Contributor
Lehman Brothers	
Bear Stearns	
Deutsche Bank	✓
Countrywide	
RBS	✓
Credit Suisse	✓
JPMorganChase	✓
Morgan Stanley	
Washington Mutual	
Merrill Lynch	

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**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

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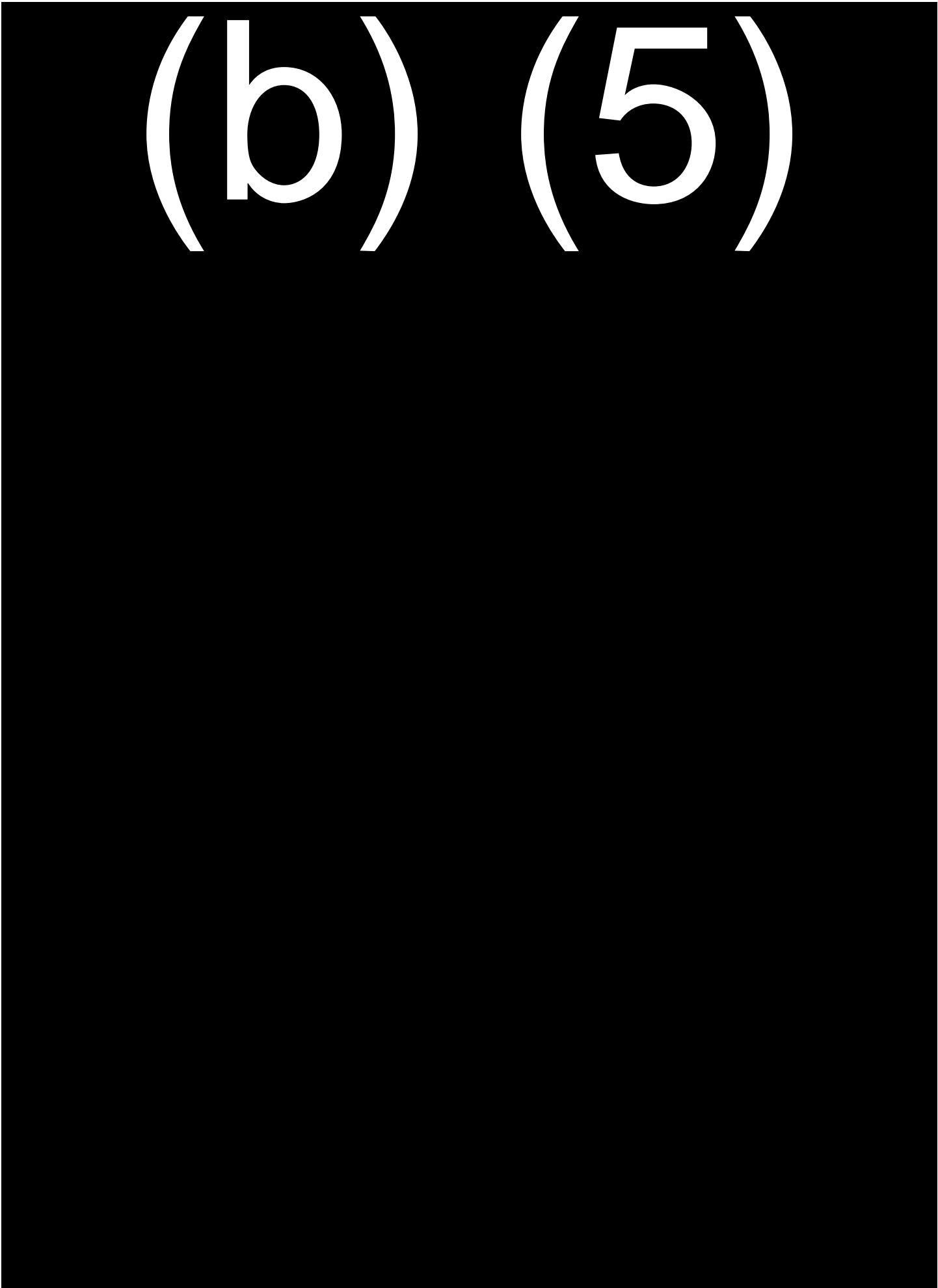
400 7th Street, S.W., Washington DC 20024

**To:** Edward DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October 9, 2012

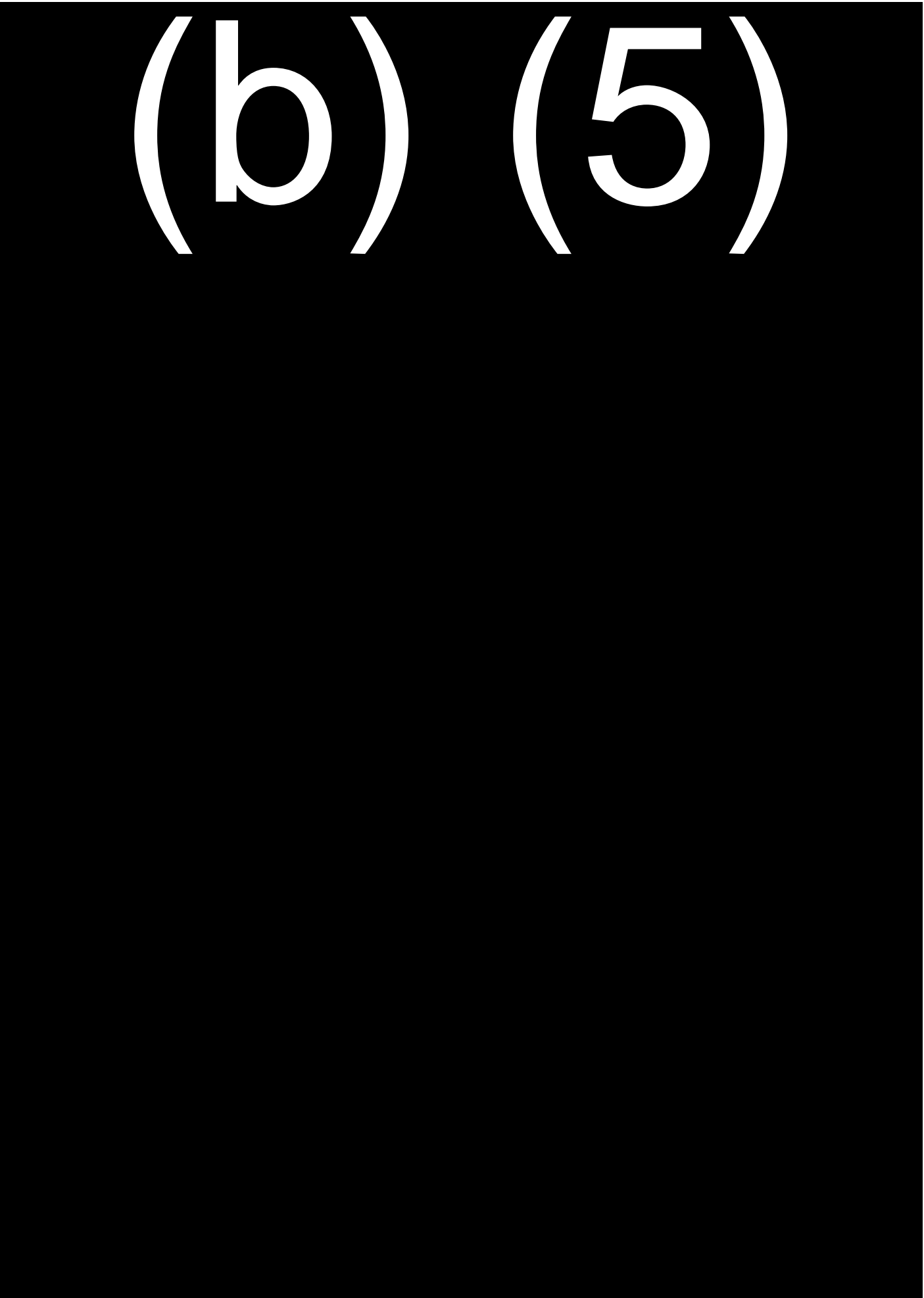
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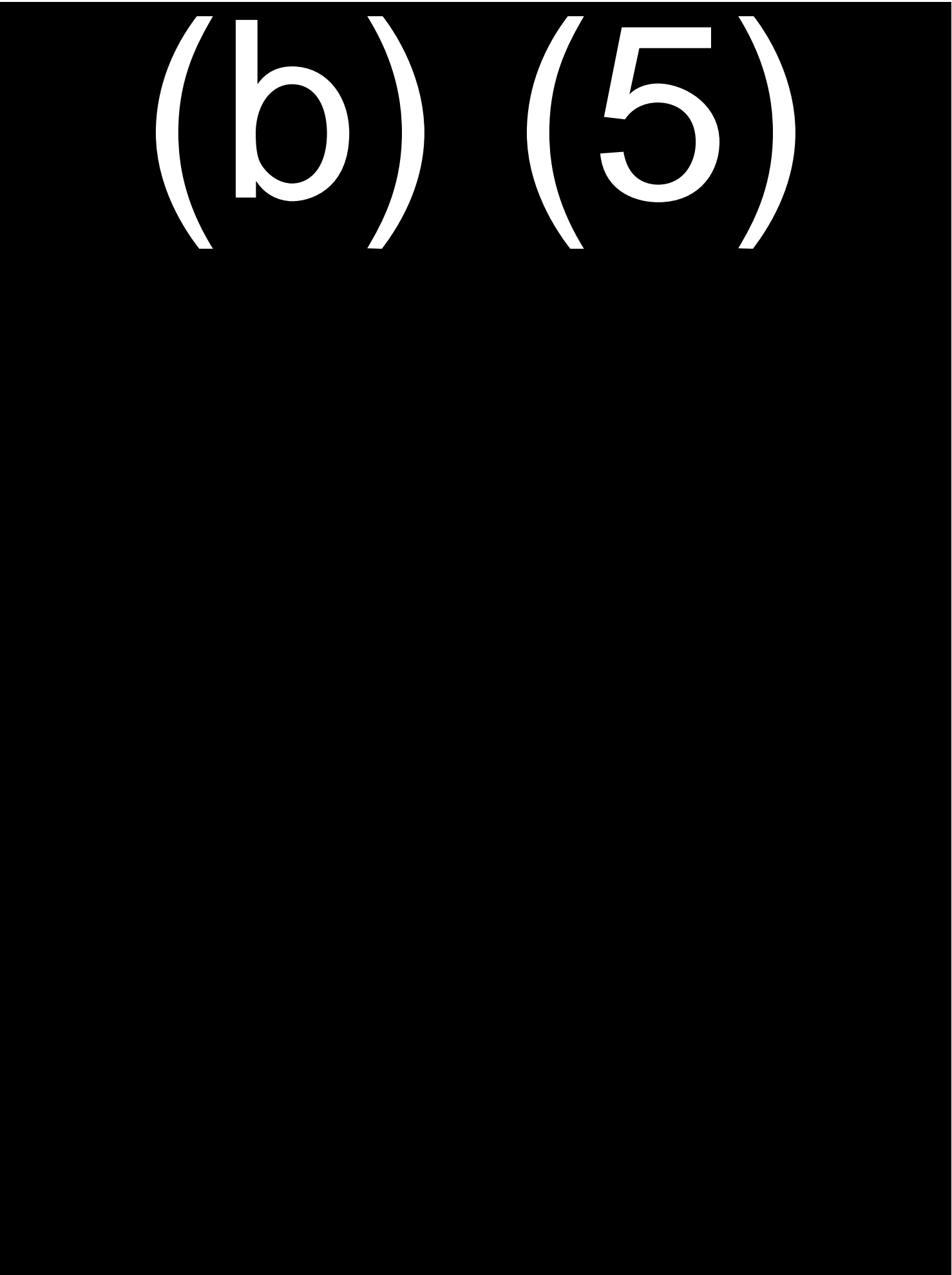
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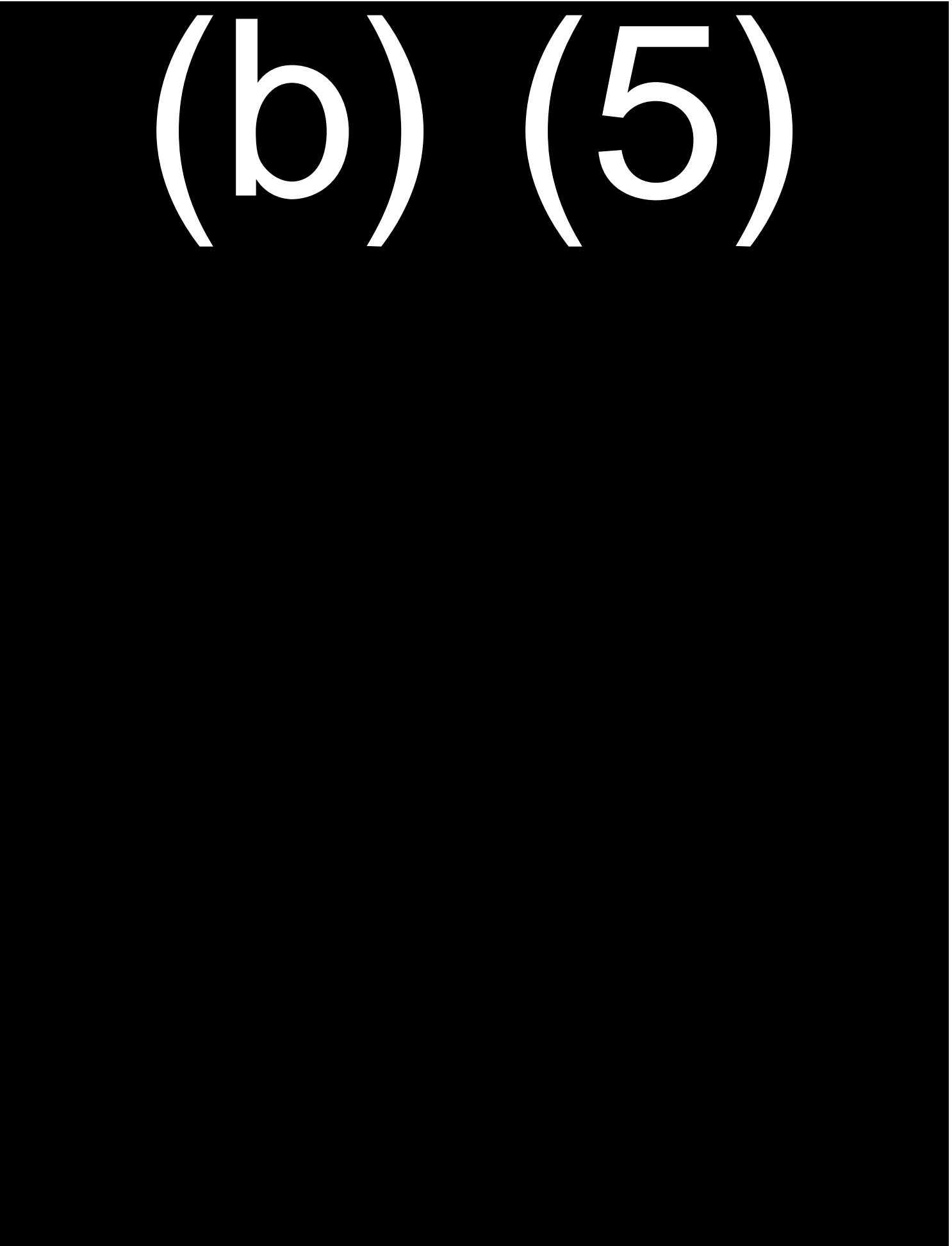
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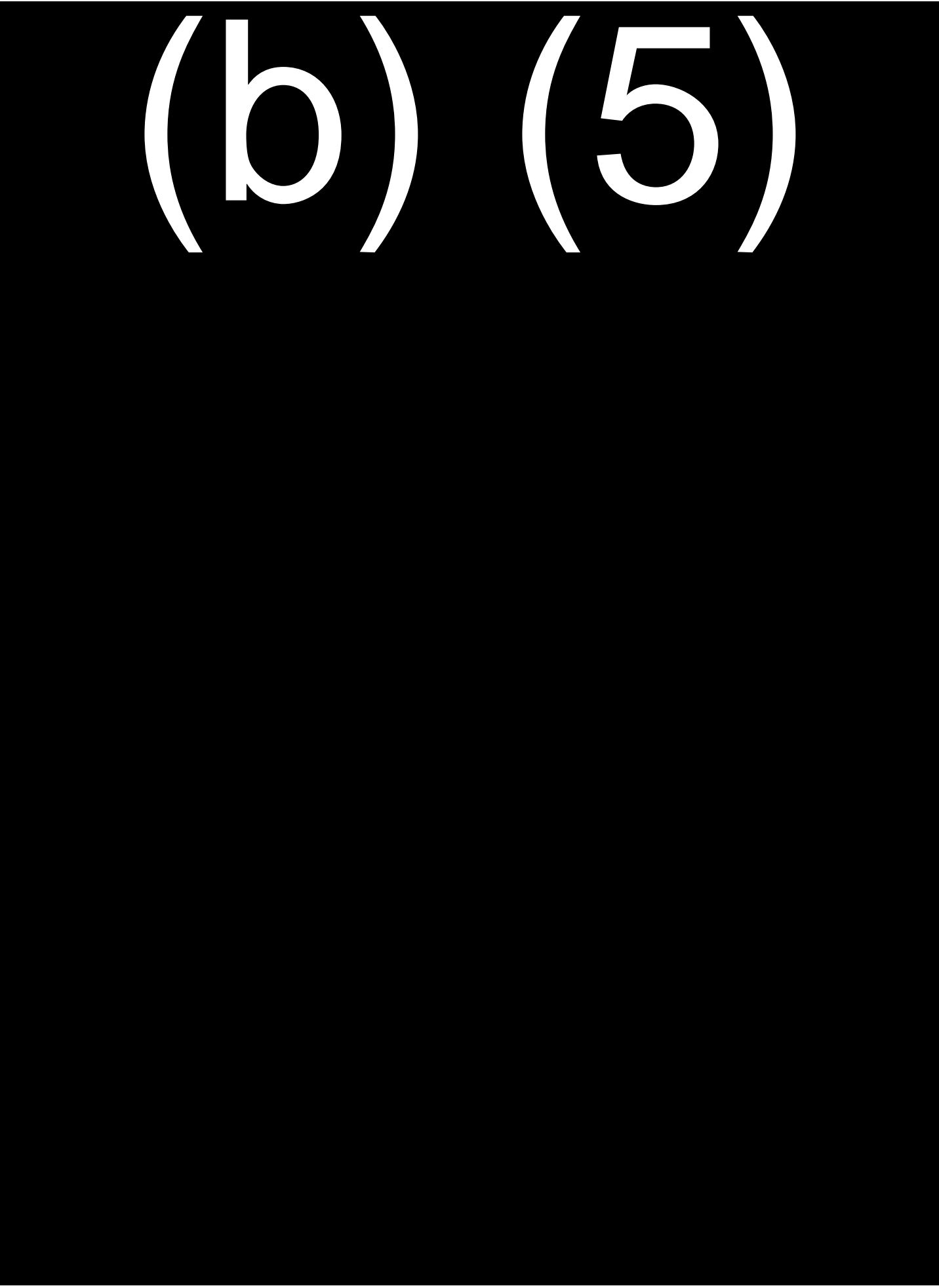
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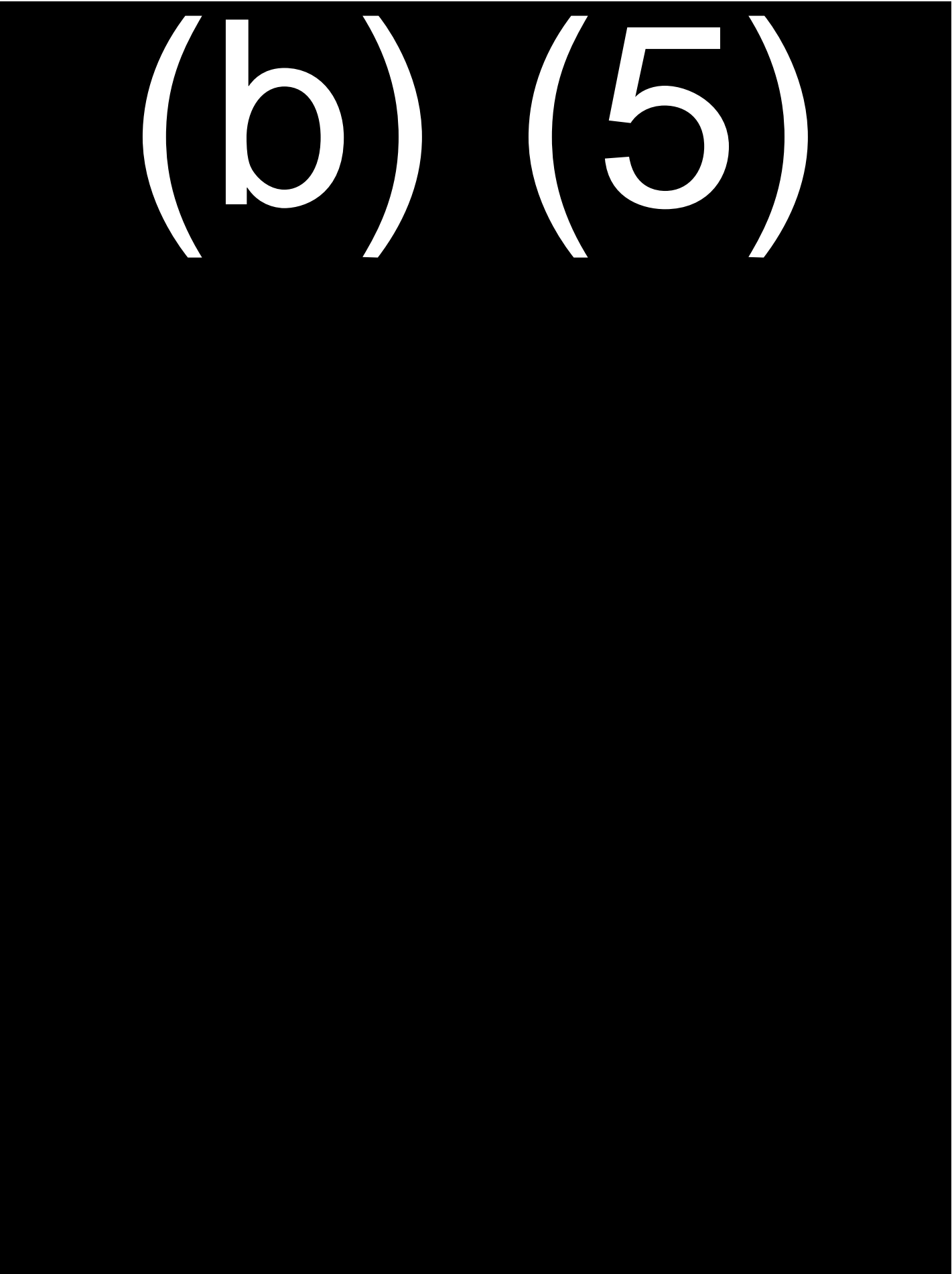
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<sup>1</sup> US Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.

<sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012

<sup>3</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.

<sup>4</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.

<sup>5</sup> University of Pennsylvania, "[The LIBOR Mess: How Did It Happen – And What Lies Ahead?](#)", July 18, 2012

<sup>6</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)", September 7, 2008, p.6.

<sup>7</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)", January 20, 2010

<sup>8</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."

<sup>9</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddie.mac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddie.mac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.

<sup>10</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."

<sup>11</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)", July 4, 2012.

<sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.

<sup>13</sup> Federal Reserve Bank of St. Louis, "[3-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD3MTD156N\)](#)". Data obtained October 1, 2012.

<sup>14</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.

<sup>15</sup> Federal Reserve Bank of St. Louis, "[3-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.

<sup>16</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.

<sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.

<sup>18</sup> Federal Reserve Bank of New York, "[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#)," March 2012. p.2

<sup>19</sup> Bloomberg L.P. league table of lead managers for US dollar, US issuer floating rate ABS/MBS for calendar years 2009 and 2010.

<sup>20</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to US dollar LIBOR. Wall Street Journal, "[New York Lender Files LIBOR Lawsuit](#)", July 30, 2012, and Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.





**OFFICE OF INSPECTOR GENERAL**

Federal Housing Finance Agency

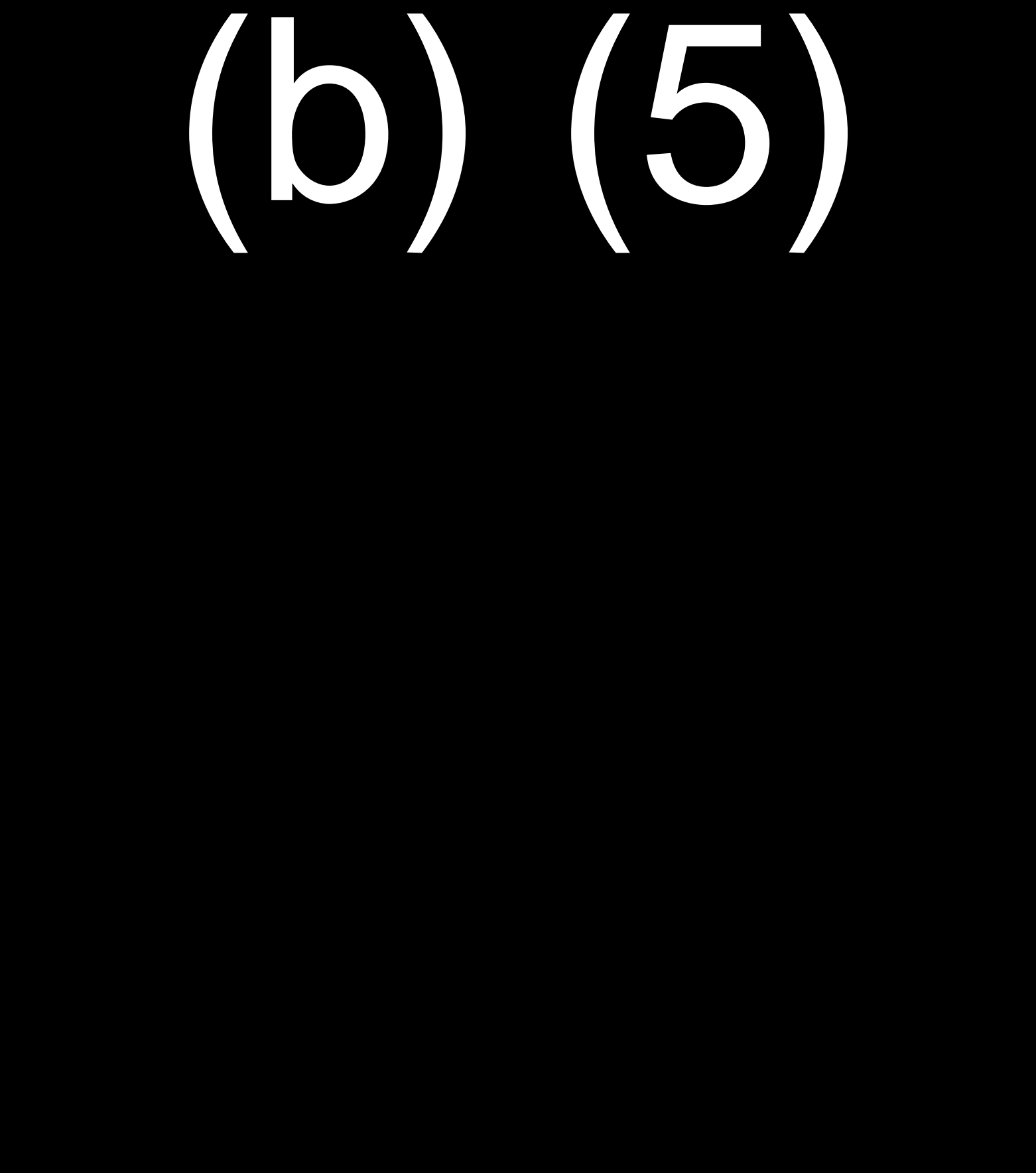
400 7th Street, S.W., Washington DC 20024

**To:** Edward DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October XX, 2012

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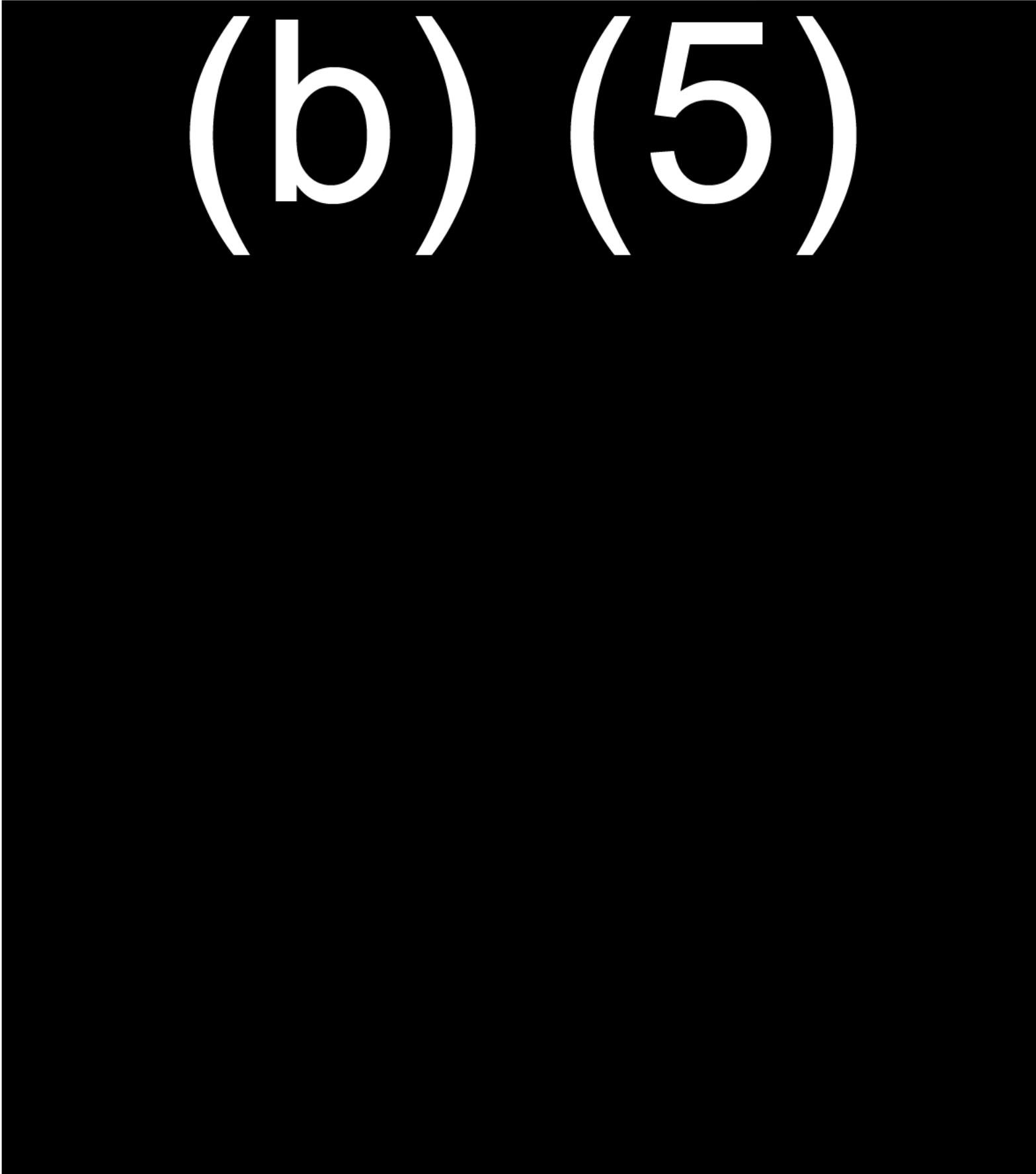
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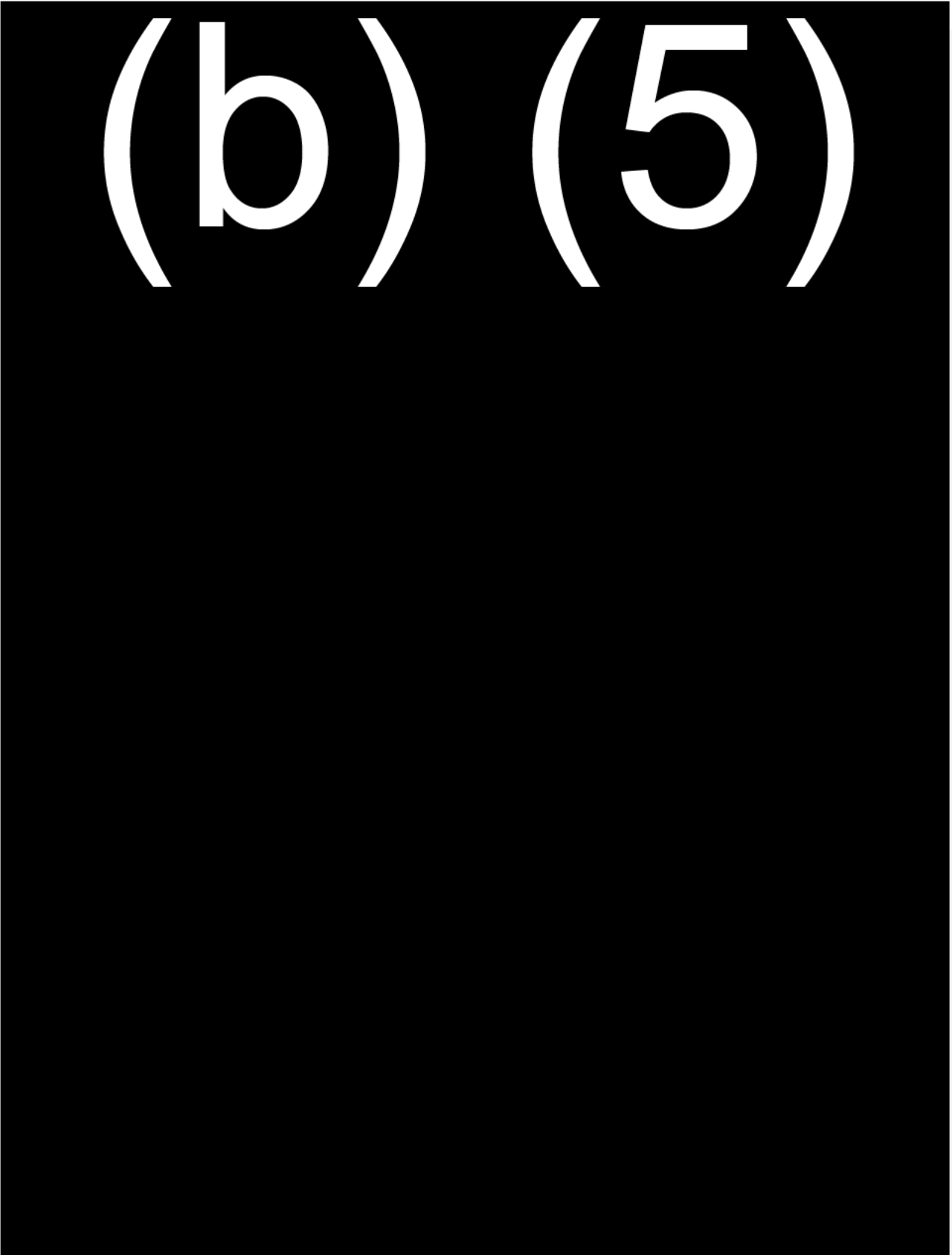
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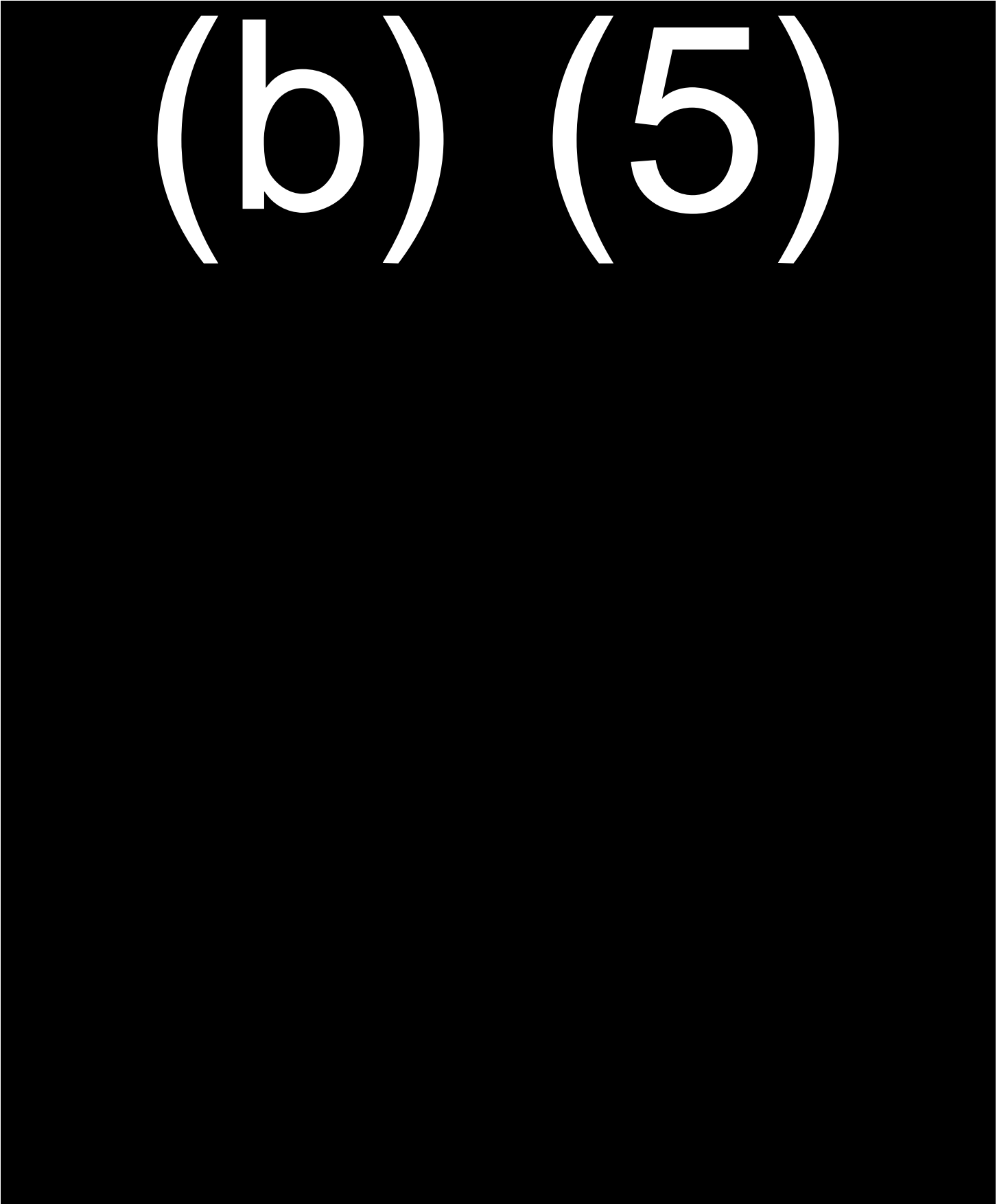
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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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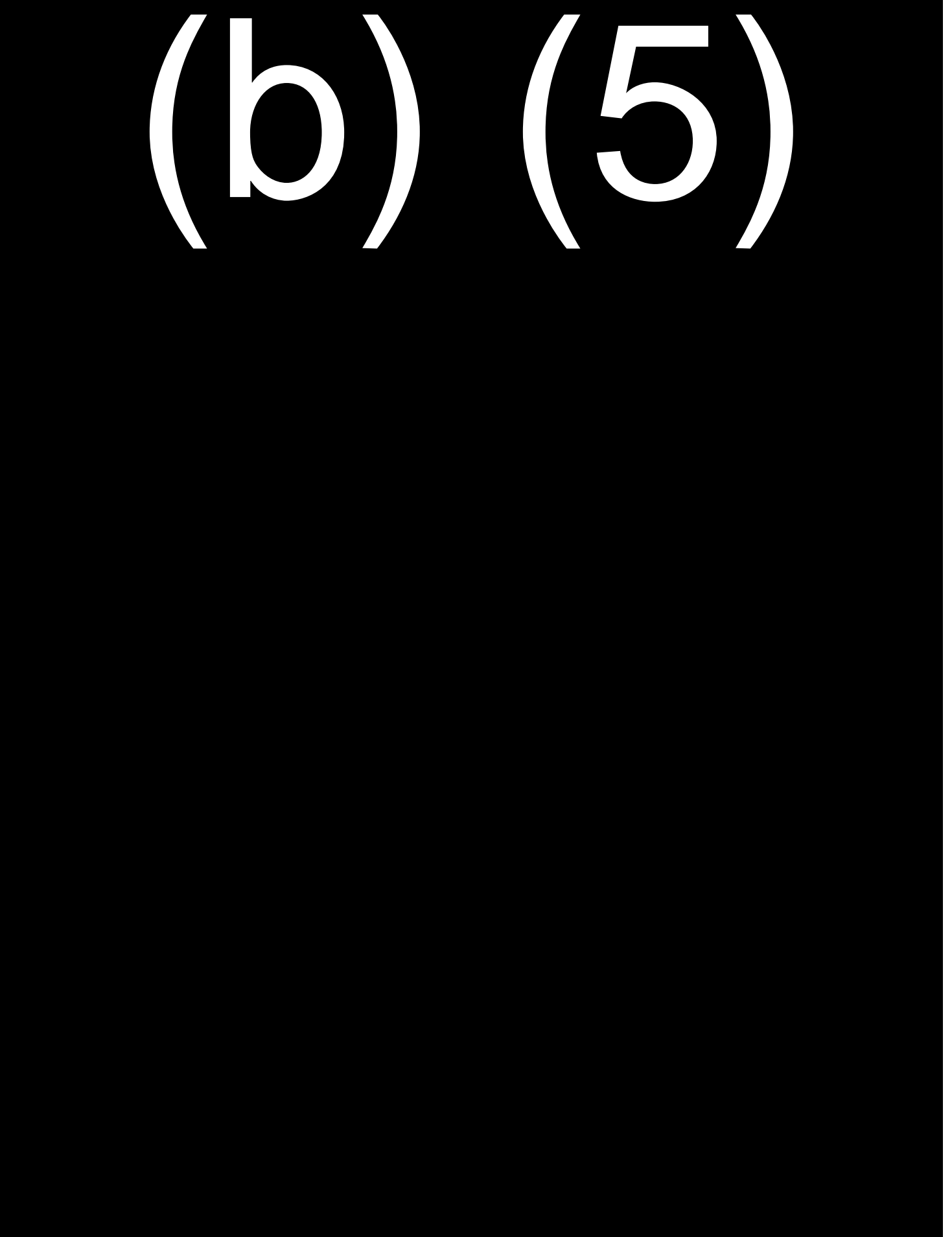
400 7th Street, S.W., Washington DC 20024

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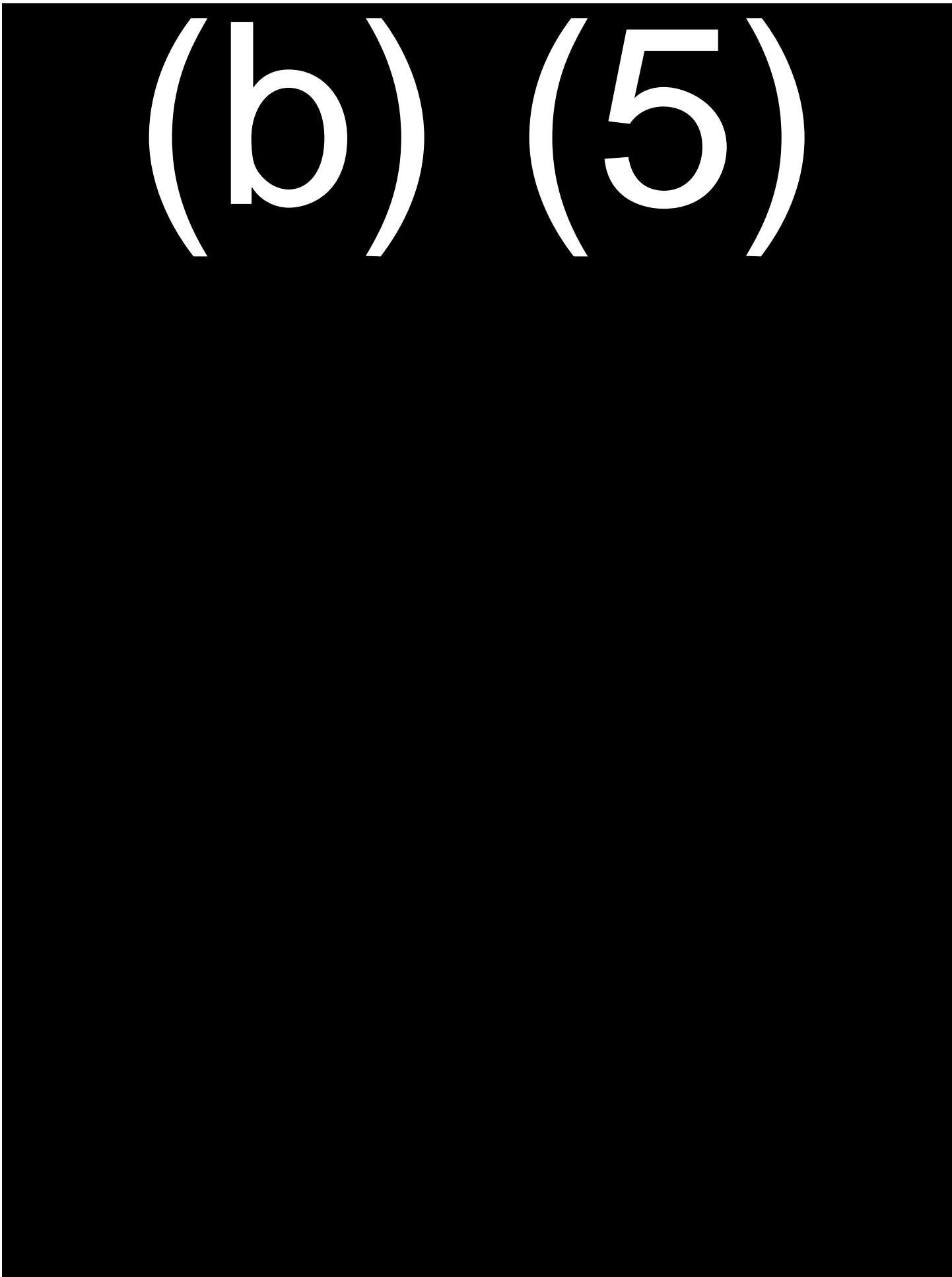
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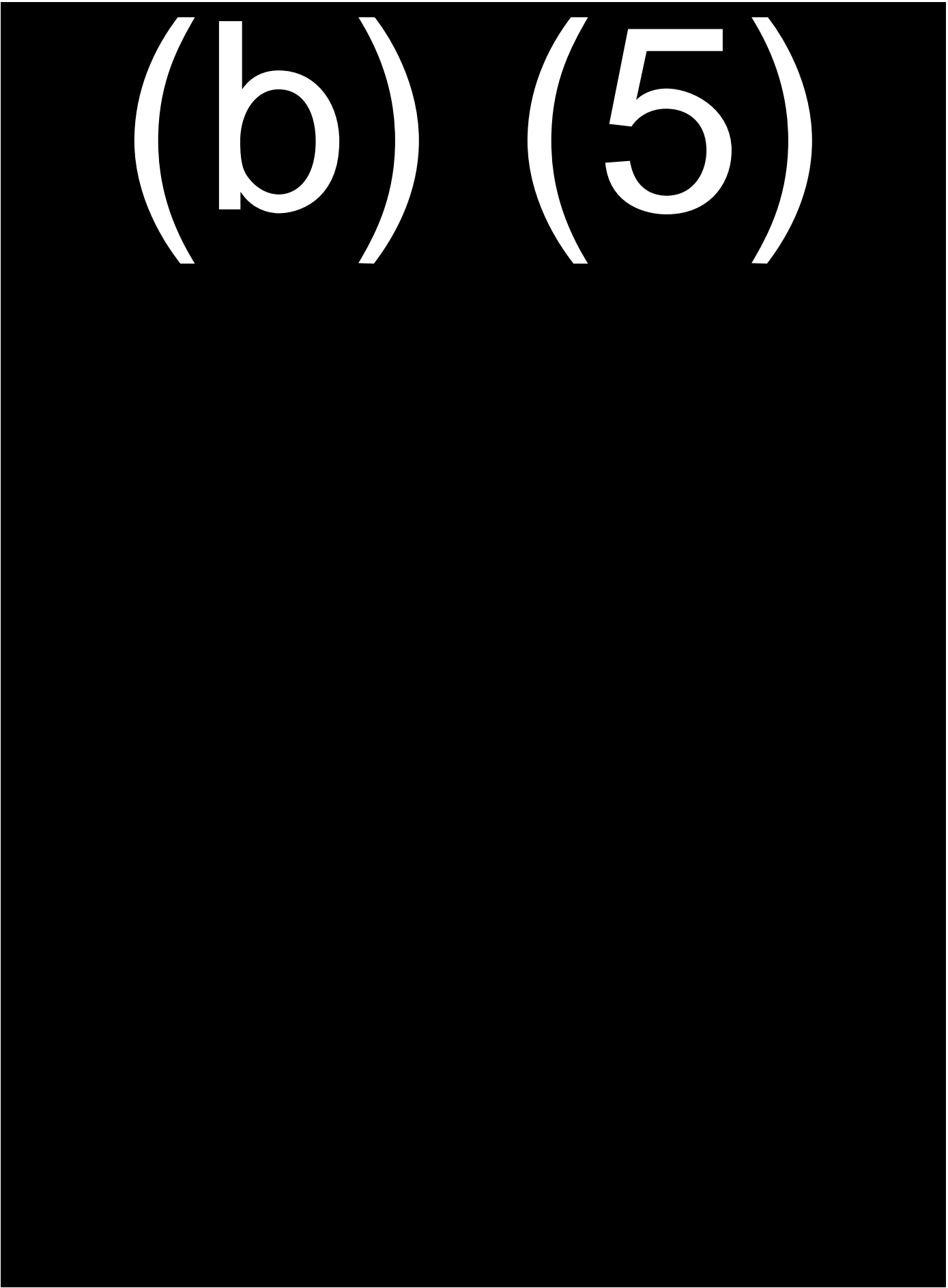
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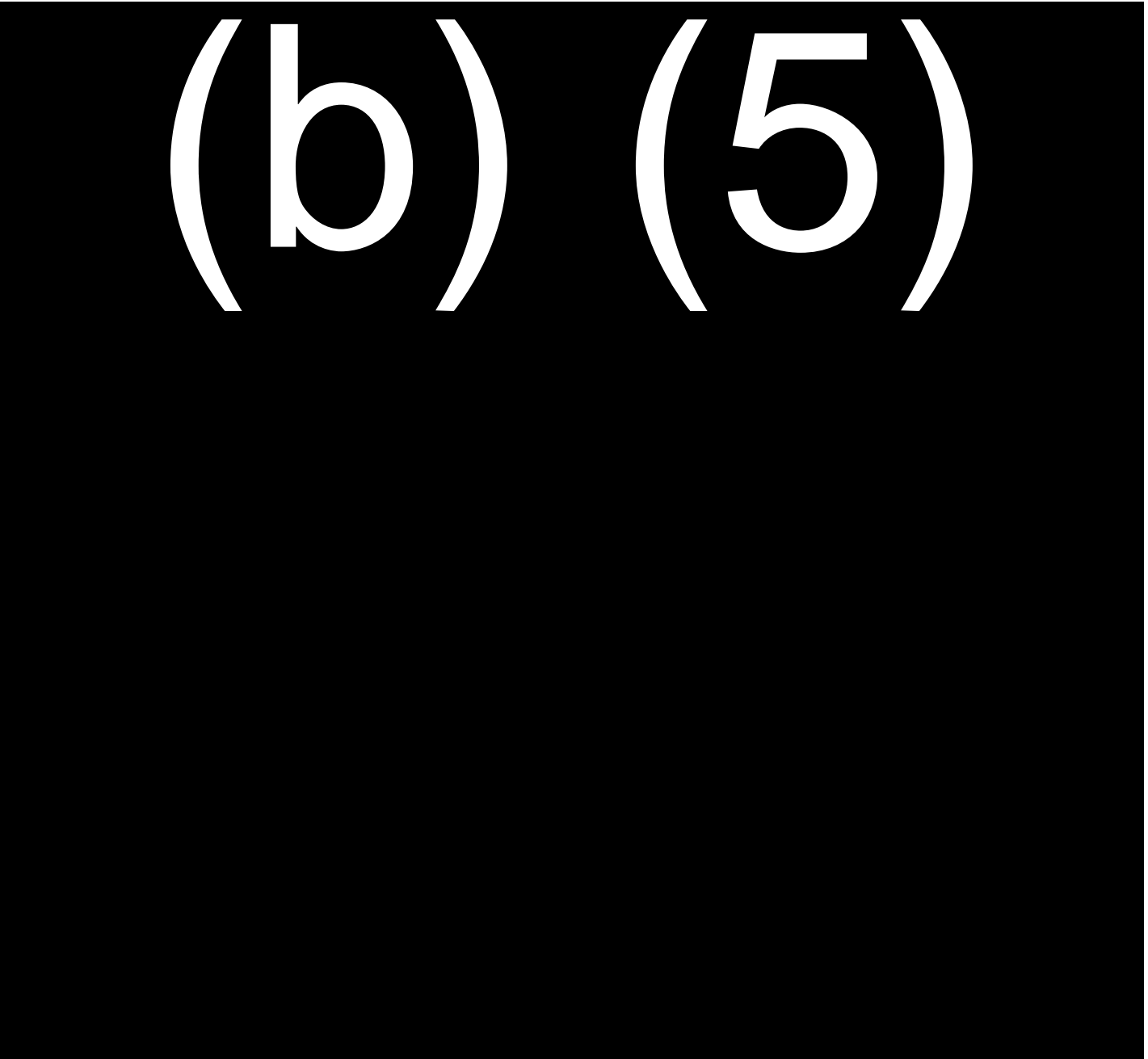
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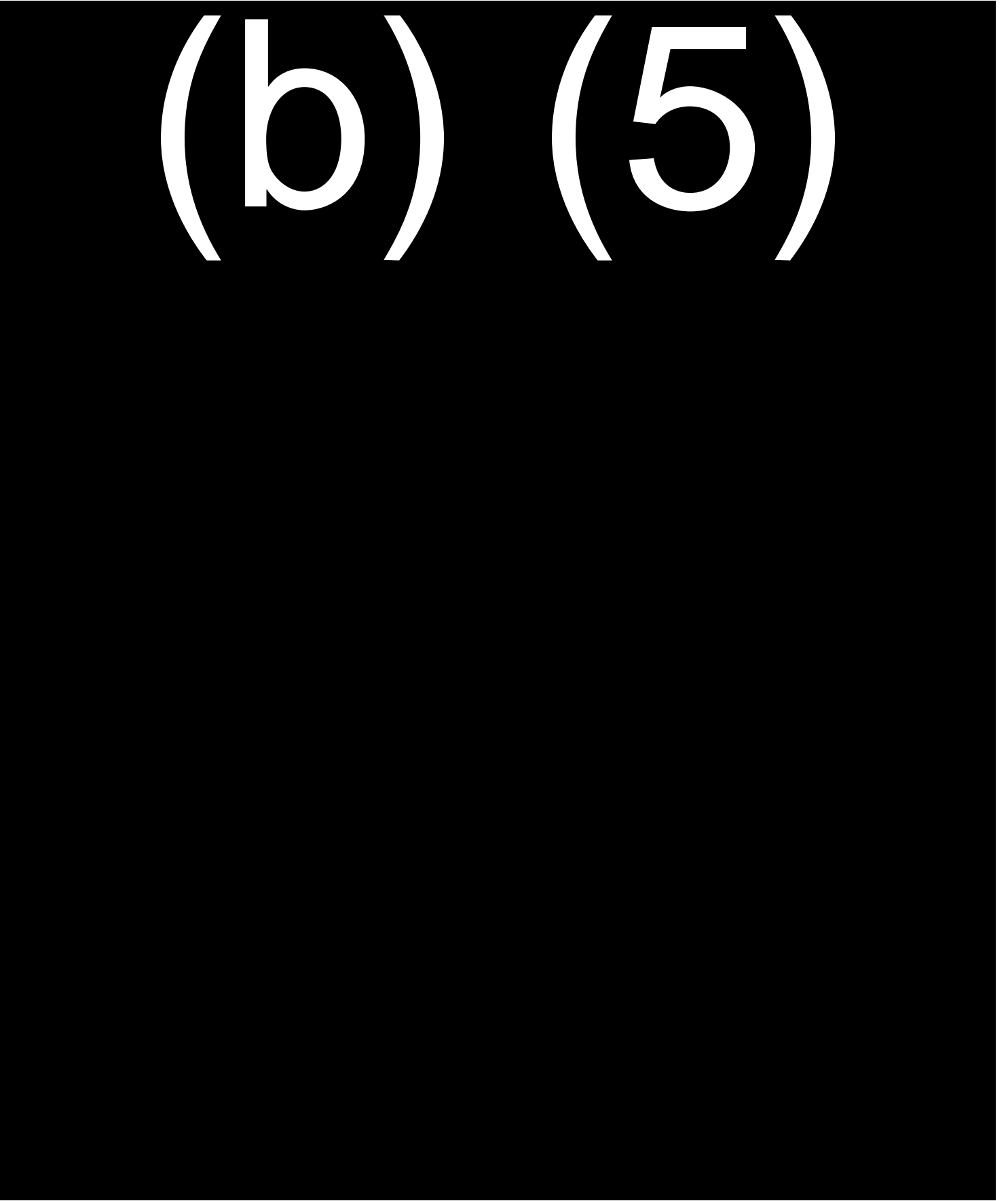
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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October 22, 2012

(b) (5)





## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
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**Date:** November 1, 2012

(b) (5)



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis,  
Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

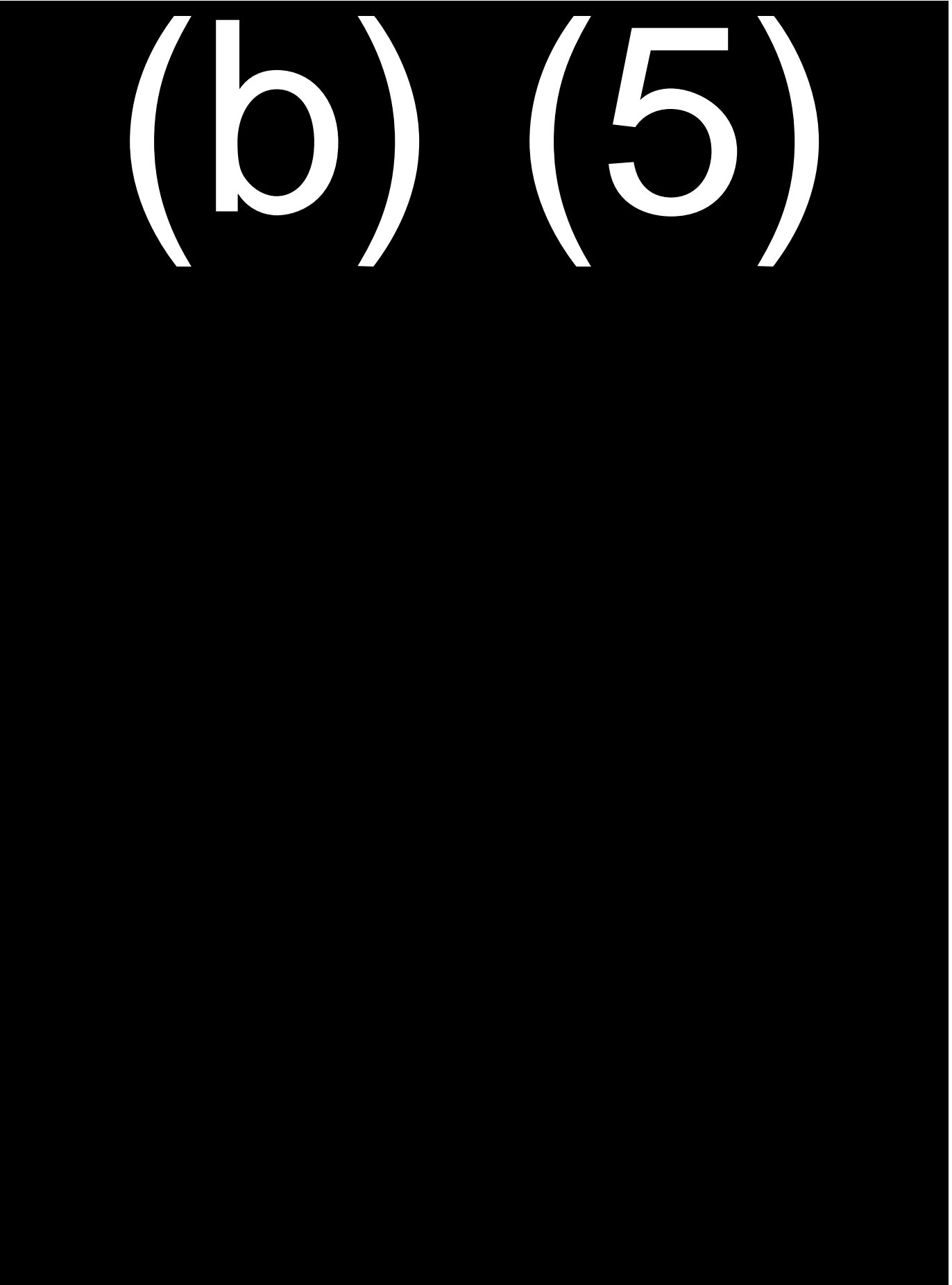
**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

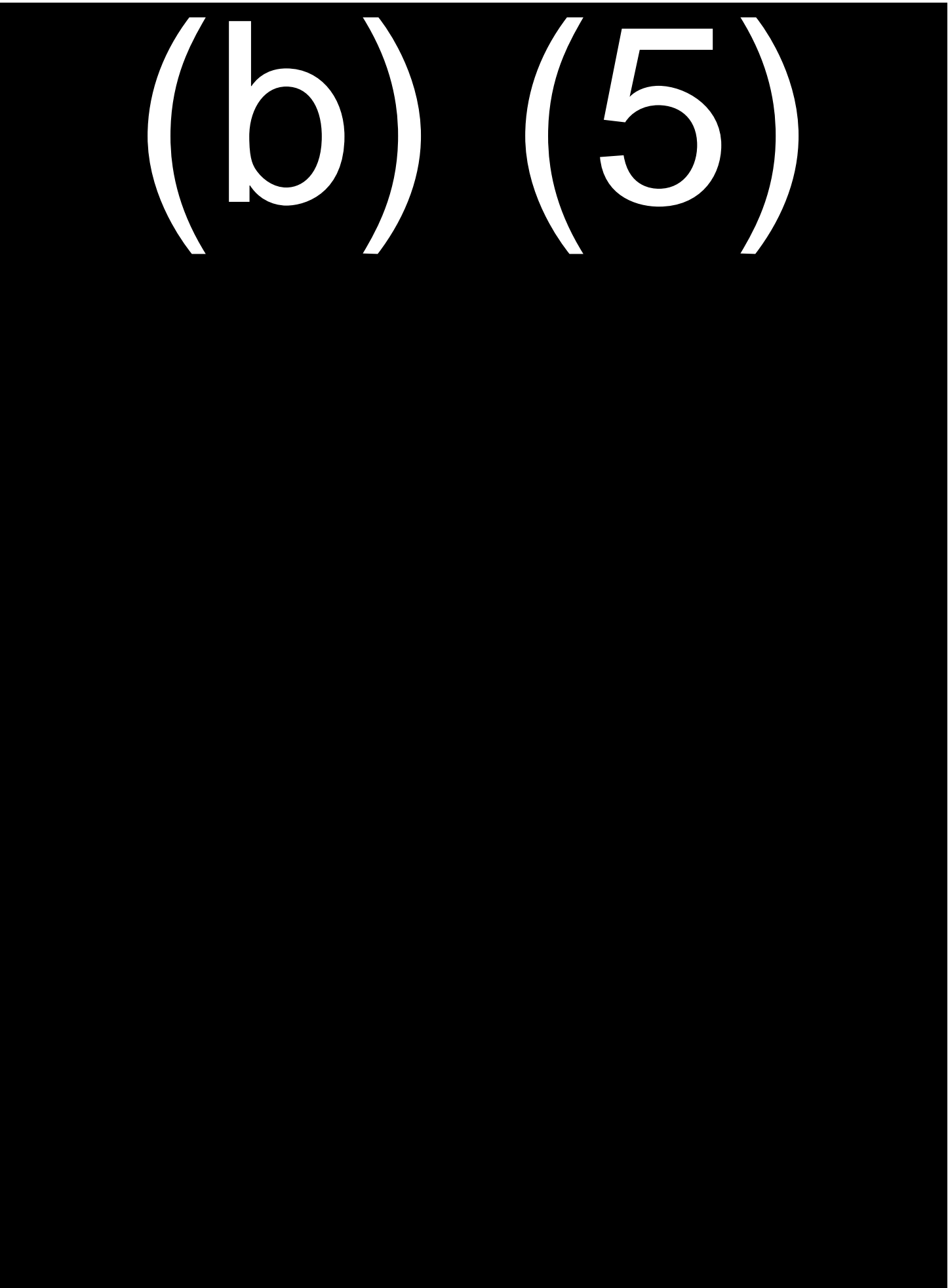
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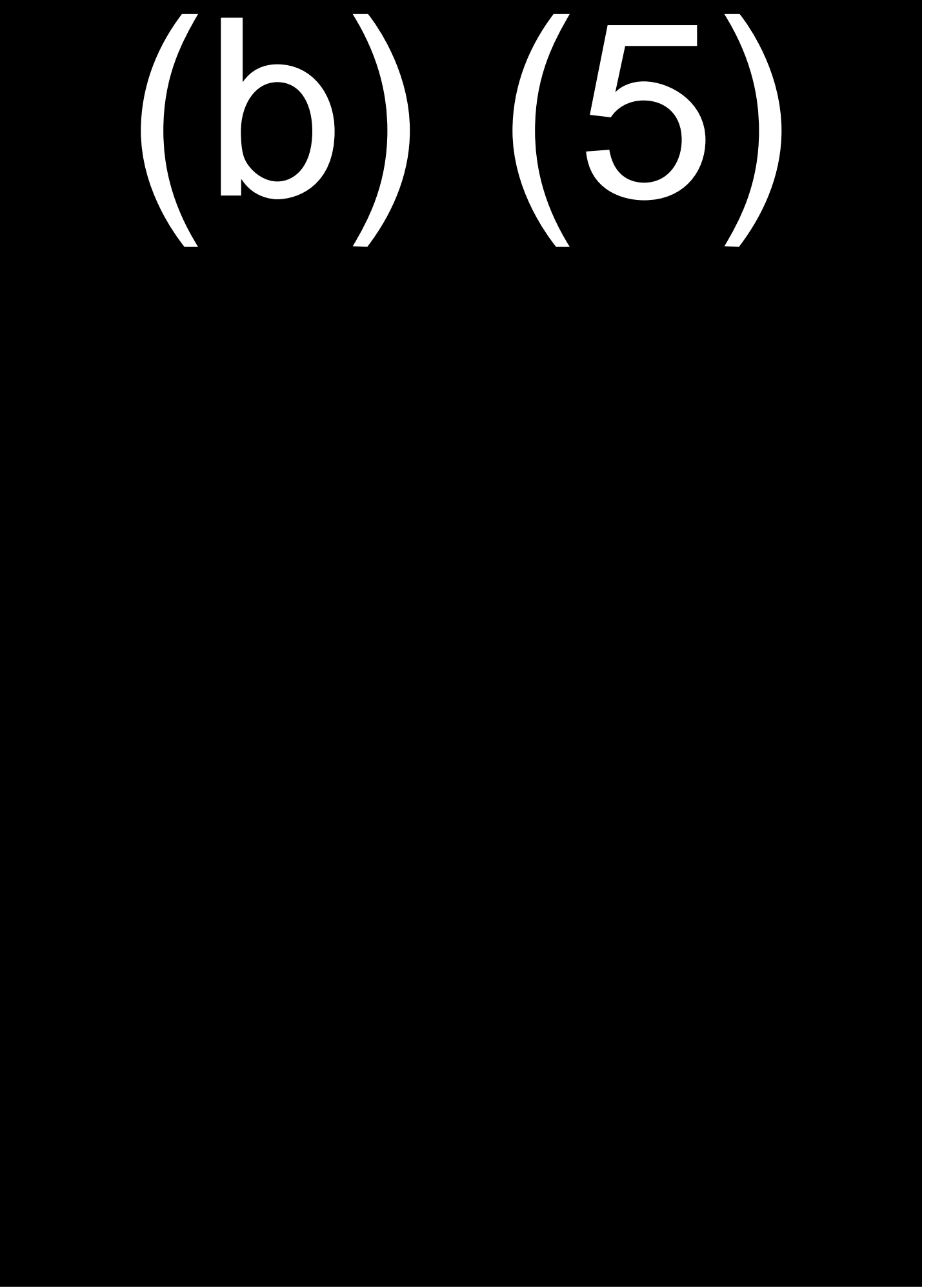
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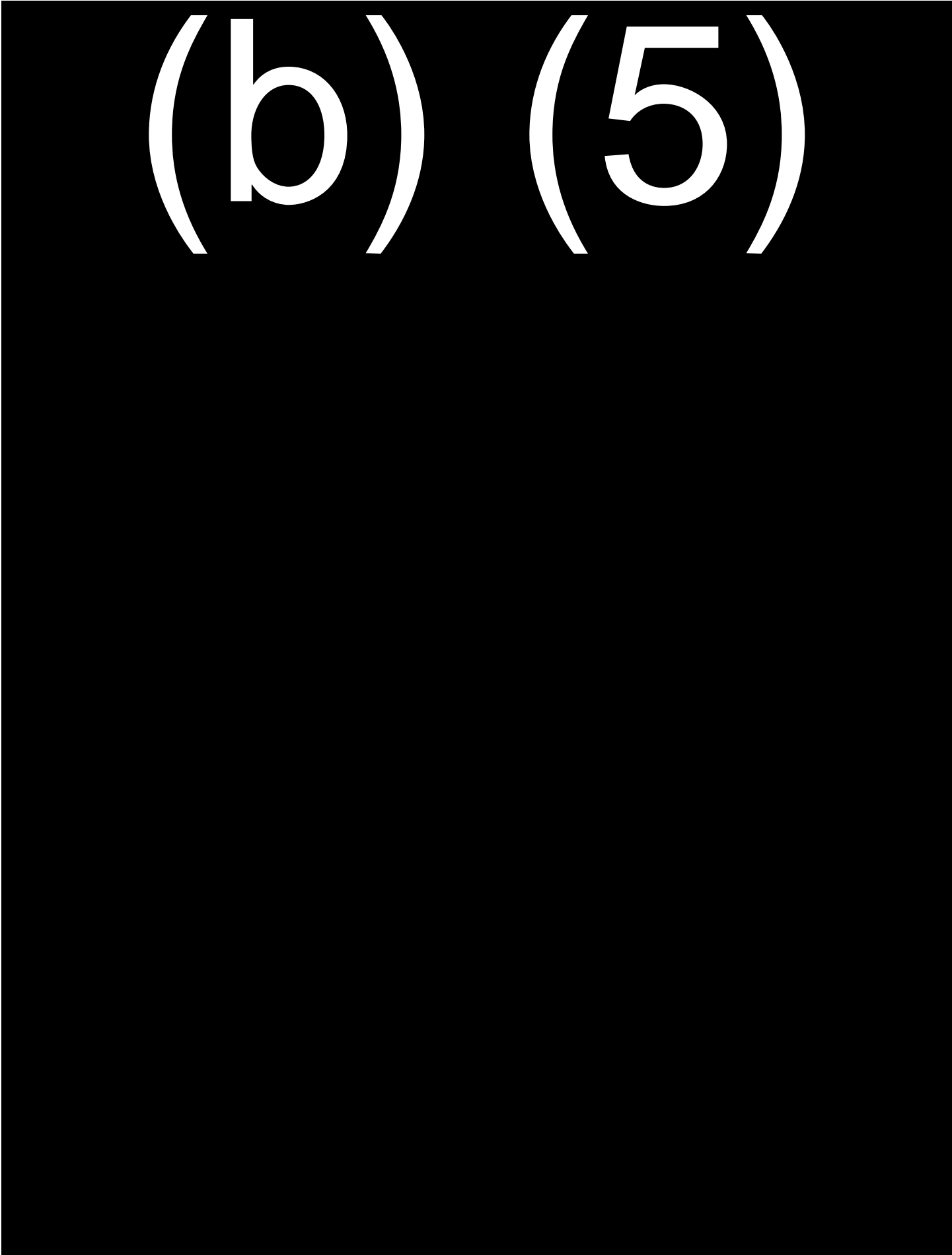


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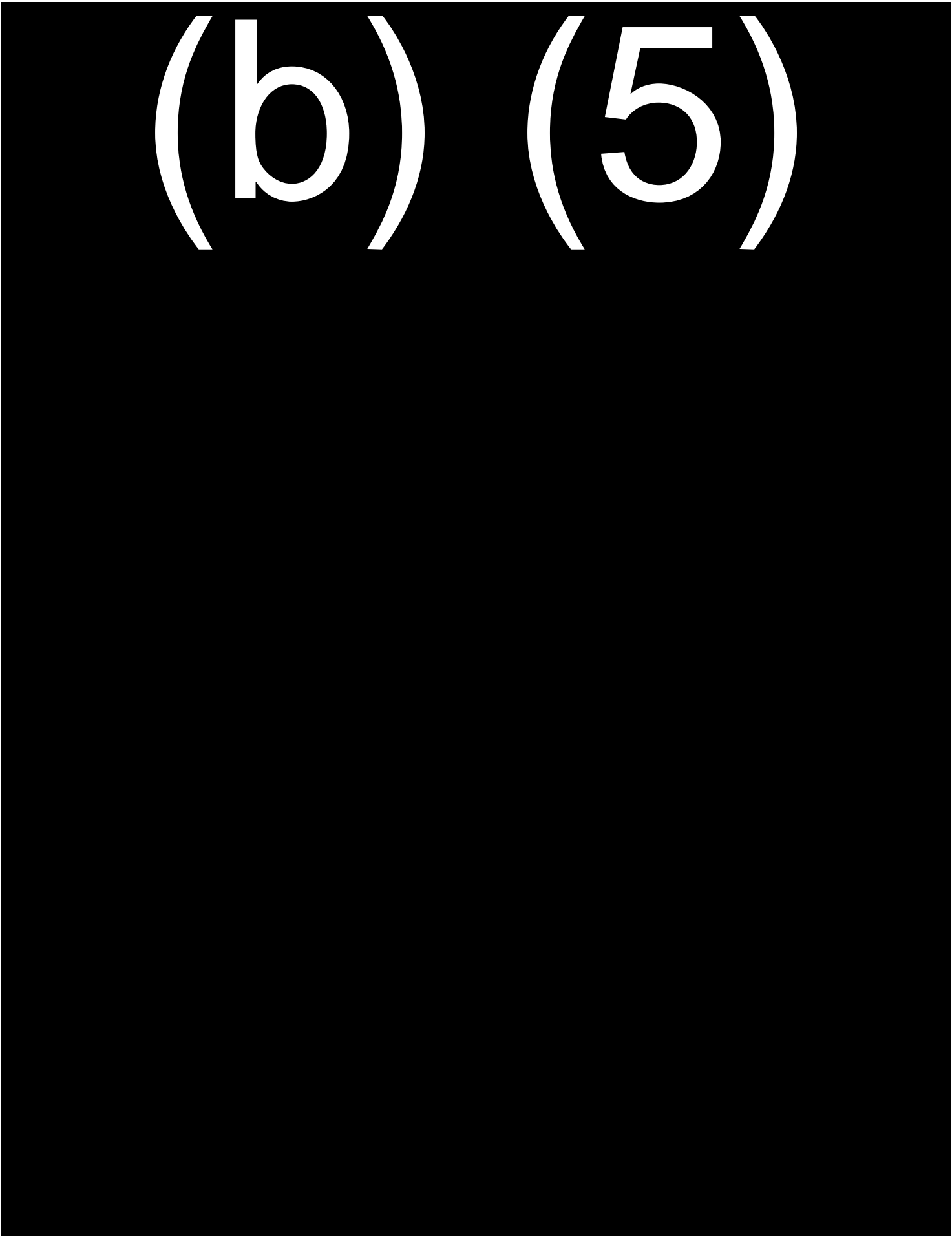
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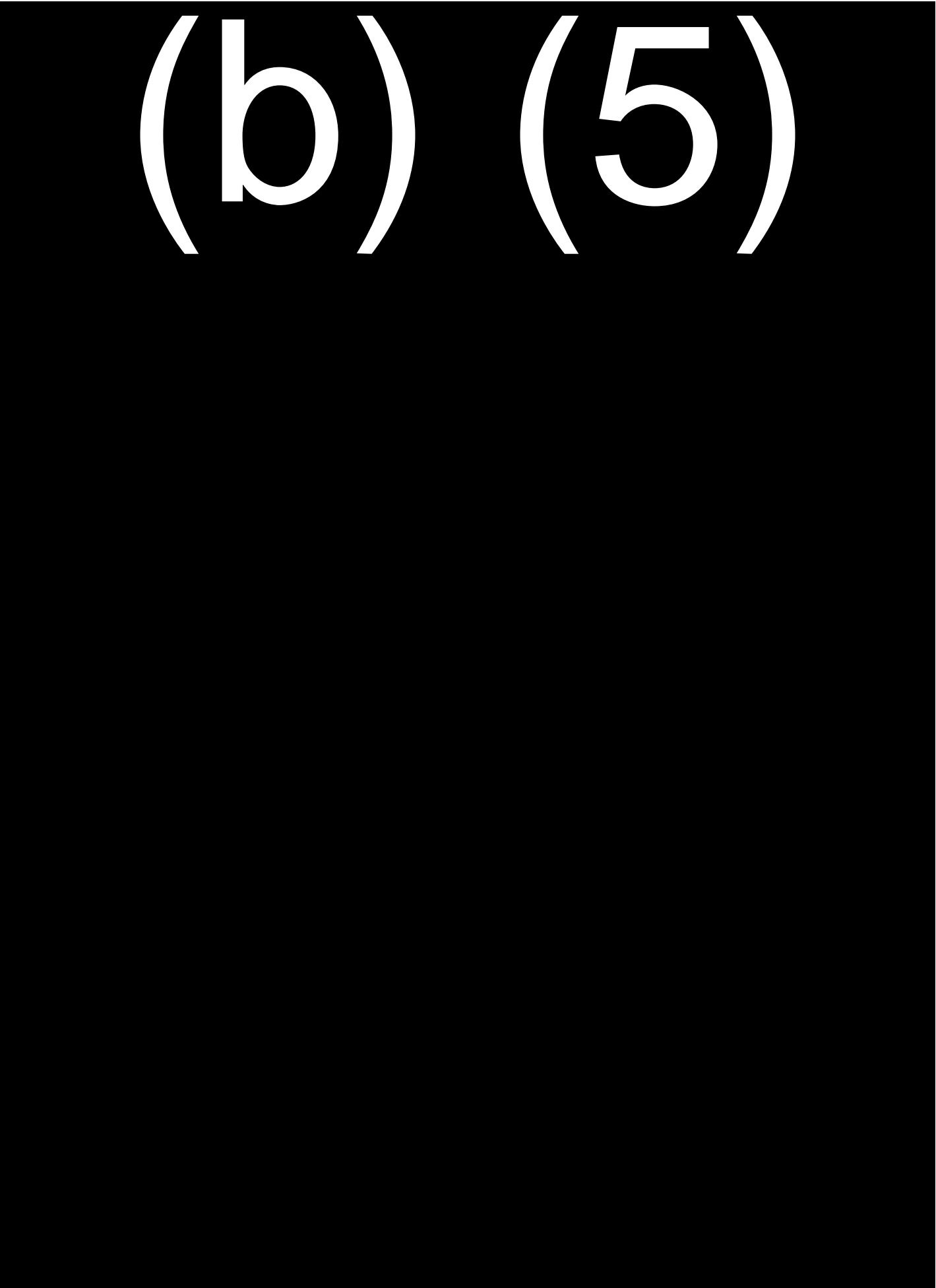
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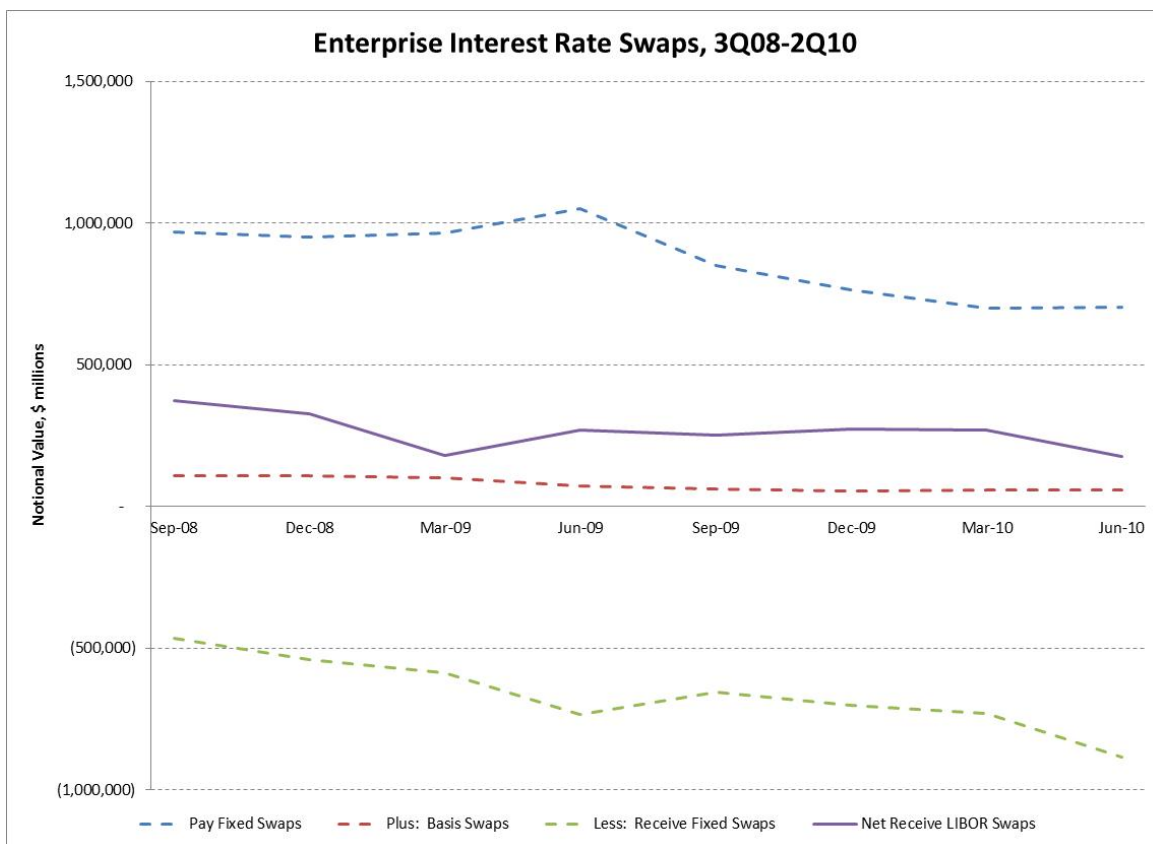
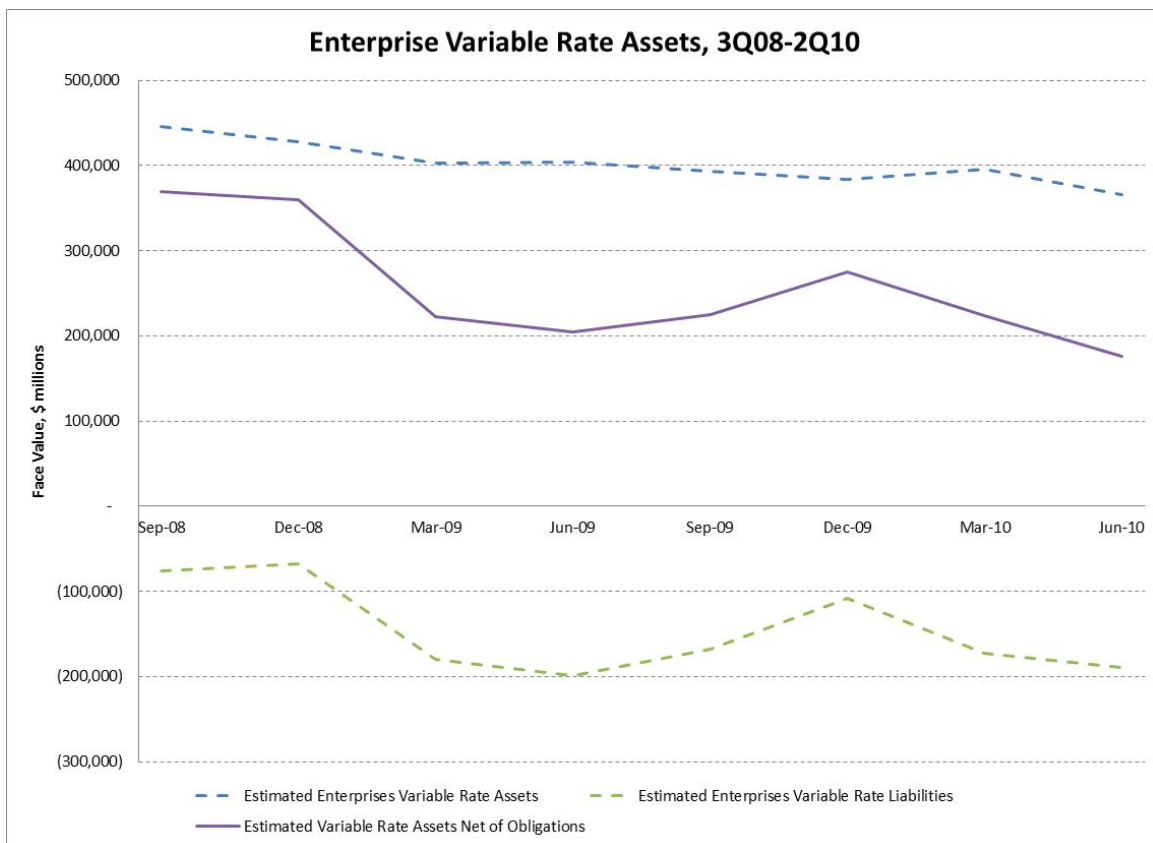
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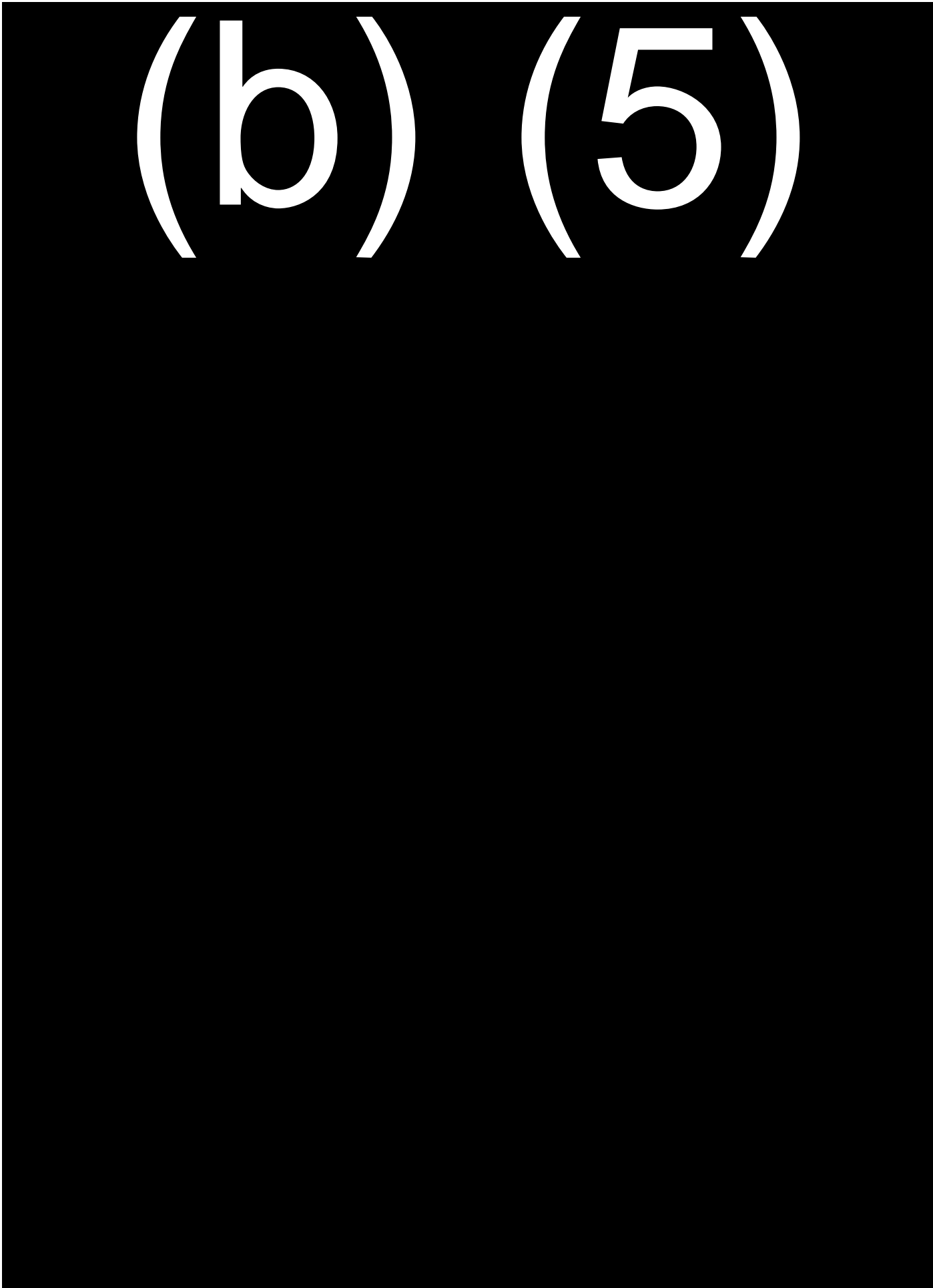
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For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)", July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
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- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
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- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)", January 20, 2010
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- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
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- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
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- <sup>19</sup> Federal Reserve Bank of New York, "[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#)," March 2012, p.2

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**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Richard Parker  
**From:** Timothy Lee  
**Subject:** FHFA-OIG interagency assistance on LIBOR  
**Date:** November 15, 2012

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(b) (5)



**OFFICE OF INSPECTOR GENERAL**

Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** November 1, 2012

(b) (5)



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis,  
Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

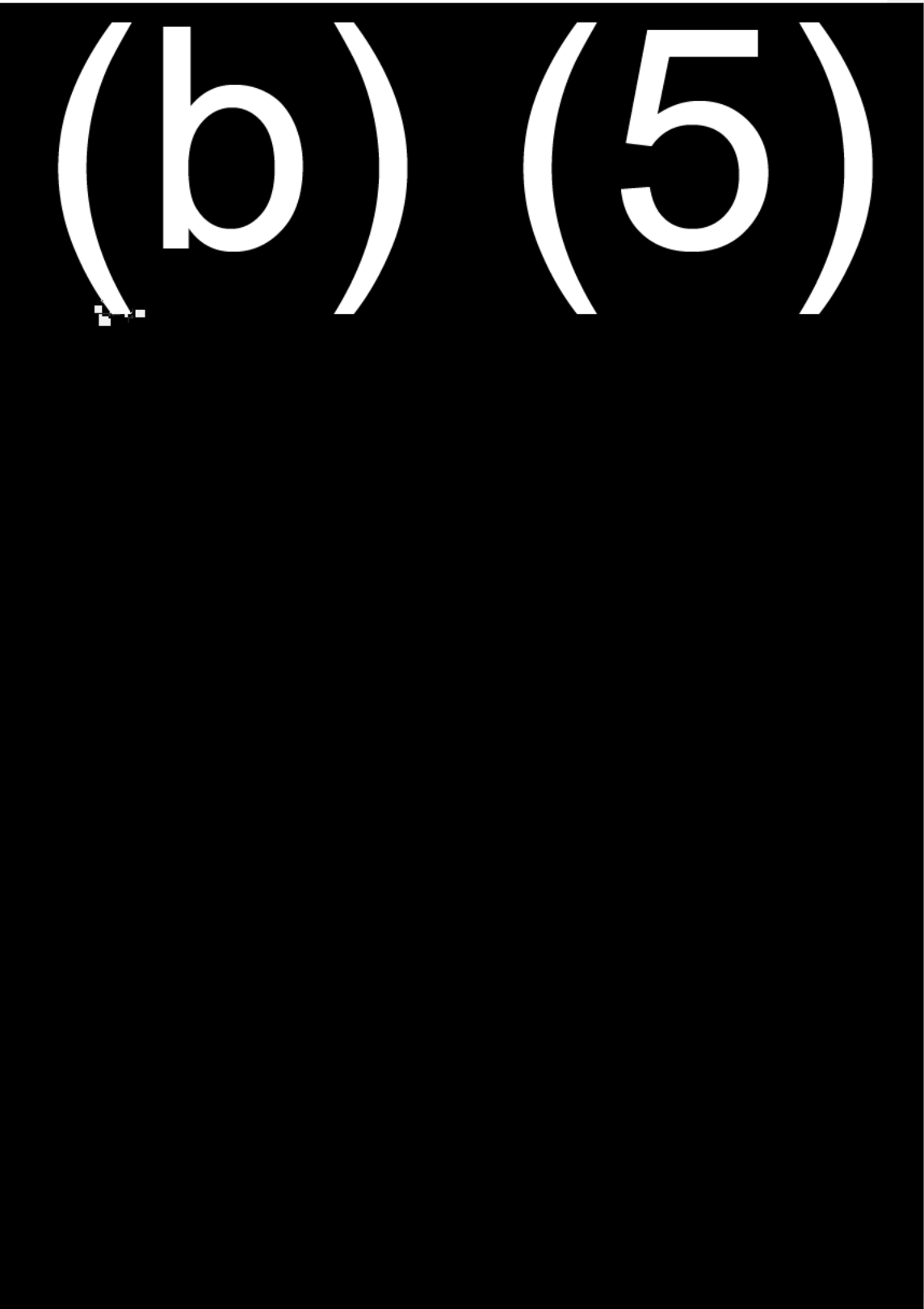
**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

