DO FAIR VALUE ADJUSTMENTS INFLUENCE DIVIDEND POLICY FOR SOUTH AFRICAN FIRMS?

by

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Supervisor: Prof. Phillip de Jager

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Abstract

This paper investigates the potential procyclical effects of fair value accounting (FVA). If FVA adjustments result in increased accounting profits with the recognition of transitory gains through a firm's profit and loss (P&L), and if management incorrectly assesses the persistence of the unrealised gains, these increased profits may be paid out as dividends. This has the potential to increase leverage and risk for these firms, thereby also possibly amplifying economic cycles.

A study by Goncharov and Van Triest (2011:59) on Russian firms found that FVA adjustments are persistent in future earnings; however, no empirical evidence was found to support an increase in dividends in response to unrealised FVA gains. By contrast, when the setting is limited to South African banks only, De Jager (2015:157) found that South African banks have paid the full amount of any unrealised transitory gains as dividends.

This study focuses on the effects of FVA adjustments on dividend policy for South African firms, as represented by the firms included in the FTSE/JSE Top 40 Index. This furthers De Jager's (2015) study by extending the investigation of the dividend relevance of FVA adjustments from the major South African banks, to South African large firms in general. The results of a panel regression of the net profit of these firms reveal that unrealised FVA adjustments do have a persistent influence on future earnings, indicating that these adjustments contain both transitory and persistent elements. A further panel regression of the annual dividends declared by these firms indicates that dividend payments do include a portion of unrealised FVA gains, as expected by the persistent nature of a portion of these unrealised FVA gains.

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1. Introduction

In October 2008, a United Nations Conference on Trade and Development (UNCTAD) task force was established to examine the causes and dimensions of the Global Financial Crisis ('the crisis'), with the aim of formulating proposals for policy action. The report details that the sudden unwinding of speculative positions in all segments of the financial market was triggered by the bursting of the housing bubble in the United States (United Nations Conference on Trade and Development, 2009:xi). The near-collapse of the financial sector resulted in the greatest economic contraction that the US and Europe had seen since the Great Depression. FVA has been identified as a possible contributor to the crisis, and to prolonging its effects, being lumped in with culprits such as reckless lending and inaccurate credit ratings of securitised debt.

According to DeAngelo and DeAngelo (2006:293), dividend payout policy is relevant to shareholders and is of high importance to these shareholders. Lintner's (1956) framework provides a link between dividends and earnings, in that firms aim for a stable dividend policy in relation to their earnings. Much has been written about stable dividend payout policies and the link between dividends and earnings (Brav, Graham, Harvey & Michaely, 2005:483; Daniel, Denis & Naveen, 2008:2; Leary & Michaely, 2011:3197). Based on these findings, if FVA gains increase a firm's net profit, the firm is inclined to increase dividends payments, so that the dividend payout ratio does not decrease. In addition, companies could distribute dividends from earnings inclusive of unrealised FVA adjustments, to signal the reliability of the latter (Chen & Gavious, 2016:218).

A number of papers investigate the role of FVA during the crisis (Adrian & Shin, 2009:418; Khan, 2010:1; Fearnley & Sunder, 2007:2; Kothari & Lester, 2011:349; Novoa, Scarlata & Solé, 2009:27). Novoa, Scarlata and Solé (2009:3) highlight the potential effects of FVA, both during the crisis and in the boom times that tend to precede crises. Pinnuck (2012:1) emphasises that further research is required to determine whether FVA, in the years immediately preceding the crisis, exacerbated the crisis when it came, because of the possibility that some of the FVA gains reported may have been unrealised. If unrealised FVA gains lead to increased dividend payouts and therefore increased

leverage, this may result in firms being financially vulnerable to economic shocks, including the enhancement of economic procyclicality (Enria, Cappiello, Dierick, Grittini, Haralambous, Maddaloni, Molitor, Pires & Poloni, 2004:45; Novoa, Scarlata & Solé, 2009:27).

This paper tests the effect of unrealised FVA adjustments on dividend payments, using the framework of Lintner (1956). Based on Lintner's (1956) framework, if FVA gains are in fact transitory and firm management correctly assesses their transitory nature, no increase in dividend distribution is expected.

