

# IFRS ACCOUNTING EFFECTS ON PUBLIC EDF™ CREDIT MEASURES

MODELING METHODOLOGY

## AUTHORS

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## Abstract

In July 2002, the International Accounting Standards Board (IASB) published a new set of accounting policies to be adopted by all firms incorporated in the European Union as of January 1, 2005. The new rubric, called the International Financial Reporting Standard (IFRS), replaced a variety of preexisting standards in France, Germany, the United Kingdom, and other European countries, each of which had a slightly different set of Generally Accepted Accounting Principles (GAAP) standards.

With the imposition of mandatory IFRS filing beginning with fiscal year 2005, all firms in the European Union were required to file under these standards with their 2005 year-end figures, though some companies did publish IFRS-compliant figures at earlier dates. Some changes in reporting standards required the reclassification of previously off-balance sheet liabilities and their subsequent marking to market, as well as reclassification of sales figures between lines of business. Other changes resulting from IFRS adoption include recognition of extraordinary items and revenue based on the transfer of risk and reward on the income statement.

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# 1 INTRODUCTION

In July 2002, the IASB published a new set of accounting policies to be adopted by all firms incorporated in the European Union as of January 1, 2005. The new rubric, called the International Financial Reporting Standard (IFRS), replaced a variety of preexisting standards in France, Germany, the United Kingdom, and other European countries, each of which had a slightly different set of GAAP standards. With the imposition of mandatory IFRS filing beginning with fiscal year 2005, all firms in the European Union were required to file under these standards with their 2005 year-end figures, though some companies did publish IFRS-compliant figures at earlier dates. Some changes in reporting standards required the reclassification of previously off-balance sheet liabilities and their subsequent marking to market, as well as reclassification of sales figures between lines of business. Other changes resulting from IFRS adoption include recognition of extraordinary items and revenue based on the transfer of risk and reward on the income statement.

The actual impact on income statements and balance sheets of the new reporting requirements would not be witnessed until the filing of 2005 annual statements, which became available throughout the first half of calendar year 2006. At this time, many firms chose to restate 2004 year-end figures under IFRS standards. When 2005 year-end financial data became available for European Union firms, changes in liability structure were evident for some companies. Most of the impact was witnessed among large financial firms in the European Union, particularly firms with large real estate investments, which were required to be marked-to-market under the new standards.

Changes in liability structure for any firm can affect default point and market value of assets calculations in the Moody's KMV Public Firm EDF model. As a result, Moody's KMV began to research the observed effects of IFRS accounting changes among companies most likely to be significantly influenced. After identifying firms with 2004 balance sheet data available in pre- and post-IFRS format to Moody's KMV, a sample of over 1,800 public firms was selected for review, and the impact of adopting IFRS standards on EDF credit measures and associated drivers was studied.

# 2 STUDY BACKGROUND

The greater than 1,800 companies that composed the sample set for analysis were selected through a single criterion: the availability of 2004 financial statement data in both pre- and post-IFRS format. The sample set included significant coverage of most European Union member nations as well as firms reporting under IFRS standards outside of Europe.

At a qualitative level, the main changes in liabilities data from IFRS restatement included moderate increases in total liabilities and assets. Nearly four out of five firms reported a minor (8%) increase or greater in total liabilities, and many firms saw short-term liabilities increase, driven in large part by the reclassification of payables from long- to short-term liabilities under the new accounting standards. Decreases in pension benefits also drove an overall decline of reported long-term debt (nearly 60% of post-IFRS filings report this trend). In the observed instances of total assets decreasing, most cases were driven by revaluation of items included under "property, plant, and equipment."

At the most basic level, adoption of IFRS had two potential avenues for ultimately affecting EDF credit measures: default point and asset volatility. It is straightforward that the default point is affected, because default point measures the amount of liabilities that a company faces, and is directly calculated from the liabilities structure that the company reports. It is, however, less trivial to explain why and how the asset volatility is also affected by the changes in liabilities.

The Moody's KMV public EDF model derives asset volatility through a combination of empirical asset volatility and modeled volatility. The empirical asset volatility captures the historical fluctuation of asset returns, and the historical asset returns are calculated from observed historical equity returns and historical leverage information.<sup>1</sup> Given a level of asset risk, a highly leveraged company would have higher equity return fluctuation due to higher leverage risk. On the other hand, given observed level of equity return fluctuation, a more highly leveraged company would have lower asset volatility. This would lead to an important trade-off mechanism that makes the EDF model robust to measurement error in liabilities: if the liability of a company is underestimated, which pushes the EDF level to the lower direction; however, the underestimated leverage would make asset volatility overestimated, which pushes the EDF level to the higher direction.<sup>2</sup>

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<sup>1</sup> For more details, see section 4.2 of Dwyer and Qu (2007).