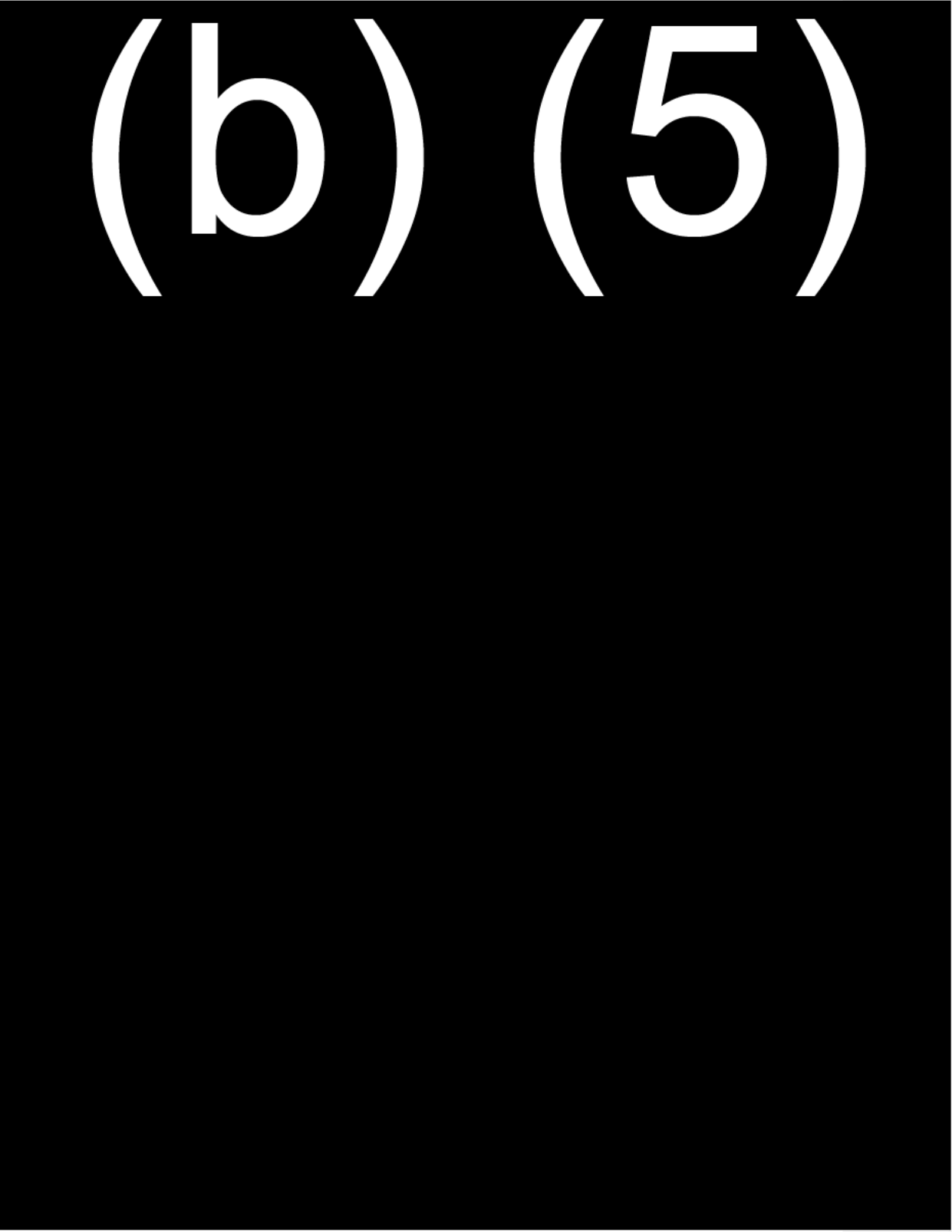
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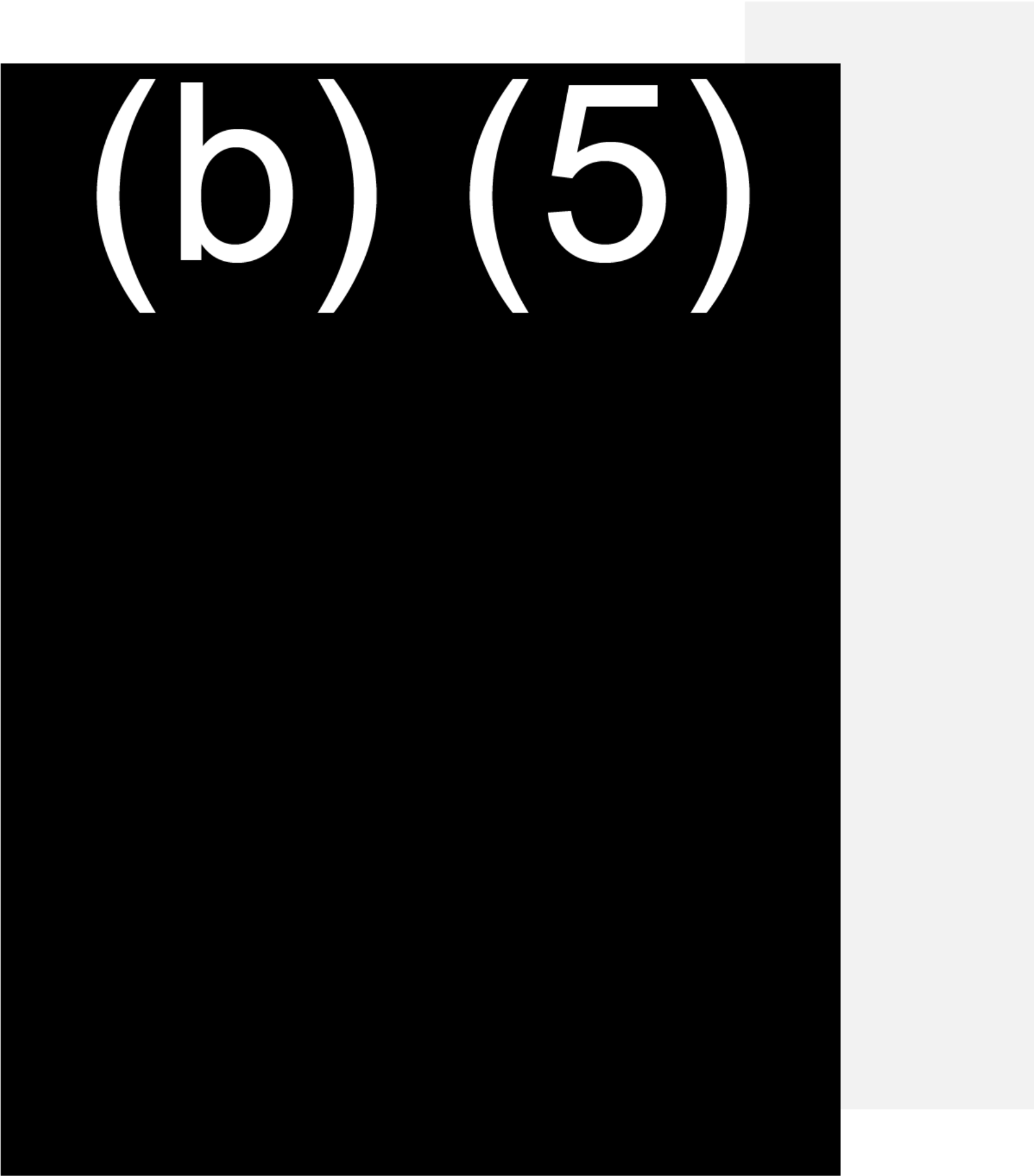


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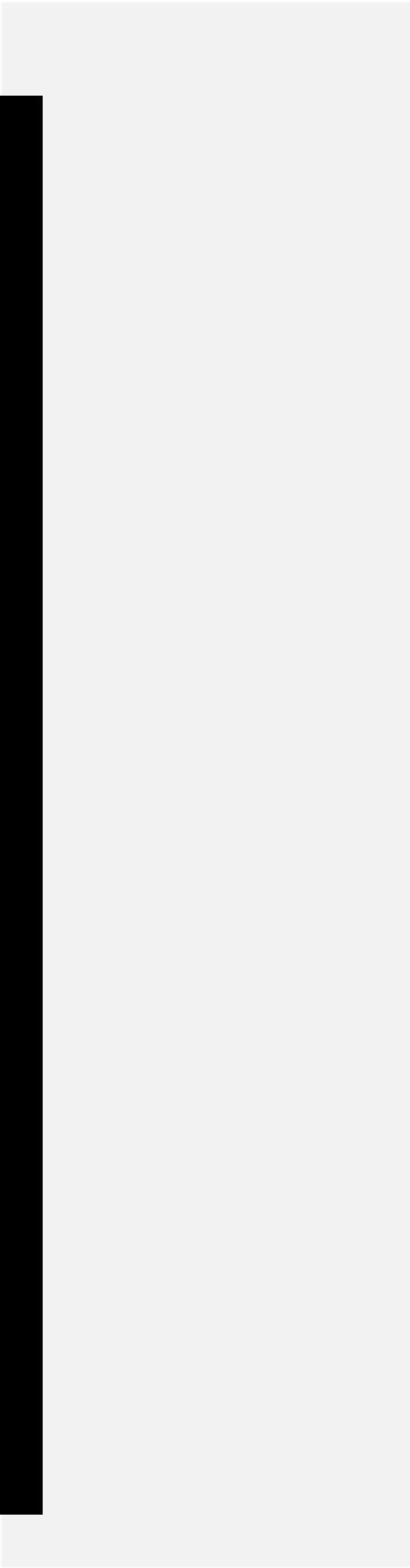
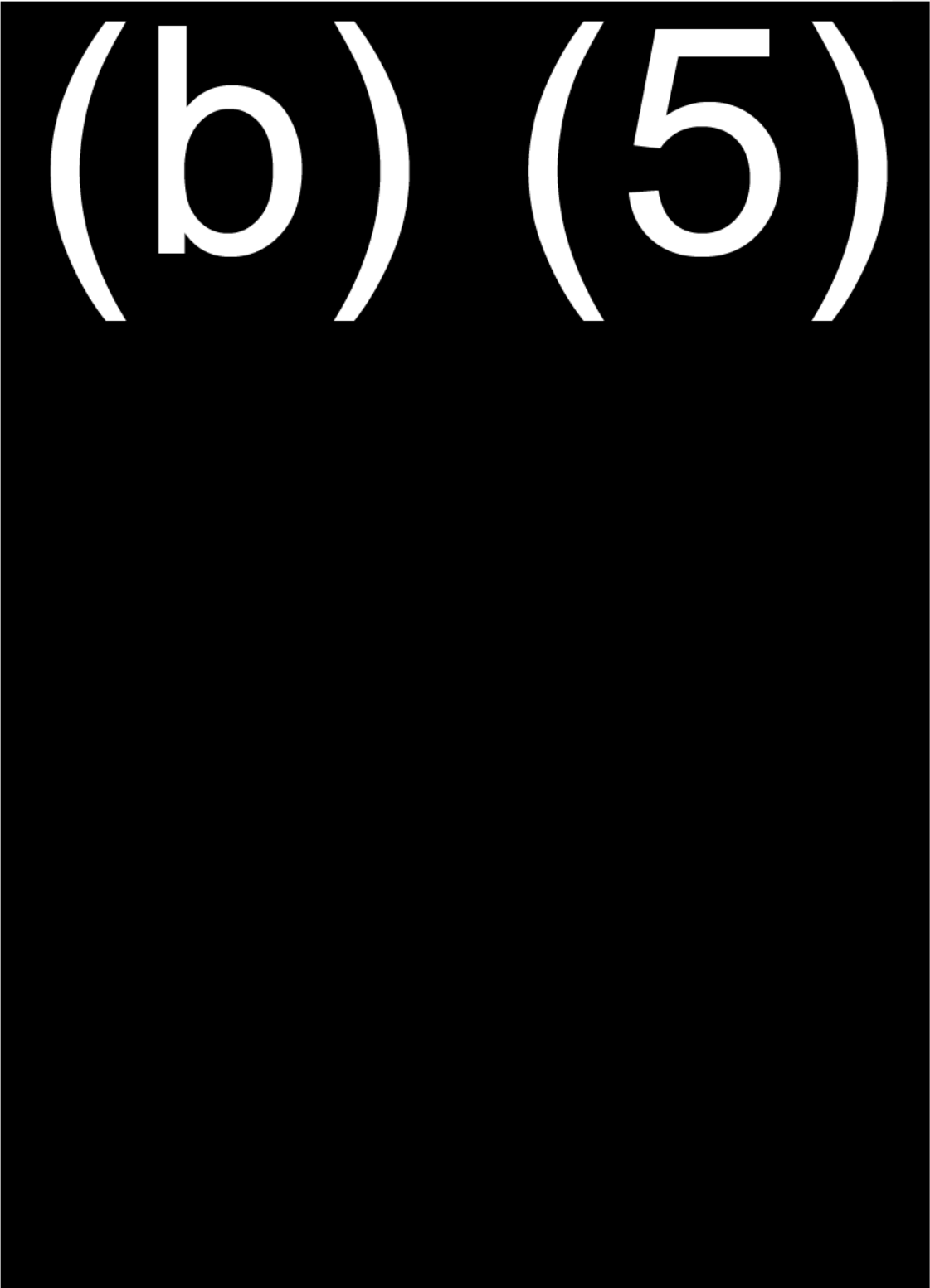


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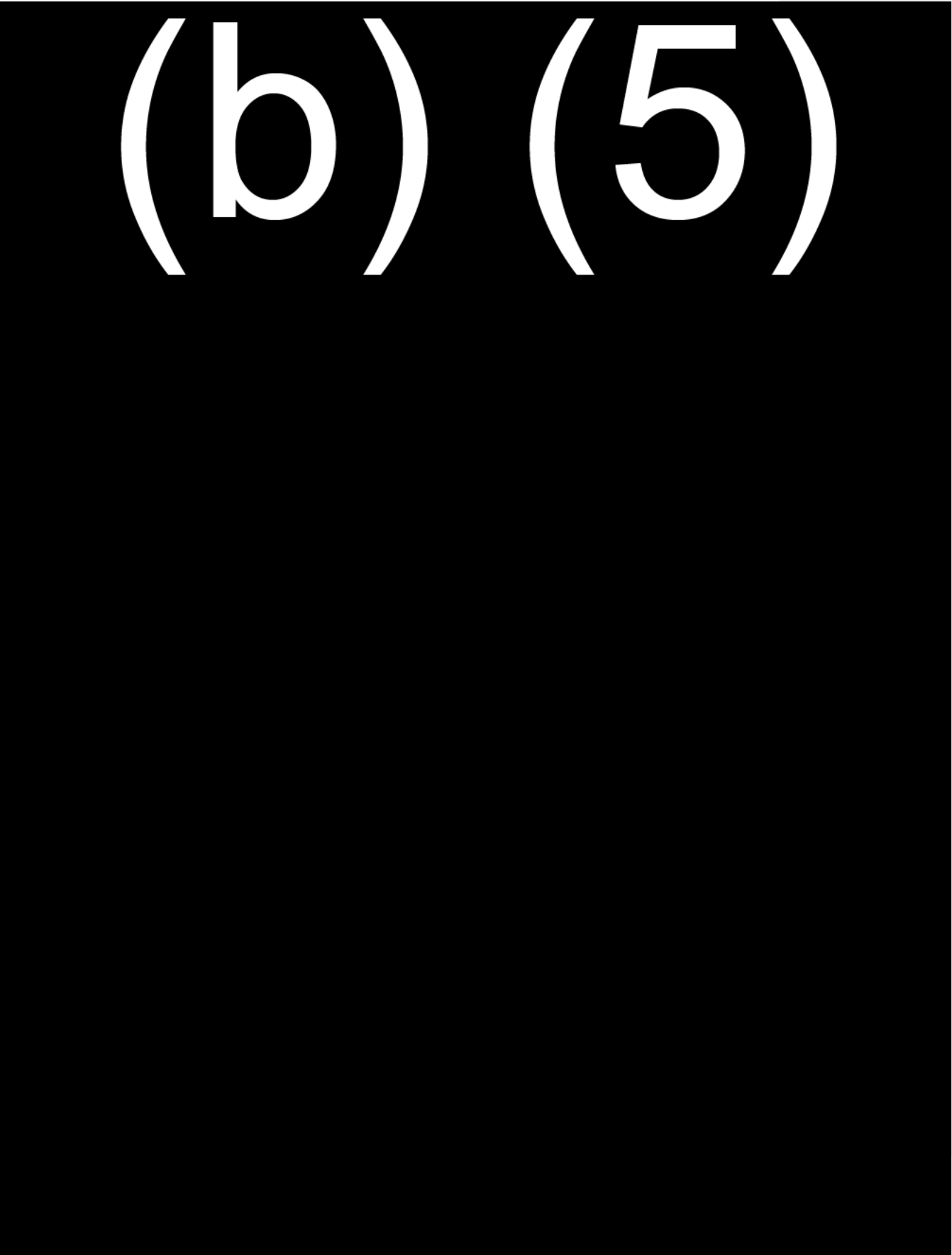
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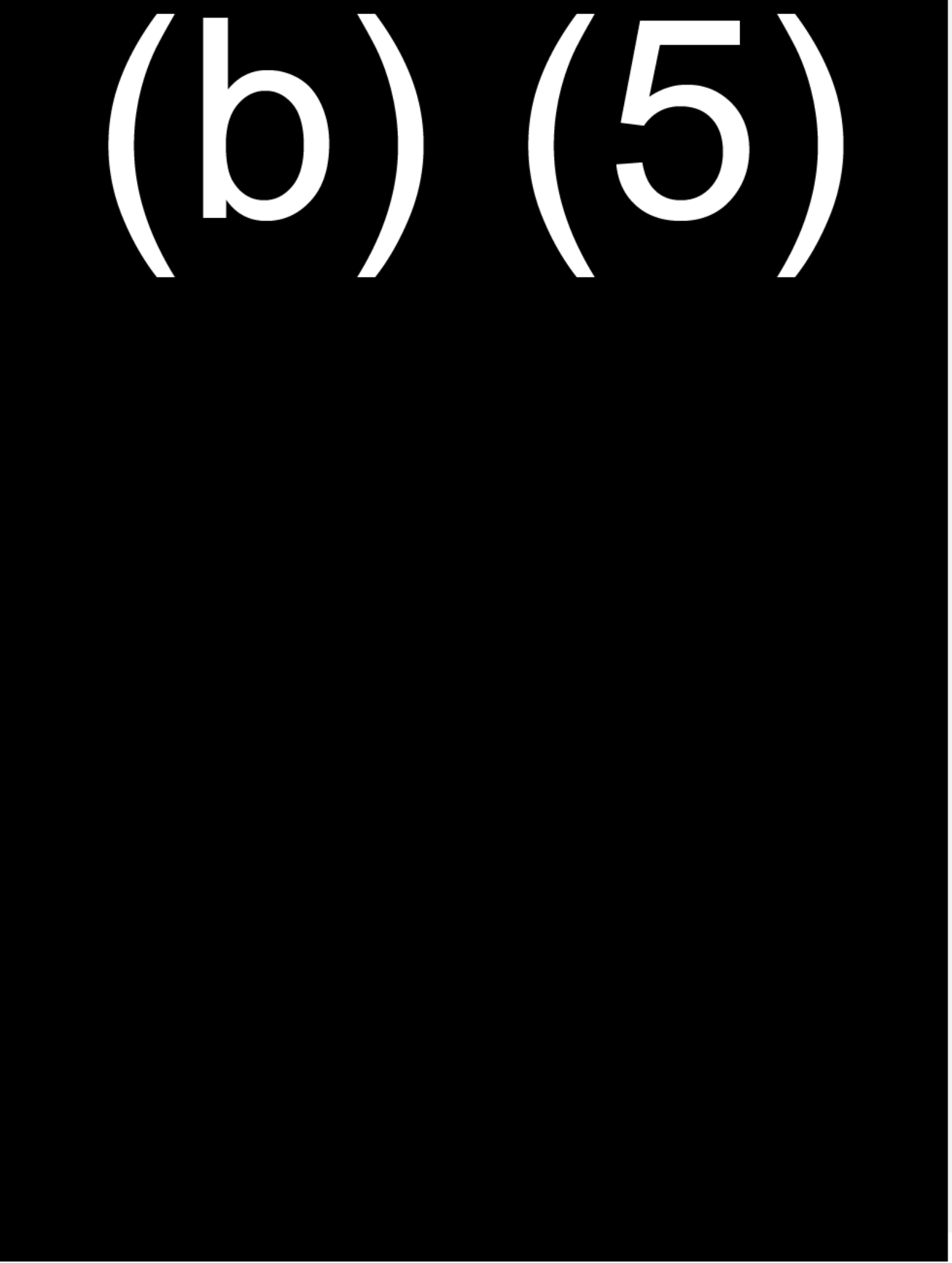


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## Endnotes

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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Files

**From:** Timothy Lee

**Subject:** Coordination Meeting on LIBOR

**Date:** September 11, 2012

Today at 1030, Richard Parker and I participated in a conference call with senior staff at FHFA and representatives of the Department of Justice's civil division. Specifically, attendees outside FHFA-OIG included:

- Jon Greenlee, Fred Graham, and Nina Nichols from FHFA
- (b) (6) from DOJ

The purpose of the conversation was to set up a working relationship between FHFA and DOJ.

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After initial introductions, (b) (5)

I briefly reviewed my previously provided analysis, but noted for the group that FHFA has access to greater analytical resources, including professional staff in-house and at the Enterprises themselves. Jon Greenlee indicated that he would reach out to the Enterprises to "get the ball rolling" in this respect.

In response to a question from Fred Graham, (b) (5)

Richard Parker (b) (5)

FHFA reconfirmed that they would consider how best to start the required analysis, and stated their intention to be back in touch with the group.

I closed the meeting with a request for all participants' contact info to circulate.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** David P. Bloch, Director, Division of Mortgages, Investments and Risk Analysis  
Timothy Lee, Senior Policy Advisor

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** LIBOR Update

**Date:** November 29, 2012

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Set forth in this memorandum is the sequence of major events, as we understand them, related to FHFA-OIG's analysis of potential Enterprise losses related to LIBOR suppression, along with FHFA's and the Enterprise's actions to date as a result of our Office's work.

- **August 8-9, 2012:** FHFA-OIG staff (Lee) conducted initial, informal discussions with regulatory liaisons at Fannie Mae and Freddie Mac and with an FHFA Market Risk Examiner. All parties were briefed on the workings of FHFA-OIG's preliminary analysis, which indicated potential losses to the Enterprises owing to LIBOR manipulation. The Enterprises confirmed that, as of that date, no analysis had been or was being undertaken to determine whether any such losses had been or were being suffered. FHFA also confirmed that, as of that time, no examination work had been or was being conducted around LIBOR suppression.
- **September 11, 2012:** FHFA-OIG staff (Parker and Lee) participated in a conference call with senior FHFA staff including Jon Greenlee, Fred Graham, and Nina Nichols, as well as representatives of the Department of Justice's Civil Division. The purpose of the conversation was to set up a dialogue among FHFA, FHFA-OIG, and the DOJ Civil Division on the issue of the Enterprises' LIBOR-related losses. The common understanding among meeting participants was that FHFA had not begun any work on computing the potential losses stemming from LIBOR suppression. After some informal discussion, during which Mr. Graham speculated that Fannie's and Freddie's LIBOR-dependent investment activities may have resulted in "a wash" or even a

profit, Mr. Greenlee stated that he would consider how best to start the required analysis, and that he would reach out to the Enterprises to “get the ball rolling.”

- **October 12, 2012:** FHFA instructed Fannie Mae and Freddie Mac immediately to undertake cost-benefit analyses designed to indicate whether the Enterprises should take action with respect to losses sustained as a result of LIBOR manipulation.
- **November 2, 2012:** FHFA-OIG formally submitted to FHFA a memorandum outlining its concerns about losses imposed on the Enterprises stemming from LIBOR manipulation.
- **November 15, 2012:** FHFA advised FHFA-OIG that Freddie Mac had retained outside counsel and an economic consulting firm to conduct a preliminary assessment of their potential damages sustained as a result of alleged LIBOR manipulation, and that Fannie Mae was in the process of undertaking comparable steps.



**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** November 1, 2012

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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

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## Endnotes

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## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** November 1, 2012

Please find attached a staff memorandum that details my concerns about financial losses that Fannie Mae and Freddie Mac (the Enterprises) may have sustained due to alleged manipulation of the London Interbank Offered Rate (LIBOR) by a number of major financial institutions. As you know, on June 27, the Department of Justice announced an agreement with Barclays Bank Plc (Barclays) in which the bank admitted to manipulating LIBOR for its own advantage over a period of years. Federal, state, and foreign government investigations into possible LIBOR manipulation at other institutions are ongoing, as are a number of high-profile civil suits predicated upon such manipulation.

FHFA-OIG's interest in the consequences of possible LIBOR manipulation upon the Enterprises stems directly from its core mission to prevent and detect fraud and abuse in FHFA's programs and operations. Members of my staff began their work on this topic within days of the Department of Justice's announcement of its agreement with Barclays. On September 6 and 11 they shared their preliminary analysis with members of your senior staff and, at about the same time, with both Enterprises. To date, however, FHFA-OIG remains unaware of any steps taken by the Agency or the Enterprises to investigate the matter further.

The memorandum outlines in detail my staff's LIBOR loss estimates and offers recommendations for Agency action to recover any such losses on behalf of the Enterprises. My staff has tentatively estimated that the Enterprises may have suffered \$3 billion in such losses. Those losses, of course, would have been funded by the Department of the Treasury under the Senior Preferred Stock Purchase Agreements in place with each Enterprise. I therefore believe that this matter warrants the Agency's attention. Please do not hesitate to contact me or any of my staff in this regard.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (LIBOR) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and U.S. authorities, including the Department of Justice (DOJ), Barclays Bank Plc (Barclays) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, [“The LIBOR Mess: How Did It Happen – And What Lies Ahead?”](#) July 18, 2012.

Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## **Background**

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises over \$187 billion.<sup>9</sup>

As part of their business, the Enterprises have always held substantial quantities of floating-rate assets on which interest is recalculated and paid each month or quarter based on currently prevailing short-term rates. Such investments are popular because, as compared to assets that pay a fixed interest rate throughout their terms, floating-rate assets greatly reduce bondholders’ market risk that their investments’ value may decline due to adverse interest rate movements. The Enterprises’ two primary categories of floating-rate investments include:

- Floating rate bonds. Many securities are structured in this fashion. For example, according to its public financial statements, Freddie Mac alone held approximately \$299 billion of floating rate securities upon entering conservatorship.<sup>10</sup>
- Interest rate swaps. Because American homeowners tend to prefer predictable mortgage payments, the Enterprises’ mortgage portfolios generally contain more fixed-rate loans

than floating-rate loans. As a result, the value of those portfolios may vary as interest rates fluctuate. However, the Enterprises also invest in interest-rate swaps, contracting with large financial institutions for the obligation to pay them fixed-rate interest streams in exchange for the right to receive corresponding floating-rate ones.<sup>b</sup> These swaps effectively offset the mortgage loans' fluctuations in value, resulting in stable combined portfolio valuations even if interest rates rise or fall. We estimate that the Enterprises received floating-rate interest payments on a net total of \$373 billion in face, or "notional" amount of interest rate swaps upon entering conservatorship.

The interest due for such floating rate obligations is recalculated for each payment period by reference to the current value of LIBOR.

### Analysis

As a first step in our analysis, we compared the historical data on two floating rate indices:

- 1-month<sup>11</sup> LIBOR rates; and
- The Federal Reserve's published Eurodollar deposit rates (Fed ED) for 1-month<sup>12</sup> obligations. Like LIBOR, this data series is designed to measure short-term bank borrowing costs via polling of financial institutions. However, the Federal Reserve measure polls a broader range of institutions and is rarely referenced in floating rate financial obligations.

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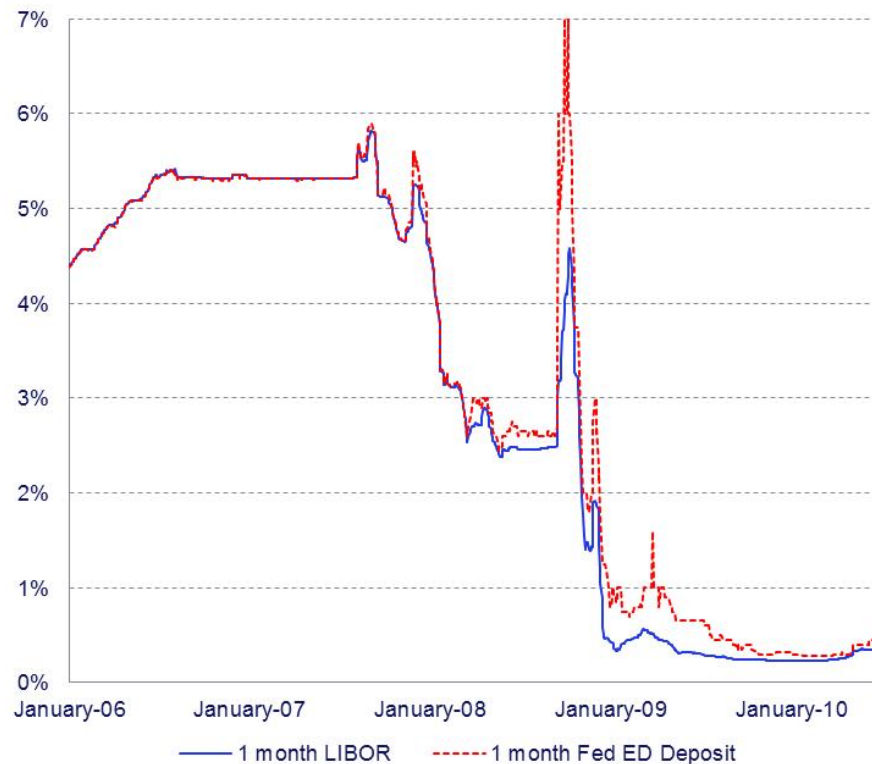
As the financial crisis began to metastasize, LIBOR and Fed ED began to diverge substantially, eventually by as much as three percentage points at the end of September 2008. Moreover, in a marked contrast with previous behavior, LIBOR began to fall below Fed ED consistently. Figure 1 illustrates the recent divergence of these two measures, beginning in mid-2007.

This anomaly has been cited in civil complaints as evidence of financial institutions' LIBOR manipulation.<sup>17</sup> Moreover, it is consistent with DOJ's statement of facts regarding Barclays' admitted LIBOR manipulation, which reads in part:

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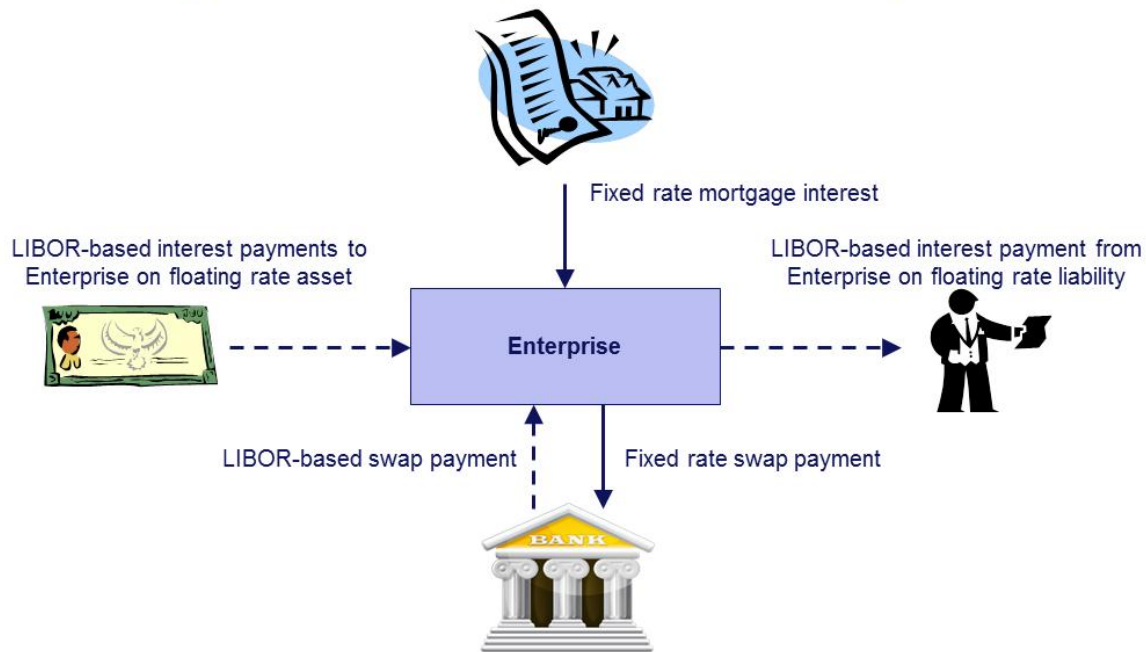
Because the Enterprises receive LIBOR-based floating rate payments on their floating rate bonds and interest rate swaps, the principal effect on them of any downward manipulation of LIBOR would be reduced interest payments with respect to their holdings of floating rate securities and interest rate swaps. (This is partially offset by lower borrowing costs on the Enterprises' own floating-rate liabilities, a factor we have considered in our estimation of Enterprise losses.)

**Figure 1. Federal Reserve Eurodollar Deposit Rate vs LIBOR, 1Q06-2Q10**





**Figure 2. LIBOR-Based Payments to and From the Enterprises**



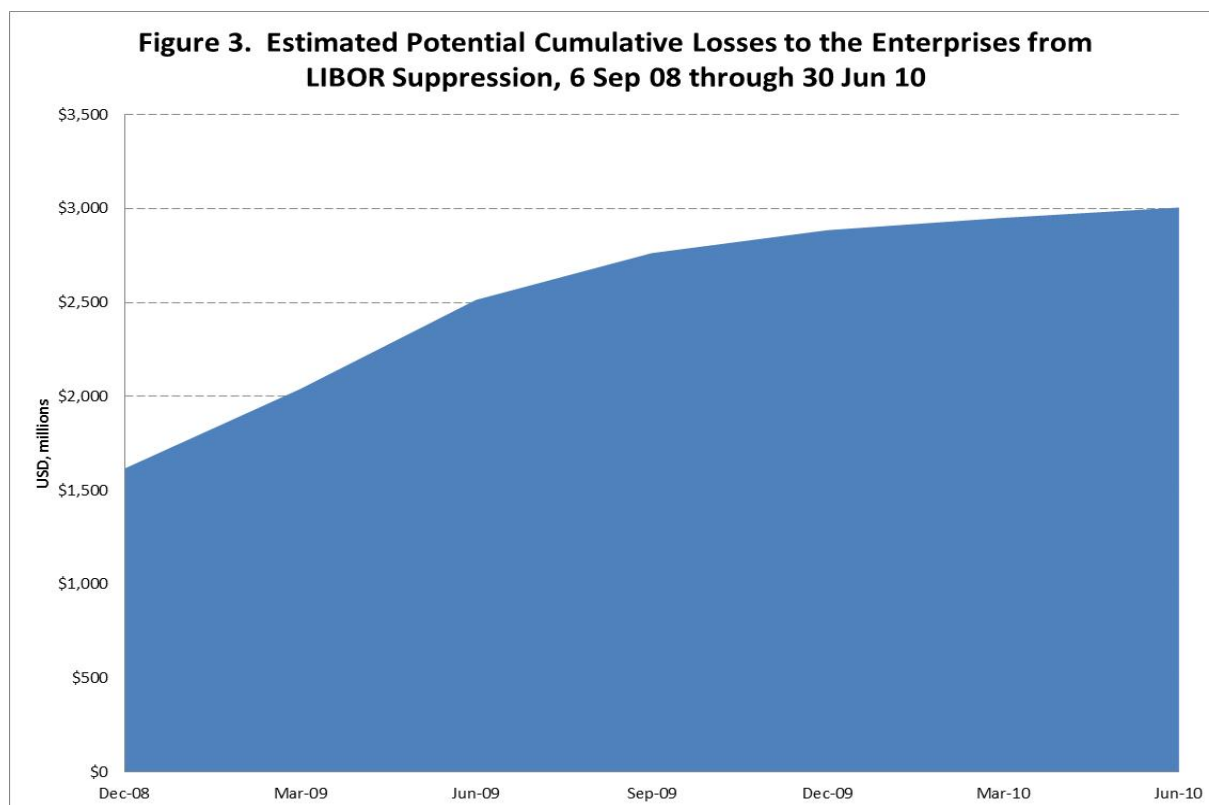
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>
- Second, we reviewed the Enterprises’ publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

<sup>d</sup> Further details on our methodology are available in the Appendix.



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both participate in setting LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.

A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup>

However, our review of a small sample of offering documents for the Enterprises' floating-rate

investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations and/or is a named defendant in existing civil actions.<sup>23</sup>

## Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.

Figure 4.

Major Derivatives Dealers		Top Private Label MBS Underwriters 2007	
	LIBOR Contributor		LIBOR Contributor
Bank of America	✓	Lehman Brothers	
Barclays	✓	Bear Stearns	
BNP Paribas		Deutsche Bank	✓
Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
UBS	✓		
Wachovia			

- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded, in light of FHFA's obligations as the Enterprises' conservator, the Agency should have in place a plan by which to effect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

- [1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#). According to the Federal Reserve, this information is provided by the British Bankers' Association. The Federal Reserve describes LIBOR as "the most widely used 'benchmark' or reference rate for short term interest rates."
- [1-Month Eurodollar Deposit Rate \(London\)\(DED1\)](#). This information is compiled by the Federal Reserve itself, working with Bloomberg and ICAP Plc, a bond brokerage firm.

We also compiled similar samples for 3-month rates in each case. Comparisons of both the 1-month and 3-month indices revealed significant rate discrepancies between LIBOR and the Federal Reserve index, beginning in 2007. The Bloomberg story cited in the body of the report includes the former Federal Reserve economist's quote that "effectively, these two rates should be the same as they are the same instrument." Several civil lawsuits, including those brought by [Charles Schwab](#) and the [City of Baltimore](#), cite the emergence of these discrepancies as evidence of malfeasance.

Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the U.S. Commodity Futures Trading Commission, cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of LIBOR.

However, because of differences in currency or maturity of the other indicators compared to the Federal Reserve Eurodollar deposit rate, we chose the Federal Reserve index as the simplest and best benchmark for comparison. For the purposes of this analysis, it served as a proxy for the appropriate LIBOR setting. Thus, we assumed that observed differences between LIBOR and the Federal Reserve Eurodollar deposit rate could indicate the timing and extent of potential manipulation by LIBOR poll participants.

## Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

- Data on derivatives investments from Table 38, page 109. We calculated Freddie Mac's net receive-LIBOR interest rate swap investment as:
  - Pay-fixed (i.e. Freddie Mac receives LIBOR), *plus*
  - Basis (i.e. Freddie Mac and its counterparty exchange different sets of floating rate interest payments. Generally, these involve the Enterprise's payments of frequently used ARM indices, such as the Cost of Funds Index or the 12-month Constant Maturity Treasury rate, in exchange for LIBOR-based payments); *less*
  - Receive-fixed (i.e. Freddie Mac pays LIBOR).
- Data on Freddie Mac's variable-rate mortgage-related securities from information on the Enterprise's Mortgage-Related Investments Portfolio, Table 24, page 93.
  - We assumed that essentially all variable-rate MBS holdings calculated interest payments by reference to LIBOR.
  - Fannie Mae did not publish explicit information on its variable rate MBS, but did provide figures for all MBS held by its Capital Markets Group. To estimate Fannie Mae's variable-rate MBS investment holdings, we assumed that Fannie Mae's Capital Markets Group held the same proportion of variable rate securities held by Freddie Mac in its Mortgage-Related Investments Portfolio.
- Data on Freddie Mac's long-term debt liabilities, including variable-rate liabilities, in Table 8.3, page 224.
  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.

- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises.

Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)", July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)", September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)", January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.



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<sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, “[Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge](#)”, July 30, 2012.

<sup>20</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, “[Mortgage-Backed Securities](#).” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to U.S. dollar LIBOR. Wall Street Journal, “[New York Lender Files LIBOR Lawsuit](#)”, July 30, 2012, and Thomson Reuters, “[In re LIBOR-Based Financial Instruments Antitrust Litigation](#),” April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, “[State Regulators Widen LIBOR Investigation](#),” August 15, 2012, and BusinessWeek, “[US LIBOR Probers Said to Seek London Trader Interviews](#),” September 27, 2012.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (LIBOR) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and U.S. authorities, including the Department of Justice (DOJ), Barclays Bank Plc (Barclays) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, [“The LIBOR Mess: How Did It Happen – And What Lies Ahead?”](#) July 18, 2012.

Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## **Background**

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises over \$187 billion.<sup>9</sup>

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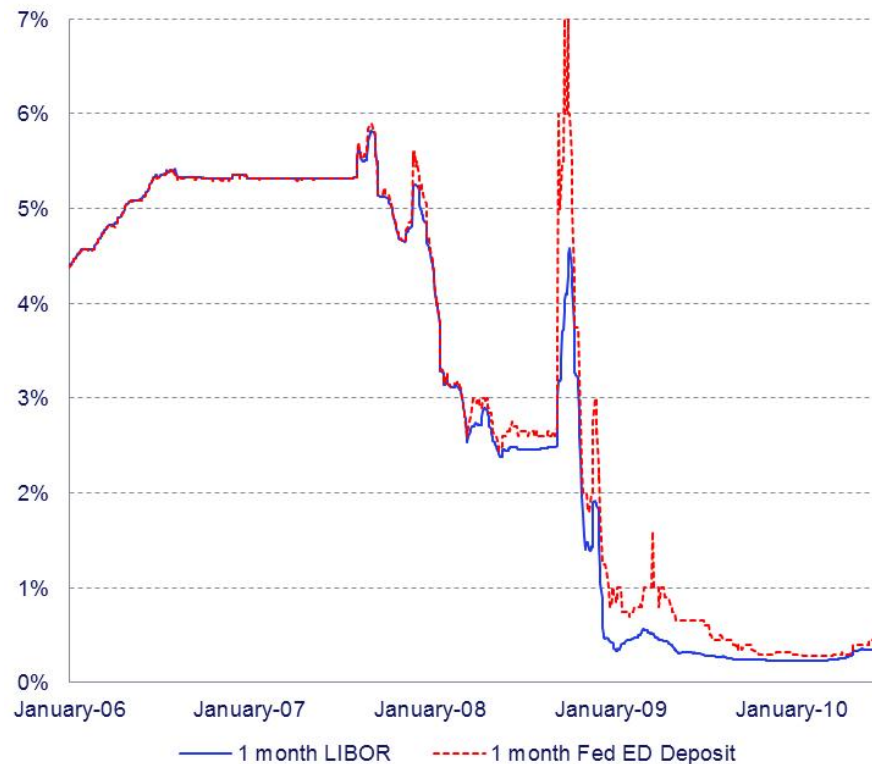
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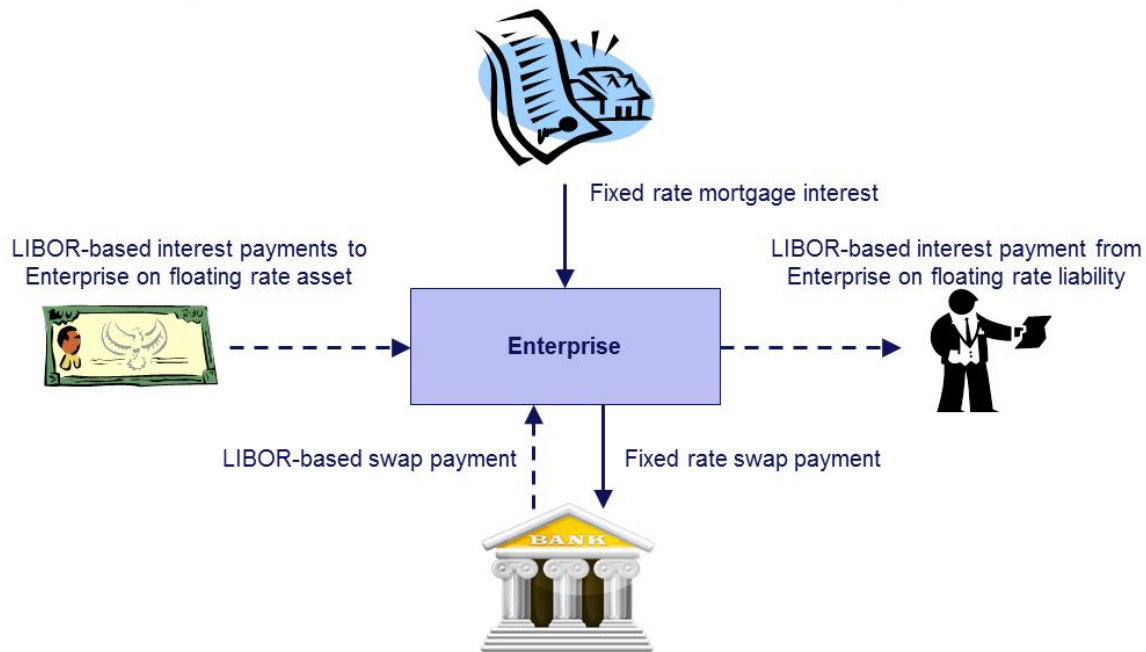
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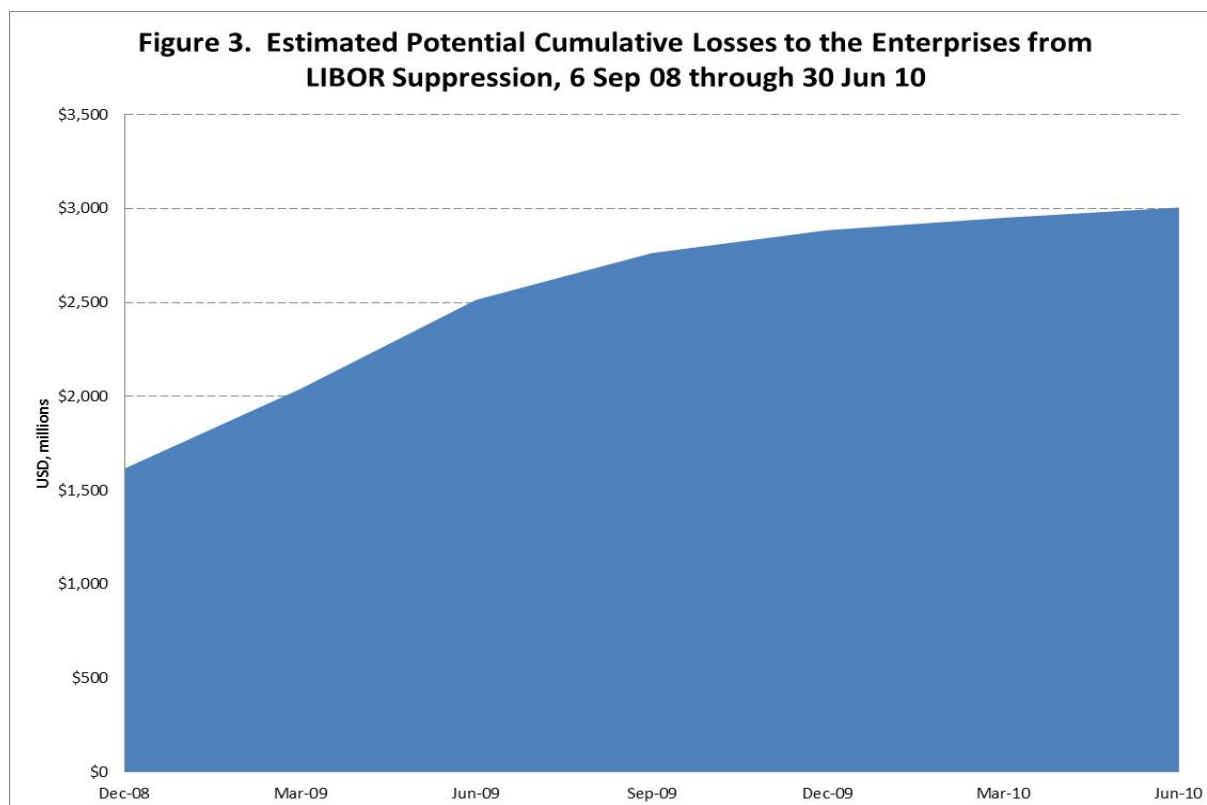
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>
- Second, we reviewed the Enterprises’ publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

<sup>d</sup> Further details on our methodology are available in the Appendix.



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both participate in setting LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.

A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup>

However, our review of a small sample of offering documents for the Enterprises' floating-rate

investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations and/or is a named defendant in existing civil actions.<sup>23</sup>

## Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.

Figure 4.

Major Derivatives Dealers		Top Private Label MBS Underwriters 2007	
	LIBOR Contributor		LIBOR Contributor
Bank of America	✓	Lehman Brothers	
Barclays	✓	Bear Stearns	
BNP Paribas		Deutsche Bank	✓
Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
UBS	✓		
Wachovia			



- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded, in light of FHFA's obligations as the Enterprises' conservator, the Agency should have in place a plan by which to effect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

- [1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#). According to the Federal Reserve, this information is provided by the British Bankers' Association. The Federal Reserve describes LIBOR as "the most widely used 'benchmark' or reference rate for short term interest rates."
- [1-Month Eurodollar Deposit Rate \(London\)\(DED1\)](#). This information is compiled by the Federal Reserve itself, working with Bloomberg and ICAP Plc, a bond brokerage firm.

We also compiled similar samples for 3-month rates in each case. Comparisons of both the 1-month and 3-month indices revealed significant rate discrepancies between LIBOR and the Federal Reserve index, beginning in 2007. The Bloomberg story cited in the body of the report includes the former Federal Reserve economist's quote that "effectively, these two rates should be the same as they are the same instrument." Several civil lawsuits, including those brought by [Charles Schwab](#) and the [City of Baltimore](#), cite the emergence of these discrepancies as evidence of malfeasance.

Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the U.S. Commodity Futures Trading Commission, cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of LIBOR.

However, because of differences in currency or maturity of the other indicators compared to the Federal Reserve Eurodollar deposit rate, we chose the Federal Reserve index as the simplest and best benchmark for comparison. For the purposes of this analysis, it served as a proxy for the appropriate LIBOR setting. Thus, we assumed that observed differences between LIBOR and the Federal Reserve Eurodollar deposit rate could indicate the timing and extent of potential manipulation by LIBOR poll participants.

## Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

- Data on derivatives investments from Table 38, page 109. We calculated Freddie Mac's net receive-LIBOR interest rate swap investment as:
  - Pay-fixed (i.e. Freddie Mac receives LIBOR), *plus*
  - Basis (i.e. Freddie Mac and its counterparty exchange different sets of floating rate interest payments. Generally, these involve the Enterprise's payments of frequently used ARM indices, such as the Cost of Funds Index or the 12-month Constant Maturity Treasury rate, in exchange for LIBOR-based payments); *less*
  - Receive-fixed (i.e. Freddie Mac pays LIBOR).
- Data on Freddie Mac's variable-rate mortgage-related securities from information on the Enterprise's Mortgage-Related Investments Portfolio, Table 24, page 93.
  - We assumed that essentially all variable-rate MBS holdings calculated interest payments by reference to LIBOR.
  - Fannie Mae did not publish explicit information on its variable rate MBS, but did provide figures for all MBS held by its Capital Markets Group. To estimate Fannie Mae's variable-rate MBS investment holdings, we assumed that Fannie Mae's Capital Markets Group held the same proportion of variable rate securities held by Freddie Mac in its Mortgage-Related Investments Portfolio.
- Data on Freddie Mac's long-term debt liabilities, including variable-rate liabilities, in Table 8.3, page 224.
  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.

- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises.

Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)," July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)," September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)," January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.

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<sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, “[Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge](#)”, July 30, 2012.

<sup>20</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, “[Mortgage-Backed Securities](#).” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to U.S. dollar LIBOR. Wall Street Journal, “[New York Lender Files LIBOR Lawsuit](#)”, July 30, 2012, and Thomson Reuters, “[In re LIBOR-Based Financial Instruments Antitrust Litigation](#),” April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, “[State Regulators Widen LIBOR Investigation](#),” August 15, 2012, and BusinessWeek, “[US LIBOR Probers Said to Seek London Trader Interviews](#),” September 27, 2012.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** November 1, 2012

Please find attached a staff memorandum that details my concerns about financial losses that Fannie Mae and Freddie Mac (the Enterprises) may have sustained due to alleged manipulation of the London Interbank Offered Rate (LIBOR) by a number of major financial institutions. As you know, on June 27, the Department of Justice announced an agreement with Barclays Bank Plc (Barclays) in which the bank admitted to manipulating LIBOR for its own advantage over a period of years. Federal, state, and foreign government investigations into possible LIBOR manipulation at other institutions are ongoing, as are a number of high-profile civil suits predicated upon such manipulation.

FHFA-OIG's interest in the consequences of possible LIBOR manipulation upon the Enterprises stems directly from its core mission to prevent and detect fraud and abuse in FHFA's programs and operations. Members of my staff began their work on this topic within days of the Department of Justice's announcement of its agreement with Barclays. On September 6 and 11 they shared their preliminary analysis with members of your senior staff and, at about the same time, with both Enterprises. To date, however, FHFA-OIG remains unaware of any steps taken by the Agency or the Enterprises to investigate the matter further.

The memorandum outlines in detail my staff's LIBOR loss estimates and offers recommendations for Agency action to recover any such losses on behalf of the Enterprises. My staff has tentatively estimated that the Enterprises may have suffered \$3 billion in such losses. Those losses, of course, would have been funded by the Department of the Treasury under the Senior Preferred Stock Purchase Agreements in place with each Enterprise. I therefore believe that this matter warrants the Agency's attention. Please do not hesitate to contact me or any of my staff in this regard.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (LIBOR) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and U.S. authorities, including the Department of Justice (DOJ), Barclays Bank Plc (Barclays) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, [“The LIBOR Mess: How Did It Happen – And What Lies Ahead?”](#) July 18, 2012.



Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## **Background**

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises over \$187 billion.<sup>9</sup>

As part of their business, the Enterprises have always held substantial quantities of floating-rate assets on which interest is recalculated and paid each month or quarter based on currently prevailing short-term rates. Such investments are popular because, as compared to assets that pay a fixed interest rate throughout their terms, floating-rate assets greatly reduce bondholders’ market risk that their investments’ value may decline due to adverse interest rate movements. The Enterprises’ two primary categories of floating-rate investments include:

- Floating rate bonds. Many securities are structured in this fashion. For example, according to its public financial statements, Freddie Mac alone held approximately \$299 billion of floating rate securities upon entering conservatorship.<sup>10</sup>
- Interest rate swaps. Because American homeowners tend to prefer predictable mortgage payments, the Enterprises’ mortgage portfolios generally contain more fixed-rate loans

than floating-rate loans. As a result, the value of those portfolios may vary as interest rates fluctuate. However, the Enterprises also invest in interest-rate swaps, contracting with large financial institutions for the obligation to pay them fixed-rate interest streams in exchange for the right to receive corresponding floating-rate ones.<sup>b</sup> These swaps effectively offset the mortgage loans' fluctuations in value, resulting in stable combined portfolio valuations even if interest rates rise or fall. We estimate that the Enterprises received floating-rate interest payments on a net total of \$373 billion in face, or "notional" amount of interest rate swaps upon entering conservatorship.

The interest due for such floating rate obligations is recalculated for each payment period by reference to the current value of LIBOR.

### Analysis

As a first step in our analysis, we compared the historical data on two floating rate indices:

- 1-month<sup>11</sup> LIBOR rates; and
- The Federal Reserve's published Eurodollar deposit rates (Fed ED) for 1-month<sup>12</sup> obligations. Like LIBOR, this data series is designed to measure short-term bank borrowing costs via polling of financial institutions. However, the Federal Reserve measure polls a broader range of institutions and is rarely referenced in floating rate financial obligations.

Our examination of daily records for 1-month Fed ED and 1-month LIBOR indicates that the two rates remained very close from the earliest point we reviewed, the beginning of 2000, until mid-2007. During that period, the largest divergence between the two indexes appeared shortly after September 11, 2001, when LIBOR *exceeded* Fed ED by as much as 0.41%. Indeed, on average the two measures remained within 0.06% of each other during that period, with LIBOR falling below Fed ED on less than one business day of each nine. The close correspondence of these two measures conformed to the expectations of market observers. As a former Federal Reserve economist said, "Effectively, these two rates should be the same as they are the same instrument."<sup>13</sup>

However, beginning in early 2007 emerging declines in home prices had begun to place strains on the financial system. New Century Financial, a leading home loan originator, filed for bankruptcy in April.<sup>14</sup> Adding to the stress were media reports of precipitous decay in two high-profile mortgage-backed securities hedge funds sponsored by Bear Stearns, a leading U.S.

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<sup>b</sup> While the Enterprises may enter into both pay-floating rate and receive-floating rate swaps, in order to offset the risk of their (principally fixed-rate) mortgage assets, historically their overall net investment in interest rate swaps has been to receive floating-rate payments.

investment bank. These began to emerge in mid-June,<sup>15</sup> followed promptly by the funds' bankruptcy filings at the end of July.<sup>16</sup>

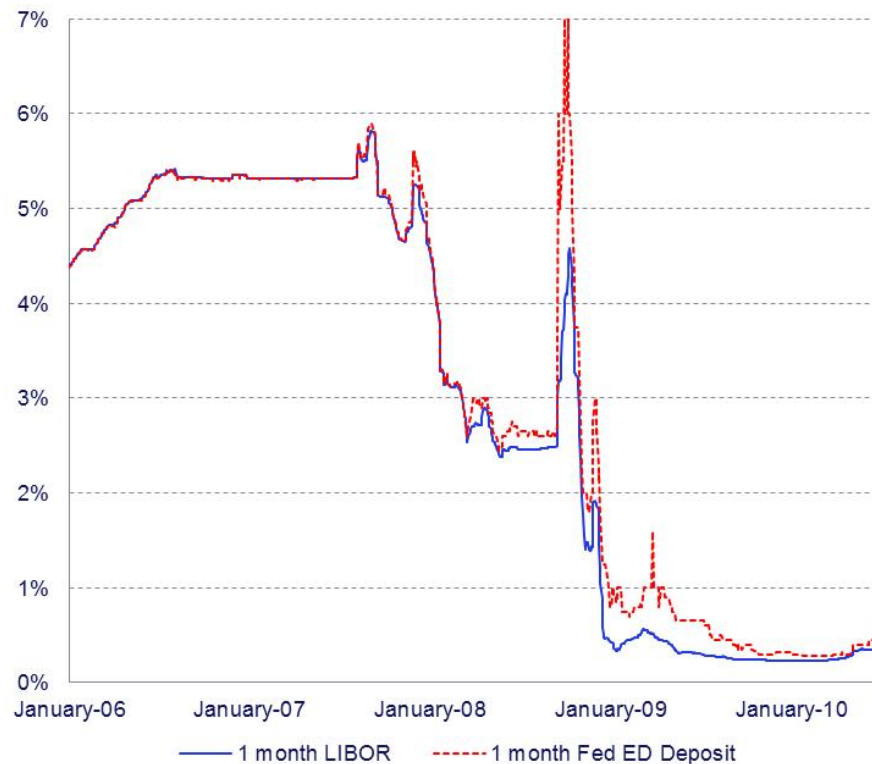
As the financial crisis began to metastasize, LIBOR and Fed ED began to diverge substantially, eventually by as much as three percentage points at the end of September 2008. Moreover, in a marked contrast with previous behavior, LIBOR began to fall below Fed ED consistently. Figure 1 illustrates the recent divergence of these two measures, beginning in mid-2007.

This anomaly has been cited in civil complaints as evidence of financial institutions' LIBOR manipulation.<sup>17</sup> Moreover, it is consistent with DOJ's statement of facts regarding Barclays' admitted LIBOR manipulation, which reads in part:

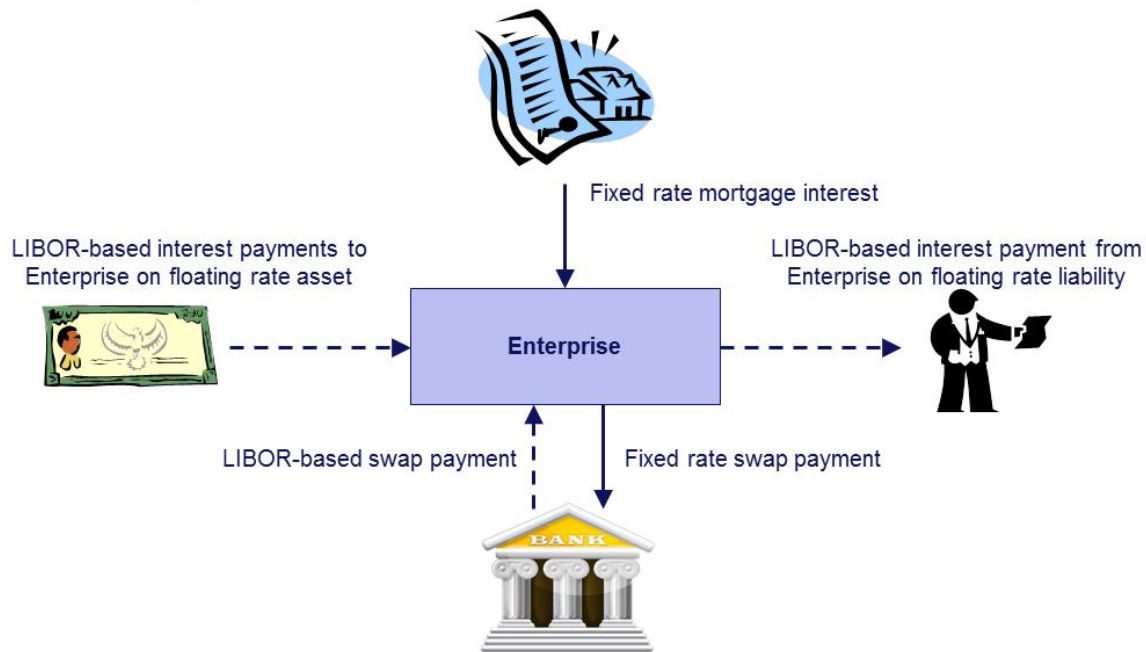
... between approximately August 2007 and January 2009, in response to initial and ongoing press speculation that Barclays's high U.S. Dollar LIBOR submissions at the time might reflect liquidity problems at Barclays, members of Barclays management directed that Barclays's Dollar LIBOR submissions be lowered. This management instruction often resulted in Barclays's submission of false rates that did not reflect its perceived cost of obtaining interbank funds.<sup>18</sup>

Because the Enterprises receive LIBOR-based floating rate payments on their floating rate bonds and interest rate swaps, the principal effect on them of any downward manipulation of LIBOR would be reduced interest payments with respect to their holdings of floating rate securities and interest rate swaps. (This is partially offset by lower borrowing costs on the Enterprises' own floating-rate liabilities, a factor we have considered in our estimation of Enterprise losses.)

**Figure 1. Federal Reserve Eurodollar Deposit Rate vs LIBOR, 1Q06-2Q10**



**Figure 2. LIBOR-Based Payments to and From the Enterprises**



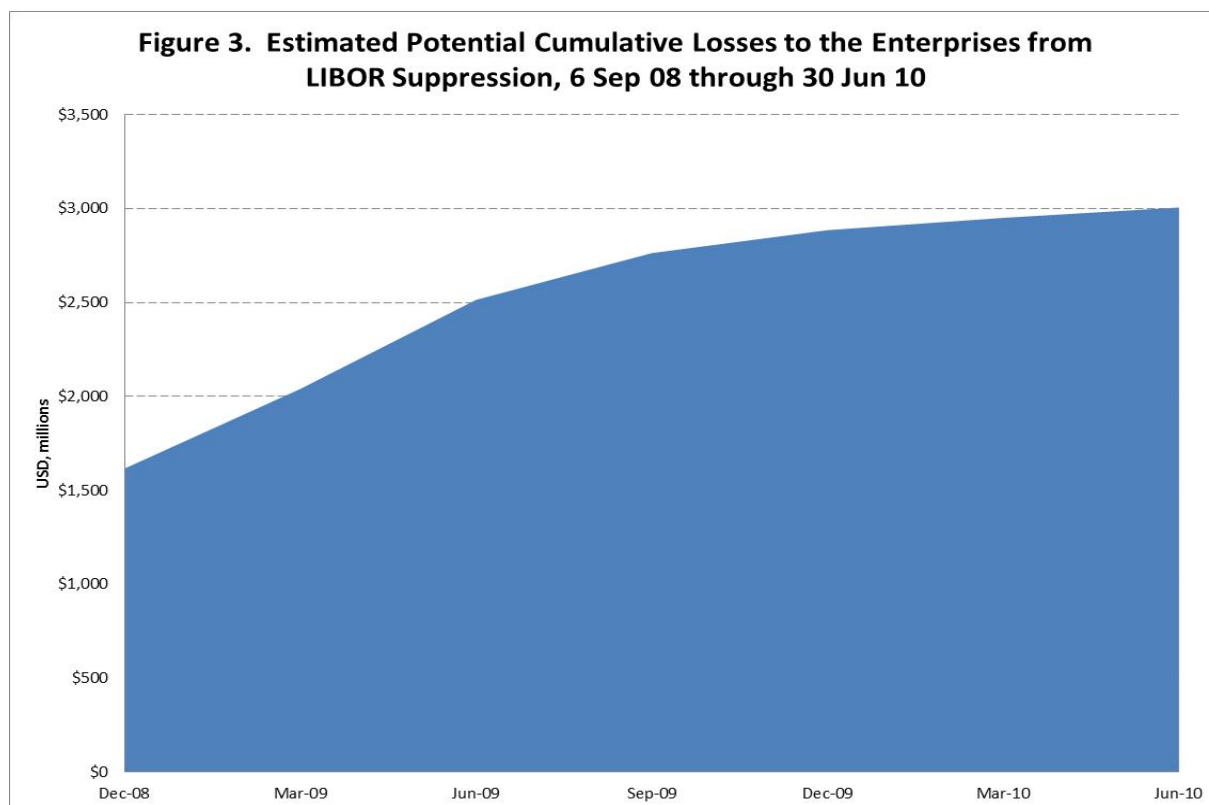
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>
- Second, we reviewed the Enterprises’ publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

<sup>d</sup> Further details on our methodology are available in the Appendix.



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both participate in setting LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.

A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup>

However, our review of a small sample of offering documents for the Enterprises' floating-rate

investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations and/or is a named defendant in existing civil actions.<sup>23</sup>

## Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.

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Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
UBS	✓		
Wachovia			

- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded then, in light of its obligations as their conservator, FHFA should have in place a plan by which to affect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

- [1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#). According to the Federal Reserve, this information is provided by the British Bankers' Association. The Federal Reserve describes LIBOR as "the most widely used 'benchmark' or reference rate for short term interest rates."
- [1-Month Eurodollar Deposit Rate \(London\)\(DED1\)](#). This information is compiled by the Federal Reserve itself, working with Bloomberg and ICAP Plc, a bond brokerage firm.

We also compiled similar samples for 3-month rates in each case. Comparisons of both the 1-month and 3-month indices revealed significant rate discrepancies between LIBOR and the Federal Reserve index, beginning in 2007. The Bloomberg story cited in the body of the report includes the former Federal Reserve economist's quote that "effectively, these two rates should be the same as they are the same instrument." Several civil lawsuits, including those brought by [Charles Schwab](#) and the [City of Baltimore](#), cite the emergence of these discrepancies as evidence of malfeasance.

Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the U.S. Commodity Futures Trading Commission, cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of LIBOR.

However, because of differences in currency or maturity of the other indicators compared to the Federal Reserve Eurodollar deposit rate, we chose the Federal Reserve index as the simplest and best benchmark for comparison. For the purposes of this analysis, it served as a proxy for the appropriate LIBOR setting. Thus, we assumed that observed differences between LIBOR and the Federal Reserve Eurodollar deposit rate could indicate the timing and extent of potential manipulation by LIBOR poll participants.



## Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

- Data on derivatives investments from Table 38, page 109. We calculated Freddie Mac's net receive-LIBOR interest rate swap investment as:
  - Pay-fixed (i.e. Freddie Mac receives LIBOR), *plus*
  - Basis (i.e. Freddie Mac and its counterparty exchange different sets of floating rate interest payments. Generally, these involve the Enterprise's payments of frequently used ARM indices, such as the Cost of Funds Index or the 12-month Constant Maturity Treasury rate, in exchange for LIBOR-based payments); *less*
  - Receive-fixed (i.e. Freddie Mac pays LIBOR).
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  - We assumed that essentially all variable-rate MBS holdings calculated interest payments by reference to LIBOR.
  - Fannie Mae did not publish explicit information on its variable rate MBS, but did provide figures for all MBS held by its Capital Markets Group. To estimate Fannie Mae's variable-rate MBS investment holdings, we assumed that Fannie Mae's Capital Markets Group held the same proportion of variable rate securities held by Freddie Mac in its Mortgage-Related Investments Portfolio.
- Data on Freddie Mac's long-term debt liabilities, including variable-rate liabilities, in Table 8.3, page 224.
  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.

- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises.

Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)," July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)," September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)," January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.

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<sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, “[Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge](#)”, July 30, 2012.

<sup>20</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, “[Mortgage-Backed Securities](#).” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to U.S. dollar LIBOR. Wall Street Journal, “[New York Lender Files LIBOR Lawsuit](#)”, July 30, 2012, and Thomson Reuters, “[In re LIBOR-Based Financial Instruments Antitrust Litigation](#),” April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, “[State Regulators Widen LIBOR Investigation](#),” August 15, 2012, and BusinessWeek, “[US LIBOR Probers Said to Seek London Trader Interviews](#),” September 27, 2012.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** November 1, 2012

Please find attached a staff memorandum that details my concerns about financial losses that Fannie Mae and Freddie Mac (the Enterprises) may have sustained due to alleged manipulation of the London Interbank Offered Rate (LIBOR) by a number of major financial institutions. As you know, on June 27, the Department of Justice announced an agreement with Barclays Bank Plc (Barclays) in which the bank admitted to manipulating LIBOR for its own advantage over a period of years. Federal, state, and foreign government investigations into possible LIBOR manipulation at other institutions are ongoing, as are a number of high-profile civil suits predicated upon such manipulation.

FHFA-OIG's interest in the consequences of possible LIBOR manipulation upon the Enterprises stems directly from its core mission to prevent and detect fraud and abuse in FHFA's programs and operations. Members of my staff began their work on this topic within days of the Department of Justice's announcement of its agreement with Barclays. On September 6 and 11 they shared their preliminary analysis with members of your senior staff and, at about the same time, with both Enterprises. To date, however, FHFA-OIG remains unaware of any steps taken by the Agency or the Enterprises to investigate the matter further.

The memorandum outlines in detail my staff's LIBOR loss estimates and offers recommendations for Agency action to recover any such losses on behalf of the Enterprises. My staff has tentatively estimated that the Enterprises may have suffered \$3 billion in such losses. Those losses, of course, would have been funded by the Department of the Treasury under the Senior Preferred Stock Purchase Agreements in place with each Enterprise. I therefore believe that this matter warrants the Agency's attention. Please do not hesitate to contact me or any of my staff in this regard.



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis, Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (LIBOR) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and U.S. authorities, including the Department of Justice (DOJ), Barclays Bank Plc (Barclays) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, [“The LIBOR Mess: How Did It Happen – And What Lies Ahead?”](#) July 18, 2012.

Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## **Background**

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises over \$187 billion.<sup>9</sup>

As part of their business, the Enterprises have always held substantial quantities of floating-rate assets on which interest is recalculated and paid each month or quarter based on currently prevailing short-term rates. Such investments are popular because, as compared to assets that pay a fixed interest rate throughout their terms, floating-rate assets greatly reduce bondholders’ market risk that their investments’ value may decline due to adverse interest rate movements. The Enterprises’ two primary categories of floating-rate investments include:

- Floating rate bonds. Many securities are structured in this fashion. For example, according to its public financial statements, Freddie Mac alone held approximately \$299 billion of floating rate securities upon entering conservatorship.<sup>10</sup>
- Interest rate swaps. Because American homeowners tend to prefer predictable mortgage payments, the Enterprises’ mortgage portfolios generally contain more fixed-rate loans

than floating-rate loans. As a result, the value of those portfolios may vary as interest rates fluctuate. However, the Enterprises also invest in interest-rate swaps, contracting with large financial institutions for the obligation to pay them fixed-rate interest streams in exchange for the right to receive corresponding floating-rate ones.<sup>b</sup> These swaps effectively offset the mortgage loans' fluctuations in value, resulting in stable combined portfolio valuations even if interest rates rise or fall. We estimate that the Enterprises received floating-rate interest payments on a net total of \$373 billion in face, or "notional" amount of interest rate swaps upon entering conservatorship.

The interest due for such floating rate obligations is recalculated for each payment period by reference to the current value of LIBOR.

### Analysis

As a first step in our analysis, we compared the historical data on two floating rate indices:

- 1-month<sup>11</sup> LIBOR rates; and
- The Federal Reserve's published Eurodollar deposit rates (Fed ED) for 1-month<sup>12</sup> obligations. Like LIBOR, this data series is designed to measure short-term bank borrowing costs via polling of financial institutions. However, the Federal Reserve measure polls a broader range of institutions and is rarely referenced in floating rate financial obligations.

Our examination of daily records for 1-month Fed ED and 1-month LIBOR indicates that the two rates remained very close from the earliest point we reviewed, the beginning of 2000, until mid-2007. During that period, the largest divergence between the two indexes appeared shortly after September 11, 2001, when LIBOR *exceeded* Fed ED by as much as 0.41%. Indeed, on average the two measures remained within 0.06% of each other during that period, with LIBOR falling below Fed ED on less than one business day of each nine. The close correspondence of these two measures conformed to the expectations of market observers. As a former Federal Reserve economist said, "Effectively, these two rates should be the same as they are the same instrument."<sup>13</sup>

However, beginning in early 2007 emerging declines in home prices had begun to place strains on the financial system. New Century Financial, a leading home loan originator, filed for bankruptcy in April.<sup>14</sup> Adding to the stress were media reports of precipitous decay in two high-profile mortgage-backed securities hedge funds sponsored by Bear Stearns, a leading U.S.

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<sup>b</sup> While the Enterprises may enter into both pay-floating rate and receive-floating rate swaps, in order to offset the risk of their (principally fixed-rate) mortgage assets, historically their overall net investment in interest rate swaps has been to receive floating-rate payments.



investment bank. These began to emerge in mid-June,<sup>15</sup> followed promptly by the funds' bankruptcy filings at the end of July.<sup>16</sup>

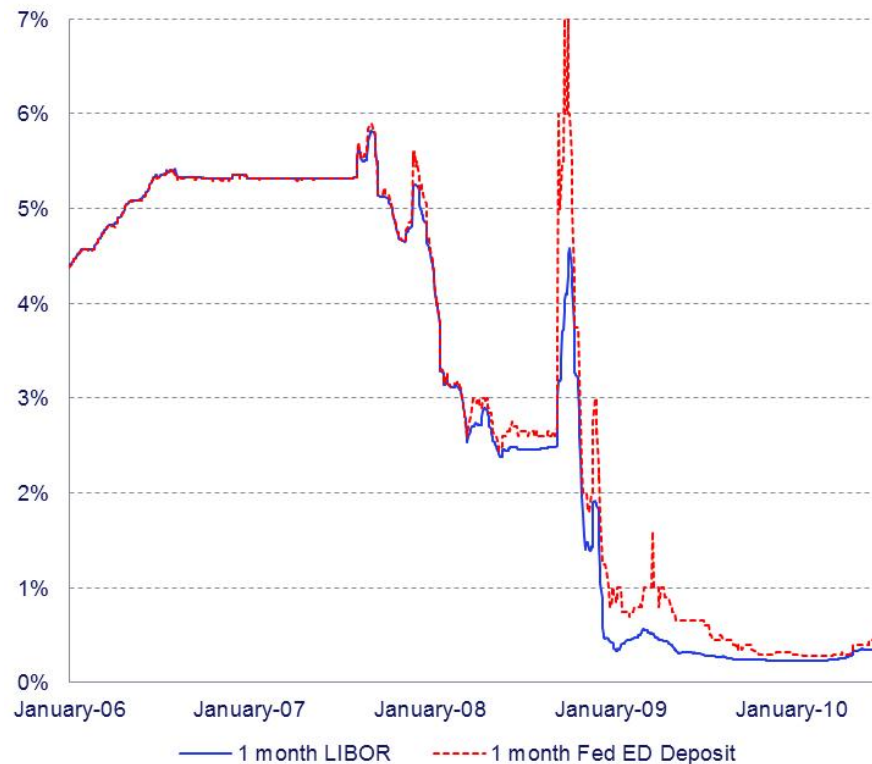
As the financial crisis began to metastasize, LIBOR and Fed ED began to diverge substantially, eventually by as much as three percentage points at the end of September 2008. Moreover, in a marked contrast with previous behavior, LIBOR began to fall below Fed ED consistently. Figure 1 illustrates the recent divergence of these two measures, beginning in mid-2007.

This anomaly has been cited in civil complaints as evidence of financial institutions' LIBOR manipulation.<sup>17</sup> Moreover, it is consistent with DOJ's statement of facts regarding Barclays' admitted LIBOR manipulation, which reads in part:

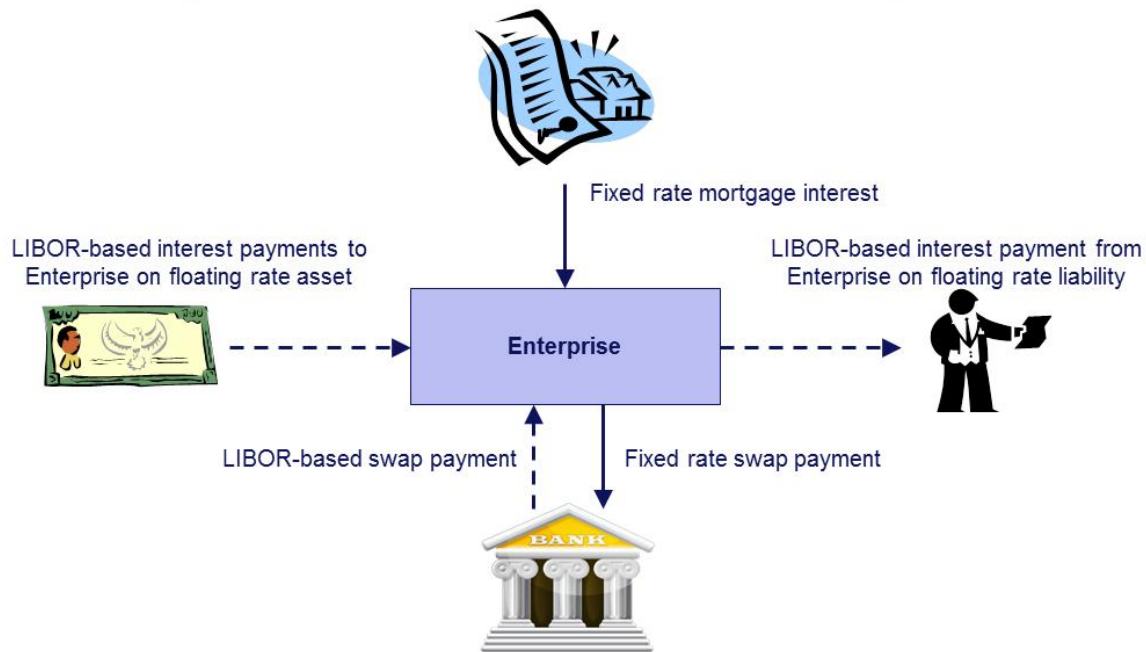
... between approximately August 2007 and January 2009, in response to initial and ongoing press speculation that Barclays's high U.S. Dollar LIBOR submissions at the time might reflect liquidity problems at Barclays, members of Barclays management directed that Barclays's Dollar LIBOR submissions be lowered. This management instruction often resulted in Barclays's submission of false rates that did not reflect its perceived cost of obtaining interbank funds.<sup>18</sup>

Because the Enterprises receive LIBOR-based floating rate payments on their floating rate bonds and interest rate swaps, the principal effect on them of any downward manipulation of LIBOR would be reduced interest payments with respect to their holdings of floating rate securities and interest rate swaps. (This is partially offset by lower borrowing costs on the Enterprises' own floating-rate liabilities, a factor we have considered in our estimation of Enterprise losses.)

**Figure 1. Federal Reserve Eurodollar Deposit Rate vs LIBOR, 1Q06-2Q10**



**Figure 2. LIBOR-Based Payments to and From the Enterprises**



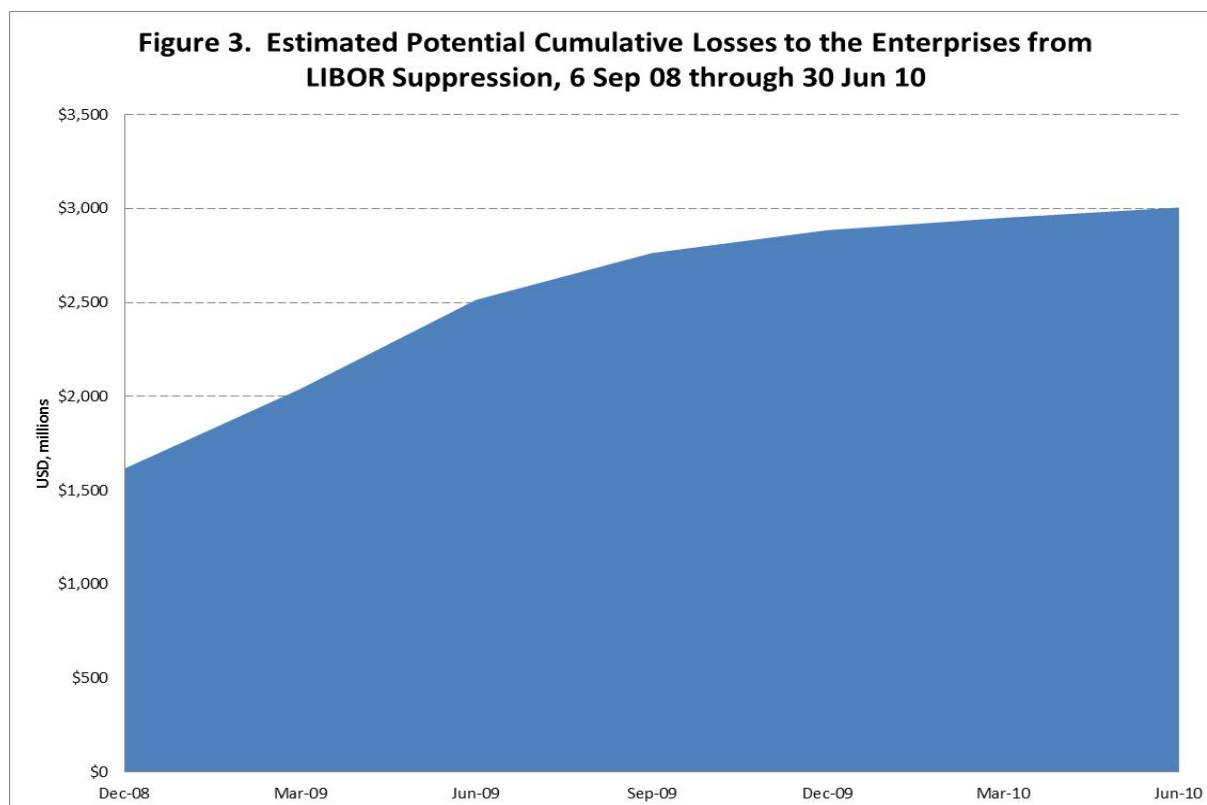
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>
- Second, we reviewed the Enterprises’ publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

<sup>d</sup> Further details on our methodology are available in the Appendix.



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both participate in setting LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.

A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup>

However, our review of a small sample of offering documents for the Enterprises' floating-rate

investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations and/or is a named defendant in existing civil actions.<sup>23</sup>

## Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.

Figure 4.

Major Derivatives Dealers		Top Private Label MBS Underwriters 2007	
	LIBOR Contributor		LIBOR Contributor
Bank of America	✓	Lehman Brothers	
Barclays	✓	Bear Stearns	
BNP Paribas		Deutsche Bank	✓
Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
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- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded then, in light of its obligations as their conservator, FHFA should have in place a plan by which to affect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

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Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the U.S. Commodity Futures Trading Commission, cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of LIBOR.

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## Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

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  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.



- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises.

Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).



## Endnotes

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- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)," July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)," September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)," January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#)."
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddiemac.com/investors/sec\\_filings/?intcmp=AFIRSF](http://www.freddiemac.com/investors/sec_filings/?intcmp=AFIRSF). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.

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<sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, “[Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge](#)”, July 30, 2012.

<sup>20</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See U.S. Securities and Exchange Commission, “[Mortgage-Backed Securities](#).” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to U.S. dollar LIBOR. Wall Street Journal, “[New York Lender Files LIBOR Lawsuit](#)”, July 30, 2012, and Thomson Reuters, “[In re LIBOR-Based Financial Instruments Antitrust Litigation](#),” April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, “[State Regulators Widen LIBOR Investigation](#),” August 15, 2012, and BusinessWeek, “[US LIBOR Probers Said to Seek London Trader Interviews](#),” September 27, 2012.