Goncharov and Van Triest (2011:58) tested the implications of unrealised FVA gains on future earnings in a Russian setting, where accounting standards mandate separate disclosure of unrealised FVA adjustments in income. Goncharov and Van Triest (2011:58) found that unrealised FVA gains do have implications for future earnings, which may contribute to a positive relationship between FVA adjustments and dividends. Following this, Goncharov and Van Triest (2011:60) tested the concern that dividends were paid from transitory FVA gains, which would have been an effect of FVA before the crisis. Goncharov and Van Triest (2011:60) find the association between positive FVA adjustments and the change in dividends is negative.

De Jager (2015:175) repeated these tests as far as possible with a focus on South African banks. As the separate disclosure of unrealised gains and losses is not required by International Financial Reporting Standard (IFRS) 7 *Financial instruments: Disclosures* (IASB, 2005), which is implemented in South Africa, De Jager's (2015:165) paper uses three proxies for unrealised FVA adjustments in lieu of a direct measure. De Jager (2015:177) found that South African banks are using earnings inclusive of the full amount of unrealised FVA gains in dividend payments.

This paper performs a similar analysis over the period 2005 to 2014; but on South African firms represented by the FTSE/JSE Top 40 Index, which consists of the largest 40 companies ranked by full market value in the FTSE/JSE All-Share Index. The paper uses four proxies for unrealised FVA adjustments in lieu of a direct measure. The results of a panel regression of the net profit of these firms reveal that unrealised FVA adjustments

do have a persistent influence on future earnings. Lintner's (1956) model determines that persistent increase in earnings will be paid out as dividends, as managers will change dividend policy if new earning levels are sustainable. A further panel regression of the annual dividends declared by these firms finds that dividend payments do include a portion of unrealised FVA gains. This is contrast to the findings of De Jager (2015:177), whose results revealed that the full amount of FVA gains are paid out as dividends by South African banks.

The paper is structured as follows: Section 2 discusses relevant literature, with a focus on the more recent literature of Chen and Gavious (2016), Sikalidis and Leventis (2016), Goncharov and Van Triest (2011), and De Jager (2015). Section 3 provides data descriptions, and the methods that will be used to address the research question. Section 4 presents and interprets the results, with Section 5 drawing a conclusion.

2. Literature Review

General

"*To be sure, fair-value advocates, including FASB members, tout the concept's main benefit: that it provides investors with added transparency by forcing companies to market assets and liabilities. But critics argue that fair-value accounting does the opposite. Instead of providing investors with a better picture of economic reality, fair-value accounting distorts market realties by leaving too much room for management's discretion and potential abuse, they contend*." (Leone, 2008:1).

Critics of FVA argue that it has created a vicious circle of falling prices, and was a major contributor to the Global Financial Crisis and near-financial meltdown (Adrian and Shin, 2009:418; Fearnley and Sunder, 2007:2; Khan, 2010:1; Kothari and Lester, 2011:349; Novoa, Scarlata and Solé, 2009:27;). Likewise, a number of academic accounting researchers have found that FVA had an insignificant effect on the crisis (Amel-Zadeh, Barth and Landsman, 2013:1; Ball, 2008:2; Barth and Landsman, 2010:399; Shaffer, 2010:2;).

For those academic researchers, policymakers, and other practitioners who lay blame (partly or wholly) on FVA, a number of the effects of FVA have been identified as possibly exacerbating the Global Financial Crisis, both before and during the crisis. Critics of FVA say that in a crisis, FVA triggers a 'liquidity death spiral' (Ball, 2008:1). During times of crisis, asset values fall. During the Global Financial Crisis, financial products were fair valued, despite concerns that then-current market prices were not an accurate reflection of the products' underlying cash flows, or of the price at which the instruments might eventually be sold.

Asset-sell decisions based on fair value pricing – in a weak market, with already falling prices – reflect a market illiquidity premium, and therefore result in further declines in market prices. If these assets are held by a bank (for example), the value reduction could trigger a violation of contractual or regulatory leverage constraints. The bank would then have two options: raise additional equity, which is expensive in times of economic downturn (or even highly improbable, in times of economic crisis); or sell these assets.