<sup>2</sup> A discussion of this mechanism in the context of off balance sheet liabilities can be found in section 6 of Crosbie and Bohn (2003).

The IFRS restatement also affects asset volatility through modeled volatility. In the Moody's KMV EDF model, modeled asset volatility captures the empirical asset volatilities of peer companies, where a peer is characterized by a number of accounting variables, such as book assets, earnings and retained earnings, as well as geographical location and industry. Restatements in IFRS could lead to changes in both relevant accounting variables and industry sector classification, both of which are addressed in this study.

The analysis was subsequently conducted using 2004 year-end financial statements available in IFRS and pre-IFRS accounting standards. EDF credit measures and associated drivers were compared using these differing statements. In addition, they were paired with December 2005 month-end market data, representing the latest observable pre-IFRS equity trading date. Changes in EDF credit measures were examined in three main ways. First, EDF changes were analyzed only in terms of default point changes (caused by shifts in liabilities data), with no asset volatility adjustments. Second, EDF credit measures were calculated incorporating both default point and asset volatility changes, adjusting volatility to incorporate changes in leverage. Because of the lack of historical IFRS and pre-IFRS statement pairs, the analysis relies on the assumption that the historical leverage differences between these two standards are the same as that observed in the 2004 statements. Thirdly, we focus on the modeled volatility, and evaluated IFRS and pre-IFRS EDF credit measures purely based on modeled volatilities.

The analysis discussed above was supplemented with a study of business segment effects resulting from changes in accounting standards. Reclassification of revenues by business segment under IFRS had the potential to result in changes in Moody's KMV industry weights, as these weightings are affected by business segmentation of sales. Elements of the public firm EDF model most potentially affected by these changes are default point (from adjustments made to liabilities term structure in the Financial EDF model) and modeled volatility (as industry weights compose one element of bucketing firms in the modeled volatility calculation). For most firms in the study sample, changes in segment sales resulted in heavier industry segment weights for Moody's KMV NDY N06 (Banks and S&Ls). Other firms saw increased weight in Moody's KMV NDY N24 (Finance, not elsewhere classified). Indeed, no uniform directional shift in industry weights could be identified. The effects of NDY changes on default points and overall EDF credit measures will be discussed later.

### **3 LIABILITIES ANALYSIS: METHODOLOGY AND RESULTS**

Following the selection and identification of the sample set, the distributions of changes in book asset value, total liabilities, short-term debt, and default point were examined. The impact of these changes on one-year EDF credit measures was plotted to identify the scale and any potential outliers of the analysis. These changes were then controlled for any confounding effects of changes in asset volatility and leverage effects of liabilities reclassifications. All distribution and impact analyses were based on 2004 year-end statements (in pre- and post-IFRS format), and December 2005 month-end market data.

The initial analysis focused on the changes in major accounting variables resulting from IFRS adoption. In Figure 1 and Figure 2, we report the histogram of percentage changes in book assets and total liabilities. Among the 1,800 firms in the initial sample, no unidirectional trend was seen. Indeed, the vast majority of companies in the sample saw little to no change in any of these basic inputs to the EDF model. About 70% of firms saw a change of less than 5% in book assets or liabilities. Key drivers of liabilities changes included the reclassification of lease-related payables from long-term to short-term liabilities, increasing current liabilities. Other instances of long-term debt decreasing were rarely systematic, but seemed to be driven in many cases by decreases in levels of pension benefits.