**OFFICE OF INSPECTOR GENERAL**  
Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director

**From:** Steve A. Linick, Inspector General

**Subject:** Effect of Possible LIBOR Manipulations on FHFA Regulated Entities

**Date:** September 14, 2012

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(b) (5)

(b) (5)



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

---

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director

**From:** Steve A. Linick, Inspector General

**Subject:** Effect of Possible LIBOR Manipulations on FHFA Regulated Entities

**Date:** September 11, 2012

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(b) (5)

(b) (5)

Federal Reserve ED  
Deposits Less LIBOR, 1  
month tenor

**4-Jan-00 through 14-Jun-07**

Average Spread	0.06%
Incidence of Zero or Negative Spreads	10.7%
Highest Spread	0.41%

**15-jun-07 through 7-Sep-08**

Average Spread	-0.09%
Incidence of Zero or Negative Spreads	89.7%
Highest Spread	0.30%

**6-sep-08 through 27-jun-12**

Average Spread	-0.19%
Incidence of Zero or Negative Spreads	100.00%
Highest Spread	-0.01%

Date	1 month LIBOR	1 month Fed ED Deposit	1 month Spread
4-Jan-00	5.81%	5.69%	0.12%
5-Jan-00	5.79%	5.69%	0.10%
6-Jan-00	5.79%	5.69%	0.10%
7-Jan-00	5.79%	5.69%	0.10%
10-Jan-00	5.78%	5.69%	0.09%
11-Jan-00	5.78%	5.69%	0.09%
12-Jan-00	5.78%	5.69%	0.09%
13-Jan-00	5.78%	5.69%	0.09%
14-Jan-00	5.79%	5.69%	0.10%
18-Jan-00	5.81%	5.69%	0.12%
19-Jan-00	5.81%	5.69%	0.12%
20-Jan-00	5.81%	5.69%	0.12%
21-Jan-00	5.81%	5.72%	0.09%
24-Jan-00	5.82%	5.75%	0.07%
25-Jan-00	5.82%	5.75%	0.07%
26-Jan-00	5.82%	5.75%	0.07%
27-Jan-00	5.83%	5.69%	0.14%
28-Jan-00	5.86%	5.81%	0.05%
31-Jan-00	5.89%	5.84%	0.04%
1-Feb-00	5.91%	5.84%	0.07%
2-Feb-00	5.92%	5.88%	0.04%
3-Feb-00	5.90%	5.84%	0.06%

4-Feb-00	5.89%	5.81%	0.08%
7-Feb-00	5.89%	5.84%	0.05%
8-Feb-00	5.89%	5.81%	0.08%
9-Feb-00	5.89%	5.81%	0.08%
10-Feb-00	5.89%	5.78%	0.11%
11-Feb-00	5.89%	5.78%	0.11%
14-Feb-00	5.88%	5.78%	0.10%
15-Feb-00	5.88%	5.78%	0.10%
16-Feb-00	5.88%	5.78%	0.10%
17-Feb-00	5.88%	5.78%	0.10%
18-Feb-00	5.88%	5.78%	0.10%
22-Feb-00	5.88%	5.78%	0.10%
23-Feb-00	5.88%	5.78%	0.10%
24-Feb-00	5.88%	5.78%	0.10%
25-Feb-00	5.88%	5.81%	0.07%
28-Feb-00	5.91%	5.81%	0.10%
29-Feb-00	5.92%	5.78%	0.14%
1-Mar-00	5.93%	5.81%	0.12%
2-Mar-00	5.94%	5.84%	0.10%
3-Mar-00	5.94%	5.84%	0.10%
6-Mar-00	5.95%	5.81%	0.14%
7-Mar-00	5.96%	5.88%	0.08%
8-Mar-00	5.97%	5.88%	0.09%
9-Mar-00	5.99%	5.94%	0.05%
10-Mar-00	6.00%	5.78%	0.22%
13-Mar-00	6.00%	5.94%	0.06%
14-Mar-00	6.02%	5.97%	0.05%
15-Mar-00	6.04%	5.97%	0.07%
16-Mar-00	6.07%	6.00%	0.07%
17-Mar-00	6.10%	6.03%	0.07%
20-Mar-00	6.11%	6.06%	0.05%
21-Mar-00	6.12%	6.06%	0.06%
22-Mar-00	6.12%	6.06%	0.06%
23-Mar-00	6.13%	6.06%	0.07%
24-Mar-00	6.13%	6.06%	0.07%
27-Mar-00	6.13%	6.06%	0.07%
28-Mar-00	6.13%	6.06%	0.07%
29-Mar-00	6.13%	6.06%	0.07%
30-Mar-00	6.13%	6.06%	0.07%
31-Mar-00	6.13%	6.06%	0.07%
3-Apr-00	6.13%	6.06%	0.07%
4-Apr-00	6.13%	6.06%	0.07%
5-Apr-00	6.13%	6.06%	0.07%
6-Apr-00	6.13%	6.06%	0.07%
7-Apr-00	6.13%	6.03%	0.10%
10-Apr-00	6.13%	6.06%	0.07%
11-Apr-00	6.13%	6.03%	0.10%



12-Apr-00	6.13%	6.03%	0.10%
13-Apr-00	6.13%	6.03%	0.10%
14-Apr-00	6.13%	6.03%	0.10%
17-Apr-00	6.13%	6.03%	0.10%
18-Apr-00	6.13%	6.03%	0.10%
19-Apr-00	6.15%	6.06%	0.09%
20-Apr-00	6.15%	6.06%	0.09%
25-Apr-00	6.16%	6.09%	0.07%
26-Apr-00	6.18%	6.13%	0.05%
27-Apr-00	6.20%	6.13%	0.07%
28-Apr-00	6.29%	6.25%	0.04%
2-May-00	6.36%	6.28%	0.08%
3-May-00	6.38%	6.31%	0.07%
4-May-00	6.43%	6.38%	0.05%
5-May-00	6.44%	6.38%	0.06%
8-May-00	6.46%	6.41%	0.05%
9-May-00	6.48%	6.44%	0.04%
10-May-00	6.50%	6.44%	0.06%
11-May-00	6.52%	6.47%	0.05%
12-May-00	6.54%	6.50%	0.04%
15-May-00	6.57%	6.53%	0.04%
16-May-00	6.58%	6.50%	0.08%
17-May-00	6.61%	6.53%	0.08%
18-May-00	6.61%	6.53%	0.08%
19-May-00	6.61%	6.53%	0.08%
22-May-00	6.61%	6.53%	0.08%
23-May-00	6.61%	6.53%	0.08%
24-May-00	6.61%	6.53%	0.08%
25-May-00	6.61%	6.56%	0.05%
26-May-00	6.62%	6.53%	0.09%
30-May-00	6.64%	6.56%	0.08%
31-May-00	6.65%	6.56%	0.09%
1-Jun-00	6.66%	6.56%	0.10%
2-Jun-00	6.66%	6.53%	0.13%
5-Jun-00	6.62%	6.53%	0.09%
6-Jun-00	6.63%	6.53%	0.10%
7-Jun-00	6.63%	6.53%	0.10%
8-Jun-00	6.64%	6.56%	0.08%
9-Jun-00	6.64%	6.56%	0.08%
12-Jun-00	6.65%	6.59%	0.06%
13-Jun-00	6.65%	6.56%	0.09%
14-Jun-00	6.65%	6.56%	0.09%
15-Jun-00	6.65%	6.59%	0.06%
16-Jun-00	6.65%	6.63%	0.02%
19-Jun-00	6.65%	6.59%	0.06%
20-Jun-00	6.65%	6.59%	0.06%
21-Jun-00	6.65%	6.59%	0.06%

22-Jun-00	6.65%	6.59%	0.06%
23-Jun-00	6.65%	6.59%	0.06%
26-Jun-00	6.67%	6.63%	0.04%
27-Jun-00	6.67%	6.66%	0.01%
28-Jun-00	6.68%	6.66%	0.02%
29-Jun-00	6.65%	6.56%	0.09%
30-Jun-00	6.64%	6.56%	0.08%
3-Jul-00	6.64%	6.56%	0.08%
5-Jul-00	6.63%	6.56%	0.07%
6-Jul-00	6.63%	6.56%	0.07%
7-Jul-00	6.63%	6.53%	0.10%
10-Jul-00	6.63%	6.56%	0.07%
11-Jul-00	6.63%	6.56%	0.07%
12-Jul-00	6.63%	6.56%	0.07%
13-Jul-00	6.63%	6.53%	0.10%
14-Jul-00	6.63%	6.53%	0.10%
17-Jul-00	6.63%	6.53%	0.10%
18-Jul-00	6.63%	6.53%	0.10%
19-Jul-00	6.63%	6.53%	0.10%
20-Jul-00	6.63%	6.53%	0.10%
21-Jul-00	6.62%	6.53%	0.09%
24-Jul-00	6.62%	6.53%	0.09%
25-Jul-00	6.62%	6.53%	0.09%
26-Jul-00	6.62%	6.53%	0.09%
27-Jul-00	6.62%	6.53%	0.09%
28-Jul-00	6.62%	6.53%	0.09%
31-Jul-00	6.62%	6.53%	0.09%
1-Aug-00	6.62%	6.53%	0.09%
2-Aug-00	6.62%	6.53%	0.09%
3-Aug-00	6.62%	6.53%	0.09%
4-Aug-00	6.62%	6.53%	0.09%
7-Aug-00	6.62%	6.53%	0.09%
8-Aug-00	6.62%	6.53%	0.09%
9-Aug-00	6.62%	6.50%	0.12%
10-Aug-00	6.62%	6.53%	0.09%
11-Aug-00	6.62%	6.53%	0.09%
14-Aug-00	6.62%	6.53%	0.09%
15-Aug-00	6.62%	6.53%	0.09%
16-Aug-00	6.62%	6.53%	0.09%
17-Aug-00	6.62%	6.53%	0.09%
18-Aug-00	6.62%	6.53%	0.09%
21-Aug-00	6.62%	6.53%	0.09%
22-Aug-00	6.62%	6.53%	0.09%
23-Aug-00	6.62%	6.53%	0.09%
24-Aug-00	6.62%	6.52%	0.10%
25-Aug-00	6.62%	6.52%	0.10%
29-Aug-00	6.62%	6.52%	0.10%

30-Aug-00	6.63%	6.53%	0.10%
31-Aug-00	6.63%	6.53%	0.10%
1-Sep-00	6.63%	6.54%	0.09%
5-Sep-00	6.62%	6.53%	0.09%
6-Sep-00	6.62%	6.53%	0.09%
7-Sep-00	6.62%	6.53%	0.09%
8-Sep-00	6.62%	6.53%	0.09%
11-Sep-00	6.62%	6.53%	0.09%
12-Sep-00	6.62%	6.53%	0.09%
13-Sep-00	6.62%	6.54%	0.08%
14-Sep-00	6.62%	6.55%	0.07%
15-Sep-00	6.62%	6.54%	0.08%
18-Sep-00	6.62%	6.54%	0.08%
19-Sep-00	6.62%	6.53%	0.09%
20-Sep-00	6.62%	6.54%	0.08%
21-Sep-00	6.62%	6.54%	0.08%
22-Sep-00	6.62%	6.54%	0.08%
25-Sep-00	6.62%	6.54%	0.08%
26-Sep-00	6.62%	6.54%	0.08%
27-Sep-00	6.62%	6.54%	0.08%
28-Sep-00	6.62%	6.53%	0.09%
29-Sep-00	6.62%	6.53%	0.09%
2-Oct-00	6.62%	6.54%	0.08%
3-Oct-00	6.62%	6.53%	0.09%
4-Oct-00	6.62%	6.53%	0.09%
5-Oct-00	6.62%	6.53%	0.09%
6-Oct-00	6.62%	6.53%	0.09%
10-Oct-00	6.62%	6.53%	0.09%
11-Oct-00	6.62%	6.50%	0.12%
12-Oct-00	6.62%	6.53%	0.09%
13-Oct-00	6.62%	6.53%	0.09%
16-Oct-00	6.62%	6.53%	0.09%
17-Oct-00	6.62%	6.53%	0.09%
18-Oct-00	6.62%	6.53%	0.09%
19-Oct-00	6.62%	6.52%	0.10%
20-Oct-00	6.62%	6.53%	0.09%
23-Oct-00	6.62%	6.52%	0.10%
24-Oct-00	6.62%	6.53%	0.09%
25-Oct-00	6.62%	6.52%	0.10%
26-Oct-00	6.62%	6.53%	0.09%
27-Oct-00	6.62%	6.53%	0.09%
30-Oct-00	6.62%	6.53%	0.09%
31-Oct-00	6.62%	6.53%	0.09%
1-Nov-00	6.62%	6.53%	0.09%
2-Nov-00	6.62%	6.53%	0.09%
3-Nov-00	6.62%	6.53%	0.09%
6-Nov-00	6.62%	6.53%	0.09%

7-Nov-00	6.62%	6.53%	0.09%
8-Nov-00	6.62%	6.53%	0.09%
9-Nov-00	6.62%	6.53%	0.09%
10-Nov-00	6.62%	6.53%	0.09%
13-Nov-00	6.62%	6.50%	0.12%
14-Nov-00	6.62%	6.53%	0.09%
15-Nov-00	6.62%	6.53%	0.09%
16-Nov-00	6.62%	6.53%	0.09%
17-Nov-00	6.62%	6.53%	0.09%
20-Nov-00	6.62%	6.53%	0.09%
21-Nov-00	6.62%	6.53%	0.09%
22-Nov-00	6.62%	6.53%	0.09%
24-Nov-00	6.62%	6.53%	0.09%
27-Nov-00	6.62%	6.53%	0.09%
28-Nov-00	6.62%	6.53%	0.09%
29-Nov-00	6.82%	6.71%	0.11%
30-Nov-00	6.80%	6.69%	0.11%
1-Dec-00	6.78%	6.66%	0.12%
4-Dec-00	6.78%	6.66%	0.12%
5-Dec-00	6.77%	6.66%	0.11%
6-Dec-00	6.75%	6.63%	0.12%
7-Dec-00	6.73%	6.62%	0.11%
8-Dec-00	6.72%	6.62%	0.10%
11-Dec-00	6.71%	6.60%	0.11%
12-Dec-00	6.71%	6.60%	0.11%
13-Dec-00	6.71%	6.60%	0.11%
14-Dec-00	6.70%	6.59%	0.11%
15-Dec-00	6.70%	6.59%	0.11%
18-Dec-00	6.69%	6.56%	0.13%
19-Dec-00	6.67%	6.53%	0.14%
20-Dec-00	6.66%	6.53%	0.13%
21-Dec-00	6.65%	6.55%	0.10%
22-Dec-00	6.65%	6.55%	0.10%
27-Dec-00	6.64%	6.53%	0.11%
28-Dec-00	6.56%	6.47%	0.09%
29-Dec-00	6.56%	6.48%	0.08%
2-Jan-01	6.55%	6.46%	0.09%
3-Jan-01	6.51%	6.41%	0.10%
4-Jan-01	6.05%	5.95%	0.10%
5-Jan-01	5.94%	5.85%	0.09%
8-Jan-01	5.88%	5.78%	0.10%
9-Jan-01	5.88%	5.80%	0.08%
10-Jan-01	5.89%	5.78%	0.11%
11-Jan-01	5.88%	5.80%	0.08%
12-Jan-01	5.88%	5.82%	0.06%
16-Jan-01	5.90%	5.81%	0.09%
17-Jan-01	5.90%	5.81%	0.09%

18-Jan-01	5.84%	5.75%	0.09%
19-Jan-01	5.79%	5.75%	0.04%
22-Jan-01	5.73%	5.65%	0.08%
23-Jan-01	5.71%	5.64%	0.07%
24-Jan-01	5.74%	5.65%	0.09%
25-Jan-01	5.72%	5.66%	0.05%
26-Jan-01	5.69%	5.66%	0.02%
29-Jan-01	5.65%	5.53%	0.12%
30-Jan-01	5.63%	5.53%	0.09%
31-Jan-01	5.57%	5.48%	0.09%
1-Feb-01	5.56%	5.49%	0.07%
2-Feb-01	5.57%	5.49%	0.08%
5-Feb-01	5.57%	5.50%	0.07%
6-Feb-01	5.57%	5.50%	0.07%
7-Feb-01	5.57%	5.50%	0.07%
8-Feb-01	5.57%	5.51%	0.06%
9-Feb-01	5.57%	5.50%	0.07%
12-Feb-01	5.57%	5.49%	0.08%
13-Feb-01	5.57%	5.50%	0.07%
14-Feb-01	5.57%	5.50%	0.07%
15-Feb-01	5.58%	5.50%	0.08%
16-Feb-01	5.58%	5.50%	0.08%
20-Feb-01	5.57%	5.51%	0.06%
21-Feb-01	5.56%	5.50%	0.06%
22-Feb-01	5.53%	5.45%	0.08%
23-Feb-01	5.48%	5.41%	0.07%
26-Feb-01	5.38%	5.25%	0.13%
27-Feb-01	5.28%	5.18%	0.10%
28-Feb-01	5.21%	5.13%	0.08%
1-Mar-01	5.29%	5.25%	0.04%
2-Mar-01	5.29%	5.25%	0.04%
5-Mar-01	5.28%	5.22%	0.06%
6-Mar-01	5.27%	5.23%	0.04%
7-Mar-01	5.26%	5.22%	0.04%
8-Mar-01	5.23%	5.15%	0.08%
9-Mar-01	5.19%	5.15%	0.04%
12-Mar-01	5.19%	5.13%	0.06%
13-Mar-01	5.16%	5.09%	0.07%
14-Mar-01	5.15%	5.05%	0.10%
15-Mar-01	5.06%	4.97%	0.09%
16-Mar-01	5.01%	4.91%	0.10%
19-Mar-01	4.98%	4.90%	0.08%
20-Mar-01	4.98%	4.90%	0.08%
21-Mar-01	5.06%	5.00%	0.06%
22-Mar-01	5.05%	4.98%	0.07%
23-Mar-01	5.06%	4.98%	0.08%
26-Mar-01	5.06%	4.98%	0.08%

27-Mar-01	5.06%	4.98%	0.07%
28-Mar-01	5.08%	5.02%	0.06%
29-Mar-01	5.08%	5.00%	0.08%
30-Mar-01	5.08%	4.98%	0.10%
2-Apr-01	5.06%	5.00%	0.06%
3-Apr-01	5.06%	5.00%	0.06%
4-Apr-01	5.05%	4.98%	0.07%
5-Apr-01	5.05%	5.00%	0.05%
6-Apr-01	5.05%	4.95%	0.10%
9-Apr-01	5.02%	4.95%	0.07%
10-Apr-01	5.02%	4.93%	0.09%
11-Apr-01	5.02%	4.97%	0.05%
12-Apr-01	5.04%	4.98%	0.06%
17-Apr-01	5.05%	4.98%	0.07%
18-Apr-01	5.05%	4.97%	0.08%
19-Apr-01	4.52%	4.44%	0.08%
20-Apr-01	4.53%	4.46%	0.07%
23-Apr-01	4.51%	4.45%	0.06%
24-Apr-01	4.47%	4.43%	0.04%
25-Apr-01	4.46%	4.40%	0.06%
26-Apr-01	4.46%	4.40%	0.06%
27-Apr-01	4.43%	4.37%	0.06%
30-Apr-01	4.43%	4.36%	0.07%
1-May-01	4.43%	4.36%	0.07%
2-May-01	4.42%	4.33%	0.09%
3-May-01	4.38%	4.30%	0.08%
4-May-01	4.35%	4.14%	0.21%
8-May-01	4.18%	4.11%	0.07%
9-May-01	4.17%	4.09%	0.08%
10-May-01	4.13%	4.06%	0.07%
11-May-01	4.12%	4.07%	0.05%
14-May-01	4.15%	4.06%	0.09%
15-May-01	4.14%	4.03%	0.11%
16-May-01	4.08%	4.00%	0.08%
17-May-01	4.08%	4.00%	0.08%
18-May-01	4.09%	4.00%	0.09%
21-May-01	4.09%	4.01%	0.08%
22-May-01	4.09%	4.02%	0.07%
23-May-01	4.09%	4.02%	0.07%
24-May-01	4.08%	4.01%	0.07%
25-May-01	4.06%	4.00%	0.06%
29-May-01	4.06%	4.00%	0.06%
30-May-01	4.06%	4.00%	0.06%
31-May-01	4.06%	4.00%	0.06%
1-Jun-01	4.04%	4.00%	0.04%
4-Jun-01	4.03%	3.98%	0.05%
5-Jun-01	4.03%	3.98%	0.05%

6-Jun-01	4.02%	3.96%	0.06%
7-Jun-01	4.01%	3.98%	0.03%
8-Jun-01	4.01%	3.94%	0.07%
11-Jun-01	4.00%	3.88%	0.12%
12-Jun-01	3.99%	3.88%	0.11%
13-Jun-01	3.98%	3.88%	0.10%
14-Jun-01	3.97%	3.88%	0.09%
15-Jun-01	3.95%	3.84%	0.11%
18-Jun-01	3.88%	3.81%	0.07%
19-Jun-01	3.85%	3.76%	0.09%
20-Jun-01	3.83%	3.74%	0.09%
21-Jun-01	3.81%	3.71%	0.09%
22-Jun-01	3.79%	3.68%	0.11%
25-Jun-01	3.76%	3.65%	0.11%
26-Jun-01	3.75%	3.65%	0.10%
27-Jun-01	3.75%	3.66%	0.09%
28-Jun-01	3.84%	3.77%	0.07%
29-Jun-01	3.86%	3.79%	0.07%
2-Jul-01	3.86%	3.79%	0.07%
3-Jul-01	3.85%	3.77%	0.08%
5-Jul-01	3.85%	3.75%	0.10%
6-Jul-01	3.85%	3.75%	0.10%
9-Jul-01	3.83%	3.75%	0.08%
10-Jul-01	3.83%	3.75%	0.08%
11-Jul-01	3.83%	3.75%	0.08%
12-Jul-01	3.83%	3.71%	0.12%
13-Jul-01	3.83%	3.75%	0.08%
16-Jul-01	3.83%	3.75%	0.08%
17-Jul-01	3.83%	3.75%	0.08%
18-Jul-01	3.83%	3.75%	0.08%
19-Jul-01	3.81%	3.73%	0.08%
20-Jul-01	3.80%	3.73%	0.07%
23-Jul-01	3.79%	3.73%	0.06%
24-Jul-01	3.79%	3.73%	0.06%
25-Jul-01	3.79%	3.73%	0.06%
26-Jul-01	3.78%	3.72%	0.06%
27-Jul-01	3.78%	3.72%	0.05%
30-Jul-01	3.76%	3.70%	0.06%
31-Jul-01	3.75%	3.70%	0.05%
1-Aug-01	3.74%	3.68%	0.06%
2-Aug-01	3.73%	3.67%	0.06%
3-Aug-01	3.73%	3.66%	0.07%
6-Aug-01	3.72%	3.65%	0.07%
7-Aug-01	3.71%	3.63%	0.08%
8-Aug-01	3.71%	3.62%	0.09%
9-Aug-01	3.67%	3.58%	0.09%
10-Aug-01	3.66%	3.57%	0.09%

13-Aug-01	3.64%	3.55%	0.09%
14-Aug-01	3.63%	3.53%	0.10%
15-Aug-01	3.62%	3.52%	0.10%
16-Aug-01	3.61%	3.52%	0.09%
17-Aug-01	3.60%	3.51%	0.09%
20-Aug-01	3.58%	3.49%	0.09%
21-Aug-01	3.58%	3.49%	0.09%
22-Aug-01	3.58%	3.50%	0.08%
23-Aug-01	3.58%	3.50%	0.08%
24-Aug-01	3.58%	3.50%	0.08%
28-Aug-01	3.58%	3.51%	0.07%
29-Aug-01	3.58%	3.52%	0.06%
30-Aug-01	3.58%	3.52%	0.06%
31-Aug-01	3.58%	3.52%	0.06%
4-Sep-01	3.57%	3.52%	0.05%
5-Sep-01	3.58%	3.52%	0.06%
6-Sep-01	3.58%	3.51%	0.07%
7-Sep-01	3.57%	3.50%	0.07%
10-Sep-01	3.50%	3.41%	0.09%
17-Sep-01	3.38%	2.97%	0.41%
18-Sep-01	3.06%	2.90%	0.16%
19-Sep-01	2.79%	2.65%	0.14%
20-Sep-01	2.61%	2.55%	0.06%
21-Sep-01	2.66%	2.52%	0.14%
24-Sep-01	2.64%	2.56%	0.08%
25-Sep-01	2.67%	2.60%	0.07%
26-Sep-01	2.66%	2.60%	0.06%
27-Sep-01	2.64%	2.60%	0.04%
28-Sep-01	2.63%	2.63%	0.00%
1-Oct-01	2.64%	2.63%	0.01%
2-Oct-01	2.64%	2.55%	0.09%
3-Oct-01	2.59%	2.52%	0.07%
4-Oct-01	2.58%	2.52%	0.06%
5-Oct-01	2.56%	2.50%	0.06%
9-Oct-01	2.53%	2.46%	0.07%
10-Oct-01	2.53%	2.46%	0.07%
11-Oct-01	2.53%	2.46%	0.06%
12-Oct-01	2.53%	2.46%	0.07%
15-Oct-01	2.52%	2.45%	0.07%
16-Oct-01	2.51%	2.45%	0.06%
17-Oct-01	2.50%	2.43%	0.07%
18-Oct-01	2.46%	2.40%	0.06%
19-Oct-01	2.45%	2.36%	0.09%
22-Oct-01	2.43%	2.35%	0.08%
23-Oct-01	2.42%	2.34%	0.08%
24-Oct-01	2.41%	2.33%	0.08%
25-Oct-01	2.38%	2.30%	0.08%



26-Oct-01	2.35%	2.25%	0.10%
29-Oct-01	2.34%	2.27%	0.07%
30-Oct-01	2.32%	2.25%	0.07%
31-Oct-01	2.29%	2.19%	0.10%
1-Nov-01	2.28%	2.25%	0.03%
2-Nov-01	2.27%	2.14%	0.13%
5-Nov-01	2.22%	2.11%	0.11%
6-Nov-01	2.19%	2.10%	0.09%
7-Nov-01	2.09%	2.02%	0.07%
8-Nov-01	2.09%	2.00%	0.09%
9-Nov-01	2.09%	2.01%	0.08%
13-Nov-01	2.08%	2.00%	0.08%
14-Nov-01	2.08%	2.02%	0.06%
15-Nov-01	2.10%	2.03%	0.07%
16-Nov-01	2.10%	2.06%	0.04%
19-Nov-01	2.10%	2.04%	0.06%
20-Nov-01	2.09%	2.03%	0.06%
21-Nov-01	2.10%	2.03%	0.07%
23-Nov-01	2.11%	2.03%	0.08%
26-Nov-01	2.11%	2.04%	0.07%
27-Nov-01	2.11%	2.05%	0.06%
28-Nov-01	2.08%	2.02%	0.06%
29-Nov-01	2.14%	2.10%	0.04%
30-Nov-01	2.12%	2.04%	0.08%
3-Dec-01	2.11%	2.03%	0.08%
4-Dec-01	2.09%	2.01%	0.08%
5-Dec-01	2.04%	1.96%	0.08%
6-Dec-01	2.04%	1.95%	0.09%
7-Dec-01	2.02%	1.87%	0.15%
10-Dec-01	1.94%	1.85%	0.09%
11-Dec-01	1.92%	1.83%	0.09%
12-Dec-01	1.90%	1.83%	0.07%
13-Dec-01	1.90%	1.85%	0.05%
14-Dec-01	1.91%	1.85%	0.06%
17-Dec-01	1.92%	1.86%	0.06%
18-Dec-01	1.93%	1.89%	0.04%
19-Dec-01	1.93%	1.87%	0.06%
20-Dec-01	1.93%	1.87%	0.06%
21-Dec-01	1.93%	1.87%	0.06%
24-Dec-01	1.93%	1.88%	0.05%
27-Dec-01	1.93%	1.84%	0.09%
28-Dec-01	1.87%	1.81%	0.06%
31-Dec-01	1.87%	1.80%	0.07%
2-Jan-02	1.86%	1.80%	0.06%
3-Jan-02	1.87%	1.80%	0.07%
4-Jan-02	1.86%	1.79%	0.07%
7-Jan-02	1.85%	1.83%	0.02%

8-Jan-02	1.84%	1.75%	0.09%
9-Jan-02	1.84%	1.74%	0.10%
10-Jan-02	1.83%	1.75%	0.08%
11-Jan-02	1.82%	1.74%	0.08%
14-Jan-02	1.74%	1.68%	0.06%
15-Jan-02	1.74%	1.65%	0.09%
16-Jan-02	1.73%	1.68%	0.05%
17-Jan-02	1.74%	1.65%	0.09%
18-Jan-02	1.75%	1.68%	0.07%
22-Jan-02	1.76%	1.71%	0.05%
23-Jan-02	1.76%	1.71%	0.05%
24-Jan-02	1.77%	1.71%	0.06%
25-Jan-02	1.83%	1.75%	0.08%
28-Jan-02	1.83%	1.76%	0.07%
29-Jan-02	1.83%	1.77%	0.06%
30-Jan-02	1.83%	1.76%	0.07%
31-Jan-02	1.85%	1.79%	0.06%
1-Feb-02	1.86%	1.80%	0.06%
4-Feb-02	1.85%	1.79%	0.06%
5-Feb-02	1.84%	1.78%	0.06%
6-Feb-02	1.84%	1.78%	0.06%
7-Feb-02	1.84%	1.80%	0.04%
8-Feb-02	1.84%	1.78%	0.06%
11-Feb-02	1.84%	1.77%	0.07%
12-Feb-02	1.84%	1.78%	0.06%
13-Feb-02	1.85%	1.80%	0.05%
14-Feb-02	1.85%	1.79%	0.06%
15-Feb-02	1.85%	1.79%	0.06%
19-Feb-02	1.85%	1.79%	0.06%
20-Feb-02	1.85%	1.79%	0.06%
21-Feb-02	1.85%	1.79%	0.06%
22-Feb-02	1.85%	1.78%	0.07%
25-Feb-02	1.85%	1.75%	0.10%
26-Feb-02	1.85%	1.78%	0.07%
27-Feb-02	1.87%	1.78%	0.09%
28-Feb-02	1.87%	1.78%	0.09%
1-Mar-02	1.87%	1.77%	0.10%
4-Mar-02	1.88%	1.81%	0.07%
5-Mar-02	1.88%	1.80%	0.08%
6-Mar-02	1.88%	1.80%	0.08%
7-Mar-02	1.88%	1.81%	0.07%
8-Mar-02	1.90%	1.83%	0.07%
11-Mar-02	1.90%	1.83%	0.07%
12-Mar-02	1.90%	1.84%	0.06%
13-Mar-02	1.90%	1.83%	0.07%
14-Mar-02	1.90%	1.83%	0.07%
15-Mar-02	1.90%	1.83%	0.07%

18-Mar-02	1.90%	1.85%	0.05%
19-Mar-02	1.90%	1.85%	0.05%
20-Mar-02	1.90%	1.83%	0.07%
21-Mar-02	1.90%	1.83%	0.07%
22-Mar-02	1.90%	1.84%	0.06%
25-Mar-02	1.90%	1.85%	0.05%
26-Mar-02	1.91%	1.85%	0.06%
27-Mar-02	1.88%	1.82%	0.06%
28-Mar-02	1.88%	1.82%	0.06%
2-Apr-02	1.88%	1.82%	0.06%
3-Apr-02	1.87%	1.81%	0.06%
4-Apr-02	1.87%	1.80%	0.07%
5-Apr-02	1.87%	1.80%	0.07%
8-Apr-02	1.86%	1.80%	0.06%
9-Apr-02	1.86%	1.80%	0.06%
10-Apr-02	1.86%	1.79%	0.07%
11-Apr-02	1.86%	1.80%	0.06%
12-Apr-02	1.86%	1.78%	0.08%
15-Apr-02	1.86%	1.78%	0.08%
16-Apr-02	1.86%	1.78%	0.08%
17-Apr-02	1.86%	1.79%	0.07%
18-Apr-02	1.86%	1.79%	0.07%
19-Apr-02	1.85%	1.78%	0.07%
22-Apr-02	1.85%	1.78%	0.07%
23-Apr-02	1.85%	1.78%	0.07%
24-Apr-02	1.85%	1.78%	0.07%
25-Apr-02	1.84%	1.77%	0.07%
26-Apr-02	1.84%	1.77%	0.07%
29-Apr-02	1.84%	1.77%	0.07%
30-Apr-02	1.84%	1.78%	0.06%
1-May-02	1.84%	1.78%	0.06%
2-May-02	1.84%	1.79%	0.05%
3-May-02	1.84%	1.78%	0.06%
7-May-02	1.84%	1.78%	0.06%
8-May-02	1.84%	1.78%	0.06%
9-May-02	1.84%	1.77%	0.07%
10-May-02	1.84%	1.77%	0.07%
13-May-02	1.84%	1.78%	0.06%
14-May-02	1.84%	1.78%	0.06%
15-May-02	1.84%	1.78%	0.06%
16-May-02	1.84%	1.75%	0.09%
17-May-02	1.84%	1.78%	0.06%
20-May-02	1.84%	1.78%	0.06%
21-May-02	1.84%	1.78%	0.06%
22-May-02	1.84%	1.78%	0.06%
23-May-02	1.84%	1.78%	0.06%
24-May-02	1.84%	1.78%	0.06%

28-May-02	1.84%	1.78%	0.06%
29-May-02	1.84%	1.79%	0.05%
30-May-02	1.84%	1.78%	0.06%
31-May-02	1.84%	1.79%	0.05%
5-Jun-02	1.84%	1.78%	0.06%
6-Jun-02	1.84%	1.78%	0.06%
7-Jun-02	1.84%	1.78%	0.06%
10-Jun-02	1.84%	1.78%	0.06%
11-Jun-02	1.84%	1.78%	0.06%
12-Jun-02	1.84%	1.78%	0.06%
13-Jun-02	1.84%	1.78%	0.06%
14-Jun-02	1.84%	1.78%	0.06%
17-Jun-02	1.84%	1.78%	0.06%
18-Jun-02	1.84%	1.77%	0.07%
19-Jun-02	1.84%	1.77%	0.07%
20-Jun-02	1.84%	1.77%	0.07%
21-Jun-02	1.84%	1.78%	0.06%
24-Jun-02	1.84%	1.78%	0.06%
25-Jun-02	1.84%	1.78%	0.06%
26-Jun-02	1.84%	1.78%	0.06%
27-Jun-02	1.84%	1.77%	0.07%
28-Jun-02	1.84%	1.78%	0.06%
1-Jul-02	1.84%	1.78%	0.06%
2-Jul-02	1.84%	1.78%	0.06%
3-Jul-02	1.84%	1.78%	0.06%
5-Jul-02	1.84%	1.77%	0.07%
8-Jul-02	1.84%	1.78%	0.06%
9-Jul-02	1.84%	1.78%	0.06%
10-Jul-02	1.84%	1.77%	0.07%
11-Jul-02	1.84%	1.78%	0.06%
12-Jul-02	1.84%	1.77%	0.07%
15-Jul-02	1.84%	1.77%	0.07%
16-Jul-02	1.84%	1.77%	0.07%
17-Jul-02	1.84%	1.77%	0.07%
18-Jul-02	1.84%	1.77%	0.07%
19-Jul-02	1.84%	1.77%	0.07%
22-Jul-02	1.84%	1.78%	0.06%
23-Jul-02	1.84%	1.76%	0.08%
24-Jul-02	1.82%	1.75%	0.07%
25-Jul-02	1.82%	1.76%	0.06%
26-Jul-02	1.81%	1.75%	0.06%
29-Jul-02	1.81%	1.75%	0.06%
30-Jul-02	1.82%	1.75%	0.07%
31-Jul-02	1.82%	1.76%	0.06%
1-Aug-02	1.81%	1.76%	0.05%
2-Aug-02	1.80%	1.75%	0.05%
5-Aug-02	1.79%	1.72%	0.07%

6-Aug-02	1.78%	1.73%	0.05%
7-Aug-02	1.78%	1.73%	0.05%
8-Aug-02	1.78%	1.72%	0.06%
9-Aug-02	1.78%	1.72%	0.06%
12-Aug-02	1.78%	1.72%	0.06%
13-Aug-02	1.78%	1.72%	0.06%
14-Aug-02	1.78%	1.72%	0.06%
15-Aug-02	1.79%	1.74%	0.05%
16-Aug-02	1.80%	1.74%	0.06%
19-Aug-02	1.81%	1.74%	0.07%
20-Aug-02	1.81%	1.75%	0.06%
21-Aug-02	1.81%	1.75%	0.06%
22-Aug-02	1.81%	1.75%	0.06%
23-Aug-02	1.81%	1.75%	0.06%
27-Aug-02	1.81%	1.76%	0.05%
28-Aug-02	1.82%	1.77%	0.05%
29-Aug-02	1.82%	1.77%	0.05%
30-Aug-02	1.82%	1.77%	0.05%
3-Sep-02	1.82%	1.77%	0.05%
4-Sep-02	1.81%	1.76%	0.05%
5-Sep-02	1.81%	1.76%	0.05%
6-Sep-02	1.81%	1.76%	0.05%
9-Sep-02	1.81%	1.76%	0.05%
10-Sep-02	1.82%	1.77%	0.05%
11-Sep-02	1.82%	1.77%	0.05%
12-Sep-02	1.82%	1.77%	0.05%
13-Sep-02	1.82%	1.77%	0.05%
16-Sep-02	1.82%	1.77%	0.05%
17-Sep-02	1.82%	1.77%	0.05%
18-Sep-02	1.82%	1.77%	0.05%
19-Sep-02	1.82%	1.77%	0.05%
20-Sep-02	1.82%	1.76%	0.05%
23-Sep-02	1.81%	1.75%	0.06%
24-Sep-02	1.81%	1.76%	0.05%
25-Sep-02	1.81%	1.77%	0.04%
26-Sep-02	1.81%	1.77%	0.04%
27-Sep-02	1.82%	1.77%	0.05%
30-Sep-02	1.81%	1.78%	0.03%
1-Oct-02	1.80%	1.76%	0.04%
2-Oct-02	1.80%	1.76%	0.04%
3-Oct-02	1.80%	1.76%	0.04%
4-Oct-02	1.80%	1.76%	0.04%
7-Oct-02	1.80%	1.76%	0.04%
8-Oct-02	1.80%	1.76%	0.04%
9-Oct-02	1.80%	1.76%	0.04%
10-Oct-02	1.80%	1.76%	0.04%
11-Oct-02	1.80%	1.75%	0.05%

15-Oct-02	1.82%	1.76%	0.05%
16-Oct-02	1.82%	1.77%	0.05%
17-Oct-02	1.83%	1.77%	0.06%
18-Oct-02	1.83%	1.77%	0.06%
21-Oct-02	1.83%	1.77%	0.06%
22-Oct-02	1.83%	1.79%	0.04%
23-Oct-02	1.83%	1.77%	0.06%
24-Oct-02	1.83%	1.78%	0.05%
25-Oct-02	1.82%	1.78%	0.04%
28-Oct-02	1.80%	1.76%	0.04%
29-Oct-02	1.79%	1.74%	0.05%
30-Oct-02	1.74%	1.67%	0.07%
31-Oct-02	1.72%	1.64%	0.08%
1-Nov-02	1.69%	1.62%	0.07%
4-Nov-02	1.65%	1.56%	0.09%
5-Nov-02	1.64%	1.55%	0.09%
6-Nov-02	1.63%	1.53%	0.10%
7-Nov-02	1.38%	1.31%	0.07%
8-Nov-02	1.38%	1.30%	0.08%
12-Nov-02	1.38%	1.31%	0.07%
13-Nov-02	1.38%	1.32%	0.06%
14-Nov-02	1.38%	1.32%	0.06%
15-Nov-02	1.39%	1.33%	0.06%
18-Nov-02	1.39%	1.33%	0.06%
19-Nov-02	1.39%	1.32%	0.07%
20-Nov-02	1.38%	1.31%	0.07%
21-Nov-02	1.38%	1.31%	0.07%
22-Nov-02	1.38%	1.31%	0.07%
25-Nov-02	1.38%	1.31%	0.07%
26-Nov-02	1.38%	1.31%	0.07%
27-Nov-02	1.38%	1.30%	0.08%
29-Nov-02	1.44%	1.38%	0.06%
2-Dec-02	1.44%	1.39%	0.05%
3-Dec-02	1.44%	1.38%	0.06%
4-Dec-02	1.44%	1.38%	0.06%
5-Dec-02	1.43%	1.38%	0.05%
6-Dec-02	1.43%	1.36%	0.07%
9-Dec-02	1.42%	1.36%	0.06%
10-Dec-02	1.42%	1.36%	0.06%
11-Dec-02	1.42%	1.35%	0.07%
12-Dec-02	1.42%	1.35%	0.07%
13-Dec-02	1.42%	1.35%	0.07%
16-Dec-02	1.42%	1.35%	0.07%
17-Dec-02	1.42%	1.35%	0.07%
18-Dec-02	1.42%	1.35%	0.07%
19-Dec-02	1.42%	1.35%	0.07%
20-Dec-02	1.42%	1.35%	0.07%

23-Dec-02	1.42%	1.35%	0.07%
24-Dec-02	1.42%	1.36%	0.06%
27-Dec-02	1.42%	1.35%	0.07%
30-Dec-02	1.38%	1.32%	0.06%
31-Dec-02	1.38%	1.30%	0.08%
2-Jan-03	1.38%	1.32%	0.06%
3-Jan-03	1.38%	1.32%	0.06%
6-Jan-03	1.38%	1.32%	0.06%
7-Jan-03	1.38%	1.30%	0.08%
8-Jan-03	1.38%	1.28%	0.10%
9-Jan-03	1.38%	1.29%	0.09%
10-Jan-03	1.37%	1.28%	0.09%
13-Jan-03	1.37%	1.29%	0.08%
14-Jan-03	1.37%	1.28%	0.09%
15-Jan-03	1.37%	1.28%	0.09%
16-Jan-03	1.36%	1.28%	0.08%
17-Jan-03	1.36%	1.28%	0.08%
21-Jan-03	1.36%	1.28%	0.08%
22-Jan-03	1.36%	1.28%	0.08%
23-Jan-03	1.35%	1.28%	0.07%
24-Jan-03	1.35%	1.27%	0.08%
27-Jan-03	1.34%	1.26%	0.08%
28-Jan-03	1.34%	1.25%	0.09%
29-Jan-03	1.34%	1.26%	0.08%
30-Jan-03	1.34%	1.27%	0.07%
31-Jan-03	1.34%	1.26%	0.08%
3-Feb-03	1.34%	1.27%	0.07%
4-Feb-03	1.34%	1.27%	0.07%
5-Feb-03	1.34%	1.24%	0.10%
6-Feb-03	1.34%	1.26%	0.08%
7-Feb-03	1.34%	1.26%	0.08%
10-Feb-03	1.34%	1.25%	0.09%
11-Feb-03	1.34%	1.26%	0.08%
12-Feb-03	1.34%	1.26%	0.08%
13-Feb-03	1.34%	1.26%	0.08%
14-Feb-03	1.34%	1.26%	0.08%
18-Feb-03	1.34%	1.31%	0.03%
19-Feb-03	1.34%	1.26%	0.08%
20-Feb-03	1.34%	1.26%	0.08%
21-Feb-03	1.34%	1.26%	0.08%
24-Feb-03	1.34%	1.26%	0.08%
25-Feb-03	1.34%	1.25%	0.09%
26-Feb-03	1.34%	1.26%	0.08%
27-Feb-03	1.34%	1.26%	0.08%
28-Feb-03	1.34%	1.26%	0.08%
3-Mar-03	1.34%	1.25%	0.09%
4-Mar-03	1.33%	1.25%	0.08%

5-Mar-03	1.33%	1.25%	0.08%
6-Mar-03	1.33%	1.25%	0.07%
7-Mar-03	1.32%	1.23%	0.09%
10-Mar-03	1.29%	1.23%	0.06%
11-Mar-03	1.27%	1.20%	0.07%
12-Mar-03	1.27%	1.20%	0.07%
13-Mar-03	1.28%	1.21%	0.07%
14-Mar-03	1.30%	1.21%	0.09%
17-Mar-03	1.28%	1.22%	0.06%
18-Mar-03	1.28%	1.21%	0.07%
19-Mar-03	1.30%	1.25%	0.05%
20-Mar-03	1.30%	1.25%	0.05%
21-Mar-03	1.31%	1.25%	0.05%
24-Mar-03	1.31%	1.25%	0.06%
25-Mar-03	1.31%	1.25%	0.06%
26-Mar-03	1.31%	1.25%	0.06%
27-Mar-03	1.31%	1.25%	0.06%
28-Mar-03	1.31%	1.25%	0.06%
31-Mar-03	1.30%	1.25%	0.05%
1-Apr-03	1.30%	1.25%	0.05%
2-Apr-03	1.30%	1.25%	0.05%
3-Apr-03	1.30%	1.25%	0.05%
4-Apr-03	1.30%	1.25%	0.05%
7-Apr-03	1.31%	1.25%	0.06%
8-Apr-03	1.31%	1.26%	0.05%
9-Apr-03	1.31%	1.25%	0.06%
10-Apr-03	1.30%	1.25%	0.05%
11-Apr-03	1.31%	1.25%	0.06%
14-Apr-03	1.31%	1.26%	0.05%
15-Apr-03	1.32%	1.25%	0.07%
16-Apr-03	1.33%	1.26%	0.07%
17-Apr-03	1.32%	1.28%	0.04%
22-Apr-03	1.32%	1.26%	0.06%
23-Apr-03	1.32%	1.25%	0.07%
24-Apr-03	1.32%	1.25%	0.07%
25-Apr-03	1.32%	1.25%	0.07%
28-Apr-03	1.32%	1.26%	0.06%
29-Apr-03	1.32%	1.26%	0.06%
30-Apr-03	1.32%	1.26%	0.06%
1-May-03	1.31%	1.26%	0.05%
2-May-03	1.31%	1.25%	0.06%
6-May-03	1.31%	1.26%	0.05%
7-May-03	1.31%	1.25%	0.06%
8-May-03	1.31%	1.25%	0.06%
9-May-03	1.31%	1.26%	0.05%
12-May-03	1.31%	1.25%	0.06%
13-May-03	1.31%	1.26%	0.05%



14-May-03	1.31%	1.26%	0.05%
15-May-03	1.32%	1.26%	0.06%
16-May-03	1.32%	1.26%	0.06%
19-May-03	1.32%	1.25%	0.07%
20-May-03	1.32%	1.25%	0.07%
21-May-03	1.32%	1.25%	0.07%
22-May-03	1.32%	1.26%	0.06%
23-May-03	1.32%	1.25%	0.07%
27-May-03	1.32%	1.25%	0.07%
28-May-03	1.32%	1.26%	0.06%
29-May-03	1.32%	1.26%	0.06%
30-May-03	1.32%	1.25%	0.07%
2-Jun-03	1.32%	1.26%	0.06%
3-Jun-03	1.32%	1.26%	0.06%
4-Jun-03	1.31%	1.25%	0.06%
5-Jun-03	1.29%	1.21%	0.08%
6-Jun-03	1.27%	1.20%	0.07%
9-Jun-03	1.26%	1.17%	0.09%
10-Jun-03	1.25%	1.16%	0.09%
11-Jun-03	1.22%	1.12%	0.10%
12-Jun-03	1.18%	1.09%	0.09%
13-Jun-03	1.14%	1.06%	0.08%
16-Jun-03	1.11%	1.02%	0.09%
17-Jun-03	1.09%	1.00%	0.09%
18-Jun-03	1.10%	1.02%	0.08%
19-Jun-03	1.06%	0.96%	0.10%
20-Jun-03	1.04%	0.96%	0.08%
23-Jun-03	1.04%	0.95%	0.09%
24-Jun-03	1.03%	0.94%	0.09%
25-Jun-03	1.02%	0.94%	0.08%
26-Jun-03	1.11%	1.05%	0.06%
27-Jun-03	1.12%	1.05%	0.07%
30-Jun-03	1.12%	1.04%	0.08%
1-Jul-03	1.12%	1.05%	0.07%
2-Jul-03	1.12%	1.05%	0.07%
3-Jul-03	1.12%	1.05%	0.07%
7-Jul-03	1.11%	1.05%	0.06%
8-Jul-03	1.11%	1.05%	0.06%
9-Jul-03	1.11%	1.05%	0.06%
10-Jul-03	1.11%	1.04%	0.07%
11-Jul-03	1.11%	1.04%	0.07%
14-Jul-03	1.10%	1.03%	0.07%
15-Jul-03	1.10%	1.04%	0.06%
16-Jul-03	1.10%	1.06%	0.04%
17-Jul-03	1.10%	1.07%	0.03%
18-Jul-03	1.10%	1.03%	0.07%
21-Jul-03	1.10%	1.03%	0.07%

22-Jul-03	1.10%	1.03%	0.07%
23-Jul-03	1.10%	1.04%	0.06%
24-Jul-03	1.10%	1.04%	0.06%
25-Jul-03	1.10%	1.04%	0.06%
28-Jul-03	1.10%	1.04%	0.06%
29-Jul-03	1.10%	1.04%	0.06%
30-Jul-03	1.10%	1.05%	0.05%
31-Jul-03	1.10%	1.04%	0.06%
1-Aug-03	1.11%	1.05%	0.06%
4-Aug-03	1.11%	1.05%	0.06%
5-Aug-03	1.11%	1.05%	0.06%
6-Aug-03	1.11%	1.04%	0.07%
7-Aug-03	1.11%	1.05%	0.06%
8-Aug-03	1.11%	1.04%	0.07%
11-Aug-03	1.11%	1.05%	0.06%
12-Aug-03	1.11%	1.05%	0.06%
13-Aug-03	1.11%	1.05%	0.06%
14-Aug-03	1.11%	1.05%	0.06%
15-Aug-03	1.11%	1.10%	0.01%
18-Aug-03	1.11%	1.06%	0.05%
19-Aug-03	1.11%	1.05%	0.06%
20-Aug-03	1.11%	1.05%	0.06%
21-Aug-03	1.11%	1.05%	0.06%
22-Aug-03	1.11%	1.05%	0.06%
26-Aug-03	1.11%	1.06%	0.05%
27-Aug-03	1.11%	1.05%	0.06%
28-Aug-03	1.12%	1.06%	0.06%
29-Aug-03	1.12%	1.07%	0.05%
2-Sep-03	1.12%	1.07%	0.05%
3-Sep-03	1.12%	1.07%	0.05%
4-Sep-03	1.12%	1.06%	0.06%
5-Sep-03	1.12%	1.06%	0.06%
8-Sep-03	1.12%	1.06%	0.06%
9-Sep-03	1.12%	1.06%	0.06%
10-Sep-03	1.12%	1.06%	0.06%
11-Sep-03	1.12%	1.06%	0.06%
12-Sep-03	1.12%	1.06%	0.06%
15-Sep-03	1.12%	1.06%	0.06%
16-Sep-03	1.12%	1.06%	0.06%
17-Sep-03	1.12%	1.06%	0.06%
18-Sep-03	1.12%	1.10%	0.02%
19-Sep-03	1.12%	1.10%	0.02%
22-Sep-03	1.12%	1.05%	0.07%
23-Sep-03	1.12%	1.05%	0.07%
24-Sep-03	1.12%	1.05%	0.07%
25-Sep-03	1.12%	1.05%	0.07%
26-Sep-03	1.12%	1.05%	0.07%

29-Sep-03	1.12%	1.05%	0.07%
30-Sep-03	1.12%	1.05%	0.07%
1-Oct-03	1.12%	1.05%	0.07%
2-Oct-03	1.12%	1.05%	0.07%
3-Oct-03	1.12%	1.05%	0.07%
6-Oct-03	1.12%	1.05%	0.07%
7-Oct-03	1.12%	1.05%	0.07%
8-Oct-03	1.12%	1.05%	0.07%
9-Oct-03	1.12%	1.04%	0.08%
10-Oct-03	1.12%	1.05%	0.07%
14-Oct-03	1.12%	1.05%	0.07%
15-Oct-03	1.12%	1.05%	0.07%
16-Oct-03	1.12%	1.05%	0.07%
17-Oct-03	1.12%	1.05%	0.07%
20-Oct-03	1.12%	1.05%	0.07%
21-Oct-03	1.12%	1.05%	0.07%
22-Oct-03	1.12%	1.05%	0.07%
23-Oct-03	1.12%	1.04%	0.08%
24-Oct-03	1.12%	1.05%	0.07%
27-Oct-03	1.12%	1.05%	0.07%
28-Oct-03	1.12%	1.05%	0.07%
29-Oct-03	1.12%	1.04%	0.08%
30-Oct-03	1.12%	1.05%	0.07%
31-Oct-03	1.12%	1.04%	0.08%
3-Nov-03	1.12%	1.04%	0.08%
4-Nov-03	1.12%	1.04%	0.08%
5-Nov-03	1.12%	1.04%	0.08%
6-Nov-03	1.12%	1.04%	0.08%
7-Nov-03	1.12%	1.04%	0.08%
10-Nov-03	1.12%	1.04%	0.08%
12-Nov-03	1.12%	1.04%	0.08%
13-Nov-03	1.12%	1.04%	0.08%
14-Nov-03	1.12%	1.04%	0.08%
17-Nov-03	1.12%	1.04%	0.08%
18-Nov-03	1.12%	1.04%	0.08%
19-Nov-03	1.12%	1.03%	0.09%
20-Nov-03	1.12%	1.04%	0.08%
21-Nov-03	1.12%	1.03%	0.09%
24-Nov-03	1.12%	1.03%	0.09%
25-Nov-03	1.12%	1.04%	0.08%
26-Nov-03	1.12%	1.04%	0.08%
28-Nov-03	1.17%	1.09%	0.08%
1-Dec-03	1.17%	1.10%	0.07%
2-Dec-03	1.17%	1.10%	0.07%
3-Dec-03	1.17%	1.09%	0.08%
4-Dec-03	1.17%	1.09%	0.08%
5-Dec-03	1.17%	1.09%	0.08%

8-Dec-03	1.17%	1.08%	0.09%
9-Dec-03	1.17%	1.09%	0.08%
10-Dec-03	1.17%	1.08%	0.09%
11-Dec-03	1.16%	1.08%	0.08%
12-Dec-03	1.15%	1.07%	0.08%
15-Dec-03	1.15%	1.06%	0.09%
16-Dec-03	1.15%	1.06%	0.09%
17-Dec-03	1.15%	1.07%	0.08%
18-Dec-03	1.15%	1.06%	0.09%
19-Dec-03	1.15%	1.06%	0.09%
22-Dec-03	1.14%	1.07%	0.07%
23-Dec-03	1.14%	1.07%	0.07%
24-Dec-03	1.14%	1.07%	0.07%
29-Dec-03	1.13%	1.06%	0.07%
30-Dec-03	1.12%	1.04%	0.08%
31-Dec-03	1.12%	1.04%	0.08%
2-Jan-04	1.12%	1.05%	0.07%
5-Jan-04	1.12%	1.04%	0.08%
6-Jan-04	1.12%	1.04%	0.08%
7-Jan-04	1.11%	1.03%	0.08%
8-Jan-04	1.11%	1.03%	0.08%
9-Jan-04	1.11%	1.03%	0.08%
12-Jan-04	1.10%	1.03%	0.07%
13-Jan-04	1.10%	1.03%	0.07%
14-Jan-04	1.10%	1.03%	0.07%
15-Jan-04	1.10%	1.03%	0.07%
16-Jan-04	1.10%	1.02%	0.08%
20-Jan-04	1.10%	1.03%	0.07%
21-Jan-04	1.10%	1.02%	0.08%
22-Jan-04	1.10%	1.02%	0.08%
23-Jan-04	1.10%	1.02%	0.08%
26-Jan-04	1.10%	1.02%	0.08%
27-Jan-04	1.10%	1.02%	0.08%
28-Jan-04	1.10%	1.02%	0.08%
29-Jan-04	1.10%	1.02%	0.08%
30-Jan-04	1.10%	1.01%	0.09%
2-Feb-04	1.10%	1.02%	0.08%
3-Feb-04	1.10%	1.02%	0.08%
4-Feb-04	1.10%	1.02%	0.08%
5-Feb-04	1.10%	1.02%	0.08%
6-Feb-04	1.10%	1.02%	0.08%
9-Feb-04	1.10%	1.02%	0.08%
10-Feb-04	1.10%	1.02%	0.08%
11-Feb-04	1.10%	1.02%	0.08%
12-Feb-04	1.09%	1.02%	0.07%
13-Feb-04	1.09%	1.02%	0.07%
17-Feb-04	1.09%	1.02%	0.07%

18-Feb-04	1.09%	1.01%	0.08%
19-Feb-04	1.09%	1.02%	0.07%
20-Feb-04	1.09%	1.02%	0.07%
23-Feb-04	1.09%	1.02%	0.07%
24-Feb-04	1.09%	1.02%	0.07%
25-Feb-04	1.09%	1.02%	0.07%
26-Feb-04	1.10%	1.02%	0.08%
27-Feb-04	1.10%	1.02%	0.08%
1-Mar-04	1.10%	1.02%	0.08%
2-Mar-04	1.10%	1.02%	0.08%
3-Mar-04	1.10%	1.02%	0.08%
4-Mar-04	1.10%	1.02%	0.08%
5-Mar-04	1.10%	1.02%	0.08%
8-Mar-04	1.09%	1.02%	0.07%
9-Mar-04	1.09%	1.01%	0.08%
10-Mar-04	1.09%	1.02%	0.07%
11-Mar-04	1.09%	1.01%	0.08%
12-Mar-04	1.09%	1.01%	0.08%
15-Mar-04	1.09%	1.02%	0.07%
16-Mar-04	1.09%	1.02%	0.07%
17-Mar-04	1.09%	1.02%	0.07%
18-Mar-04	1.09%	1.02%	0.07%
19-Mar-04	1.09%	1.01%	0.08%
22-Mar-04	1.09%	1.02%	0.07%
23-Mar-04	1.09%	1.01%	0.08%
24-Mar-04	1.09%	1.02%	0.07%
25-Mar-04	1.09%	1.02%	0.07%
26-Mar-04	1.09%	1.02%	0.07%
29-Mar-04	1.09%	1.02%	0.07%
30-Mar-04	1.09%	1.02%	0.07%
31-Mar-04	1.09%	1.02%	0.07%
1-Apr-04	1.09%	1.02%	0.07%
2-Apr-04	1.09%	1.02%	0.07%
5-Apr-04	1.10%	1.02%	0.08%
6-Apr-04	1.10%	1.02%	0.08%
7-Apr-04	1.10%	1.03%	0.07%
8-Apr-04	1.10%	1.02%	0.08%
13-Apr-04	1.10%	1.02%	0.08%
14-Apr-04	1.10%	1.02%	0.08%
15-Apr-04	1.10%	1.03%	0.07%
16-Apr-04	1.10%	1.02%	0.08%
19-Apr-04	1.10%	1.01%	0.09%
20-Apr-04	1.10%	1.02%	0.08%
21-Apr-04	1.10%	1.01%	0.09%
22-Apr-04	1.10%	1.02%	0.08%
23-Apr-04	1.10%	1.02%	0.08%
26-Apr-04	1.10%	1.03%	0.07%

27-Apr-04	1.10%	1.03%	0.07%
28-Apr-04	1.10%	1.03%	0.07%
29-Apr-04	1.10%	1.03%	0.07%
30-Apr-04	1.10%	1.03%	0.07%
4-May-04	1.10%	1.03%	0.07%
5-May-04	1.10%	1.03%	0.07%
6-May-04	1.10%	1.03%	0.07%
7-May-04	1.10%	1.03%	0.07%
10-May-04	1.10%	1.03%	0.07%
11-May-04	1.10%	1.03%	0.07%
12-May-04	1.10%	1.03%	0.07%
13-May-04	1.10%	1.02%	0.08%
14-May-04	1.10%	1.03%	0.07%
17-May-04	1.10%	1.03%	0.07%
18-May-04	1.10%	1.03%	0.07%
19-May-04	1.10%	1.03%	0.07%
20-May-04	1.10%	1.03%	0.07%
21-May-04	1.10%	1.03%	0.07%
24-May-04	1.10%	1.03%	0.07%
25-May-04	1.10%	1.03%	0.07%
26-May-04	1.10%	1.03%	0.07%
27-May-04	1.11%	1.03%	0.08%
28-May-04	1.11%	1.04%	0.07%
1-Jun-04	1.13%	1.05%	0.07%
2-Jun-04	1.13%	1.06%	0.07%
3-Jun-04	1.15%	1.08%	0.07%
4-Jun-04	1.16%	1.09%	0.07%
7-Jun-04	1.17%	1.10%	0.07%
8-Jun-04	1.18%	1.13%	0.05%
9-Jun-04	1.19%	1.11%	0.08%
10-Jun-04	1.21%	1.16%	0.05%
14-Jun-04	1.25%	1.20%	0.05%
15-Jun-04	1.28%	1.19%	0.09%
16-Jun-04	1.26%	1.20%	0.06%
17-Jun-04	1.28%	1.21%	0.07%
18-Jun-04	1.28%	1.21%	0.07%
21-Jun-04	1.29%	1.22%	0.07%
22-Jun-04	1.29%	1.24%	0.05%
23-Jun-04	1.30%	1.24%	0.06%
24-Jun-04	1.32%	1.25%	0.07%
25-Jun-04	1.33%	1.26%	0.07%
28-Jun-04	1.34%	1.29%	0.05%
29-Jun-04	1.36%	1.29%	0.07%
30-Jun-04	1.37%	1.28%	0.09%
1-Jul-04	1.36%	1.29%	0.07%
2-Jul-04	1.36%	1.28%	0.08%
6-Jul-04	1.35%	1.29%	0.06%

7-Jul-04	1.35%	1.28%	0.07%
8-Jul-04	1.36%	1.29%	0.07%
9-Jul-04	1.37%	1.29%	0.08%
12-Jul-04	1.38%	1.29%	0.09%
13-Jul-04	1.38%	1.31%	0.07%
14-Jul-04	1.39%	1.31%	0.08%
15-Jul-04	1.41%	1.33%	0.08%
16-Jul-04	1.42%	1.35%	0.07%
19-Jul-04	1.42%	1.35%	0.07%
20-Jul-04	1.43%	1.35%	0.08%
21-Jul-04	1.43%	1.35%	0.08%
22-Jul-04	1.45%	1.38%	0.07%
23-Jul-04	1.45%	1.38%	0.07%
26-Jul-04	1.46%	1.40%	0.06%
27-Jul-04	1.47%	1.42%	0.05%
28-Jul-04	1.48%	1.43%	0.05%
29-Jul-04	1.49%	1.45%	0.04%
30-Jul-04	1.50%	1.44%	0.06%
2-Aug-04	1.51%	1.45%	0.06%
3-Aug-04	1.53%	1.47%	0.06%
4-Aug-04	1.54%	1.49%	0.05%
5-Aug-04	1.56%	1.51%	0.05%
6-Aug-04	1.57%	1.51%	0.06%
9-Aug-04	1.57%	1.50%	0.07%
10-Aug-04	1.58%	1.51%	0.07%
11-Aug-04	1.60%	1.52%	0.08%
12-Aug-04	1.60%	1.52%	0.08%
13-Aug-04	1.60%	1.52%	0.08%
16-Aug-04	1.60%	1.52%	0.08%
17-Aug-04	1.60%	1.52%	0.08%
18-Aug-04	1.60%	1.52%	0.08%
19-Aug-04	1.61%	1.52%	0.09%
20-Aug-04	1.61%	1.53%	0.08%
23-Aug-04	1.62%	1.52%	0.10%
24-Aug-04	1.63%	1.53%	0.09%
25-Aug-04	1.63%	1.54%	0.09%
26-Aug-04	1.64%	1.56%	0.08%
27-Aug-04	1.65%	1.57%	0.08%
31-Aug-04	1.67%	1.58%	0.09%
1-Sep-04	1.67%	1.59%	0.08%
2-Sep-04	1.69%	1.62%	0.07%
3-Sep-04	1.70%	1.62%	0.08%
7-Sep-04	1.74%	1.66%	0.08%
8-Sep-04	1.74%	1.67%	0.07%
9-Sep-04	1.75%	1.68%	0.07%
10-Sep-04	1.76%	1.68%	0.08%
13-Sep-04	1.76%	1.70%	0.06%

14-Sep-04	1.78%	1.71%	0.07%
15-Sep-04	1.79%	1.72%	0.07%
16-Sep-04	1.81%	1.76%	0.05%
17-Sep-04	1.82%	1.75%	0.07%
20-Sep-04	1.83%	1.77%	0.06%
21-Sep-04	1.83%	1.77%	0.06%
22-Sep-04	1.84%	1.77%	0.07%
23-Sep-04	1.84%	1.77%	0.07%
24-Sep-04	1.84%	1.77%	0.07%
27-Sep-04	1.84%	1.78%	0.06%
28-Sep-04	1.84%	1.77%	0.07%
29-Sep-04	1.84%	1.77%	0.07%
30-Sep-04	1.84%	1.77%	0.07%
1-Oct-04	1.84%	1.77%	0.07%
4-Oct-04	1.84%	1.77%	0.07%
5-Oct-04	1.84%	1.77%	0.07%
6-Oct-04	1.84%	1.78%	0.06%
7-Oct-04	1.86%	1.78%	0.08%
8-Oct-04	1.86%	1.79%	0.07%
12-Oct-04	1.87%	1.80%	0.07%
13-Oct-04	1.87%	1.80%	0.07%
14-Oct-04	1.89%	1.82%	0.07%
15-Oct-04	1.89%	1.82%	0.07%
18-Oct-04	1.91%	1.83%	0.08%
19-Oct-04	1.91%	1.84%	0.07%
20-Oct-04	1.91%	1.85%	0.06%
21-Oct-04	1.93%	1.88%	0.05%
22-Oct-04	1.94%	1.88%	0.06%
25-Oct-04	1.95%	1.88%	0.07%
26-Oct-04	1.96%	1.89%	0.07%
27-Oct-04	1.96%	1.89%	0.07%
28-Oct-04	1.99%	1.93%	0.06%
29-Oct-04	2.00%	1.93%	0.07%
1-Nov-04	2.02%	1.95%	0.07%
2-Nov-04	2.04%	1.96%	0.08%
3-Nov-04	2.05%	1.98%	0.07%
4-Nov-04	2.06%	1.99%	0.07%
5-Nov-04	2.07%	2.01%	0.06%
8-Nov-04	2.09%	2.02%	0.07%
9-Nov-04	2.09%	2.03%	0.06%
10-Nov-04	2.09%	2.03%	0.06%
12-Nov-04	2.10%	2.04%	0.06%
15-Nov-04	2.11%	2.03%	0.08%
16-Nov-04	2.13%	2.05%	0.08%
17-Nov-04	2.13%	2.06%	0.07%
18-Nov-04	2.14%	2.06%	0.08%
19-Nov-04	2.15%	2.08%	0.07%



22-Nov-04	2.16%	2.09%	0.07%
23-Nov-04	2.18%	2.10%	0.08%
24-Nov-04	2.18%	2.11%	0.07%
26-Nov-04	2.21%	2.13%	0.08%
29-Nov-04	2.28%	2.21%	0.07%
30-Nov-04	2.29%	2.23%	0.06%
1-Dec-04	2.31%	2.24%	0.07%
2-Dec-04	2.33%	2.27%	0.06%
3-Dec-04	2.34%	2.26%	0.08%
6-Dec-04	2.35%	2.28%	0.07%
7-Dec-04	2.36%	2.27%	0.09%
8-Dec-04	2.37%	2.30%	0.07%
9-Dec-04	2.39%	2.32%	0.07%
10-Dec-04	2.40%	2.33%	0.07%
13-Dec-04	2.40%	2.33%	0.07%
14-Dec-04	2.41%	2.33%	0.08%
15-Dec-04	2.41%	2.35%	0.06%
16-Dec-04	2.41%	2.34%	0.07%
17-Dec-04	2.41%	2.39%	0.02%
20-Dec-04	2.41%	2.34%	0.07%
21-Dec-04	2.42%	2.34%	0.08%
22-Dec-04	2.42%	2.34%	0.08%
23-Dec-04	2.42%	2.34%	0.08%
24-Dec-04	2.42%	2.34%	0.08%
29-Dec-04	2.42%	2.35%	0.07%
30-Dec-04	2.39%	2.32%	0.07%
31-Dec-04	2.40%	2.32%	0.08%
4-Jan-05	2.40%	2.32%	0.08%
5-Jan-05	2.40%	2.33%	0.07%
6-Jan-05	2.42%	2.35%	0.07%
7-Jan-05	2.43%	2.36%	0.07%
10-Jan-05	2.44%	2.36%	0.08%
11-Jan-05	2.44%	2.37%	0.07%
12-Jan-05	2.45%	2.37%	0.08%
13-Jan-05	2.48%	2.42%	0.06%
14-Jan-05	2.48%	2.41%	0.07%
18-Jan-05	2.50%	2.43%	0.07%
19-Jan-05	2.50%	2.43%	0.07%
20-Jan-05	2.52%	2.45%	0.07%
21-Jan-05	2.53%	2.46%	0.07%
24-Jan-05	2.54%	2.47%	0.07%
25-Jan-05	2.55%	2.48%	0.07%
26-Jan-05	2.56%	2.48%	0.08%
27-Jan-05	2.58%	2.52%	0.06%
28-Jan-05	2.59%	2.53%	0.06%
31-Jan-05	2.59%	2.53%	0.06%
1-Feb-05	2.59%	2.53%	0.06%

2-Feb-05	2.59%	2.53%	0.06%
3-Feb-05	2.59%	2.53%	0.06%
4-Feb-05	2.59%	2.53%	0.06%
7-Feb-05	2.59%	2.53%	0.06%
8-Feb-05	2.59%	2.53%	0.06%
9-Feb-05	2.59%	2.53%	0.06%
10-Feb-05	2.59%	2.53%	0.06%
11-Feb-05	2.59%	2.53%	0.06%
14-Feb-05	2.59%	2.53%	0.06%
15-Feb-05	2.59%	2.53%	0.06%
16-Feb-05	2.59%	2.53%	0.06%
17-Feb-05	2.60%	2.53%	0.07%
18-Feb-05	2.60%	2.53%	0.07%
22-Feb-05	2.62%	2.55%	0.07%
23-Feb-05	2.65%	2.57%	0.08%
24-Feb-05	2.67%	2.60%	0.07%
25-Feb-05	2.69%	2.63%	0.06%
28-Feb-05	2.72%	2.64%	0.08%
1-Mar-05	2.72%	2.65%	0.07%
2-Mar-05	2.72%	2.65%	0.07%
3-Mar-05	2.75%	2.67%	0.08%
4-Mar-05	2.75%	2.68%	0.07%
7-Mar-05	2.76%	2.69%	0.07%
8-Mar-05	2.77%	2.70%	0.07%
9-Mar-05	2.77%	2.70%	0.07%
10-Mar-05	2.80%	2.74%	0.06%
11-Mar-05	2.81%	2.74%	0.07%
14-Mar-05	2.82%	2.74%	0.08%
15-Mar-05	2.83%	2.77%	0.06%
16-Mar-05	2.83%	2.77%	0.06%
17-Mar-05	2.85%	2.80%	0.05%
18-Mar-05	2.85%	2.79%	0.06%
21-Mar-05	2.85%	2.79%	0.06%
22-Mar-05	2.85%	2.78%	0.07%
23-Mar-05	2.85%	2.79%	0.06%
24-Mar-05	2.85%	2.80%	0.05%
29-Mar-05	2.85%	2.80%	0.05%
30-Mar-05	2.86%	2.81%	0.05%
31-Mar-05	2.87%	2.81%	0.06%
1-Apr-05	2.87%	2.82%	0.05%
4-Apr-05	2.87%	2.82%	0.05%
5-Apr-05	2.89%	2.85%	0.04%
6-Apr-05	2.89%	2.85%	0.04%
7-Apr-05	2.91%	2.85%	0.06%
8-Apr-05	2.92%	2.86%	0.06%
11-Apr-05	2.93%	2.87%	0.06%
12-Apr-05	2.95%	2.89%	0.06%

13-Apr-05	2.95%	2.88%	0.07%
14-Apr-05	2.97%	2.90%	0.07%
15-Apr-05	2.98%	2.93%	0.05%
18-Apr-05	2.99%	2.93%	0.06%
19-Apr-05	3.00%	2.94%	0.06%
20-Apr-05	3.00%	2.94%	0.06%
21-Apr-05	3.02%	2.96%	0.06%
22-Apr-05	3.03%	2.98%	0.05%
25-Apr-05	3.04%	2.99%	0.05%
26-Apr-05	3.06%	3.01%	0.05%
27-Apr-05	3.06%	3.01%	0.05%
28-Apr-05	3.08%	3.02%	0.06%
29-Apr-05	3.09%	3.02%	0.07%
3-May-05	3.09%	3.04%	0.05%
4-May-05	3.09%	3.04%	0.05%
5-May-05	3.09%	3.04%	0.05%
6-May-05	3.09%	3.03%	0.06%
9-May-05	3.09%	3.02%	0.07%
10-May-05	3.09%	3.03%	0.06%
11-May-05	3.09%	3.03%	0.06%
12-May-05	3.09%	3.03%	0.06%
13-May-05	3.09%	3.03%	0.06%
16-May-05	3.09%	3.03%	0.06%
17-May-05	3.09%	3.02%	0.07%
18-May-05	3.09%	3.02%	0.07%
19-May-05	3.09%	3.02%	0.07%
20-May-05	3.09%	3.02%	0.07%
23-May-05	3.09%	3.03%	0.06%
24-May-05	3.09%	3.02%	0.07%
25-May-05	3.09%	3.03%	0.06%
26-May-05	3.10%	3.03%	0.07%
27-May-05	3.11%	3.04%	0.07%
31-May-05	3.13%	3.07%	0.06%
1-Jun-05	3.14%	3.07%	0.07%
2-Jun-05	3.15%	3.09%	0.06%
3-Jun-05	3.16%	3.09%	0.07%
6-Jun-05	3.17%	3.08%	0.09%
7-Jun-05	3.18%	3.13%	0.05%
8-Jun-05	3.19%	3.12%	0.07%
9-Jun-05	3.21%	3.14%	0.07%
10-Jun-05	3.22%	3.15%	0.07%
13-Jun-05	3.22%	3.16%	0.06%
14-Jun-05	3.24%	3.18%	0.06%
15-Jun-05	3.24%	3.19%	0.05%
16-Jun-05	3.26%	3.20%	0.06%
17-Jun-05	3.27%	3.20%	0.07%
20-Jun-05	3.28%	3.23%	0.05%

21-Jun-05	3.30%	3.24%	0.06%
22-Jun-05	3.30%	3.25%	0.05%
23-Jun-05	3.31%	3.26%	0.05%
24-Jun-05	3.32%	3.26%	0.06%
27-Jun-05	3.33%	3.26%	0.07%
28-Jun-05	3.33%	3.29%	0.04%
29-Jun-05	3.34%	3.28%	0.06%
30-Jun-05	3.34%	3.28%	0.06%
1-Jul-05	3.34%	3.28%	0.06%
5-Jul-05	3.34%	3.27%	0.07%
6-Jul-05	3.34%	3.29%	0.05%
7-Jul-05	3.35%	3.30%	0.05%
8-Jul-05	3.36%	3.30%	0.06%
11-Jul-05	3.38%	3.31%	0.07%
12-Jul-05	3.38%	3.31%	0.07%
13-Jul-05	3.39%	3.31%	0.08%
14-Jul-05	3.41%	3.33%	0.08%
15-Jul-05	3.42%	3.35%	0.07%
18-Jul-05	3.43%	3.35%	0.08%
19-Jul-05	3.43%	3.36%	0.07%
20-Jul-05	3.44%	3.37%	0.07%
21-Jul-05	3.46%	3.40%	0.06%
22-Jul-05	3.46%	3.40%	0.06%
25-Jul-05	3.48%	3.42%	0.06%
26-Jul-05	3.48%	3.42%	0.06%
27-Jul-05	3.49%	3.43%	0.06%
28-Jul-05	3.51%	3.45%	0.06%
29-Jul-05	3.52%	3.46%	0.06%
1-Aug-05	3.53%	3.48%	0.05%
2-Aug-05	3.54%	3.48%	0.06%
3-Aug-05	3.55%	3.50%	0.05%
4-Aug-05	3.56%	3.51%	0.05%
5-Aug-05	3.56%	3.52%	0.04%
8-Aug-05	3.57%	3.51%	0.06%
9-Aug-05	3.57%	3.52%	0.05%
10-Aug-05	3.57%	3.51%	0.06%
11-Aug-05	3.57%	3.52%	0.05%
12-Aug-05	3.57%	3.50%	0.07%
15-Aug-05	3.58%	3.53%	0.05%
16-Aug-05	3.59%	3.52%	0.07%
17-Aug-05	3.59%	3.52%	0.07%
18-Aug-05	3.61%	3.52%	0.09%
19-Aug-05	3.62%	3.55%	0.07%
22-Aug-05	3.64%	3.57%	0.07%
23-Aug-05	3.64%	3.58%	0.06%
24-Aug-05	3.64%	3.58%	0.06%
25-Aug-05	3.67%	3.60%	0.07%

26-Aug-05	3.67%	3.59%	0.08%
30-Aug-05	3.69%	3.64%	0.05%
31-Aug-05	3.70%	3.62%	0.08%
1-Sep-05	3.72%	3.66%	0.06%
2-Sep-05	3.68%	3.60%	0.08%
6-Sep-05	3.70%	3.64%	0.06%
7-Sep-05	3.70%	3.62%	0.08%
8-Sep-05	3.73%	3.66%	0.07%
9-Sep-05	3.74%	3.68%	0.06%
12-Sep-05	3.75%	3.68%	0.07%
13-Sep-05	3.77%	3.70%	0.07%
14-Sep-05	3.77%	3.71%	0.06%
15-Sep-05	3.79%	3.74%	0.05%
16-Sep-05	3.80%	3.74%	0.06%
19-Sep-05	3.81%	3.75%	0.06%
20-Sep-05	3.82%	3.75%	0.07%
21-Sep-05	3.83%	3.76%	0.07%
22-Sep-05	3.83%	3.77%	0.06%
23-Sep-05	3.83%	3.77%	0.06%
26-Sep-05	3.84%	3.77%	0.07%
27-Sep-05	3.84%	3.78%	0.06%
28-Sep-05	3.84%	3.78%	0.06%
29-Sep-05	3.86%	3.80%	0.06%
30-Sep-05	3.86%	3.80%	0.06%
3-Oct-05	3.88%	3.80%	0.08%
4-Oct-05	3.89%	3.82%	0.07%
5-Oct-05	3.89%	3.83%	0.06%
6-Oct-05	3.94%	3.86%	0.08%
7-Oct-05	3.94%	3.87%	0.07%
11-Oct-05	3.94%	3.87%	0.07%
12-Oct-05	3.95%	3.88%	0.07%
13-Oct-05	3.97%	3.90%	0.07%
14-Oct-05	3.98%	3.91%	0.07%
17-Oct-05	4.00%	3.93%	0.07%
18-Oct-05	4.00%	3.93%	0.07%
19-Oct-05	4.00%	3.93%	0.07%
20-Oct-05	4.03%	4.02%	0.01%
21-Oct-05	4.04%	4.02%	0.02%
24-Oct-05	4.05%	4.02%	0.03%
25-Oct-05	4.06%	4.05%	0.01%
26-Oct-05	4.07%	4.06%	0.01%
27-Oct-05	4.08%	4.08%	0.00%
28-Oct-05	4.09%	4.08%	0.01%
31-Oct-05	4.09%	4.08%	0.01%
1-Nov-05	4.09%	4.08%	0.01%
2-Nov-05	4.09%	4.08%	0.01%
3-Nov-05	4.09%	4.06%	0.03%

4-Nov-05	4.09%	4.06%	0.03%
7-Nov-05	4.09%	4.08%	0.01%
8-Nov-05	4.10%	4.08%	0.02%
9-Nov-05	4.11%	4.09%	0.02%
10-Nov-05	4.12%	4.09%	0.03%
14-Nov-05	4.12%	4.10%	0.02%
15-Nov-05	4.14%	4.12%	0.02%
16-Nov-05	4.14%	4.12%	0.02%
17-Nov-05	4.16%	4.14%	0.02%
18-Nov-05	4.17%	4.15%	0.02%
21-Nov-05	4.17%	4.15%	0.02%
22-Nov-05	4.19%	4.18%	0.01%
23-Nov-05	4.19%	4.18%	0.01%
25-Nov-05	4.21%	4.20%	0.01%
28-Nov-05	4.22%	4.22%	0.00%
29-Nov-05	4.29%	4.27%	0.02%
30-Nov-05	4.29%	4.28%	0.01%
1-Dec-05	4.31%	4.29%	0.02%
2-Dec-05	4.32%	4.29%	0.03%
5-Dec-05	4.33%	4.30%	0.03%
6-Dec-05	4.34%	4.31%	0.03%
7-Dec-05	4.34%	4.33%	0.01%
8-Dec-05	4.36%	4.33%	0.03%
9-Dec-05	4.36%	4.33%	0.03%
12-Dec-05	4.37%	4.35%	0.02%
13-Dec-05	4.37%	4.35%	0.02%
14-Dec-05	4.37%	4.35%	0.02%
15-Dec-05	4.37%	4.35%	0.02%
16-Dec-05	4.37%	4.34%	0.03%
19-Dec-05	4.37%	4.35%	0.02%
20-Dec-05	4.37%	4.35%	0.02%
21-Dec-05	4.37%	4.35%	0.02%
22-Dec-05	4.38%	4.37%	0.01%
23-Dec-05	4.38%	4.36%	0.02%
28-Dec-05	4.39%	4.36%	0.03%
29-Dec-05	4.39%	4.35%	0.04%
30-Dec-05	4.39%	4.36%	0.03%
3-Jan-06	4.40%	4.37%	0.03%
4-Jan-06	4.40%	4.39%	0.01%
5-Jan-06	4.42%	4.40%	0.02%
6-Jan-06	4.42%	4.40%	0.02%
9-Jan-06	4.44%	4.42%	0.02%
10-Jan-06	4.44%	4.43%	0.01%
11-Jan-06	4.44%	4.43%	0.01%
12-Jan-06	4.47%	4.46%	0.01%
13-Jan-06	4.47%	4.47%	0.00%
17-Jan-06	4.48%	4.48%	0.00%

18-Jan-06	4.49%	4.48%	0.01%
19-Jan-06	4.51%	4.51%	0.00%
20-Jan-06	4.52%	4.51%	0.01%
23-Jan-06	4.53%	4.52%	0.01%
24-Jan-06	4.53%	4.53%	0.00%
25-Jan-06	4.54%	4.53%	0.01%
26-Jan-06	4.56%	4.55%	0.01%
27-Jan-06	4.57%	4.56%	0.01%
30-Jan-06	4.57%	4.56%	0.01%
31-Jan-06	4.57%	4.56%	0.01%
1-Feb-06	4.57%	4.57%	0.00%
2-Feb-06	4.57%	4.58%	-0.01%
3-Feb-06	4.57%	4.57%	0.00%
7-Feb-06	4.57%	4.57%	0.00%
8-Feb-06	4.57%	4.57%	0.00%
9-Feb-06	4.57%	4.57%	0.00%
10-Feb-06	4.57%	4.55%	0.02%
13-Feb-06	4.57%	4.57%	0.00%
14-Feb-06	4.57%	4.57%	0.00%
15-Feb-06	4.57%	4.57%	0.00%
16-Feb-06	4.57%	4.57%	0.00%
17-Feb-06	4.57%	4.55%	0.02%
21-Feb-06	4.57%	4.57%	0.00%
22-Feb-06	4.57%	4.57%	0.00%
23-Feb-06	4.58%	4.57%	0.01%
24-Feb-06	4.61%	4.58%	0.03%
27-Feb-06	4.63%	4.62%	0.01%
28-Feb-06	4.63%	4.63%	0.00%
1-Mar-06	4.64%	4.63%	0.01%
2-Mar-06	4.66%	4.65%	0.01%
3-Mar-06	4.67%	4.67%	0.00%
6-Mar-06	4.69%	4.68%	0.01%
7-Mar-06	4.69%	4.68%	0.01%
8-Mar-06	4.70%	4.68%	0.02%
9-Mar-06	4.72%	4.71%	0.01%
10-Mar-06	4.74%	4.73%	0.01%
13-Mar-06	4.75%	4.74%	0.01%
14-Mar-06	4.75%	4.75%	0.00%
15-Mar-06	4.75%	4.75%	0.00%
16-Mar-06	4.78%	4.77%	0.01%
17-Mar-06	4.78%	4.78%	0.00%
20-Mar-06	4.79%	4.80%	-0.01%
21-Mar-06	4.80%	4.79%	0.01%
22-Mar-06	4.81%	4.81%	0.00%
23-Mar-06	4.82%	4.81%	0.01%
24-Mar-06	4.82%	4.82%	0.00%
27-Mar-06	4.82%	4.82%	0.00%

28-Mar-06	4.82%	4.82%	0.00%
29-Mar-06	4.83%	4.83%	0.00%
30-Mar-06	4.83%	4.82%	0.01%
31-Mar-06	4.83%	4.82%	0.01%
3-Apr-06	4.83%	4.81%	0.02%
4-Apr-06	4.84%	4.82%	0.02%
5-Apr-06	4.84%	4.80%	0.04%
6-Apr-06	4.85%	4.81%	0.04%
7-Apr-06	4.85%	4.82%	0.03%
10-Apr-06	4.86%	4.85%	0.01%
11-Apr-06	4.88%	4.87%	0.01%
12-Apr-06	4.90%	4.90%	0.00%
13-Apr-06	4.91%	4.90%	0.01%
18-Apr-06	4.92%	4.92%	0.00%
19-Apr-06	4.93%	4.92%	0.01%
20-Apr-06	4.95%	4.95%	0.00%
21-Apr-06	4.96%	4.95%	0.01%
24-Apr-06	4.97%	4.96%	0.01%
25-Apr-06	4.99%	4.98%	0.01%
26-Apr-06	5.00%	4.99%	0.01%
27-Apr-06	5.02%	5.02%	0.00%
28-Apr-06	5.04%	5.04%	0.00%
2-May-06	5.05%	5.05%	0.00%
3-May-06	5.06%	5.05%	0.01%
4-May-06	5.07%	5.06%	0.01%
5-May-06	5.08%	5.07%	0.01%
8-May-06	5.08%	5.08%	0.00%
9-May-06	5.08%	5.08%	0.00%
10-May-06	5.08%	5.08%	0.00%
11-May-06	5.08%	5.07%	0.01%
12-May-06	5.08%	5.07%	0.01%
15-May-06	5.08%	5.07%	0.01%
16-May-06	5.08%	5.07%	0.01%
17-May-06	5.08%	5.08%	0.00%
18-May-06	5.08%	5.08%	0.00%
19-May-06	5.08%	5.08%	0.00%
22-May-06	5.08%	5.08%	0.00%
23-May-06	5.08%	5.08%	0.00%
24-May-06	5.08%	5.08%	0.00%
25-May-06	5.09%	5.08%	0.01%
26-May-06	5.09%	5.08%	0.01%
30-May-06	5.11%	5.09%	0.02%
31-May-06	5.11%	5.11%	0.00%
1-Jun-06	5.13%	5.12%	0.01%
2-Jun-06	5.14%	5.12%	0.02%
5-Jun-06	5.13%	5.12%	0.01%
6-Jun-06	5.14%	5.13%	0.01%



7-Jun-06	5.15%	5.15%	0.00%
8-Jun-06	5.17%	5.16%	0.01%
9-Jun-06	5.18%	5.17%	0.01%
12-Jun-06	5.18%	5.18%	0.00%
13-Jun-06	5.20%	5.19%	0.01%
14-Jun-06	5.21%	5.22%	-0.01%
15-Jun-06	5.25%	5.25%	0.00%
16-Jun-06	5.27%	5.26%	0.01%
19-Jun-06	5.28%	5.27%	0.01%
20-Jun-06	5.29%	5.29%	0.00%
21-Jun-06	5.30%	5.30%	0.00%
22-Jun-06	5.32%	5.32%	0.00%
23-Jun-06	5.34%	5.33%	0.01%
26-Jun-06	5.34%	5.33%	0.01%
27-Jun-06	5.35%	5.34%	0.01%
28-Jun-06	5.35%	5.34%	0.01%
29-Jun-06	5.35%	5.33%	0.02%
30-Jun-06	5.33%	5.31%	0.02%
3-Jul-06	5.33%	5.33%	0.00%
5-Jul-06	5.34%	5.33%	0.01%
6-Jul-06	5.35%	5.34%	0.01%
7-Jul-06	5.35%	5.34%	0.01%
10-Jul-06	5.36%	5.35%	0.01%
11-Jul-06	5.36%	5.35%	0.01%
12-Jul-06	5.36%	5.35%	0.01%
13-Jul-06	5.37%	5.36%	0.01%
14-Jul-06	5.37%	5.36%	0.01%
17-Jul-06	5.37%	5.36%	0.01%
18-Jul-06	5.38%	5.37%	0.01%
19-Jul-06	5.39%	5.38%	0.01%
20-Jul-06	5.40%	5.39%	0.01%
21-Jul-06	5.39%	5.38%	0.00%
24-Jul-06	5.39%	5.38%	0.01%
25-Jul-06	5.40%	5.39%	0.01%
26-Jul-06	5.40%	5.40%	0.00%
27-Jul-06	5.40%	5.40%	0.00%
28-Jul-06	5.40%	5.40%	0.00%
31-Jul-06	5.39%	5.37%	0.02%
1-Aug-06	5.39%	5.39%	0.00%
2-Aug-06	5.40%	5.38%	0.02%
3-Aug-06	5.41%	5.38%	0.03%
4-Aug-06	5.42%	5.35%	0.07%
7-Aug-06	5.37%	5.36%	0.01%
8-Aug-06	5.37%	5.37%	0.00%
9-Aug-06	5.33%	5.31%	0.02%
10-Aug-06	5.33%	5.30%	0.03%
11-Aug-06	5.33%	5.32%	0.01%

14-Aug-06	5.33%	5.30%	0.03%
15-Aug-06	5.33%	5.33%	0.00%
16-Aug-06	5.33%	5.33%	0.00%
17-Aug-06	5.33%	5.32%	0.00%
18-Aug-06	5.33%	5.32%	0.01%
21-Aug-06	5.32%	5.32%	0.00%
22-Aug-06	5.33%	5.32%	0.01%
23-Aug-06	5.32%	5.32%	0.00%
24-Aug-06	5.33%	5.32%	0.01%
25-Aug-06	5.33%	5.32%	0.01%
29-Aug-06	5.33%	5.33%	0.00%
30-Aug-06	5.33%	5.33%	0.00%
31-Aug-06	5.33%	5.33%	0.00%
1-Sep-06	5.33%	5.33%	0.00%
5-Sep-06	5.33%	5.33%	0.00%
6-Sep-06	5.33%	5.33%	0.00%
7-Sep-06	5.33%	5.33%	0.00%
8-Sep-06	5.33%	5.33%	0.00%
11-Sep-06	5.33%	5.33%	0.00%
12-Sep-06	5.33%	5.33%	0.00%
13-Sep-06	5.33%	5.29%	0.04%
14-Sep-06	5.33%	5.30%	0.03%
15-Sep-06	5.33%	5.30%	0.03%
18-Sep-06	5.33%	5.33%	0.00%
19-Sep-06	5.33%	5.33%	0.00%
20-Sep-06	5.33%	5.33%	0.00%
21-Sep-06	5.33%	5.33%	0.00%
22-Sep-06	5.33%	5.32%	0.01%
25-Sep-06	5.33%	5.32%	0.01%
26-Sep-06	5.32%	5.32%	0.00%
27-Sep-06	5.32%	5.32%	0.00%
28-Sep-06	5.32%	5.32%	0.00%
29-Sep-06	5.32%	5.32%	0.00%
2-Oct-06	5.32%	5.32%	0.00%
3-Oct-06	5.32%	5.32%	0.00%
4-Oct-06	5.32%	5.32%	0.00%
5-Oct-06	5.32%	5.32%	0.00%
6-Oct-06	5.32%	5.32%	0.00%
10-Oct-06	5.32%	5.33%	-0.01%
11-Oct-06	5.32%	5.32%	0.00%
12-Oct-06	5.32%	5.32%	0.00%
13-Oct-06	5.32%	5.32%	0.00%
16-Oct-06	5.32%	5.32%	0.00%
17-Oct-06	5.32%	5.32%	0.00%
18-Oct-06	5.32%	5.32%	0.00%
19-Oct-06	5.32%	5.32%	0.00%
20-Oct-06	5.32%	5.29%	0.03%

23-Oct-06	5.32%	5.32%	0.00%
24-Oct-06	5.32%	5.32%	0.00%
25-Oct-06	5.32%	5.32%	0.00%
26-Oct-06	5.32%	5.32%	0.00%
27-Oct-06	5.32%	5.32%	0.00%
30-Oct-06	5.32%	5.32%	0.00%
31-Oct-06	5.32%	5.32%	0.00%
1-Nov-06	5.32%	5.32%	0.00%
2-Nov-06	5.32%	5.32%	0.00%
3-Nov-06	5.32%	5.32%	0.00%
6-Nov-06	5.32%	5.29%	0.03%
7-Nov-06	5.32%	5.32%	0.00%
8-Nov-06	5.32%	5.32%	0.00%
9-Nov-06	5.32%	5.29%	0.03%
10-Nov-06	5.32%	5.29%	0.03%
13-Nov-06	5.32%	5.32%	0.00%
14-Nov-06	5.32%	5.32%	0.00%
15-Nov-06	5.32%	5.32%	0.00%
16-Nov-06	5.32%	5.32%	0.00%
17-Nov-06	5.32%	5.32%	0.00%
20-Nov-06	5.32%	5.32%	0.00%
21-Nov-06	5.32%	5.32%	0.00%
22-Nov-06	5.32%	5.29%	0.03%
24-Nov-06	5.32%	5.32%	0.00%
27-Nov-06	5.32%	5.32%	0.00%
28-Nov-06	5.32%	5.32%	0.00%
29-Nov-06	5.35%	5.35%	0.00%
30-Nov-06	5.35%	5.35%	0.00%
1-Dec-06	5.35%	5.35%	0.00%
4-Dec-06	5.35%	5.35%	0.00%
5-Dec-06	5.35%	5.35%	0.00%
6-Dec-06	5.35%	5.35%	0.00%
7-Dec-06	5.35%	5.35%	0.00%
8-Dec-06	5.35%	5.35%	0.00%
11-Dec-06	5.35%	5.35%	0.00%
12-Dec-06	5.35%	5.35%	0.00%
13-Dec-06	5.35%	5.32%	0.03%
14-Dec-06	5.35%	5.35%	0.00%
15-Dec-06	5.35%	5.35%	0.00%
18-Dec-06	5.35%	5.35%	0.00%
19-Dec-06	5.35%	5.35%	0.00%
20-Dec-06	5.35%	5.35%	0.00%
21-Dec-06	5.35%	5.35%	0.00%
22-Dec-06	5.35%	5.34%	0.01%
27-Dec-06	5.35%	5.35%	0.00%
28-Dec-06	5.33%	5.33%	0.00%
29-Dec-06	5.32%	5.32%	0.00%

2-Jan-07	5.32%	5.32%	0.00%
3-Jan-07	5.32%	5.32%	0.00%
4-Jan-07	5.32%	5.32%	0.00%
5-Jan-07	5.32%	5.32%	0.00%
8-Jan-07	5.32%	5.32%	0.00%
9-Jan-07	5.32%	5.32%	0.00%
10-Jan-07	5.32%	5.32%	0.00%
11-Jan-07	5.32%	5.32%	0.00%
12-Jan-07	5.32%	5.32%	0.00%
16-Jan-07	5.32%	5.32%	0.00%
17-Jan-07	5.32%	5.30%	0.02%
18-Jan-07	5.32%	5.32%	0.00%
19-Jan-07	5.32%	5.32%	0.00%
22-Jan-07	5.32%	5.32%	0.00%
23-Jan-07	5.32%	5.30%	0.02%
24-Jan-07	5.32%	5.32%	0.00%
25-Jan-07	5.32%	5.32%	0.00%
26-Jan-07	5.32%	5.32%	0.00%
29-Jan-07	5.32%	5.32%	0.00%
30-Jan-07	5.32%	5.32%	0.00%
31-Jan-07	5.32%	5.32%	0.00%
1-Feb-07	5.32%	5.30%	0.02%
2-Feb-07	5.32%	5.32%	0.00%
5-Feb-07	5.32%	5.32%	0.00%
6-Feb-07	5.32%	5.32%	0.00%
7-Feb-07	5.32%	5.32%	0.00%
8-Feb-07	5.32%	5.32%	0.00%
9-Feb-07	5.32%	5.32%	0.00%
12-Feb-07	5.32%	5.32%	0.00%
13-Feb-07	5.32%	5.32%	0.00%
14-Feb-07	5.32%	5.32%	0.00%
15-Feb-07	5.32%	5.32%	0.00%
16-Feb-07	5.32%	5.32%	0.00%
20-Feb-07	5.32%	5.32%	0.00%
21-Feb-07	5.32%	5.32%	0.00%
22-Feb-07	5.32%	5.32%	0.00%
23-Feb-07	5.32%	5.32%	0.00%
26-Feb-07	5.32%	5.32%	0.00%
27-Feb-07	5.32%	5.32%	0.00%
28-Feb-07	5.32%	5.32%	0.00%
1-Mar-07	5.32%	5.32%	0.00%
2-Mar-07	5.32%	5.32%	0.00%
5-Mar-07	5.32%	5.32%	0.00%
6-Mar-07	5.32%	5.32%	0.00%
7-Mar-07	5.32%	5.32%	0.00%
8-Mar-07	5.32%	5.32%	0.00%
9-Mar-07	5.32%	5.32%	0.00%

12-Mar-07	5.32%	5.32%	0.00%
13-Mar-07	5.32%	5.32%	0.00%
14-Mar-07	5.32%	5.32%	0.00%
15-Mar-07	5.32%	5.32%	0.00%
16-Mar-07	5.32%	5.32%	0.00%
19-Mar-07	5.32%	5.32%	0.00%
20-Mar-07	5.32%	5.32%	0.00%
21-Mar-07	5.32%	5.32%	0.00%
22-Mar-07	5.32%	5.32%	0.00%
23-Mar-07	5.32%	5.32%	0.00%
26-Mar-07	5.32%	5.32%	0.00%
27-Mar-07	5.32%	5.32%	0.00%
28-Mar-07	5.32%	5.32%	0.00%
29-Mar-07	5.32%	5.32%	0.00%
30-Mar-07	5.32%	5.32%	0.00%
2-Apr-07	5.32%	5.32%	0.00%
3-Apr-07	5.32%	5.32%	0.00%
4-Apr-07	5.32%	5.32%	0.00%
5-Apr-07	5.32%	5.32%	0.00%
10-Apr-07	5.32%	5.29%	0.03%
11-Apr-07	5.32%	5.30%	0.02%
12-Apr-07	5.32%	5.29%	0.03%
13-Apr-07	5.32%	5.30%	0.02%
16-Apr-07	5.32%	5.30%	0.02%
17-Apr-07	5.32%	5.30%	0.02%
18-Apr-07	5.32%	5.30%	0.02%
19-Apr-07	5.32%	5.32%	0.00%
20-Apr-07	5.32%	5.32%	0.00%
23-Apr-07	5.32%	5.32%	0.00%
24-Apr-07	5.32%	5.32%	0.00%
25-Apr-07	5.32%	5.32%	0.00%
26-Apr-07	5.32%	5.32%	0.00%
27-Apr-07	5.32%	5.32%	0.00%
30-Apr-07	5.32%	5.32%	0.00%
1-May-07	5.32%	5.32%	0.00%
2-May-07	5.32%	5.32%	0.00%
3-May-07	5.32%	5.32%	0.00%
4-May-07	5.32%	5.32%	0.00%
8-May-07	5.32%	5.32%	0.00%
9-May-07	5.32%	5.32%	0.00%
10-May-07	5.32%	5.30%	0.02%
11-May-07	5.32%	5.30%	0.02%
14-May-07	5.32%	5.30%	0.02%
15-May-07	5.32%	5.32%	0.00%
16-May-07	5.32%	5.32%	0.00%
17-May-07	5.32%	5.32%	0.00%
18-May-07	5.32%	5.32%	0.00%

21-May-07	5.32%	5.32%	0.00%
22-May-07	5.32%	5.32%	0.00%
23-May-07	5.32%	5.32%	0.00%
24-May-07	5.32%	5.32%	0.00%
25-May-07	5.32%	5.32%	0.00%
29-May-07	5.32%	5.32%	0.00%
30-May-07	5.32%	5.32%	0.00%
31-May-07	5.32%	5.32%	0.00%
1-Jun-07	5.32%	5.32%	0.00%
4-Jun-07	5.32%	5.32%	0.00%
5-Jun-07	5.32%	5.31%	0.01%
6-Jun-07	5.32%	5.32%	0.00%
7-Jun-07	5.32%	5.32%	0.00%
8-Jun-07	5.32%	5.32%	0.00%
11-Jun-07	5.32%	5.31%	0.01%
12-Jun-07	5.32%	5.32%	0.00%
13-Jun-07	5.32%	5.32%	0.00%
14-Jun-07	5.32%	5.32%	0.00%
15-Jun-07	5.32%	5.32%	0.00%
18-Jun-07	5.32%	5.32%	0.00%
19-Jun-07	5.32%	5.32%	0.00%
20-Jun-07	5.32%	5.32%	0.00%
21-Jun-07	5.32%	5.32%	0.00%
22-Jun-07	5.32%	5.31%	0.01%
25-Jun-07	5.32%	5.32%	0.00%
26-Jun-07	5.32%	5.31%	0.01%
27-Jun-07	5.32%	5.31%	0.01%
28-Jun-07	5.32%	5.32%	0.00%
29-Jun-07	5.32%	5.31%	0.01%
2-Jul-07	5.32%	5.32%	0.00%
3-Jul-07	5.32%	5.32%	0.00%
5-Jul-07	5.32%	5.32%	0.00%
6-Jul-07	5.32%	5.32%	0.00%
9-Jul-07	5.32%	5.31%	0.01%
10-Jul-07	5.32%	5.31%	0.01%
11-Jul-07	5.32%	5.31%	0.01%
12-Jul-07	5.32%	5.31%	0.01%
13-Jul-07	5.32%	5.31%	0.01%
16-Jul-07	5.32%	5.32%	0.00%
17-Jul-07	5.32%	5.32%	0.00%
18-Jul-07	5.32%	5.32%	0.00%
19-Jul-07	5.32%	5.32%	0.00%
20-Jul-07	5.32%	5.32%	0.00%
23-Jul-07	5.32%	5.31%	0.01%
24-Jul-07	5.32%	5.31%	0.01%
25-Jul-07	5.32%	5.31%	0.01%
26-Jul-07	5.32%	5.32%	0.00%

27-Jul-07	5.32%	5.32%	0.00%
30-Jul-07	5.32%	5.32%	0.00%
31-Jul-07	5.32%	5.32%	0.00%
1-Aug-07	5.33%	5.32%	0.01%
2-Aug-07	5.33%	5.33%	0.00%
3-Aug-07	5.33%	5.31%	0.02%
6-Aug-07	5.33%	5.33%	0.00%
7-Aug-07	5.33%	5.33%	0.00%
8-Aug-07	5.35%	5.37%	-0.02%
9-Aug-07	5.54%	5.50%	0.04%
10-Aug-07	5.62%	5.70%	-0.08%
13-Aug-07	5.61%	5.62%	-0.01%
14-Aug-07	5.59%	5.60%	-0.01%
15-Aug-07	5.57%	5.60%	-0.03%
16-Aug-07	5.54%	5.54%	0.00%
17-Aug-07	5.51%	5.52%	-0.01%
20-Aug-07	5.50%	5.53%	-0.03%
21-Aug-07	5.50%	5.55%	-0.05%
22-Aug-07	5.50%	5.55%	-0.05%
23-Aug-07	5.51%	5.55%	-0.04%
24-Aug-07	5.50%	5.57%	-0.07%
28-Aug-07	5.51%	5.57%	-0.06%
29-Aug-07	5.57%	5.68%	-0.11%
30-Aug-07	5.67%	5.80%	-0.14%
31-Aug-07	5.72%	5.85%	-0.13%
4-Sep-07	5.80%	5.90%	-0.10%
5-Sep-07	5.82%	5.90%	-0.08%
6-Sep-07	5.82%	5.90%	-0.08%
7-Sep-07	5.82%	5.90%	-0.08%
10-Sep-07	5.81%	5.85%	-0.04%
11-Sep-07	5.80%	5.85%	-0.05%
12-Sep-07	5.80%	5.85%	-0.05%
13-Sep-07	5.75%	5.76%	-0.01%
14-Sep-07	5.61%	5.55%	0.06%
17-Sep-07	5.50%	5.55%	-0.05%
18-Sep-07	5.50%	5.20%	0.30%
19-Sep-07	5.15%	5.15%	0.00%
20-Sep-07	5.14%	5.15%	-0.01%
21-Sep-07	5.13%	5.15%	-0.02%
24-Sep-07	5.13%	5.15%	-0.02%
25-Sep-07	5.13%	5.15%	-0.02%
26-Sep-07	5.13%	5.15%	-0.02%
27-Sep-07	5.13%	5.15%	-0.02%
28-Sep-07	5.12%	5.15%	-0.03%
1-Oct-07	5.12%	5.20%	-0.08%
2-Oct-07	5.13%	5.18%	-0.05%
3-Oct-07	5.13%	5.20%	-0.08%

4-Oct-07	5.13%	5.20%	-0.08%
5-Oct-07	5.12%	5.15%	-0.03%
9-Oct-07	5.12%	5.15%	-0.03%
10-Oct-07	5.11%	5.15%	-0.04%
11-Oct-07	5.09%	5.15%	-0.06%
12-Oct-07	5.06%	5.15%	-0.09%
15-Oct-07	5.05%	5.08%	-0.03%
16-Oct-07	5.04%	5.08%	-0.04%
17-Oct-07	5.02%	5.05%	-0.03%
18-Oct-07	5.00%	5.00%	0.00%
19-Oct-07	4.95%	4.95%	0.00%
22-Oct-07	4.89%	4.90%	-0.01%
23-Oct-07	4.87%	4.90%	-0.03%
24-Oct-07	4.86%	4.90%	-0.04%
25-Oct-07	4.82%	4.81%	0.01%
26-Oct-07	4.79%	4.80%	-0.01%
29-Oct-07	4.75%	4.75%	0.00%
30-Oct-07	4.72%	4.75%	-0.03%
31-Oct-07	4.71%	4.70%	0.01%
1-Nov-07	4.69%	4.68%	0.01%
2-Nov-07	4.68%	4.68%	0.00%
5-Nov-07	4.67%	4.67%	0.00%
6-Nov-07	4.67%	4.69%	-0.02%
7-Nov-07	4.67%	4.66%	0.00%
8-Nov-07	4.66%	4.66%	0.00%
9-Nov-07	4.66%	4.66%	0.00%
13-Nov-07	4.65%	4.65%	0.00%
14-Nov-07	4.66%	4.68%	-0.02%
15-Nov-07	4.69%	4.75%	-0.06%
16-Nov-07	4.74%	4.78%	-0.04%
19-Nov-07	4.77%	4.82%	-0.05%
20-Nov-07	4.78%	4.85%	-0.07%
21-Nov-07	4.78%	4.85%	-0.07%
23-Nov-07	4.79%	4.85%	-0.06%
26-Nov-07	4.80%	4.85%	-0.05%
27-Nov-07	4.81%	4.90%	-0.09%
28-Nov-07	4.82%	4.90%	-0.08%
29-Nov-07	5.23%	5.60%	-0.38%
30-Nov-07	5.24%	5.50%	-0.26%
3-Dec-07	5.25%	5.60%	-0.35%
4-Dec-07	5.25%	5.50%	-0.25%
5-Dec-07	5.25%	5.45%	-0.20%
6-Dec-07	5.24%	5.50%	-0.26%
7-Dec-07	5.24%	5.50%	-0.26%
10-Dec-07	5.23%	5.40%	-0.17%
11-Dec-07	5.20%	5.35%	-0.15%
12-Dec-07	5.10%	5.25%	-0.15%



13-Dec-07	5.03%	5.20%	-0.17%
14-Dec-07	5.00%	5.20%	-0.20%
17-Dec-07	4.97%	5.25%	-0.29%
18-Dec-07	4.95%	5.20%	-0.25%
19-Dec-07	4.93%	5.20%	-0.27%
20-Dec-07	4.90%	5.15%	-0.25%
21-Dec-07	4.87%	5.10%	-0.24%
27-Dec-07	4.85%	5.05%	-0.21%
28-Dec-07	4.63%	4.70%	-0.07%
31-Dec-07	4.60%	4.70%	-0.10%
2-Jan-08	4.57%	4.65%	-0.08%
3-Jan-08	4.54%	4.60%	-0.06%
4-Jan-08	4.52%	4.55%	-0.04%
7-Jan-08	4.44%	4.50%	-0.06%
8-Jan-08	4.41%	4.45%	-0.04%
9-Jan-08	4.37%	4.40%	-0.03%
10-Jan-08	4.32%	4.35%	-0.03%
11-Jan-08	4.24%	4.25%	-0.01%
14-Jan-08	4.08%	4.10%	-0.02%
15-Jan-08	4.02%	4.05%	-0.03%
16-Jan-08	3.99%	3.98%	0.01%
17-Jan-08	3.96%	4.00%	-0.04%
18-Jan-08	3.93%	3.95%	-0.02%
22-Jan-08	3.77%	3.80%	-0.03%
23-Jan-08	3.38%	3.30%	0.08%
24-Jan-08	3.29%	3.30%	-0.01%
25-Jan-08	3.31%	3.30%	0.01%
28-Jan-08	3.28%	3.30%	-0.02%
29-Jan-08	3.27%	3.30%	-0.03%
30-Jan-08	3.26%	3.25%	0.01%
31-Jan-08	3.14%	3.15%	-0.01%
1-Feb-08	3.14%	3.15%	-0.01%
4-Feb-08	3.18%	3.25%	-0.07%
5-Feb-08	3.22%	3.25%	-0.03%
6-Feb-08	3.19%	3.25%	-0.06%
7-Feb-08	3.17%	3.20%	-0.04%
8-Feb-08	3.15%	3.15%	0.00%
11-Feb-08	3.14%	3.13%	0.01%
12-Feb-08	3.13%	3.13%	0.00%
13-Feb-08	3.12%	3.13%	-0.01%
14-Feb-08	3.12%	3.15%	-0.03%
15-Feb-08	3.12%	3.15%	-0.03%
19-Feb-08	3.11%	3.15%	-0.04%
20-Feb-08	3.12%	3.15%	-0.03%
21-Feb-08	3.14%	3.15%	-0.02%
22-Feb-08	3.12%	3.15%	-0.03%
25-Feb-08	3.12%	3.15%	-0.03%

26-Feb-08	3.13%	3.15%	-0.03%
27-Feb-08	3.12%	3.18%	-0.06%
28-Feb-08	3.12%	3.18%	-0.06%
29-Feb-08	3.11%	3.18%	-0.07%
3-Mar-08	3.09%	3.13%	-0.04%
4-Mar-08	3.08%	3.10%	-0.02%
5-Mar-08	3.08%	3.10%	-0.02%
6-Mar-08	3.06%	3.08%	-0.02%
7-Mar-08	3.00%	3.00%	0.00%
10-Mar-08	2.94%	2.95%	-0.02%
11-Mar-08	2.89%	2.90%	-0.01%
12-Mar-08	2.86%	2.90%	-0.04%
13-Mar-08	2.82%	2.80%	0.02%
14-Mar-08	2.78%	2.70%	0.07%
17-Mar-08	2.56%	2.60%	-0.04%
18-Mar-08	2.54%	2.60%	-0.06%
19-Mar-08	2.60%	2.70%	-0.10%
20-Mar-08	2.61%	2.70%	-0.09%
25-Mar-08	2.65%	2.80%	-0.15%
26-Mar-08	2.68%	2.80%	-0.12%
27-Mar-08	2.70%	2.90%	-0.20%
28-Mar-08	2.71%	2.90%	-0.19%
31-Mar-08	2.70%	3.00%	-0.30%
1-Apr-08	2.70%	3.00%	-0.30%
2-Apr-08	2.71%	3.00%	-0.29%
3-Apr-08	2.74%	3.00%	-0.26%
4-Apr-08	2.74%	3.00%	-0.26%
7-Apr-08	2.72%	2.95%	-0.23%
8-Apr-08	2.72%	3.00%	-0.28%
9-Apr-08	2.73%	3.00%	-0.27%
10-Apr-08	2.72%	3.00%	-0.28%
11-Apr-08	2.72%	2.95%	-0.23%
14-Apr-08	2.71%	2.90%	-0.19%
15-Apr-08	2.72%	2.90%	-0.18%
16-Apr-08	2.73%	2.90%	-0.17%
17-Apr-08	2.80%	2.90%	-0.10%
18-Apr-08	2.87%	3.00%	-0.13%
21-Apr-08	2.90%	3.00%	-0.10%
22-Apr-08	2.90%	3.00%	-0.11%
23-Apr-08	2.90%	3.00%	-0.11%
24-Apr-08	2.89%	2.95%	-0.06%
25-Apr-08	2.88%	3.00%	-0.12%
28-Apr-08	2.86%	3.00%	-0.14%
29-Apr-08	2.83%	2.90%	-0.07%
30-Apr-08	2.80%	2.90%	-0.10%
1-May-08	2.72%	2.90%	-0.18%
2-May-08	2.70%	2.85%	-0.15%

6-May-08	2.67%	2.85%	-0.18%
7-May-08	2.62%	2.75%	-0.13%
8-May-08	2.59%	2.75%	-0.16%
9-May-08	2.55%	2.65%	-0.10%
12-May-08	2.53%	2.60%	-0.07%
13-May-08	2.51%	2.60%	-0.09%
14-May-08	2.51%	2.60%	-0.10%
15-May-08	2.50%	2.60%	-0.10%
16-May-08	2.48%	2.60%	-0.12%
19-May-08	2.45%	2.55%	-0.10%
20-May-08	2.43%	2.50%	-0.07%
21-May-08	2.40%	2.45%	-0.05%
22-May-08	2.39%	2.45%	-0.06%
23-May-08	2.38%	2.45%	-0.07%
27-May-08	2.38%	2.50%	-0.12%
28-May-08	2.38%	2.50%	-0.12%
29-May-08	2.46%	2.60%	-0.14%
30-May-08	2.46%	2.60%	-0.14%
2-Jun-08	2.46%	2.60%	-0.14%
3-Jun-08	2.45%	2.60%	-0.15%
4-Jun-08	2.45%	2.60%	-0.15%
5-Jun-08	2.45%	2.60%	-0.15%
6-Jun-08	2.45%	2.65%	-0.20%
9-Jun-08	2.45%	2.65%	-0.20%
10-Jun-08	2.48%	2.65%	-0.18%
11-Jun-08	2.48%	2.65%	-0.17%
12-Jun-08	2.47%	2.70%	-0.23%
13-Jun-08	2.48%	2.65%	-0.17%
16-Jun-08	2.48%	2.75%	-0.27%
17-Jun-08	2.48%	2.70%	-0.22%
18-Jun-08	2.48%	2.70%	-0.22%
19-Jun-08	2.48%	2.70%	-0.22%
20-Jun-08	2.48%	2.70%	-0.22%
23-Jun-08	2.48%	2.70%	-0.22%
24-Jun-08	2.48%	2.70%	-0.22%
25-Jun-08	2.48%	2.70%	-0.22%
26-Jun-08	2.48%	2.70%	-0.22%
27-Jun-08	2.47%	2.65%	-0.18%
30-Jun-08	2.46%	2.60%	-0.14%
1-Jul-08	2.46%	2.65%	-0.19%
2-Jul-08	2.46%	2.65%	-0.19%
3-Jul-08	2.46%	2.65%	-0.19%
7-Jul-08	2.46%	2.65%	-0.19%
8-Jul-08	2.46%	2.65%	-0.19%
9-Jul-08	2.46%	2.65%	-0.19%
10-Jul-08	2.46%	2.65%	-0.19%
11-Jul-08	2.46%	2.65%	-0.19%

14-Jul-08	2.46%	2.65%	-0.19%
15-Jul-08	2.46%	2.65%	-0.19%
16-Jul-08	2.46%	2.65%	-0.19%
17-Jul-08	2.46%	2.65%	-0.19%
18-Jul-08	2.46%	2.60%	-0.14%
21-Jul-08	2.46%	2.65%	-0.19%
22-Jul-08	2.46%	2.65%	-0.19%
23-Jul-08	2.46%	2.65%	-0.19%
24-Jul-08	2.46%	2.65%	-0.19%
25-Jul-08	2.46%	2.65%	-0.19%
28-Jul-08	2.46%	2.65%	-0.19%
29-Jul-08	2.46%	2.65%	-0.19%
30-Jul-08	2.46%	2.65%	-0.19%
31-Jul-08	2.46%	2.65%	-0.19%
1-Aug-08	2.46%	2.60%	-0.14%
4-Aug-08	2.46%	2.60%	-0.14%
5-Aug-08	2.46%	2.60%	-0.14%
6-Aug-08	2.46%	2.65%	-0.19%
7-Aug-08	2.46%	2.60%	-0.14%
8-Aug-08	2.46%	2.60%	-0.14%
11-Aug-08	2.46%	2.60%	-0.14%
12-Aug-08	2.46%	2.60%	-0.14%
13-Aug-08	2.47%	2.60%	-0.13%
14-Aug-08	2.47%	2.60%	-0.13%
15-Aug-08	2.47%	2.60%	-0.13%
18-Aug-08	2.47%	2.60%	-0.13%
19-Aug-08	2.47%	2.60%	-0.13%
20-Aug-08	2.47%	2.60%	-0.13%
21-Aug-08	2.47%	2.60%	-0.13%
22-Aug-08	2.47%	2.60%	-0.13%
26-Aug-08	2.47%	2.60%	-0.13%
27-Aug-08	2.47%	2.60%	-0.13%
28-Aug-08	2.49%	2.65%	-0.16%
29-Aug-08	2.49%	2.65%	-0.16%
2-Sep-08	2.49%	2.60%	-0.11%
3-Sep-08	2.49%	2.60%	-0.11%
4-Sep-08	2.49%	2.60%	-0.11%
5-Sep-08	2.49%	2.60%	-0.11%
8-Sep-08	2.49%	2.65%	-0.16%
9-Sep-08	2.49%	2.65%	-0.16%
10-Sep-08	2.49%	2.65%	-0.16%
11-Sep-08	2.49%	2.60%	-0.11%
12-Sep-08	2.49%	2.60%	-0.11%
15-Sep-08	2.50%	2.70%	-0.20%
16-Sep-08	2.75%	3.20%	-0.45%
17-Sep-08	3.03%	3.75%	-0.72%
18-Sep-08	3.19%	6.00%	-2.81%

19-Sep-08	3.19%	6.00%	-2.81%
22-Sep-08	3.18%	5.00%	-1.82%
23-Sep-08	3.21%	5.25%	-2.04%
24-Sep-08	3.43%	5.25%	-1.82%
25-Sep-08	3.71%	5.50%	-1.79%
26-Sep-08	3.70%	5.50%	-1.80%
29-Sep-08	3.72%	5.50%	-1.78%
30-Sep-08	3.93%	7.00%	-3.07%
1-Oct-08	4.00%	6.00%	-2.00%
2-Oct-08	4.05%	6.00%	-1.96%
3-Oct-08	4.11%	6.00%	-1.89%
6-Oct-08	4.09%	6.00%	-1.91%
7-Oct-08	4.14%	6.50%	-2.36%
8-Oct-08	4.29%	7.00%	-2.71%
9-Oct-08	4.51%	6.00%	-1.49%
10-Oct-08	4.59%	6.00%	-1.41%
14-Oct-08	4.47%	5.75%	-1.28%
15-Oct-08	4.36%	5.50%	-1.14%
16-Oct-08	4.28%	5.50%	-1.22%
17-Oct-08	4.18%	5.00%	-0.82%
20-Oct-08	3.75%	4.25%	-0.50%
21-Oct-08	3.53%	4.00%	-0.47%
22-Oct-08	3.28%	3.75%	-0.48%
23-Oct-08	3.26%	3.75%	-0.49%
24-Oct-08	3.24%	3.75%	-0.51%
27-Oct-08	3.22%	3.75%	-0.53%
28-Oct-08	3.17%	3.75%	-0.58%
29-Oct-08	3.12%	3.75%	-0.63%
30-Oct-08	2.85%	3.25%	-0.40%
31-Oct-08	2.58%	3.25%	-0.67%
3-Nov-08	2.36%	2.75%	-0.39%
5-Nov-08	1.96%	2.25%	-0.29%
6-Nov-08	1.77%	2.00%	-0.23%
10-Nov-08	1.54%	2.00%	-0.46%
12-Nov-08	1.41%	2.00%	-0.59%
13-Nov-08	1.42%	2.00%	-0.58%
14-Nov-08	1.48%	2.00%	-0.52%
17-Nov-08	1.47%	1.80%	-0.33%
18-Nov-08	1.45%	1.80%	-0.35%
19-Nov-08	1.41%	1.80%	-0.39%
20-Nov-08	1.40%	1.80%	-0.40%
21-Nov-08	1.40%	1.90%	-0.51%
24-Nov-08	1.41%	2.00%	-0.59%
25-Nov-08	1.44%	2.00%	-0.56%
26-Nov-08	1.43%	2.00%	-0.57%
28-Nov-08	1.90%	2.75%	-0.85%
1-Dec-08	1.91%	3.00%	-1.09%

2-Dec-08	1.90%	3.00%	-1.10%
3-Dec-08	1.89%	3.00%	-1.11%
4-Dec-08	1.88%	2.60%	-0.72%
5-Dec-08	1.87%	2.70%	-0.83%
8-Dec-08	1.83%	2.25%	-0.43%
9-Dec-08	1.64%	2.15%	-0.52%
10-Dec-08	1.44%	2.20%	-0.76%
11-Dec-08	1.20%	1.75%	-0.56%
12-Dec-08	1.04%	1.75%	-0.71%
15-Dec-08	0.96%	1.50%	-0.54%
16-Dec-08	0.88%	1.25%	-0.37%
17-Dec-08	0.58%	1.25%	-0.67%
18-Dec-08	0.51%	1.25%	-0.74%
19-Dec-08	0.47%	1.25%	-0.78%
22-Dec-08	0.46%	1.25%	-0.79%
23-Dec-08	0.47%	1.20%	-0.73%
24-Dec-08	0.47%	1.20%	-0.73%
29-Dec-08	0.46%	1.00%	-0.54%
30-Dec-08	0.45%	1.00%	-0.55%
31-Dec-08	0.44%	0.80%	-0.36%
2-Jan-09	0.43%	0.80%	-0.37%
5-Jan-09	0.43%	0.90%	-0.47%
6-Jan-09	0.42%	1.00%	-0.58%
7-Jan-09	0.41%	1.00%	-0.59%
8-Jan-09	0.39%	0.95%	-0.56%
9-Jan-09	0.37%	0.90%	-0.53%
12-Jan-09	0.34%	0.90%	-0.56%
13-Jan-09	0.33%	0.85%	-0.52%
14-Jan-09	0.33%	0.85%	-0.52%
15-Jan-09	0.33%	0.90%	-0.57%
16-Jan-09	0.36%	1.00%	-0.64%
20-Jan-09	0.35%	1.00%	-0.65%
21-Jan-09	0.36%	1.00%	-0.64%
22-Jan-09	0.39%	1.00%	-0.61%
23-Jan-09	0.40%	1.00%	-0.60%
26-Jan-09	0.41%	0.75%	-0.34%
27-Jan-09	0.41%	0.75%	-0.34%
28-Jan-09	0.41%	0.75%	-0.34%
29-Jan-09	0.41%	0.75%	-0.34%
30-Jan-09	0.42%	0.75%	-0.33%
2-Feb-09	0.44%	0.75%	-0.31%
3-Feb-09	0.45%	0.75%	-0.31%
4-Feb-09	0.45%	0.75%	-0.31%
5-Feb-09	0.45%	0.75%	-0.30%
6-Feb-09	0.45%	0.75%	-0.30%
9-Feb-09	0.45%	0.70%	-0.25%
10-Feb-09	0.45%	0.75%	-0.30%

11-Feb-09	0.45%	0.75%	-0.30%
12-Feb-09	0.46%	0.75%	-0.30%
13-Feb-09	0.46%	0.75%	-0.29%
17-Feb-09	0.47%	0.75%	-0.28%
18-Feb-09	0.47%	0.80%	-0.33%
19-Feb-09	0.47%	0.80%	-0.33%
20-Feb-09	0.47%	0.80%	-0.33%
23-Feb-09	0.47%	0.80%	-0.33%
24-Feb-09	0.48%	0.80%	-0.32%
25-Feb-09	0.48%	0.80%	-0.32%
26-Feb-09	0.50%	0.80%	-0.30%
27-Feb-09	0.50%	0.80%	-0.30%
2-Mar-09	0.50%	0.80%	-0.30%
3-Mar-09	0.51%	0.85%	-0.34%
4-Mar-09	0.52%	0.80%	-0.28%
5-Mar-09	0.53%	0.80%	-0.27%
6-Mar-09	0.55%	0.80%	-0.25%
9-Mar-09	0.56%	0.90%	-0.34%
10-Mar-09	0.56%	1.00%	-0.44%
11-Mar-09	0.56%	1.00%	-0.44%
12-Mar-09	0.56%	1.00%	-0.44%
13-Mar-09	0.56%	1.00%	-0.44%
16-Mar-09	0.56%	1.00%	-0.44%
17-Mar-09	0.56%	1.00%	-0.44%
18-Mar-09	0.55%	1.00%	-0.46%
19-Mar-09	0.52%	1.00%	-0.48%
20-Mar-09	0.52%	1.00%	-0.48%
23-Mar-09	0.52%	1.00%	-0.48%
24-Mar-09	0.52%	1.00%	-0.48%
25-Mar-09	0.52%	1.00%	-0.48%
26-Mar-09	0.52%	1.00%	-0.48%
27-Mar-09	0.52%	1.60%	-1.08%
30-Mar-09	0.51%	1.00%	-0.49%
31-Mar-09	0.50%	1.00%	-0.50%
1-Apr-09	0.50%	1.00%	-0.51%
2-Apr-09	0.49%	1.00%	-0.51%
3-Apr-09	0.48%	1.00%	-0.52%
6-Apr-09	0.48%	1.00%	-0.52%
7-Apr-09	0.47%	1.00%	-0.53%
8-Apr-09	0.46%	1.00%	-0.54%
9-Apr-09	0.45%	0.80%	-0.35%
14-Apr-09	0.45%	1.00%	-0.55%
15-Apr-09	0.45%	1.00%	-0.55%
16-Apr-09	0.45%	1.00%	-0.55%
17-Apr-09	0.45%	1.00%	-0.55%
20-Apr-09	0.44%	1.00%	-0.56%
21-Apr-09	0.44%	0.90%	-0.46%

22-Apr-09	0.44%	0.90%	-0.46%
23-Apr-09	0.44%	0.90%	-0.46%
24-Apr-09	0.44%	0.90%	-0.47%
27-Apr-09	0.43%	0.90%	-0.47%
28-Apr-09	0.43%	0.90%	-0.47%
29-Apr-09	0.42%	0.90%	-0.48%
30-Apr-09	0.41%	0.90%	-0.49%
1-May-09	0.41%	0.85%	-0.44%
5-May-09	0.40%	0.80%	-0.40%
6-May-09	0.40%	0.80%	-0.41%
7-May-09	0.38%	0.75%	-0.37%
8-May-09	0.37%	0.75%	-0.38%
11-May-09	0.35%	0.75%	-0.40%
12-May-09	0.35%	0.75%	-0.40%
13-May-09	0.34%	0.65%	-0.31%
14-May-09	0.34%	0.65%	-0.32%
15-May-09	0.33%	0.65%	-0.32%
18-May-09	0.32%	0.65%	-0.33%
19-May-09	0.31%	0.65%	-0.34%
20-May-09	0.31%	0.65%	-0.34%
21-May-09	0.31%	0.65%	-0.34%
22-May-09	0.31%	0.65%	-0.34%
26-May-09	0.32%	0.65%	-0.33%
27-May-09	0.32%	0.65%	-0.33%
28-May-09	0.32%	0.65%	-0.33%
29-May-09	0.32%	0.65%	-0.33%
1-Jun-09	0.32%	0.65%	-0.33%
2-Jun-09	0.32%	0.65%	-0.33%
3-Jun-09	0.32%	0.65%	-0.33%
4-Jun-09	0.32%	0.65%	-0.33%
5-Jun-09	0.32%	0.65%	-0.33%
8-Jun-09	0.32%	0.65%	-0.33%
9-Jun-09	0.32%	0.65%	-0.33%
10-Jun-09	0.32%	0.65%	-0.33%
11-Jun-09	0.32%	0.65%	-0.33%
12-Jun-09	0.32%	0.65%	-0.33%
15-Jun-09	0.32%	0.65%	-0.33%
16-Jun-09	0.32%	0.65%	-0.33%
17-Jun-09	0.31%	0.65%	-0.34%
18-Jun-09	0.32%	0.65%	-0.34%
19-Jun-09	0.32%	0.65%	-0.33%
22-Jun-09	0.32%	0.65%	-0.34%
23-Jun-09	0.31%	0.65%	-0.34%
24-Jun-09	0.31%	0.65%	-0.34%
25-Jun-09	0.31%	0.65%	-0.34%
26-Jun-09	0.31%	0.65%	-0.34%
29-Jun-09	0.31%	0.65%	-0.34%



30-Jun-09	0.31%	0.65%	-0.34%	
1-Jul-09	0.31%	0.65%	-0.34%	
2-Jul-09	0.30%	0.65%	-0.35%	
6-Jul-09	0.30%	0.65%	-0.35%	
7-Jul-09	0.30%	0.65%	-0.35%	
8-Jul-09	0.30%	0.65%	-0.35%	
9-Jul-09	0.30%	0.65%	-0.35%	
10-Jul-09	0.29%	0.60%	-0.31%	
13-Jul-09	0.29%	0.60%	-0.31%	
14-Jul-09	0.29%	0.60%	-0.31%	
15-Jul-09	0.29%	0.60%	-0.31%	
16-Jul-09	0.29%	0.60%	-0.31%	
17-Jul-09	0.29%	0.60%	-0.31%	
20-Jul-09	0.29%	0.60%	-0.31%	
21-Jul-09	0.29%	0.50%	-0.22%	
22-Jul-09	0.29%	0.50%	-0.22%	
23-Jul-09	0.29%	0.50%	-0.22%	
24-Jul-09	0.29%	0.50%	-0.22%	
27-Jul-09	0.29%	0.45%	-0.16%	
28-Jul-09	0.29%	0.45%	-0.17%	
29-Jul-09	0.29%	0.45%	-0.17%	
30-Jul-09	0.28%	0.45%	-0.17%	
31-Jul-09	0.28%	0.45%	-0.17%	
3-Aug-09	0.28%	0.45%	-0.17%	
4-Aug-09	0.28%	0.45%	-0.17%	
5-Aug-09	0.28%	0.45%	-0.17%	
6-Aug-09	0.28%	0.45%	-0.17%	
7-Aug-09	0.28%	0.45%	-0.17%	
10-Aug-09	0.28%	0.45%	-0.18%	
11-Aug-09	0.27%	0.50%	-0.23%	
12-Aug-09	0.27%	0.50%	-0.23%	
13-Aug-09	0.27%	0.50%	-0.23%	
14-Aug-09	0.27%	0.50%	-0.23%	
17-Aug-09	0.28%	0.45%	-0.17%	
18-Aug-09	0.27%	0.45%	-0.18%	
19-Aug-09	0.27%	0.45%	-0.18%	
20-Aug-09	0.27%	0.45%	-0.18%	
21-Aug-09	0.27%	0.45%	-0.18%	
24-Aug-09	0.26%	0.45%	-0.19%	
25-Aug-09	0.26%	0.45%	-0.19%	
26-Aug-09	0.26%	0.45%	-0.19%	
27-Aug-09	0.26%	0.45%	-0.19%	
28-Aug-09	0.26%	0.45%	-0.19%	
1-Sep-09	0.26%	0.45%	-0.19%	
2-Sep-09	0.25%	0.45%	-0.20%	
3-Sep-09	0.25%	0.45%	-0.20%	
4-Sep-09	0.25%	0.45%	-0.20%	

8-Sep-09	0.25%	0.40%	-0.15%
9-Sep-09	0.25%	0.40%	-0.15%
10-Sep-09	0.24%	0.40%	-0.16%
11-Sep-09	0.24%	0.40%	-0.16%
14-Sep-09	0.24%	0.35%	-0.11%
15-Sep-09	0.24%	0.35%	-0.11%
16-Sep-09	0.24%	0.35%	-0.11%
17-Sep-09	0.25%	0.40%	-0.15%
18-Sep-09	0.25%	0.40%	-0.15%
21-Sep-09	0.25%	0.40%	-0.15%
22-Sep-09	0.25%	0.40%	-0.15%
23-Sep-09	0.25%	0.35%	-0.10%
24-Sep-09	0.25%	0.35%	-0.10%
25-Sep-09	0.25%	0.35%	-0.10%
28-Sep-09	0.25%	0.40%	-0.15%
29-Sep-09	0.25%	0.40%	-0.15%
30-Sep-09	0.25%	0.40%	-0.15%
1-Oct-09	0.25%	0.40%	-0.15%
2-Oct-09	0.24%	0.40%	-0.16%
5-Oct-09	0.24%	0.40%	-0.16%
6-Oct-09	0.24%	0.40%	-0.16%
7-Oct-09	0.24%	0.40%	-0.16%
8-Oct-09	0.24%	0.40%	-0.16%
9-Oct-09	0.25%	0.40%	-0.16%
13-Oct-09	0.25%	0.40%	-0.16%
14-Oct-09	0.25%	0.35%	-0.11%
15-Oct-09	0.25%	0.35%	-0.11%
16-Oct-09	0.25%	0.35%	-0.11%
19-Oct-09	0.25%	0.34%	-0.10%
20-Oct-09	0.25%	0.34%	-0.10%
21-Oct-09	0.24%	0.34%	-0.10%
22-Oct-09	0.24%	0.32%	-0.08%
23-Oct-09	0.24%	0.32%	-0.08%
26-Oct-09	0.24%	0.32%	-0.08%
27-Oct-09	0.24%	0.32%	-0.08%
28-Oct-09	0.24%	0.30%	-0.06%
29-Oct-09	0.24%	0.30%	-0.06%
30-Oct-09	0.24%	0.30%	-0.06%
2-Nov-09	0.24%	0.30%	-0.06%
3-Nov-09	0.24%	0.30%	-0.06%
4-Nov-09	0.24%	0.30%	-0.06%
5-Nov-09	0.24%	0.30%	-0.06%
6-Nov-09	0.24%	0.30%	-0.06%
9-Nov-09	0.24%	0.30%	-0.06%
10-Nov-09	0.24%	0.30%	-0.06%
12-Nov-09	0.24%	0.30%	-0.06%
13-Nov-09	0.24%	0.30%	-0.06%

16-Nov-09	0.24%	0.30%	-0.06%
17-Nov-09	0.24%	0.30%	-0.06%
18-Nov-09	0.24%	0.30%	-0.06%
19-Nov-09	0.24%	0.30%	-0.06%
20-Nov-09	0.24%	0.30%	-0.06%
23-Nov-09	0.24%	0.30%	-0.06%
24-Nov-09	0.24%	0.30%	-0.06%
25-Nov-09	0.23%	0.30%	-0.07%
27-Nov-09	0.24%	0.30%	-0.06%
30-Nov-09	0.24%	0.30%	-0.06%
1-Dec-09	0.23%	0.30%	-0.07%
2-Dec-09	0.23%	0.32%	-0.09%
3-Dec-09	0.23%	0.32%	-0.09%
4-Dec-09	0.23%	0.32%	-0.09%
7-Dec-09	0.23%	0.32%	-0.09%
8-Dec-09	0.23%	0.32%	-0.09%
9-Dec-09	0.23%	0.32%	-0.09%
10-Dec-09	0.23%	0.32%	-0.09%
11-Dec-09	0.23%	0.32%	-0.09%
14-Dec-09	0.23%	0.32%	-0.09%
15-Dec-09	0.23%	0.32%	-0.09%
16-Dec-09	0.23%	0.32%	-0.09%
17-Dec-09	0.23%	0.32%	-0.09%
18-Dec-09	0.23%	0.32%	-0.09%
21-Dec-09	0.23%	0.32%	-0.09%
22-Dec-09	0.23%	0.32%	-0.09%
23-Dec-09	0.23%	0.32%	-0.09%
24-Dec-09	0.23%	0.32%	-0.09%
29-Dec-09	0.23%	0.32%	-0.09%
30-Dec-09	0.23%	0.32%	-0.09%
31-Dec-09	0.23%	0.32%	-0.09%
4-Jan-10	0.23%	0.32%	-0.09%
5-Jan-10	0.23%	0.32%	-0.09%
6-Jan-10	0.23%	0.30%	-0.07%
7-Jan-10	0.23%	0.30%	-0.07%
8-Jan-10	0.23%	0.30%	-0.07%
11-Jan-10	0.23%	0.30%	-0.07%
12-Jan-10	0.23%	0.30%	-0.07%
13-Jan-10	0.23%	0.30%	-0.07%
14-Jan-10	0.23%	0.30%	-0.07%
15-Jan-10	0.23%	0.30%	-0.07%
19-Jan-10	0.23%	0.30%	-0.07%
20-Jan-10	0.23%	0.30%	-0.07%
21-Jan-10	0.23%	0.30%	-0.07%
22-Jan-10	0.23%	0.30%	-0.07%
25-Jan-10	0.23%	0.28%	-0.05%
26-Jan-10	0.23%	0.28%	-0.05%

27-Jan-10	0.23%	0.28%	-0.05%
28-Jan-10	0.23%	0.28%	-0.05%
29-Jan-10	0.23%	0.28%	-0.05%
1-Feb-10	0.23%	0.28%	-0.05%
2-Feb-10	0.23%	0.28%	-0.05%
3-Feb-10	0.23%	0.28%	-0.05%
4-Feb-10	0.23%	0.28%	-0.05%
5-Feb-10	0.23%	0.28%	-0.05%
8-Feb-10	0.23%	0.28%	-0.05%
9-Feb-10	0.23%	0.28%	-0.05%
10-Feb-10	0.23%	0.28%	-0.05%
11-Feb-10	0.23%	0.28%	-0.05%
12-Feb-10	0.23%	0.28%	-0.05%
16-Feb-10	0.23%	0.28%	-0.05%
17-Feb-10	0.23%	0.28%	-0.05%
18-Feb-10	0.23%	0.28%	-0.05%
19-Feb-10	0.23%	0.28%	-0.05%
22-Feb-10	0.23%	0.28%	-0.05%
23-Feb-10	0.23%	0.28%	-0.05%
24-Feb-10	0.23%	0.28%	-0.05%
25-Feb-10	0.23%	0.28%	-0.05%
26-Feb-10	0.23%	0.28%	-0.05%
1-Mar-10	0.23%	0.28%	-0.05%
2-Mar-10	0.23%	0.28%	-0.05%
3-Mar-10	0.23%	0.28%	-0.05%
4-Mar-10	0.23%	0.28%	-0.05%
5-Mar-10	0.23%	0.28%	-0.05%
8-Mar-10	0.23%	0.28%	-0.05%
9-Mar-10	0.23%	0.28%	-0.05%
10-Mar-10	0.23%	0.28%	-0.05%
11-Mar-10	0.23%	0.28%	-0.05%
12-Mar-10	0.23%	0.28%	-0.05%
15-Mar-10	0.23%	0.28%	-0.05%
16-Mar-10	0.24%	0.28%	-0.04%
17-Mar-10	0.24%	0.28%	-0.04%
18-Mar-10	0.24%	0.28%	-0.04%
19-Mar-10	0.25%	0.28%	-0.03%
22-Mar-10	0.25%	0.28%	-0.03%
23-Mar-10	0.25%	0.28%	-0.03%
24-Mar-10	0.25%	0.28%	-0.03%
25-Mar-10	0.25%	0.28%	-0.03%
26-Mar-10	0.25%	0.28%	-0.03%
29-Mar-10	0.25%	0.30%	-0.05%
30-Mar-10	0.25%	0.30%	-0.05%
31-Mar-10	0.25%	0.30%	-0.05%
1-Apr-10	0.25%	0.30%	-0.05%
6-Apr-10	0.25%	0.30%	-0.05%

7-Apr-10	0.25%	0.30%	-0.05%
8-Apr-10	0.25%	0.30%	-0.05%
9-Apr-10	0.25%	0.30%	-0.05%
12-Apr-10	0.25%	0.30%	-0.05%
13-Apr-10	0.25%	0.30%	-0.05%
14-Apr-10	0.26%	0.30%	-0.04%
15-Apr-10	0.26%	0.32%	-0.06%
16-Apr-10	0.26%	0.30%	-0.04%
19-Apr-10	0.26%	0.30%	-0.04%
20-Apr-10	0.26%	0.30%	-0.04%
21-Apr-10	0.26%	0.30%	-0.04%
22-Apr-10	0.26%	0.30%	-0.04%
23-Apr-10	0.26%	0.30%	-0.04%
26-Apr-10	0.26%	0.30%	-0.04%
27-Apr-10	0.27%	0.30%	-0.03%
28-Apr-10	0.27%	0.30%	-0.03%
29-Apr-10	0.28%	0.30%	-0.02%
30-Apr-10	0.28%	0.30%	-0.02%
4-May-10	0.28%	0.32%	-0.04%
5-May-10	0.29%	0.32%	-0.03%
6-May-10	0.30%	0.32%	-0.02%
7-May-10	0.35%	0.40%	-0.05%
10-May-10	0.34%	0.40%	-0.06%
11-May-10	0.34%	0.40%	-0.06%
12-May-10	0.34%	0.40%	-0.06%
13-May-10	0.34%	0.40%	-0.06%
14-May-10	0.34%	0.40%	-0.06%
17-May-10	0.34%	0.40%	-0.06%
18-May-10	0.34%	0.40%	-0.06%
19-May-10	0.34%	0.40%	-0.06%
20-May-10	0.34%	0.40%	-0.06%
21-May-10	0.34%	0.40%	-0.06%
24-May-10	0.35%	0.40%	-0.05%
25-May-10	0.35%	0.40%	-0.05%
26-May-10	0.35%	0.40%	-0.05%
27-May-10	0.35%	0.40%	-0.05%
28-May-10	0.35%	0.40%	-0.05%
1-Jun-10	0.35%	0.40%	-0.05%
2-Jun-10	0.35%	0.40%	-0.05%
3-Jun-10	0.35%	0.40%	-0.05%
4-Jun-10	0.35%	0.40%	-0.05%
7-Jun-10	0.35%	0.40%	-0.05%
8-Jun-10	0.35%	0.40%	-0.05%
9-Jun-10	0.35%	0.45%	-0.10%
10-Jun-10	0.35%	0.45%	-0.10%
11-Jun-10	0.35%	0.45%	-0.10%
14-Jun-10	0.35%	0.45%	-0.10%

15-Jun-10	0.35%	0.45%	-0.10%
16-Jun-10	0.35%	0.45%	-0.10%
17-Jun-10	0.35%	0.45%	-0.10%
18-Jun-10	0.35%	0.45%	-0.10%
21-Jun-10	0.35%	0.45%	-0.10%
22-Jun-10	0.35%	0.48%	-0.13%
23-Jun-10	0.35%	0.45%	-0.10%
24-Jun-10	0.35%	0.45%	-0.10%
25-Jun-10	0.35%	0.45%	-0.10%
28-Jun-10	0.35%	0.45%	-0.10%
29-Jun-10	0.35%	0.45%	-0.10%
30-Jun-10	0.35%	0.45%	-0.10%
1-Jul-10	0.35%	0.45%	-0.10%
2-Jul-10	0.35%	0.45%	-0.10%
6-Jul-10	0.35%	0.45%	-0.10%
7-Jul-10	0.35%	0.40%	-0.06%
8-Jul-10	0.34%	0.45%	-0.11%
9-Jul-10	0.34%	0.45%	-0.11%
12-Jul-10	0.34%	0.45%	-0.11%
13-Jul-10	0.34%	0.45%	-0.11%
14-Jul-10	0.34%	0.45%	-0.11%
15-Jul-10	0.34%	0.45%	-0.11%
16-Jul-10	0.34%	0.45%	-0.11%
19-Jul-10	0.34%	0.45%	-0.11%
20-Jul-10	0.33%	0.45%	-0.12%
21-Jul-10	0.33%	0.45%	-0.12%
22-Jul-10	0.33%	0.45%	-0.12%
23-Jul-10	0.33%	0.45%	-0.12%
26-Jul-10	0.33%	0.45%	-0.13%
27-Jul-10	0.32%	0.45%	-0.13%
28-Jul-10	0.32%	0.40%	-0.08%
29-Jul-10	0.31%	0.40%	-0.09%
30-Jul-10	0.31%	0.40%	-0.10%
2-Aug-10	0.30%	0.40%	-0.10%
3-Aug-10	0.30%	0.40%	-0.10%
4-Aug-10	0.30%	0.38%	-0.08%
5-Aug-10	0.29%	0.38%	-0.09%
6-Aug-10	0.29%	0.38%	-0.09%
9-Aug-10	0.29%	0.38%	-0.09%
10-Aug-10	0.29%	0.37%	-0.08%
11-Aug-10	0.28%	0.37%	-0.09%
12-Aug-10	0.28%	0.37%	-0.09%
13-Aug-10	0.27%	0.37%	-0.10%
16-Aug-10	0.27%	0.37%	-0.10%
17-Aug-10	0.27%	0.37%	-0.10%
18-Aug-10	0.27%	0.36%	-0.09%
19-Aug-10	0.26%	0.36%	-0.10%

20-Aug-10	0.26%	0.36%	-0.10%
24-Aug-10	0.26%	0.36%	-0.10%
26-Aug-10	0.26%	0.36%	-0.10%
27-Aug-10	0.26%	0.36%	-0.10%
31-Aug-10	0.26%	0.36%	-0.10%
1-Sep-10	0.26%	0.36%	-0.10%
2-Sep-10	0.26%	0.36%	-0.10%
3-Sep-10	0.26%	0.36%	-0.10%
8-Sep-10	0.26%	0.36%	-0.10%
9-Sep-10	0.26%	0.36%	-0.10%
10-Sep-10	0.26%	0.36%	-0.10%
13-Sep-10	0.26%	0.35%	-0.09%
14-Sep-10	0.26%	0.35%	-0.09%
15-Sep-10	0.26%	0.35%	-0.09%
16-Sep-10	0.26%	0.35%	-0.09%
17-Sep-10	0.26%	0.35%	-0.09%
20-Sep-10	0.26%	0.32%	-0.06%
21-Sep-10	0.26%	0.32%	-0.06%
22-Sep-10	0.26%	0.32%	-0.06%
23-Sep-10	0.26%	0.32%	-0.06%
24-Sep-10	0.26%	0.32%	-0.06%
27-Sep-10	0.26%	0.32%	-0.06%
28-Sep-10	0.26%	0.35%	-0.09%
29-Sep-10	0.26%	0.35%	-0.09%
30-Sep-10	0.26%	0.35%	-0.09%
1-Oct-10	0.26%	0.35%	-0.09%
4-Oct-10	0.26%	0.35%	-0.09%
5-Oct-10	0.26%	0.35%	-0.09%
6-Oct-10	0.26%	0.35%	-0.09%
8-Oct-10	0.26%	0.35%	-0.09%
12-Oct-10	0.26%	0.35%	-0.09%
13-Oct-10	0.26%	0.35%	-0.09%
14-Oct-10	0.26%	0.35%	-0.09%
15-Oct-10	0.26%	0.35%	-0.09%
18-Oct-10	0.26%	0.35%	-0.09%
19-Oct-10	0.26%	0.35%	-0.09%
20-Oct-10	0.26%	0.33%	-0.07%
21-Oct-10	0.26%	0.33%	-0.07%
22-Oct-10	0.26%	0.33%	-0.07%
25-Oct-10	0.26%	0.33%	-0.07%
26-Oct-10	0.26%	0.33%	-0.07%
27-Oct-10	0.26%	0.33%	-0.07%
28-Oct-10	0.25%	0.33%	-0.08%
29-Oct-10	0.25%	0.33%	-0.08%
1-Nov-10	0.25%	0.33%	-0.08%
2-Nov-10	0.25%	0.33%	-0.08%
3-Nov-10	0.25%	0.33%	-0.08%

4-Nov-10	0.25%	0.33%	-0.08%
5-Nov-10	0.25%	0.31%	-0.06%
8-Nov-10	0.25%	0.33%	-0.08%
9-Nov-10	0.25%	0.33%	-0.08%
10-Nov-10	0.25%	0.33%	-0.08%
12-Nov-10	0.25%	0.33%	-0.08%
15-Nov-10	0.25%	0.33%	-0.08%
16-Nov-10	0.25%	0.33%	-0.08%
17-Nov-10	0.25%	0.33%	-0.08%
18-Nov-10	0.25%	0.33%	-0.08%
19-Nov-10	0.25%	0.33%	-0.08%
22-Nov-10	0.25%	0.33%	-0.08%
23-Nov-10	0.25%	0.33%	-0.08%
24-Nov-10	0.25%	0.33%	-0.08%
26-Nov-10	0.26%	0.33%	-0.07%
29-Nov-10	0.26%	0.33%	-0.07%
30-Nov-10	0.26%	0.33%	-0.07%
1-Dec-10	0.27%	0.33%	-0.06%
2-Dec-10	0.27%	0.33%	-0.06%
3-Dec-10	0.27%	0.33%	-0.07%
6-Dec-10	0.27%	0.33%	-0.07%
7-Dec-10	0.26%	0.33%	-0.07%
8-Dec-10	0.26%	0.33%	-0.07%
9-Dec-10	0.26%	0.32%	-0.06%
10-Dec-10	0.26%	0.32%	-0.06%
13-Dec-10	0.26%	0.32%	-0.06%
14-Dec-10	0.26%	0.32%	-0.06%
15-Dec-10	0.26%	0.32%	-0.06%
16-Dec-10	0.26%	0.32%	-0.06%
17-Dec-10	0.26%	0.32%	-0.06%
20-Dec-10	0.26%	0.32%	-0.06%
21-Dec-10	0.26%	0.32%	-0.06%
22-Dec-10	0.26%	0.32%	-0.06%
23-Dec-10	0.26%	0.32%	-0.06%
29-Dec-10	0.26%	0.32%	-0.06%
31-Dec-10	0.26%	0.32%	-0.06%
4-Jan-11	0.26%	0.32%	-0.06%
5-Jan-11	0.26%	0.32%	-0.06%
6-Jan-11	0.26%	0.32%	-0.06%
7-Jan-11	0.26%	0.32%	-0.06%
10-Jan-11	0.26%	0.32%	-0.06%
11-Jan-11	0.26%	0.32%	-0.06%
12-Jan-11	0.26%	0.32%	-0.06%
13-Jan-11	0.26%	0.32%	-0.06%
14-Jan-11	0.26%	0.32%	-0.06%
18-Jan-11	0.26%	0.32%	-0.06%
19-Jan-11	0.26%	0.32%	-0.06%



20-Jan-11	0.26%	0.32%	-0.06%
21-Jan-11	0.26%	0.32%	-0.06%
24-Jan-11	0.26%	0.32%	-0.06%
25-Jan-11	0.26%	0.32%	-0.06%
26-Jan-11	0.26%	0.32%	-0.06%
27-Jan-11	0.26%	0.32%	-0.06%
28-Jan-11	0.26%	0.32%	-0.06%
31-Jan-11	0.26%	0.32%	-0.06%
1-Feb-11	0.26%	0.32%	-0.06%
2-Feb-11	0.26%	0.32%	-0.06%
3-Feb-11	0.26%	0.32%	-0.06%
4-Feb-11	0.26%	0.32%	-0.06%
7-Feb-11	0.26%	0.32%	-0.06%
8-Feb-11	0.26%	0.32%	-0.06%
9-Feb-11	0.26%	0.32%	-0.06%
10-Feb-11	0.26%	0.32%	-0.06%
11-Feb-11	0.27%	0.32%	-0.05%
14-Feb-11	0.26%	0.32%	-0.06%
15-Feb-11	0.26%	0.32%	-0.06%
16-Feb-11	0.26%	0.32%	-0.06%
17-Feb-11	0.26%	0.32%	-0.06%
18-Feb-11	0.26%	0.32%	-0.06%
22-Feb-11	0.26%	0.32%	-0.06%
23-Feb-11	0.26%	0.31%	-0.05%
24-Feb-11	0.26%	0.31%	-0.05%
25-Feb-11	0.26%	0.31%	-0.05%
28-Feb-11	0.26%	0.31%	-0.05%
1-Mar-11	0.26%	0.31%	-0.05%
2-Mar-11	0.26%	0.31%	-0.05%
3-Mar-11	0.26%	0.31%	-0.05%
4-Mar-11	0.26%	0.31%	-0.05%
7-Mar-11	0.26%	0.31%	-0.05%
8-Mar-11	0.26%	0.31%	-0.05%
9-Mar-11	0.26%	0.31%	-0.05%
10-Mar-11	0.26%	0.31%	-0.05%
11-Mar-11	0.26%	0.31%	-0.06%
14-Mar-11	0.25%	0.31%	-0.06%
15-Mar-11	0.25%	0.31%	-0.06%
16-Mar-11	0.25%	0.30%	-0.05%
17-Mar-11	0.25%	0.30%	-0.05%
18-Mar-11	0.25%	0.30%	-0.05%
21-Mar-11	0.25%	0.30%	-0.05%
22-Mar-11	0.25%	0.30%	-0.05%
23-Mar-11	0.25%	0.30%	-0.05%
24-Mar-11	0.25%	0.30%	-0.05%
25-Mar-11	0.25%	0.30%	-0.05%
28-Mar-11	0.25%	0.30%	-0.05%

29-Mar-11	0.25%	0.29%	-0.04%	
30-Mar-11	0.24%	0.29%	-0.05%	
31-Mar-11	0.24%	0.29%	-0.05%	
1-Apr-11	0.24%	0.29%	-0.05%	
4-Apr-11	0.24%	0.29%	-0.05%	
5-Apr-11	0.24%	0.29%	-0.05%	
6-Apr-11	0.23%	0.29%	-0.06%	
7-Apr-11	0.23%	0.29%	-0.06%	
8-Apr-11	0.23%	0.29%	-0.06%	
11-Apr-11	0.22%	0.24%	-0.02%	
12-Apr-11	0.22%	0.24%	-0.02%	
13-Apr-11	0.22%	0.25%	-0.03%	
14-Apr-11	0.22%	0.25%	-0.03%	
15-Apr-11	0.21%	0.25%	-0.04%	
18-Apr-11	0.21%	0.25%	-0.04%	
19-Apr-11	0.21%	0.25%	-0.04%	
20-Apr-11	0.21%	0.25%	-0.04%	
21-Apr-11	0.21%	0.25%	-0.04%	
26-Apr-11	0.21%	0.25%	-0.04%	
27-Apr-11	0.21%	0.25%	-0.04%	
28-Apr-11	0.21%	0.25%	-0.04%	
3-May-11	0.21%	0.26%	-0.05%	
4-May-11	0.21%	0.26%	-0.05%	
5-May-11	0.21%	0.26%	-0.05%	
6-May-11	0.20%	0.26%	-0.06%	
9-May-11	0.20%	0.26%	-0.06%	
10-May-11	0.20%	0.26%	-0.06%	
11-May-11	0.20%	0.26%	-0.06%	
12-May-11	0.20%	0.26%	-0.06%	
13-May-11	0.20%	0.26%	-0.06%	
16-May-11	0.20%	0.26%	-0.06%	
17-May-11	0.20%	0.26%	-0.06%	
18-May-11	0.20%	0.26%	-0.06%	
19-May-11	0.20%	0.26%	-0.06%	
20-May-11	0.19%	0.26%	-0.07%	
23-May-11	0.19%	0.26%	-0.07%	
24-May-11	0.19%	0.26%	-0.07%	
25-May-11	0.19%	0.26%	-0.07%	
26-May-11	0.19%	0.26%	-0.07%	
27-May-11	0.19%	0.26%	-0.07%	
31-May-11	0.19%	0.26%	-0.07%	
1-Jun-11	0.19%	0.26%	-0.07%	
2-Jun-11	0.19%	0.26%	-0.07%	
3-Jun-11	0.19%	0.26%	-0.07%	
6-Jun-11	0.19%	0.26%	-0.07%	
7-Jun-11	0.19%	0.24%	-0.05%	
8-Jun-11	0.19%	0.24%	-0.05%	

9-Jun-11	0.19%	0.24%	-0.05%
10-Jun-11	0.19%	0.24%	-0.05%
13-Jun-11	0.19%	0.24%	-0.05%
14-Jun-11	0.19%	0.24%	-0.05%
15-Jun-11	0.19%	0.24%	-0.05%
16-Jun-11	0.19%	0.24%	-0.05%
17-Jun-11	0.19%	0.24%	-0.05%
20-Jun-11	0.19%	0.24%	-0.05%
21-Jun-11	0.19%	0.24%	-0.05%
22-Jun-11	0.19%	0.24%	-0.05%
23-Jun-11	0.19%	0.24%	-0.05%
24-Jun-11	0.19%	0.24%	-0.05%
27-Jun-11	0.19%	0.24%	-0.05%
28-Jun-11	0.19%	0.24%	-0.05%
29-Jun-11	0.19%	0.24%	-0.05%
30-Jun-11	0.19%	0.24%	-0.05%
1-Jul-11	0.19%	0.24%	-0.05%
5-Jul-11	0.19%	0.24%	-0.05%
6-Jul-11	0.19%	0.21%	-0.02%
7-Jul-11	0.19%	0.21%	-0.02%
8-Jul-11	0.19%	0.21%	-0.02%
11-Jul-11	0.19%	0.21%	-0.02%
12-Jul-11	0.19%	0.21%	-0.02%
13-Jul-11	0.19%	0.20%	-0.01%
14-Jul-11	0.19%	0.20%	-0.01%
15-Jul-11	0.19%	0.20%	-0.01%
18-Jul-11	0.19%	0.20%	-0.01%
19-Jul-11	0.19%	0.20%	-0.01%
20-Jul-11	0.19%	0.22%	-0.03%
21-Jul-11	0.19%	0.22%	-0.03%
22-Jul-11	0.19%	0.22%	-0.03%
25-Jul-11	0.19%	0.22%	-0.03%
26-Jul-11	0.19%	0.22%	-0.03%
27-Jul-11	0.19%	0.22%	-0.03%
28-Jul-11	0.19%	0.22%	-0.03%
29-Jul-11	0.19%	0.22%	-0.03%
1-Aug-11	0.19%	0.22%	-0.03%
2-Aug-11	0.20%	0.22%	-0.02%
3-Aug-11	0.21%	0.22%	-0.01%
4-Aug-11	0.21%	0.22%	-0.01%
5-Aug-11	0.21%	0.22%	-0.01%
8-Aug-11	0.21%	0.22%	-0.01%
9-Aug-11	0.21%	0.25%	-0.04%
10-Aug-11	0.21%	0.25%	-0.04%
11-Aug-11	0.21%	0.25%	-0.04%
12-Aug-11	0.21%	0.25%	-0.04%
15-Aug-11	0.21%	0.25%	-0.04%

16-Aug-11	0.21%	0.25%	-0.04%
17-Aug-11	0.21%	0.25%	-0.04%
18-Aug-11	0.21%	0.26%	-0.05%
19-Aug-11	0.22%	0.26%	-0.04%
22-Aug-11	0.22%	0.26%	-0.04%
23-Aug-11	0.22%	0.26%	-0.04%
24-Aug-11	0.22%	0.26%	-0.04%
25-Aug-11	0.22%	0.26%	-0.04%
26-Aug-11	0.22%	0.26%	-0.04%
30-Aug-11	0.22%	0.26%	-0.04%
31-Aug-11	0.22%	0.30%	-0.08%
1-Sep-11	0.22%	0.30%	-0.08%
2-Sep-11	0.22%	0.30%	-0.08%
6-Sep-11	0.23%	0.30%	-0.07%
7-Sep-11	0.23%	0.30%	-0.07%
8-Sep-11	0.23%	0.30%	-0.08%
9-Sep-11	0.23%	0.30%	-0.07%
12-Sep-11	0.23%	0.30%	-0.07%
13-Sep-11	0.23%	0.35%	-0.12%
14-Sep-11	0.23%	0.35%	-0.12%
15-Sep-11	0.23%	0.35%	-0.12%
16-Sep-11	0.23%	0.35%	-0.12%
19-Sep-11	0.23%	0.35%	-0.12%
20-Sep-11	0.23%	0.35%	-0.12%
21-Sep-11	0.23%	0.35%	-0.12%
22-Sep-11	0.23%	0.35%	-0.12%
23-Sep-11	0.24%	0.35%	-0.11%
26-Sep-11	0.24%	0.35%	-0.11%
27-Sep-11	0.24%	0.35%	-0.11%
28-Sep-11	0.24%	0.35%	-0.11%
29-Sep-11	0.24%	0.35%	-0.11%
30-Sep-11	0.24%	0.35%	-0.11%
3-Oct-11	0.24%	0.35%	-0.11%
4-Oct-11	0.24%	0.35%	-0.11%
5-Oct-11	0.24%	0.35%	-0.11%
6-Oct-11	0.24%	0.35%	-0.11%
7-Oct-11	0.24%	0.35%	-0.11%
11-Oct-11	0.24%	0.35%	-0.11%
12-Oct-11	0.24%	0.35%	-0.11%
13-Oct-11	0.24%	0.35%	-0.11%
14-Oct-11	0.24%	0.35%	-0.11%
17-Oct-11	0.24%	0.35%	-0.11%
18-Oct-11	0.24%	0.35%	-0.11%
19-Oct-11	0.24%	0.35%	-0.11%
20-Oct-11	0.24%	0.35%	-0.11%
21-Oct-11	0.24%	0.35%	-0.11%
24-Oct-11	0.24%	0.35%	-0.11%

25-Oct-11	0.24%	0.35%	-0.11%
26-Oct-11	0.25%	0.35%	-0.10%
27-Oct-11	0.25%	0.35%	-0.10%
28-Oct-11	0.25%	0.35%	-0.10%
31-Oct-11	0.25%	0.35%	-0.10%
1-Nov-11	0.25%	0.35%	-0.10%
2-Nov-11	0.25%	0.35%	-0.10%
3-Nov-11	0.25%	0.35%	-0.10%
4-Nov-11	0.25%	0.35%	-0.10%
7-Nov-11	0.25%	0.35%	-0.10%
8-Nov-11	0.25%	0.35%	-0.10%
9-Nov-11	0.25%	0.35%	-0.10%
10-Nov-11	0.25%	0.35%	-0.10%
14-Nov-11	0.25%	0.35%	-0.10%
15-Nov-11	0.25%	0.35%	-0.10%
16-Nov-11	0.25%	0.35%	-0.10%
17-Nov-11	0.25%	0.35%	-0.10%
18-Nov-11	0.26%	0.35%	-0.09%
21-Nov-11	0.26%	0.35%	-0.09%
22-Nov-11	0.26%	0.35%	-0.09%
23-Nov-11	0.26%	0.35%	-0.09%
25-Nov-11	0.26%	0.35%	-0.09%
28-Nov-11	0.26%	0.35%	-0.09%
29-Nov-11	0.27%	0.35%	-0.08%
30-Nov-11	0.27%	0.35%	-0.08%
1-Dec-11	0.27%	0.35%	-0.08%
2-Dec-11	0.27%	0.35%	-0.08%
5-Dec-11	0.27%	0.35%	-0.08%
6-Dec-11	0.28%	0.35%	-0.07%
7-Dec-11	0.28%	0.35%	-0.07%
8-Dec-11	0.28%	0.35%	-0.07%
9-Dec-11	0.28%	0.35%	-0.07%
12-Dec-11	0.28%	0.35%	-0.07%
13-Dec-11	0.28%	0.35%	-0.07%
14-Dec-11	0.28%	0.35%	-0.07%
15-Dec-11	0.28%	0.35%	-0.07%
16-Dec-11	0.28%	0.35%	-0.07%
19-Dec-11	0.29%	0.36%	-0.07%
20-Dec-11	0.29%	0.35%	-0.06%
21-Dec-11	0.29%	0.35%	-0.06%
22-Dec-11	0.29%	0.35%	-0.06%
23-Dec-11	0.29%	0.36%	-0.07%
28-Dec-11	0.30%	0.36%	-0.06%
29-Dec-11	0.30%	0.36%	-0.06%
30-Dec-11	0.30%	0.36%	-0.06%
3-Jan-12	0.30%	0.35%	-0.05%
4-Jan-12	0.30%	0.35%	-0.05%

5-Jan-12	0.30%	0.35%	-0.05%
6-Jan-12	0.30%	0.35%	-0.05%
9-Jan-12	0.30%	0.35%	-0.05%
10-Jan-12	0.30%	0.35%	-0.05%
11-Jan-12	0.29%	0.35%	-0.06%
12-Jan-12	0.29%	0.33%	-0.04%
13-Jan-12	0.29%	0.33%	-0.04%
16-Jan-12	0.28%	0.33%	-0.05%
17-Jan-12	0.28%	0.34%	-0.06%
18-Jan-12	0.28%	0.34%	-0.06%
19-Jan-12	0.28%	0.34%	-0.06%
20-Jan-12	0.28%	0.35%	-0.07%
23-Jan-12	0.28%	0.35%	-0.07%
24-Jan-12	0.28%	0.35%	-0.07%
25-Jan-12	0.27%	0.35%	-0.08%
26-Jan-12	0.27%	0.35%	-0.08%
27-Jan-12	0.27%	0.35%	-0.08%
30-Jan-12	0.27%	0.35%	-0.08%
31-Jan-12	0.26%	0.35%	-0.09%
1-Feb-12	0.26%	0.35%	-0.09%
2-Feb-12	0.26%	0.35%	-0.09%
3-Feb-12	0.26%	0.35%	-0.09%
6-Feb-12	0.26%	0.35%	-0.09%
7-Feb-12	0.26%	0.35%	-0.09%
8-Feb-12	0.25%	0.35%	-0.10%
9-Feb-12	0.25%	0.35%	-0.10%
10-Feb-12	0.25%	0.35%	-0.10%
13-Feb-12	0.25%	0.35%	-0.10%
14-Feb-12	0.25%	0.34%	-0.09%
15-Feb-12	0.25%	0.34%	-0.09%
16-Feb-12	0.25%	0.35%	-0.10%
17-Feb-12	0.25%	0.34%	-0.09%
20-Feb-12	0.25%	0.34%	-0.09%
21-Feb-12	0.25%	0.33%	-0.08%
22-Feb-12	0.24%	0.33%	-0.09%
23-Feb-12	0.24%	0.33%	-0.09%
24-Feb-12	0.24%	0.33%	-0.09%
27-Feb-12	0.24%	0.33%	-0.09%
28-Feb-12	0.24%	0.33%	-0.09%
29-Feb-12	0.24%	0.33%	-0.09%
1-Mar-12	0.24%	0.33%	-0.09%
2-Mar-12	0.24%	0.33%	-0.09%
5-Mar-12	0.24%	0.34%	-0.10%
6-Mar-12	0.24%	0.34%	-0.10%
7-Mar-12	0.24%	0.34%	-0.10%
8-Mar-12	0.24%	0.34%	-0.10%
9-Mar-12	0.24%	0.34%	-0.10%

12-Mar-12	0.24%	0.34%	-0.10%
13-Mar-12	0.24%	0.34%	-0.10%
14-Mar-12	0.24%	0.34%	-0.10%
15-Mar-12	0.24%	0.34%	-0.10%
16-Mar-12	0.24%	0.34%	-0.10%
19-Mar-12	0.24%	0.34%	-0.10%
20-Mar-12	0.24%	0.34%	-0.10%
21-Mar-12	0.24%	0.33%	-0.09%
22-Mar-12	0.24%	0.33%	-0.09%
23-Mar-12	0.24%	0.33%	-0.09%
26-Mar-12	0.24%	0.33%	-0.09%
27-Mar-12	0.24%	0.33%	-0.09%
28-Mar-12	0.24%	0.33%	-0.09%
29-Mar-12	0.24%	0.33%	-0.09%
30-Mar-12	0.24%	0.33%	-0.09%
2-Apr-12	0.24%	0.33%	-0.09%
3-Apr-12	0.24%	0.33%	-0.09%
4-Apr-12	0.24%	0.33%	-0.09%
5-Apr-12	0.24%	0.33%	-0.09%
10-Apr-12	0.24%	0.33%	-0.09%
11-Apr-12	0.24%	0.33%	-0.09%
12-Apr-12	0.24%	0.33%	-0.09%
13-Apr-12	0.24%	0.33%	-0.09%
16-Apr-12	0.24%	0.33%	-0.09%
17-Apr-12	0.24%	0.33%	-0.09%
18-Apr-12	0.24%	0.33%	-0.09%
19-Apr-12	0.24%	0.33%	-0.09%
20-Apr-12	0.24%	0.33%	-0.09%
23-Apr-12	0.24%	0.33%	-0.09%
24-Apr-12	0.24%	0.31%	-0.07%
25-Apr-12	0.24%	0.31%	-0.07%
26-Apr-12	0.24%	0.31%	-0.07%
27-Apr-12	0.24%	0.31%	-0.07%
30-Apr-12	0.24%	0.31%	-0.07%
1-May-12	0.24%	0.31%	-0.07%
2-May-12	0.24%	0.31%	-0.07%
3-May-12	0.24%	0.31%	-0.07%
4-May-12	0.24%	0.31%	-0.07%
8-May-12	0.24%	0.30%	-0.06%
9-May-12	0.24%	0.30%	-0.06%
10-May-12	0.24%	0.30%	-0.06%
11-May-12	0.24%	0.30%	-0.06%
14-May-12	0.24%	0.30%	-0.06%
15-May-12	0.24%	0.30%	-0.06%
16-May-12	0.24%	0.30%	-0.06%
17-May-12	0.24%	0.30%	-0.06%
18-May-12	0.24%	0.30%	-0.06%

21-May-12	0.24%	0.30%	-0.06%
22-May-12	0.24%	0.30%	-0.06%
23-May-12	0.24%	0.30%	-0.06%
24-May-12	0.24%	0.30%	-0.06%
25-May-12	0.24%	0.30%	-0.06%
28-May-12	0.24%	0.30%	-0.06%
29-May-12	0.24%	0.30%	-0.06%
30-May-12	0.24%	0.30%	-0.06%
31-May-12	0.24%	0.30%	-0.06%
1-Jun-12	0.24%	0.30%	-0.06%
6-Jun-12	0.24%	0.30%	-0.06%
7-Jun-12	0.24%	0.30%	-0.06%
8-Jun-12	0.24%	0.30%	-0.06%
11-Jun-12	0.24%	0.30%	-0.06%
12-Jun-12	0.24%	0.30%	-0.06%
13-Jun-12	0.24%	0.30%	-0.06%
14-Jun-12	0.24%	0.30%	-0.06%
15-Jun-12	0.24%	0.30%	-0.06%
18-Jun-12	0.24%	0.30%	-0.06%
19-Jun-12	0.24%	0.30%	-0.06%
20-Jun-12	0.25%	0.30%	-0.05%
21-Jun-12	0.25%	0.30%	-0.05%
22-Jun-12	0.25%	0.30%	-0.05%
25-Jun-12	0.25%	0.30%	-0.05%
26-Jun-12	0.25%	0.30%	-0.05%
27-Jun-12	0.25%	0.30%	-0.05%



		Federal Reserve ED Deposits Less LIBOR, 3 month tenor		Average Spread by Quarter
		0.06%		30-Jun-07
		4.0%		30-Sep-07
		0.23%		31-Dec-07
				31-Mar-08
				30-Jun-08
		-0.10%		30-Sep-08
		86.1%		31-Dec-08
		0.39%		31-Mar-09
				30-Jun-09
				30-Sep-09
		-0.21%		31-Dec-09
		83.62%		31-Mar-10
		0.10%		30-Jun-10
				30-Sep-10
				31-Dec-10
		3 month Fed ED		
Date	3 month LIBOR	Deposit	3 month Spread	
				31-Mar-11
				30-Jun-11
4-Jan-00	6.04%	5.94%	0.10%	30-Sep-11
5-Jan-00	6.03%	5.94%	0.09%	31-Dec-11
6-Jan-00	6.03%	5.94%	0.09%	31-Mar-12
7-Jan-00	6.03%	5.94%	0.09%	30-Jun-12
10-Jan-00	6.03%	5.94%	0.09%	
11-Jan-00	6.03%	5.94%	0.09%	
12-Jan-00	6.04%	5.94%	0.10%	
13-Jan-00	6.04%	5.94%	0.10%	
14-Jan-00	6.04%	5.94%	0.10%	
18-Jan-00	6.04%	5.94%	0.09%	
19-Jan-00	6.04%	5.94%	0.10%	
20-Jan-00	6.04%	5.94%	0.10%	
21-Jan-00	6.04%	5.94%	0.10%	
24-Jan-00	6.04%	5.94%	0.10%	
25-Jan-00	6.04%	5.94%	0.10%	
26-Jan-00	6.04%	5.94%	0.10%	
27-Jan-00	6.04%	5.94%	0.10%	
28-Jan-00	6.05%	5.97%	0.08%	
31-Jan-00	6.08%	6.03%	0.05%	
1-Feb-00	6.09%	6.03%	0.06%	
2-Feb-00	6.10%	6.06%	0.04%	
3-Feb-00	6.10%	6.03%	0.07%	

4-Feb-00	6.09%	6.00%	0.09%
7-Feb-00	6.10%	6.03%	0.07%
8-Feb-00	6.10%	6.00%	0.10%
9-Feb-00	6.10%	6.00%	0.10%
10-Feb-00	6.10%	6.00%	0.10%
11-Feb-00	6.10%	6.00%	0.10%
14-Feb-00	6.09%	6.00%	0.09%
15-Feb-00	6.09%	6.00%	0.09%
16-Feb-00	6.09%	5.97%	0.12%
17-Feb-00	6.09%	6.00%	0.09%
18-Feb-00	6.11%	6.03%	0.08%
22-Feb-00	6.11%	6.03%	0.08%
23-Feb-00	6.11%	6.03%	0.08%
24-Feb-00	6.11%	6.00%	0.11%
25-Feb-00	6.10%	6.03%	0.07%
28-Feb-00	6.10%	6.06%	0.04%
29-Feb-00	6.11%	6.06%	0.05%
1-Mar-00	6.11%	6.06%	0.05%
2-Mar-00	6.12%	6.06%	0.06%
3-Mar-00	6.12%	6.06%	0.06%
6-Mar-00	6.12%	6.00%	0.12%
7-Mar-00	6.13%	6.03%	0.10%
8-Mar-00	6.13%	6.06%	0.07%
9-Mar-00	6.14%	6.09%	0.05%
10-Mar-00	6.14%	6.06%	0.08%
13-Mar-00	6.15%	6.06%	0.09%
14-Mar-00	6.16%	6.09%	0.07%
15-Mar-00	6.17%	6.09%	0.08%
16-Mar-00	6.19%	6.13%	0.06%
17-Mar-00	6.21%	6.16%	0.05%
20-Mar-00	6.23%	6.16%	0.07%
21-Mar-00	6.24%	6.19%	0.05%
22-Mar-00	6.25%	6.19%	0.06%
23-Mar-00	6.25%	6.16%	0.09%
24-Mar-00	6.26%	6.19%	0.06%
27-Mar-00	6.28%	6.22%	0.06%
28-Mar-00	6.28%	6.22%	0.06%
29-Mar-00	6.28%	6.22%	0.06%
30-Mar-00	6.29%	6.22%	0.07%
31-Mar-00	6.29%	6.22%	0.07%
3-Apr-00	6.29%	6.22%	0.07%
4-Apr-00	6.29%	6.22%	0.07%
5-Apr-00	6.27%	6.19%	0.08%
6-Apr-00	6.27%	6.22%	0.05%
7-Apr-00	6.28%	6.22%	0.06%
10-Apr-00	6.28%	6.22%	0.06%
11-Apr-00	6.28%	6.22%	0.06%

12-Apr-00	6.28%	6.22%	0.06%
13-Apr-00	6.28%	6.22%	0.06%
14-Apr-00	6.28%	6.22%	0.06%
17-Apr-00	6.28%	6.22%	0.06%
18-Apr-00	6.29%	6.25%	0.04%
19-Apr-00	6.31%	6.25%	0.06%
20-Apr-00	6.32%	6.25%	0.07%
25-Apr-00	6.33%	6.28%	0.05%
26-Apr-00	6.38%	6.31%	0.07%
27-Apr-00	6.39%	6.34%	0.05%
28-Apr-00	6.50%	6.47%	0.03%
2-May-00	6.57%	6.50%	0.07%
3-May-00	6.60%	6.56%	0.04%
4-May-00	6.65%	6.63%	0.02%
5-May-00	6.67%	6.63%	0.04%
8-May-00	6.70%	6.66%	0.04%
9-May-00	6.72%	6.66%	0.06%
10-May-00	6.72%	6.66%	0.06%
11-May-00	6.72%	6.69%	0.03%
12-May-00	6.73%	6.69%	0.04%
15-May-00	6.76%	6.72%	0.04%
16-May-00	6.76%	6.72%	0.04%
17-May-00	6.81%	6.75%	0.06%
18-May-00	6.82%	6.75%	0.07%
19-May-00	6.82%	6.78%	0.04%
22-May-00	6.82%	6.78%	0.04%
23-May-00	6.82%	6.78%	0.04%
24-May-00	6.82%	6.75%	0.07%
25-May-00	6.83%	6.78%	0.05%
26-May-00	6.83%	6.78%	0.05%
30-May-00	6.84%	6.81%	0.03%
31-May-00	6.86%	6.81%	0.05%
1-Jun-00	6.87%	6.81%	0.06%
2-Jun-00	6.85%	6.75%	0.10%
5-Jun-00	6.79%	6.75%	0.04%
6-Jun-00	6.79%	6.72%	0.07%
7-Jun-00	6.80%	6.72%	0.08%
8-Jun-00	6.80%	6.75%	0.05%
9-Jun-00	6.81%	6.75%	0.06%
12-Jun-00	6.81%	6.75%	0.06%
13-Jun-00	6.81%	6.75%	0.06%
14-Jun-00	6.79%	6.72%	0.07%
15-Jun-00	6.78%	6.72%	0.06%
16-Jun-00	6.78%	6.72%	0.06%
19-Jun-00	6.76%	6.69%	0.07%
20-Jun-00	6.76%	6.69%	0.07%
21-Jun-00	6.77%	6.69%	0.08%

22-Jun-00	6.77%	6.72%	0.05%
23-Jun-00	6.77%	6.72%	0.05%
26-Jun-00	6.77%	6.69%	0.08%
27-Jun-00	6.78%	6.72%	0.06%
28-Jun-00	6.78%	6.75%	0.03%
29-Jun-00	6.78%	6.72%	0.06%
30-Jun-00	6.77%	6.69%	0.08%
3-Jul-00	6.77%	6.72%	0.05%
5-Jul-00	6.75%	6.69%	0.05%
6-Jul-00	6.74%	6.69%	0.05%
7-Jul-00	6.74%	6.66%	0.08%
10-Jul-00	6.73%	6.66%	0.07%
11-Jul-00	6.73%	6.66%	0.07%
12-Jul-00	6.73%	6.66%	0.07%
13-Jul-00	6.73%	6.66%	0.07%
14-Jul-00	6.73%	6.66%	0.07%
17-Jul-00	6.74%	6.66%	0.08%
18-Jul-00	6.74%	6.69%	0.05%
19-Jul-00	6.74%	6.69%	0.05%
20-Jul-00	6.74%	6.69%	0.05%
21-Jul-00	6.72%	6.66%	0.06%
24-Jul-00	6.71%	6.66%	0.05%
25-Jul-00	6.72%	6.66%	0.05%
26-Jul-00	6.71%	6.66%	0.05%
27-Jul-00	6.71%	6.66%	0.05%
28-Jul-00	6.71%	6.66%	0.05%
31-Jul-00	6.72%	6.66%	0.06%
1-Aug-00	6.72%	6.66%	0.06%
2-Aug-00	6.72%	6.66%	0.06%
3-Aug-00	6.71%	6.66%	0.05%
4-Aug-00	6.71%	6.63%	0.08%
7-Aug-00	6.69%	6.63%	0.06%
8-Aug-00	6.69%	6.59%	0.10%
9-Aug-00	6.69%	6.59%	0.10%
10-Aug-00	6.68%	6.59%	0.09%
11-Aug-00	6.68%	6.59%	0.09%
14-Aug-00	6.69%	6.59%	0.10%
15-Aug-00	6.69%	6.59%	0.10%
16-Aug-00	6.69%	6.59%	0.10%
17-Aug-00	6.69%	6.59%	0.10%
18-Aug-00	6.69%	6.60%	0.09%
21-Aug-00	6.69%	6.60%	0.09%
22-Aug-00	6.69%	6.60%	0.09%
23-Aug-00	6.69%	6.60%	0.09%
24-Aug-00	6.68%	6.60%	0.08%
25-Aug-00	6.68%	6.59%	0.09%
29-Aug-00	6.68%	6.58%	0.10%

30-Aug-00	6.68%	6.60%	0.08%
31-Aug-00	6.68%	6.60%	0.08%
1-Sep-00	6.67%	6.60%	0.07%
5-Sep-00	6.65%	6.58%	0.07%
6-Sep-00	6.65%	6.58%	0.07%
7-Sep-00	6.66%	6.59%	0.07%
8-Sep-00	6.66%	6.57%	0.09%
11-Sep-00	6.66%	6.59%	0.07%
12-Sep-00	6.66%	6.59%	0.07%
13-Sep-00	6.66%	6.58%	0.08%
14-Sep-00	6.66%	6.57%	0.09%
15-Sep-00	6.66%	6.58%	0.08%
18-Sep-00	6.66%	6.58%	0.08%
19-Sep-00	6.66%	6.58%	0.08%
20-Sep-00	6.66%	6.58%	0.08%
21-Sep-00	6.66%	6.58%	0.08%
22-Sep-00	6.66%	6.58%	0.08%
25-Sep-00	6.66%	6.56%	0.10%
26-Sep-00	6.66%	6.58%	0.08%
27-Sep-00	6.66%	6.58%	0.08%
28-Sep-00	6.82%	6.69%	0.13%
29-Sep-00	6.81%	6.70%	0.11%
2-Oct-00	6.80%	6.71%	0.09%
3-Oct-00	6.80%	6.70%	0.10%
4-Oct-00	6.80%	6.70%	0.10%
5-Oct-00	6.80%	6.67%	0.13%
6-Oct-00	6.80%	6.67%	0.13%
10-Oct-00	6.80%	6.69%	0.11%
11-Oct-00	6.80%	6.70%	0.10%
12-Oct-00	6.80%	6.68%	0.12%
13-Oct-00	6.77%	6.66%	0.11%
16-Oct-00	6.77%	6.66%	0.11%
17-Oct-00	6.77%	6.66%	0.11%
18-Oct-00	6.76%	6.65%	0.11%
19-Oct-00	6.76%	6.64%	0.12%
20-Oct-00	6.76%	6.64%	0.12%
23-Oct-00	6.76%	6.64%	0.12%
24-Oct-00	6.76%	6.65%	0.11%
25-Oct-00	6.76%	6.64%	0.12%
26-Oct-00	6.76%	6.65%	0.11%
27-Oct-00	6.76%	6.65%	0.11%
30-Oct-00	6.76%	6.63%	0.13%
31-Oct-00	6.76%	6.63%	0.13%
1-Nov-00	6.76%	6.63%	0.13%
2-Nov-00	6.75%	6.63%	0.12%
3-Nov-00	6.75%	6.63%	0.12%
6-Nov-00	6.75%	6.64%	0.11%

7-Nov-00	6.76%	6.68%	0.08%
8-Nov-00	6.76%	6.65%	0.11%
9-Nov-00	6.76%	6.66%	0.10%
10-Nov-00	6.76%	6.64%	0.12%
13-Nov-00	6.76%	6.63%	0.13%
14-Nov-00	6.76%	6.64%	0.12%
15-Nov-00	6.76%	6.65%	0.11%
16-Nov-00	6.76%	6.64%	0.12%
17-Nov-00	6.75%	6.64%	0.11%
20-Nov-00	6.75%	6.64%	0.11%
21-Nov-00	6.75%	6.64%	0.11%
22-Nov-00	6.75%	6.64%	0.11%
24-Nov-00	6.75%	6.64%	0.11%
27-Nov-00	6.75%	6.65%	0.10%
28-Nov-00	6.75%	6.65%	0.10%
29-Nov-00	6.74%	6.63%	0.11%
30-Nov-00	6.72%	6.60%	0.12%
1-Dec-00	6.69%	6.58%	0.11%
4-Dec-00	6.68%	6.58%	0.10%
5-Dec-00	6.68%	6.56%	0.12%
6-Dec-00	6.62%	6.51%	0.11%
7-Dec-00	6.58%	6.47%	0.11%
8-Dec-00	6.57%	6.46%	0.11%
11-Dec-00	6.58%	6.48%	0.10%
12-Dec-00	6.58%	6.47%	0.11%
13-Dec-00	6.58%	6.48%	0.10%
14-Dec-00	6.55%	6.47%	0.08%
15-Dec-00	6.55%	6.45%	0.10%
18-Dec-00	6.54%	6.44%	0.10%
19-Dec-00	6.52%	6.44%	0.08%
20-Dec-00	6.50%	6.39%	0.11%
21-Dec-00	6.46%	6.36%	0.10%
22-Dec-00	6.45%	6.33%	0.12%
27-Dec-00	6.44%	6.32%	0.12%
28-Dec-00	6.40%	6.30%	0.10%
29-Dec-00	6.40%	6.30%	0.10%
2-Jan-01	6.37%	6.27%	0.10%
3-Jan-01	6.29%	6.20%	0.09%
4-Jan-01	5.87%	5.76%	0.11%
5-Jan-01	5.70%	5.61%	0.08%
8-Jan-01	5.62%	5.52%	0.10%
9-Jan-01	5.62%	5.53%	0.09%
10-Jan-01	5.65%	5.59%	0.06%
11-Jan-01	5.68%	5.60%	0.08%
12-Jan-01	5.68%	5.62%	0.06%
16-Jan-01	5.74%	5.66%	0.08%
17-Jan-01	5.74%	5.66%	0.08%

18-Jan-01	5.65%	5.56%	0.09%
19-Jan-01	5.61%	5.56%	0.05%
22-Jan-01	5.58%	5.50%	0.08%
23-Jan-01	5.57%	5.50%	0.07%
24-Jan-01	5.61%	5.51%	0.10%
25-Jan-01	5.60%	5.52%	0.08%
26-Jan-01	5.57%	5.54%	0.03%
29-Jan-01	5.54%	5.44%	0.10%
30-Jan-01	5.53%	5.44%	0.08%
31-Jan-01	5.42%	5.33%	0.09%
1-Feb-01	5.39%	5.30%	0.09%
2-Feb-01	5.40%	5.32%	0.08%
5-Feb-01	5.41%	5.32%	0.09%
6-Feb-01	5.41%	5.33%	0.08%
7-Feb-01	5.41%	5.33%	0.08%
8-Feb-01	5.41%	5.33%	0.08%
9-Feb-01	5.41%	5.32%	0.09%
12-Feb-01	5.39%	5.31%	0.08%
13-Feb-01	5.39%	5.30%	0.09%
14-Feb-01	5.40%	5.32%	0.08%
15-Feb-01	5.41%	5.33%	0.08%
16-Feb-01	5.41%	5.33%	0.08%
20-Feb-01	5.38%	5.29%	0.09%
21-Feb-01	5.37%	5.30%	0.07%
22-Feb-01	5.35%	5.26%	0.08%
23-Feb-01	5.30%	5.15%	0.15%
26-Feb-01	5.19%	5.09%	0.10%
27-Feb-01	5.10%	5.02%	0.08%
28-Feb-01	5.05%	4.97%	0.08%
1-Mar-01	5.09%	5.04%	0.05%
2-Mar-01	5.08%	5.03%	0.05%
5-Mar-01	5.08%	5.02%	0.06%
6-Mar-01	5.09%	5.02%	0.07%
7-Mar-01	5.07%	5.02%	0.05%
8-Mar-01	5.06%	5.01%	0.05%
9-Mar-01	5.04%	5.00%	0.04%
12-Mar-01	5.06%	4.98%	0.08%
13-Mar-01	5.03%	4.98%	0.05%
14-Mar-01	5.02%	4.92%	0.10%
15-Mar-01	4.94%	4.87%	0.07%
16-Mar-01	4.90%	4.81%	0.09%
19-Mar-01	4.88%	4.79%	0.09%
20-Mar-01	4.89%	4.80%	0.09%
21-Mar-01	4.87%	4.78%	0.09%
22-Mar-01	4.86%	4.73%	0.13%
23-Mar-01	4.86%	4.75%	0.11%
26-Mar-01	4.87%	4.78%	0.09%

27-Mar-01	4.86%	4.80%	0.06%
28-Mar-01	4.90%	4.82%	0.08%
29-Mar-01	4.88%	4.80%	0.08%
30-Mar-01	4.88%	4.80%	0.08%
2-Apr-01	4.84%	4.75%	0.09%
3-Apr-01	4.85%	4.76%	0.09%
4-Apr-01	4.81%	4.73%	0.08%
5-Apr-01	4.80%	4.74%	0.06%
6-Apr-01	4.81%	4.68%	0.13%
9-Apr-01	4.74%	4.65%	0.09%
10-Apr-01	4.74%	4.65%	0.09%
11-Apr-01	4.76%	4.70%	0.06%
12-Apr-01	4.78%	4.72%	0.06%
17-Apr-01	4.81%	4.71%	0.10%
18-Apr-01	4.83%	4.75%	0.08%
19-Apr-01	4.41%	4.32%	0.09%
20-Apr-01	4.42%	4.30%	0.12%
23-Apr-01	4.38%	4.28%	0.10%
24-Apr-01	4.36%	4.27%	0.09%
25-Apr-01	4.34%	4.24%	0.10%
26-Apr-01	4.34%	4.25%	0.09%
27-Apr-01	4.31%	4.25%	0.06%
30-Apr-01	4.34%	4.26%	0.08%
1-May-01	4.34%	4.25%	0.09%
2-May-01	4.31%	4.21%	0.10%
3-May-01	4.30%	4.19%	0.11%
4-May-01	4.27%	4.04%	0.23%
8-May-01	4.10%	4.01%	0.09%
9-May-01	4.09%	3.98%	0.11%
10-May-01	4.06%	3.96%	0.10%
11-May-01	4.07%	4.00%	0.07%
14-May-01	4.12%	4.06%	0.06%
15-May-01	4.10%	4.03%	0.07%
16-May-01	4.03%	3.94%	0.09%
17-May-01	4.04%	3.94%	0.10%
18-May-01	4.06%	3.97%	0.08%
21-May-01	4.08%	3.99%	0.09%
22-May-01	4.08%	3.98%	0.09%
23-May-01	4.07%	3.98%	0.09%
24-May-01	4.06%	3.96%	0.10%
25-May-01	4.03%	3.94%	0.09%
29-May-01	4.00%	3.91%	0.09%
30-May-01	4.00%	3.91%	0.09%
31-May-01	3.99%	3.88%	0.11%
1-Jun-01	3.94%	3.88%	0.06%
4-Jun-01	3.94%	3.85%	0.09%
5-Jun-01	3.94%	3.85%	0.09%