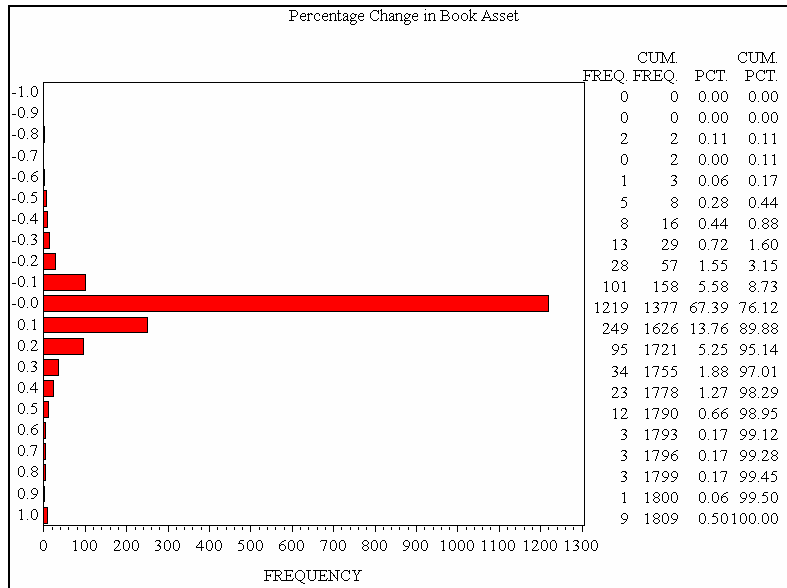


FIGURE 1 Percentage Change in Book Assets

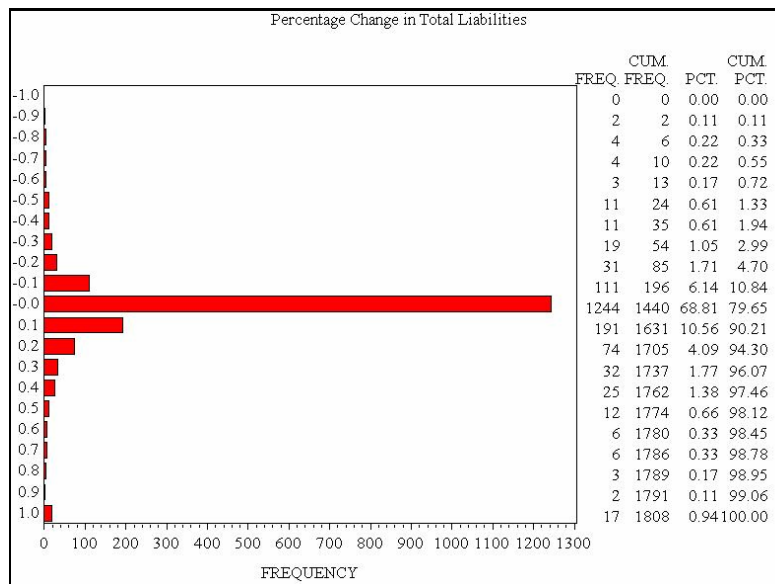


FIGURE 2 Percentage Change in Total Liabilities

Not reported here, we found qualitatively similar pictures for changes in short-term debt (see “Appendix” on page 11) and default point, in that companies were still tightly clustered within the no-change bucket, although the distribution was slightly wider quantitatively.

We do see some outliers, though, which are mostly firms that reclassified elements from the balance sheet. For an example, see “Case Study of Corporación Mapfre SA” on page 11 for a discussion in the Appendix of this paper. Liabilities for some firms did increase significantly with the incorporation of off-balance sheet items not required under older reporting standards. The changes in total and current liabilities figures for firms had a fairly direct impact on default points used to calculate EDF credit measures.

In Figure 3, we plot the changes in EDF credit measures calculated from pre- and post-IFRS balance sheets, holding asset volatility constant. No overall increase in EDF credit measures was observed under this framework.