6-Jun-01	3.93%	3.83%	0.10%
7-Jun-01	3.92%	3.81%	0.11%
8-Jun-01	3.92%	3.83%	0.09%
11-Jun-01	3.91%	3.78%	0.13%
12-Jun-01	3.90%	3.75%	0.15%
13-Jun-01	3.89%	3.75%	0.14%
14-Jun-01	3.88%	3.75%	0.13%
15-Jun-01	3.85%	3.70%	0.15%
18-Jun-01	3.79%	3.68%	0.11%
19-Jun-01	3.76%	3.64%	0.12%
20-Jun-01	3.75%	3.64%	0.11%
21-Jun-01	3.74%	3.65%	0.09%
22-Jun-01	3.73%	3.64%	0.09%
25-Jun-01	3.71%	3.61%	0.09%
26-Jun-01	3.70%	3.60%	0.10%
27-Jun-01	3.71%	3.62%	0.09%
28-Jun-01	3.79%	3.75%	0.04%
29-Jun-01	3.84%	3.76%	0.08%
2-Jul-01	3.83%	3.76%	0.07%
3-Jul-01	3.82%	3.75%	0.07%
5-Jul-01	3.82%	3.75%	0.07%
6-Jul-01	3.81%	3.71%	0.10%
9-Jul-01	3.79%	3.70%	0.09%
10-Jul-01	3.79%	3.70%	0.09%
11-Jul-01	3.76%	3.67%	0.09%
12-Jul-01	3.77%	3.68%	0.09%
13-Jul-01	3.76%	3.65%	0.11%
16-Jul-01	3.76%	3.66%	0.10%
17-Jul-01	3.76%	3.67%	0.09%
18-Jul-01	3.76%	3.66%	0.10%
19-Jul-01	3.71%	3.62%	0.09%
20-Jul-01	3.71%	3.62%	0.09%
23-Jul-01	3.70%	3.63%	0.07%
24-Jul-01	3.70%	3.62%	0.08%
25-Jul-01	3.70%	3.61%	0.09%
26-Jul-01	3.71%	3.62%	0.08%
27-Jul-01	3.70%	3.60%	0.10%
30-Jul-01	3.68%	3.58%	0.10%
31-Jul-01	3.67%	3.60%	0.07%
1-Aug-01	3.66%	3.58%	0.08%
2-Aug-01	3.65%	3.57%	0.08%
3-Aug-01	3.66%	3.59%	0.07%
6-Aug-01	3.65%	3.57%	0.08%
7-Aug-01	3.64%	3.55%	0.09%
8-Aug-01	3.64%	3.56%	0.08%
9-Aug-01	3.60%	3.50%	0.09%
10-Aug-01	3.59%	3.49%	0.10%

13-Aug-01	3.57%	3.46%	0.11%
14-Aug-01	3.56%	3.45%	0.11%
15-Aug-01	3.56%	3.44%	0.12%
16-Aug-01	3.56%	3.46%	0.10%
17-Aug-01	3.55%	3.45%	0.10%
20-Aug-01	3.53%	3.42%	0.11%
21-Aug-01	3.53%	3.42%	0.11%
22-Aug-01	3.51%	3.41%	0.10%
23-Aug-01	3.51%	3.43%	0.08%
24-Aug-01	3.52%	3.43%	0.09%
28-Aug-01	3.53%	3.45%	0.07%
29-Aug-01	3.50%	3.44%	0.06%
30-Aug-01	3.49%	3.40%	0.09%
31-Aug-01	3.46%	3.40%	0.06%
4-Sep-01	3.47%	3.40%	0.07%
5-Sep-01	3.52%	3.43%	0.09%
6-Sep-01	3.52%	3.43%	0.09%
7-Sep-01	3.49%	3.34%	0.15%
10-Sep-01	3.36%	3.26%	0.10%
17-Sep-01	3.11%	2.88%	0.23%
18-Sep-01	2.97%	2.82%	0.15%
19-Sep-01	2.78%	2.68%	0.10%
20-Sep-01	2.60%	2.57%	0.03%
21-Sep-01	2.62%	2.47%	0.15%
24-Sep-01	2.60%	2.45%	0.15%
25-Sep-01	2.60%	2.51%	0.09%
26-Sep-01	2.59%	2.51%	0.08%
27-Sep-01	2.60%	2.51%	0.09%
28-Sep-01	2.59%	2.50%	0.09%
1-Oct-01	2.60%	2.50%	0.10%
2-Oct-01	2.59%	2.53%	0.06%
3-Oct-01	2.50%	2.42%	0.08%
4-Oct-01	2.50%	2.42%	0.08%
5-Oct-01	2.48%	2.42%	0.06%
9-Oct-01	2.43%	2.37%	0.06%
10-Oct-01	2.43%	2.37%	0.06%
11-Oct-01	2.43%	2.36%	0.07%
12-Oct-01	2.46%	2.37%	0.09%
15-Oct-01	2.43%	2.36%	0.07%
16-Oct-01	2.42%	2.32%	0.10%
17-Oct-01	2.41%	2.32%	0.09%
18-Oct-01	2.39%	2.31%	0.08%
19-Oct-01	2.37%	2.29%	0.08%
22-Oct-01	2.35%	2.27%	0.08%
23-Oct-01	2.35%	2.27%	0.08%
24-Oct-01	2.33%	2.24%	0.09%
25-Oct-01	2.31%	2.18%	0.13%

26-Oct-01	2.28%	2.15%	0.13%
29-Oct-01	2.27%	2.18%	0.09%
30-Oct-01	2.23%	2.14%	0.09%
31-Oct-01	2.20%	2.12%	0.08%
1-Nov-01	2.21%	2.18%	0.03%
2-Nov-01	2.20%	2.07%	0.13%
5-Nov-01	2.17%	2.08%	0.09%
6-Nov-01	2.14%	2.05%	0.09%
7-Nov-01	2.00%	1.92%	0.08%
8-Nov-01	2.00%	1.94%	0.06%
9-Nov-01	2.02%	1.89%	0.13%
13-Nov-01	2.01%	1.94%	0.07%
14-Nov-01	2.02%	1.96%	0.06%
15-Nov-01	2.10%	2.03%	0.07%
16-Nov-01	2.14%	2.07%	0.07%
19-Nov-01	2.15%	2.07%	0.08%
20-Nov-01	2.11%	2.05%	0.06%
21-Nov-01	2.13%	2.06%	0.07%
23-Nov-01	2.16%	2.08%	0.08%
26-Nov-01	2.16%	2.07%	0.09%
27-Nov-01	2.17%	2.08%	0.09%
28-Nov-01	2.10%	2.04%	0.06%
29-Nov-01	2.08%	2.00%	0.08%
30-Nov-01	2.03%	1.96%	0.07%
3-Dec-01	2.01%	1.90%	0.11%
4-Dec-01	2.00%	1.92%	0.08%
5-Dec-01	1.98%	1.90%	0.08%
6-Dec-01	2.02%	1.91%	0.11%
7-Dec-01	2.00%	1.83%	0.17%
10-Dec-01	1.93%	1.79%	0.14%
11-Dec-01	1.90%	1.80%	0.10%
12-Dec-01	1.86%	1.79%	0.07%
13-Dec-01	1.87%	1.81%	0.06%
14-Dec-01	1.90%	1.82%	0.08%
17-Dec-01	1.90%	1.84%	0.06%
18-Dec-01	1.91%	1.85%	0.06%
19-Dec-01	1.90%	1.83%	0.07%
20-Dec-01	1.90%	1.82%	0.08%
21-Dec-01	1.90%	1.82%	0.08%
24-Dec-01	1.90%	1.88%	0.02%
27-Dec-01	1.91%	1.82%	0.09%
28-Dec-01	1.88%	1.78%	0.10%
31-Dec-01	1.88%	1.78%	0.10%
2-Jan-02	1.86%	1.79%	0.07%
3-Jan-02	1.88%	1.82%	0.06%
4-Jan-02	1.87%	1.79%	0.08%
7-Jan-02	1.87%	1.82%	0.05%

8-Jan-02	1.84%	1.75%	0.09%
9-Jan-02	1.84%	1.74%	0.10%
10-Jan-02	1.83%	1.73%	0.10%
11-Jan-02	1.83%	1.74%	0.09%
14-Jan-02	1.72%	1.64%	0.08%
15-Jan-02	1.72%	1.65%	0.07%
16-Jan-02	1.72%	1.64%	0.08%
17-Jan-02	1.74%	1.67%	0.07%
18-Jan-02	1.77%	1.68%	0.09%
22-Jan-02	1.80%	1.73%	0.07%
23-Jan-02	1.80%	1.72%	0.08%
24-Jan-02	1.81%	1.75%	0.06%
25-Jan-02	1.87%	1.80%	0.07%
28-Jan-02	1.87%	1.80%	0.07%
29-Jan-02	1.87%	1.79%	0.08%
30-Jan-02	1.86%	1.78%	0.08%
31-Jan-02	1.88%	1.82%	0.06%
1-Feb-02	1.92%	1.83%	0.09%
4-Feb-02	1.91%	1.83%	0.08%
5-Feb-02	1.90%	1.80%	0.10%
6-Feb-02	1.90%	1.81%	0.09%
7-Feb-02	1.90%	1.83%	0.07%
8-Feb-02	1.90%	1.80%	0.10%
11-Feb-02	1.89%	1.79%	0.10%
12-Feb-02	1.89%	1.79%	0.10%
13-Feb-02	1.90%	1.83%	0.07%
14-Feb-02	1.91%	1.83%	0.08%
15-Feb-02	1.91%	1.82%	0.09%
19-Feb-02	1.90%	1.83%	0.07%
20-Feb-02	1.90%	1.82%	0.08%
21-Feb-02	1.91%	1.83%	0.08%
22-Feb-02	1.90%	1.81%	0.09%
25-Feb-02	1.90%	1.81%	0.09%
26-Feb-02	1.90%	1.80%	0.10%
27-Feb-02	1.91%	1.82%	0.09%
28-Feb-02	1.90%	1.82%	0.08%
1-Mar-02	1.90%	1.80%	0.10%
4-Mar-02	1.92%	1.84%	0.08%
5-Mar-02	1.92%	1.84%	0.08%
6-Mar-02	1.92%	1.84%	0.08%
7-Mar-02	1.92%	1.84%	0.08%
8-Mar-02	1.96%	1.91%	0.05%
11-Mar-02	2.00%	1.91%	0.09%
12-Mar-02	2.00%	1.92%	0.08%
13-Mar-02	2.00%	1.92%	0.08%
14-Mar-02	1.99%	1.91%	0.08%
15-Mar-02	2.01%	1.94%	0.07%

18-Mar-02	2.01%	1.93%	0.08%
19-Mar-02	2.01%	1.93%	0.08%
20-Mar-02	1.99%	1.93%	0.06%
21-Mar-02	2.02%	1.94%	0.08%
22-Mar-02	2.03%	1.93%	0.10%
25-Mar-02	2.04%	1.95%	0.09%
26-Mar-02	2.05%	1.98%	0.07%
27-Mar-02	2.04%	1.96%	0.08%
28-Mar-02	2.03%	1.95%	0.08%
2-Apr-02	2.04%	1.95%	0.09%
3-Apr-02	2.03%	1.94%	0.09%
4-Apr-02	2.01%	1.93%	0.08%
5-Apr-02	2.01%	1.90%	0.11%
8-Apr-02	1.99%	1.91%	0.08%
9-Apr-02	1.99%	1.91%	0.08%
10-Apr-02	1.98%	1.87%	0.11%
11-Apr-02	1.98%	1.88%	0.10%
12-Apr-02	1.98%	1.88%	0.10%
15-Apr-02	1.97%	1.86%	0.11%
16-Apr-02	1.97%	1.85%	0.12%
17-Apr-02	1.97%	1.88%	0.09%
18-Apr-02	1.95%	1.85%	0.10%
19-Apr-02	1.94%	1.84%	0.10%
22-Apr-02	1.94%	1.85%	0.09%
23-Apr-02	1.94%	1.83%	0.11%
24-Apr-02	1.94%	1.84%	0.10%
25-Apr-02	1.93%	1.83%	0.10%
26-Apr-02	1.92%	1.83%	0.09%
29-Apr-02	1.91%	1.83%	0.08%
30-Apr-02	1.92%	1.84%	0.08%
1-May-02	1.92%	1.82%	0.10%
2-May-02	1.92%	1.82%	0.10%
3-May-02	1.92%	1.81%	0.11%
7-May-02	1.90%	1.82%	0.08%
8-May-02	1.90%	1.82%	0.08%
9-May-02	1.92%	1.83%	0.09%
10-May-02	1.90%	1.82%	0.08%
13-May-02	1.90%	1.81%	0.09%
14-May-02	1.90%	1.82%	0.08%
15-May-02	1.92%	1.83%	0.09%
16-May-02	1.91%	1.80%	0.11%
17-May-02	1.90%	1.82%	0.08%
20-May-02	1.91%	1.82%	0.09%
21-May-02	1.90%	1.82%	0.08%
22-May-02	1.90%	1.82%	0.08%
23-May-02	1.90%	1.83%	0.07%
24-May-02	1.90%	1.83%	0.07%

28-May-02	1.90%	1.83%	0.07%
29-May-02	1.90%	1.82%	0.08%
30-May-02	1.90%	1.80%	0.10%
31-May-02	1.90%	1.82%	0.08%
5-Jun-02	1.89%	1.81%	0.08%
6-Jun-02	1.89%	1.82%	0.07%
7-Jun-02	1.89%	1.82%	0.07%
10-Jun-02	1.89%	1.82%	0.07%
11-Jun-02	1.89%	1.82%	0.07%
12-Jun-02	1.89%	1.80%	0.09%
13-Jun-02	1.89%	1.80%	0.09%
14-Jun-02	1.88%	1.81%	0.07%
17-Jun-02	1.88%	1.81%	0.07%
18-Jun-02	1.88%	1.81%	0.07%
19-Jun-02	1.87%	1.80%	0.07%
20-Jun-02	1.87%	1.79%	0.08%
21-Jun-02	1.87%	1.80%	0.07%
24-Jun-02	1.87%	1.80%	0.07%
25-Jun-02	1.87%	1.81%	0.06%
26-Jun-02	1.86%	1.80%	0.05%
27-Jun-02	1.86%	1.80%	0.06%
28-Jun-02	1.86%	1.80%	0.06%
1-Jul-02	1.86%	1.80%	0.06%
2-Jul-02	1.86%	1.80%	0.06%
3-Jul-02	1.86%	1.80%	0.06%
5-Jul-02	1.86%	1.79%	0.07%
8-Jul-02	1.86%	1.80%	0.06%
9-Jul-02	1.86%	1.80%	0.06%
10-Jul-02	1.86%	1.80%	0.06%
11-Jul-02	1.86%	1.79%	0.07%
12-Jul-02	1.86%	1.79%	0.07%
15-Jul-02	1.86%	1.79%	0.07%
16-Jul-02	1.86%	1.79%	0.07%
17-Jul-02	1.86%	1.79%	0.07%
18-Jul-02	1.86%	1.79%	0.07%
19-Jul-02	1.86%	1.79%	0.07%
22-Jul-02	1.85%	1.80%	0.05%
23-Jul-02	1.85%	1.79%	0.06%
24-Jul-02	1.82%	1.75%	0.07%
25-Jul-02	1.83%	1.76%	0.07%
26-Jul-02	1.81%	1.75%	0.06%
29-Jul-02	1.81%	1.75%	0.06%
30-Jul-02	1.82%	1.75%	0.07%
31-Jul-02	1.82%	1.76%	0.06%
1-Aug-02	1.81%	1.76%	0.05%
2-Aug-02	1.80%	1.75%	0.05%
5-Aug-02	1.77%	1.70%	0.07%

6-Aug-02	1.76%	1.70%	0.06%
7-Aug-02	1.76%	1.69%	0.07%
8-Aug-02	1.74%	1.67%	0.07%
9-Aug-02	1.75%	1.69%	0.06%
12-Aug-02	1.75%	1.68%	0.07%
13-Aug-02	1.75%	1.69%	0.06%
14-Aug-02	1.73%	1.66%	0.07%
15-Aug-02	1.76%	1.68%	0.08%
16-Aug-02	1.76%	1.70%	0.06%
19-Aug-02	1.77%	1.71%	0.06%
20-Aug-02	1.77%	1.72%	0.05%
21-Aug-02	1.77%	1.72%	0.05%
22-Aug-02	1.78%	1.73%	0.05%
23-Aug-02	1.80%	1.74%	0.06%
27-Aug-02	1.80%	1.75%	0.05%
28-Aug-02	1.82%	1.77%	0.05%
29-Aug-02	1.81%	1.77%	0.04%
30-Aug-02	1.81%	1.75%	0.06%
3-Sep-02	1.80%	1.76%	0.04%
4-Sep-02	1.78%	1.74%	0.04%
5-Sep-02	1.78%	1.73%	0.05%
6-Sep-02	1.78%	1.72%	0.05%
9-Sep-02	1.80%	1.75%	0.05%
10-Sep-02	1.82%	1.75%	0.07%
11-Sep-02	1.82%	1.75%	0.07%
12-Sep-02	1.83%	1.76%	0.07%
13-Sep-02	1.82%	1.76%	0.06%
16-Sep-02	1.82%	1.76%	0.06%
17-Sep-02	1.83%	1.77%	0.06%
18-Sep-02	1.82%	1.76%	0.06%
19-Sep-02	1.82%	1.74%	0.08%
20-Sep-02	1.80%	1.75%	0.05%
23-Sep-02	1.80%	1.74%	0.06%
24-Sep-02	1.79%	1.75%	0.04%
25-Sep-02	1.79%	1.74%	0.05%
26-Sep-02	1.80%	1.74%	0.06%
27-Sep-02	1.81%	1.73%	0.08%
30-Sep-02	1.79%	1.75%	0.04%
1-Oct-02	1.76%	1.70%	0.06%
2-Oct-02	1.77%	1.70%	0.07%
3-Oct-02	1.76%	1.70%	0.06%
4-Oct-02	1.76%	1.72%	0.04%
7-Oct-02	1.76%	1.70%	0.06%
8-Oct-02	1.77%	1.71%	0.06%
9-Oct-02	1.77%	1.72%	0.05%
10-Oct-02	1.76%	1.71%	0.05%
11-Oct-02	1.78%	1.72%	0.05%

15-Oct-02	1.80%	1.75%	0.05%
16-Oct-02	1.82%	1.77%	0.05%
17-Oct-02	1.84%	1.77%	0.07%
18-Oct-02	1.83%	1.78%	0.05%
21-Oct-02	1.83%	1.77%	0.06%
22-Oct-02	1.84%	1.78%	0.06%
23-Oct-02	1.84%	1.77%	0.07%
24-Oct-02	1.83%	1.78%	0.05%
25-Oct-02	1.82%	1.77%	0.05%
28-Oct-02	1.78%	1.74%	0.04%
29-Oct-02	1.76%	1.71%	0.05%
30-Oct-02	1.71%	1.63%	0.08%
31-Oct-02	1.69%	1.62%	0.07%
1-Nov-02	1.66%	1.59%	0.07%
4-Nov-02	1.63%	1.55%	0.08%
5-Nov-02	1.62%	1.55%	0.07%
6-Nov-02	1.61%	1.54%	0.07%
7-Nov-02	1.40%	1.34%	0.06%
8-Nov-02	1.40%	1.33%	0.07%
12-Nov-02	1.40%	1.34%	0.06%
13-Nov-02	1.40%	1.34%	0.06%
14-Nov-02	1.41%	1.34%	0.07%
15-Nov-02	1.42%	1.35%	0.07%
18-Nov-02	1.42%	1.36%	0.06%
19-Nov-02	1.42%	1.36%	0.06%
20-Nov-02	1.42%	1.34%	0.08%
21-Nov-02	1.42%	1.36%	0.06%
22-Nov-02	1.43%	1.35%	0.08%
25-Nov-02	1.43%	1.37%	0.06%
26-Nov-02	1.43%	1.36%	0.07%
27-Nov-02	1.42%	1.36%	0.06%
29-Nov-02	1.43%	1.37%	0.06%
2-Dec-02	1.42%	1.37%	0.05%
3-Dec-02	1.42%	1.37%	0.05%
4-Dec-02	1.42%	1.37%	0.05%
5-Dec-02	1.42%	1.37%	0.05%
6-Dec-02	1.42%	1.34%	0.08%
9-Dec-02	1.41%	1.35%	0.06%
10-Dec-02	1.41%	1.36%	0.05%
11-Dec-02	1.41%	1.35%	0.06%
12-Dec-02	1.41%	1.34%	0.07%
13-Dec-02	1.41%	1.34%	0.07%
16-Dec-02	1.41%	1.34%	0.07%
17-Dec-02	1.41%	1.34%	0.07%
18-Dec-02	1.41%	1.35%	0.06%
19-Dec-02	1.40%	1.34%	0.06%
20-Dec-02	1.40%	1.34%	0.06%



23-Dec-02	1.40%	1.34%	0.06%
24-Dec-02	1.40%	1.34%	0.06%
27-Dec-02	1.40%	1.34%	0.06%
30-Dec-02	1.38%	1.32%	0.06%
31-Dec-02	1.38%	1.30%	0.08%
2-Jan-03	1.38%	1.32%	0.06%
3-Jan-03	1.39%	1.32%	0.07%
6-Jan-03	1.39%	1.32%	0.07%
7-Jan-03	1.39%	1.30%	0.09%
8-Jan-03	1.38%	1.30%	0.08%
9-Jan-03	1.38%	1.30%	0.08%
10-Jan-03	1.38%	1.28%	0.10%
13-Jan-03	1.38%	1.30%	0.08%
14-Jan-03	1.37%	1.30%	0.07%
15-Jan-03	1.37%	1.30%	0.07%
16-Jan-03	1.37%	1.30%	0.07%
17-Jan-03	1.37%	1.29%	0.08%
21-Jan-03	1.36%	1.28%	0.08%
22-Jan-03	1.36%	1.28%	0.08%
23-Jan-03	1.35%	1.28%	0.07%
24-Jan-03	1.35%	1.27%	0.08%
27-Jan-03	1.34%	1.26%	0.08%
28-Jan-03	1.34%	1.25%	0.09%
29-Jan-03	1.34%	1.26%	0.08%
30-Jan-03	1.35%	1.27%	0.08%
31-Jan-03	1.35%	1.26%	0.09%
3-Feb-03	1.35%	1.27%	0.08%
4-Feb-03	1.35%	1.27%	0.08%
5-Feb-03	1.35%	1.25%	0.10%
6-Feb-03	1.35%	1.26%	0.09%
7-Feb-03	1.35%	1.26%	0.09%
10-Feb-03	1.35%	1.25%	0.10%
11-Feb-03	1.35%	1.26%	0.09%
12-Feb-03	1.34%	1.26%	0.08%
13-Feb-03	1.34%	1.26%	0.08%
14-Feb-03	1.34%	1.26%	0.08%
18-Feb-03	1.34%	1.31%	0.03%
19-Feb-03	1.34%	1.26%	0.08%
20-Feb-03	1.34%	1.26%	0.08%
21-Feb-03	1.34%	1.26%	0.08%
24-Feb-03	1.34%	1.26%	0.08%
25-Feb-03	1.34%	1.25%	0.09%
26-Feb-03	1.34%	1.26%	0.08%
27-Feb-03	1.34%	1.26%	0.08%
28-Feb-03	1.34%	1.26%	0.08%
3-Mar-03	1.34%	1.25%	0.09%
4-Mar-03	1.33%	1.25%	0.08%

5-Mar-03	1.32%	1.25%	0.07%
6-Mar-03	1.32%	1.25%	0.07%
7-Mar-03	1.31%	1.21%	0.10%
10-Mar-03	1.26%	1.18%	0.08%
11-Mar-03	1.23%	1.17%	0.06%
12-Mar-03	1.23%	1.15%	0.08%
13-Mar-03	1.26%	1.18%	0.08%
14-Mar-03	1.28%	1.20%	0.08%
17-Mar-03	1.26%	1.17%	0.09%
18-Mar-03	1.27%	1.20%	0.07%
19-Mar-03	1.29%	1.22%	0.07%
20-Mar-03	1.29%	1.23%	0.06%
21-Mar-03	1.29%	1.22%	0.07%
24-Mar-03	1.29%	1.22%	0.07%
25-Mar-03	1.29%	1.23%	0.06%
26-Mar-03	1.29%	1.23%	0.06%
27-Mar-03	1.29%	1.23%	0.06%
28-Mar-03	1.29%	1.22%	0.07%
31-Mar-03	1.28%	1.22%	0.06%
1-Apr-03	1.28%	1.22%	0.06%
2-Apr-03	1.28%	1.21%	0.07%
3-Apr-03	1.28%	1.21%	0.07%
4-Apr-03	1.28%	1.21%	0.07%
7-Apr-03	1.29%	1.22%	0.07%
8-Apr-03	1.29%	1.22%	0.07%
9-Apr-03	1.29%	1.22%	0.07%
10-Apr-03	1.28%	1.21%	0.07%
11-Apr-03	1.29%	1.23%	0.06%
14-Apr-03	1.30%	1.23%	0.07%
15-Apr-03	1.32%	1.25%	0.07%
16-Apr-03	1.33%	1.25%	0.08%
17-Apr-03	1.32%	1.27%	0.05%
22-Apr-03	1.32%	1.26%	0.06%
23-Apr-03	1.32%	1.25%	0.07%
24-Apr-03	1.32%	1.25%	0.07%
25-Apr-03	1.31%	1.25%	0.06%
28-Apr-03	1.30%	1.23%	0.07%
29-Apr-03	1.31%	1.24%	0.07%
30-Apr-03	1.31%	1.25%	0.06%
1-May-03	1.30%	1.22%	0.08%
2-May-03	1.29%	1.22%	0.07%
6-May-03	1.29%	1.23%	0.06%
7-May-03	1.28%	1.20%	0.08%
8-May-03	1.28%	1.22%	0.06%
9-May-03	1.29%	1.22%	0.07%
12-May-03	1.29%	1.22%	0.07%
13-May-03	1.29%	1.22%	0.07%

14-May-03	1.29%	1.23%	0.06%
15-May-03	1.29%	1.22%	0.07%
16-May-03	1.29%	1.21%	0.08%
19-May-03	1.28%	1.19%	0.09%
20-May-03	1.28%	1.20%	0.08%
21-May-03	1.27%	1.19%	0.08%
22-May-03	1.28%	1.20%	0.08%
23-May-03	1.28%	1.19%	0.09%
27-May-03	1.28%	1.19%	0.09%
28-May-03	1.28%	1.21%	0.07%
29-May-03	1.28%	1.20%	0.08%
30-May-03	1.28%	1.21%	0.07%
2-Jun-03	1.28%	1.21%	0.07%
3-Jun-03	1.28%	1.20%	0.08%
4-Jun-03	1.26%	1.16%	0.10%
5-Jun-03	1.24%	1.12%	0.12%
6-Jun-03	1.21%	1.12%	0.09%
9-Jun-03	1.20%	1.09%	0.11%
10-Jun-03	1.18%	1.09%	0.09%
11-Jun-03	1.14%	1.02%	0.12%
12-Jun-03	1.12%	1.01%	0.11%
13-Jun-03	1.09%	0.98%	0.11%
16-Jun-03	1.06%	0.95%	0.11%
17-Jun-03	1.06%	0.93%	0.13%
18-Jun-03	1.07%	0.97%	0.09%
19-Jun-03	1.03%	0.93%	0.10%
20-Jun-03	1.02%	0.92%	0.10%
23-Jun-03	1.02%	0.93%	0.09%
24-Jun-03	1.01%	0.91%	0.10%
25-Jun-03	1.00%	0.90%	0.10%
26-Jun-03	1.10%	1.03%	0.07%
27-Jun-03	1.11%	1.04%	0.07%
30-Jun-03	1.12%	1.04%	0.08%
1-Jul-03	1.11%	1.04%	0.07%
2-Jul-03	1.11%	1.05%	0.06%
3-Jul-03	1.11%	1.05%	0.06%
7-Jul-03	1.11%	1.04%	0.07%
8-Jul-03	1.11%	1.05%	0.06%
9-Jul-03	1.11%	1.04%	0.07%
10-Jul-03	1.11%	1.04%	0.07%
11-Jul-03	1.11%	1.03%	0.08%
14-Jul-03	1.10%	1.03%	0.07%
15-Jul-03	1.10%	1.04%	0.06%
16-Jul-03	1.11%	1.06%	0.05%
17-Jul-03	1.11%	1.08%	0.03%
18-Jul-03	1.11%	1.03%	0.08%
21-Jul-03	1.11%	1.05%	0.06%

22-Jul-03	1.11%	1.03%	0.08%
23-Jul-03	1.11%	1.04%	0.07%
24-Jul-03	1.11%	1.04%	0.07%
25-Jul-03	1.11%	1.04%	0.07%
28-Jul-03	1.11%	1.04%	0.07%
29-Jul-03	1.11%	1.05%	0.06%
30-Jul-03	1.12%	1.05%	0.07%
31-Jul-03	1.11%	1.05%	0.06%
1-Aug-03	1.14%	1.06%	0.08%
4-Aug-03	1.14%	1.06%	0.08%
5-Aug-03	1.14%	1.07%	0.07%
6-Aug-03	1.14%	1.06%	0.08%
7-Aug-03	1.14%	1.07%	0.07%
8-Aug-03	1.13%	1.06%	0.07%
11-Aug-03	1.13%	1.07%	0.06%
12-Aug-03	1.13%	1.06%	0.07%
13-Aug-03	1.13%	1.06%	0.07%
14-Aug-03	1.13%	1.07%	0.06%
15-Aug-03	1.13%	1.11%	0.02%
18-Aug-03	1.13%	1.06%	0.07%
19-Aug-03	1.13%	1.07%	0.06%
20-Aug-03	1.13%	1.07%	0.06%
21-Aug-03	1.13%	1.07%	0.06%
22-Aug-03	1.14%	1.07%	0.07%
26-Aug-03	1.14%	1.08%	0.06%
27-Aug-03	1.14%	1.07%	0.07%
28-Aug-03	1.14%	1.08%	0.06%
29-Aug-03	1.14%	1.07%	0.07%
2-Sep-03	1.14%	1.08%	0.06%
3-Sep-03	1.15%	1.09%	0.06%
4-Sep-03	1.15%	1.09%	0.06%
5-Sep-03	1.14%	1.08%	0.06%
8-Sep-03	1.14%	1.08%	0.06%
9-Sep-03	1.14%	1.08%	0.06%
10-Sep-03	1.14%	1.08%	0.06%
11-Sep-03	1.14%	1.06%	0.08%
12-Sep-03	1.14%	1.07%	0.07%
15-Sep-03	1.14%	1.09%	0.05%
16-Sep-03	1.14%	1.08%	0.06%
17-Sep-03	1.14%	1.08%	0.06%
18-Sep-03	1.14%	1.12%	0.02%
19-Sep-03	1.14%	1.12%	0.02%
22-Sep-03	1.14%	1.06%	0.08%
23-Sep-03	1.14%	1.07%	0.07%
24-Sep-03	1.14%	1.08%	0.06%
25-Sep-03	1.14%	1.07%	0.07%
26-Sep-03	1.14%	1.07%	0.07%

29-Sep-03	1.16%	1.08%	0.08%
30-Sep-03	1.16%	1.09%	0.07%
1-Oct-03	1.15%	1.08%	0.07%
2-Oct-03	1.15%	1.08%	0.07%
3-Oct-03	1.15%	1.09%	0.06%
6-Oct-03	1.15%	1.08%	0.07%
7-Oct-03	1.15%	1.08%	0.07%
8-Oct-03	1.15%	1.08%	0.07%
9-Oct-03	1.15%	1.08%	0.07%
10-Oct-03	1.15%	1.09%	0.06%
14-Oct-03	1.15%	1.09%	0.06%
15-Oct-03	1.16%	1.09%	0.07%
16-Oct-03	1.16%	1.09%	0.07%
17-Oct-03	1.17%	1.10%	0.07%
20-Oct-03	1.17%	1.11%	0.06%
21-Oct-03	1.17%	1.11%	0.06%
22-Oct-03	1.17%	1.11%	0.06%
23-Oct-03	1.16%	1.09%	0.07%
24-Oct-03	1.16%	1.10%	0.06%
27-Oct-03	1.16%	1.09%	0.07%
28-Oct-03	1.17%	1.10%	0.07%
29-Oct-03	1.16%	1.10%	0.06%
30-Oct-03	1.16%	1.10%	0.06%
31-Oct-03	1.17%	1.10%	0.07%
3-Nov-03	1.17%	1.12%	0.05%
4-Nov-03	1.17%	1.10%	0.07%
5-Nov-03	1.17%	1.10%	0.07%
6-Nov-03	1.17%	1.10%	0.07%
7-Nov-03	1.17%	1.10%	0.07%
10-Nov-03	1.18%	1.10%	0.08%
12-Nov-03	1.18%	1.12%	0.06%
13-Nov-03	1.18%	1.12%	0.06%
14-Nov-03	1.17%	1.09%	0.08%
17-Nov-03	1.17%	1.09%	0.08%
18-Nov-03	1.17%	1.10%	0.07%
19-Nov-03	1.17%	1.09%	0.08%
20-Nov-03	1.17%	1.11%	0.06%
21-Nov-03	1.17%	1.08%	0.09%
24-Nov-03	1.17%	1.08%	0.09%
25-Nov-03	1.17%	1.10%	0.07%
26-Nov-03	1.17%	1.11%	0.06%
28-Nov-03	1.17%	1.10%	0.07%
1-Dec-03	1.18%	1.10%	0.08%
2-Dec-03	1.18%	1.10%	0.08%
3-Dec-03	1.18%	1.11%	0.07%
4-Dec-03	1.18%	1.10%	0.08%
5-Dec-03	1.18%	1.10%	0.08%

8-Dec-03	1.17%	1.08%	0.09%
9-Dec-03	1.17%	1.10%	0.07%
10-Dec-03	1.17%	1.09%	0.08%
11-Dec-03	1.17%	1.09%	0.08%
12-Dec-03	1.17%	1.08%	0.09%
15-Dec-03	1.17%	1.10%	0.07%
16-Dec-03	1.17%	1.10%	0.07%
17-Dec-03	1.17%	1.08%	0.09%
18-Dec-03	1.17%	1.08%	0.09%
19-Dec-03	1.17%	1.08%	0.09%
22-Dec-03	1.17%	1.08%	0.09%
23-Dec-03	1.17%	1.09%	0.08%
24-Dec-03	1.17%	1.09%	0.08%
29-Dec-03	1.16%	1.08%	0.08%
30-Dec-03	1.16%	1.08%	0.07%
31-Dec-03	1.15%	1.07%	0.08%
2-Jan-04	1.15%	1.07%	0.08%
5-Jan-04	1.15%	1.09%	0.06%
6-Jan-04	1.15%	1.08%	0.07%
7-Jan-04	1.14%	1.06%	0.08%
8-Jan-04	1.14%	1.08%	0.06%
9-Jan-04	1.14%	1.05%	0.09%
12-Jan-04	1.12%	1.05%	0.07%
13-Jan-04	1.12%	1.05%	0.07%
14-Jan-04	1.12%	1.05%	0.07%
15-Jan-04	1.12%	1.05%	0.07%
16-Jan-04	1.12%	1.05%	0.07%
20-Jan-04	1.12%	1.04%	0.08%
21-Jan-04	1.12%	1.04%	0.08%
22-Jan-04	1.12%	1.04%	0.08%
23-Jan-04	1.12%	1.04%	0.08%
26-Jan-04	1.12%	1.04%	0.08%
27-Jan-04	1.12%	1.04%	0.08%
28-Jan-04	1.12%	1.04%	0.08%
29-Jan-04	1.13%	1.05%	0.08%
30-Jan-04	1.13%	1.06%	0.07%
2-Feb-04	1.13%	1.05%	0.08%
3-Feb-04	1.13%	1.06%	0.07%
4-Feb-04	1.13%	1.04%	0.09%
5-Feb-04	1.13%	1.05%	0.08%
6-Feb-04	1.13%	1.04%	0.09%
9-Feb-04	1.13%	1.05%	0.08%
10-Feb-04	1.13%	1.04%	0.09%
11-Feb-04	1.13%	1.05%	0.08%
12-Feb-04	1.12%	1.04%	0.08%
13-Feb-04	1.12%	1.05%	0.07%
17-Feb-04	1.12%	1.04%	0.08%

18-Feb-04	1.12%	1.03%	0.09%
19-Feb-04	1.12%	1.05%	0.07%
20-Feb-04	1.12%	1.03%	0.09%
23-Feb-04	1.12%	1.03%	0.09%
24-Feb-04	1.12%	1.03%	0.09%
25-Feb-04	1.12%	1.04%	0.08%
26-Feb-04	1.12%	1.04%	0.08%
27-Feb-04	1.12%	1.05%	0.07%
1-Mar-04	1.12%	1.04%	0.08%
2-Mar-04	1.12%	1.04%	0.08%
3-Mar-04	1.12%	1.05%	0.07%
4-Mar-04	1.12%	1.05%	0.07%
5-Mar-04	1.12%	1.03%	0.09%
8-Mar-04	1.11%	1.04%	0.07%
9-Mar-04	1.11%	1.03%	0.08%
10-Mar-04	1.11%	1.04%	0.07%
11-Mar-04	1.11%	1.04%	0.07%
12-Mar-04	1.11%	1.04%	0.07%
15-Mar-04	1.11%	1.04%	0.07%
16-Mar-04	1.11%	1.04%	0.07%
17-Mar-04	1.11%	1.04%	0.07%
18-Mar-04	1.11%	1.04%	0.07%
19-Mar-04	1.11%	1.04%	0.07%
22-Mar-04	1.11%	1.04%	0.07%
23-Mar-04	1.11%	1.03%	0.08%
24-Mar-04	1.11%	1.04%	0.07%
25-Mar-04	1.11%	1.04%	0.07%
26-Mar-04	1.11%	1.04%	0.07%
29-Mar-04	1.11%	1.03%	0.08%
30-Mar-04	1.11%	1.04%	0.07%
31-Mar-04	1.11%	1.05%	0.06%
1-Apr-04	1.11%	1.04%	0.07%
2-Apr-04	1.11%	1.04%	0.07%
5-Apr-04	1.14%	1.06%	0.08%
6-Apr-04	1.14%	1.07%	0.07%
7-Apr-04	1.14%	1.06%	0.08%
8-Apr-04	1.14%	1.06%	0.08%
13-Apr-04	1.14%	1.05%	0.09%
14-Apr-04	1.14%	1.07%	0.07%
15-Apr-04	1.15%	1.07%	0.08%
16-Apr-04	1.15%	1.07%	0.08%
19-Apr-04	1.15%	1.05%	0.10%
20-Apr-04	1.15%	1.07%	0.08%
21-Apr-04	1.17%	1.08%	0.09%
22-Apr-04	1.17%	1.08%	0.09%
23-Apr-04	1.17%	1.07%	0.10%
26-Apr-04	1.17%	1.09%	0.08%

27-Apr-04	1.17%	1.09%	0.08%
28-Apr-04	1.17%	1.08%	0.09%
29-Apr-04	1.18%	1.10%	0.08%
30-Apr-04	1.18%	1.10%	0.08%
4-May-04	1.18%	1.10%	0.08%
5-May-04	1.18%	1.10%	0.08%
6-May-04	1.18%	1.10%	0.08%
7-May-04	1.19%	1.16%	0.03%
10-May-04	1.24%	1.14%	0.10%
11-May-04	1.24%	1.18%	0.06%
12-May-04	1.24%	1.17%	0.07%
13-May-04	1.25%	1.17%	0.08%
14-May-04	1.26%	1.19%	0.07%
17-May-04	1.26%	1.18%	0.08%
18-May-04	1.26%	1.18%	0.08%
19-May-04	1.27%	1.20%	0.07%
20-May-04	1.28%	1.21%	0.07%
21-May-04	1.28%	1.21%	0.07%
24-May-04	1.29%	1.22%	0.07%
25-May-04	1.29%	1.22%	0.07%
26-May-04	1.30%	1.23%	0.07%
27-May-04	1.31%	1.24%	0.07%
28-May-04	1.32%	1.25%	0.07%
1-Jun-04	1.33%	1.25%	0.08%
2-Jun-04	1.34%	1.27%	0.07%
3-Jun-04	1.36%	1.30%	0.06%
4-Jun-04	1.37%	1.32%	0.05%
7-Jun-04	1.40%	1.34%	0.06%
8-Jun-04	1.41%	1.34%	0.07%
9-Jun-04	1.43%	1.35%	0.08%
10-Jun-04	1.47%	1.42%	0.05%
14-Jun-04	1.54%	1.49%	0.05%
15-Jun-04	1.56%	1.49%	0.07%
16-Jun-04	1.53%	1.47%	0.06%
17-Jun-04	1.55%	1.48%	0.07%
18-Jun-04	1.55%	1.47%	0.08%
21-Jun-04	1.56%	1.48%	0.08%
22-Jun-04	1.56%	1.48%	0.08%
23-Jun-04	1.57%	1.49%	0.08%
24-Jun-04	1.59%	1.50%	0.09%
25-Jun-04	1.58%	1.50%	0.08%
28-Jun-04	1.59%	1.51%	0.08%
29-Jun-04	1.60%	1.53%	0.07%
30-Jun-04	1.61%	1.55%	0.06%
1-Jul-04	1.60%	1.53%	0.07%
2-Jul-04	1.60%	1.49%	0.11%
6-Jul-04	1.58%	1.51%	0.07%



7-Jul-04	1.58%	1.52%	0.06%
8-Jul-04	1.59%	1.52%	0.07%
9-Jul-04	1.59%	1.52%	0.07%
12-Jul-04	1.60%	1.51%	0.09%
13-Jul-04	1.60%	1.53%	0.07%
14-Jul-04	1.61%	1.53%	0.08%
15-Jul-04	1.62%	1.55%	0.07%
16-Jul-04	1.63%	1.55%	0.08%
19-Jul-04	1.63%	1.54%	0.09%
20-Jul-04	1.63%	1.54%	0.09%
21-Jul-04	1.65%	1.55%	0.10%
22-Jul-04	1.66%	1.57%	0.09%
23-Jul-04	1.66%	1.58%	0.08%
26-Jul-04	1.66%	1.58%	0.08%
27-Jul-04	1.67%	1.60%	0.07%
28-Jul-04	1.68%	1.62%	0.06%
29-Jul-04	1.69%	1.63%	0.06%
30-Jul-04	1.70%	1.63%	0.07%
2-Aug-04	1.69%	1.62%	0.07%
3-Aug-04	1.70%	1.64%	0.06%
4-Aug-04	1.70%	1.66%	0.04%
5-Aug-04	1.71%	1.64%	0.07%
6-Aug-04	1.71%	1.60%	0.11%
9-Aug-04	1.67%	1.60%	0.07%
10-Aug-04	1.68%	1.61%	0.07%
11-Aug-04	1.71%	1.65%	0.06%
12-Aug-04	1.71%	1.65%	0.06%
13-Aug-04	1.72%	1.65%	0.07%
16-Aug-04	1.72%	1.65%	0.07%
17-Aug-04	1.73%	1.67%	0.06%
18-Aug-04	1.73%	1.66%	0.07%
19-Aug-04	1.74%	1.67%	0.07%
20-Aug-04	1.74%	1.66%	0.08%
23-Aug-04	1.75%	1.67%	0.08%
24-Aug-04	1.76%	1.69%	0.07%
25-Aug-04	1.77%	1.70%	0.07%
26-Aug-04	1.78%	1.72%	0.06%
27-Aug-04	1.79%	1.73%	0.06%
31-Aug-04	1.80%	1.73%	0.07%
1-Sep-04	1.80%	1.73%	0.07%
2-Sep-04	1.81%	1.75%	0.06%
3-Sep-04	1.82%	1.76%	0.06%
7-Sep-04	1.86%	1.79%	0.07%
8-Sep-04	1.86%	1.80%	0.06%
9-Sep-04	1.87%	1.80%	0.07%
10-Sep-04	1.87%	1.82%	0.05%
13-Sep-04	1.88%	1.81%	0.07%

14-Sep-04	1.88%	1.82%	0.06%
15-Sep-04	1.89%	1.83%	0.06%
16-Sep-04	1.91%	1.85%	0.06%
17-Sep-04	1.91%	1.85%	0.06%
20-Sep-04	1.92%	1.87%	0.05%
21-Sep-04	1.93%	1.86%	0.07%
22-Sep-04	1.94%	1.88%	0.06%
23-Sep-04	1.95%	1.88%	0.07%
24-Sep-04	1.96%	1.89%	0.07%
27-Sep-04	1.97%	1.88%	0.09%
28-Sep-04	1.98%	1.90%	0.08%
29-Sep-04	2.01%	1.95%	0.06%
30-Sep-04	2.02%	1.95%	0.07%
1-Oct-04	2.03%	1.97%	0.06%
4-Oct-04	2.03%	1.96%	0.07%
5-Oct-04	2.04%	1.97%	0.07%
6-Oct-04	2.05%	1.97%	0.08%
7-Oct-04	2.06%	1.98%	0.08%
8-Oct-04	2.06%	2.02%	0.04%
12-Oct-04	2.06%	1.99%	0.07%
13-Oct-04	2.07%	1.99%	0.08%
14-Oct-04	2.07%	2.00%	0.07%
15-Oct-04	2.07%	2.00%	0.07%
18-Oct-04	2.08%	2.00%	0.08%
19-Oct-04	2.08%	2.01%	0.07%
20-Oct-04	2.09%	2.03%	0.06%
21-Oct-04	2.10%	2.05%	0.05%
22-Oct-04	2.11%	2.06%	0.05%
25-Oct-04	2.11%	2.04%	0.07%
26-Oct-04	2.12%	2.05%	0.07%
27-Oct-04	2.13%	2.05%	0.08%
28-Oct-04	2.16%	2.09%	0.07%
29-Oct-04	2.17%	2.09%	0.08%
1-Nov-04	2.18%	2.10%	0.08%
2-Nov-04	2.19%	2.12%	0.07%
3-Nov-04	2.20%	2.12%	0.08%
4-Nov-04	2.21%	2.14%	0.07%
5-Nov-04	2.22%	2.14%	0.08%
8-Nov-04	2.26%	2.20%	0.06%
9-Nov-04	2.27%	2.20%	0.07%
10-Nov-04	2.28%	2.22%	0.06%
12-Nov-04	2.29%	2.22%	0.07%
15-Nov-04	2.30%	2.22%	0.08%
16-Nov-04	2.31%	2.27%	0.04%
17-Nov-04	2.33%	2.26%	0.07%
18-Nov-04	2.34%	2.26%	0.08%
19-Nov-04	2.35%	2.28%	0.07%

22-Nov-04	2.36%	2.28%	0.08%
23-Nov-04	2.38%	2.31%	0.07%
24-Nov-04	2.38%	2.31%	0.07%
26-Nov-04	2.40%	2.33%	0.07%
29-Nov-04	2.40%	2.34%	0.06%
30-Nov-04	2.41%	2.34%	0.07%
1-Dec-04	2.42%	2.34%	0.08%
2-Dec-04	2.44%	2.35%	0.09%
3-Dec-04	2.44%	2.36%	0.08%
6-Dec-04	2.44%	2.37%	0.07%
7-Dec-04	2.45%	2.38%	0.07%
8-Dec-04	2.46%	2.38%	0.08%
9-Dec-04	2.47%	2.38%	0.09%
10-Dec-04	2.48%	2.41%	0.07%
13-Dec-04	2.49%	2.42%	0.07%
14-Dec-04	2.50%	2.43%	0.07%
15-Dec-04	2.50%	2.44%	0.06%
16-Dec-04	2.51%	2.44%	0.07%
17-Dec-04	2.52%	2.45%	0.07%
20-Dec-04	2.52%	2.46%	0.06%
21-Dec-04	2.53%	2.45%	0.08%
22-Dec-04	2.53%	2.45%	0.08%
23-Dec-04	2.55%	2.47%	0.08%
24-Dec-04	2.55%	2.47%	0.08%
29-Dec-04	2.56%	2.48%	0.08%
30-Dec-04	2.56%	2.49%	0.07%
31-Dec-04	2.56%	2.49%	0.07%
4-Jan-05	2.57%	2.51%	0.06%
5-Jan-05	2.59%	2.52%	0.07%
6-Jan-05	2.61%	2.55%	0.06%
7-Jan-05	2.61%	2.55%	0.06%
10-Jan-05	2.62%	2.56%	0.06%
11-Jan-05	2.63%	2.57%	0.06%
12-Jan-05	2.64%	2.56%	0.08%
13-Jan-05	2.66%	2.57%	0.09%
14-Jan-05	2.66%	2.59%	0.07%
18-Jan-05	2.67%	2.60%	0.07%
19-Jan-05	2.68%	2.62%	0.06%
20-Jan-05	2.69%	2.63%	0.06%
21-Jan-05	2.70%	2.63%	0.07%
24-Jan-05	2.70%	2.63%	0.07%
25-Jan-05	2.70%	2.63%	0.07%
26-Jan-05	2.71%	2.65%	0.06%
27-Jan-05	2.73%	2.67%	0.06%
28-Jan-05	2.74%	2.68%	0.06%
31-Jan-05	2.75%	2.69%	0.06%
1-Feb-05	2.75%	2.68%	0.07%

2-Feb-05	2.75%	2.68%	0.07%
3-Feb-05	2.77%	2.71%	0.06%
4-Feb-05	2.77%	2.70%	0.07%
7-Feb-05	2.77%	2.70%	0.07%
8-Feb-05	2.77%	2.71%	0.06%
9-Feb-05	2.77%	2.71%	0.06%
10-Feb-05	2.79%	2.73%	0.06%
11-Feb-05	2.79%	2.74%	0.05%
14-Feb-05	2.80%	2.73%	0.07%
15-Feb-05	2.81%	2.74%	0.07%
16-Feb-05	2.82%	2.75%	0.07%
17-Feb-05	2.85%	2.78%	0.07%
18-Feb-05	2.85%	2.78%	0.07%
22-Feb-05	2.87%	2.79%	0.08%
23-Feb-05	2.87%	2.81%	0.06%
24-Feb-05	2.89%	2.83%	0.06%
25-Feb-05	2.91%	2.85%	0.06%
28-Feb-05	2.92%	2.84%	0.08%
1-Mar-05	2.93%	2.85%	0.08%
2-Mar-05	2.94%	2.87%	0.07%
3-Mar-05	2.95%	2.90%	0.05%
4-Mar-05	2.96%	2.88%	0.08%
7-Mar-05	2.96%	2.89%	0.07%
8-Mar-05	2.97%	2.89%	0.08%
9-Mar-05	2.98%	2.90%	0.08%
10-Mar-05	3.00%	2.93%	0.07%
11-Mar-05	3.01%	2.94%	0.07%
14-Mar-05	3.02%	2.95%	0.07%
15-Mar-05	3.03%	2.96%	0.07%
16-Mar-05	3.04%	2.97%	0.07%
17-Mar-05	3.05%	2.97%	0.08%
18-Mar-05	3.05%	2.98%	0.07%
21-Mar-05	3.05%	2.98%	0.07%
22-Mar-05	3.06%	2.98%	0.08%
23-Mar-05	3.09%	3.02%	0.07%
24-Mar-05	3.09%	3.02%	0.07%
29-Mar-05	3.09%	3.02%	0.07%
30-Mar-05	3.10%	3.04%	0.06%
31-Mar-05	3.12%	3.05%	0.07%
1-Apr-05	3.12%	3.02%	0.10%
4-Apr-05	3.12%	3.03%	0.09%
5-Apr-05	3.12%	3.04%	0.08%
6-Apr-05	3.12%	3.04%	0.08%
7-Apr-05	3.13%	3.05%	0.08%
8-Apr-05	3.13%	3.06%	0.07%
11-Apr-05	3.14%	3.05%	0.09%
12-Apr-05	3.14%	3.06%	0.08%

13-Apr-05	3.14%	3.07%	0.07%
14-Apr-05	3.15%	3.07%	0.08%
15-Apr-05	3.15%	3.07%	0.08%
18-Apr-05	3.14%	3.08%	0.06%
19-Apr-05	3.15%	3.07%	0.08%
20-Apr-05	3.15%	3.08%	0.07%
21-Apr-05	3.16%	3.09%	0.07%
22-Apr-05	3.17%	3.10%	0.07%
25-Apr-05	3.18%	3.12%	0.06%
26-Apr-05	3.19%	3.13%	0.06%
27-Apr-05	3.19%	3.13%	0.06%
28-Apr-05	3.21%	3.13%	0.08%
29-Apr-05	3.21%	3.14%	0.07%
3-May-05	3.22%	3.15%	0.07%
4-May-05	3.22%	3.15%	0.07%
5-May-05	3.23%	3.16%	0.07%
6-May-05	3.23%	3.16%	0.07%
9-May-05	3.25%	3.18%	0.07%
10-May-05	3.25%	3.19%	0.06%
11-May-05	3.26%	3.20%	0.06%
12-May-05	3.27%	3.20%	0.07%
13-May-05	3.27%	3.20%	0.07%
16-May-05	3.27%	3.21%	0.06%
17-May-05	3.27%	3.20%	0.07%
18-May-05	3.28%	3.21%	0.07%
19-May-05	3.28%	3.22%	0.06%
20-May-05	3.29%	3.22%	0.07%
23-May-05	3.29%	3.23%	0.06%
24-May-05	3.30%	3.23%	0.07%
25-May-05	3.31%	3.23%	0.08%
26-May-05	3.32%	3.25%	0.07%
27-May-05	3.33%	3.25%	0.08%
31-May-05	3.34%	3.26%	0.08%
1-Jun-05	3.35%	3.28%	0.07%
2-Jun-05	3.35%	3.28%	0.07%
3-Jun-05	3.36%	3.27%	0.09%
6-Jun-05	3.37%	3.28%	0.09%
7-Jun-05	3.37%	3.30%	0.07%
8-Jun-05	3.38%	3.30%	0.08%
9-Jun-05	3.39%	3.33%	0.06%
10-Jun-05	3.40%	3.33%	0.07%
13-Jun-05	3.41%	3.34%	0.07%
14-Jun-05	3.41%	3.35%	0.06%
15-Jun-05	3.42%	3.35%	0.07%
16-Jun-05	3.43%	3.37%	0.06%
17-Jun-05	3.44%	3.38%	0.06%
20-Jun-05	3.44%	3.39%	0.05%

21-Jun-05	3.45%	3.39%	0.06%
22-Jun-05	3.46%	3.41%	0.05%
23-Jun-05	3.47%	3.41%	0.06%
24-Jun-05	3.48%	3.42%	0.06%
27-Jun-05	3.48%	3.41%	0.07%
28-Jun-05	3.49%	3.44%	0.05%
29-Jun-05	3.50%	3.44%	0.06%
30-Jun-05	3.52%	3.46%	0.06%
1-Jul-05	3.53%	3.49%	0.04%
5-Jul-05	3.55%	3.48%	0.07%
6-Jul-05	3.56%	3.51%	0.05%
7-Jul-05	3.55%	3.50%	0.05%
8-Jul-05	3.56%	3.50%	0.06%
11-Jul-05	3.57%	3.51%	0.06%
12-Jul-05	3.58%	3.52%	0.06%
13-Jul-05	3.60%	3.54%	0.06%
14-Jul-05	3.61%	3.55%	0.06%
15-Jul-05	3.61%	3.55%	0.06%
18-Jul-05	3.62%	3.47%	0.15%
19-Jul-05	3.63%	3.55%	0.08%
20-Jul-05	3.64%	3.58%	0.06%
21-Jul-05	3.65%	3.59%	0.06%
22-Jul-05	3.66%	3.60%	0.06%
25-Jul-05	3.66%	3.60%	0.06%
26-Jul-05	3.67%	3.61%	0.06%
27-Jul-05	3.68%	3.62%	0.06%
28-Jul-05	3.69%	3.64%	0.05%
29-Jul-05	3.70%	3.64%	0.06%
1-Aug-05	3.71%	3.65%	0.06%
2-Aug-05	3.72%	3.66%	0.06%
3-Aug-05	3.73%	3.68%	0.05%
4-Aug-05	3.75%	3.69%	0.06%
5-Aug-05	3.75%	3.70%	0.05%
8-Aug-05	3.76%	3.70%	0.06%
9-Aug-05	3.78%	3.71%	0.07%
10-Aug-05	3.78%	3.71%	0.07%
11-Aug-05	3.79%	3.74%	0.05%
12-Aug-05	3.79%	3.72%	0.07%
15-Aug-05	3.80%	3.75%	0.05%
16-Aug-05	3.80%	3.74%	0.06%
17-Aug-05	3.81%	3.75%	0.06%
18-Aug-05	3.82%	3.76%	0.06%
19-Aug-05	3.82%	3.77%	0.05%
22-Aug-05	3.83%	3.79%	0.04%
23-Aug-05	3.84%	3.79%	0.05%
24-Aug-05	3.84%	3.79%	0.05%
25-Aug-05	3.86%	3.81%	0.05%

26-Aug-05	3.86%	3.80%	0.06%
30-Aug-05	3.87%	3.82%	0.05%
31-Aug-05	3.87%	3.80%	0.07%
1-Sep-05	3.86%	3.80%	0.06%
2-Sep-05	3.76%	3.68%	0.08%
6-Sep-05	3.79%	3.73%	0.06%
7-Sep-05	3.80%	3.70%	0.10%
8-Sep-05	3.83%	3.78%	0.05%
9-Sep-05	3.85%	3.79%	0.06%
12-Sep-05	3.86%	3.80%	0.06%
13-Sep-05	3.87%	3.81%	0.06%
14-Sep-05	3.87%	3.81%	0.06%
15-Sep-05	3.89%	3.83%	0.06%
16-Sep-05	3.89%	3.83%	0.06%
19-Sep-05	3.92%	3.85%	0.07%
20-Sep-05	3.92%	3.86%	0.06%
21-Sep-05	3.96%	3.90%	0.06%
22-Sep-05	3.96%	3.90%	0.06%
23-Sep-05	3.97%	3.91%	0.06%
26-Sep-05	4.00%	3.94%	0.06%
27-Sep-05	4.01%	3.95%	0.06%
28-Sep-05	4.02%	3.96%	0.06%
29-Sep-05	4.05%	4.00%	0.05%
30-Sep-05	4.07%	4.00%	0.07%
3-Oct-05	4.08%	4.01%	0.07%
4-Oct-05	4.09%	4.03%	0.06%
5-Oct-05	4.10%	4.04%	0.06%
6-Oct-05	4.11%	4.05%	0.06%
7-Oct-05	4.12%	4.04%	0.08%
11-Oct-05	4.13%	4.07%	0.06%
12-Oct-05	4.14%	4.08%	0.06%
13-Oct-05	4.15%	4.10%	0.05%
14-Oct-05	4.16%	4.10%	0.06%
17-Oct-05	4.17%	4.11%	0.06%
18-Oct-05	4.17%	4.11%	0.06%
19-Oct-05	4.18%	4.12%	0.06%
20-Oct-05	4.19%	4.18%	0.01%
21-Oct-05	4.20%	4.19%	0.01%
24-Oct-05	4.21%	4.19%	0.02%
25-Oct-05	4.22%	4.20%	0.02%
26-Oct-05	4.23%	4.20%	0.03%
27-Oct-05	4.24%	4.24%	0.00%
28-Oct-05	4.25%	4.24%	0.01%
31-Oct-05	4.26%	4.25%	0.01%
1-Nov-05	4.26%	4.25%	0.01%
2-Nov-05	4.28%	4.28%	0.00%
3-Nov-05	4.29%	4.27%	0.02%

4-Nov-05	4.30%	4.27%	0.03%
7-Nov-05	4.30%	4.28%	0.02%
8-Nov-05	4.31%	4.28%	0.03%
9-Nov-05	4.33%	4.31%	0.02%
10-Nov-05	4.33%	4.31%	0.02%
14-Nov-05	4.34%	4.33%	0.01%
15-Nov-05	4.35%	4.34%	0.01%
16-Nov-05	4.37%	4.35%	0.02%
17-Nov-05	4.37%	4.36%	0.01%
18-Nov-05	4.37%	4.36%	0.01%
21-Nov-05	4.38%	4.36%	0.02%
22-Nov-05	4.39%	4.38%	0.01%
23-Nov-05	4.39%	4.38%	0.01%
25-Nov-05	4.40%	4.39%	0.01%
28-Nov-05	4.41%	4.39%	0.02%
29-Nov-05	4.41%	4.40%	0.01%
30-Nov-05	4.42%	4.41%	0.01%
1-Dec-05	4.44%	4.41%	0.03%
2-Dec-05	4.45%	4.44%	0.01%
5-Dec-05	4.45%	4.42%	0.03%
6-Dec-05	4.46%	4.43%	0.03%
7-Dec-05	4.46%	4.44%	0.02%
8-Dec-05	4.48%	4.47%	0.01%
9-Dec-05	4.48%	4.46%	0.02%
12-Dec-05	4.49%	4.47%	0.02%
13-Dec-05	4.49%	4.47%	0.02%
14-Dec-05	4.49%	4.47%	0.02%
15-Dec-05	4.50%	4.47%	0.03%
16-Dec-05	4.50%	4.48%	0.02%
19-Dec-05	4.50%	4.48%	0.02%
20-Dec-05	4.50%	4.48%	0.02%
21-Dec-05	4.50%	4.48%	0.02%
22-Dec-05	4.52%	4.50%	0.02%
23-Dec-05	4.52%	4.50%	0.02%
28-Dec-05	4.53%	4.50%	0.03%
29-Dec-05	4.53%	4.50%	0.03%
30-Dec-05	4.54%	4.52%	0.02%
3-Jan-06	4.54%	4.53%	0.01%
4-Jan-06	4.54%	4.53%	0.01%
5-Jan-06	4.55%	4.54%	0.01%
6-Jan-06	4.55%	4.54%	0.01%
9-Jan-06	4.56%	4.55%	0.01%
10-Jan-06	4.57%	4.56%	0.01%
11-Jan-06	4.58%	4.56%	0.02%
12-Jan-06	4.60%	4.58%	0.02%
13-Jan-06	4.60%	4.58%	0.02%
17-Jan-06	4.60%	4.59%	0.01%



18-Jan-06	4.60%	4.60%	0.00%
19-Jan-06	4.61%	4.60%	0.01%
20-Jan-06	4.62%	4.61%	0.01%
23-Jan-06	4.62%	4.61%	0.01%
24-Jan-06	4.63%	4.62%	0.01%
25-Jan-06	4.64%	4.62%	0.02%
26-Jan-06	4.66%	4.65%	0.01%
27-Jan-06	4.67%	4.65%	0.02%
30-Jan-06	4.68%	4.67%	0.01%
31-Jan-06	4.68%	4.67%	0.01%
1-Feb-06	4.69%	4.68%	0.01%
2-Feb-06	4.71%	4.69%	0.02%
3-Feb-06	4.71%	4.70%	0.01%
7-Feb-06	4.72%	4.71%	0.01%
8-Feb-06	4.72%	4.71%	0.01%
9-Feb-06	4.74%	4.73%	0.01%
10-Feb-06	4.74%	4.72%	0.02%
13-Feb-06	4.75%	4.74%	0.01%
14-Feb-06	4.75%	4.75%	0.00%
15-Feb-06	4.75%	4.75%	0.00%
16-Feb-06	4.77%	4.77%	0.00%
17-Feb-06	4.77%	4.75%	0.02%
21-Feb-06	4.77%	4.77%	0.00%
22-Feb-06	4.78%	4.77%	0.01%
23-Feb-06	4.80%	4.79%	0.01%
24-Feb-06	4.81%	4.80%	0.01%
27-Feb-06	4.82%	4.81%	0.01%
28-Feb-06	4.82%	4.82%	0.00%
1-Mar-06	4.83%	4.82%	0.01%
2-Mar-06	4.84%	4.83%	0.01%
3-Mar-06	4.85%	4.85%	0.00%
6-Mar-06	4.86%	4.85%	0.01%
7-Mar-06	4.87%	4.86%	0.01%
8-Mar-06	4.88%	4.85%	0.03%
9-Mar-06	4.89%	4.87%	0.02%
10-Mar-06	4.90%	4.90%	0.00%
13-Mar-06	4.91%	4.90%	0.01%
14-Mar-06	4.92%	4.90%	0.02%
15-Mar-06	4.92%	4.90%	0.02%
16-Mar-06	4.93%	4.92%	0.01%
17-Mar-06	4.93%	4.92%	0.01%
20-Mar-06	4.94%	4.92%	0.02%
21-Mar-06	4.94%	4.92%	0.02%
22-Mar-06	4.95%	4.95%	0.00%
23-Mar-06	4.96%	4.95%	0.01%
24-Mar-06	4.96%	4.96%	0.00%
27-Mar-06	4.96%	4.96%	0.00%

28-Mar-06	4.96%	4.96%	0.00%
29-Mar-06	4.98%	4.97%	0.01%
30-Mar-06	4.99%	4.98%	0.01%
31-Mar-06	5.00%	4.99%	0.01%
3-Apr-06	5.00%	4.98%	0.02%
4-Apr-06	5.01%	5.00%	0.01%
5-Apr-06	5.01%	5.01%	0.00%
6-Apr-06	5.02%	5.00%	0.02%
7-Apr-06	5.03%	5.00%	0.03%
10-Apr-06	5.04%	5.02%	0.02%
11-Apr-06	5.05%	5.05%	0.00%
12-Apr-06	5.07%	5.06%	0.01%
13-Apr-06	5.08%	5.07%	0.01%
18-Apr-06	5.08%	5.07%	0.01%
19-Apr-06	5.07%	5.07%	0.00%
20-Apr-06	5.09%	5.08%	0.01%
21-Apr-06	5.10%	5.09%	0.01%
24-Apr-06	5.11%	5.09%	0.02%
25-Apr-06	5.11%	5.10%	0.01%
26-Apr-06	5.13%	5.12%	0.01%
27-Apr-06	5.15%	5.14%	0.01%
28-Apr-06	5.13%	5.13%	0.00%
2-May-06	5.15%	5.14%	0.01%
3-May-06	5.15%	5.14%	0.01%
4-May-06	5.16%	5.14%	0.02%
5-May-06	5.17%	5.14%	0.03%
8-May-06	5.16%	5.15%	0.01%
9-May-06	5.16%	5.16%	0.00%
10-May-06	5.16%	5.16%	0.00%
11-May-06	5.17%	5.16%	0.01%
12-May-06	5.17%	5.16%	0.01%
15-May-06	5.17%	5.17%	0.00%
16-May-06	5.17%	5.17%	0.00%
17-May-06	5.17%	5.17%	0.00%
18-May-06	5.19%	5.18%	0.01%
19-May-06	5.19%	5.19%	0.00%
22-May-06	5.21%	5.20%	0.01%
23-May-06	5.21%	5.21%	0.00%
24-May-06	5.21%	5.21%	0.00%
25-May-06	5.22%	5.22%	0.00%
26-May-06	5.23%	5.22%	0.01%
30-May-06	5.23%	5.23%	0.00%
31-May-06	5.24%	5.23%	0.01%
1-Jun-06	5.27%	5.26%	0.01%
2-Jun-06	5.27%	5.26%	0.01%
5-Jun-06	5.24%	5.23%	0.01%
6-Jun-06	5.27%	5.26%	0.01%

7-Jun-06	5.28%	5.28%	0.00%
8-Jun-06	5.30%	5.29%	0.01%
9-Jun-06	5.31%	5.30%	0.01%
12-Jun-06	5.32%	5.31%	0.01%
13-Jun-06	5.33%	5.32%	0.01%
14-Jun-06	5.34%	5.35%	-0.01%
15-Jun-06	5.40%	5.39%	0.01%
16-Jun-06	5.41%	5.41%	0.00%
19-Jun-06	5.42%	5.42%	0.00%
20-Jun-06	5.44%	5.43%	0.01%
21-Jun-06	5.45%	5.43%	0.02%
22-Jun-06	5.46%	5.45%	0.01%
23-Jun-06	5.48%	5.47%	0.01%
26-Jun-06	5.49%	5.47%	0.02%
27-Jun-06	5.50%	5.50%	0.00%
28-Jun-06	5.50%	5.48%	0.02%
29-Jun-06	5.51%	5.49%	0.02%
30-Jun-06	5.48%	5.48%	0.00%
3-Jul-06	5.48%	5.47%	0.01%
5-Jul-06	5.49%	5.48%	0.01%
6-Jul-06	5.51%	5.50%	0.01%
7-Jul-06	5.51%	5.50%	0.01%
10-Jul-06	5.50%	5.50%	0.00%
11-Jul-06	5.50%	5.50%	0.00%
12-Jul-06	5.50%	5.50%	0.00%
13-Jul-06	5.51%	5.50%	0.01%
14-Jul-06	5.50%	5.49%	0.01%
17-Jul-06	5.49%	5.49%	0.00%
18-Jul-06	5.50%	5.49%	0.01%
19-Jul-06	5.52%	5.51%	0.01%
20-Jul-06	5.51%	5.51%	0.00%
21-Jul-06	5.49%	5.48%	0.01%
24-Jul-06	5.49%	5.48%	0.01%
25-Jul-06	5.49%	5.48%	0.01%
26-Jul-06	5.50%	5.49%	0.01%
27-Jul-06	5.49%	5.49%	-0.01%
28-Jul-06	5.49%	5.47%	0.02%
31-Jul-06	5.47%	5.45%	0.02%
1-Aug-06	5.47%	5.45%	0.02%
2-Aug-06	5.47%	5.45%	0.02%
3-Aug-06	5.48%	5.47%	0.01%
4-Aug-06	5.50%	5.41%	0.09%
7-Aug-06	5.44%	5.43%	0.01%
8-Aug-06	5.45%	5.44%	0.01%
9-Aug-06	5.40%	5.39%	0.01%
10-Aug-06	5.40%	5.36%	0.04%
11-Aug-06	5.41%	5.38%	0.03%

14-Aug-06	5.42%	5.39%	0.03%
15-Aug-06	5.43%	5.42%	0.01%
16-Aug-06	5.41%	5.41%	0.00%
17-Aug-06	5.39%	5.39%	0.00%
18-Aug-06	5.40%	5.39%	0.01%
21-Aug-06	5.40%	5.39%	0.01%
22-Aug-06	5.40%	5.39%	0.01%
23-Aug-06	5.40%	5.40%	0.00%
24-Aug-06	5.40%	5.40%	0.00%
25-Aug-06	5.40%	5.40%	0.00%
29-Aug-06	5.40%	5.40%	0.00%
30-Aug-06	5.40%	5.39%	0.01%
31-Aug-06	5.40%	5.39%	0.01%
1-Sep-06	5.39%	5.39%	0.00%
5-Sep-06	5.39%	5.39%	0.00%
6-Sep-06	5.39%	5.39%	0.00%
7-Sep-06	5.39%	5.39%	0.00%
8-Sep-06	5.39%	5.39%	0.00%
11-Sep-06	5.39%	5.39%	0.00%
12-Sep-06	5.39%	5.39%	0.00%
13-Sep-06	5.39%	5.36%	0.03%
14-Sep-06	5.39%	5.37%	0.02%
15-Sep-06	5.39%	5.36%	0.03%
18-Sep-06	5.39%	5.39%	0.00%
19-Sep-06	5.39%	5.39%	0.00%
20-Sep-06	5.39%	5.38%	0.01%
21-Sep-06	5.39%	5.38%	0.01%
22-Sep-06	5.37%	5.36%	0.01%
25-Sep-06	5.37%	5.36%	0.01%
26-Sep-06	5.36%	5.36%	0.00%
27-Sep-06	5.37%	5.36%	0.01%
28-Sep-06	5.37%	5.36%	0.01%
29-Sep-06	5.37%	5.36%	0.01%
2-Oct-06	5.37%	5.36%	0.01%
3-Oct-06	5.37%	5.36%	0.01%
4-Oct-06	5.37%	5.36%	0.01%
5-Oct-06	5.37%	5.36%	0.01%
6-Oct-06	5.37%	5.36%	0.01%
10-Oct-06	5.37%	5.36%	0.01%
11-Oct-06	5.37%	5.36%	0.01%
12-Oct-06	5.37%	5.36%	0.01%
13-Oct-06	5.37%	5.36%	0.01%
16-Oct-06	5.37%	5.36%	0.01%
17-Oct-06	5.37%	5.36%	0.01%
18-Oct-06	5.37%	5.36%	0.01%
19-Oct-06	5.37%	5.36%	0.01%
20-Oct-06	5.38%	5.34%	0.04%

23-Oct-06	5.38%	5.37%	0.01%
24-Oct-06	5.38%	5.38%	0.00%
25-Oct-06	5.38%	5.38%	0.00%
26-Oct-06	5.38%	5.37%	0.01%
27-Oct-06	5.38%	5.37%	0.01%
30-Oct-06	5.37%	5.37%	0.00%
31-Oct-06	5.37%	5.37%	0.00%
1-Nov-06	5.37%	5.37%	0.00%
2-Nov-06	5.37%	5.37%	0.00%
3-Nov-06	5.37%	5.37%	0.00%
6-Nov-06	5.38%	5.36%	0.02%
7-Nov-06	5.38%	5.37%	0.01%
8-Nov-06	5.37%	5.37%	0.00%
9-Nov-06	5.38%	5.34%	0.04%
10-Nov-06	5.37%	5.35%	0.02%
13-Nov-06	5.37%	5.37%	0.00%
14-Nov-06	5.38%	5.37%	0.01%
15-Nov-06	5.37%	5.37%	0.00%
16-Nov-06	5.38%	5.37%	0.01%
17-Nov-06	5.38%	5.37%	0.01%
20-Nov-06	5.37%	5.37%	0.00%
21-Nov-06	5.37%	5.37%	0.00%
22-Nov-06	5.37%	5.34%	0.03%
24-Nov-06	5.37%	5.37%	0.00%
27-Nov-06	5.37%	5.37%	0.00%
28-Nov-06	5.37%	5.36%	0.01%
29-Nov-06	5.37%	5.36%	0.01%
30-Nov-06	5.37%	5.36%	0.01%
1-Dec-06	5.37%	5.35%	0.02%
4-Dec-06	5.35%	5.35%	0.00%
5-Dec-06	5.35%	5.35%	0.00%
6-Dec-06	5.35%	5.35%	0.00%
7-Dec-06	5.35%	5.35%	0.00%
8-Dec-06	5.36%	5.35%	0.01%
11-Dec-06	5.36%	5.35%	0.01%
12-Dec-06	5.36%	5.35%	0.01%
13-Dec-06	5.36%	5.34%	0.02%
14-Dec-06	5.36%	5.36%	0.00%
15-Dec-06	5.37%	5.35%	0.02%
18-Dec-06	5.37%	5.35%	0.02%
19-Dec-06	5.37%	5.36%	0.01%
20-Dec-06	5.37%	5.36%	0.01%
21-Dec-06	5.37%	5.36%	0.01%
22-Dec-06	5.36%	5.34%	0.02%
27-Dec-06	5.36%	5.36%	0.00%
28-Dec-06	5.36%	5.36%	0.00%
29-Dec-06	5.36%	5.36%	0.00%

2-Jan-07	5.36%	5.36%	0.00%
3-Jan-07	5.36%	5.35%	0.01%
4-Jan-07	5.36%	5.35%	0.01%
5-Jan-07	5.36%	5.35%	0.01%
8-Jan-07	5.36%	5.35%	0.01%
9-Jan-07	5.36%	5.35%	0.01%
10-Jan-07	5.36%	5.35%	0.01%
11-Jan-07	5.36%	5.35%	0.01%
12-Jan-07	5.36%	5.35%	0.01%
16-Jan-07	5.36%	5.35%	0.01%
17-Jan-07	5.36%	5.34%	0.02%
18-Jan-07	5.36%	5.36%	0.00%
19-Jan-07	5.36%	5.36%	0.00%
22-Jan-07	5.36%	5.36%	0.00%
23-Jan-07	5.36%	5.33%	0.03%
24-Jan-07	5.36%	5.36%	0.00%
25-Jan-07	5.36%	5.36%	0.00%
26-Jan-07	5.36%	5.36%	0.00%
29-Jan-07	5.36%	5.36%	0.00%
30-Jan-07	5.36%	5.36%	0.00%
31-Jan-07	5.36%	5.36%	0.00%
1-Feb-07	5.36%	5.33%	0.03%
2-Feb-07	5.36%	5.36%	0.00%
5-Feb-07	5.36%	5.36%	0.00%
6-Feb-07	5.36%	5.36%	0.00%
7-Feb-07	5.36%	5.36%	0.00%
8-Feb-07	5.36%	5.36%	0.00%
9-Feb-07	5.36%	5.36%	0.00%
12-Feb-07	5.36%	5.36%	0.00%
13-Feb-07	5.36%	5.36%	0.00%
14-Feb-07	5.36%	5.36%	0.00%
15-Feb-07	5.36%	5.35%	0.01%
16-Feb-07	5.36%	5.35%	0.01%
20-Feb-07	5.36%	5.35%	0.01%
21-Feb-07	5.36%	5.35%	0.01%
22-Feb-07	5.36%	5.35%	0.01%
23-Feb-07	5.36%	5.35%	0.01%
26-Feb-07	5.36%	5.35%	0.01%
27-Feb-07	5.36%	5.34%	0.02%
28-Feb-07	5.35%	5.34%	0.01%
1-Mar-07	5.35%	5.34%	0.01%
2-Mar-07	5.35%	5.34%	0.01%
5-Mar-07	5.33%	5.33%	0.00%
6-Mar-07	5.34%	5.34%	0.00%
7-Mar-07	5.34%	5.34%	0.00%
8-Mar-07	5.34%	5.33%	0.01%
9-Mar-07	5.34%	5.34%	0.00%

12-Mar-07	5.36%	5.35%	0.01%
13-Mar-07	5.35%	5.34%	0.01%
14-Mar-07	5.35%	5.34%	0.01%
15-Mar-07	5.35%	5.34%	0.01%
16-Mar-07	5.35%	5.34%	0.01%
19-Mar-07	5.35%	5.34%	0.01%
20-Mar-07	5.35%	5.34%	0.01%
21-Mar-07	5.35%	5.33%	0.02%
22-Mar-07	5.35%	5.33%	0.02%
23-Mar-07	5.35%	5.33%	0.02%
26-Mar-07	5.35%	5.34%	0.01%
27-Mar-07	5.35%	5.34%	0.01%
28-Mar-07	5.35%	5.34%	0.01%
29-Mar-07	5.35%	5.34%	0.01%
30-Mar-07	5.35%	5.34%	0.01%
2-Apr-07	5.35%	5.34%	0.01%
3-Apr-07	5.35%	5.34%	0.01%
4-Apr-07	5.35%	5.34%	0.01%
5-Apr-07	5.35%	5.34%	0.01%
10-Apr-07	5.36%	5.32%	0.04%
11-Apr-07	5.36%	5.32%	0.04%
12-Apr-07	5.36%	5.33%	0.03%
13-Apr-07	5.36%	5.33%	0.03%
16-Apr-07	5.36%	5.32%	0.04%
17-Apr-07	5.36%	5.33%	0.03%
18-Apr-07	5.36%	5.32%	0.04%
19-Apr-07	5.36%	5.35%	0.01%
20-Apr-07	5.36%	5.35%	0.01%
23-Apr-07	5.36%	5.35%	0.01%
24-Apr-07	5.36%	5.35%	0.01%
25-Apr-07	5.36%	5.35%	0.01%
26-Apr-07	5.36%	5.35%	0.01%
27-Apr-07	5.36%	5.35%	0.01%
30-Apr-07	5.36%	5.35%	0.01%
1-May-07	5.36%	5.35%	0.01%
2-May-07	5.36%	5.35%	0.01%
3-May-07	5.36%	5.35%	0.01%
4-May-07	5.36%	5.34%	0.02%
8-May-07	5.36%	5.35%	0.01%
9-May-07	5.36%	5.35%	0.01%
10-May-07	5.36%	5.32%	0.04%
11-May-07	5.36%	5.32%	0.04%
14-May-07	5.36%	5.32%	0.04%
15-May-07	5.36%	5.35%	0.01%
16-May-07	5.36%	5.35%	0.01%
17-May-07	5.36%	5.35%	0.01%
18-May-07	5.36%	5.35%	0.01%

21-May-07	5.36%	5.35%	0.01%
22-May-07	5.36%	5.35%	0.01%
23-May-07	5.36%	5.35%	0.01%
24-May-07	5.36%	5.35%	0.01%
25-May-07	5.36%	5.35%	0.01%
29-May-07	5.36%	5.35%	0.01%
30-May-07	5.36%	5.35%	0.01%
31-May-07	5.36%	5.35%	0.01%
1-Jun-07	5.36%	5.35%	0.01%
4-Jun-07	5.36%	5.36%	0.00%
5-Jun-07	5.36%	5.33%	0.03%
6-Jun-07	5.36%	5.36%	0.00%
7-Jun-07	5.36%	5.36%	0.00%
8-Jun-07	5.36%	5.36%	0.00%
11-Jun-07	5.36%	5.33%	0.03%
12-Jun-07	5.36%	5.36%	0.00%
13-Jun-07	5.36%	5.36%	0.00%
14-Jun-07	5.36%	5.36%	0.00%
15-Jun-07	5.36%	5.36%	0.00%
18-Jun-07	5.36%	5.36%	0.00%
19-Jun-07	5.36%	5.36%	0.00%
20-Jun-07	5.36%	5.36%	0.00%
21-Jun-07	5.36%	5.36%	0.00%
22-Jun-07	5.36%	5.34%	0.02%
25-Jun-07	5.36%	5.36%	0.00%
26-Jun-07	5.36%	5.34%	0.02%
27-Jun-07	5.36%	5.34%	0.02%
28-Jun-07	5.36%	5.36%	0.00%
29-Jun-07	5.36%	5.34%	0.02%
2-Jul-07	5.36%	5.36%	0.00%
3-Jul-07	5.36%	5.36%	0.00%
5-Jul-07	5.36%	5.36%	0.00%
6-Jul-07	5.36%	5.36%	0.00%
9-Jul-07	5.36%	5.34%	0.02%
10-Jul-07	5.36%	5.34%	0.02%
11-Jul-07	5.36%	5.34%	0.02%
12-Jul-07	5.36%	5.34%	0.02%
13-Jul-07	5.36%	5.34%	0.02%
16-Jul-07	5.36%	5.36%	0.00%
17-Jul-07	5.36%	5.36%	0.00%
18-Jul-07	5.36%	5.36%	0.00%
19-Jul-07	5.36%	5.36%	0.00%
20-Jul-07	5.36%	5.36%	0.00%
23-Jul-07	5.36%	5.34%	0.02%
24-Jul-07	5.36%	5.34%	0.02%
25-Jul-07	5.36%	5.34%	0.02%
26-Jul-07	5.36%	5.35%	0.01%



27-Jul-07	5.36%	5.34%	0.02%
30-Jul-07	5.36%	5.34%	0.02%
31-Jul-07	5.36%	5.35%	0.01%
1-Aug-07	5.36%	5.35%	0.01%
2-Aug-07	5.36%	5.35%	0.01%
3-Aug-07	5.36%	5.34%	0.02%
6-Aug-07	5.36%	5.35%	0.01%
7-Aug-07	5.36%	5.36%	0.00%
8-Aug-07	5.38%	5.41%	-0.03%
9-Aug-07	5.50%	5.45%	0.05%
10-Aug-07	5.58%	5.60%	-0.02%
13-Aug-07	5.56%	5.56%	0.00%
14-Aug-07	5.53%	5.55%	-0.02%
15-Aug-07	5.52%	5.53%	-0.01%
16-Aug-07	5.51%	5.52%	-0.01%
17-Aug-07	5.50%	5.52%	-0.02%
20-Aug-07	5.50%	5.55%	-0.06%
21-Aug-07	5.49%	5.53%	-0.04%
22-Aug-07	5.50%	5.53%	-0.03%
23-Aug-07	5.51%	5.53%	-0.03%
24-Aug-07	5.51%	5.57%	-0.06%
28-Aug-07	5.51%	5.57%	-0.06%
29-Aug-07	5.54%	5.65%	-0.11%
30-Aug-07	5.58%	5.68%	-0.10%
31-Aug-07	5.62%	5.78%	-0.16%
4-Sep-07	5.70%	5.85%	-0.15%
5-Sep-07	5.72%	5.85%	-0.13%
6-Sep-07	5.72%	5.85%	-0.13%
7-Sep-07	5.73%	5.85%	-0.13%
10-Sep-07	5.70%	5.85%	-0.15%
11-Sep-07	5.70%	5.85%	-0.15%
12-Sep-07	5.70%	5.80%	-0.10%
13-Sep-07	5.69%	5.75%	-0.06%
14-Sep-07	5.65%	5.65%	0.00%
17-Sep-07	5.60%	5.60%	0.00%
18-Sep-07	5.59%	5.20%	0.39%
19-Sep-07	5.24%	5.22%	0.02%
20-Sep-07	5.21%	5.25%	-0.04%
21-Sep-07	5.20%	5.25%	-0.05%
24-Sep-07	5.20%	5.25%	-0.05%
25-Sep-07	5.20%	5.30%	-0.10%
26-Sep-07	5.20%	5.23%	-0.03%
27-Sep-07	5.23%	5.25%	-0.02%
28-Sep-07	5.23%	5.25%	-0.02%
1-Oct-07	5.23%	5.30%	-0.07%
2-Oct-07	5.24%	5.25%	-0.01%
3-Oct-07	5.24%	5.30%	-0.06%

4-Oct-07	5.24%	5.25%	-0.01%
5-Oct-07	5.24%	5.30%	-0.06%
9-Oct-07	5.25%	5.25%	0.00%
10-Oct-07	5.25%	5.25%	0.00%
11-Oct-07	5.24%	5.25%	-0.01%
12-Oct-07	5.22%	5.25%	-0.03%
15-Oct-07	5.21%	5.23%	-0.02%
16-Oct-07	5.21%	5.21%	0.00%
17-Oct-07	5.20%	5.25%	-0.05%
18-Oct-07	5.18%	5.20%	-0.02%
19-Oct-07	5.15%	5.15%	0.00%
22-Oct-07	5.09%	5.10%	-0.01%
23-Oct-07	5.08%	5.09%	-0.01%
24-Oct-07	5.07%	5.06%	0.01%
25-Oct-07	5.01%	5.00%	0.01%
26-Oct-07	4.98%	4.95%	0.03%
29-Oct-07	4.96%	4.95%	0.01%
30-Oct-07	4.91%	4.85%	0.06%
31-Oct-07	4.89%	4.85%	0.04%
1-Nov-07	4.88%	4.83%	0.05%
2-Nov-07	4.87%	4.83%	0.03%
5-Nov-07	4.88%	4.83%	0.04%
6-Nov-07	4.90%	4.90%	0.00%
7-Nov-07	4.90%	4.91%	-0.01%
8-Nov-07	4.89%	4.90%	-0.01%
9-Nov-07	4.88%	4.90%	-0.02%
13-Nov-07	4.87%	4.90%	-0.03%
14-Nov-07	4.88%	4.90%	-0.02%
15-Nov-07	4.91%	4.95%	-0.04%
16-Nov-07	4.95%	5.05%	-0.10%
19-Nov-07	4.98%	5.05%	-0.07%
20-Nov-07	5.00%	5.10%	-0.10%
21-Nov-07	5.02%	5.10%	-0.08%
23-Nov-07	5.04%	5.15%	-0.11%
26-Nov-07	5.05%	5.20%	-0.15%
27-Nov-07	5.06%	5.15%	-0.09%
28-Nov-07	5.08%	5.25%	-0.17%
29-Nov-07	5.12%	5.25%	-0.13%
30-Nov-07	5.13%	5.25%	-0.12%
3-Dec-07	5.14%	5.30%	-0.16%
4-Dec-07	5.15%	5.25%	-0.10%
5-Dec-07	5.15%	5.25%	-0.10%
6-Dec-07	5.15%	5.30%	-0.15%
7-Dec-07	5.14%	5.30%	-0.16%
10-Dec-07	5.13%	5.25%	-0.12%
11-Dec-07	5.11%	5.25%	-0.14%
12-Dec-07	5.06%	5.20%	-0.14%

13-Dec-07	4.99%	5.15%	-0.16%
14-Dec-07	4.97%	5.15%	-0.18%
17-Dec-07	4.94%	5.25%	-0.31%
18-Dec-07	4.93%	5.20%	-0.27%
19-Dec-07	4.91%	5.20%	-0.29%
20-Dec-07	4.88%	5.20%	-0.32%
21-Dec-07	4.86%	5.10%	-0.24%
27-Dec-07	4.83%	5.05%	-0.22%
28-Dec-07	4.73%	4.85%	-0.12%
31-Dec-07	4.70%	4.85%	-0.15%
2-Jan-08	4.68%	4.73%	-0.05%
3-Jan-08	4.65%	4.80%	-0.15%
4-Jan-08	4.62%	4.75%	-0.13%
7-Jan-08	4.54%	4.60%	-0.06%
8-Jan-08	4.51%	4.55%	-0.04%
9-Jan-08	4.44%	4.40%	0.04%
10-Jan-08	4.38%	4.40%	-0.02%
11-Jan-08	4.26%	4.25%	0.01%
14-Jan-08	4.06%	4.05%	0.00%
15-Jan-08	4.00%	4.05%	-0.05%
16-Jan-08	3.95%	3.92%	0.03%
17-Jan-08	3.93%	3.95%	-0.02%
18-Jan-08	3.89%	3.90%	-0.01%
22-Jan-08	3.72%	3.70%	0.02%
23-Jan-08	3.33%	3.30%	0.03%
24-Jan-08	3.24%	3.25%	-0.01%
25-Jan-08	3.31%	3.30%	0.01%
28-Jan-08	3.25%	3.30%	-0.05%
29-Jan-08	3.24%	3.30%	-0.06%
30-Jan-08	3.24%	3.30%	-0.06%
31-Jan-08	3.11%	3.15%	-0.04%
1-Feb-08	3.10%	3.15%	-0.05%
4-Feb-08	3.15%	3.20%	-0.06%
5-Feb-08	3.16%	3.25%	-0.09%
6-Feb-08	3.13%	3.15%	-0.02%
7-Feb-08	3.10%	3.10%	0.00%
8-Feb-08	3.09%	3.10%	-0.01%
11-Feb-08	3.07%	3.10%	-0.03%
12-Feb-08	3.07%	3.10%	-0.03%
13-Feb-08	3.07%	3.07%	0.00%
14-Feb-08	3.07%	3.08%	-0.02%
15-Feb-08	3.07%	3.08%	-0.01%
19-Feb-08	3.07%	3.10%	-0.03%
20-Feb-08	3.08%	3.10%	-0.02%
21-Feb-08	3.09%	3.15%	-0.06%
22-Feb-08	3.08%	3.10%	-0.02%
25-Feb-08	3.09%	3.10%	-0.01%

26-Feb-08	3.09%	3.10%	-0.01%
27-Feb-08	3.09%	3.12%	-0.04%
28-Feb-08	3.08%	3.12%	-0.04%
29-Feb-08	3.06%	3.10%	-0.04%
3-Mar-08	3.01%	3.07%	-0.06%
4-Mar-08	3.01%	3.05%	-0.04%
5-Mar-08	3.00%	3.05%	-0.05%
6-Mar-08	2.99%	3.02%	-0.03%
7-Mar-08	2.94%	3.00%	-0.06%
10-Mar-08	2.90%	2.90%	0.00%
11-Mar-08	2.87%	2.90%	-0.03%
12-Mar-08	2.85%	2.90%	-0.05%
13-Mar-08	2.80%	2.85%	-0.05%
14-Mar-08	2.76%	2.80%	-0.04%
17-Mar-08	2.58%	2.55%	0.03%
18-Mar-08	2.54%	2.65%	-0.11%
19-Mar-08	2.60%	2.70%	-0.10%
20-Mar-08	2.61%	2.70%	-0.09%
25-Mar-08	2.66%	2.80%	-0.15%
26-Mar-08	2.67%	2.80%	-0.13%
27-Mar-08	2.70%	2.90%	-0.20%
28-Mar-08	2.70%	2.95%	-0.25%
31-Mar-08	2.69%	2.95%	-0.26%
1-Apr-08	2.68%	2.95%	-0.27%
2-Apr-08	2.70%	2.95%	-0.25%
3-Apr-08	2.73%	3.00%	-0.27%
4-Apr-08	2.73%	3.00%	-0.27%
7-Apr-08	2.71%	3.00%	-0.29%
8-Apr-08	2.71%	3.00%	-0.29%
9-Apr-08	2.72%	3.00%	-0.28%
10-Apr-08	2.71%	3.00%	-0.29%
11-Apr-08	2.71%	3.00%	-0.29%
14-Apr-08	2.71%	2.85%	-0.14%
15-Apr-08	2.72%	2.90%	-0.18%
16-Apr-08	2.73%	2.95%	-0.22%
17-Apr-08	2.82%	2.95%	-0.13%
18-Apr-08	2.91%	3.10%	-0.19%
21-Apr-08	2.92%	3.10%	-0.18%
22-Apr-08	2.92%	3.10%	-0.18%
23-Apr-08	2.92%	3.10%	-0.18%
24-Apr-08	2.91%	3.05%	-0.14%
25-Apr-08	2.91%	3.10%	-0.19%
28-Apr-08	2.90%	3.15%	-0.25%
29-Apr-08	2.87%	3.15%	-0.28%
30-Apr-08	2.85%	3.15%	-0.30%
1-May-08	2.78%	3.00%	-0.22%
2-May-08	2.77%	2.90%	-0.13%

6-May-08	2.76%	2.90%	-0.14%
7-May-08	2.73%	2.85%	-0.12%
8-May-08	2.72%	2.85%	-0.13%
9-May-08	2.69%	2.75%	-0.07%
12-May-08	2.68%	2.90%	-0.22%
13-May-08	2.68%	2.80%	-0.12%
14-May-08	2.72%	2.85%	-0.13%
15-May-08	2.72%	2.85%	-0.13%
16-May-08	2.70%	2.85%	-0.16%
19-May-08	2.68%	2.75%	-0.07%
20-May-08	2.66%	2.75%	-0.09%
21-May-08	2.64%	2.75%	-0.11%
22-May-08	2.64%	2.75%	-0.11%
23-May-08	2.65%	2.75%	-0.10%
27-May-08	2.64%	2.80%	-0.16%
28-May-08	2.65%	2.80%	-0.15%
29-May-08	2.68%	2.90%	-0.22%
30-May-08	2.68%	2.90%	-0.22%
2-Jun-08	2.68%	2.90%	-0.22%
3-Jun-08	2.67%	2.90%	-0.23%
4-Jun-08	2.67%	2.85%	-0.18%
5-Jun-08	2.68%	2.85%	-0.17%
6-Jun-08	2.70%	2.85%	-0.15%
9-Jun-08	2.69%	2.85%	-0.16%
10-Jun-08	2.79%	2.90%	-0.11%
11-Jun-08	2.79%	2.90%	-0.11%
12-Jun-08	2.78%	2.95%	-0.17%
13-Jun-08	2.81%	2.95%	-0.14%
16-Jun-08	2.81%	3.10%	-0.29%
17-Jun-08	2.81%	3.05%	-0.24%
18-Jun-08	2.80%	3.00%	-0.20%
19-Jun-08	2.80%	2.95%	-0.15%
20-Jun-08	2.80%	3.00%	-0.20%
23-Jun-08	2.80%	3.00%	-0.20%
24-Jun-08	2.81%	3.00%	-0.19%
25-Jun-08	2.81%	3.00%	-0.19%
26-Jun-08	2.80%	3.00%	-0.20%
27-Jun-08	2.79%	3.00%	-0.21%
30-Jun-08	2.78%	3.00%	-0.22%
1-Jul-08	2.79%	3.00%	-0.21%
2-Jul-08	2.79%	3.00%	-0.21%
3-Jul-08	2.79%	3.00%	-0.21%
7-Jul-08	2.79%	3.00%	-0.21%
8-Jul-08	2.79%	3.00%	-0.21%
9-Jul-08	2.79%	3.00%	-0.21%
10-Jul-08	2.79%	3.00%	-0.21%
11-Jul-08	2.79%	3.00%	-0.21%

14-Jul-08	2.79%	3.00%	-0.21%
15-Jul-08	2.79%	3.00%	-0.21%
16-Jul-08	2.79%	3.00%	-0.22%
17-Jul-08	2.79%	3.00%	-0.21%
18-Jul-08	2.79%	3.00%	-0.21%
21-Jul-08	2.80%	3.00%	-0.20%
22-Jul-08	2.80%	3.00%	-0.20%
23-Jul-08	2.80%	3.00%	-0.20%
24-Jul-08	2.80%	3.00%	-0.21%
25-Jul-08	2.79%	3.00%	-0.21%
28-Jul-08	2.80%	3.00%	-0.20%
29-Jul-08	2.80%	3.00%	-0.20%
30-Jul-08	2.80%	3.00%	-0.20%
31-Jul-08	2.79%	3.00%	-0.21%
1-Aug-08	2.79%	3.00%	-0.21%
4-Aug-08	2.80%	3.00%	-0.20%
5-Aug-08	2.80%	3.00%	-0.20%
6-Aug-08	2.80%	3.00%	-0.20%
7-Aug-08	2.80%	3.00%	-0.20%
8-Aug-08	2.80%	3.00%	-0.20%
11-Aug-08	2.80%	3.00%	-0.20%
12-Aug-08	2.80%	3.00%	-0.20%
13-Aug-08	2.80%	3.00%	-0.20%
14-Aug-08	2.81%	2.95%	-0.14%
15-Aug-08	2.81%	2.95%	-0.14%
18-Aug-08	2.81%	3.00%	-0.19%
19-Aug-08	2.81%	3.00%	-0.19%
20-Aug-08	2.81%	3.00%	-0.19%
21-Aug-08	2.81%	3.00%	-0.19%
22-Aug-08	2.81%	3.00%	-0.19%
26-Aug-08	2.81%	3.00%	-0.19%
27-Aug-08	2.81%	3.00%	-0.19%
28-Aug-08	2.81%	3.00%	-0.19%
29-Aug-08	2.81%	3.00%	-0.19%
2-Sep-08	2.81%	3.00%	-0.19%
3-Sep-08	2.81%	3.00%	-0.19%
4-Sep-08	2.82%	3.00%	-0.19%
5-Sep-08	2.81%	3.00%	-0.19%
8-Sep-08	2.82%	3.00%	-0.18%
9-Sep-08	2.82%	3.00%	-0.18%
10-Sep-08	2.82%	3.00%	-0.18%
11-Sep-08	2.82%	3.00%	-0.18%
12-Sep-08	2.82%	3.00%	-0.18%
15-Sep-08	2.82%	3.00%	-0.18%
16-Sep-08	2.88%	3.20%	-0.32%
17-Sep-08	3.06%	3.75%	-0.69%
18-Sep-08	3.20%	5.00%	-1.80%

19-Sep-08	3.21%	5.00%	-1.79%
22-Sep-08	3.20%	5.00%	-1.80%
23-Sep-08	3.21%	5.00%	-1.79%
24-Sep-08	3.48%	5.00%	-1.52%
25-Sep-08	3.77%	5.00%	-1.23%
26-Sep-08	3.76%	5.00%	-1.24%
29-Sep-08	3.88%	5.00%	-1.12%
30-Sep-08	4.05%	6.00%	-1.95%
1-Oct-08	4.15%	6.00%	-1.85%
2-Oct-08	4.21%	6.00%	-1.79%
3-Oct-08	4.33%	6.00%	-1.67%
6-Oct-08	4.29%	6.00%	-1.71%
7-Oct-08	4.32%	6.00%	-1.68%
8-Oct-08	4.52%	6.00%	-1.48%
9-Oct-08	4.75%	6.00%	-1.25%
10-Oct-08	4.82%	6.00%	-1.18%
14-Oct-08	4.64%	6.00%	-1.37%
15-Oct-08	4.55%	5.75%	-1.20%
16-Oct-08	4.50%	5.75%	-1.25%
17-Oct-08	4.42%	5.75%	-1.33%
20-Oct-08	4.06%	5.00%	-0.94%
21-Oct-08	3.83%	4.50%	-0.67%
22-Oct-08	3.54%	4.50%	-0.96%
23-Oct-08	3.54%	4.50%	-0.97%
24-Oct-08	3.52%	4.50%	-0.98%
27-Oct-08	3.51%	4.50%	-0.99%
28-Oct-08	3.47%	4.50%	-1.04%
29-Oct-08	3.42%	4.50%	-1.08%
30-Oct-08	3.19%	4.50%	-1.31%
31-Oct-08	3.03%	4.50%	-1.47%
3-Nov-08	2.86%	4.25%	-1.39%
5-Nov-08	2.51%	3.25%	-0.74%
6-Nov-08	2.39%	3.00%	-0.61%
10-Nov-08	2.24%	3.00%	-0.77%
12-Nov-08	2.13%	2.75%	-0.62%
13-Nov-08	2.15%	2.75%	-0.60%
14-Nov-08	2.24%	3.00%	-0.76%
17-Nov-08	2.24%	3.00%	-0.76%
18-Nov-08	2.22%	3.00%	-0.78%
19-Nov-08	2.17%	3.00%	-0.83%
20-Nov-08	2.15%	3.00%	-0.85%
21-Nov-08	2.16%	3.00%	-0.84%
24-Nov-08	2.17%	3.00%	-0.83%
25-Nov-08	2.20%	3.00%	-0.80%
26-Nov-08	2.18%	3.00%	-0.82%
28-Nov-08	2.22%	3.00%	-0.78%
1-Dec-08	2.22%	3.00%	-0.78%

2-Dec-08	2.21%	3.00%	-0.79%
3-Dec-08	2.20%	3.00%	-0.80%
4-Dec-08	2.19%	3.00%	-0.81%
5-Dec-08	2.19%	3.00%	-0.81%
8-Dec-08	2.19%	3.00%	-0.81%
9-Dec-08	2.16%	3.00%	-0.84%
10-Dec-08	2.10%	3.00%	-0.90%
11-Dec-08	2.00%	3.00%	-1.00%
12-Dec-08	1.92%	2.90%	-0.98%
15-Dec-08	1.87%	2.55%	-0.68%
16-Dec-08	1.85%	2.15%	-0.30%
17-Dec-08	1.58%	2.00%	-0.42%
18-Dec-08	1.53%	2.00%	-0.48%
19-Dec-08	1.50%	2.00%	-0.50%
22-Dec-08	1.47%	2.00%	-0.53%
23-Dec-08	1.47%	2.00%	-0.53%
24-Dec-08	1.47%	2.00%	-0.53%
29-Dec-08	1.46%	2.00%	-0.54%
30-Dec-08	1.44%	2.00%	-0.57%
31-Dec-08	1.43%	1.75%	-0.33%
2-Jan-09	1.41%	1.75%	-0.34%
5-Jan-09	1.42%	1.75%	-0.33%
6-Jan-09	1.41%	1.75%	-0.34%
7-Jan-09	1.40%	1.85%	-0.45%
8-Jan-09	1.35%	1.85%	-0.50%
9-Jan-09	1.26%	1.85%	-0.59%
12-Jan-09	1.16%	1.75%	-0.59%
13-Jan-09	1.09%	1.75%	-0.66%
14-Jan-09	1.08%	1.75%	-0.67%
15-Jan-09	1.09%	1.75%	-0.66%
16-Jan-09	1.14%	1.75%	-0.61%
20-Jan-09	1.12%	1.75%	-0.63%
21-Jan-09	1.13%	1.75%	-0.63%
22-Jan-09	1.16%	1.80%	-0.64%
23-Jan-09	1.17%	1.80%	-0.63%
26-Jan-09	1.18%	1.75%	-0.57%
27-Jan-09	1.18%	1.75%	-0.57%
28-Jan-09	1.17%	1.50%	-0.33%
29-Jan-09	1.17%	1.50%	-0.33%
30-Jan-09	1.18%	1.50%	-0.32%
2-Feb-09	1.23%	1.65%	-0.43%
3-Feb-09	1.23%	1.65%	-0.42%
4-Feb-09	1.24%	1.65%	-0.41%
5-Feb-09	1.24%	1.65%	-0.41%
6-Feb-09	1.24%	1.65%	-0.41%
9-Feb-09	1.23%	1.65%	-0.42%
10-Feb-09	1.22%	1.65%	-0.43%



11-Feb-09	1.23%	1.65%	-0.42%
12-Feb-09	1.23%	1.65%	-0.42%
13-Feb-09	1.24%	1.65%	-0.41%
17-Feb-09	1.25%	1.65%	-0.40%
18-Feb-09	1.25%	1.65%	-0.40%
19-Feb-09	1.25%	1.65%	-0.40%
20-Feb-09	1.25%	1.65%	-0.40%
23-Feb-09	1.25%	1.65%	-0.40%
24-Feb-09	1.25%	1.65%	-0.40%
25-Feb-09	1.26%	1.65%	-0.39%
26-Feb-09	1.26%	1.65%	-0.39%
27-Feb-09	1.26%	1.65%	-0.39%
2-Mar-09	1.27%	1.65%	-0.38%
3-Mar-09	1.27%	1.65%	-0.38%
4-Mar-09	1.28%	1.65%	-0.37%
5-Mar-09	1.28%	1.65%	-0.37%
6-Mar-09	1.29%	1.65%	-0.36%
9-Mar-09	1.31%	1.65%	-0.34%
10-Mar-09	1.33%	1.65%	-0.32%
11-Mar-09	1.33%	1.65%	-0.32%
12-Mar-09	1.32%	1.65%	-0.33%
13-Mar-09	1.32%	1.65%	-0.33%
16-Mar-09	1.31%	1.65%	-0.34%
17-Mar-09	1.30%	1.65%	-0.35%
18-Mar-09	1.29%	1.65%	-0.36%
19-Mar-09	1.23%	1.60%	-0.37%
20-Mar-09	1.22%	1.60%	-0.38%
23-Mar-09	1.22%	1.60%	-0.38%
24-Mar-09	1.23%	1.60%	-0.37%
25-Mar-09	1.23%	1.60%	-0.37%
26-Mar-09	1.23%	1.60%	-0.37%
27-Mar-09	1.22%	1.60%	-0.38%
30-Mar-09	1.21%	1.55%	-0.34%
31-Mar-09	1.19%	1.55%	-0.36%
1-Apr-09	1.18%	1.55%	-0.37%
2-Apr-09	1.17%	1.55%	-0.38%
3-Apr-09	1.16%	1.55%	-0.39%
6-Apr-09	1.16%	1.55%	-0.39%
7-Apr-09	1.15%	1.55%	-0.40%
8-Apr-09	1.14%	1.55%	-0.41%
9-Apr-09	1.13%	1.50%	-0.37%
14-Apr-09	1.12%	1.50%	-0.38%
15-Apr-09	1.11%	1.50%	-0.39%
16-Apr-09	1.11%	1.50%	-0.39%
17-Apr-09	1.10%	1.50%	-0.40%
20-Apr-09	1.10%	1.50%	-0.40%
21-Apr-09	1.10%	1.50%	-0.40%

22-Apr-09	1.10%	1.50%	-0.40%
23-Apr-09	1.09%	1.50%	-0.41%
24-Apr-09	1.07%	1.40%	-0.33%
27-Apr-09	1.05%	1.40%	-0.35%
28-Apr-09	1.04%	1.40%	-0.36%
29-Apr-09	1.03%	1.40%	-0.37%
30-Apr-09	1.02%	1.40%	-0.38%
1-May-09	1.01%	1.40%	-0.39%
5-May-09	0.99%	1.40%	-0.41%
6-May-09	0.97%	1.40%	-0.43%
7-May-09	0.96%	1.35%	-0.39%
8-May-09	0.94%	1.35%	-0.41%
11-May-09	0.92%	1.35%	-0.43%
12-May-09	0.91%	1.35%	-0.44%
13-May-09	0.88%	1.25%	-0.37%
14-May-09	0.85%	1.25%	-0.40%
15-May-09	0.83%	1.25%	-0.42%
18-May-09	0.79%	1.25%	-0.47%
19-May-09	0.75%	1.25%	-0.50%
20-May-09	0.72%	1.25%	-0.53%
21-May-09	0.66%	1.25%	-0.59%
22-May-09	0.66%	1.25%	-0.59%
26-May-09	0.66%	1.25%	-0.59%
27-May-09	0.67%	1.25%	-0.58%
28-May-09	0.67%	1.25%	-0.58%
29-May-09	0.66%	1.25%	-0.59%
1-Jun-09	0.65%	1.25%	-0.60%
2-Jun-09	0.65%	1.20%	-0.55%
3-Jun-09	0.64%	1.20%	-0.56%
4-Jun-09	0.63%	1.15%	-0.52%
5-Jun-09	0.63%	1.15%	-0.52%
8-Jun-09	0.65%	1.15%	-0.50%
9-Jun-09	0.65%	1.15%	-0.50%
10-Jun-09	0.64%	1.15%	-0.51%
11-Jun-09	0.63%	1.15%	-0.52%
12-Jun-09	0.62%	1.15%	-0.53%
15-Jun-09	0.61%	1.15%	-0.54%
16-Jun-09	0.61%	1.15%	-0.54%
17-Jun-09	0.61%	1.15%	-0.54%
18-Jun-09	0.61%	1.15%	-0.54%
19-Jun-09	0.61%	1.15%	-0.54%
22-Jun-09	0.61%	1.05%	-0.44%
23-Jun-09	0.61%	1.05%	-0.44%
24-Jun-09	0.60%	1.05%	-0.45%
25-Jun-09	0.60%	1.05%	-0.45%
26-Jun-09	0.60%	1.05%	-0.45%
29-Jun-09	0.60%	1.05%	-0.45%

30-Jun-09	0.60%	1.05%	-0.46%
1-Jul-09	0.59%	1.05%	-0.46%
2-Jul-09	0.58%	1.02%	-0.44%
6-Jul-09	0.55%	1.05%	-0.50%
7-Jul-09	0.54%	1.05%	-0.51%
8-Jul-09	0.53%	1.05%	-0.53%
9-Jul-09	0.51%	1.05%	-0.54%
10-Jul-09	0.51%	1.03%	-0.53%
13-Jul-09	0.51%	1.05%	-0.54%
14-Jul-09	0.51%	1.00%	-0.49%
15-Jul-09	0.51%	0.90%	-0.39%
16-Jul-09	0.51%	0.90%	-0.39%
17-Jul-09	0.50%	0.90%	-0.40%
20-Jul-09	0.51%	0.90%	-0.40%
21-Jul-09	0.50%	0.85%	-0.35%
22-Jul-09	0.50%	0.85%	-0.35%
23-Jul-09	0.50%	0.85%	-0.35%
24-Jul-09	0.50%	0.85%	-0.35%
27-Jul-09	0.50%	0.75%	-0.25%
28-Jul-09	0.49%	0.75%	-0.26%
29-Jul-09	0.49%	0.75%	-0.26%
30-Jul-09	0.48%	0.75%	-0.27%
31-Jul-09	0.48%	0.75%	-0.27%
3-Aug-09	0.47%	0.75%	-0.28%
4-Aug-09	0.47%	0.75%	-0.28%
5-Aug-09	0.47%	0.75%	-0.28%
6-Aug-09	0.46%	0.75%	-0.29%
7-Aug-09	0.46%	0.75%	-0.29%
10-Aug-09	0.46%	0.75%	-0.29%
11-Aug-09	0.45%	0.80%	-0.35%
12-Aug-09	0.45%	0.80%	-0.35%
13-Aug-09	0.44%	0.75%	-0.31%
14-Aug-09	0.43%	0.75%	-0.32%
17-Aug-09	0.43%	0.70%	-0.27%
18-Aug-09	0.43%	0.70%	-0.28%
19-Aug-09	0.42%	0.70%	-0.28%
20-Aug-09	0.41%	0.70%	-0.29%
21-Aug-09	0.39%	0.70%	-0.31%
24-Aug-09	0.39%	0.55%	-0.16%
25-Aug-09	0.38%	0.55%	-0.17%
26-Aug-09	0.37%	0.55%	-0.18%
27-Aug-09	0.36%	0.55%	-0.19%
28-Aug-09	0.35%	0.55%	-0.20%
1-Sep-09	0.33%	0.55%	-0.22%
2-Sep-09	0.33%	0.45%	-0.12%
3-Sep-09	0.32%	0.55%	-0.23%
4-Sep-09	0.31%	0.55%	-0.24%

8-Sep-09	0.30%	0.55%	-0.25%
9-Sep-09	0.30%	0.55%	-0.25%
10-Sep-09	0.30%	0.55%	-0.25%
11-Sep-09	0.30%	0.55%	-0.25%
14-Sep-09	0.30%	0.50%	-0.21%
15-Sep-09	0.29%	0.50%	-0.21%
16-Sep-09	0.29%	0.50%	-0.21%
17-Sep-09	0.29%	0.55%	-0.26%
18-Sep-09	0.29%	0.55%	-0.26%
21-Sep-09	0.29%	0.55%	-0.26%
22-Sep-09	0.29%	0.55%	-0.26%
23-Sep-09	0.29%	0.45%	-0.17%
24-Sep-09	0.28%	0.45%	-0.17%
25-Sep-09	0.28%	0.45%	-0.17%
28-Sep-09	0.28%	0.55%	-0.27%
29-Sep-09	0.29%	0.55%	-0.26%
30-Sep-09	0.29%	0.55%	-0.26%
1-Oct-09	0.28%	0.55%	-0.27%
2-Oct-09	0.28%	0.55%	-0.27%
5-Oct-09	0.28%	0.55%	-0.27%
6-Oct-09	0.28%	0.55%	-0.27%
7-Oct-09	0.28%	0.55%	-0.27%
8-Oct-09	0.28%	0.55%	-0.27%
9-Oct-09	0.28%	0.55%	-0.27%
13-Oct-09	0.28%	0.55%	-0.27%
14-Oct-09	0.28%	0.45%	-0.17%
15-Oct-09	0.28%	0.45%	-0.17%
16-Oct-09	0.28%	0.45%	-0.17%
19-Oct-09	0.28%	0.45%	-0.17%
20-Oct-09	0.28%	0.45%	-0.17%
21-Oct-09	0.28%	0.45%	-0.17%
22-Oct-09	0.28%	0.45%	-0.17%
23-Oct-09	0.28%	0.45%	-0.17%
26-Oct-09	0.28%	0.45%	-0.17%
27-Oct-09	0.28%	0.45%	-0.17%
28-Oct-09	0.28%	0.45%	-0.17%
29-Oct-09	0.28%	0.45%	-0.17%
30-Oct-09	0.28%	0.45%	-0.17%
2-Nov-09	0.28%	0.45%	-0.17%
3-Nov-09	0.28%	0.45%	-0.17%
4-Nov-09	0.28%	0.45%	-0.17%
5-Nov-09	0.28%	0.45%	-0.17%
6-Nov-09	0.27%	0.45%	-0.18%
9-Nov-09	0.27%	0.45%	-0.18%
10-Nov-09	0.27%	0.45%	-0.18%
12-Nov-09	0.27%	0.45%	-0.18%
13-Nov-09	0.27%	0.45%	-0.18%

16-Nov-09	0.27%	0.45%	-0.18%
17-Nov-09	0.27%	0.45%	-0.18%
18-Nov-09	0.27%	0.45%	-0.18%
19-Nov-09	0.27%	0.45%	-0.18%
20-Nov-09	0.26%	0.45%	-0.19%
23-Nov-09	0.26%	0.45%	-0.19%
24-Nov-09	0.26%	0.45%	-0.19%
25-Nov-09	0.26%	0.45%	-0.19%
27-Nov-09	0.26%	0.45%	-0.19%
30-Nov-09	0.26%	0.45%	-0.19%
1-Dec-09	0.26%	0.45%	-0.19%
2-Dec-09	0.26%	0.45%	-0.20%
3-Dec-09	0.26%	0.45%	-0.19%
4-Dec-09	0.26%	0.45%	-0.19%
7-Dec-09	0.26%	0.45%	-0.19%
8-Dec-09	0.26%	0.45%	-0.19%
9-Dec-09	0.26%	0.45%	-0.19%
10-Dec-09	0.25%	0.45%	-0.20%
11-Dec-09	0.25%	0.45%	-0.20%
14-Dec-09	0.25%	0.45%	-0.20%
15-Dec-09	0.25%	0.45%	-0.20%
16-Dec-09	0.25%	0.45%	-0.20%
17-Dec-09	0.25%	0.45%	-0.20%
18-Dec-09	0.25%	0.45%	-0.20%
21-Dec-09	0.25%	0.45%	-0.20%
22-Dec-09	0.25%	0.45%	-0.20%
23-Dec-09	0.25%	0.45%	-0.20%
24-Dec-09	0.25%	0.45%	-0.20%
29-Dec-09	0.25%	0.45%	-0.20%
30-Dec-09	0.25%	0.45%	-0.20%
31-Dec-09	0.25%	0.45%	-0.20%
4-Jan-10	0.25%	0.45%	-0.20%
5-Jan-10	0.25%	0.45%	-0.20%
6-Jan-10	0.25%	0.45%	-0.20%
7-Jan-10	0.25%	0.45%	-0.20%
8-Jan-10	0.25%	0.45%	-0.20%
11-Jan-10	0.25%	0.45%	-0.20%
12-Jan-10	0.25%	0.45%	-0.20%
13-Jan-10	0.25%	0.45%	-0.20%
14-Jan-10	0.25%	0.45%	-0.20%
15-Jan-10	0.25%	0.45%	-0.20%
19-Jan-10	0.25%	0.45%	-0.20%
20-Jan-10	0.25%	0.40%	-0.15%
21-Jan-10	0.25%	0.40%	-0.15%
22-Jan-10	0.25%	0.40%	-0.15%
25-Jan-10	0.25%	0.40%	-0.15%
26-Jan-10	0.25%	0.40%	-0.15%

27-Jan-10	0.25%	0.40%	-0.15%
28-Jan-10	0.25%	0.40%	-0.15%
29-Jan-10	0.25%	0.40%	-0.15%
1-Feb-10	0.25%	0.40%	-0.15%
2-Feb-10	0.25%	0.40%	-0.15%
3-Feb-10	0.25%	0.40%	-0.15%
4-Feb-10	0.25%	0.40%	-0.15%
5-Feb-10	0.25%	0.40%	-0.15%
8-Feb-10	0.25%	0.40%	-0.15%
9-Feb-10	0.25%	0.40%	-0.15%
10-Feb-10	0.25%	0.40%	-0.15%
11-Feb-10	0.25%	0.40%	-0.15%
12-Feb-10	0.25%	0.40%	-0.15%
16-Feb-10	0.25%	0.40%	-0.15%
17-Feb-10	0.25%	0.40%	-0.15%
18-Feb-10	0.25%	0.40%	-0.15%
19-Feb-10	0.25%	0.40%	-0.15%
22-Feb-10	0.25%	0.40%	-0.15%
23-Feb-10	0.25%	0.40%	-0.15%
24-Feb-10	0.25%	0.40%	-0.15%
25-Feb-10	0.25%	0.40%	-0.15%
26-Feb-10	0.25%	0.40%	-0.15%
1-Mar-10	0.25%	0.40%	-0.15%
2-Mar-10	0.25%	0.40%	-0.15%
3-Mar-10	0.25%	0.40%	-0.15%
4-Mar-10	0.25%	0.40%	-0.15%
5-Mar-10	0.25%	0.40%	-0.15%
8-Mar-10	0.25%	0.40%	-0.15%
9-Mar-10	0.26%	0.40%	-0.14%
10-Mar-10	0.26%	0.40%	-0.14%
11-Mar-10	0.26%	0.40%	-0.14%
12-Mar-10	0.26%	0.40%	-0.14%
15-Mar-10	0.26%	0.40%	-0.14%
16-Mar-10	0.26%	0.40%	-0.14%
17-Mar-10	0.27%	0.41%	-0.14%
18-Mar-10	0.27%	0.41%	-0.14%
19-Mar-10	0.28%	0.40%	-0.12%
22-Mar-10	0.28%	0.40%	-0.12%
23-Mar-10	0.28%	0.40%	-0.12%
24-Mar-10	0.28%	0.40%	-0.12%
25-Mar-10	0.29%	0.40%	-0.11%
26-Mar-10	0.29%	0.40%	-0.11%
29-Mar-10	0.29%	0.40%	-0.11%
30-Mar-10	0.29%	0.40%	-0.11%
31-Mar-10	0.29%	0.40%	-0.11%
1-Apr-10	0.29%	0.40%	-0.11%
6-Apr-10	0.29%	0.40%	-0.11%

7-Apr-10	0.30%	0.40%	-0.10%
8-Apr-10	0.29%	0.40%	-0.11%
9-Apr-10	0.30%	0.40%	-0.10%
12-Apr-10	0.30%	0.40%	-0.10%
13-Apr-10	0.30%	0.40%	-0.10%
14-Apr-10	0.30%	0.40%	-0.10%
15-Apr-10	0.30%	0.40%	-0.10%
16-Apr-10	0.31%	0.40%	-0.09%
19-Apr-10	0.31%	0.40%	-0.09%
20-Apr-10	0.31%	0.40%	-0.09%
21-Apr-10	0.31%	0.40%	-0.09%
22-Apr-10	0.32%	0.40%	-0.08%
23-Apr-10	0.32%	0.40%	-0.08%
26-Apr-10	0.32%	0.40%	-0.08%
27-Apr-10	0.33%	0.40%	-0.07%
28-Apr-10	0.34%	0.40%	-0.06%
29-Apr-10	0.34%	0.40%	-0.06%
30-Apr-10	0.35%	0.40%	-0.05%
4-May-10	0.35%	0.40%	-0.05%
5-May-10	0.36%	0.40%	-0.04%
6-May-10	0.37%	0.40%	-0.03%
7-May-10	0.43%	0.50%	-0.07%
10-May-10	0.42%	0.45%	-0.03%
11-May-10	0.42%	0.45%	-0.03%
12-May-10	0.43%	0.45%	-0.02%
13-May-10	0.44%	0.45%	-0.01%
14-May-10	0.45%	0.45%	0.00%
17-May-10	0.46%	0.45%	0.01%
18-May-10	0.46%	0.45%	0.01%
19-May-10	0.48%	0.50%	-0.02%
20-May-10	0.48%	0.50%	-0.02%
21-May-10	0.50%	0.55%	-0.05%
24-May-10	0.51%	0.55%	-0.04%
25-May-10	0.54%	0.55%	-0.01%
26-May-10	0.54%	0.55%	-0.01%
27-May-10	0.54%	0.60%	-0.06%
28-May-10	0.54%	0.60%	-0.06%
1-Jun-10	0.54%	0.60%	-0.06%
2-Jun-10	0.54%	0.60%	-0.06%
3-Jun-10	0.54%	0.60%	-0.06%
4-Jun-10	0.54%	0.60%	-0.06%
7-Jun-10	0.54%	0.60%	-0.06%
8-Jun-10	0.54%	0.60%	-0.06%
9-Jun-10	0.54%	0.60%	-0.06%
10-Jun-10	0.54%	0.60%	-0.06%
11-Jun-10	0.54%	0.60%	-0.06%
14-Jun-10	0.54%	0.60%	-0.06%

15-Jun-10	0.54%	0.60%	-0.06%	
16-Jun-10	0.54%	0.60%	-0.06%	
17-Jun-10	0.54%	0.60%	-0.06%	
18-Jun-10	0.54%	0.60%	-0.06%	
21-Jun-10	0.54%	0.60%	-0.06%	
22-Jun-10	0.54%	0.62%	-0.08%	
23-Jun-10	0.54%	0.62%	-0.08%	
24-Jun-10	0.54%	0.62%	-0.08%	
25-Jun-10	0.53%	0.62%	-0.09%	
28-Jun-10	0.53%	0.62%	-0.09%	
29-Jun-10	0.53%	0.62%	-0.09%	
30-Jun-10	0.53%	0.62%	-0.09%	
1-Jul-10	0.53%	0.62%	-0.09%	
2-Jul-10	0.53%	0.62%	-0.09%	
6-Jul-10	0.53%	0.62%	-0.09%	
7-Jul-10	0.53%	0.50%	0.03%	
8-Jul-10	0.53%	0.62%	-0.09%	
9-Jul-10	0.53%	0.62%	-0.09%	
12-Jul-10	0.53%	0.62%	-0.09%	
13-Jul-10	0.53%	0.62%	-0.09%	
14-Jul-10	0.53%	0.62%	-0.09%	
15-Jul-10	0.52%	0.62%	-0.10%	
16-Jul-10	0.52%	0.62%	-0.10%	
19-Jul-10	0.52%	0.60%	-0.08%	
20-Jul-10	0.51%	0.60%	-0.09%	
21-Jul-10	0.51%	0.60%	-0.09%	
22-Jul-10	0.50%	0.60%	-0.10%	
23-Jul-10	0.49%	0.60%	-0.11%	
26-Jul-10	0.49%	0.62%	-0.13%	
27-Jul-10	0.48%	0.62%	-0.14%	
28-Jul-10	0.48%	0.60%	-0.13%	
29-Jul-10	0.47%	0.60%	-0.13%	
30-Jul-10	0.45%	0.60%	-0.15%	
2-Aug-10	0.44%	0.60%	-0.16%	
3-Aug-10	0.43%	0.60%	-0.17%	
4-Aug-10	0.42%	0.55%	-0.13%	
5-Aug-10	0.42%	0.55%	-0.13%	
6-Aug-10	0.41%	0.55%	-0.14%	
9-Aug-10	0.40%	0.55%	-0.15%	
10-Aug-10	0.40%	0.55%	-0.15%	
11-Aug-10	0.38%	0.55%	-0.17%	
12-Aug-10	0.38%	0.55%	-0.17%	
13-Aug-10	0.37%	0.55%	-0.18%	
16-Aug-10	0.36%	0.55%	-0.19%	
17-Aug-10	0.35%	0.55%	-0.20%	
18-Aug-10	0.35%	0.55%	-0.20%	
19-Aug-10	0.34%	0.45%	-0.11%	



20-Aug-10	0.33%	0.45%	-0.12%
24-Aug-10	0.31%	0.45%	-0.14%
26-Aug-10	0.30%	0.45%	-0.15%
27-Aug-10	0.30%	0.45%	-0.15%
31-Aug-10	0.30%	0.45%	-0.15%
1-Sep-10	0.30%	0.45%	-0.15%
2-Sep-10	0.29%	0.45%	-0.16%
3-Sep-10	0.29%	0.45%	-0.16%
8-Sep-10	0.29%	0.45%	-0.16%
9-Sep-10	0.29%	0.45%	-0.16%
10-Sep-10	0.29%	0.45%	-0.16%
13-Sep-10	0.29%	0.42%	-0.13%
14-Sep-10	0.29%	0.42%	-0.13%
15-Sep-10	0.29%	0.42%	-0.13%
16-Sep-10	0.29%	0.42%	-0.13%
17-Sep-10	0.29%	0.42%	-0.13%
20-Sep-10	0.29%	0.40%	-0.11%
21-Sep-10	0.29%	0.40%	-0.11%
22-Sep-10	0.29%	0.40%	-0.11%
23-Sep-10	0.29%	0.40%	-0.11%
24-Sep-10	0.29%	0.40%	-0.11%
27-Sep-10	0.29%	0.40%	-0.11%
28-Sep-10	0.29%	0.42%	-0.13%
29-Sep-10	0.29%	0.42%	-0.13%
30-Sep-10	0.29%	0.41%	-0.12%
1-Oct-10	0.29%	0.41%	-0.12%
4-Oct-10	0.29%	0.39%	-0.10%
5-Oct-10	0.29%	0.41%	-0.12%
6-Oct-10	0.29%	0.41%	-0.12%
8-Oct-10	0.29%	0.41%	-0.12%
12-Oct-10	0.29%	0.40%	-0.11%
13-Oct-10	0.29%	0.40%	-0.11%
14-Oct-10	0.29%	0.40%	-0.11%
15-Oct-10	0.29%	0.40%	-0.11%
18-Oct-10	0.29%	0.40%	-0.11%
19-Oct-10	0.29%	0.40%	-0.11%
20-Oct-10	0.29%	0.40%	-0.11%
21-Oct-10	0.29%	0.40%	-0.11%
22-Oct-10	0.29%	0.40%	-0.11%
25-Oct-10	0.29%	0.40%	-0.11%
26-Oct-10	0.29%	0.40%	-0.11%
27-Oct-10	0.29%	0.40%	-0.11%
28-Oct-10	0.29%	0.40%	-0.11%
29-Oct-10	0.29%	0.40%	-0.11%
1-Nov-10	0.29%	0.40%	-0.11%
2-Nov-10	0.29%	0.40%	-0.11%
3-Nov-10	0.29%	0.40%	-0.11%

4-Nov-10	0.29%	0.40%	-0.11%
5-Nov-10	0.29%	0.40%	-0.11%
8-Nov-10	0.29%	0.40%	-0.11%
9-Nov-10	0.29%	0.40%	-0.11%
10-Nov-10	0.29%	0.40%	-0.11%
12-Nov-10	0.28%	0.40%	-0.12%
15-Nov-10	0.28%	0.40%	-0.12%
16-Nov-10	0.28%	0.40%	-0.12%
17-Nov-10	0.28%	0.40%	-0.12%
18-Nov-10	0.28%	0.40%	-0.12%
19-Nov-10	0.28%	0.40%	-0.12%
22-Nov-10	0.28%	0.39%	-0.11%
23-Nov-10	0.28%	0.39%	-0.11%
24-Nov-10	0.29%	0.39%	-0.10%
26-Nov-10	0.29%	0.39%	-0.10%
29-Nov-10	0.30%	0.39%	-0.09%
30-Nov-10	0.30%	0.39%	-0.09%
1-Dec-10	0.30%	0.40%	-0.10%
2-Dec-10	0.30%	0.40%	-0.10%
3-Dec-10	0.30%	0.40%	-0.10%
6-Dec-10	0.30%	0.40%	-0.10%
7-Dec-10	0.30%	0.40%	-0.10%
8-Dec-10	0.30%	0.40%	-0.10%
9-Dec-10	0.30%	0.38%	-0.08%
10-Dec-10	0.30%	0.38%	-0.08%
13-Dec-10	0.30%	0.38%	-0.08%
14-Dec-10	0.30%	0.38%	-0.08%
15-Dec-10	0.30%	0.39%	-0.09%
16-Dec-10	0.30%	0.39%	-0.09%
17-Dec-10	0.30%	0.39%	-0.09%
20-Dec-10	0.30%	0.39%	-0.09%
21-Dec-10	0.30%	0.39%	-0.09%
22-Dec-10	0.30%	0.39%	-0.09%
23-Dec-10	0.30%	0.39%	-0.09%
29-Dec-10	0.30%	0.39%	-0.09%
31-Dec-10	0.30%	0.39%	-0.09%
4-Jan-11	0.30%	0.39%	-0.09%
5-Jan-11	0.30%	0.39%	-0.09%
6-Jan-11	0.30%	0.39%	-0.09%
7-Jan-11	0.30%	0.39%	-0.09%
10-Jan-11	0.30%	0.39%	-0.09%
11-Jan-11	0.30%	0.39%	-0.09%
12-Jan-11	0.30%	0.39%	-0.09%
13-Jan-11	0.30%	0.39%	-0.09%
14-Jan-11	0.30%	0.39%	-0.09%
18-Jan-11	0.30%	0.39%	-0.09%
19-Jan-11	0.30%	0.39%	-0.09%

20-Jan-11	0.30%	0.39%	-0.09%
21-Jan-11	0.30%	0.39%	-0.09%
24-Jan-11	0.30%	0.39%	-0.09%
25-Jan-11	0.30%	0.39%	-0.09%
26-Jan-11	0.30%	0.39%	-0.09%
27-Jan-11	0.30%	0.39%	-0.09%
28-Jan-11	0.30%	0.39%	-0.09%
31-Jan-11	0.30%	0.39%	-0.09%
1-Feb-11	0.31%	0.40%	-0.09%
2-Feb-11	0.31%	0.40%	-0.09%
3-Feb-11	0.31%	0.40%	-0.09%
4-Feb-11	0.31%	0.40%	-0.09%
7-Feb-11	0.31%	0.40%	-0.09%
8-Feb-11	0.31%	0.40%	-0.09%
9-Feb-11	0.31%	0.40%	-0.09%
10-Feb-11	0.31%	0.41%	-0.10%
11-Feb-11	0.31%	0.41%	-0.10%
14-Feb-11	0.31%	0.41%	-0.10%
15-Feb-11	0.31%	0.41%	-0.10%
16-Feb-11	0.31%	0.41%	-0.10%
17-Feb-11	0.31%	0.41%	-0.10%
18-Feb-11	0.31%	0.41%	-0.10%
22-Feb-11	0.31%	0.41%	-0.10%
23-Feb-11	0.31%	0.41%	-0.10%
24-Feb-11	0.31%	0.41%	-0.10%
25-Feb-11	0.31%	0.41%	-0.10%
28-Feb-11	0.31%	0.41%	-0.10%
1-Mar-11	0.31%	0.41%	-0.10%
2-Mar-11	0.31%	0.41%	-0.10%
3-Mar-11	0.31%	0.41%	-0.10%
4-Mar-11	0.31%	0.41%	-0.10%
7-Mar-11	0.31%	0.41%	-0.10%
8-Mar-11	0.31%	0.41%	-0.10%
9-Mar-11	0.31%	0.41%	-0.10%
10-Mar-11	0.31%	0.41%	-0.10%
11-Mar-11	0.31%	0.41%	-0.10%
14-Mar-11	0.31%	0.41%	-0.10%
15-Mar-11	0.31%	0.41%	-0.10%
16-Mar-11	0.31%	0.42%	-0.11%
17-Mar-11	0.31%	0.42%	-0.11%
18-Mar-11	0.31%	0.42%	-0.11%
21-Mar-11	0.31%	0.42%	-0.11%
22-Mar-11	0.31%	0.42%	-0.11%
23-Mar-11	0.31%	0.42%	-0.11%
24-Mar-11	0.31%	0.42%	-0.11%
25-Mar-11	0.31%	0.42%	-0.11%
28-Mar-11	0.31%	0.42%	-0.11%

29-Mar-11	0.31%	0.42%	-0.11%	
30-Mar-11	0.30%	0.42%	-0.12%	
31-Mar-11	0.30%	0.42%	-0.12%	
1-Apr-11	0.30%	0.42%	-0.12%	
4-Apr-11	0.30%	0.42%	-0.12%	
5-Apr-11	0.29%	0.42%	-0.13%	
6-Apr-11	0.29%	0.42%	-0.13%	
7-Apr-11	0.29%	0.42%	-0.13%	
8-Apr-11	0.29%	0.42%	-0.13%	
11-Apr-11	0.28%	0.42%	-0.14%	
12-Apr-11	0.28%	0.42%	-0.14%	
13-Apr-11	0.28%	0.40%	-0.12%	
14-Apr-11	0.28%	0.40%	-0.12%	
15-Apr-11	0.27%	0.40%	-0.13%	
18-Apr-11	0.27%	0.40%	-0.13%	
19-Apr-11	0.27%	0.40%	-0.13%	
20-Apr-11	0.27%	0.40%	-0.13%	
21-Apr-11	0.27%	0.40%	-0.13%	
26-Apr-11	0.27%	0.38%	-0.11%	
27-Apr-11	0.27%	0.38%	-0.11%	
28-Apr-11	0.27%	0.38%	-0.11%	
3-May-11	0.27%	0.38%	-0.11%	
4-May-11	0.27%	0.38%	-0.11%	
5-May-11	0.27%	0.38%	-0.11%	
6-May-11	0.27%	0.38%	-0.11%	
9-May-11	0.27%	0.38%	-0.11%	
10-May-11	0.26%	0.38%	-0.12%	
11-May-11	0.26%	0.38%	-0.12%	
12-May-11	0.26%	0.38%	-0.12%	
13-May-11	0.26%	0.38%	-0.12%	
16-May-11	0.26%	0.38%	-0.12%	
17-May-11	0.26%	0.38%	-0.12%	
18-May-11	0.26%	0.38%	-0.12%	
19-May-11	0.26%	0.38%	-0.12%	
20-May-11	0.26%	0.38%	-0.12%	
23-May-11	0.26%	0.38%	-0.12%	
24-May-11	0.26%	0.38%	-0.13%	
25-May-11	0.25%	0.38%	-0.13%	
26-May-11	0.25%	0.38%	-0.13%	
27-May-11	0.25%	0.38%	-0.13%	
31-May-11	0.25%	0.38%	-0.13%	
1-Jun-11	0.25%	0.38%	-0.13%	
2-Jun-11	0.25%	0.38%	-0.13%	
3-Jun-11	0.25%	0.38%	-0.13%	
6-Jun-11	0.25%	0.38%	-0.13%	
7-Jun-11	0.25%	0.35%	-0.10%	
8-Jun-11	0.25%	0.35%	-0.10%	

9-Jun-11	0.25%	0.35%	-0.10%
10-Jun-11	0.25%	0.35%	-0.10%
13-Jun-11	0.25%	0.35%	-0.10%
14-Jun-11	0.25%	0.35%	-0.10%
15-Jun-11	0.25%	0.35%	-0.11%
16-Jun-11	0.25%	0.35%	-0.10%
17-Jun-11	0.25%	0.35%	-0.10%
20-Jun-11	0.25%	0.35%	-0.10%
21-Jun-11	0.25%	0.35%	-0.10%
22-Jun-11	0.25%	0.35%	-0.10%
23-Jun-11	0.25%	0.35%	-0.10%
24-Jun-11	0.25%	0.35%	-0.10%
27-Jun-11	0.25%	0.35%	-0.10%
28-Jun-11	0.25%	0.35%	-0.10%
29-Jun-11	0.25%	0.35%	-0.10%
30-Jun-11	0.25%	0.35%	-0.10%
1-Jul-11	0.25%	0.35%	-0.10%
5-Jul-11	0.25%	0.35%	-0.10%
6-Jul-11	0.25%	0.30%	-0.05%
7-Jul-11	0.25%	0.30%	-0.05%
8-Jul-11	0.25%	0.30%	-0.05%
11-Jul-11	0.25%	0.30%	-0.05%
12-Jul-11	0.25%	0.30%	-0.05%
13-Jul-11	0.25%	0.30%	-0.05%
14-Jul-11	0.25%	0.31%	-0.06%
15-Jul-11	0.25%	0.31%	-0.06%
18-Jul-11	0.25%	0.31%	-0.06%
19-Jul-11	0.25%	0.31%	-0.06%
20-Jul-11	0.25%	0.34%	-0.09%
21-Jul-11	0.25%	0.34%	-0.09%
22-Jul-11	0.25%	0.34%	-0.09%
25-Jul-11	0.25%	0.34%	-0.09%
26-Jul-11	0.25%	0.34%	-0.09%
27-Jul-11	0.25%	0.34%	-0.09%
28-Jul-11	0.25%	0.34%	-0.09%
29-Jul-11	0.26%	0.34%	-0.08%
1-Aug-11	0.26%	0.37%	-0.11%
2-Aug-11	0.26%	0.37%	-0.11%
3-Aug-11	0.27%	0.37%	-0.10%
4-Aug-11	0.27%	0.37%	-0.10%
5-Aug-11	0.27%	0.37%	-0.10%
8-Aug-11	0.27%	0.37%	-0.10%
9-Aug-11	0.28%	0.37%	-0.09%
10-Aug-11	0.28%	0.37%	-0.09%
11-Aug-11	0.29%	0.37%	-0.08%
12-Aug-11	0.29%	0.37%	-0.08%
15-Aug-11	0.29%	0.37%	-0.08%

16-Aug-11	0.29%	0.37%	-0.08%
17-Aug-11	0.30%	0.37%	-0.07%
18-Aug-11	0.30%	0.37%	-0.07%
19-Aug-11	0.30%	0.37%	-0.07%
22-Aug-11	0.31%	0.37%	-0.06%
23-Aug-11	0.31%	0.37%	-0.06%
24-Aug-11	0.31%	0.37%	-0.06%
25-Aug-11	0.32%	0.37%	-0.05%
26-Aug-11	0.32%	0.37%	-0.05%
30-Aug-11	0.33%	0.37%	-0.04%
31-Aug-11	0.33%	0.38%	-0.05%
1-Sep-11	0.33%	0.38%	-0.05%
2-Sep-11	0.33%	0.38%	-0.05%
6-Sep-11	0.34%	0.38%	-0.04%
7-Sep-11	0.34%	0.38%	-0.04%
8-Sep-11	0.34%	0.38%	-0.04%
9-Sep-11	0.34%	0.38%	-0.04%
12-Sep-11	0.34%	0.39%	-0.05%
13-Sep-11	0.35%	0.42%	-0.07%
14-Sep-11	0.35%	0.42%	-0.07%
15-Sep-11	0.35%	0.42%	-0.07%
16-Sep-11	0.35%	0.42%	-0.07%
19-Sep-11	0.35%	0.45%	-0.10%
20-Sep-11	0.36%	0.45%	-0.10%
21-Sep-11	0.36%	0.45%	-0.09%
22-Sep-11	0.36%	0.45%	-0.09%
23-Sep-11	0.36%	0.45%	-0.09%
26-Sep-11	0.36%	0.45%	-0.09%
27-Sep-11	0.37%	0.45%	-0.08%
28-Sep-11	0.37%	0.45%	-0.08%
29-Sep-11	0.37%	0.45%	-0.08%
30-Sep-11	0.37%	0.45%	-0.08%
3-Oct-11	0.38%	0.47%	-0.09%
4-Oct-11	0.38%	0.49%	-0.11%
5-Oct-11	0.38%	0.49%	-0.11%
6-Oct-11	0.39%	0.49%	-0.10%
7-Oct-11	0.39%	0.49%	-0.10%
11-Oct-11	0.40%	0.49%	-0.09%
12-Oct-11	0.40%	0.49%	-0.09%
13-Oct-11	0.40%	0.49%	-0.09%
14-Oct-11	0.40%	0.49%	-0.09%
17-Oct-11	0.41%	0.49%	-0.08%
18-Oct-11	0.41%	0.49%	-0.08%
19-Oct-11	0.41%	0.49%	-0.08%
20-Oct-11	0.42%	0.49%	-0.07%
21-Oct-11	0.42%	0.49%	-0.07%
24-Oct-11	0.42%	0.49%	-0.07%

25-Oct-11	0.42%	0.49%	-0.07%
26-Oct-11	0.42%	0.49%	-0.07%
27-Oct-11	0.43%	0.49%	-0.06%
28-Oct-11	0.43%	0.49%	-0.06%
31-Oct-11	0.43%	0.49%	-0.06%
1-Nov-11	0.43%	0.49%	-0.06%
2-Nov-11	0.43%	0.49%	-0.06%
3-Nov-11	0.44%	0.49%	-0.06%
4-Nov-11	0.44%	0.49%	-0.05%
7-Nov-11	0.44%	0.49%	-0.05%
8-Nov-11	0.44%	0.50%	-0.06%
9-Nov-11	0.45%	0.50%	-0.05%
10-Nov-11	0.45%	0.50%	-0.05%
14-Nov-11	0.46%	0.50%	-0.04%
15-Nov-11	0.47%	0.49%	-0.02%
16-Nov-11	0.47%	0.49%	-0.02%
17-Nov-11	0.48%	0.49%	-0.01%
18-Nov-11	0.49%	0.49%	0.00%
21-Nov-11	0.50%	0.49%	0.00%
22-Nov-11	0.50%	0.49%	0.01%
23-Nov-11	0.51%	0.49%	0.02%
25-Nov-11	0.52%	0.49%	0.03%
28-Nov-11	0.52%	0.49%	0.03%
29-Nov-11	0.53%	0.49%	0.04%
30-Nov-11	0.53%	0.49%	0.04%
1-Dec-11	0.53%	0.49%	0.04%
2-Dec-11	0.53%	0.49%	0.04%
5-Dec-11	0.53%	0.49%	0.04%
6-Dec-11	0.54%	0.49%	0.05%
7-Dec-11	0.54%	0.49%	0.05%
8-Dec-11	0.54%	0.49%	0.05%
9-Dec-11	0.54%	0.49%	0.05%
12-Dec-11	0.54%	0.49%	0.05%
13-Dec-11	0.55%	0.49%	0.06%
14-Dec-11	0.56%	0.49%	0.07%
15-Dec-11	0.56%	0.49%	0.07%
16-Dec-11	0.56%	0.49%	0.07%
19-Dec-11	0.57%	0.50%	0.07%
20-Dec-11	0.57%	0.50%	0.07%
21-Dec-11	0.57%	0.50%	0.07%
22-Dec-11	0.57%	0.50%	0.07%
23-Dec-11	0.58%	0.51%	0.07%
28-Dec-11	0.58%	0.51%	0.07%
29-Dec-11	0.58%	0.51%	0.07%
30-Dec-11	0.58%	0.51%	0.07%
3-Jan-12	0.58%	0.49%	0.09%
4-Jan-12	0.58%	0.49%	0.09%

5-Jan-12	0.58%	0.49%	0.09%
6-Jan-12	0.58%	0.49%	0.09%
9-Jan-12	0.58%	0.49%	0.09%
10-Jan-12	0.58%	0.49%	0.09%
11-Jan-12	0.58%	0.49%	0.09%
12-Jan-12	0.57%	0.47%	0.10%
13-Jan-12	0.57%	0.47%	0.10%
16-Jan-12	0.56%	0.47%	0.09%
17-Jan-12	0.56%	0.48%	0.08%
18-Jan-12	0.56%	0.48%	0.08%
19-Jan-12	0.56%	0.48%	0.08%
20-Jan-12	0.56%	0.50%	0.06%
23-Jan-12	0.56%	0.50%	0.06%
24-Jan-12	0.56%	0.50%	0.06%
25-Jan-12	0.56%	0.50%	0.06%
26-Jan-12	0.55%	0.50%	0.05%
27-Jan-12	0.55%	0.50%	0.05%
30-Jan-12	0.55%	0.50%	0.05%
31-Jan-12	0.54%	0.50%	0.04%
1-Feb-12	0.54%	0.49%	0.05%
2-Feb-12	0.53%	0.49%	0.04%
3-Feb-12	0.53%	0.50%	0.03%
6-Feb-12	0.52%	0.49%	0.03%
7-Feb-12	0.52%	0.49%	0.03%
8-Feb-12	0.51%	0.49%	0.02%
9-Feb-12	0.51%	0.49%	0.02%
10-Feb-12	0.51%	0.49%	0.02%
13-Feb-12	0.50%	0.49%	0.01%
14-Feb-12	0.50%	0.49%	0.01%
15-Feb-12	0.50%	0.48%	0.02%
16-Feb-12	0.49%	0.48%	0.01%
17-Feb-12	0.49%	0.47%	0.02%
20-Feb-12	0.49%	0.47%	0.02%
21-Feb-12	0.49%	0.47%	0.02%
22-Feb-12	0.49%	0.45%	0.04%
23-Feb-12	0.49%	0.45%	0.04%
24-Feb-12	0.49%	0.45%	0.04%
27-Feb-12	0.49%	0.45%	0.04%
28-Feb-12	0.49%	0.45%	0.04%
29-Feb-12	0.48%	0.45%	0.03%
1-Mar-12	0.48%	0.45%	0.03%
2-Mar-12	0.48%	0.45%	0.03%
5-Mar-12	0.47%	0.45%	0.02%
6-Mar-12	0.47%	0.45%	0.02%
7-Mar-12	0.47%	0.45%	0.02%
8-Mar-12	0.47%	0.45%	0.02%
9-Mar-12	0.47%	0.45%	0.02%



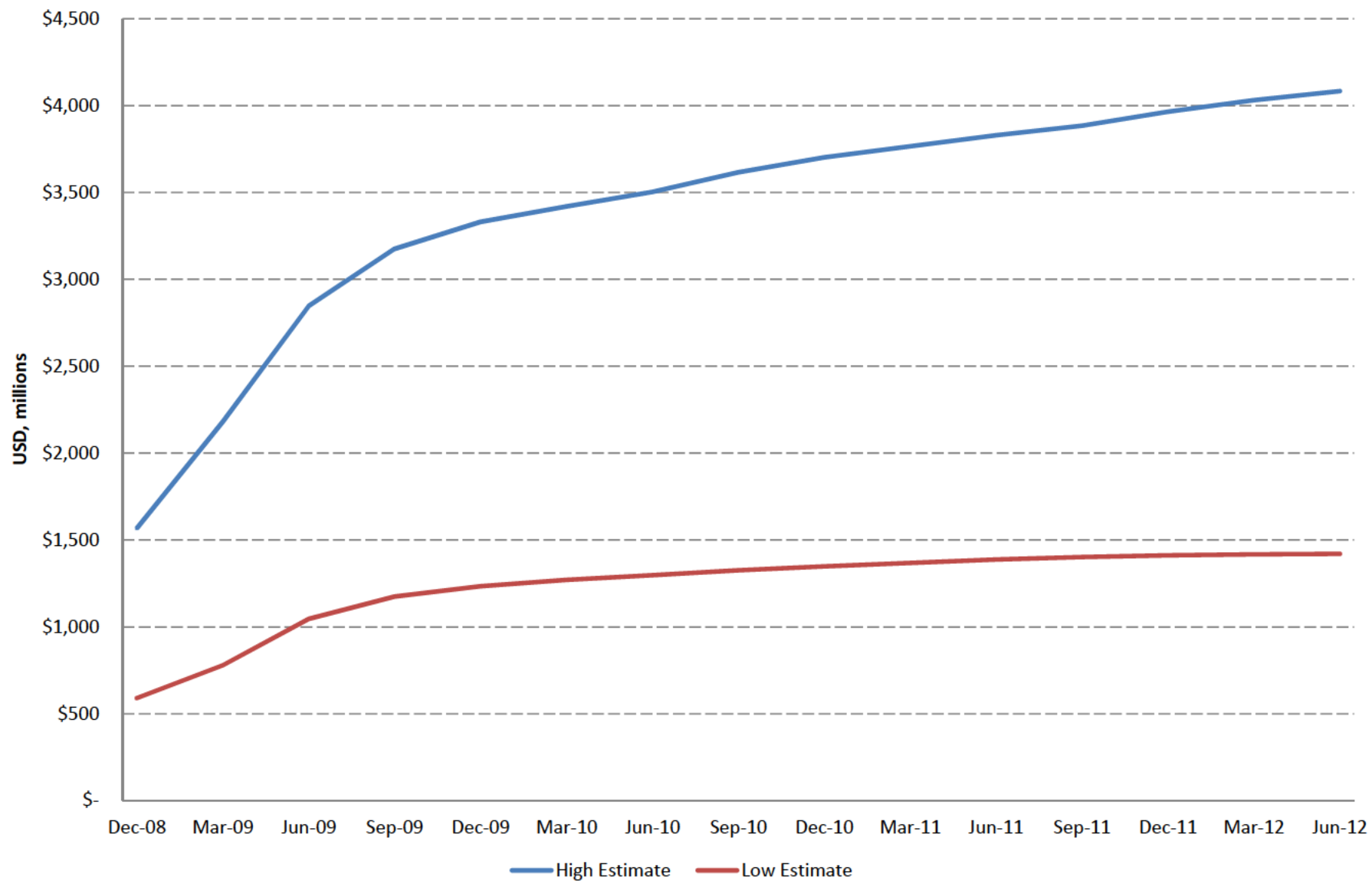
12-Mar-12	0.47%	0.45%	0.02%
13-Mar-12	0.47%	0.45%	0.02%
14-Mar-12	0.47%	0.45%	0.02%
15-Mar-12	0.47%	0.45%	0.02%
16-Mar-12	0.47%	0.45%	0.02%
19-Mar-12	0.47%	0.45%	0.02%
20-Mar-12	0.47%	0.45%	0.02%
21-Mar-12	0.47%	0.45%	0.02%
22-Mar-12	0.47%	0.45%	0.02%
23-Mar-12	0.47%	0.45%	0.02%
26-Mar-12	0.47%	0.45%	0.02%
27-Mar-12	0.47%	0.45%	0.02%
28-Mar-12	0.47%	0.46%	0.01%
29-Mar-12	0.47%	0.46%	0.01%
30-Mar-12	0.47%	0.46%	0.01%
2-Apr-12	0.47%	0.46%	0.01%
3-Apr-12	0.47%	0.46%	0.01%
4-Apr-12	0.47%	0.46%	0.01%
5-Apr-12	0.47%	0.46%	0.01%
10-Apr-12	0.47%	0.46%	0.01%
11-Apr-12	0.47%	0.46%	0.01%
12-Apr-12	0.47%	0.46%	0.01%
13-Apr-12	0.47%	0.46%	0.01%
16-Apr-12	0.47%	0.46%	0.01%
17-Apr-12	0.47%	0.46%	0.01%
18-Apr-12	0.47%	0.46%	0.01%
19-Apr-12	0.47%	0.46%	0.01%
20-Apr-12	0.47%	0.46%	0.01%
23-Apr-12	0.47%	0.46%	0.01%
24-Apr-12	0.47%	0.44%	0.03%
25-Apr-12	0.47%	0.44%	0.03%
26-Apr-12	0.47%	0.44%	0.03%
27-Apr-12	0.47%	0.44%	0.03%
30-Apr-12	0.47%	0.44%	0.03%
1-May-12	0.47%	0.44%	0.03%
2-May-12	0.47%	0.44%	0.03%
3-May-12	0.47%	0.44%	0.03%
4-May-12	0.47%	0.44%	0.03%
8-May-12	0.47%	0.43%	0.04%
9-May-12	0.47%	0.43%	0.04%
10-May-12	0.47%	0.43%	0.04%
11-May-12	0.47%	0.43%	0.04%
14-May-12	0.47%	0.43%	0.04%
15-May-12	0.47%	0.43%	0.04%
16-May-12	0.47%	0.43%	0.04%
17-May-12	0.47%	0.43%	0.04%
18-May-12	0.47%	0.43%	0.04%

21-May-12	0.47%	0.43%	0.04%
22-May-12	0.47%	0.43%	0.04%
23-May-12	0.47%	0.43%	0.04%
24-May-12	0.47%	0.43%	0.04%
25-May-12	0.47%	0.43%	0.04%
28-May-12	0.47%	0.43%	0.04%
29-May-12	0.47%	0.43%	0.04%
30-May-12	0.47%	0.43%	0.04%
31-May-12	0.47%	0.43%	0.04%
1-Jun-12	0.47%	0.43%	0.04%
6-Jun-12	0.47%	0.43%	0.04%
7-Jun-12	0.47%	0.43%	0.04%
8-Jun-12	0.47%	0.43%	0.04%
11-Jun-12	0.47%	0.43%	0.04%
12-Jun-12	0.47%	0.43%	0.04%
13-Jun-12	0.47%	0.43%	0.04%
14-Jun-12	0.47%	0.43%	0.04%
15-Jun-12	0.47%	0.43%	0.04%
18-Jun-12	0.47%	0.43%	0.04%
19-Jun-12	0.47%	0.43%	0.04%
20-Jun-12	0.47%	0.43%	0.04%
21-Jun-12	0.47%	0.43%	0.04%
22-Jun-12	0.46%	0.43%	0.03%
25-Jun-12	0.46%	0.43%	0.03%
26-Jun-12	0.46%	0.43%	0.03%
27-Jun-12	0.46%	0.43%	0.03%

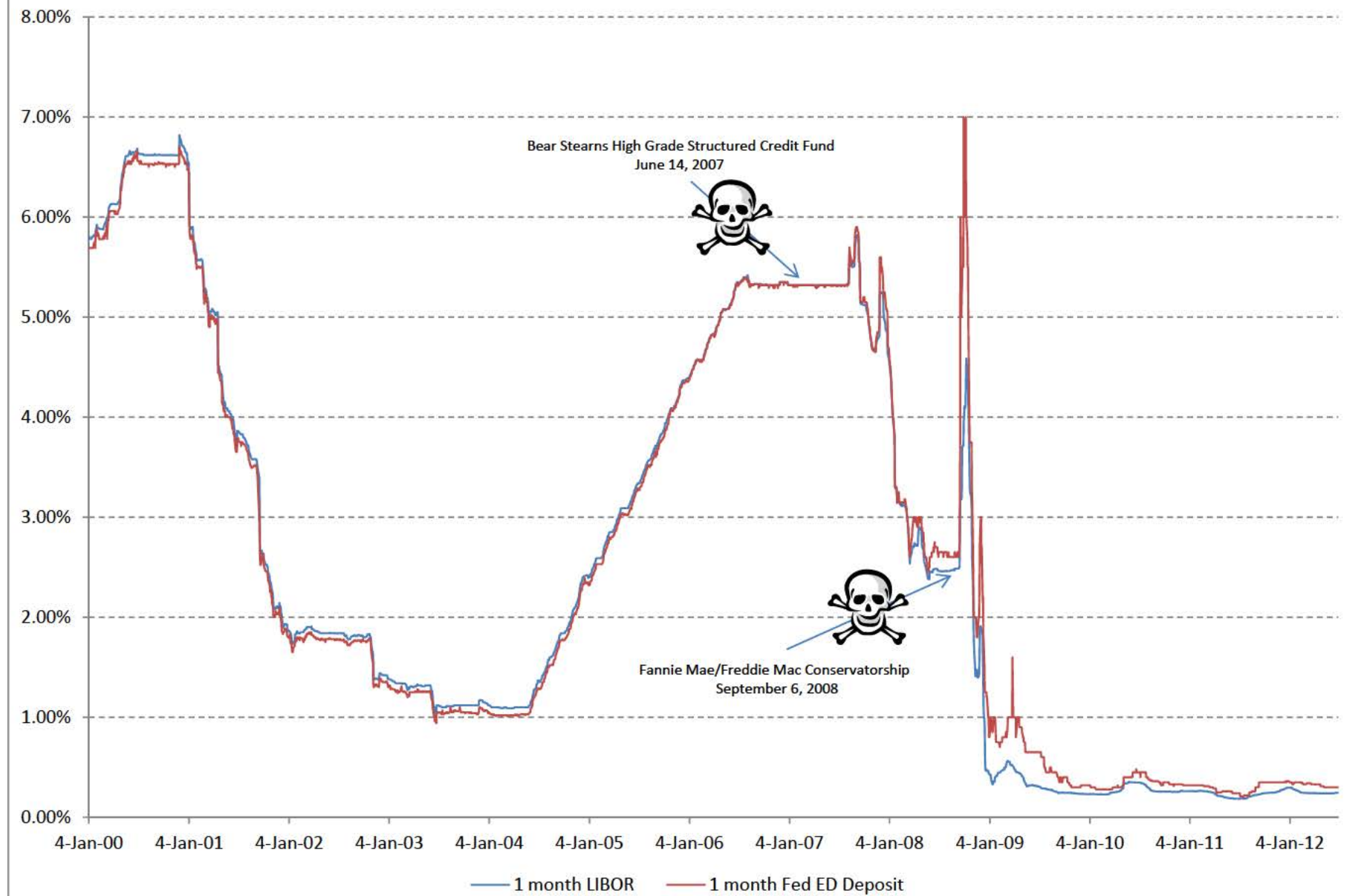
1 month	3 month
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0.00%	0.01%
-0.02%	-0.02%
-0.10%	-0.08%
-0.04%	-0.05%
-0.16%	-0.19%
-0.16%	-0.20%
-0.87%	-0.90%
-0.42%	-0.43%
-0.40%	-0.46%
-0.20%	-0.30%
-0.09%	-0.19%
-0.05%	-0.15%
-0.06%	-0.06%
-0.10%	-0.13%
-0.07%	-0.10%
-0.05%	-0.10%
-0.05%	-0.12%
-0.06%	-0.07%
-0.09%	-0.01%
-0.08%	0.04%
-0.07%	0.03%

## Estimated Potential Cumulative Net Losses to the Enterprises on Floating Rate MBS and Interest Rate Swaps from LIBOR Suppression



## Federal Reserve Eurodollar Deposit Rates versus LIBOR, 2000-2012



Cash Flow Shortfall from LIBOR Suppression  
Enterprises Variable Rate Mortgage Assets and Interest Rate Swaps  
dollars in millions

Swap Notional Amounts	31-Dec-08	31-Mar-09	30-Jun-09	30-Sep-09	31-Dec-09	31-Mar-10	30-Jun-10	30-Sep-10	31-Dec-10	31-Mar-11	30-Jun-11	30-Sep-11	31-Dec-11	31-Mar-12	30-Jun-12
<b>Fannie Mae</b>															
Pay Fixed Swaps	546,916	620,850	650,447	435,693	382,600	315,857	317,259	296,877	277,227	270,250	205,084	193,882	186,757	206,307	229,227
Less: Receive Fixed Swaps	451,081	549,823	571,802	340,384	275,417	229,293	234,901	233,613	224,177	214,777	161,151	179,808	229,695	250,322	265,593
Plus: Basis Swaps	24,560	19,815	22,200	11,000	3,225	3,220	3,020	2,485	485	1,565	2,552	6,997	9,622	18,673	20,922
Net Receive LIBOR Swaps	120,395	90,842	100,845	106,309	110,408	89,784	85,378	65,749	53,535	57,038	46,485	21,071	(33,316)	(25,342)	(15,444)
<b>Freddie Mac</b>															
Less: Receive Fixed Swaps	266,685	336,207	284,244	320,458	271,403	255,940	349,545	316,574	324,590	249,793	215,758	220,668	211,808	248,453	260,428
Plus: Pay Fixed Swaps	404,359	342,747	401,904	414,776	382,259	382,145	386,194	363,668	394,294	330,015	321,870	293,683	289,335	296,573	292,660
Plus: Basis Swaps		82,090	51,065	51,615	52,045	54,070	53,910	2,775	2,375	3,375	3,275	2,275	2,750	2,400	2,350
Net Receive LIBOR Swaps	137,674	88,630	168,725	145,933	162,901	180,275	90,559	49,869	72,079	83,597	109,387	75,290	80,277	50,520	34,582
<b>Enterprises</b>															
Net Receive LIBOR Swaps	258,069	179,472	269,570	252,242	273,309	270,059	175,937	115,618	125,614	140,635	155,872	96,361	46,961	25,178	19,138
<b>Mortgage Related Securities on Balance Sheet</b>															
<b>Fannie Mae</b>															
Capital Markets group's mortgage-related securities	362,703	353,172	369,546	368,389	491,566	434,532	391,615	373,018	361,697	335,762	326,384	318,353	310,143	296,886	285,982
Estimated Freddie Mac Variable Rate Securities Ratio	37%	33%	34%	34%	40%	52%	52%	53%	53%	52%	52%	52%	53%	54%	55%
Estimated Fannie Mae Variable Rate Securities	132,796	116,457	124,378	125,616	194,803	224,780	204,120	196,789	190,011	174,970	169,673	166,610	165,685	160,482	158,349
<b>Freddie Mac</b>															
Fixed Rate Securities	510,116	581,180	550,539	516,778	372,160	159,278	148,851	139,603	137,033	136,725	133,048	128,918	121,676	114,306	106,577
Variable Rate Securities	294,646	285,924	279,298	267,393	244,296	170,690	162,049	155,890	151,660	148,780	144,053	141,548	139,556	134,484	132,225
Variable Rate Securities Ratio	37%	33%	34%	34%	40%	52%	52%	53%	53%	52%	52%	52%	53%	54%	55%
<b>Enterprises</b>															
Estimated Variable Rate Securities Holdings	427,442 TRUE	402,381 TRUE	403,676 TRUE	393,009 TRUE	439,099 TRUE	395,470 TRUE	366,169 TRUE	352,679 TRUE	341,671 TRUE	323,750 TRUE	313,726 TRUE	308,158 TRUE	305,241 TRUE	294,966 TRUE	290,574 TRUE
Fed CP-LIBOR spread, 1 month	0.91%	0.42%	0.40%	0.20%	0.09%	0.05%	0.06%	0.10%	0.07%	0.05%	0.05%	0.06%	0.09%	0.08%	0.07%
<b>High Estimate</b>															
LIBOR Cash Flow Shortfall - Quarterly Totals	1,567.2	614.0	664.9	329.5	154.9	88.6	83.7	112.9	86.3	63.3	63.0	56.3	79.7	66.3	53.0
LIBOR Cash Flow Shortfall - Cumulative	1,567.2	2,181.2	2,846.1	3,175.6	3,330.5	3,419.1	3,502.9	3,615.8	3,702.1	3,765.4	3,828.4	3,884.7	3,964.4	4,030.6	4,083.6
<b>Low Estimate</b>															
LIBOR Cash Flow Shortfall - Quarterly Totals	590.0	189.4	266.2	128.8	59.4	35.9	27.2	27.9	23.2	19.2	20.9	13.4	10.6	5.2	3.3
LIBOR Cash Flow Shortfall - Cumulative	590.0	779.4	1,045.6	1,174.4	1,233.9	1,269.8	1,297.0	1,324.9	1,348.1	1,367.2	1,388.2	1,401.6	1,412.2	1,417.4	1,420.7



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

5 July 2012

**To** Richard Parker

**From** Timothy Lee

**Subject** Effect of LIBOR Bid-Rigging Investigation on Fannie Mae and Freddie Mac

**Cc** (b) (6) Peter Emerzian Wesley Phillips  
(b) (6) (b) (6), (b) (7)(C)  
Alan Rhinesmith Simon Wu

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Cash Flow Shortfall from LIBOR Suppression  
Enterprises Variable Rate Mortgage Assets and Interest Rate Swaps  
dollars in millions

	30-Jun-07	30-Sep-07	31-Dec-07	31-Mar-08	30-Jun-08	30-Sep-08	31-Dec-08	31-Mar-09	30-Jun-09	30-Sep-09	31-Dec-09	31-Mar-10	30-Jun-10
<b>Swap Notional Amounts</b>													
<b>Fannie Mae</b>	<a href="#">Table 25</a>	<a href="#">Table 28</a>	<a href="#">Table 30</a>	<a href="#">Table 43</a>	<a href="#">Table 43</a>	<a href="#">Table 48</a>	<a href="#">Table 29</a>	<a href="#">Table 50</a>	<a href="#">Table 45</a>	<a href="#">Table 47</a>	<a href="#">Table 53</a>	<a href="#">Table 45</a>	<a href="#">Table 48</a>
Pay Fixed Swaps	303,243	329,657	377,738	443,845	526,028	515,853	546,916	620,850	650,447	435,693	382,600	315,857	317,259
Less: Receive Fixed Swaps	248,916	256,902	285,885	408,658	409,181	372,555	451,081	549,823	571,802	340,384	275,417	229,293	234,901
Plus: Basis Swaps	7,601	8,401	7,001	18,026	25,626	24,761	24,560	19,815	22,200	11,000	3,225	3,220	3,020
Net Receive LIBOR Swaps	61,928	81,156	98,854	53,213	142,473	168,059	120,395	90,842	100,845	106,309	110,408	89,784	85,378
<b>Freddie Mac</b>	<a href="#">Table 7</a>	<a href="#">Table 7</a>	<a href="#">Table 15</a>	<a href="#">Table 17</a>	<a href="#">Table 26</a>	<a href="#">Table 28</a>	<a href="#">Table 38</a>	<a href="#">Table 25</a>	<a href="#">Table 26</a>	<a href="#">Table 26</a>	<a href="#">Table 38</a>	<a href="#">Table 29</a>	<a href="#">Table 29</a>
Less: Receive Fixed Swaps	214,657	282,070	301,649	326,247	245,054	329,828	279,609	336,207	284,244	320,458	271,403	255,940	349,545
Plus: Pay Fixed Swaps	284,927	380,370	409,682	425,450	411,074	452,633	404,359	342,747	401,901	414,776	382,259	382,145	386,194
Plus: Basis Swaps	473	1,093	498	17,988	32,205	82,205	82,190	82,090	51,065	51,615	52,045	54,070	53,910
Net Receive LIBOR Swaps	70,743	99,393	108,531	117,191	198,225	205,010	206,940	88,630	168,722	145,933	162,901	180,275	90,559
<b>Enterprises</b>													
Net Receive LIBOR Swaps	132,671	180,549	207,385	170,404	340,698	373,069	327,335	179,472	269,567	252,242	273,309	270,059	175,937
<b>Mortgage Related Securities on Balance Sheet</b>													
<b>Fannie Mae</b>	<a href="#">Table 11</a>	<a href="#">Table 11</a>	<a href="#">Table 23</a>	<a href="#">Table 22</a>	<a href="#">Table 22</a>	<a href="#">Table 22</a>	<a href="#">Table 20</a>	<a href="#">Table 20</a>	<a href="#">Table 18</a>	<a href="#">Table 19</a>	<a href="#">Table 22</a>	<a href="#">Table 18</a>	<a href="#">Table 22</a>
Capital Markets group's mortgage-related securities	333,959	329,158	324,326	314,867	333,124	359,495	362,703	353,172	369,546	368,389	352,709	434,532	391,615
Freddie Mac Variable Rate Securities Ratio	43%	42%	42%	43%	39%	41%	37%	33%	34%	34%	40%	52%	52%
Estimated Fannie Mae Variable Rate Securities	143,728	139,816	136,268	134,230	130,345	146,025	132,796	116,457	124,378	125,616	139,775	224,780	204,120
<b>Freddie Mac</b>	<a href="#">Table 10</a>	<a href="#">Table 10</a>	<a href="#">Table 22</a>	<a href="#">Table 15</a>	<a href="#">Table 15</a>	<a href="#">Table 17</a>	<a href="#">Table 24</a>	<a href="#">Table 19</a>	<a href="#">Table 19</a>	<a href="#">Table 19</a>	<a href="#">Table 28</a>	<a href="#">Table 19</a>	<a href="#">Table 20</a>
Fixed Rate Securities	405,650	410,235	417,959	408,735	481,983	437,560	510,116	581,180	550,539	516,778	372,160	159,278	148,851
Variable Rate Securities	306,486	302,929	302,854	303,727	309,815	299,316	294,646	285,924	279,298	267,393	244,296	170,690	162,049
Variable Rate Securities Ratio	43%	42%	42%	43%	39%	41%	37%	33%	34%	34%	40%	52%	52%
<b>Floating Rate Liabilities on Balance Sheet</b>													
<b>Fannie Mae</b>	<a href="#">Table 13</a>	<a href="#">Table 13</a>	<a href="#">Table 28</a>	<a href="#">Note 8</a>	<a href="#">Note 8</a>	<a href="#">Note 9</a>	<a href="#">Note 10</a>	<a href="#">Note 10</a>	<a href="#">Note 10</a>	<a href="#">Note 10</a>	<a href="#">Note 9</a>	<a href="#">Note 9</a>	<a href="#">Note 9</a>
Floating Rate Short Term Debt			-	4,501	4,501	4,495	7,585	3,132	3,102	3,069	50	-	-
Senior Floating Rate Long Term Debt	12,201	15,651	13,700	25,652	33,064	47,087	46,611	58,770	68,766	51,142	42,952	46,170	45,144
<b>Freddie Mac</b>	<a href="#">Table 7.1</a>	<a href="#">Table 7.1</a>	<a href="#">Table 7.3</a>	<a href="#">Table 7.1</a>	<a href="#">Table 7.1</a>	<a href="#">Table 7.1</a>	<a href="#">Table 8.3</a>	<a href="#">Table 7.1</a>	<a href="#">Table 7.1</a>	<a href="#">Table 7.1</a>	<a href="#">Table 9.3</a>	<a href="#">Table 8.3</a>	<a href="#">Table 8.3</a>
Long-Term Debt, Variable Rate	24,176	25,487	25,566	25,230	27,093	24,708	13,664	118,160	126,647	113,775	65,855	126,036	144,833
Total Other Long-Term Debt	483,522	509,744	479,087	504,592	541,851	494,168	433,954	478,379	512,742	460,626	461,051	593,174	585,630
Ratio: Variable Rate Long-Term Debt to Other Long-Term Debt	5%	5%	5%	5%	5%	5%	3%	25%	25%	25%	14%	21%	25%
<b>Enterprises</b>													
Estimated Variable Rate Assets Net of Obligations	413,837	401,606	399,856	382,574	375,502	369,051	359,582	222,319	205,161	225,024	275,214	223,264	176,192
Fed ED-LIBOR spread, 1 month	0.00%	-0.02%	-0.10%	-0.04%	-0.16%	-0.16%	-0.87%	-0.42%	-0.40%	-0.20%	-0.09%	-0.05%	-0.06%
<b>Estimated Damages</b>													
LIBOR Cash Flow Shortfall - Quarterly Totals	(6.3)	24.5	150.5	55.7	295.2	312.3	1,535.0	424.0	474.0	249.1	122.0	65.7	55.0
LIBOR Cash Flow Shortfall - Cumulative	(6.3)	18.2	168.7	224.4	519.6	750.4	1,616.5	2,040.5	2,514.5	2,763.6	2,885.6	2,951.3	3,006.3
Prorated LIBOR Cash Flow Shortfall - 9/6/08 thru 9/30/08						81.5							



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

5 July 2012

**To** Richard Parker

**From** Timothy Lee

**Subject** Effect of LIBOR Bid-Rigging Investigation on Fannie Mae and Freddie Mac

**Cc** (b) (6) Peter Emerzian Wesley Phillips  
(b) (6) (b) (6), (b) (7)(C)  
Alan Rhinesmith Simon Wu

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## OFFICE OF INSPECTOR GENERAL

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Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

5 July 2012

**To** Richard Parker

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Alan Rhinesmith Simon Wu

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# Cash Flow Shortfall from LIBOR Suppression

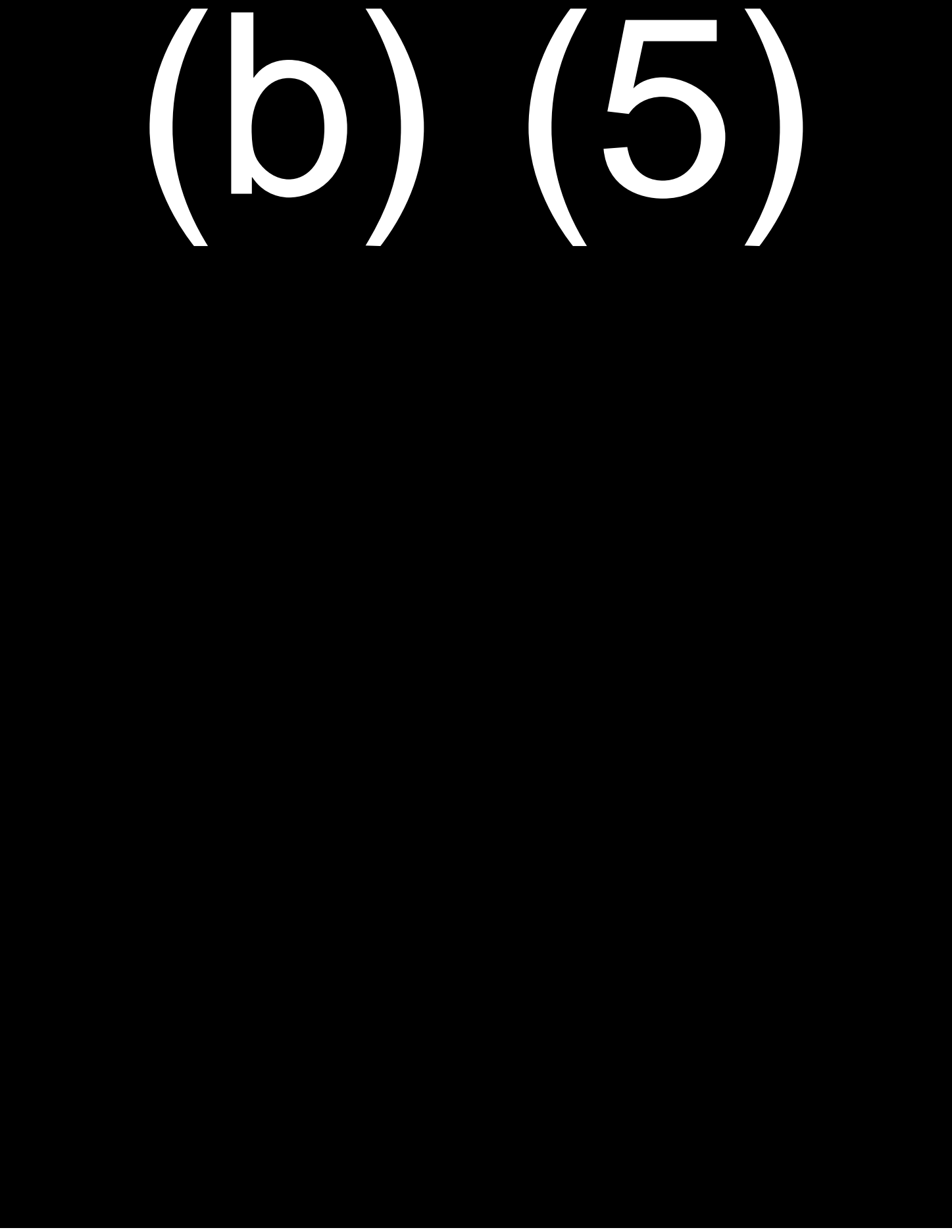
## Enterprises Variable Rate Mortgage Assets and Interest Rate Swaps

dollars in millions

Column verified?

	31-Mar-07	30-Sep-08	31-Dec-08	31-Mar-09	30-Jun-09	30-Sep-09	31-Dec-09	31-Mar-10	30-Jun-10
<b>Swap Notional Amounts</b>									
<b>Fannie Mae</b>									
Pay Fixed Swaps		515,853	546,916	620,850	650,447	435,693	382,600	315,857	317,259
Less: Receive Fixed Swaps		372,555	451,081	549,823	571,802	340,384	275,417	229,293	234,901
Plus: Basis Swaps		24,761	24,560	19,815	22,200	11,000	3,225	3,220	3,020
Net Receive LIBOR Swaps		168,059	120,395	90,842	100,845	106,309	110,408	89,784	85,378
<b>Freddie Mac</b>									
Less: Receive Fixed Swaps		329,828	279,609	336,207	284,244	320,458	271,403	255,940	349,545
Plus: Pay Fixed Swaps		452,633	404,359	342,747	401,901	414,776	382,259	382,145	386,194
Plus: Basis Swaps		82,205	82,190	82,090	51,065	51,615	52,045	54,070	53,910
Net Receive LIBOR Swaps		205,010	206,940	88,630	168,722	145,933	162,901	180,275	90,559
<b>Enterprises</b>									
Net Receive LIBOR Swaps		373,069	327,335	179,472	269,567	252,242	273,309	270,059	175,937
<b>Mortgage Related Securities on Balance Sheet</b>									
<b>Fannie Mae</b>									
Capital Markets group's mortgage-related securities		359,495	362,703	353,172	369,546	368,389	352,709	434,532	391,615
Estimated Freddie Mac Variable Rate Securities Ratio		41%	37%	33%	34%	34%	40%	52%	52%
Estimated Fannie Mae Variable Rate Securities		146,025	132,796	116,457	124,378	125,616	139,775	224,780	204,120
<b>Freddie Mac</b>									
Fixed Rate Securities		437,560	510,116	581,180	550,539	516,778	372,160	159,278	148,851
Variable Rate Securities		299,316	294,646	285,924	279,298	267,393	244,296	170,690	162,049
Variable Rate Securities Ratio		41%	37%	33%	34%	34%	40%	52%	52%
<b>Floating Rate Liabilities on Balance Sheet</b>									
<b>Fannie Mae</b>									
Floating Rate Short Term Debt		4,495	7,585	3,132	3,102	3,069	50	-	-
Senior Floating Rate Long Term Debt		47,087	46,611	58,770	68,766	51,142	42,952	46,170	45,144
<b>Freddie Mac</b>									
Long-Term Debt, Variable Rate		24,708	13,664	118,160	126,647	113,775	65,875	126,036	144,833
Total Other Long-Term Debt		494,168	433,954	478,379	512,742	460,626	461,051	593,174	585,630
Ratio: Variable Rate Long-Term Debt to Other Long-Term Debt		5%	3%	25%	25%	25%	14 3%	21%	25%
<b>Enterprises</b>									
Estimated Variable Rate Assets Net of Obligations		369,051	359,582	222,319	205,161	225,024	275,194	223,264	176,192
Fed ED-LIBOR spread, 1 month		-0.16%	-0.87%	-0.42%	-0.40%	-0.20%	-0.09%	-0.05%	-0 06%
<b>Estimated Damages</b>									
LIBOR Cash Flow Shortfall - Quarterly Totals		312.3	1,535.0	424.0	474.0	249.1	121.9	65.7	55 0
LIBOR Cash Flow Shortfall - Cumulative		750.6	1,616.5	2,040.5	2,514.5	2,763.6	2,885.6	2,951.3	3,006 3
Prorated LIBOR Cash Flow Shortfall - 9/6/08 thru 9/30/08		81.5							

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**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

MAYOR AND CITY COUNCIL OF  
BALTIMORE, on behalf of itself and all others  
similarly situated,

Plaintiff,

vs.

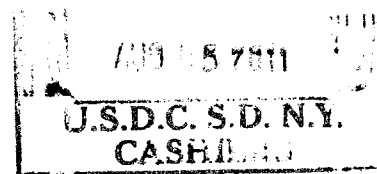
BANK OF AMERICA CORPORATION;  
BARCLAYS BANK PLC; CITIBANK NA;  
HSBC HOLDINGS PLC; J.P. MORGAN CHASE  
& CO.; LLOYDS BANKING GROUP PLC; UBS  
AG; and WESTLB AG.,

Defendants.

Case No. \_\_\_\_\_

**CLASS ACTION COMPLAINT  
FOR VIOLATION OF THE  
FEDERAL ANTITRUST LAWS**

**JURY TRIAL DEMANDED**



Plaintiff Mayor and City Council of Baltimore (“Baltimore” or “Plaintiff”), on behalf of itself and all others similarly situated, brings this action against defendants Bank of America Corporation, Barclays Bank plc, Citibank NA, HSBC Holdings plc, JP Morgan Chase & Co., Lloyds Banking Group plc, UBS AG, and WestLB AG (collectively, “Defendants”) and alleges as follows:

**NATURE OF CLAIM**

1. This action arises from Defendants’ conspiracy to unlawfully manipulate the London Interbank Offered Rate for the U.S. dollar (“LIBOR”) from August 1, 2007 through such time as the effects of Defendants’ illegal conduct ceased, in violation of Section 1 of the Sherman Act, 15 U.S.C. § 1.
2. As alleged herein, during the Class Period (defined below), Defendants conspired to and did suppress and manipulate LIBOR throughout the Class Period.

3. Owned and administered by the British Bankers Association (“BBA”), LIBOR is a daily benchmark interest rate based on the trimmed average of interest rates at which designated contributor banks borrow unsecured funds from other banks in the London wholesale money market for maturities ranging from overnight to one year. LIBOR is calculated for 10 different currencies.

4. Every morning by 11:10 a.m. London time, the individual banks on the U.S. dollar LIBOR panel send data to Thompson Reuters Group (“Reuters”), a news information provider reporting what it would cost them to “borrow funds, were [they] to do so by asking for and then accepting inter-bank offers in reasonable market size, just prior to 11.00 London time.” Reuters makes those rates public, which constitutes the day’s LIBOR. Prior to February 2011, 16 banks sat on the U.S. dollar LIBOR panel and Reuters determined LIBOR by discarding the lowest four and highest four of the reported estimates, and calculating the average of the remaining eight. In February 2011, the panel size was increased to 20 banks and Reuters now calculates LIBOR from the rates provided by eliminating the five highest and five lowest rates and averaging the remaining 10.

5. Throughout the Class Period, Defendants were members of the U.S. dollar LIBOR panel. Pursuant to their illegal conspiracy, Defendants knowingly and purposely submitted borrowing rates to Reuters that were below their true borrowing costs in order to suppress and manipulate LIBOR.

6. Defendants devised and executed their scheme to manipulate LIBOR in order to benefit their financial positions. Throughout the Class Period, Defendants sold financial products which tied rates of return to LIBOR. By manipulating LIBOR, Defendants paid lower returns to customers who bought those financial products.

7. Defendants' manipulation of LIBOR directly caused and resulted in an artificially lower LIBOR during the Class Period.

8. Defendants' conspiracy to suppress LIBOR violates Section 1 of the Sherman Act, 15 U.S.C. § 1. Plaintiff and members of the Class suffered damages by purchasing directly from Defendants during the Class Period financial products that had rates of return tied to LIBOR ("LIBOR-Based Derivatives"), as more fully alleged herein.

### **JURISDICTION AND VENUE**

9. This action arises under Section 1 of the Sherman Act, 15 U.S.C., § 1, and Sections 4 and 16 of the Clayton Act, 15 U.S.C. §§ 15 and 26.

10. This Court has jurisdiction under 28 U.S.C. §§ 1331 and 1337 and Sections 4 and 16 of the Clayton Act, 15 U.S.C. §§ 15 and 26.

11. Venue is proper in this District pursuant to Sections 4, 12 and 16 of the Clayton Act, 15 U.S.C. §§ 15, 22 and 26 and 28 U.S.C. § 1391(b), (c) and (d). One or more of the Defendants resided, transacted business, were found, or had agents in the District, a substantial part of the events giving rise to Plaintiff's claims arose in the District, and a substantial portion of the affected interstate trade and commerce described herein has been carried out in this District.

### **PARTIES**

12. During the Class Period, Plaintiff Baltimore purchased tens of millions of dollars worth of Interest Rate Swaps directly from at least one Defendant in which the rate of return was tied to LIBOR and was injured as a result of Defendants' anticompetitive conduct.

13. Defendant Bank of America Corporation (“Bank of America”) is a Delaware corporation headquartered in Charlotte, North Carolina. During the Class Period, Bank of America was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

14. Defendant Barclays Bank plc (“Barclays”) is a British public limited company headquartered in London, England. During the Class Period, Barclays was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

15. Defendant Citibank NA (“Citibank”) is a wholly-owned subsidiary of the United States financial services corporation Citigroup, Inc., which is headquartered in New York, New York. During the Class Period, Citibank was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

16. Defendant HSBC Holdings plc (“HSBC Holdings”) is a United Kingdom public company with its corporate headquarters in London, England. During the Class Period, HSBC was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

17. Defendant J.P. Morgan Chase & Co. (“JP Morgan”) is a Delaware financial holding company headquartered in New York, New York. During the Class Period, JP Morgan was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

18. Defendant Lloyds Banking Group plc (“Lloyds”) is a United Kingdom public limited company with its corporate headquarters in London, England. Lloyds was formed in 2009 through the acquisition of HBOS plc (“HBOS”) and Lloyds TSB Bank plc (“Lloyds TSB”). During the Class Period, both HBOS and Lloyds TSB were members of the British Bankers’ Association’s U.S. dollar LIBOR panel.

19. Defendant UBS AG (“UBS”) is a Swiss company based in Basel and Zurich, Switzerland. During the Class Period, UBS was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

20. Defendant WestLB AG (“WestLB”) is a German joint stock company headquartered in Dusseldorf, Germany. During the Class Period, WestLB was a member of the British Bankers’ Association’s U.S. dollar LIBOR panel.

### **UNNAMED CO-CONSPIRATORS**

21. Various other entities and individuals not named as Defendants in this Complaint participated as co-conspirators in the acts complained of, and performed acts and made statements which aided and abetted and was in furtherance of the unlawful conduct alleged herein.

### **THE RELEVANT MARKET**

22. The relevant market is LIBOR-Based Derivatives sold directly by Defendants.

### **CLASS ACTION ALLEGATIONS**

23. Plaintiff brings this action as a class action under Rules 23(a) and 23(b)(3) of the Federal Rules of Civil Procedure, on behalf of itself and all others similarly situated. The

“Class” is defined as:

All persons or entities other than Defendants and their employees, affiliates, parents, subsidiaries or co-conspirators (whether or not named in this Complaint) who purchased LIBOR-Based Derivatives directly from Defendants, including their subsidiaries and/or affiliates, from August 1, 2007 through such time as the effects of Defendants’ illegal conduct ceased.