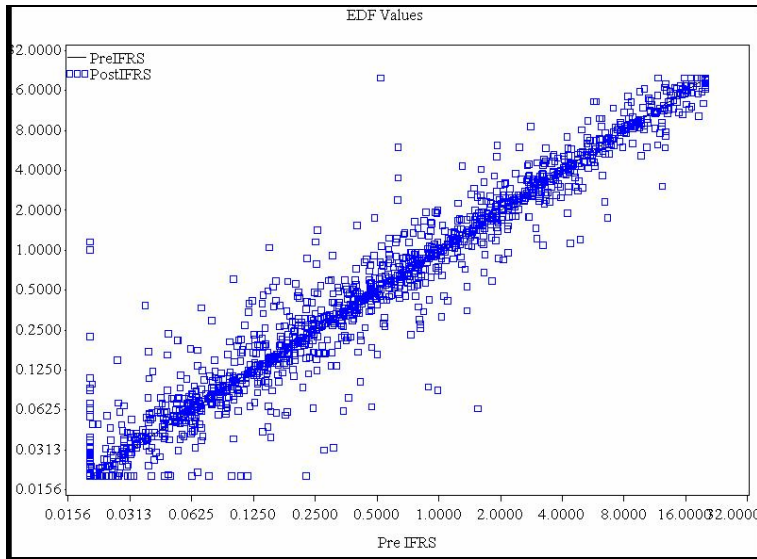


FIGURE 3 Comparing EDF Measures from Differing Reported Liabilities

To avoid possible data anomalies that may occur when using a potentially unrepresentative volatility figure to calculate empirical asset volatility, the study also analyzed the effect of IFRS using only modeled asset volatility, adjusting for changes in leverage between statements. Solely using a firm’s identifying characteristics (profitability, geography, industry, size, and income) to provide an estimate of its volatility given peer companies, a more stable measure of a firm’s asset volatility can be achieved in spite of significant changes in drivers to empirical asset volatility that may occur with accounting standard changes. Observations of modeled volatility for most firms experienced little to no change with the adoption of IFRS, as shown in Figure 4. Not reported here, there was no evidence of systematic unidirectional change in EDF credit measures. For more details, see “Appendix” on page 11.

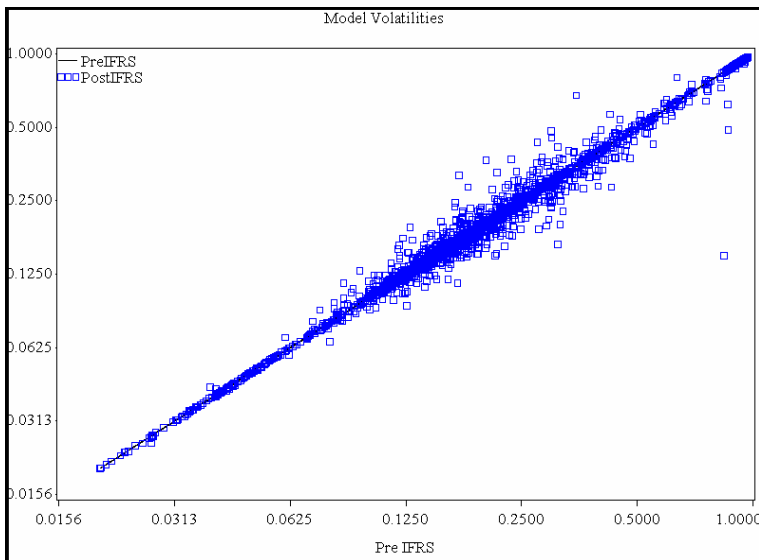


FIGURE 4 Comparing Model Volatilities from Differing Liabilities

## 4 BUSINESS SEGMENT EFFECTS OF IFRS ADOPTION

As mentioned above, the adoption of IFRS accounting standards caused changes in revenues reported by business segment for some firms. The Moody's KMV public EDF model calculates line of business segmentation for non-North American firms by revenues; as a result, changes to industry segment breakdowns could occur with IFRS adoption. The data set for industry segment analysis was smaller than that of the liabilities analysis, as new industry segment information was not provided with each 2004 IFRS data restatement—indeed, the sample size for this analysis was just over 800 firms, or less than half that of the liabilities analysis.

The impact of changing business segments was assessed as part of the IFRS inquiry, resulting in findings similar to those of the liabilities analysis. As industry segmentation plays a major role in the calculation of modeled volatility, the effects of these changes were of particular interest. Industry segment changes were reviewed side-by-side with new liabilities data so as to isolate the effects. Indeed, changes in modeled volatilities due to new liabilities data were plotted with old industry classifications first, followed by post-IFRS liabilities data with post-IFRS business segment data. As shown in Figure 5, changes due to industry re-classification are quite limited. Notably, there was more clustering of data points under the industry effect analysis than under the liabilities effect analysis of changes to modeled volatility.

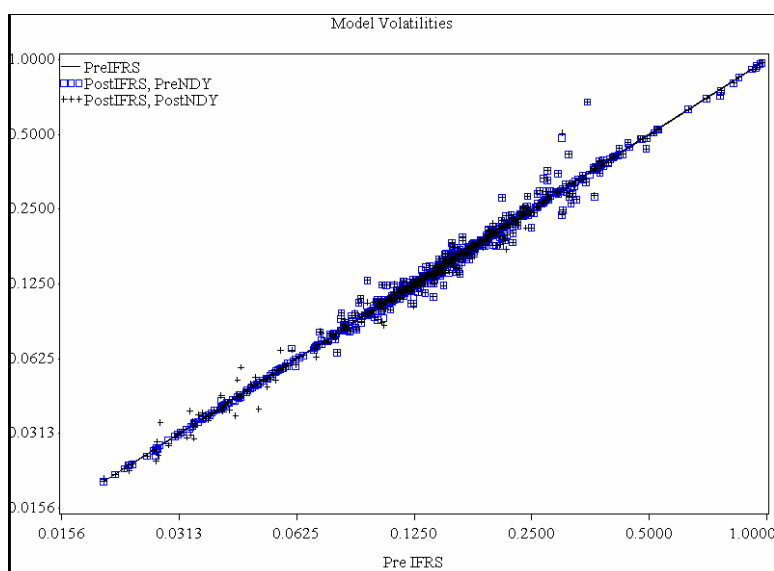


FIGURE 5 Comparing Model Volatilities Due to Differing Reported Liabilities and Industry Classification