24. The Class is so numerous that joinder of all members is impracticable. While the exact number of Class members is unknown to Plaintiff at this time, Plaintiff is informed and



believes that at least thousands of geographically dispersed Class members purchased LIBOR-Based Derivatives directly from Defendants during the Class Period.

25. Plaintiff's claims are typical of the claims of the other members of the Class. Plaintiff and the members of the Class sustained damages arising out of Defendants' common course of conduct in violation of law as complained herein. The injuries and damages of each member of the Class were directly caused by Defendants' wrongful conduct in violation of the antitrust laws as alleged herein.

26. Plaintiff will fairly and adequately protect the interests of the members of the Class and has retained counsel competent and experienced in class action litigation, including antitrust class action litigation.

27. Common questions of law and fact exist as to all members of the Class which predominate over any questions affecting solely individual members of the Class. Among the questions of law and fact common to the Class are:

(a) whether Defendants conspired with others to artificially suppress LIBOR in violation of the Sherman Act;

(b) Whether Defendants' conduct had an anticompetitive and manipulative effect on LIBOR during the Class Period;

(c) Whether Defendants' conduct negatively affected the rates of return of LIBOR-Based Derivatives purchased directly from the Defendants during the Class Period; and

(d) The appropriate measure of damages for the injury sustained by Plaintiff and other members of the Class as a result of Defendants' unlawful activities.

28. A class action is superior to other available methods for the fair and efficient adjudication of this controversy because joinder of all Class members is impracticable. The

prosecution of separate actions by individual members of the Class would impose heavy burdens upon the courts and Defendants, and would create a risk of inconsistent or varying adjudications of the questions of law and fact common to the Class. A class action, on the other hand, would achieve substantial economies of time, effort and expense, and would assure uniformity of decision as to persons similarly situated without sacrificing procedural fairness or bringing about other undesirable results.

29. The interest of members of the Class in individually controlling the prosecution of separate actions is theoretical rather than practical. The Class has a high degree of cohesion, and prosecution of the action through representatives would be unobjectionable. The amounts at stake for Class members, while substantial in the aggregate, are not great enough individually to enable them to maintain separate suits against Defendants. Plaintiff does not anticipate any difficulty in the management of this action as a class action.

## **FACTUAL ALLEGATIONS**

### **I. Background**

#### **A. Overview of LIBOR**

30. Administered and owned by the BBA, LIBOR is a daily benchmark interest rate based on the trimmed average of interest rates at which designated contributor banks borrow unsecured funds from other banks in the London wholesale money market for maturities ranging from overnight to one year. LIBOR is calculated for 10 different currencies.

31. Every morning by 11:10 a.m. London time, the individual banks on the U.S. Dollar LIBOR panel send data to Reuters, a news information provider reporting what it would cost them to “borrow funds, were [they] to do so by asking for and then accepting inter-bank offers in reasonable market size, just prior to 11.00 London time.” Reuters makes those rates

public, which constitutes the day's LIBOR. Prior to February 2011, 16 banks sat on the U.S. Dollar LIBOR panel and Reuters determined LIBOR by discarding the lowest four and highest four of the reported estimates, and calculating the average of the remaining eight. In February 2011, the panel size was increased to 20 banks and Reuters now calculates LIBOR from the rates provided by eliminating the five highest and five lowest rates and averaging the remaining 10.

**B. LIBOR-Based Derivatives**

32. LIBOR is the primary benchmark for short-term interest rates globally.

33. According to the BBA, "the objectivity and accuracy of the [LIBOR] rates allowed derivatives to be created based on the data as a reference, and this has flourished to become an enormously successful cornerstone of business transacted in London and worldwide."

34. The perceived integrity of LIBOR allows many derivative products to be priced based on LIBOR. About \$350 trillion worth of financial products globally reference LIBOR. To the extent that LIBOR is mispriced, these derivatives are also mispriced.

**II. Defendants Unlawfully Conspired to Suppress and Manipulate LIBOR**

35. In August, 2007, LIBOR began behaving erratically. Overnight, LIBOR began a period in which it dramatically decoupled from other financial indicators that had historically functioned as benchmarks. Reports initially assumed that low liquidity and increased credit risk endemic to the financial crisis were the likely contributing factors to the aberrant behavior of LIBOR. Subsequent examination reflects that Defendants were conspiring to artificially manipulate LIBOR to the benefit of their LIBOR-Based Derivatives positions.

36. As set forth below, Defendants' conspiracy to manipulate LIBOR throughout the Class Period is evidenced by several forms of analysis. During the Class Period, LIBOR shattered its historical relationships with various economic benchmarks, signifying that it was no longer representative of external market forces and was a result of manipulation by the

Defendants. Additionally, LIBOR has been shown to respond to external criticism, demonstrating that it was intentionally manipulated by Defendants, as opposed to reflecting an objective report of market conditions.

37. An examination of Defendants' LIBOR quotes reveals inconsistencies among Defendants' reporting across currencies and on a day-to-day basis, which supports the fact that Defendants purposefully and collectively agreed to underreport their actual borrowing costs in order to artificially and unlawfully suppress LIBOR. In so doing, they reaped massive profits from their enormous LIBOR-Based Derivatives positions, which directly benefited from their artificial suppression of LIBOR.

**A. The Defendants' Unlawful Manipulation Of LIBOR**

38. On December 12, 2007, the day after the Federal Reserve cut short-term interest rates for the third time that year in an effort to help ease the credit crunch and reduce the chances of an impending recession, The Wall Street Journal ("Journal") published an article predicting that continued worry over the credit crisis would effectively keep LIBOR rates high, even as other short-term interest rates would continue to fall. In fact, the Journal quoted one mortgage banker as stating that historically, in times of credit crisis, LIBOR rates have tended to spike.

39. Despite the Journal's prediction, in the early months of 2008, during the most significant financial crisis since the great depression, U.S. dollar-denominated LIBOR rates submitted by panel banks did not vary markedly, nor did they increase or decrease sharply. This fact did not correspond to traditional market behavior because in times of severe uncertainty, banks would normally be reluctant to lend to one another on an unsecured basis without receiving a higher risk premium.

40. In a market not artificially manipulated, LIBOR rates should have increased significantly during this period. In addition, because different panel banks were experiencing

different levels of economic stress, the panel banks should have been reporting markedly different borrowing rates. None of this was reflected in LIBOR rates reported by Defendants.

41. On April 16, 2008, the Journal published an article detailing the findings of a three month study it conducted into the borrowing rates of the 16 banks forming the U.S. dollar LIBOR panel. The Journal concluded that a number of banks – specifically Citibank, WestLB, HBOS, JP Morgan and UBS – had been reporting significantly lower borrowing costs than what other market measures suggest they should have been reporting. The Journal attributed this disparity to certain panel banks intentionally understating their borrowing rates.

42. The Journal's examination of the borrowing costs submitted by the panel banks during the first four months of 2008 indicated that the panel banks reported remarkably similar borrowing rates despite the fact that the banks were facing different financial stresses. For the first four months of 2008, for example, the three-month borrowing rates reported by the panel banks remained, on average, within a range of only .06 of a percentage point.

43. According to Professor Darrell Duffie, a Stanford University finance professor, the reported rates during the first four months of 2008 “[were] far too similar to be believed.”

44. David Juran, a statistics professor at Columbia University who reviewed the Journal's methodology, concluded that the Journal's calculations demonstrate “very convincingly” that reported LIBOR rates are lower than what the market thinks they should be by a factor which well surpassed the threshold statisticians use to assess the significance of a result.

45. Following the Journal's April 16, 2008 report that the panel banks may be intentionally understating their borrowing rates, the BBA announced it would review LIBOR reporting process and remove any bank found to be reporting inaccurate rates from the panel.

46. In November 2007 and again in April 2008, the money market committee of the Bank of England raised questions about the integrity of LIBOR. The minutes of the committee's November 2007 meeting stated that, "several group members thought that Libor fixings had been lower than actual traded interbank rates." Minutes from the April, 2008 committee meeting noted that "U.S. dollar Libor rates had at times appeared lower than actual traded interbank rates." Similarly, Citigroup interest-rate strategist Scott Peng raised similar questions, writing that "Libor at times no longer represents the level at which banks extend loans to others."

47. On April 17, 2008, just days after the Journal published its analysis, there was a sudden jump in the U.S. dollar-denominated LIBOR. The benchmark dollar rate for three-month borrowing hit 2.1875% Thursday, or about .08 percentage points more than the 2.735% rate set on Wednesday.

48. Suspiciously, reported LIBOR rates for other currencies fell or remained relatively flat at the time the U.S. dollar LIBOR surged, a sign that the U.S. dollar LIBOR rate was susceptible to manipulation.

49. Notably, the significant move in the U.S. dollar-denominated LIBOR closely followed the BBA's announcement that it was accelerating its inquiry into the daily borrowing rates that banks provide to establish LIBOR rate.

50. The BBA's decision to speed up its inquiry was made in response to concerns expressed by bankers and the financial media that certain panel banks were not accurately reporting the rates they were paying for short-term loans.

51. In a note to clients the day after LIBOR surged, UBS strategist William O'Donnell suggested that the panel banks were responding to the heightened scrutiny, noting that

the BBA's announcement of its inquiry was an attempt "to bring publicly posted rates back into line with the shadow interbank money rate market."

52. At the time, William Porter, credit strategist at Credit Suisse, said he believed the three-month U.S. dollar LIBOR was .4 percentage points below where it should be. That echoed the view of Scott Peng, who concluded that LIBOR understated panel banks' true borrowing costs by as much as .3 percentage points.

**B. Empirical Evidence Confirms Defendants' Manipulative and Conspiratorial Conduct**

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53. One of the unique characteristics of LIBOR's calculation is its opaqueness. The method for LIBOR calculation is only transparent to the extent that each panel bank reports to Reuters its borrowing rate and Reuters publicizes the rates and computes LIBOR. The internal calculations and methodology of the panel banks in determining their borrowing rates are unobservable to the public. This renders LIBOR susceptible to manipulation by Defendants. Since LIBOR is the basis for a large number of daily financial transactions, comparisons to observable market rates have historically been monitored.

54. In reaction to the media reports of LIBOR manipulation, various empirical studies have demonstrated that the aberrant behavior of LIBOR during the Class Period is suggestive of collective agreement amongst Defendants to manipulate and suppress LIBOR. During the Class Period, LIBOR deviated dramatically from its historic relationships with other economic indicators. This sudden and dramatic variation is consistent with the fact that LIBOR was in fact being manipulated by Defendants, as opposed to accurately reporting market characteristics.

**1. LIBOR Diverges From Its Historical Relationship With The Eurodollar**

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55. The U.S. dollar LIBOR, in effect, measures the interest rate offered to panel banks to borrow U.S. dollar deposits, also known as Eurodollars. Eurodollars are also traded in

the market, and the market rate for Eurodollars is commonly seen as the best market proxy for LIBOR. An analysis conducted by Connan Snider, a Professor at UCLA and Thomas Youle, emphasized that, prior to August 2007, the previous day's Eurodollar bid rate was a better predictor of LIBOR than the previous days LIBOR.

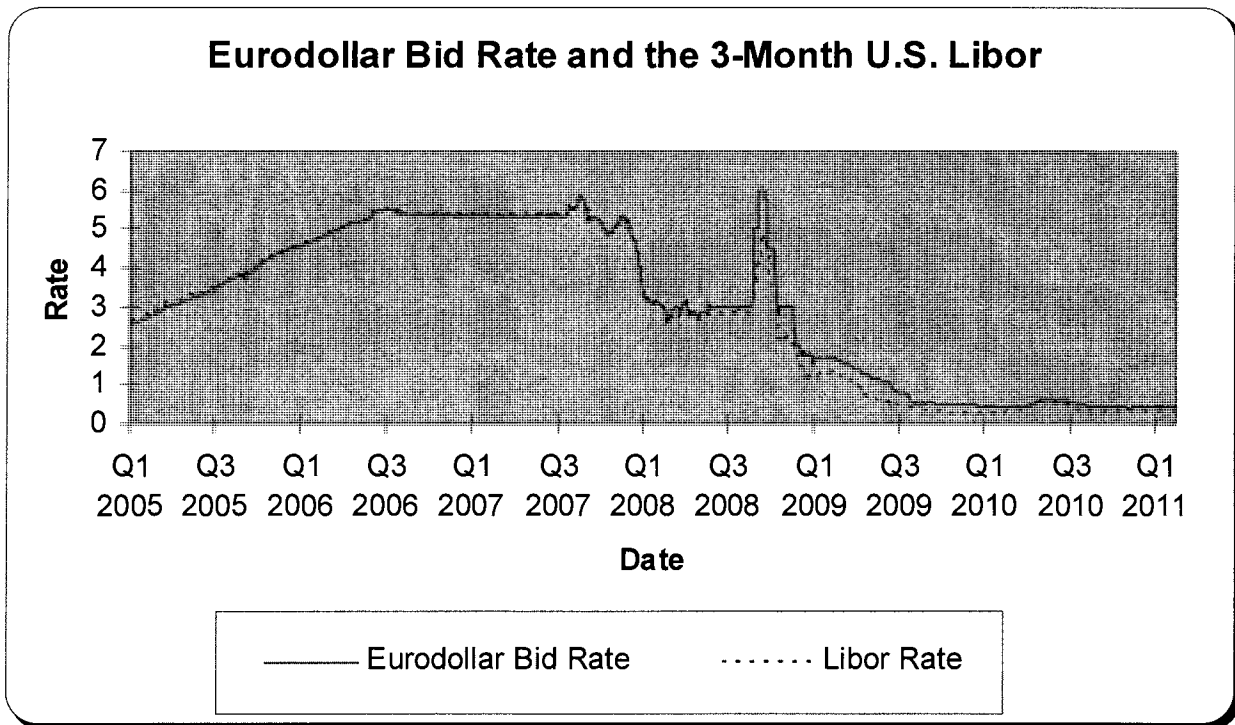
56. Historically, the difference between LIBOR and Eurodollar rate, known as LIBOR/Eurodollar spread (effectively LIBOR minus the Eurodollar bid rate), average 2.75 basis points.<sup>1</sup> The spread was almost always positive, meaning the Eurodollar rate was slightly lower, reflecting the measurement of LIBOR as an offer rate and the Eurodollar rate as a bid rate on U.S. dollar deposits. After August 2007, Defendants' manipulation and suppression of LIBOR resulted in a decoupling of LIBOR and the Eurodollar rate, and a reversal of the relationship so that the spread was negative. In the post manipulation period, the average spread was -24.70 basis points.

57. Even more indicative of Defendants' manipulation was that after August 2007, LIBOR/Eurodollar spread became strongly negative as opposed to the historical mildly positive relationship, as illustrated by the chart below. This change in the historical relationship is evidence of the downward manipulation of LIBOR. In some cases, LIBOR was 15 to 20 basis points lower than the Eurodollar market rate. In effect, LIBOR reported that banks were offering Eurodollars at a rate lower than market participants were actually buying them, a result that strongly indicates Defendants' manipulation of LIBOR.

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<sup>1</sup> A "basis point" is a term commonly used to measure a financial instrument, interest rates. A basis point is equal to 1/100th of 1%. It is a commonly used term of measurement for financial instruments because daily rate changes are typically smaller than 1 percent, though small changes have huge financial effects.





58. When Snider and Youle performed the identical analysis for the period after August 2007, they found that the previous day's Eurodollar rate had less predictive power on LIBOR. In fact, as LIBOR dropped below the Eurodollar rate, the previous day's LIBOR became a better predictor of the current LIBOR. This demonstrates that LIBOR was no longer responding to market forces, but instead was the product of Defendants' manipulation.

## **2. LIBOR Diverges From Its Historical Relationship With Credit Default Swaps**

59. A credit default swap ("CDS") is a swap contract and agreement in which the protection buyer of the CDS makes a series of payments (often referred to as the CDS "fee" or "spread") to the protection seller and, in exchange, receives a payment if the underlying credit instrument (typically a bond or loan) experiences a credit event. The spread serves as a measure of the perceived risk of default by the entity issuing the underlying bond or receiving the loan. The greater the risk of default on the underlying bond or loan, the greater the spread. In the case

of a CDS whose underlying instrument is an interbank loan in which a panel bank is the borrower, the greater the perceived risk that the panel bank will default on the loan, the higher its CDS spread.

60. CDSs are a useful benchmark for LIBOR because both CDSs and LIBOR are a measure of perceived credit risks. On May 29, 2008, Carrick Mollenkamp and Mark Whitehouse (“Mollenkamp and Whitehouse”) published an article in the Journal, emphasizing significant disparities between certain panel banks’ perceived risk in the CDS market and their LIBOR reporting. A higher CDS spread is indicative of a larger perceived risk in lending to an institution because it represents the cost of insuring against a default on that loan.

61. In their analysis, which followed Mollenkamp and Whitehouse, Snider and Youle performed two separate comparisons between LIBOR and CDSs to highlight inconsistencies in LIBOR reporting. First, they noted that a specific reporting bank may have a comparatively higher CDS spread than a second reporting bank (and therefore be perceived as comparatively “riskier”), while simultaneously having a lower LIBOR than the same bank (which would indicate that it is perceived as a “less risky” investment). For example, Citigroup consistently has a substantially higher CDS spread than the Bank of Tokyo – Mitsubishi, yet Citigroup reported comparatively lower LIBOR quotes. Mollenkamp and Whitehouse also noted the same pattern.

**C. Inconsistencies With LIBOR Reporting By Individual Banks**

62. A close examination of the borrowing rates reported by Defendants to Reuters for calculation of LIBOR during the Class period and each bank’s incentive to manipulate LIBOR further evidences Defendants’ conspiracy to manipulate and suppress LIBOR. For example, Alexandre Harthieser of ESCP Europe and Natixis Bank and Phillippe K. Spieser, Professor of

Finance at ESCP Europe, performed clustering analysis on the panel members' individual reporting and concluded that "a suspect cartel has been identified."

### **1. Panel Banks Report Inconsistent Rates Across Currencies**

63. Panel Banks report LIBOR across different currencies each day. Since LIBOR is a measure of a bank's stability as an institution, absent manipulation, the comparative ranking of panel banks should largely be the same across different currencies (allowing for the variation in panel composition across currencies). A comparison of LIBOR across different currencies shows this is not consistently so.

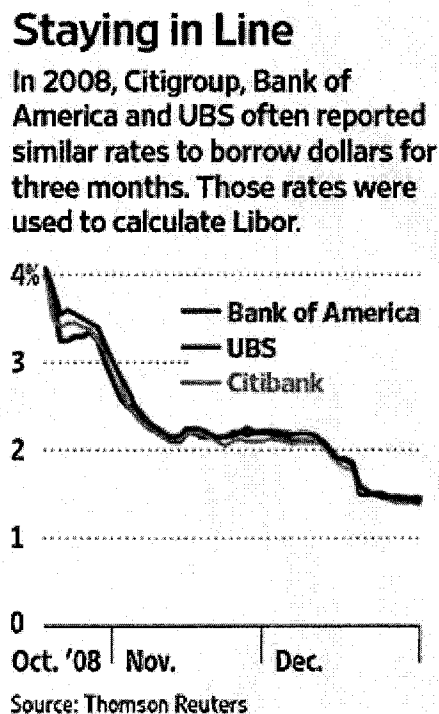
64. For example, Bank of America and Bank of Tokyo-Mitsubishi both report rates to Reuters for calculation of the U.S. dollar and Yen LIBOR. Over the manipulation period, it was common for Bank of America to simultaneously quote a lower rate than Bank of Tokyo-Mitsubishi in U.S. dollar LIBOR and a higher quote in the Yen LIBOR. Since institutional risk should be the same for each panel bank regardless of the what currency it is measured in, this indicates that the rates being reported do not accurately reflect market conditions and are an indication of manipulation.

### **2. Bunching**

65. Throughout the Class Period, the rates reported by certain Defendants "bunch" around the fourth lowest quote each day. That is to say that the rates reported by those Defendants to Reuters were consistently near the fourth lowest of the 16 panel banks. Since Reuters, at the time, calculated LIBOR by removing the lowest (and highest) four reported rates everyday, bunching around the fourth lowest rate is suggestive that those Defendants collectively acted and colluded to suppress and manipulate LIBOR.

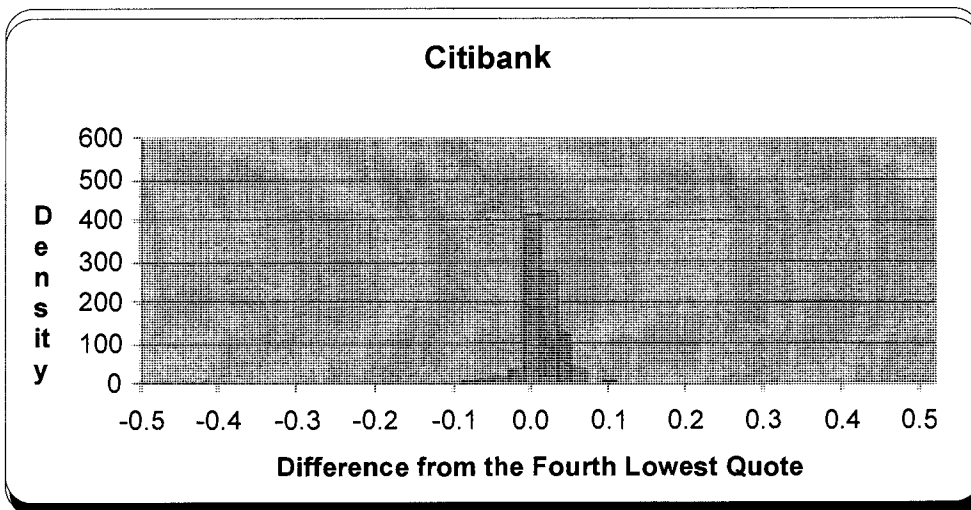
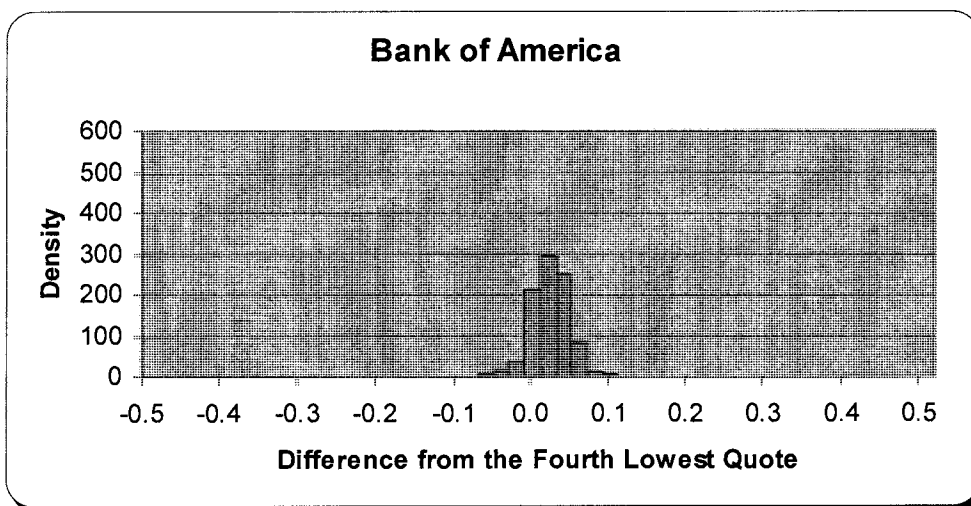
66. As an initial matter, bunching among Defendants' reported rates demonstrates that Defendants intended to report the same or similar rates. The individual variation between

the financial situation of each reporting bank should lead to differences in the reported rates. The fact that, throughout the Class Period, Defendants repeatedly reported identical rates to Reuters is an indication that the Defendants were conspiring to manipulate LIBOR. The chart below, for example, indicates that, in late 2008, Bank of America, UBS and Citibank reported nearly identical rates to borrow dollars for three months.



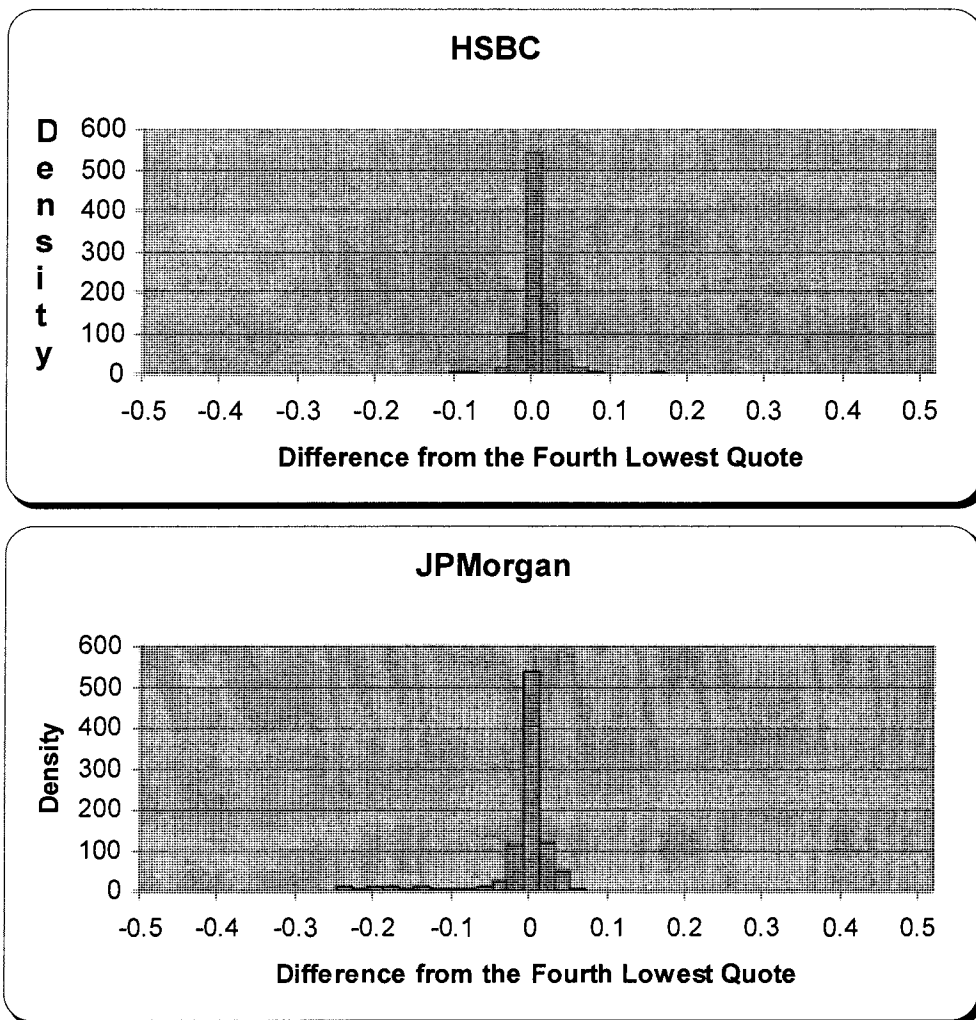
67. Further, certain Defendants' consistent bunching of their reported rates at or near the fourth lowest position is suggestive of their intent to artificially suppress LIBOR. This is because the fifth lowest quote is the lowest quote that is included by Reuters in calculating the day's LIBOR. Defendants' clustering at or near the fourth lowest rate ensures that the artificially low rates reported by Defendants will be included in the BBA's daily calculation resulting in the artificial suppression of LIBOR.

68. The following charts of daily U.S. dollar LIBOR reported rates show the frequency with which Defendants Bank of America, Citibank, HSBC, and JP Morgan reported within a given percentage rate from the 4th lowest quote. A negative difference means that they were below the 4th lowest quote, and therefore not included in the daily LIBOR calculation. Zero difference means that they either were the 4th lowest quote on a given day or tied at the same value as the 4th lowest quote.<sup>2</sup>




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<sup>2</sup> If there is a tie between LIBOR quotes on a given day, one of the banks' quotes is discarded at random.



69. While bunching is reflective of Defendants' intention to report the lowest borrowing rate to be calculated by Reuters, *i.e.*, the fifth lowest borrowing rate, this does not suggest that the panel banks reporting the four lowest quotes (quotes that are discarded by Reuters) are not members of the conspiracy. Due to the mechanics of LIBOR calculation, there will always be discounted outliers. If all of the panel banks reported the same low rate, the lowest four would always be discounted. Therefore by bunching quoted rates around the 4th lowest rate, the panel banks ensured the maximum downward manipulation.

### 3. Defendants Had Significant Incentives to Manipulate LIBOR

70. Defendants held significant financial positions in LIBOR-Based Derivatives, such as in exchange-traded futures contracts and in over-the-counter Interest Rate Swaps, providing them incentive to suppress LIBOR. Defendants' positions in Interest Rate Swaps, for example, were so large throughout the Class Period, that even a small unhedged exposure to LIBOR-Based Derivatives would create enormous financial incentives for Defendants to manipulate LIBOR. Furthermore, when LIBOR experienced a significant drop in Q1 2009, Defendants reaped billions of dollars in profits. It was no accident that Defendants experienced sharply increased profits in their Interest Rate Swap positions at the time LIBOR fell – Defendants purposely took positions in Interest Rate Swaps, which benefited from their suppression of LIBOR. Upon information and belief, throughout the Class Period, Defendants' manipulation and suppression of LIBOR benefited their other LIBOR-Based derivative positions as well.

71. As a result of these incentives Defendants' trading positions came to dominate their reporting obligations to the BBA. A Financial Times article reports, for example, that Barclays is currently under investigation by the regulatory authorities of the United States and the United Kingdom for violating "Chinese Wall" rules which restrict information sharing between different parts of the bank. Barclays' treasury department submits its daily borrowing costs to the BBA and is walled-off from its traders. Barclays is being investigated regarding communications between its traders and its treasury department which improperly influenced the daily submission process.

### III. Governmental Investigations

72. Defendants' conspiracy to manipulate and make artificial LIBOR-Based Derivatives during the Class Period has spurred investigations by numerous government regulatory agencies into the reporting practices of various banks on the U.S. dollar panel.



73. The regulatory investigations were first publicly disclosed on March 15, 2011, when UBS disclosed in its annual report that it had received subpoenas from the Securities and Exchange Commission, the Commodity Futures Trading Commission, and the United States Department of Justice, as well as an information request from the Japanese Financial Supervisory Agency, relating to its reporting of lending rates to Reuters for calculation of LIBOR. UBS's disclosure states that the focus of the investigations is "whether there were improper attempts by UBS, either acting on its own or together with others, to manipulate LIBOR at certain times." Other Defendants have subsequently disclosed that they are subject to investigation by regulatory authorities related to LIBOR. On August 1, 2011, for example, HSBC released its 2011 Interim Results and Barclays released its Half-Yearly Report in the United Kingdom, each disclosing that they were under investigation by various regulatory authorities around the World. Barclays specifically identified investigations by the United Kingdom Financial Services Authority, the Commodity Futures Trading Commission, the Securities and Exchange Commission, the Department of Justice Fraud Section of the Criminal Division and Antitrust Division' and the European Commission. The Journal has reported that the investigators are looking into whether the banks effectively formed a global cartel and coordinated how to report borrowing costs between 2006 and 2008.

74. A Financial Times article published the same day as UBS's disclosure reported that the three U.S. agencies the Japanese Financial Supervisory Agency and the United Kingdom's Financial Services Authority had also requested information, and had begun interviewing witnesses, connected to Defendants for several months.

75. On July 26, 2011, the Financial Times reported that investigators had expanded their probe to include yen-based LIBOR and the Tokyo interbank offered rate ("TIBOR"). In its



results announcement made that day, UBS confirmed that the investigation's scope had widened and disclosed that it had received "conditional leniency and conditional immunity" from the United States Department of Justice for turning over information on the setting of yen-based LIBOR and of the Tokyo interbank offered rate ("TIBOR"). UBS said that while its immunity stretched to the yen-based LIBOR and the TIBOR the deal did not bar the Department of Justice or other "government agencies from asserting other claims against us". The Antitrust Division's leniency policies were established for corporations and individuals "reporting their illegal antitrust activity" and the policies protect leniency recipients from criminal conviction. Notably, each of the Defendants from 2006 to 2009 were members of the yen-based LIBOR panel.

76. Latham & Watkins LLP has observed that the coordinated antitrust investigations in the United States, EU, UK, and Japan indicate that the enforcers are cooperating with each other and that the antitrust investigations may have been triggered by one of the banks taking advantage of the Antitrust Division's Corporate Leniency Policy, as well as other leniency policies around the globe.

### **FRAUDULENT CONCEALMENT**

77. By its very nature, the unlawful activity, as alleged herein, that Defendants engaged in was self-concealing. Defendants, *inter alia*, conspired and engaged in secret and surreptitious activities in order to manipulate LIBOR.

78. Defendants fraudulently concealed their participation in their conspiracy to manipulate LIBOR by, among other things, engaging in secret meetings and communications in furtherance of the conspiracies. Because of such fraudulent concealment, and the fact that a conspiracy in restraint of trade is inherently self-concealing, Plaintiff and the members of the

Class could not have discovered the existence of Defendants' conspiracy and manipulation any earlier than public disclosures thereof.

79. Defendants agreed among themselves not to discuss publicly or otherwise reveal the nature and substance of the acts and communications in furtherance of their illegal conspiracy and manipulation.

80. Defendants' actions in fraudulently concealing their illegal conspiracy caused the BBA, the organization that owns and administers LIBOR, to issue a number of statements defending the integrity of LIBOR.

81. For instance, in a statement issued in May 2008, in response to published reports suggesting that Defendants had artificially suppressed LIBOR as evidenced by the decoupling of LIBOR from the CDS market, a BBA spokeswoman announced that there was "no indication" that the default-insurance market provides a more accurate picture of banks' borrowing costs than LIBOR.

82. In June 2009, John Ewan, director of the BBA, represented that LIBOR was "not a false signal to the markets." Even as recently as March 2011, in response to UBS's disclosure that it was the subject of government investigations in connection with Defendants' suppression of LIBOR, the BBA issued a statement characterizing LIBOR as an "accurate and reliable benchmark[].".

83. Plaintiff and members of the Class were lulled into believing that the returns on their LIBOR-Based Derivatives were the result of market conditions, rather than the product of Defendants' manipulation and collusive activities.

84. Because of Defendants' active steps, including fraudulent concealment of their conspiracy to prevent Plaintiffs and members of the Classes from suing them for the

anticompetitive activities alleged in this Complaint, Defendants are equitably estopped from asserting that any otherwise applicable limitations period has run.

**DEFENDANTS' ANTITRUST VIOLATIONS**

85. Beginning at least as early as August 1, 2007, and continuing until at least the date of the filing of the Complaint, the exact dates being unknown to Plaintiff, Defendants and their co-conspirators engaged in a continuing agreement, understanding, or conspiracy in restraint of trade to artificially fix, maintain, suppress and stabilize LIBOR and thus the prices and rates of return on LIBOR-Based Derivatives sold by them.

86. In formulating and effectuating the contract, combination, or conspiracy, Defendants and their co-conspirators engaged in anticompetitive activities, the purpose and effect of which were to fix, maintain, suppress and otherwise make artificial the price of LIBOR-Based Derivatives. These activities included the following:

- (a) Defendants participated in meetings and/or conversations to unlawfully discuss their reporting of their borrowing rates to Reuters for calculation of the daily LIBOR;
- (b) Defendants agreed during those meetings and conversations to unlawfully report their borrowing rates to Reuters for calculation of LIBOR in order to drive down LIBOR and otherwise to depress or make artificial LIBOR;
- (c) Defendants signaled to one another their intention to depress or otherwise make artificial LIBOR and colluded with one another in achieving this unlawful and anticompetitive purpose; and
- (d) Pursuant to such an unlawful conspiracy in restraint of trade, Defendants knowingly and collusively traded in order to depress or otherwise make artificial the price of LIBOR-Based Derivatives.

**ALLEGATIONS OF ANTITRUST  
INJURY TO PLAINTIFF AND THE CLASS**

87. Defendants' anticompetitive conduct had severe adverse consequences on competition in that Plaintiff and other members of the Class who traded in LIBOR-Based Derivatives during the Class Period were trading at artificially determined prices that were made artificial as a result of Defendants' unlawful conduct. As a consequence thereof, Plaintiff and the Class suffered financial losses and were, therefore, injured in their business or property.

**COUNT ONE**

**VIOLATIONS OF SECTION 1 OF THE SHERMAN ACT**

88. Plaintiff incorporates by reference the preceding allegations.

89. Defendants and their unnamed co-conspirators entered into and engaged in a conspiracy in unreasonable restraint of trade in violation of Section 1 of the Sherman Act and Section 4 of the Clayton Act.

90. During the Class Period, Defendants controlled what LIBOR rate would be reported and therefore controlled the rates of return on LIBOR-Based Derivatives sold by them.

91. The conspiracy consisted of a continuing agreement, understanding or concerted action between and among Defendants and their co-conspirators in furtherance of which Defendants fixed, maintained, suppressed and stabilized LIBOR and thus the prices and rates of return on LIBOR-Based Derivatives sold by them. Defendants' conspiracy is a *per se* violation of the federal antitrust laws and is, in any event, an unreasonable and unlawful restraint of trade and commerce.

92. Defendants' conspiracy, and resulting impact on the market for LIBOR-Based Derivatives, occurred in or affected interstate and foreign commerce.

93. As a proximate result of Defendants' unlawful conduct, Plaintiff and members of the Class have suffered injury to their business or property.

94. Plaintiff and members of the Class are each entitled to treble damages for the violations of the Sherman Act alleged herein.

## **COUNT TWO**

### **UNJUST ENRICHMENT AND RESTITUTION**

95. Plaintiff incorporates by reference the preceding allegations.

96. It would be inequitable for Defendants to be permitted to retain the benefit which Defendants obtained from their manipulative acts and at the expense of Plaintiff and members of the Class.

97. Plaintiff and members of the Class are entitled to the establishment of a constructive trust impressed on the benefits to Defendants from their unjust enrichment and inequitable conduct.

98. Alternatively or additionally each Defendant should pay restitution or its own unjust enrichment to Plaintiff and members of the Class.

## **RELIEF SOUGHT**

Accordingly, Plaintiff demands relief as follows:

A. That the Court determine that this action may be maintained as a class action under Rule 23(b)(3) of the Federal Rules of Civil Procedure, that Plaintiff be appointed as class representative, and that Plaintiff's counsel be appointed as counsel for the Class;

B. That the unlawful conduct alleged herein be adjudged and decreed to be an unlawful restraint of trade in violation of Section 1 of the Sherman Act and Section 4 of the Clayton Act;

C. That Defendants, their subsidiaries, affiliates, successors, transferees, assignees and the respective officers, directors, partners, agents, and employees and all other persons acting or claiming to act on their behalf, be permanently enjoined and restrained from continuing and maintaining the conspiracy alleged in the Complaint;

D. That Plaintiff and the Class recover damages, as provided under federal antitrust laws, and that a joint and several judgment in favor of Plaintiff and the Class be entered against Defendants in an amount to be trebled in accordance with such laws;

E. That Plaintiff and the Class recover their costs of the suit, including attorneys' fees, as provided by law; and

F. That the Court direct such further relief it may deem just and proper.

**DEMAND FOR JURY TRIAL**

Pursuant to Rule 38(a) of the Federal Rules of Civil Procedure, Plaintiff demands a jury trial as to all issues triable by a jury.

Dated: August 3, 2011

Respectfully submitted,



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***Counsel for Plaintiff and the Proposed Class***



## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Steve A. Linick

**From:** Richard Parker  
Timothy Lee

**Subject:** Long Range Surveillance Mission After Action Report

**Date:** September 27, 2012

Yesterday afternoon and today, we traveled to New York to gather further additional information related to our research on the effects of possible LIBOR suppression on Fannie Mae and Freddie Mac. We spoke with three parties.

(b) (6) at the New York State Attorney General. Previous reports have indicated that NYSAG has delivered subpoenas related to the LIBOR matter to the major banks, a fact (b) (6) confirmed. (b) (5)

[REDACTED]

(b) (6) at BlackRock Solutions. BlackRock Solutions is an arm of BlackRock, the prominent fixed-income asset management firm, that provides analytical and valuation services to a broad range of investor clients, including Freddie Mac. (b) (5)

[REDACTED]

BlackRock (b) (5)

[REDACTED]



(b) (5)

When asked, BlackRock Solutions stated that, to date, they have not heard from either Freddie Mac or FHFA about looking at LIBOR suppression. (b) (5)

Finally, we spoke with (b) (6) and [ ] at Thompson Wigdor LLP and (b) (6), a former securities attorney and ratings agency analyst who is now an independent structured finance consultant. [Rich to complete.]

In light of these observations, we plan to undertake the following steps:

(b) (5)

**Figure 1**

30 Year Loan

1-Jul-12 Closing Date  
 1-Jul-42 Maturity Date  
 4.00% Fixed Rate

Market Yield

Price

**Figure 2**

5 Year Loan

1-Jul-12 Closing Date  
 1-Jul-17 Maturity Date  
 4.00% Fixed Rate

Market Yield

Price

**Figure 3**

5 Year Swap (right

1-Jul-12  
 1-Jul-17  
 4.00%  
 100

Market Yield

1.0%	177.4231247
1.5%	160.039595
2.0%	144.7929111
2.5%	131.3954389
3.0%	119.6004413
3.5%	109.1960227
4.0%	100
4.5%	91.85555573
5.0%	84.62754897
5.5%	78.19938224
6.0%	72.4703377
6.5%	67.35331023

1.0%	114.5602937
1.5%	111.9566124
2.0%	109.426919
2.5%	106.9687427
3.0%	104.5797072
3.5%	102.2575262
4.0%	100
4.5%	97.80501163
5.0%	95.67052333
5.5%	93.59457329
6.0%	91.57527243
6.5%	89.6108014

1.0%
1.5%
2.0%
2.5%
3.0%
3.5%
4.0%
4.5%
5.0%
5.5%
6.0%
6.5%



Figure 4

Figure 5

axis)

Loan and Swap

Closing Date  
Maturity Date  
Fixed Rate  
Notional

Price		Date	<a href="#">Conventional Mortgage Rates, Federal Reserve Data</a>	Date	<a href="#">3 Month LIBOR</a>	<a href="#">Conventional Mortgage Rates, Federal Reserve Data</a>
-14.56029372	100	1Q00	8.24%	1-Jan-78	7.32%	9.02%
-11.95661243	100	2Q00	8.29%	1-Feb-78	7.28%	9.16%
-9.426919017	100	3Q00	7.91%	1-Mar-78	7.29%	9.20%
-6.968742743	100	4Q00	7.38%	1-Apr-78	7.38%	9.36%
-4.579707187	100	1Q01	6.95%	1-May-78	7.82%	9.58%
-2.257526188	100	2Q01	7.16%	1-Jun-78	8.33%	9.71%
0	100	3Q01	6.82%	1-Jul-78	8.52%	9.74%
2.194988372	100	4Q01	7.07%	1-Aug-78	8.48%	9.79%
4.329476671	100	1Q02	7.01%	1-Sep-78	9.12%	9.76%
6.405426713	100	2Q02	6.65%	1-Oct-78	10.12%	9.86%
8.424727571	100	3Q02	6.09%	1-Nov-78	11.51%	10.11%
10.3891986	100	4Q02	6.05%	1-Dec-78	11.62%	10.35%
		1Q03	5.75%	1-Jan-79	11.16%	10.39%
		2Q03	5.23%	1-Feb-79	10.79%	10.41%
		3Q03	6.15%	1-Mar-79	10.64%	10.43%
		4Q03	5.88%	1-Apr-79	10.60%	10.50%
		1Q04	5.45%	1-May-79	10.74%	10.69%
		2Q04	6.29%	1-Jun-79	10.52%	11.04%
		3Q04	5.75%	1-Jul-79	10.87%	11.09%
		4Q04	5.75%	1-Aug-79	11.53%	11.09%
		1Q05	5.93%	1-Sep-79	12.61%	11.30%
		2Q05	5.58%	1-Oct-79	14.59%	11.64%
		3Q05	5.77%	1-Nov-79	15.00%	12.83%
		4Q05	6.27%	1-Dec-79	14.51%	12.90%
		1Q06	6.32%	1-Jan-80	14.33%	12.88%
		2Q06	6.68%	1-Feb-80	15.32%	13.04%
		3Q06	6.40%	1-Mar-80	18.71%	15.28%
		4Q06	6.14%	1-Apr-80	17.81%	16.33%
		1Q07	6.16%	1-May-80	11.20%	14.26%
		2Q07	6.66%	1-Jun-80	9.41%	12.71%
		3Q07	6.38%	1-Jul-80	9.33%	12.19%

4Q07	6.10%	1-Aug-80	10.82%	12.56%
1Q08	5.97%	1-Sep-80	12.07%	13.20%
2Q08	6.32%	1-Oct-80	13.55%	13.79%
3Q08	6.04%	1-Nov-80	16.46%	14.21%
4Q08	5.33%	1-Dec-80	19.47%	14.79%
1Q09	5.00%	1-Jan-81	18.07%	14.90%
2Q09	5.42%	1-Feb-81	17.18%	15.13%
3Q09	5.06%	1-Mar-81	15.36%	15.40%
4Q09	4.93%	1-Apr-81	15.95%	15.58%
1Q10	4.97%	1-May-81	19.06%	16.40%
2Q10	4.74%	1-Jun-81	17.86%	16.70%
3Q10	4.35%	1-Jul-81	18.49%	16.83%
4Q10	4.71%	1-Aug-81	18.79%	17.29%
		1-Sep-81	17.80%	18.16%
		1-Oct-81	16.34%	18.45%
		1-Nov-81	13.32%	17.83%
		1-Dec-81	13.24%	16.92%
		1-Jan-82	14.29%	17.40%
		1-Feb-82	15.75%	17.60%
		1-Mar-82	14.90%	17.16%
		1-Apr-82	15.18%	16.89%
		1-May-82	14.53%	16.68%
		1-Jun-82	15.45%	16.70%
		1-Jul-82	14.37%	16.82%
		1-Aug-82	11.57%	16.27%
		1-Sep-82	11.74%	15.43%
		1-Oct-82	10.43%	14.61%
		1-Nov-82	9.77%	13.83%
		1-Dec-82	9.47%	13.62%

Figure 6

Figure 7

Derivatives Notional Amount (In Billion \$)  
March 2012

Date	<a href="#">Fannie Mae 1-4 Family MBS Outstanding, Year End</a>	<a href="#">Freddie Mac 1-4 Family MBS Outstanding, Year End</a>		Fannie Mae
1972		331	Interest Rate Swaps	456.6
1973		617	Call and Put Options	98
1974		608	Forward Agreements	1.2
1975		1,349	Other	26.3
1976		2,282	Total	582.1
1977		5,621		
1978		9,657		
1979		12,149	<b>Figure 7b (Replacing Figure 7)</b>	
1980		13,471	Derivatives Notional Amount (In Billion \$)	
1981	717	19,501	December 2010 and 2011	
1982	14,450	42,560		
1983	25,121	57,273		<b>Fannie Mae - December 2010</b>
1984	35,965	70,253	Pay-Fixed Swaps	277.2
1985	54,036	99,515	Received-Fixed Swaps	224.2
1986	95,791	166,667	Call Swaptions	78.6
1987	137,988	205,977	Put Swaptions	97.2
1988	172,331	219,988	Futures	0.2
1989	219,577	266,060	Other Derivatives	9.0
1990	291,194	308,369		
1991	362,667	351,906	Caps	7.0
1992	435,979	401,525	Other Swaps (Basis and Curre	2.0
1993	486,804	442,612	Other Options	-
1994	520,763	487,725	Total	686.4
1995	569,724	512,238		
1996	633,209	551,513		
1997	687,981	576,846		
1998	804,204	643,465		
1999	924,941	744,619		
2000	1,016,398	816,602		
2001	1,238,125	940,933		
2002	1,478,610	1,072,990		



**Figure XX.**  
Notional Amounts of l  
<http://www.bis.org/st>

Freddie Mac

548.6
114.2
41.3
31
735.1

Fannie Mae - December 2011	Fannie Mae - June 2012	Freddie Mac - December 2010	Freddie Mac - December 2011	Freddie Mac - June 2012
187.0	229.2	394.3	289.0	292.7
230.0	265.6	329.0	216.0	263.9
81.0	39.8	125.9	104.0	54.7
96.0	50.3	66.0	71.0	45.3
0.7	1.4	211.6	41.0	39.9
18.0	28.6	32.2	30.0	28.0
7.0	6.5	-	-	-
11.0	22.1	-	-	-
-	-	32.2	30.0	28.0
612.7	614.9	1,159.0	751.0	724.5





JS Dollar Derivatives Outstanding, Period End, \$trillions  
<http://www.fhfa.gov/statistics/otcder/dt07.csv>

**Figure 8 and 9.**  
 Retained Portfolio and GSE  
 Source: FHFA Office of Fin

Forwards and swaps		Options	Figure 8. Year-End Retain
All counterparties (net)	All counterparties (net)		Asset Type
1998-H1	11.2	3.5	Whole Loans
1998-H2	11.2	2.9	Agency MBS
1999-H1	8.7	2.6	Agency REMICs
1999-H2	8.8	2.0	Non-Agency Securities
2000-H1	9.8	2.0	
2000-H2	9.3	2.1	CMBS
2001-H1	10.0	2.1	PLS
2001-H2	9.6	2.2	MRBs
2002-H1	9.6	2.9	Total Retained Portfolio
2002-H2	9.7	2.8	
2003-H1	11.1	3.8	
2003-H2	11.1	4.9	Figure 9. Year-End Debt O
2004-H1	12.9	5.7	
2004-H2	13.5	5.4	Asset Type
2005-H1	14.3	6.1	Short-Term
2005-H2	13.9	5.2	Long-Term
2006-H1	16.9	6.9	
2006-H2	17.2	7.6	Callable MTNs
2007-H1	21.2	8.9	Non-Callable MTNs
2007-H2	25.2	9.6	Benchmark (FN) / Refer
2008-H1	27.7	10.9	Other
2008-H2	21.2	8.3	
2009-H1	20.0	8.2	Total Retained Portfolio
2009-H2	19.4	7.5	
2010-H1	21.9	8.9	
2010-H2	24.0	8.1	
2011-H1	26.3	8.6	
2011-H2	26.3	7.6	

**Figure 8. Year-End Retain**

**Figure 9. Year-End Debt O**

**Asset Type**



Debt Outstanding (In Billion \$)  
Financial Analysis

**ed Portfolio (In Billions \$)**

<b>Fannie Mae - December 2009</b>	<b>Fannie Mae - December 2010</b>	<b>Fannie Mae - December 2011</b>	<b>Fannie Mae - June 2012</b>	<b>Freddie Mac - December 2009</b>	<b>Freddie Mac - December 2010</b>
281.2	427.1	398.3	386.8	138.8	234.7
334.3	241.0	195.7	179.2	310.4	188.9
66.8	38.2	39.9	36.6	130.5	114.8
90.4	82.4	74.5	70.1	175.7	158.4
25.7	25.0	23.2	21.9	61.9	58.7
50.3	44.9	40.4	38.2	101.9	89.8
14.4	12.5	10.9	10.0	11.9	9.9
772.7	788.7	708.4	672.7	755.4	696.8

**Outstanding (In Billion \$)**

<b>Fannie Mae - December 2009</b>	<b>Fannie Mae - December 2010</b>	<b>Fannie Mae - December 2011</b>	<b>Fannie Mae - June 2012</b>	<b>Freddie Mac - December 2009</b>	<b>Freddie Mac - December 2010</b>
200.6	152.1	146.8	93.1	228.0	194.9
585.1	641.8	595.5	574.0	579.4	533.9
210.2	219.8	187.9	174.0	194.4	142.0
84.0	111.4	123.8	126.2	115.0	137.5
280.2	300.6	277.4	267.6	257.6	241.1
10.7	10.0	6.4	6.2	12.4	13.3
785.7	793.9	742.3	667.1	807.4	728.8



**Figure 10.**  
**Derivative Strategy - Impact (In Million \$)**  
Source: FHFA and Enterprises

Panel A				
Freddie Mac - December 2011	Freddie Mac - June 2012	50 Basis Point Adverse Interest Rate Shock	Fannie Mae 2010	Fannie Mae 2011
254.0	232.1	Pre-Derivative Impact - Losses	(864)	(1,298)
149.6	119.4	Derivative Impact - Gains Offsetting Losses	698	1,216
107.2	95.7			
142.6	134.1	Net Impact	(166)	(82)
54.1	50.6	Panel B		
80.7	76.3	100 Basis Point Adverse Interest Rate Shock		
7.8	7.2	Without Derivative - Losses	(1,987)	(2,661)
653.4	581.3	Derivative Impact - Gains Offsetting Losses	1,518	2,284
		Net Impact	(469)	(377)

Freddie Mac - December 2011	Freddie Mac - June 2012
161.3	130.3
516.1	460.9
129.8	93.1
142.0	116.7
239.5	246.2
4.8	4.9
677.4	591.2



**Figure 11.**

**Derivative Counterparty Exposure (In Billion \$)**

Source: FHFA Office of Financial Analysis

Freddie Mac 2010	Freddie Mac 2011		Fannie Mae - December 2010	Fannie Mae - December 2011
(3,614)	(2,471)	Total Notional Amount	686.4	612.7
3,493	2,005	Top-Ten Counterparties	646.9	587.5
(121)	(465)	Concentration Ratio	94.2%	95.9%
(7,933)	(5,247)			
6,984	3,898			
(950)	(1,349)			





**Figure 12.**  
 GAAP Accounting and Vali  
 Source: Enterprises

Panel A				
Fannie Mae - June 2012	Freddie Mac - December 2010	Freddie Mac - December 2011	Freddie Mac - June 2012	June 2011
614.9	1,159.0	751.0	724.5	GAAP Carrying Value
573.3	861.5	641.3	607.3	Estimated Fair Value
93.2%	74.3%	85.4%	83.8%	Difference
Panel B				
September 2011				
GAAP Carrying Value				
Estimated Fair Value				
Difference				



uation - June and September 2011 (In Million \$)

Fannie Mae				Freddie	
Assets	Debt	Net Position	Hedging Derivatives	Assets	Debt
656,774	(724,799)	(68,025)	159	267,225	(2,294)
631,743	(747,439)	(115,696)	159	705,406	(813,258)
25,031	22,640	47,671	-	(438,181)	810,964
648,201	(744,803)	(96,602)	(3,353)	252,235	(1,898)
628,653	(773,997)	(145,344)	(3,353)	692,907	(813,690)
19,548	29,194	48,742	-	(440,672)	811,792



e Mac

Net Position	Hedging Derivatives
264,931	(8,110)
(107,852)	(8,109)
372,783	(1)
250,337	(10,642)
(120,783)	(10,641)
371,120	(1)

Data Requirements
Net MBS Outstanding 90-12
Enterprise retained portfolios 90-12
Composition of retained portfolios 08-12
Net flat duration targeting
Derivatives book over time
FHLB mortgage assets 95-12, qtrly 08-12
FHLB-SEA and FHLB-CHI mortgage assets 95-12, qtrly 08-12
GSE callable debt issuance 95-12

#### Potential sources

[Fannie Mae Monthly Summaries](#)

[Freddie Mac Monthly Volume Summaries](#)

10Ks and 10Qs will have much of this information in Notes

Summaries
Funding risk
Prepay risk
Features of callable debt
How derivatives are used to manage interest rate risk
FHFA 2010-2012 related exam findings for Enterprises, FHLB-SEA, FHLB-CHI
Accounting treatment of derivatives
Earnings management scandals at Fannie and Freddie 2003-2004

Primary Responsibility	ETA


Primary Responsibility	ETA
Tim	
Tim	
Tim	
Tim	
Tim	
Tim	



Notes
Some data (see following sheets); more can be gathered from monthly summaries
Simon should already have much of this
I have quarterly data on the swaps book 2007-12. See next sheet.
Best approach is probably to contact GSEs directly

Notes
Already in earlier drafts
Already in earlier drafts
Already in earlier drafts
Already in earlier drafts
Already in earlier drafts

# Non-Responsive

# Non Responsive

# Non Responsive

# Non Responsive

# Non Responsive

Indicative Estimate of LIBOR Losses to Federal Reserve and Treasury Programs

Quarter Ending	Fed ED - LIBOR Spread	Maiden Lane II Senior Loan	Maiden Lane III	AIG Credit Facility
30-Sep-08	-0.16%			
31-Dec-08	-0.87%	19,522	24,384	38,924
31-Mar-09	-0.42%	18,638	24,168	44,712
30-Jun-09	-0.40%	17,712	22,614	42,834
30-Sep-09	-0.20%	16,801	19,855	38,306
31-Dec-09	-0.09%	16,005	18,500	20,771
31-Mar-10	-0.05%	15,283	17,325	26,222
30-Jun-10	-0.06%	14,672	16,294	24,857
Total				

TALF	Loan Balances	LIBOR Losses
	82,830	(185.09)
4,692	92,210	(97.31)
25,143	108,303	(108.15)
42,854	117,816	(61.50)
47,624	102,900	(22.88)
47,324	106,154	(14.13)
42,681	98,504	(15.38)
		(504.44)





## OFFICE OF INSPECTOR GENERAL

Federal Housing Finance Agency

400 7th Street, S.W., Washington DC 20024

**To:** Edward J. DeMarco, Acting Director  
**From:** Steve A. Linick, Inspector General  
**Subject:** Potential losses to Fannie Mae and Freddie Mac from LIBOR manipulation  
**Date:** October ~~22~~<sup>26</sup>, 2012

Please find attached a staff memorandum that details my concerns about financial losses that Fannie Mae and Freddie Mac (the Enterprises) may have sustained due to alleged manipulation of the London Interbank Offered Rate (LIBOR) by a number of major financial institutions. As you know, on June 27, the Department of Justice announced an agreement with Barclays Bank Plc (Barclays) in which the bank admitted to manipulating LIBOR for its own advantage over a period of years. Federal, state, and foreign government investigations into possible LIBOR manipulation at other institutions are ongoing, as are a number of high-profile civil suits predicated upon such manipulation.

FHFA-OIG's interest in the consequences of possible LIBOR manipulation upon the Enterprises stems directly from its core mission to prevent and detect fraud and abuse in FHFA's programs and operations. Members of my staff began their work on this topic within days of the Department of Justice's ~~June 27th~~ announcement of its agreement with Barclays. On September ~~6th~~ and ~~11th~~ they shared their preliminary analysis with members of your senior staff and, at about the same time, with both Enterprises. To date, however, FHFA-OIG remains unaware of any steps taken by the Agency or the Enterprises to investigate the matter further.

The enclosed memorandum outlines in detail my staff's LIBOR loss estimates and offers recommendations for Agency action to recover any such losses on behalf of the Enterprises.

~~In light of the fact that my~~ staff has ~~tentatively~~ preliminarily estimated that the Enterprises may have suffered more than \$3 billion in such losses, ~~which that~~ Those losses, of course, would have been funded by the Department of the Treasury under the Senior Preferred Stock Purchase Agreements in place with each Enterprise. ~~I therefore~~ believe that this matter warrants the Agency's attention. Please do not hesitate to contact me or any of the members of my staff in this regard.

Comment [pam1]: awkward; perhaps rephrase to "preliminary estimates showing"



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**To:** Steve A. Linick, Inspector General

**From:** Timothy Lee, Senior Policy Advisor, Office of Policy, Oversight and Review  
David P. Bloch, Director, Division of Mortgage, Investments and Risk Analysis,  
Office of Evaluations  
Simon Z. Wu, Chief Economist, Office of Policy, Oversight and Review

**Through:** Richard Parker, Director, Office of Policy, Oversight and Review, and  
George P. Grob, Deputy Inspector General, Office of Evaluations

**Subject:** Potential losses to Fannie Mae and Freddie Mac due to LIBOR manipulation

**Date:** October 26, 2012

The London Interbank Offered Rate (~~“(LIBOR)”~~) is a market-standard interest rate index used extensively by participants in the global financial markets.<sup>1</sup> It is used to calculate payments on over \$300 trillion of financial instruments, and has been described as “the most important figure in finance.”<sup>2</sup> LIBOR is determined by daily polls of 18 leading financial institutions (16 firms through 2010), which are asked to estimate their own short-term borrowing costs. The highest four and lowest four submissions are eliminated, and LIBOR is calculated by averaging the remaining ones.<sup>3</sup>

In a June 2012 settlement with British and ~~“U.S.”~~ authorities, including the Department of Justice (~~“(DOJ)”~~), Barclays Bank Plc (~~“(Barclays)”~~) admitted to submitting falsified borrowing cost data in an effort to manipulate LIBOR to its own advantage.<sup>4</sup> According to subsequent media reports, further LIBOR-related state and federal government investigations remain ongoing.<sup>5</sup> Additionally, several parties have filed civil damage claims seeking compensation for

financial losses related to LIBOR manipulation.<sup>6</sup> These civil suits incorporate allegations that banks contributing to the determination of LIBOR strove to depress the published rates.<sup>a</sup>

Fannie Mae and Freddie Mac (collectively, the Enterprises) rely upon LIBOR in the determination of interest payments on their sizable investments in floating-rate financial instruments, such as mortgage-backed securities and interest rate swaps. Many of the banks that contribute to the LIBOR calculation also have existing commitments to pay the Enterprises hundreds of millions of dollars in such LIBOR-based interest payments. As detailed under the “Analysis” portion of this document, our preliminary review of the Enterprises’ published financial statements and publicly available historical interest rate data indicates that, during conservatorship, the Enterprises may have suffered \$3 billion in cumulative losses from any such manipulation. Those losses would ultimately have been borne by the Department of the Treasury (Treasury), through its Senior Preferred Stock Purchase Agreements (PSPAs) with the Enterprises.

Because of the seriousness of these allegations and the possibility that Treasury and the Enterprises may have suffered significant losses due to LIBOR manipulation, we recommend that FHFA take three steps, outlined in further detail below:

- Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation;
- Promptly consider options for appropriate legal action, if warranted; and
- Coordinate efforts and share information with other federal and state regulatory agencies.

## Background

Since September 6, 2008, the Enterprises have operated under FHFA conservatorship.<sup>7</sup> Under the terms of the conservatorship, Treasury has ensured the Enterprises’ ability to remain viable entities through PSPAs with each. Under the terms of the PSPAs, Treasury provides capital funding directly to the Enterprises in amounts necessary to ensure their continued solvency.<sup>8</sup> To date, the federal government has provided the Enterprises \$187 billion.<sup>9</sup>

As part of their business, the Enterprises have always held substantial quantities of floating-rate assets on which interest is recalculated and paid each month or quarter based on currently prevailing short-term rates. Such investments are popular because, as compared to assets that pay a fixed interest rate throughout their terms, floating-rate assets greatly reduce bondholders’

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<sup>a</sup> Market participants deem lower borrowing costs to reflect better creditworthiness. Thus, publicly disclosed borrowing costs became a closely watched indicator of the industry’s stability during the financial crisis. As one academic observer noted, “Especially in 2008, the biggest problem was that all the banks wanted to claim they were able to borrow more cheaply than was in fact the case, so as not to heighten concerns about their creditworthiness.” University of Pennsylvania, “[The LIBOR Mess: How Did It Happen – And What Lies Ahead?](#)”, July 18, 2012.

market risk that their investments' value may decline due to adverse interest rate movements. The Enterprises' two primary categories of floating-rate investments include:

- Floating rate bonds. Many securities are structured in this fashion. For example, according to its public financial statements, Freddie Mac alone held approximately \$299 billion of floating rate securities upon entering conservatorship.<sup>10</sup>
- Interest rate swaps. Because American homeowners tend to prefer predictable mortgage payments, the Enterprises' mortgage portfolios generally contain more fixed-rate loans than floating-rate loans. As a result, the value of those portfolios may vary as interest rates fluctuate. However, the Enterprises also invest in interest-rate swaps, contracting with large financial institutions for the obligation to pay them fixed-rate interest streams in exchange for the right to receive corresponding floating-rate ones.<sup>b</sup> These swaps effectively offset the mortgage loans' fluctuations in value, resulting in stable combined portfolio valuations even if interest rates rise or fall. We estimate that the Enterprises received floating-rate interest payments on a net total of \$373 billion in face, or "notional" amount of interest rate swaps upon entering conservatorship.

The interest due for such floating rate obligations is recalculated for each payment period by reference to the current value of LIBOR.

### Analysis

As a first step in our analysis, we compared the historical data on two floating rate indices:

- 1-month<sup>11</sup> LIBOR rates; and
- The Federal Reserve's published Eurodollar deposit rates (Fed ED) for 1-month<sup>12</sup> obligations. Like LIBOR, this data series is designed to measure short-term bank borrowing costs via polling of financial institutions. However, the Federal Reserve measure polls a broader range of institutions<sup>7</sup> and is rarely referenced in floating rate financial obligations.

Our examination of daily records for 1-month Fed ED and 1-month LIBOR indicates that the two rates remained very close from the earliest point we reviewed, the beginning of 2000, until mid-2007. During that period, the largest divergence between the two indexes appeared shortly after September 11, 2001, when LIBOR *exceeded* Fed ED by as much as 0.41%. Indeed, on average the two measures remained within 0.06% of each other during that period, with LIBOR falling below Fed ED on less than one business day of each nine. The close correspondence of

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<sup>b</sup> While the Enterprises may enter into both pay-floating rate and receive-floating rate swaps, in order to offset the risk of their (principally fixed-rate) mortgage assets, historically their overall net investment in interest rate swaps has been to receive floating-rate payments.



these two measures conformed to the expectations of market observers. As a former Federal Reserve economist said, “effectively, these two rates should be the same as they are the same instrument.”<sup>13</sup>

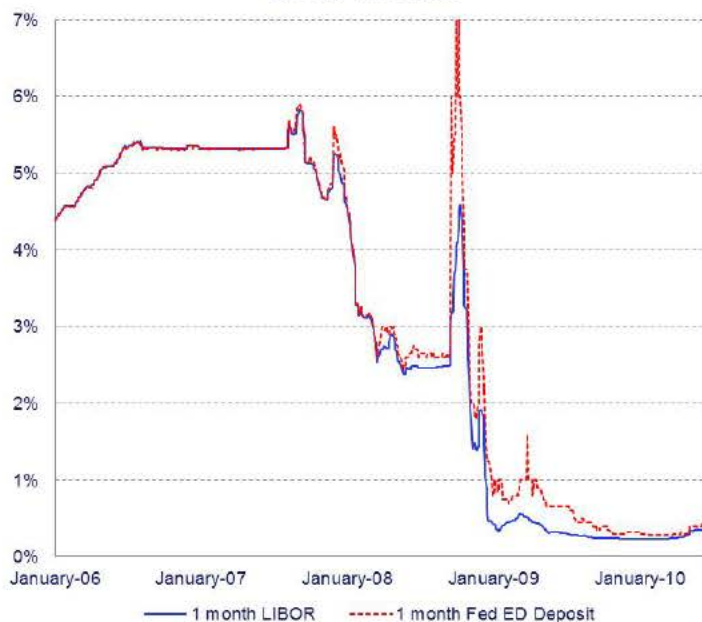
However, beginning in early 2007 emerging declines in home prices had begun to place strains on the financial system. New Century Financial, a leading home loan originator, filed for bankruptcy in April.<sup>14</sup> Adding to the stress were media reports of precipitous decay in two high-profile mortgage-backed securities hedge funds sponsored by Bear Stearns, a leading ~~U.S.~~ U.S. investment bank. These began to emerge in mid-June,<sup>15</sup> followed promptly by the funds’ bankruptcy filings at the end of July.<sup>16</sup>

As the financial crisis began to metastasize, LIBOR and Fed ED began to diverge substantially, eventually by as much as three percentage points at the end of September 2008. Moreover, in a marked contrast with previous behavior, LIBOR began to fall below Fed ED consistently. Figure 1 illustrates the recent divergence of these two measures, beginning in mid-2007.

This anomaly has been cited in civil complaints as evidence of financial institutions’ LIBOR manipulation.<sup>17</sup> Moreover, it is consistent with DOJ’s statement of facts regarding Barclays’ admitted LIBOR manipulation, which reads in part:

... between approximately August 2007 and January 2009, in response to initial and ongoing press speculation that Barclays’s high U.S. Dollar LIBOR submissions at the time might reflect liquidity problems at Barclays, members of Barclays management directed that Barclays’s Dollar LIBOR submissions be

Figure 1. Federal Reserve Eurodollar Deposit Rate vs LIBOR, 1Q06-2Q10

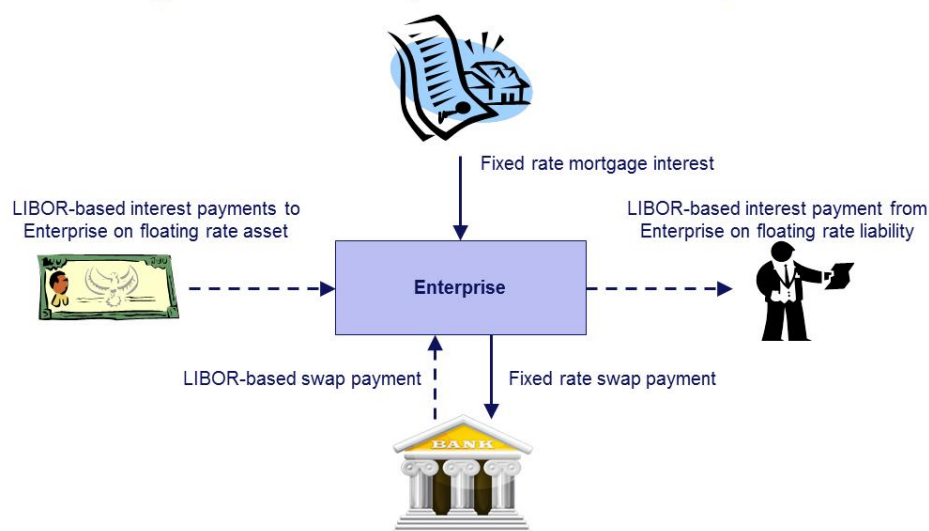


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lowered. This management instruction often resulted in Barclays's submission of false rates that did not reflect its perceived cost of obtaining interbank funds.<sup>18</sup>

Because the Enterprises receive LIBOR-based floating rate payments on their floating rate bonds and interest rate swaps, the principal effect on them of any downward manipulation of LIBOR would be reduced interest payments with respect to their holdings of floating rate securities and interest rate swaps. (This is partially offset by lower borrowing costs on the Enterprises' own floating-rate liabilities, a factor we have considered in our estimation of Enterprise losses.)

**Figure 2. LIBOR-Based Payments to and From the Enterprises**



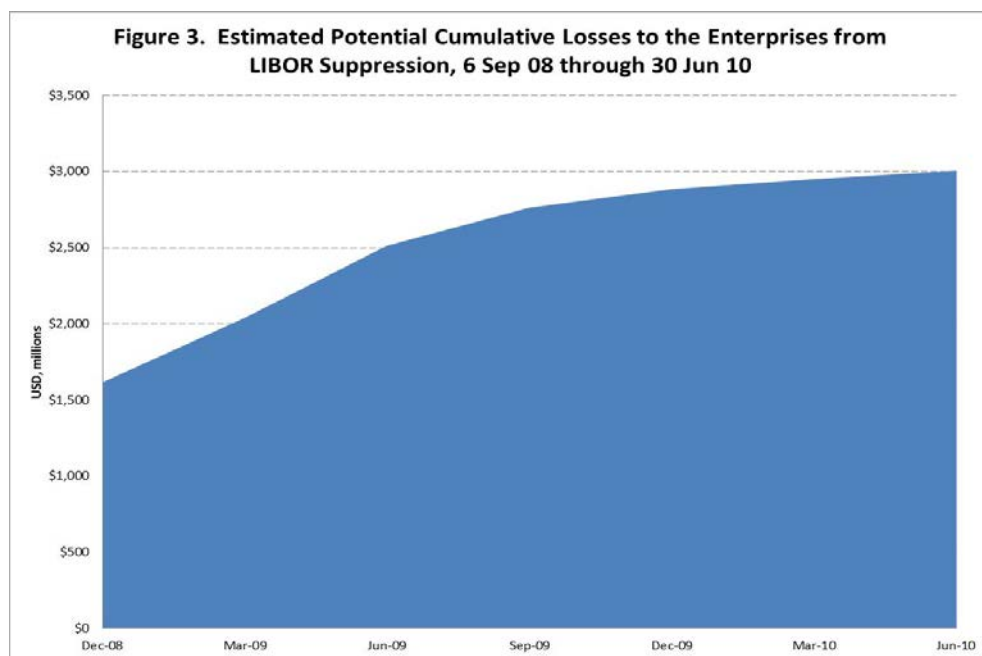
To the extent that the Enterprises suffered such “short-changing” of LIBOR-related interest payments after September 6, 2008, these practices contributed to the operating losses made whole by Treasury’s investments under the PSPAs. Therefore, it stands to reason that any manipulation of LIBOR may have inflicted meaningful losses on Treasury and the taxpayers.

To gauge the effect of possible LIBOR manipulation on the Enterprises, we undertook a three-step analytical process:

- First, we measured the daily divergence between 1-month LIBOR and the corresponding Fed ED rate (essentially treating the latter as the correct benchmark rate), and calculated its average value for each calendar quarter since the Enterprises entered conservatorship.<sup>c</sup>

<sup>c</sup> To simplify our calculations, we assumed that all Enterprise floating rate assets referenced 1-month LIBOR. In practice, mortgage-related bonds and interest rate swaps typically reference either 1-month or 3-month LIBOR.

- Second, we reviewed the Enterprises' publicly available financial statements to develop rough estimates of their holdings of variable rate securities, interest rate swaps, and variable rate liabilities for each quarter.
- Finally, using these figures, we calculated an estimate for the additional quarterly net interest payments that the Enterprises would have received if LIBOR had matched the corresponding Fed ED rate since conservatorship.<sup>d</sup>



Using this methodology, we estimate that, from the beginning of the Enterprises' conservatorship in 2008 through the second quarter of 2010,<sup>19</sup> net Enterprise losses on their holdings of floating rate bonds and interest rate swaps may have exceeded \$3 billion. Over half of those potential losses appear to have taken place in the fourth quarter of 2008 alone.<sup>e</sup>

With respect to the Enterprises' interest rate swaps, it is notable that the leading providers of these instruments are many of the same institutions that contribute to the determination of U.S. dollar LIBOR. Figure 4 presents a table of banks recently identified by the Federal Reserve Bank of New York as major derivatives dealers.<sup>20</sup> Ten of these fourteen major

<sup>d</sup> Further details on our methodology are available in the Appendix.

<sup>e</sup> We also estimate that the Enterprises may have suffered approximately \$750 million of net LIBOR-related losses after market turmoil began in mid-2007, but prior to entering conservatorship.

derivatives dealers also contribute to the poll used to determine LIBOR. Collectively, these dealers both set LIBOR and make LIBOR-based payments to their transaction partners, or counterparties, under the terms of their interest rate swaps. If the Enterprises conduct most of their derivatives business with these institutions, the potential for conflicts of interest is readily apparent.

A comparable situation exists in the market for floating-rate securities. For example, of 2007's ten leading underwriters of "private label" mortgage-backed securities,<sup>21</sup> four contributed to the determination of LIBOR. The Enterprises purchased significant quantities of such securities from these underwriters.<sup>22</sup>

However, our review of a small sample of offering documents for the Enterprises' floating-rate investments in this category failed to uncover any disclosure of risks that the underwriters could manipulate LIBOR for their own advantage, to the detriment of bondholders.

In addition to the Barclays settlement, each LIBOR poll contributor among these dealers has been contacted by federal or state authorities with respect to ongoing investigations, and/or is a named defendant in existing civil actions.<sup>23</sup>

### Recommendations

In the context of active federal and state investigations into possible LIBOR manipulation, as well as the results of our own preliminary analysis of publicly available information, we believe that further investigation of the potential harm to Fannie Mae and Freddie Mac – and therefore to Treasury and, ultimately, the American taxpayer – of any LIBOR manipulation is firmly warranted. While FHFA-OIG should remain ready to offer advice and assistance, FHFA and the Enterprises themselves possess the detailed information needed to develop precise loss calculations and take any legal action that may prove appropriate. Therefore, we recommend that FHFA:

Figure 4.

Major Derivatives Dealers		Top Private Label MBS Underwriters 2007	
	LIBOR Contributor		LIBOR Contributor
Bank of America	✓	Lehman Brothers	
Barclays	✓	Bear Stearns	
BNP Paribas		Deutsche Bank	✓
Citibank	✓	Countrywide	
Credit Suisse	✓	RBS	✓
Deutsche Bank	✓	Credit Suisse	✓
Goldman Sachs		JPMorganChase	✓
HSBC Group	✓	Morgan Stanley	
JPMorganChase	✓	Washington Mutual	
Morgan Stanley		Merrill Lynch	
RBS	✓		
Societe Generale	✓		
UBS	✓		
Wachovia			

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- **Require the Enterprises to conduct or commission detailed analyses of the potential financial losses due to LIBOR manipulation.** The Enterprises should possess detailed records of individual LIBOR-based assets and liabilities. An itemized analysis of these records would produce a better-founded estimate of their losses than is possible from reviewing only the Enterprises' public 10-K and 10-Q filings.
- **Promptly consider options for appropriate legal action, if warranted.** If the existing accusations of LIBOR manipulation prove well founded then, in light of its obligations as their conservator, FHFA should have in place a plan by which to affect full recovery of any Enterprise funds lost and deter further malfeasance of this type. Due to the possibility that the Enterprises' legal options may soon be narrowed by statute of limitations considerations, FHFA should develop this plan promptly.
- **Coordinate efforts and share information with other federal and state regulatory agencies.** FHFA and FHFA-OIG can be valuable and effective partners with other federal and state agencies in their efforts on behalf of the public to recover losses and obtain justice for any wrongdoing that may ultimately be proven.

## Appendix

### Notes on Analytical Methodology

To estimate the Enterprises' potential losses due to LIBOR manipulation, we drew on two principal sources of information.

#### LIBOR Benchmarks

First, we referenced Federal Reserve Bank of St. Louis repositories of daily historical data for the following data series:

- [1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#). According to the Federal Reserve, this information is provided by the British Bankers' Association. The Federal Reserve describes LIBOR as "the most widely used 'benchmark' or reference rate for short term interest rates."
- [1-Month Eurodollar Deposit Rate \(London\)\(DED1\)](#). This information is compiled by the Federal Reserve itself, working with Bloomberg and ICAP Plc, a bond brokerage firm.

We also compiled similar samples for 3-month rates in each case. Comparisons of both the 1-month and 3-month indices revealed significant rate discrepancies between LIBOR and the Federal Reserve index, beginning in 2007. The Bloomberg story cited in the body of the report includes the former Federal Reserve economist's quote that "effectively, these two rates should be the same as they are the same instrument." Several civil lawsuits, including those brought by [Charles Schwab](#) and the [City of Baltimore](#), cite the emergence of these discrepancies as evidence of malfeasance.

Notably, other commentators have also cited additional market indicators as evidence of potential LIBOR manipulation. For example, in a recent speech to the [European Parliament's Economic and Monetary Affairs Committee](#), Gary Gensler, head of the [U.S. Commodity Futures Trading Commission](#), cited persistent anomalies compared to other short-term interest rate indexes, such as Euribor and non-dollar indexes, along with pricing in derivatives such as interest rate options and credit default swaps in questioning the recent behavior of the LIBOR index.

However, because of differences in currency or maturity of the other indicators compared to the Federal Reserve Eurodollar deposit rate, we chose the Federal Reserve index as the simplest and best benchmark for comparison. For the purposes of this analysis, it served as a proxy for the appropriate LIBOR setting. Thus, we assumed that observed differences between LIBOR and the Federal Reserve Eurodollar deposit rate could indicate the timing and extent of potential manipulation by LIBOR poll participants.

#### Calculation of Enterprise Losses

Second, we assembled Fannie Mae and Freddie Mac balance sheet data for the relevant period from the Enterprises' published financial statements. For example, Freddie Mac data for 4Q08 are drawn from the [2008 10-K](#), including:

- Data on derivatives investments from Table 38, page 109. We calculated Freddie Mac's net receive-LIBOR interest rate swap investment as:
  - Pay-fixed (i.e. Freddie Mac receives LIBOR), *plus*
  - Basis (i.e. Freddie Mac and its counterparty exchange different sets of floating rate interest payments. Generally, these involve the Enterprise's payments of frequently -used ARM indices, such as the Cost of Funds Index or the 12-month Constant Maturity Treasury rate, in exchange for LIBOR-based payments); *less*
  - Receive-fixed (i.e. Freddie Mac pays LIBOR).
- Data on Freddie Mac's variable-rate mortgage-related securities from information on the Enterprise's Mortgage-Related Investments Portfolio, Table 24, page 93.
  - We assumed that essentially all variable-rate MBS holdings calculated interest payments by reference to LIBOR.
  - Fannie Mae did not publish explicit information on its variable rate MBS, but did provide figures for all MBS held by its Capital Markets Group. To estimate Fannie Mae's variable-rate MBS investment holdings, we assumed that Fannie Mae's Capital Markets Group held the same proportion of variable rate securities held by Freddie Mac in its Mortgage-Related Investments Portfolio.
- Data on Freddie Mac's long-term debt liabilities, including variable-rate liabilities, in Table 8.3, page 224.
  - We assumed that essentially all long-term floating-rate debt obligations of the Enterprises calculated interest payments by reference to LIBOR.
  - Fannie Mae explicitly discloses floating-rate obligations in its financial statements.
  - Freddie Mac's reporting of floating-rate obligations for the time period under review is intermittent. Long-term variable-rate debt obligations are totaled as of December 31, 2009, and subsequently, but not for the 10Qs as of 1Q09, 2Q09, and 3Q09. Within the time period examined, the highest proportion of long-term variable-rate obligations to other long-term debt (i.e., direct obligations not brought onto the balance sheet by the requirements of SFAS 167) was 24.7%, reported as of 2Q10. We used that proportion to estimate Freddie Mac's variable-rate debt obligations when no other information was available.

- Except where explicitly disclosed, short-term variable rate obligations of the Enterprises were excluded from the analysis as a relatively minor component.

We calculated cash flow shortfalls to the Enterprises as equivalent to (a) the difference between 1-month LIBOR and the 1-month Federal Reserve Eurodollar deposit rate, multiplied by (b) (i) the notional amount of net receive-LIBOR swaps investments held by the Enterprises, plus (ii) the face value of Enterprise variable-rate mortgage-related securities net of their variable-rate liabilities. Cash flow shortfalls were calculated on a quarterly basis. We assumed reported figures remained constant within each quarter. We included a portion of the indicated cash flow shortfalls for 3Q08, prorated for the final 24 days of September.

We believe that direct cash flow shortfalls, due to reduced interest and swap payments on LIBOR-based investments held by the Enterprises, are likely to constitute the great majority of Enterprise financial losses resulting from any LIBOR manipulation. However, additional secondary effects of LIBOR manipulation may also affect the amount of such losses. These include, but are not limited to:

- Distortions in the volatility measures used to benchmark pricing of the Enterprises' interest rate options
- Effects on the interest rate futures market used to value interest rate swaps
- Effects on prepayment valuation models used to value MBS, which rely on short-term interest rate data as an input

However, we did not incorporate such factors into this analysis.

### **Limitations of Our Analysis**

The goal of this report is not to provide a definitive accounting of the Enterprises' losses, nor to demonstrate conclusively the culpability of specific organizations or individuals. We acknowledge the limitations inherent in any corporate financial analysis developed exclusively from public reports. However, this analysis does indicate that the numerous accusations of LIBOR manipulation raise legitimate concerns about their impact on the Enterprises. Accordingly, they warrant closer examination by FHFA and the Enterprises, which have access to the detailed asset-level records and information needed to generate a more accurate and precise figure for potential losses and provide guidance for any future action that may be required to protect the taxpayers.

For more details about this analysis, please contact Timothy Lee, Senior Policy Advisor, at (202) 730-2821 or [timothy.lee@fhfaoig.gov](mailto:timothy.lee@fhfaoig.gov).

## Endnotes

- <sup>1</sup> British Bankers' Association, "[BBA LIBOR Explained](#)."
- <sup>2</sup> The Telegraph, "[LIBOR Scandal: Martin Wheatley's Speech](#)," September 28, 2012.
- <sup>3</sup> Thomson Reuters, "[Thomson Reuters Role in the Calculation and Distribution of BBA LIBOR™](#)", July 4, 2012. The number of poll contributors is cited in the Department of Justice's settlement documentation, "[Appendix A: Statement of Facts](#)."
- <sup>4</sup> ~~US~~U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>5</sup> See, inter alia, The New York Times, "[State Regulators Widen LIBOR Investigation](#)," August 15, 2012, and BusinessWeek, "[US LIBOR Probers Said to Seek London Trader Interviews](#)," September 27, 2012.
- <sup>6</sup> The Wall Street Journal, "[Suits Mount in Rate Scandal](#)," August 26, 2012.
- <sup>7</sup> Federal Housing Finance Agency, "[Statement of Director James A. Lockhart](#)", September 7, 2008, p.6.
- <sup>8</sup> Federal Housing Finance Agency, "[Mortgage Market Note 10-1](#)", January 20, 2010
- <sup>9</sup> Federal Housing Finance Agency, "[Data as of August 8, 2012 on Treasury and Federal Reserve Purchase Programs for GSE and Mortgage-Related Securities](#),"~~"~~
- <sup>10</sup> Current and historical financial statement data for Freddie Mac can be found at [http://www.freddie.mac.com/investors/sec\\_filings/?intcmp=AFIRSE](http://www.freddie.mac.com/investors/sec_filings/?intcmp=AFIRSE). Data for Fannie Mae can be found at <http://www.fanniemae.com/portal/about-us/investor-relations/sec-filings.html>.
- <sup>11</sup> Federal Reserve Bank of St. Louis, "[1-Month London Interbank Offered Rate \(LIBOR\), based on U.S. Dollar \(USD1MTD156N\)](#)". Data obtained October 1, 2012.
- <sup>12</sup> Federal Reserve Bank of St. Louis, "[1-Month Eurodollar Deposit Rate \(London\) \(DED\)](#)". Data obtained October 1, 2012.
- <sup>13</sup> Bloomberg News, "[Fed's Eurodollar Rates Suggest Dollar LIBOR May Stabilize](#)", April 28, 2008.
- <sup>14</sup> See, for example, the *Report of the Financial Crisis Inquiry Commission*. Facts noted here are taken from [Chapter 12](#) of that document, page 233.
- <sup>15</sup> BusinessWeek, "[Bear Stearns' Subprime Bath](#)", June 12, 2007.
- <sup>16</sup> *Report of the Financial Crisis Inquiry Commission*, [Chapter 12](#), page 240.
- <sup>17</sup> See, for example, Thomson Reuters, "[In re LIBOR-Based Financial Instruments Antitrust Litigation](#)," April 30, 2012, pp. 23-31.
- <sup>18</sup> ~~US~~U.S. Department of Justice, "[Barclays Bank PLC Admits Misconduct Related to Submissions for the London Interbank Offered Rate and the Euro Interbank Offered Rate and Agrees to Pay \\$160 Million Penalty](#)," June 27, 2012.
- <sup>19</sup> Media reports cite allegations that LIBOR manipulation continued through at least mid-2010. See, e.g., Washington Post, "[Trickle of LIBOR Lawsuits From Rate-Fixing Scandal Likely to Become Deluge](#)", July 30~~2~~, 2012.

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<sup>20</sup> Federal Reserve Bank of New York, “[An Analysis of OTC Interest Rate Derivatives Transactions: Implications for Public Reporting](#),” March 2012, p.2

<sup>21</sup> “Private label” MBS are those not brought to market and guaranteed through the Enterprises. See [U.S. Securities and Exchange Commission](#), “[Mortgage-Backed Securities](#),” League table data provided by Inside Mortgage Finance, “Mortgage Market Statistical Annual.”

<sup>22</sup> See, for example, Federal Housing Finance Agency, “[FHFA Sues 17 Firms to Recover Losses to Fannie Mae and Freddie Mac](#).”

<sup>23</sup> At least two complaints, those of Berkshire Bank and the City of Baltimore, name all 16 contributors to [U.S.](#) dollar LIBOR. Wall Street Journal, “[New York Lender Files LIBOR Lawsuit](#),” July 30, 2012, and Thomson Reuters, “[In re LIBOR-Based Financial Instruments Antitrust Litigation](#),” April 30, 2012. Also see with respect to federal and state investigations, inter alia, The New York Times, “[State Regulators Widen LIBOR Investigation](#),” August 15, 2012, and BusinessWeek, “[US LIBOR Probers Said to Seek London Trader Interviews](#),” September 27, 2012.



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Federal Housing Finance Agency

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400 7th Street, S.W., Washington DC 20024

**To:** Edward DeMarco, Acting Director

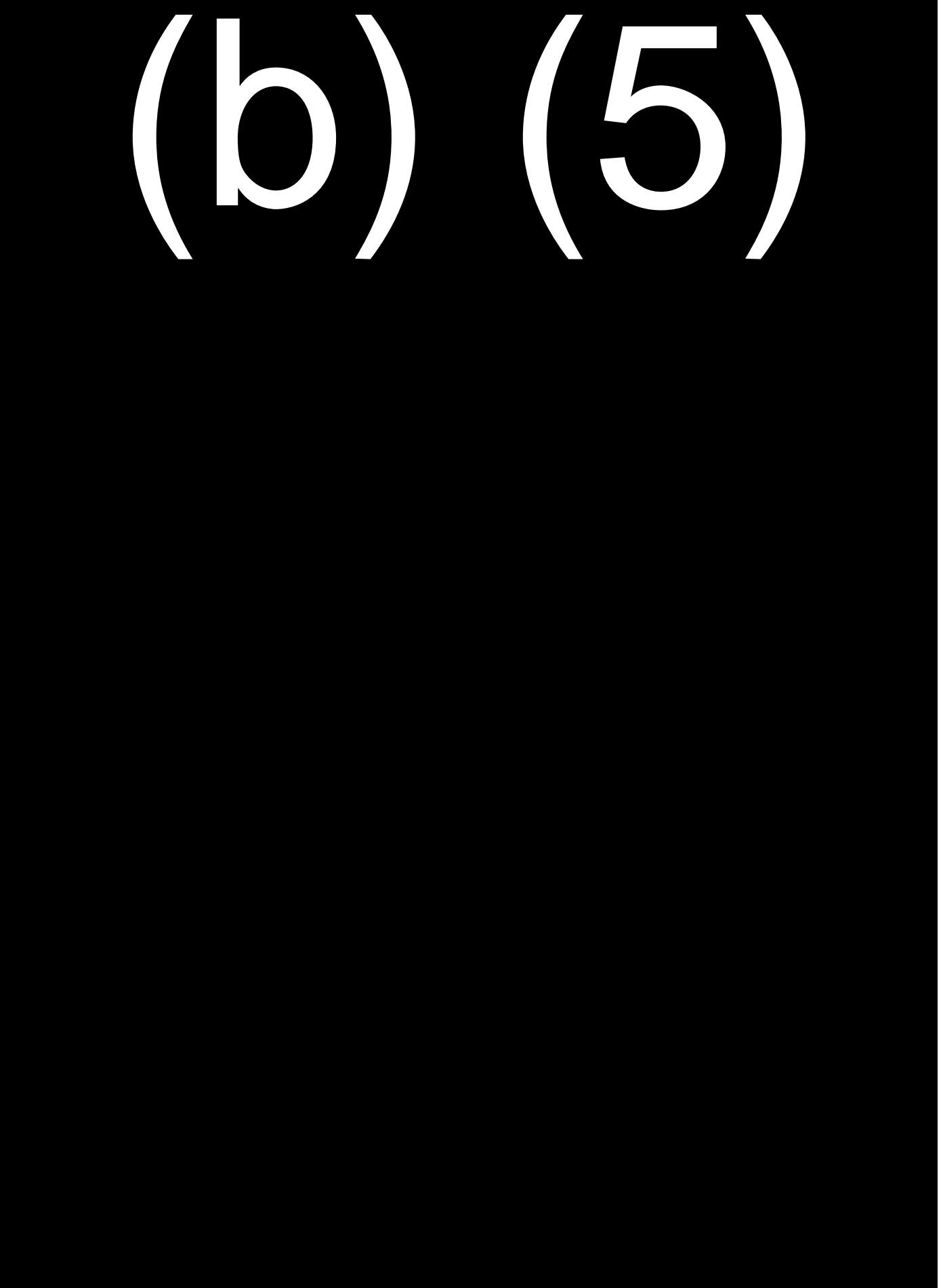
**From:** Steve A. Linick, Inspector General

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**Date:** October XX, 2012

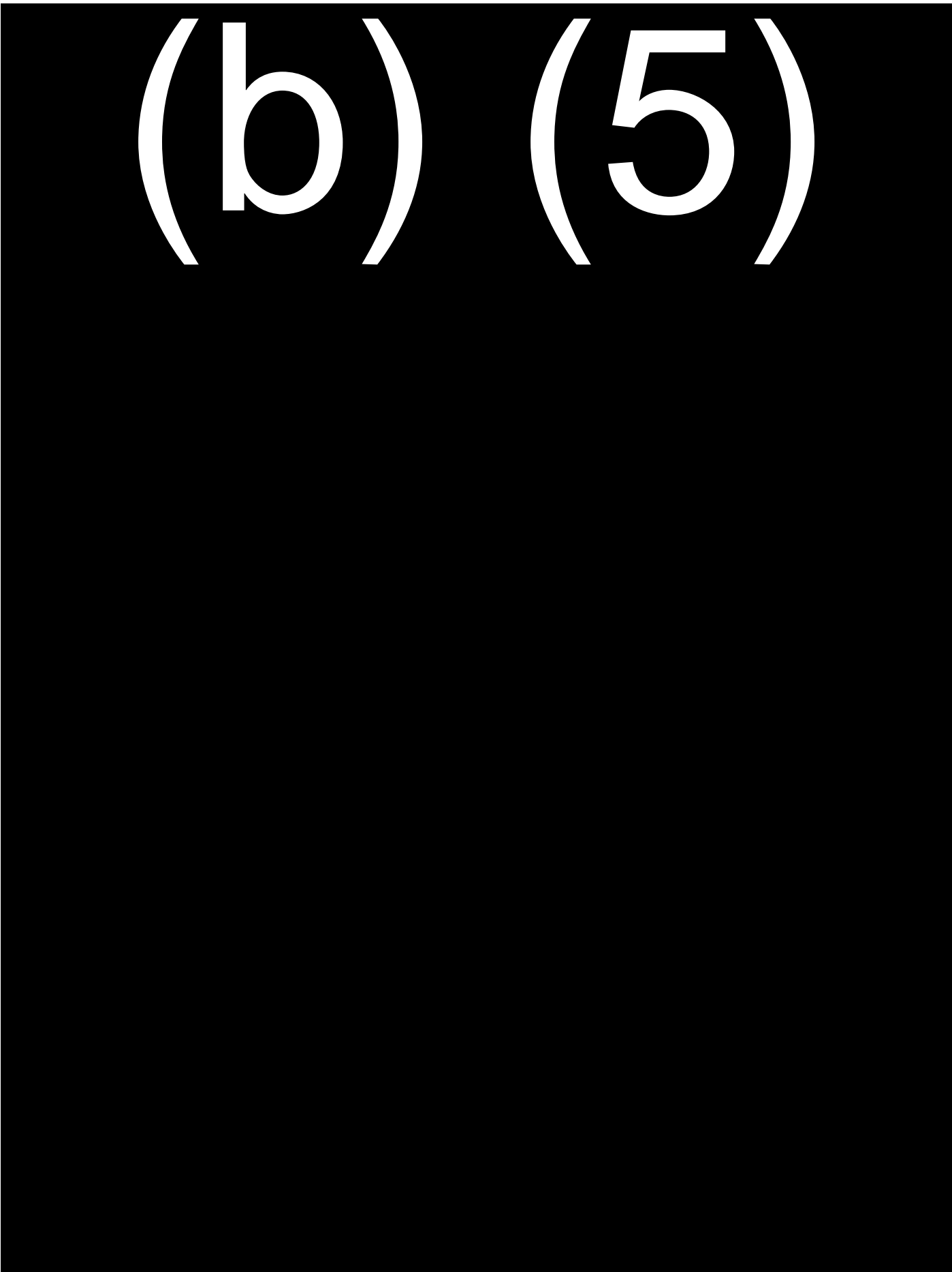
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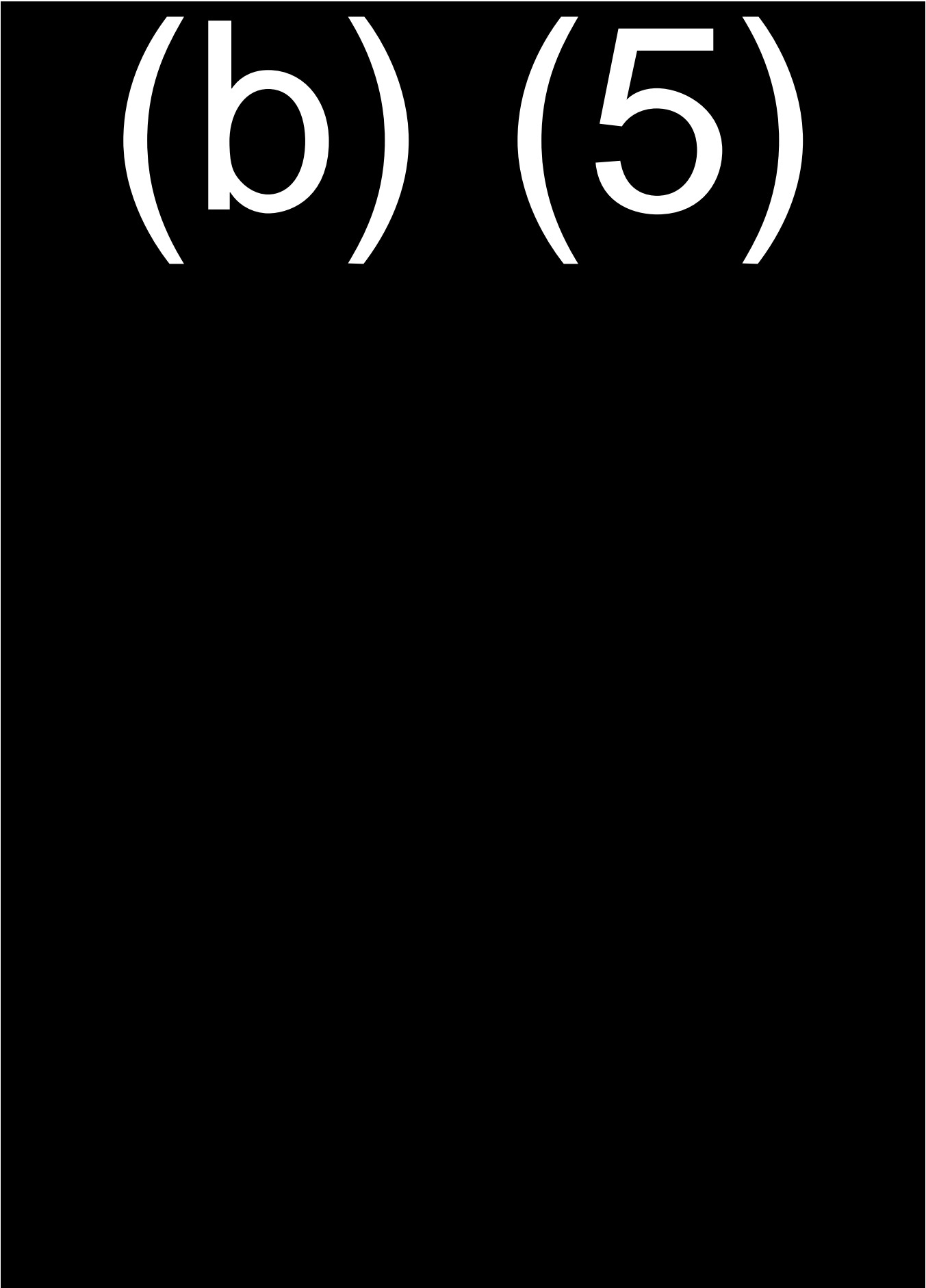




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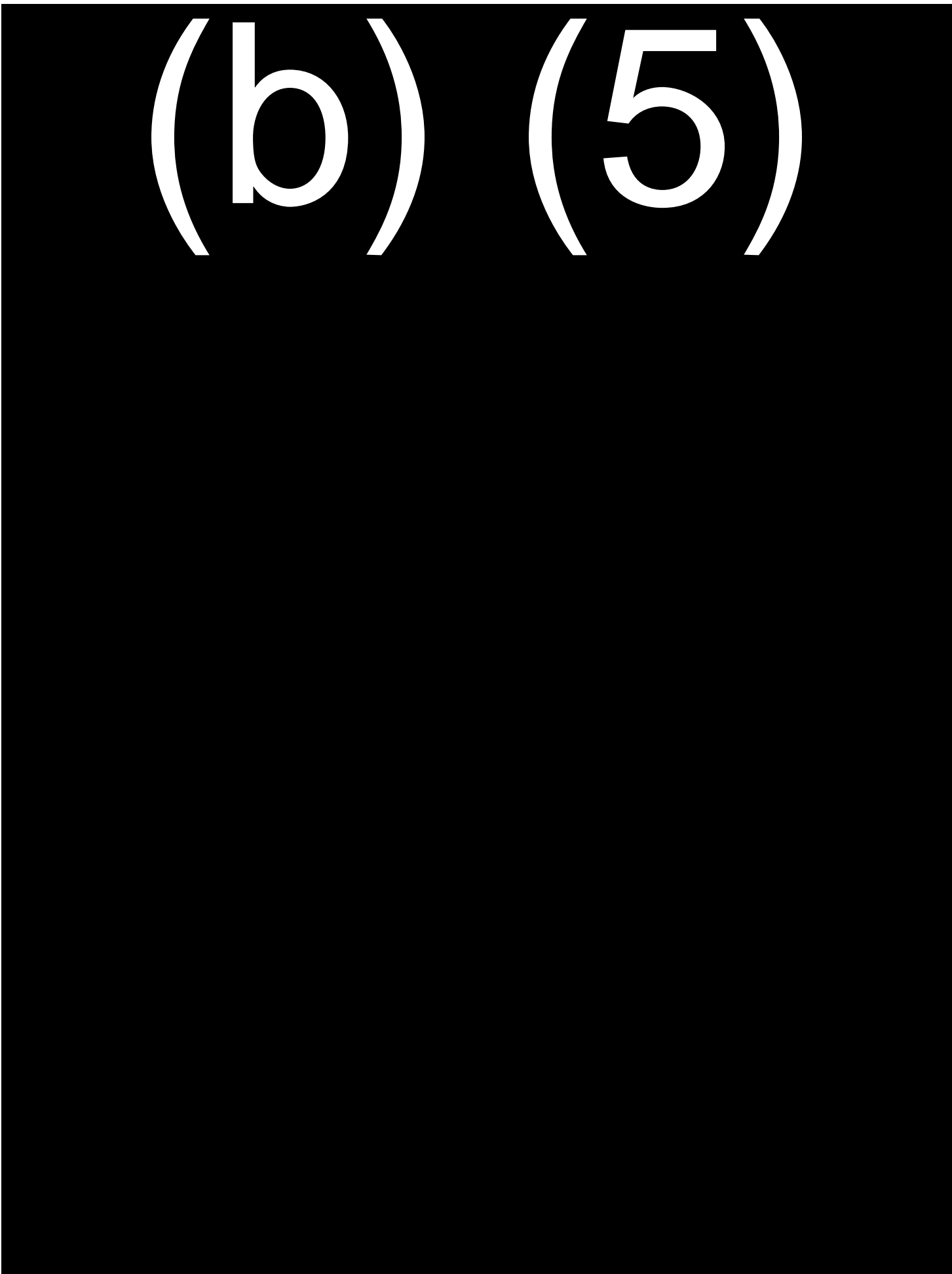


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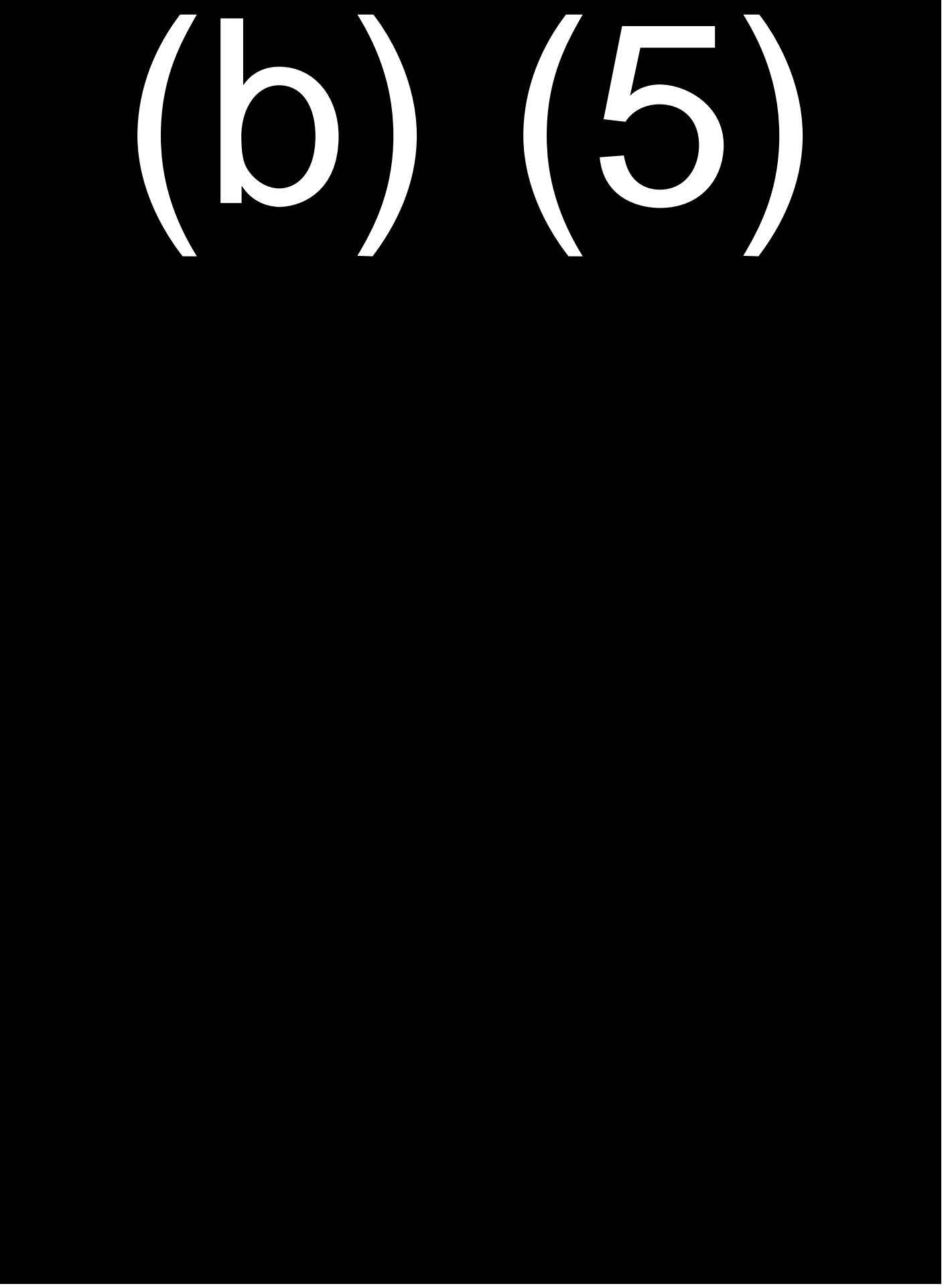


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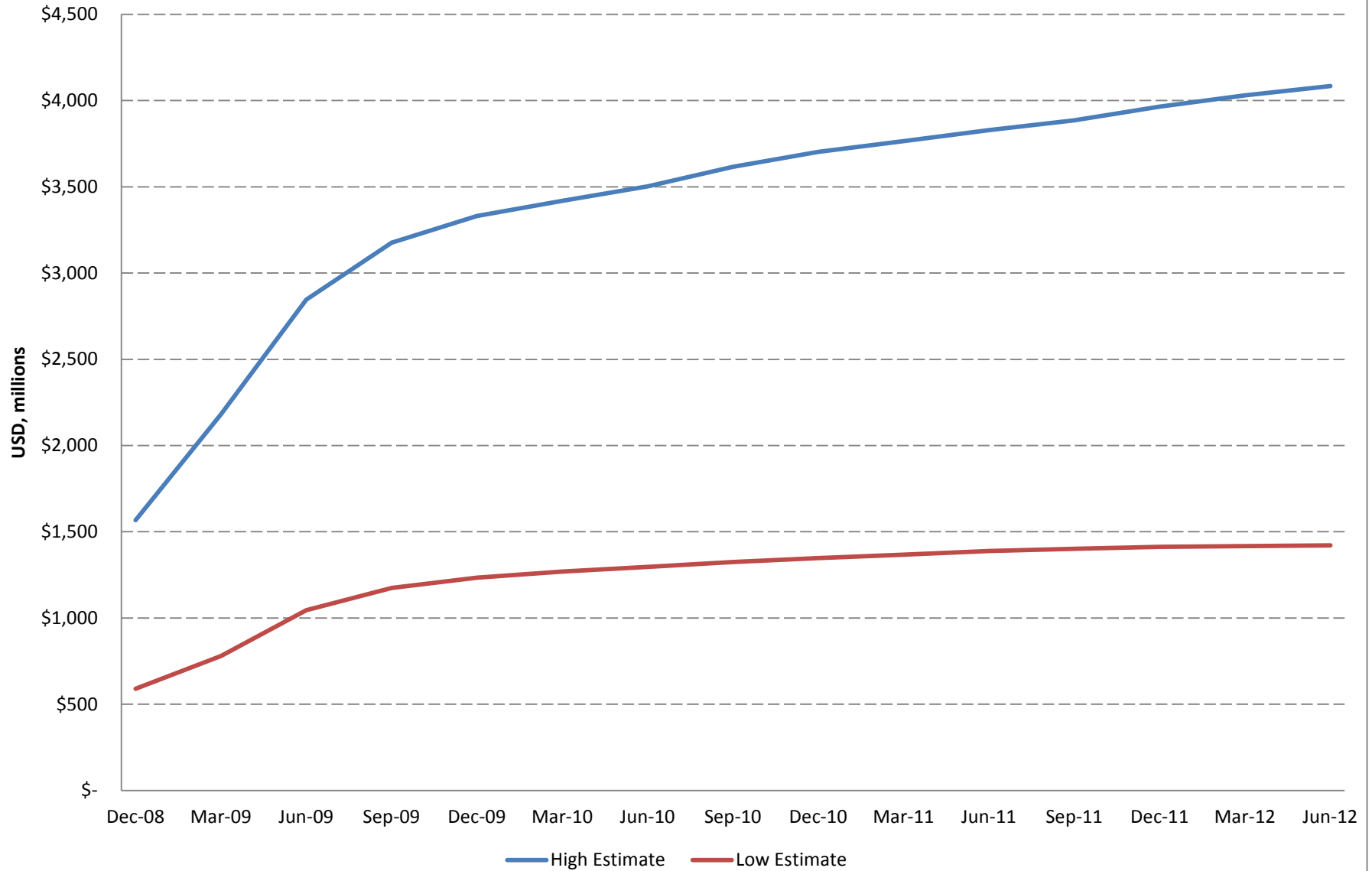
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## Estimated Potential Cumulative Net Losses to the Enterprises on Floating Rate MBS and Interest Rate Swaps from LIBOR Suppression





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# Essentials of Mortgage Securitization

## Lecture Notes

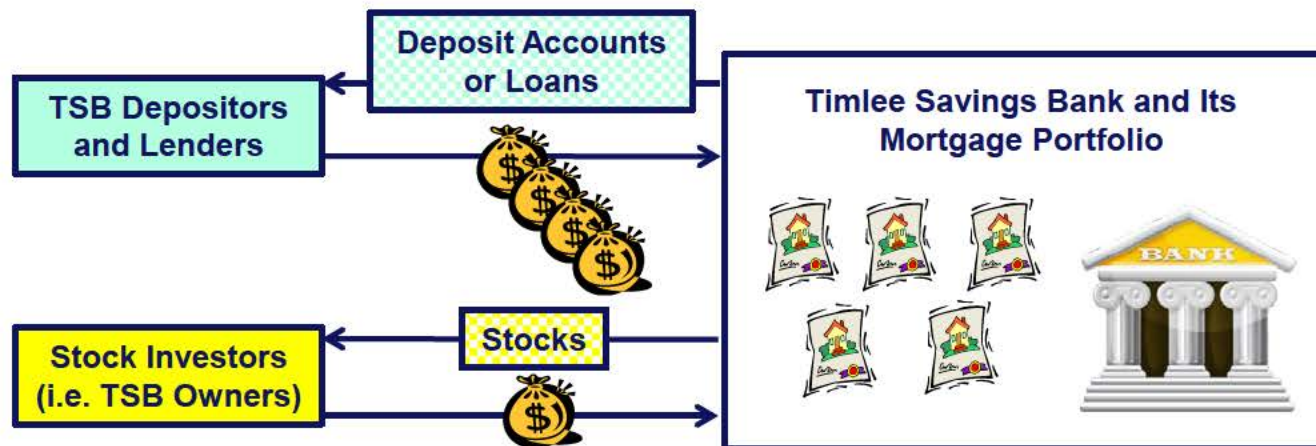
May 26, 2011

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# How Does a Mortgage Lender Finance Its Business?

## *Traditional Approach: Stock or Equity Investments and Debt*

- A traditional mortgage lender, such as Timlee Savings Bank (TSB), obtains money to fund the mortgage loans it makes and holds, using stock investments and borrowed money
  - Stock (AKA equity) investments represent shared ownership in the bank
  - Most of the lender's funding is borrowed from depositors, bond investors, or other banks
- Both types of investors look to TSB for returns on their investment from its business operations
  - Depositors and bond investors seek a contractually fixed rate of return, and are also entitled to repayment of their capital (depositors, on demand; bond investors, at maturity)
  - Stock investors commit their money indefinitely (though they can sell their shares), seek excess returns after creditors are paid, and are the first to suffer if TSB's business falters

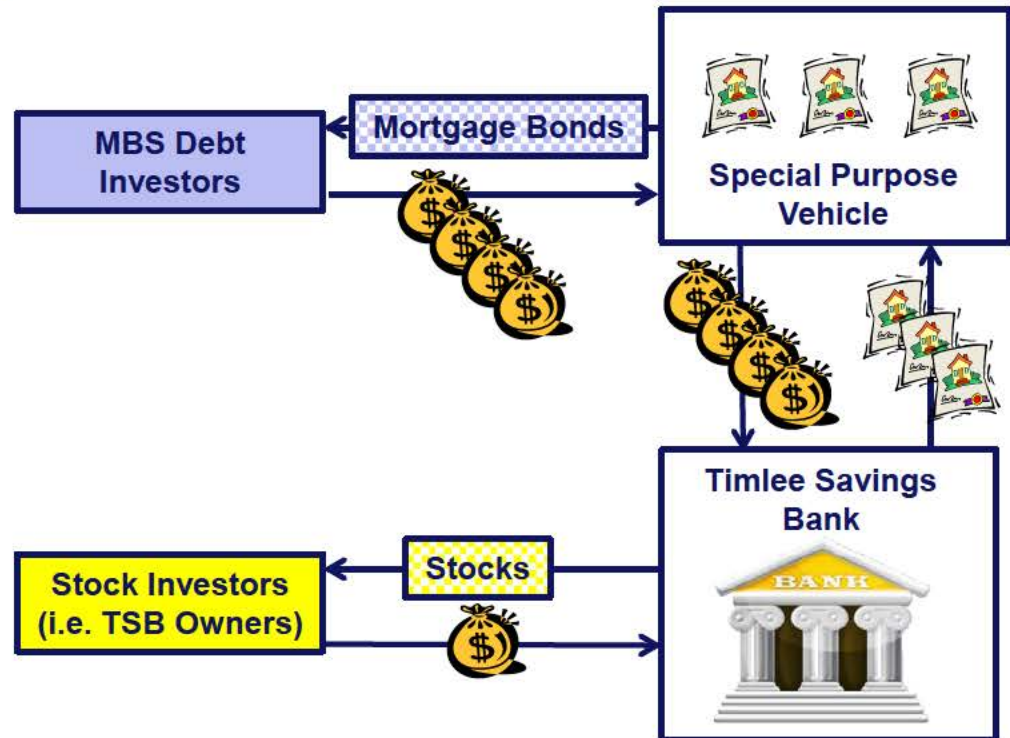




# How is Securitization Different?

## *Securitization bundles and sells off income-producing assets like mortgage loans*

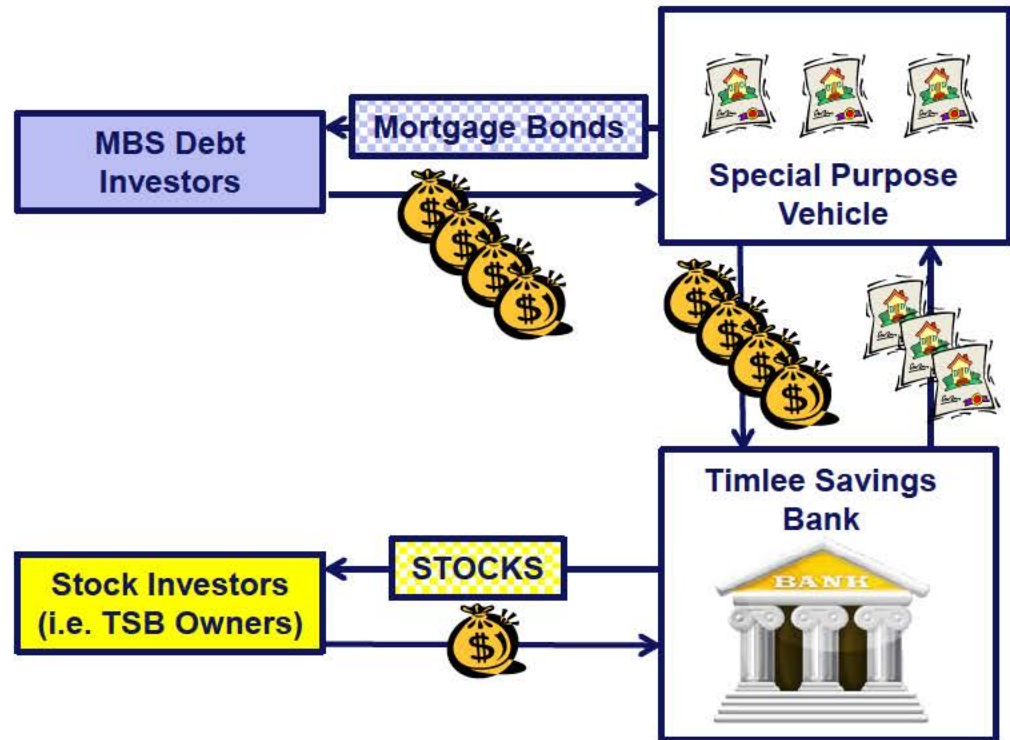
- Instead of keeping its debts and mortgage loan assets on its own balance sheets, TSB could finance its business by securitizing them instead
- Rather than holding on to the mortgages it originates, TSB could sell them to a Special Purpose Vehicle (SPV)
- The SPV is a company formed solely to hold the mortgages and issue bonds; it conducts no business of its own
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# How are MBS Bondholders Repaid?

## *MBS bondholders look only to their asset portfolio for repayment*

- Investors in the MBS bonds may look only to the SPV for repayment
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- In practice, this process is intermediated by the Enterprises

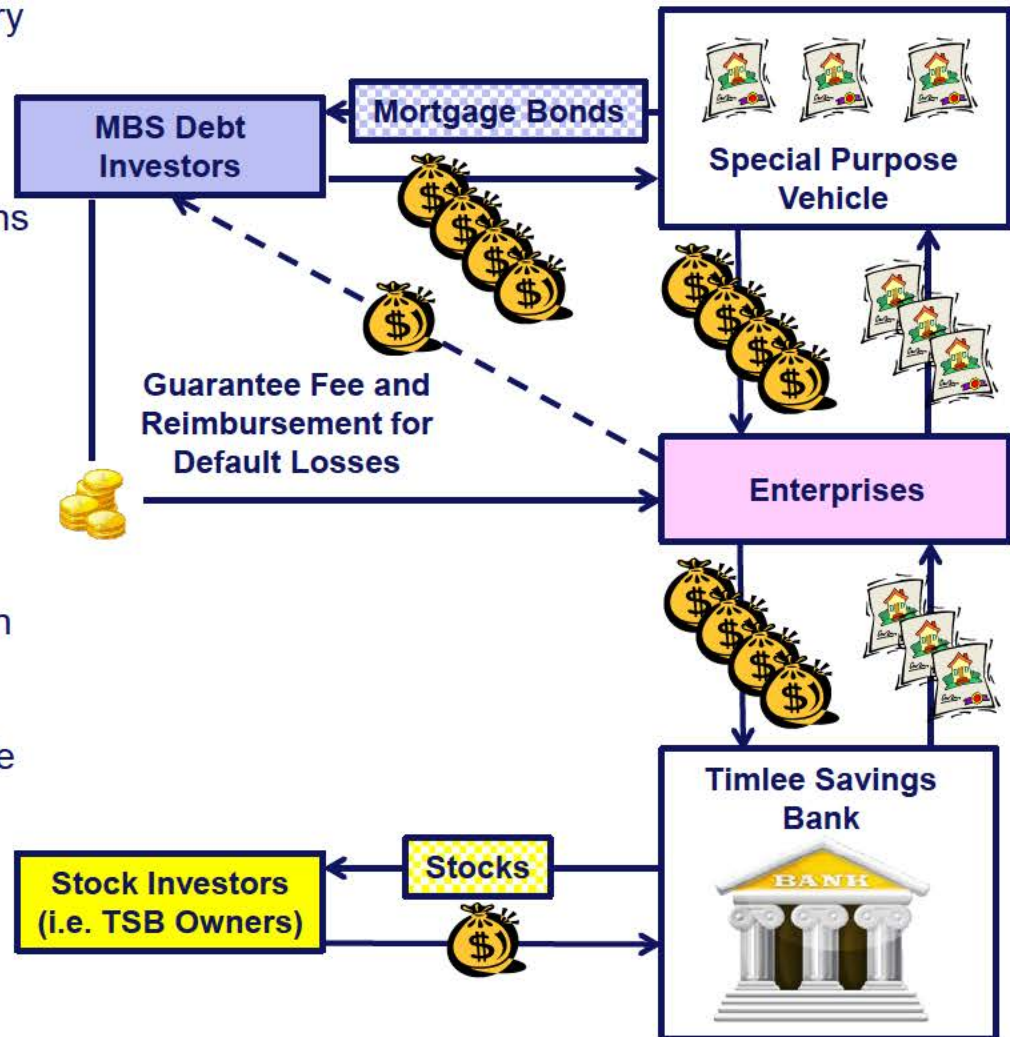




# The Role of the Enterprises

## *The Enterprises intermediate the mortgage securitization process*

- The Enterprises serve three intermediary functions in the securitization process:
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  - Oversee the “capital markets” process of securitizing the loans into MBS and selling the bonds
  - For a fee, they also guarantee MBS bondholders against loss on their investments
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# A Word About Portfolio Risks: Interest Rate Risk

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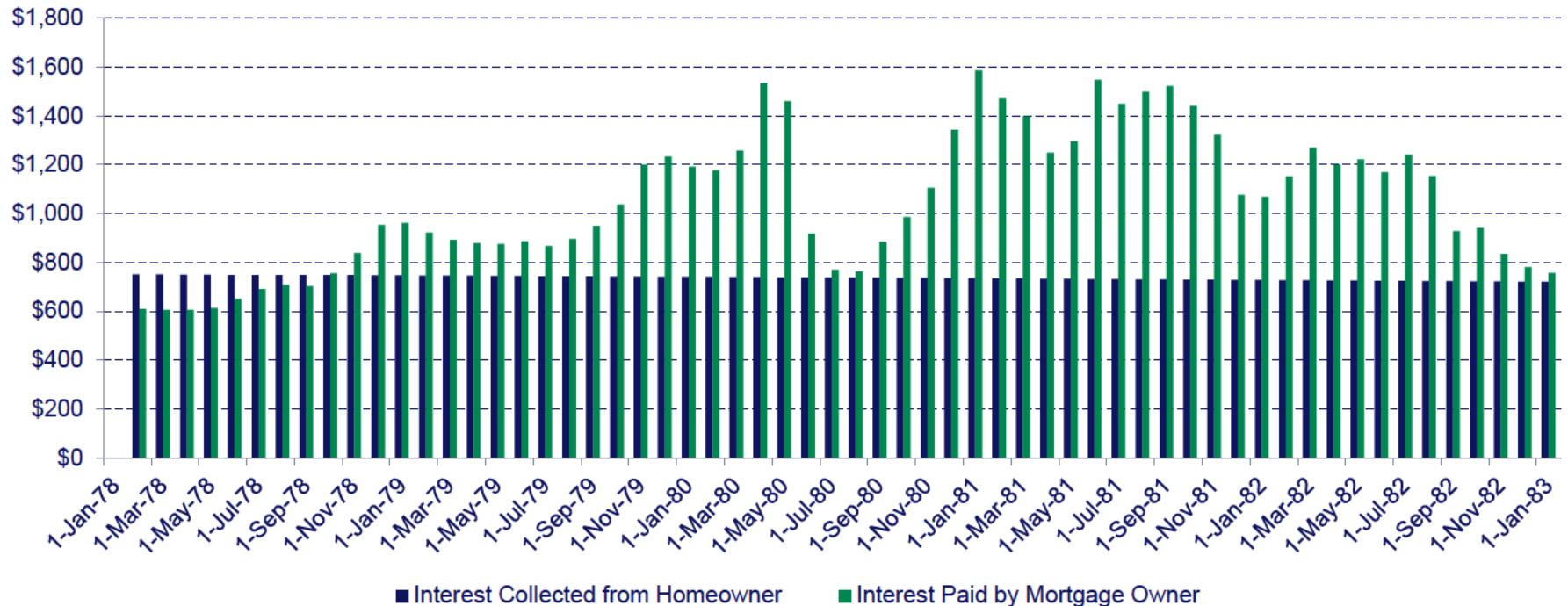
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- Borrowing costs are calculated by looking up the value of the index and adding a predetermined margin to calculate the interest payment
- For example, a \$1,000 bond pays interest quarterly at 3-month LIBOR + 100
  - On May 12, the value of 3-month LIBOR was 0.26%. So, if calculated today, the subsequent quarter's interest would be based on a rate of 1.26%, and equal about \$3.15.
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- As short-term interest rates skyrocketed over the next few years, TSB paid more interest on the borrowed money than it was collecting from Kotter. In fact, TSB ended up losing about \$19,000 on a \$100,000 mortgage over the next five years.
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Source: Board of Governors of the Federal Reserve System

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## *MBS holders also worry about prepayment risk in their holdings*

- Nearly all mortgage contracts permit the borrower to pay down additional principal on the mortgage any time before maturity, in part or whole, without penalty
- When interest rates fall, a debt tends to become more valuable
  - A \$100 debt that pays 5% annually will be worth over \$100 when the going rate is 2%
- But homeowners like to refinance their mortgages when rates are low
- So MBS owners experience more early repayments when rates are low, and have to reinvest that money in lower-yielding alternatives
- Prepayments are also driven by home sales and relocations

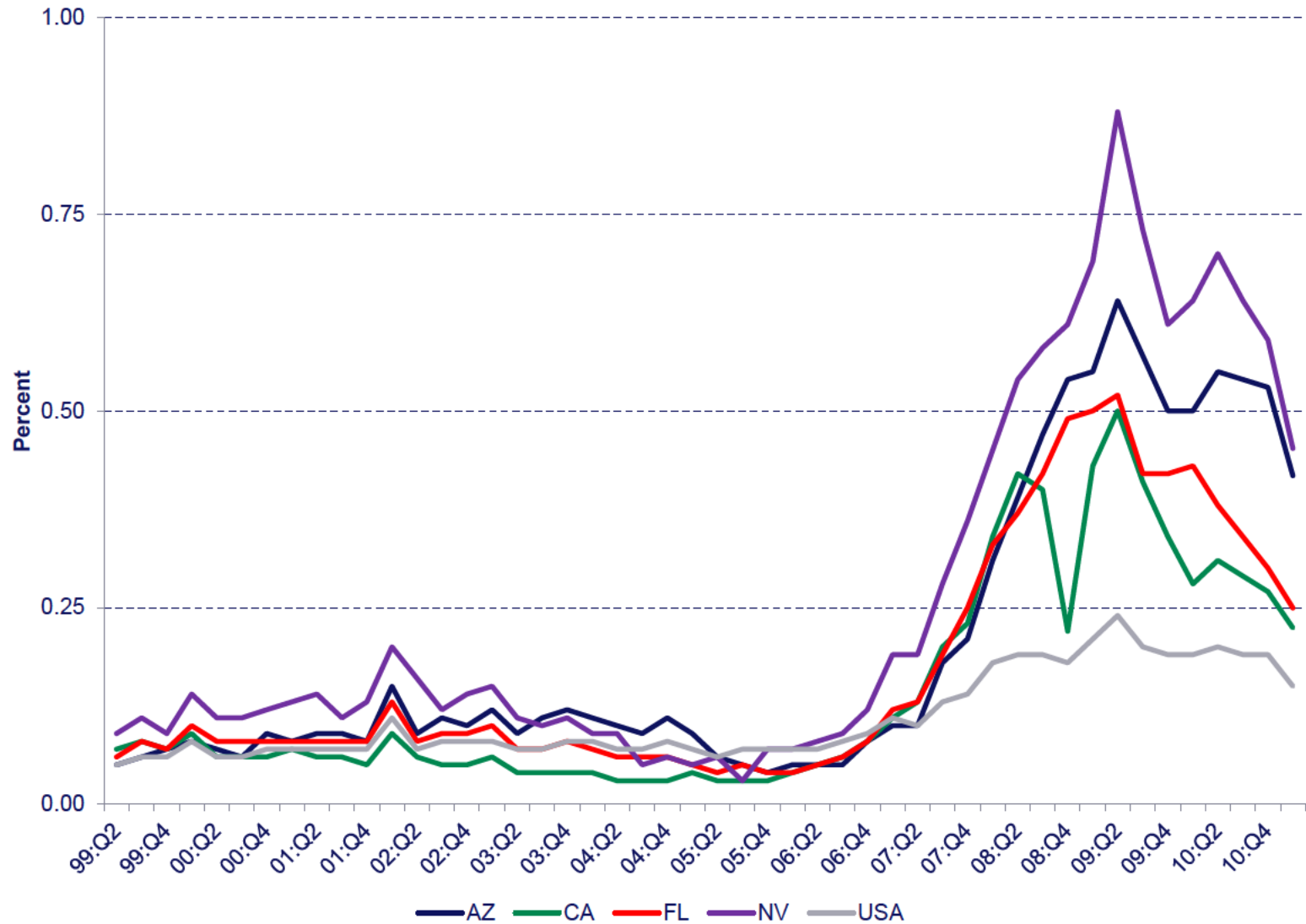
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***Finally, MBS holders face credit risk, or default risk, in their holdings***

- Borrowers may not make their mortgage payments in full and on time
- A payment default typically results in modification of the loan's terms or foreclosure and sale of the house, with most of the proceeds going to repay the mortgage holder to the extent possible
- Historically, default rates tended to be very low for portfolios of mortgage loans
  - Borrowers tended to pay mortgages even if they fell behind on auto loans and credit cards
  - During the housing boom, the default rate was suppressed by the easy availability of refinancings at lower initial monthly payments
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# Percentage of Consumers with New Foreclosures, 1999-2011



Source: Federal Reserve Bank of New York



# Why Securitize?

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***Securitization can transfer these risks and provide more cost-efficient financing for mortgage lenders***

- Quickly converts lender's loan assets into cash for further mortgage lending
- Transfers interest rate, prepayment and credit risk from lender to MBS bondholders
  - In practice, a number of contractual provisions, such as repurchase rights, resulted in lenders' retaining some degree of risk
  - Also, lenders often hold a small portion of the securitized MBS themselves ("eat your own cooking")
- Historically, because of this risk transfer, lenders were able to treat their securitized mortgage loans as sold ("moved off balance sheet"), which often resulted in
  - Reduction of regulatory capital requirements; i.e. reduced need for stockholder investment or earnings retained as a buffer against unexpected losses
  - Immediately reportable book profits
  - Higher return on equity for comparable mortgage portfolios
- Future of securitization perhaps most uncertain with respect to accounting and capital treatment

# How Do Lenders Make Money If They Sell Off Their Loans?

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## *Fee income from origination and servicing*

- “Vertical disintegration” of the mortgage lending supply chain
  - Transformation of mortgage lenders from asset management companies to loan origination and servicing companies
- Lender business model changed to focus on origination and servicing fees
  - Origination is the sales process for mortgage lending; it generates upfront fees
  - Servicing is the process of tracking and collecting amounts due from borrowers each month, as well as undertaking modification and foreclosure proceedings when necessary
  - Because the SPV for the MBS does not conduct business on its own, it must contract with third parties to service the mortgage loans it owns.
  - In practice, these “servicing rights” often remain with the same company (“seller-servicer”) that originated the mortgage loan and sold it to the SPV
- Fee levels and structure
  - Upfront origination fees have generally been around 1% of the loan amount
  - Originator may also take a portion of the interest paid by the borrower (yield spread premium)
  - Historically, servicing fees have been 0.25% and up of the principal balance per annum
  - For a \$200,000 loan, this meant \$2,000 upfront and at least \$500 per year for a seller-servicer

# How Did This Change Lender Business Models?

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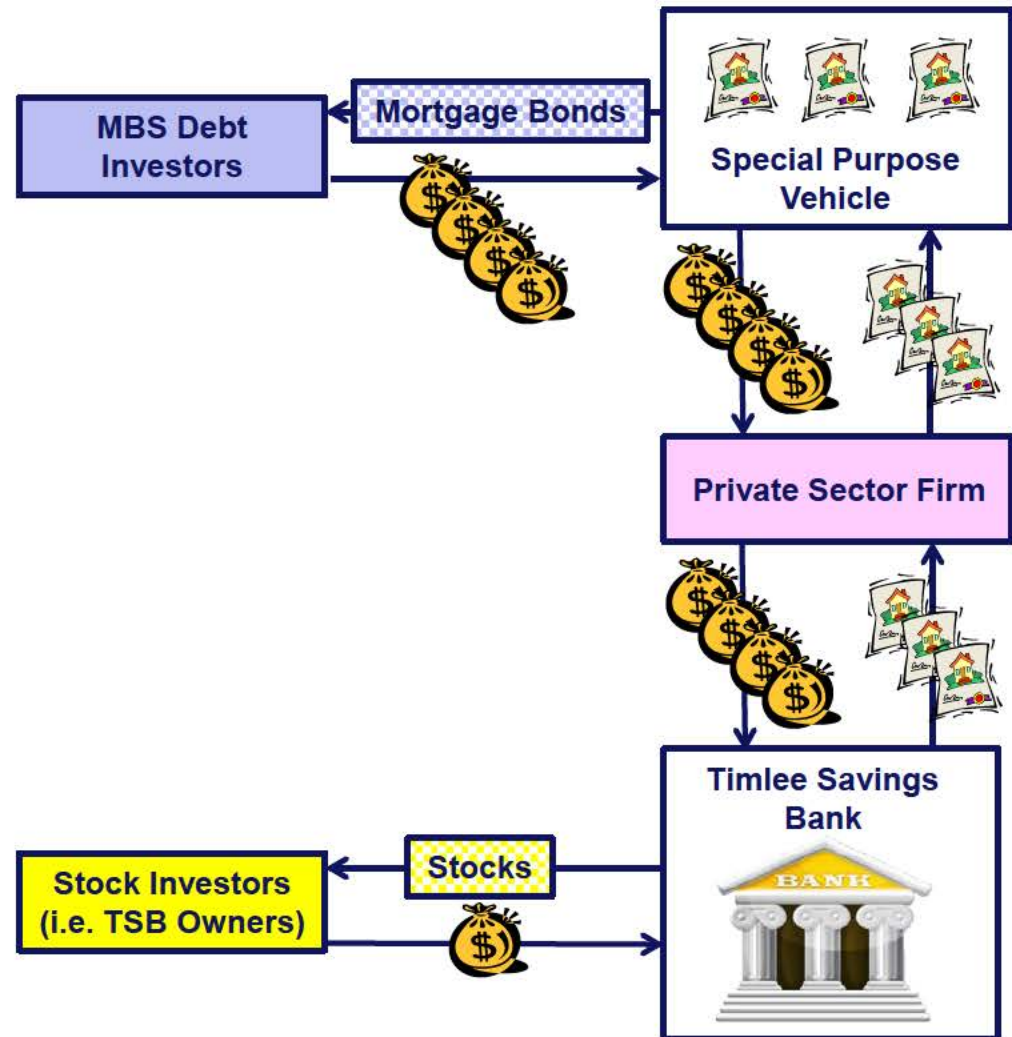
## ***Mortgage lenders transitioned from the storage business to the moving business***

- Before the spread of securitization, lenders had to attract and maintain a sizable base of funding in order to build a lending business
  - Before securitization, development of the funding base (attracting deposits, obtaining loans) typically preceded the lending business
  - Lenders typically held on to the loans they originated, so underwriting for long-term creditworthiness was critical to institutional survival
- Securitization permitted ‘outsourcing’ of funding and asset management
  - New lending businesses could be built from temporary “warehouse” credit lines and MBS bonds sold by Wall Street firms
  - Investors looked to the loans themselves, rather than to an established corporate name, for creditworthiness
  - These circumstances transformed the lending business and gave rise to new entrants
- Lenders shifted focus with transition to fee-based businesses
  - Shift to fee revenue implied opportunity for more stable reported earnings and lower capital requirements
  - Loan volume (origination fees) mattered more; long-term credit risks were offloaded to others

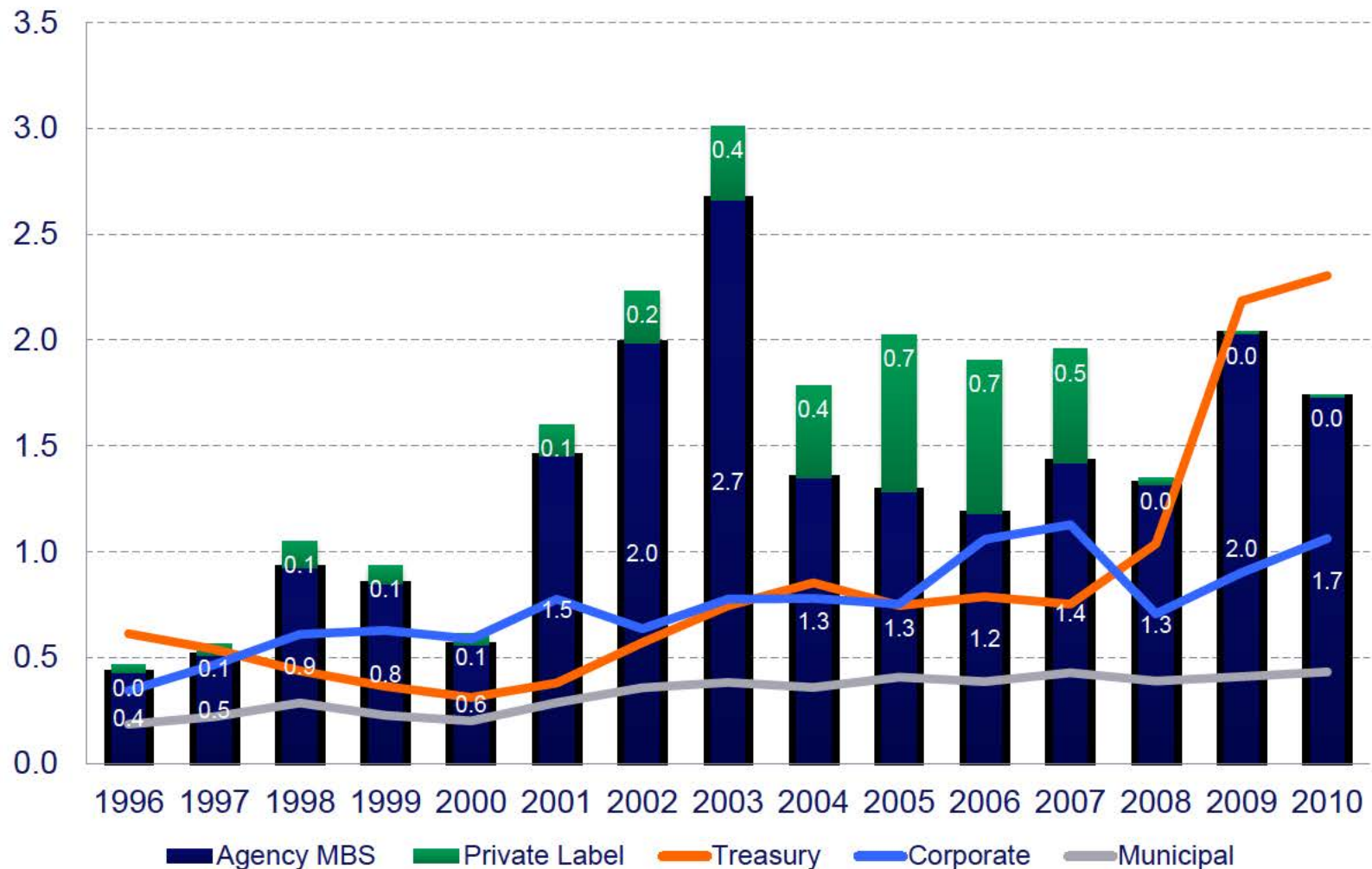
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- With large quantities of capital available from MBS investors to lend, mortgage lenders responded to their incentives to generate new loans
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## US Bond Issuance 1996-2010 (\$ Trillions)



Source: Securities Industry and Financial Markets Association



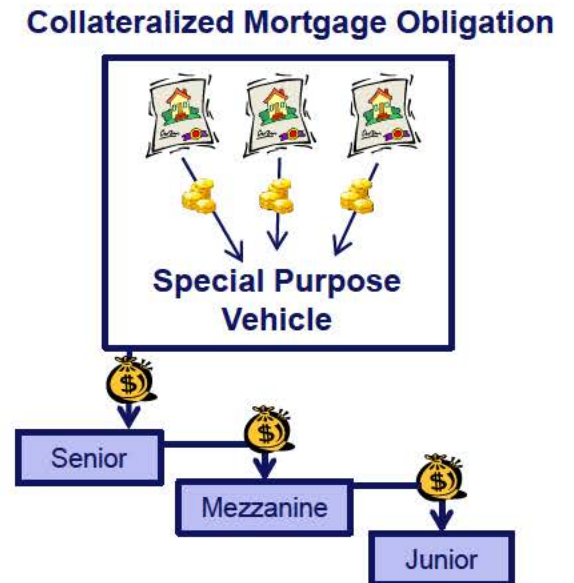
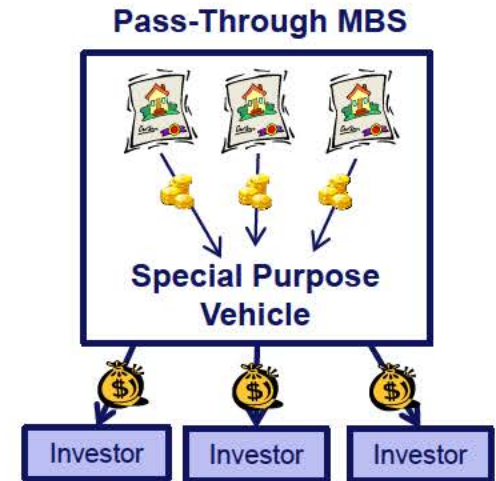
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## *Pass-throughs versus CMOs; CDOs*

- Pass-through MBS are the oldest type; they simply pass through mortgage payments to bondholders on a pro rata basis
- Collateralized mortgage obligations (CMOs) distribute payments to bondholders according to predefined rules (the “waterfall”).

The most common approaches include:

- Junior/senior priority of payments (i.e. senior bondholders receive a lower yield in return for being shielded from defaults in the portfolio by better-paid junior bondholders)
- “Time tranching”, wherein some bondholders receive principal payments before others (this addresses prepayment risk)
- MBS themselves can be sold into other SPVs, which issue bonds called collateralized debt obligations (CDOs). CDOs are basically CMOs that hold MBS, asset-backed securities, or corporate debt instead of mortgage loans



# Who Buys MBS Bonds?

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***MBS bond market is well-developed, with a wide range of buyers***

- Major MBS investors include commercial banks, pension funds, and the Enterprises themselves
- Investor advantages include:
  - Traditionally large issuer of sought-after top-rated debt (Aaa/AAA bonds are typically the vast majority of all the debt issued in an MBS transaction)
  - Consistently higher yield than sovereign or corporate bonds of similar life
  - For senior investors, inherent benefits of diversified asset portfolio
  - For “agency” investors in MBS sponsored by the Enterprises, benefit of guarantees with implicit Federal backing (wink!)
  - Through mid-2000s, MBS bonds had had few downgrades or defaults. No, really!
- Many large investors limited to highly-rated debt, forming a ready audience for MBS bonds
- More recently, the Federal Reserve and Treasury have stepped in to support the market

# Why Were They Highly Rated?

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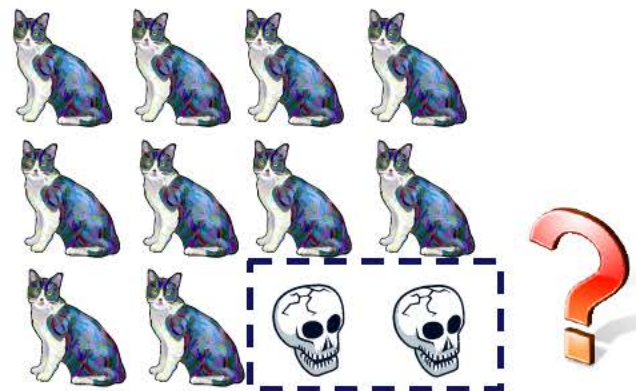
***Like other bonds, MBS are typically rated for creditworthiness by NRSROs***

- Nationally Recognized Statistical Rating Organizations (NRSROs or rating agencies) include Fitch, Moody's, and Standard and Poor's, among others
- While the NRSROs rate corporate and sovereign debt using conventional credit and balance sheet analysis techniques, they apply a different methodology to rate MBS
  - Like one big Schrodinger's cat, a corporate or sovereign bond is either dead or alive
  - By contrast, each residential MBS is usually backed by thousands of home loans, each one a little Schrodinger's cat
  - MBS default analysis boils down to predicting how many dead cats you will find
- The NRSROs use statistical techniques and made key assumptions to evaluate MBS

**Corporate/Sovereign Analysis**



**MBS Default Analysis**





# What Went Wrong With Rating MBS?

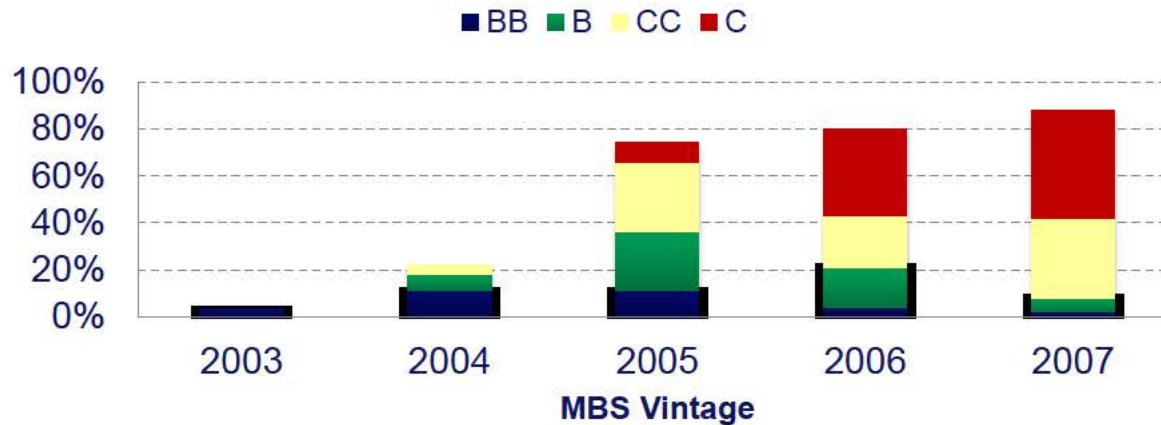
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## *Rating agency approaches used assumptions that did not hold up*

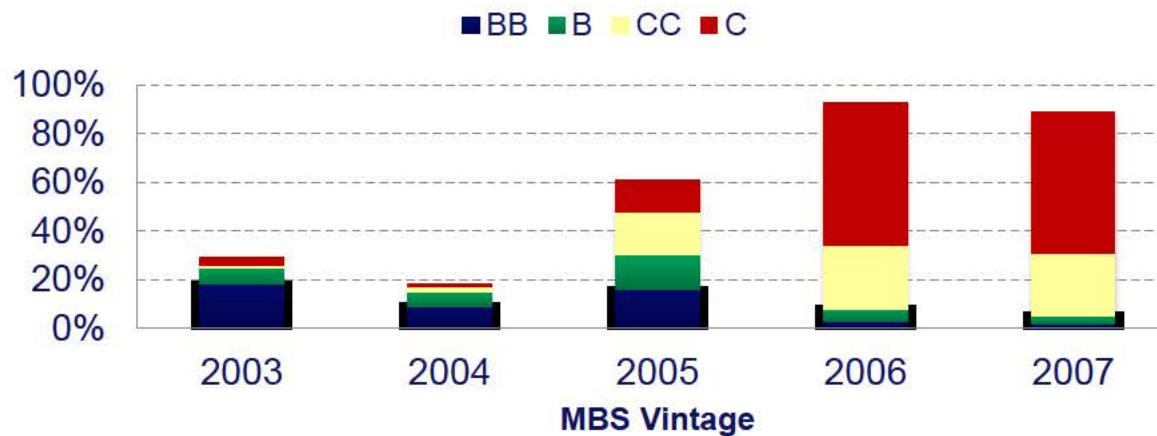
- The NRSROs based their probability of individual defaults on historical mortgage default data
  - Did not properly account for the drop in lending standards during the housing boom and other secular trends
  - Did not anticipate the effects of a nationwide fall in home prices
- Weaknesses in modeling correlation
  - Correlation describes the likelihood of one event given another; e.g. the likelihood that a second loan in the portfolio will default if the first one does
  - Rating agency methodology assumes correlation is static, but correlation between different assets tends to rise during hard times, especially financial panics
    - “Men, it has been well said, think in herds; it will be seen that they go mad in herds, while they only recover their senses slowly, and one by one.” – Charles Mackay
- Literally thousands of MBS bonds have been downgraded from top-level credit ratings (Aaa/AAA) over the past four years
- [An MBS banker, newly fired from Lehman Brothers, reacts to the collapse of the mortgage market](#)

# Fallen Angels: Junk MBS Rated AAA at Issuance

**Percentage by Balance of MBS Backed by Prime Mortgage Loans**



**Percentage by Balance of MBS Backed by Subprime Mortgage Loans**



Approximate Bond Rating	Idealized Ten-Year Default Risk
AAA	0.1%
BB	13.5%
B	27.2%
CC	65.0%
C	100.0%

Source: Charts - JPMorgan Securities. As of May 2011. Table – Moody's Investors Service

# The Future of Mortgage Securitization

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***Currently, securitization remains mired in market and regulatory uncertainty***

- Effect of Dodd-Frank Act
  - Risk retention requirements proposed by FHFA, Federal Reserve, SEC, HUD and FDIC
  - Possible carveout for conservative, standard “qualified residential mortgage” loans; specifics to be defined
  - New disclosures with respect to loan portfolio, lender compensation and risk retention
- Stricter accounting standards (FAS 166/167) may raise regulatory capital requirements for many lenders that sell loans to MBS SPVs
- MBS: Still a four-letter word for many investors



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# Essentials of Mortgage Securitization

## Lecture Notes

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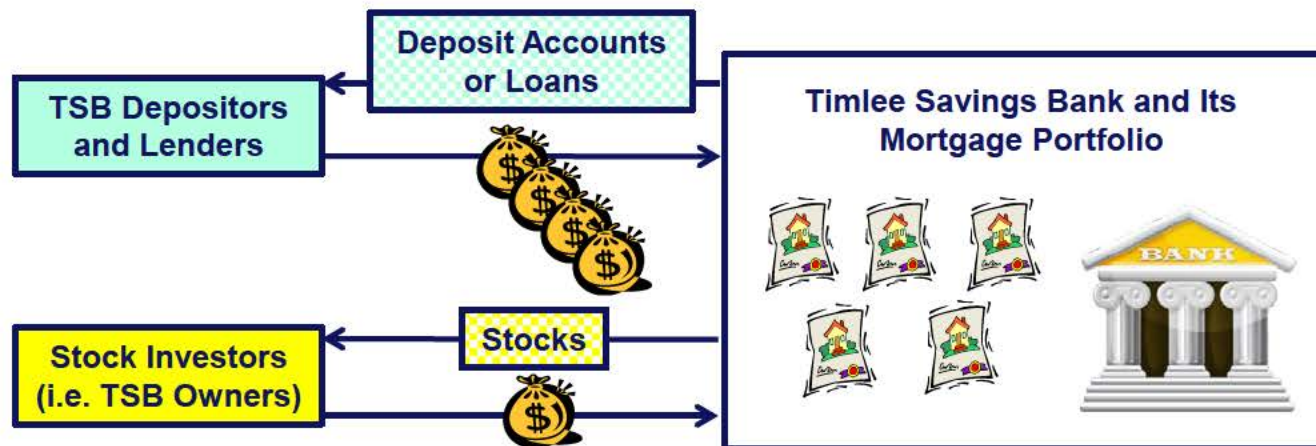
May 26, 2011

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# How Does a Mortgage Lender Finance Its Business?

## *Traditional Approach: Stock or Equity Investments and Debt*

- A traditional mortgage lender, such as Timlee Savings Bank (TSB), obtains money to fund the mortgage loans it makes and holds, using stock investments and borrowed money
  - Stock (AKA equity) investments represent shared ownership in the bank
  - Most of the lender's funding is borrowed from depositors, bond investors, or other banks
- Both types of investors look to TSB for returns on their investment from its business operations
  - Depositors and bond investors seek a contractually fixed rate of return, and are also entitled to repayment of their capital (depositors, on demand; bond investors, at maturity)
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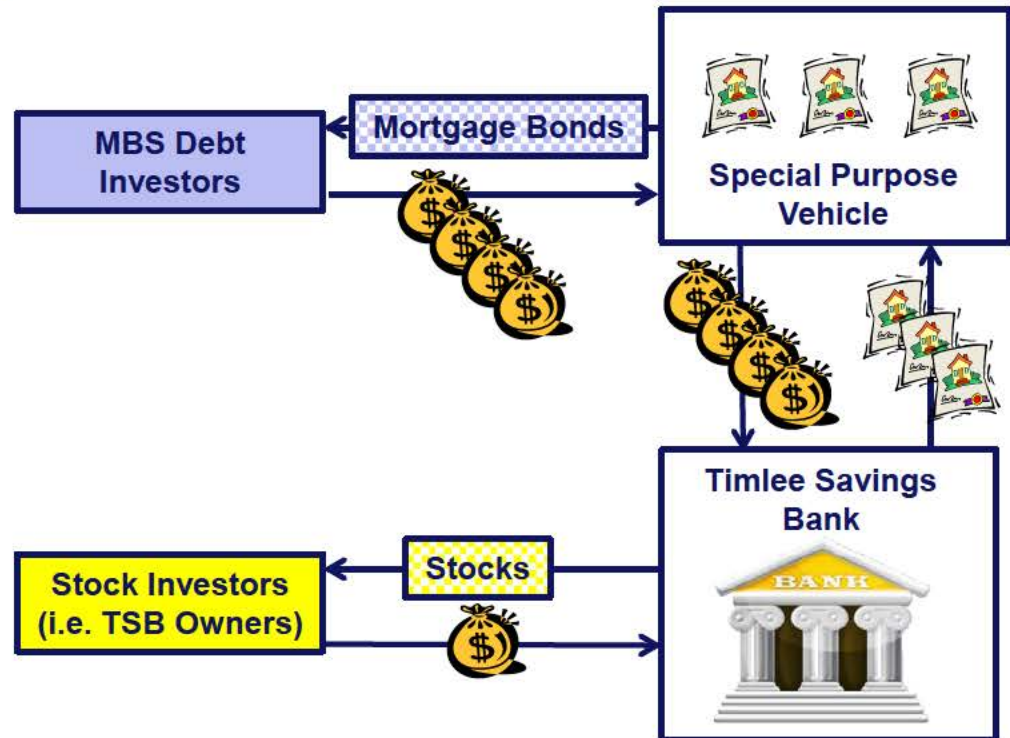




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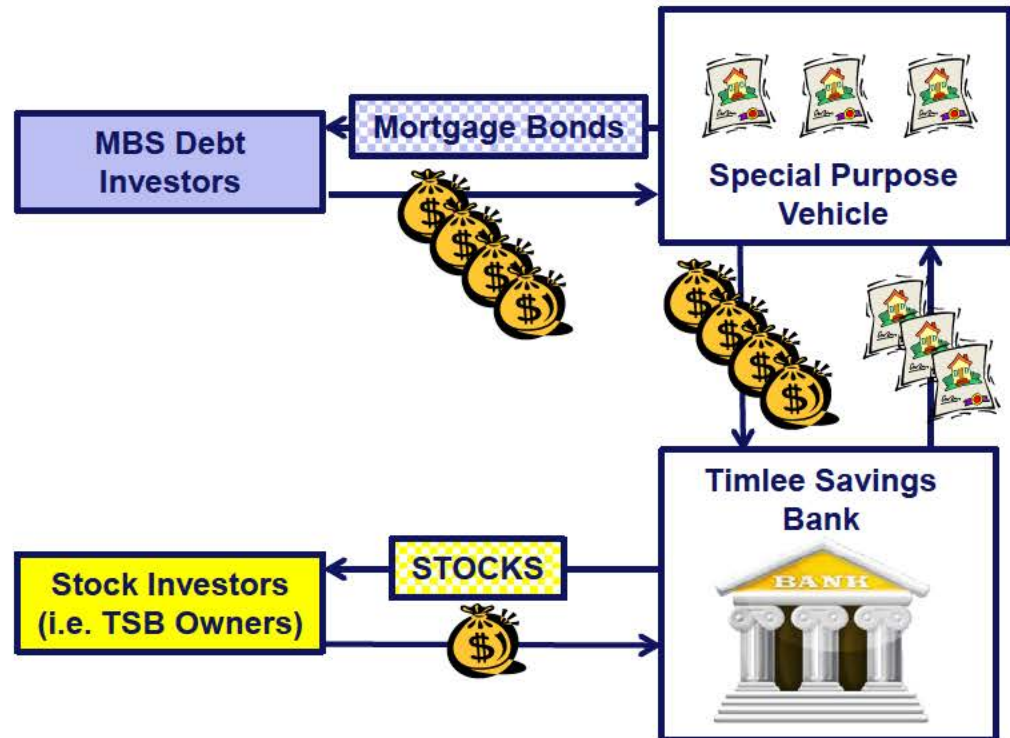
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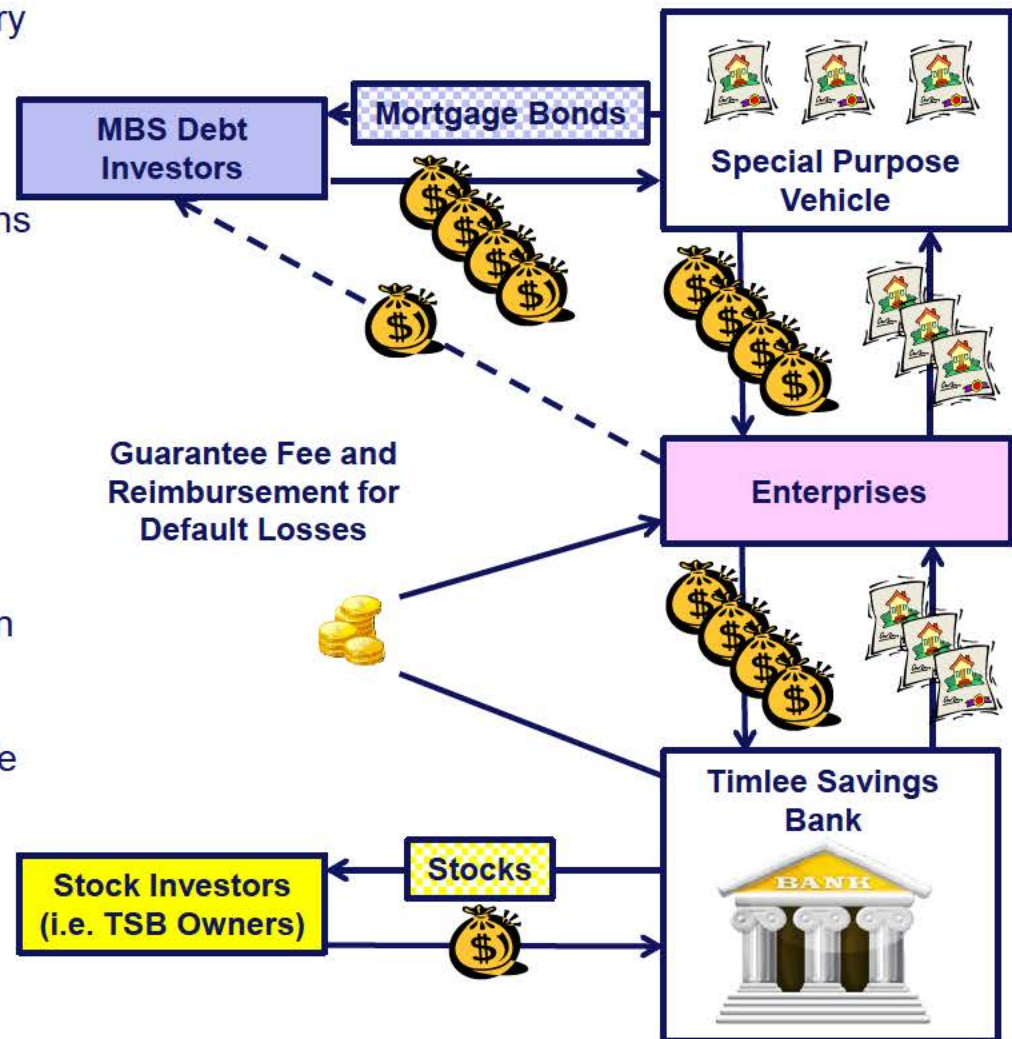




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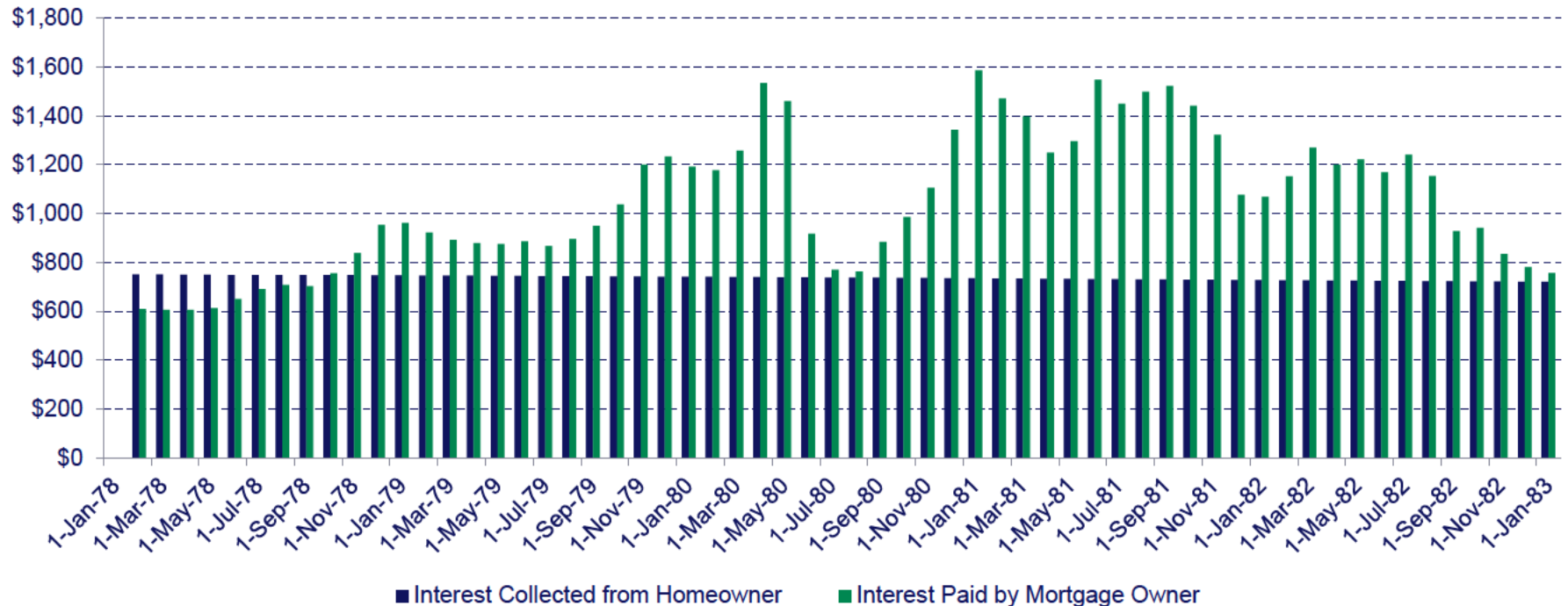
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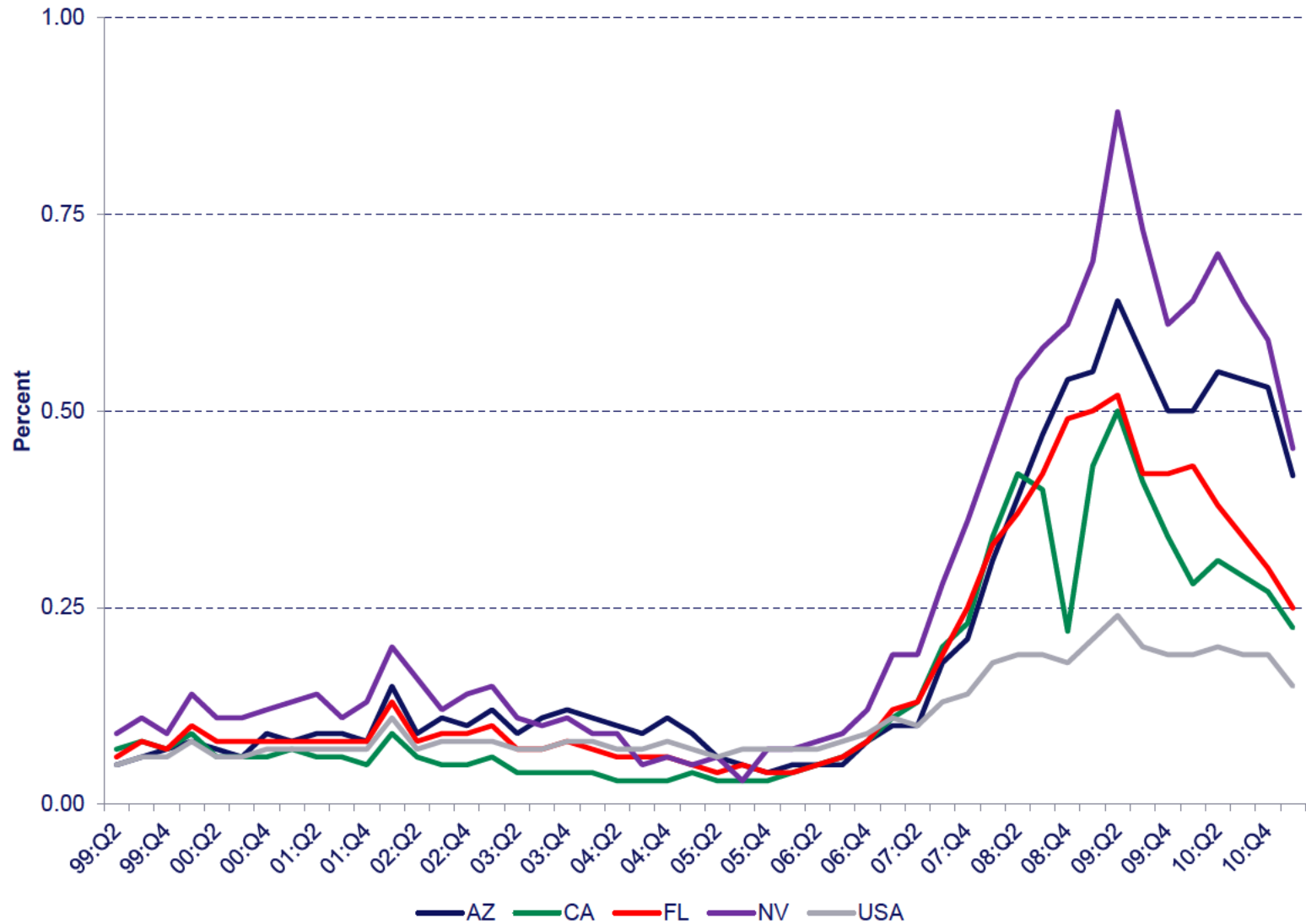
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# How Did This Change Lender Business Models?

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## ***Mortgage lenders transitioned from the storage business to the moving business***

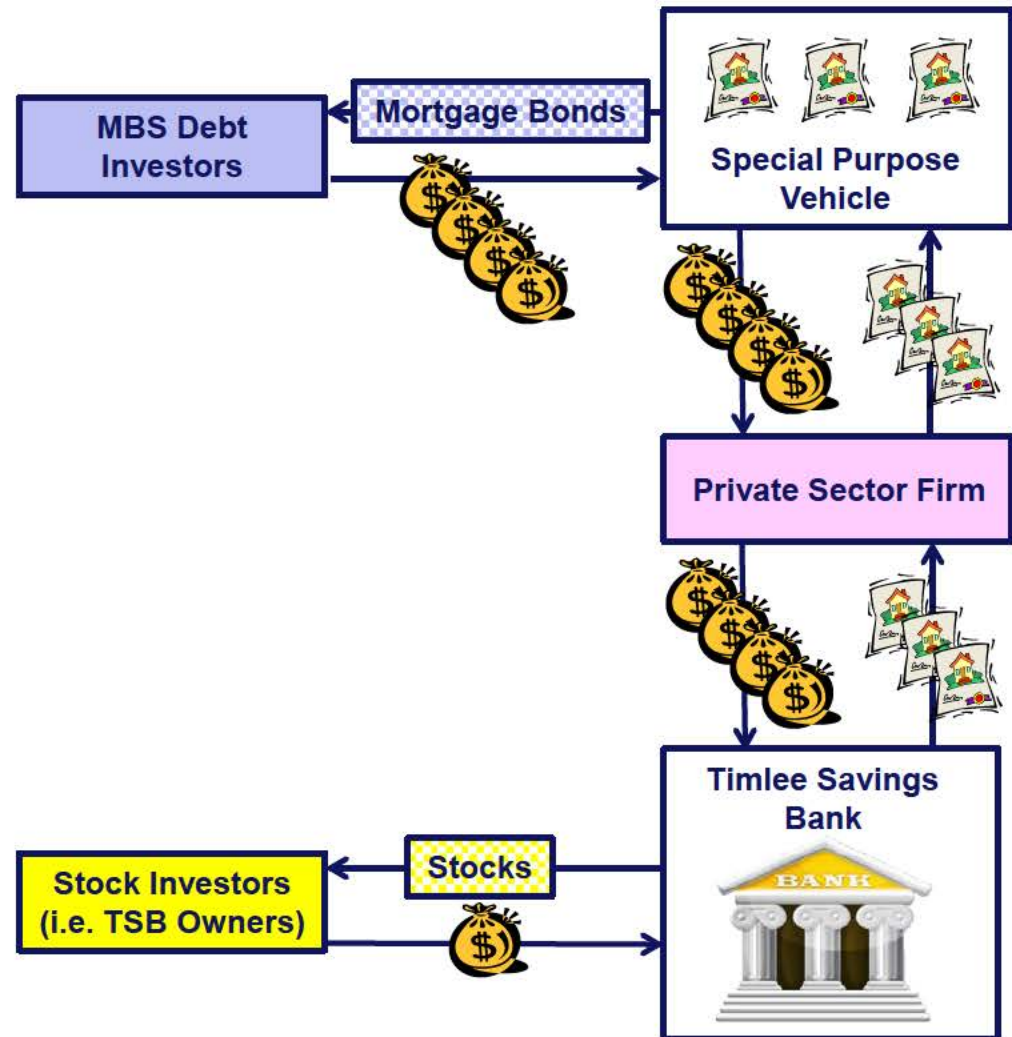
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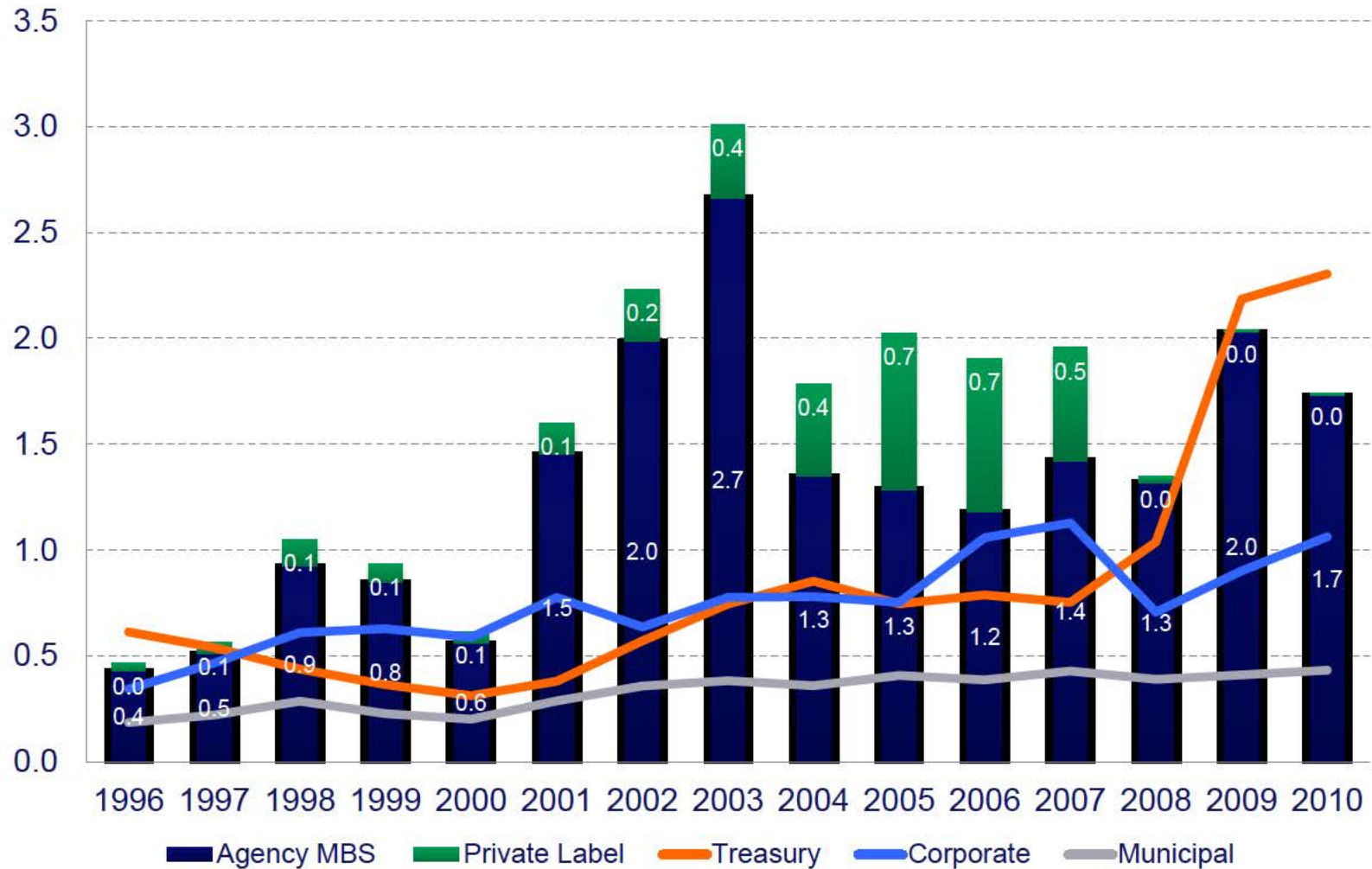
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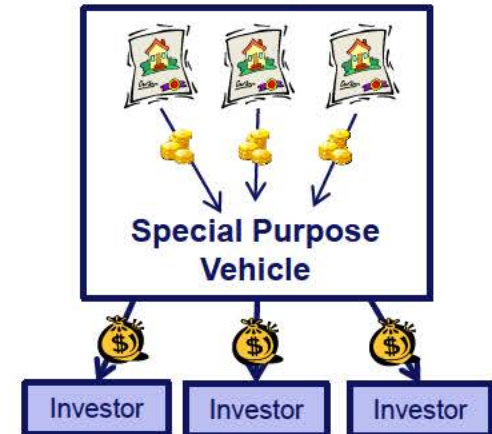
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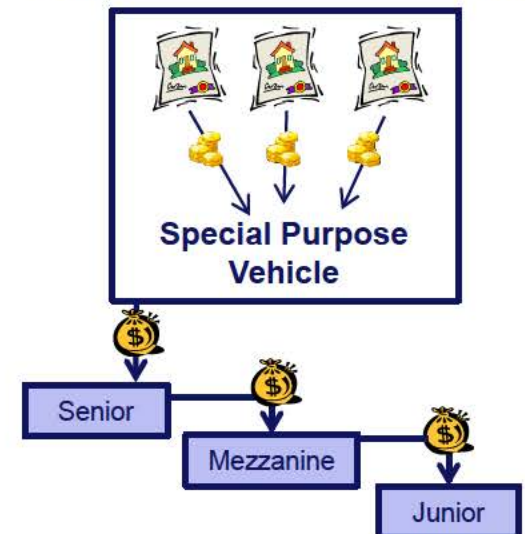
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- MBS themselves can be sold into other SPVs, which issue bonds called collateralized debt obligations (CDOs). CDOs are basically CMOs that hold MBS, asset-backed securities, or corporate debt instead of mortgage loans

### Pass-Through MBS



### Collateralized Mortgage Obligation



# Who Buys MBS Bonds?

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***MBS bond market is well-developed, with a wide range of buyers***

- Major MBS investors include commercial banks, pension funds, and the Enterprises themselves
- Investor advantages include:
  - Traditionally large issuer of sought-after top-rated debt (Aaa/AAA bonds are typically the vast majority of all the debt issued in an MBS transaction)
  - Consistently higher yield than sovereign or corporate bonds of similar life
  - For senior investors, inherent benefits of diversified asset portfolio
  - For “agency” investors in MBS sponsored by the Enterprises, benefit of guarantees with implicit Federal backing (wink!)
  - Through mid-2000s, MBS bonds had had few downgrades or defaults. No, really!
- Many large investors limited to highly-rated debt, forming a ready audience for MBS bonds
- More recently, the Federal Reserve and Treasury have stepped in to support the market



# Why Were They Highly Rated?

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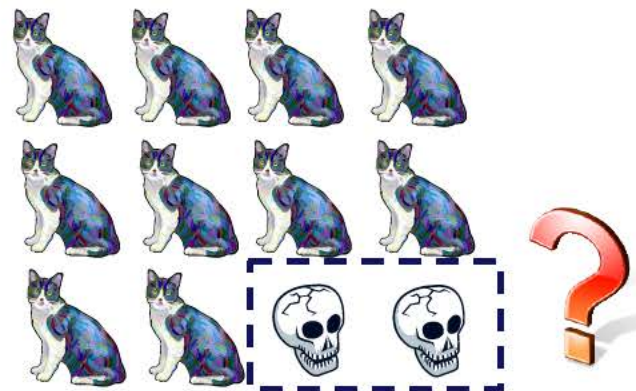
***Like other bonds, MBS are typically rated for creditworthiness by NRSROs***

- Nationally Recognized Statistical Rating Organizations (NRSROs or rating agencies) include Fitch, Moody's, and Standard and Poor's, among others
- While the NRSROs rate corporate and sovereign debt using conventional credit and balance sheet analysis techniques, they apply a different methodology to rate MBS
  - Like one big Schrodinger's cat, a corporate or sovereign bond is either dead or alive
  - By contrast, each residential MBS is usually backed by thousands of home loans, each one a little Schrodinger's cat
  - MBS default analysis boils down to predicting how many dead cats you will find
- The NRSROs use statistical techniques and made key assumptions to evaluate MBS

**Corporate/Sovereign Analysis**



**MBS Default Analysis**



# What Went Wrong With Rating MBS?

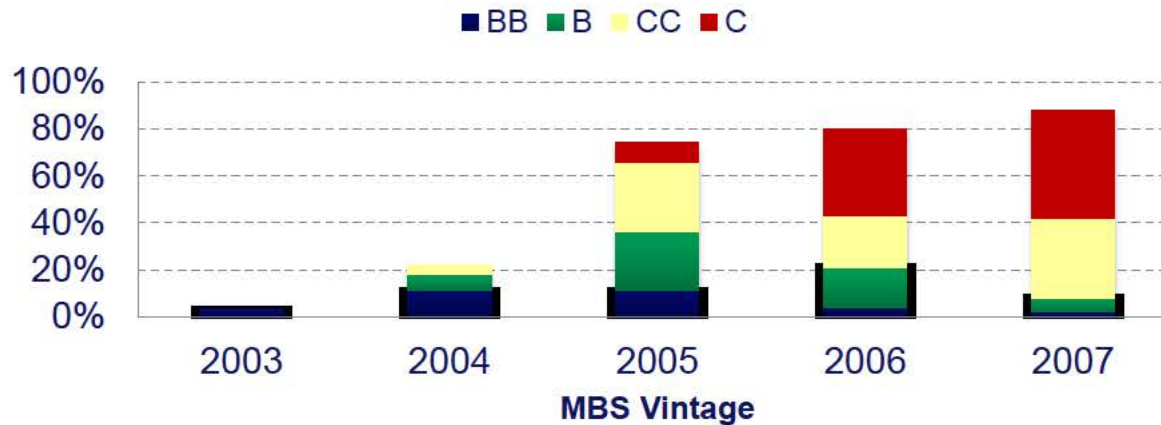
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## *Rating agency approaches used assumptions that did not hold up*

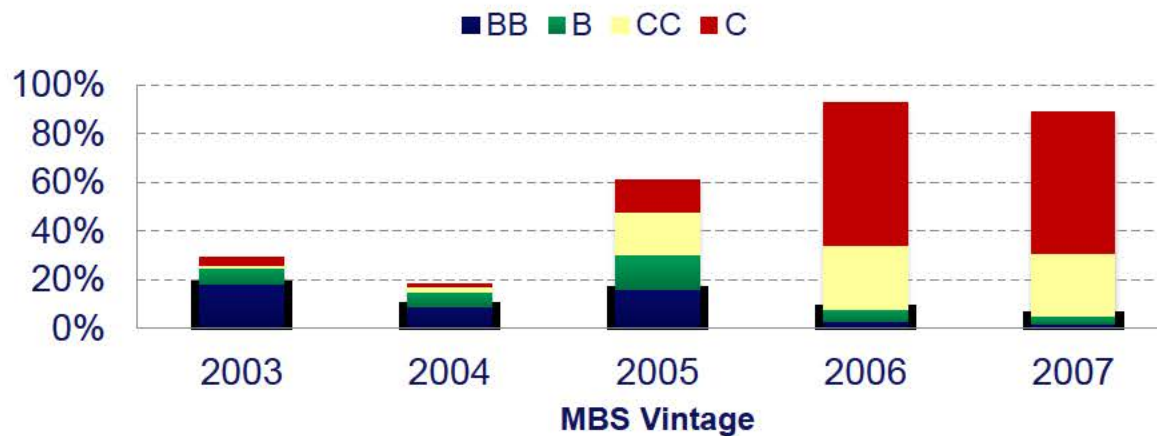
- The NRSROs based their probability of individual defaults on historical mortgage default data
  - Did not properly account for the drop in lending standards during the housing boom and other secular trends
  - Did not anticipate the effects of a nationwide fall in home prices
- Weaknesses in modeling correlation
  - Correlation describes the likelihood of one event given another; e.g. the likelihood that a second loan in the portfolio will default if the first one does
  - Rating agency methodology assumes correlation is static, but correlation between different assets tends to rise during hard times, especially financial panics
    - “Men, it has been well said, think in herds; it will be seen that they go mad in herds, while they only recover their senses slowly, and one by one.” – Charles Mackay
- Literally thousands of MBS bonds have been downgraded from top-level credit ratings (Aaa/AAA) over the past four years
- [An MBS banker, newly fired from Lehman Brothers, reacts to the collapse of the mortgage market](#)

# Fallen Angels: Junk MBS Rated AAA at Issuance

**Percentage by Balance of MBS Backed by Prime Mortgage Loans**



**Percentage by Balance of MBS Backed by Subprime Mortgage Loans**



Approximate Bond Rating	Idealized Ten-Year Default Risk
AAA	0.1%
BB	13.5%
B	27.2%
CC	65.0%
C	100.0%

Source: Charts - JPMorgan Securities. As of May 2011. Table – Moody's Investors Service

# The Future of Mortgage Securitization

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***Currently, securitization remains mired in market and regulatory uncertainty***

- Effect of Dodd-Frank Act
  - Risk retention requirements proposed by FHFA, Federal Reserve, SEC, HUD and FDIC
  - Possible carveout for conservative, standard “qualified residential mortgage” loans; specifics to be defined
  - New disclosures with respect to loan portfolio, lender compensation and risk retention
- Stricter accounting standards (FAS 166/167) may raise regulatory capital requirements for many lenders that sell loans to MBS SPVs
- MBS: Still a four-letter word for many investors