As discussed earlier, the other area in which industry segmentation data can play a significant role is in the calculation of default points. Moody's KMV performs an adjustment to reported short- and long-term liabilities according to the extent to which companies are involved in "finance-related" industries. Each company's "financial component" is determined by the weight of its business segments deemed financial in nature (and requiring adjustment); the size of a firm's financial component will dictate, in part, the size of the adjustment performed.<sup>3</sup> Thus, if a firm undergoes a significant reclassification of revenues between business segments under IFRS, a change to its default point calculation may be witnessed. As seen in Figure 6, however, few firms saw major changes to default point after IFRS adoption, and none witnessed a significant change to default point explicitly as a result of changes to industry segment data.

<sup>3</sup> Tse, Terry and Matthew Kurbat, "A Note on Financial EDF Calculations," 2002. San Francisco: Moody's KMV, 2002.

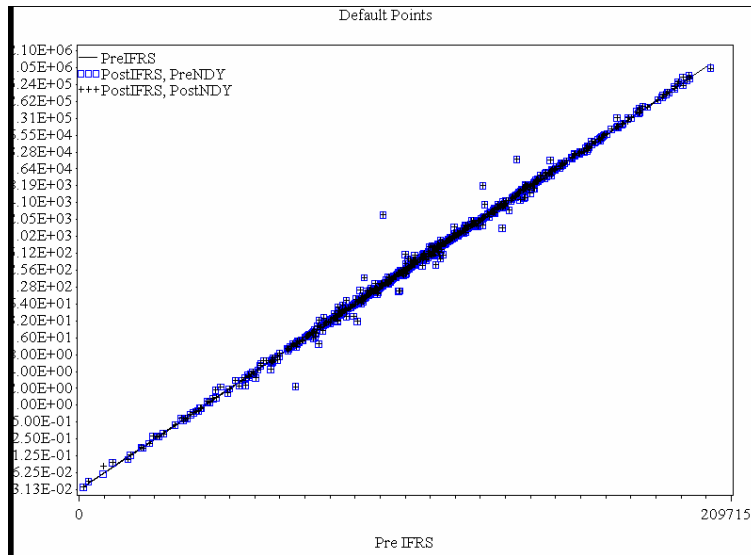


FIGURE 6 Comparing Default Points Due to Differing Reported Liabilities and Industry Classification

In interpreting the above graph, note that the 45-degree line represents the distribution of pre-IFRS default points; the squares represent default points calculated from post-IFRS liabilities data with pre-IFRS industry weights; and the '+' points indicate default points from post-IFRS liabilities and industry data. For more information on default point adjustments, please see the document “Estimation of Short- and Long-Term Liabilities,” available on the Moody’s KMV Support Web.

## 5 SUMMARY AND CONCLUSION

With the adoption of IFRS accounting standards in FY 2005, there existed the potential for significant changes to many of the data items crucial to Moody’s KMV’s public EDF calculations. Main areas of concern included changes to EDF input items such as book assets, short- and long-term liabilities, and business segments by revenue. As noted in the “Study Background” on page 5, one can point to anecdotal broad changes in liabilities and asset data, though the subsequent analysis seemed to indicate no systematic effect on calculation of public EDF credit measures.

On a more general basis, the Moody’s KMV public EDF model is predicated upon the inclusion of as much reliable data as is feasible. Consequently, the increased burden of reporting under IFRS should, from a modeling standpoint, improve the predictive power of the model. This should make sense intuitively—as more transparency and comprehensiveness in financial reporting is required, the estimated default risk of a firm as determined by publicly available data should improve in quality.

For more information on the changes to public firm data resulting from IFRS restatement, please see “Appendix,” which includes plots of the liability and industry change effects for EDF credit measures and combined volatility.

## APPENDIX

### Case Study of Corporación Mapfre SA

Corporación Mapfre SA, a Spanish insurance holding company, reclassified several elements from their balance sheet in restating their 2004 year-end filing in accordance with IFRS reporting guidelines. Major line items involved in this reclassification included Securities to Maturity and Securities for Sale, which received their own line items on the asset side; Life Insurance and Loan Reserves appeared as new line items on the liabilities side, in addition to direct debt and coinsurance debt, among other items.

The resulting 2004 post-IFRS statement allowed for a clearer statement of liabilities structure; short-and long-term liabilities both increased as a result of the new statement as well. These changes, though contributing to a modest increase in total liabilities, were offset by an increase in book assets and a decrease in modeled volatility (driven by the increased size of the company). The end result seen in public EDF products was a decrease in the EDF measure with the incorporation of the 2005 year-end statement in February 2006.

### Additional Result Plots

Below are two additional plots from the IFRS impact analysis of industry segmentation changes. The format of each plot is similar to Figure 5 and Figure 6; the squares represent changes resulting solely from changes in liabilities due to IFRS restatement, while '+' points plot the combined effects of liabilities and industry segment revenue restatement.

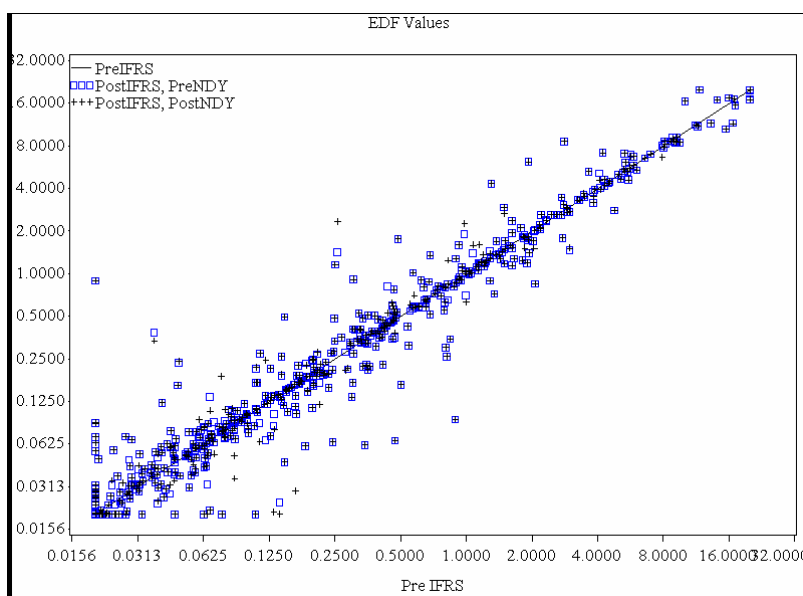


FIGURE 7 EDF Changes, Incorporating Balance Sheet and Industry Segment Restatement

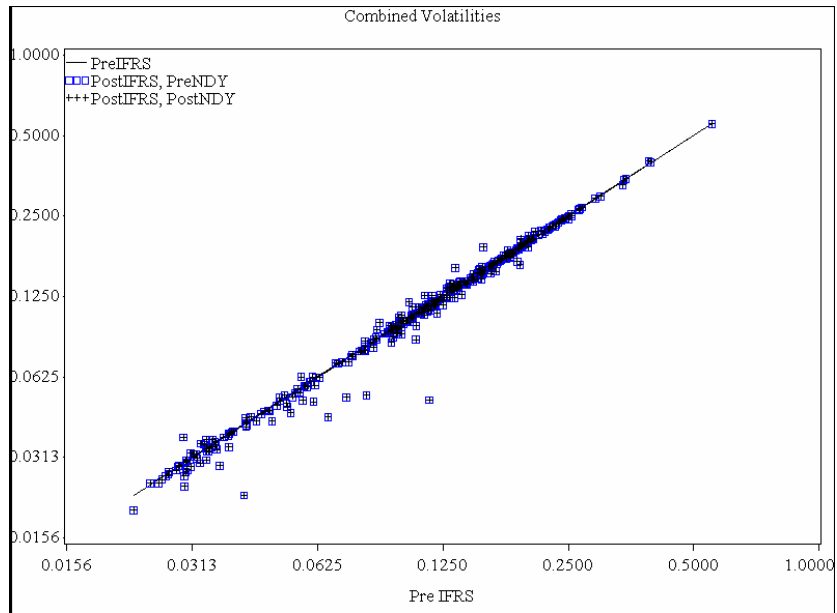


FIGURE 8 Combined Volatility, Incorporating Balance Sheet and Industry Segment Restatement

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