Additionally, falling prices can activate margin calls for both banks and non-financial firms, contributing to the downward trend. Other institutions that hold similar positions on these assets try to sell at the same time, and liquidity evaporates. These prices establish a new and lower fair value benchmark, causing a further round of fair value write-downs and further attempts to sell, resulting in a spiral decline in prices. This potential of exacerbating contagion has been identified in a number of academic papers (Adrian and Shin, 2009:418; Bowen, Khan and Rajgopal, 2009:26; Khan, 2010:1; Kothari and Lester, 2011:349; Novoa, Scarlata and Solé, 2009:27).

The considerable devaluation resulting from financial instruments measured at fair value during the Global Financial Crisis resulted in strong political pressure on the International Accounting Standards Board (IASB) to allow financial companies to suspend FVA for selected financial assets. In October 2008, the IASB issued emergency amendments to the International Accounting Standard (IAS) 39 *Financial Instruments: Recognition and Measurement* (IASB, 1998), and the IFRS 7 *Financial instruments: Disclosures* (IASB, 2005), which permitted the reclassification of selected financial instruments so that banks reporting under IFRS could avoid using fair values in reporting for these selected

instruments. Under these amendments, banks reporting under IFRS had the choice to retroactively reclassify financial assets that were previously measured at fair value into categories that require measurement at amortised cost.

In addition to the effects of FVA during the Global Financial Crisis, a number of authors provide evidence of FVA's contribution in the economic boom years leading up to the crisis. Kothari and Lester (2011:336) present information showing that the "inconsistent implementation" and "subsequent misapplication" of FVA prior to the financial crisis contributed to the severity of the crisis. Specifically, in the years 2004 to 2008, reporting of immediate gains on securitisation motivated more subprime lending, as gains recorded on the securitisation transactions inflated earnings and overstated asset balances. Novoa, Scarlata and Solé (2009:4) found that difficulties exist not only in determining fair value prices in economic downturns and illiquid markets, but also during economic boom times in liquid, active markets, when inflated prices can lead to increased profits.

Market prices during these economic boom times may not accurately reflect risks, and can result in inflated profits that amplify the cyclical upturn. Adrian and Shin (2009:421) interpret financial-market liquidity as the rate of growth of aggregate balance sheets. Using a bank as an example: when asset prices increase on the asset side of a bank balance sheet during economic boom times, leverage falls; and the bank will then hold surplus capital. This surplus capital will need to be used to maintain the bank's return on equity (ROE). As leverage is inversely related to total assets, one way in which bank managers can maintain or achieve the expected ROE is to increase leverage. The bank will take on more short-term debt, thereby increasing its short-term liabilities. On the long-term asset side, they search for potential borrowers that they can lend to. This results in a timing mismatch; which can increase risk, as cash outflows of interest and debt repayments are short-term, and do not match the longer-term cash inflows from the assets. In this situation, the bank is relying on the short-term debt being rolled over. To the extent that a bank borrows short-term and lends long-term, it has a mismatch that it must address, through restructuring of assets and liabilities or by using derivative financial instruments.

This was the case prior to the sub-prime crisis in the United States, where bank balance sheets were expanding so fast, even borrowers who did not have the means to repay their loans were granted credit. “The seeds of the subsequent downturn in the credit cycle are thus sown” (Adrian and Shin, 2009:435). Leone (2008:2) refers to the assumption of fair value that markets have good information, accumulated from financial results and credit-rating reports. However, if rating agencies and investors get their data from corporate financials that are themselves based on prices inflated by a market bubble, the accounting numbers merely support the bubble. This may result in FVA feeding the prices back to the market. De Jager (2014:97) emphasises finding the link *before* the crisis. De Jager’s (2014:97) model shows FVA in banks to be an accelerator that amplifies the financial cycle upswing. The model demonstrates that the cause of the financial downturn can be found during the economic boom, with FVA resulting in the replacement, in bank capital, of liquid assets with unrealised FVA gains – “bad capital driving out good capital” (De Jager, 2014:98).

To assist with the understanding of the effects of FVA on company profits, the relevant FVA standards issued to date – along with the requirements under these standards– will be detailed.

Fair Value Accounting

In 1993, the Financial Accounting Standards Board (FASB) in the United States issued the Statement of Financial Accounting Standards (SFAS) 115 *Accounting for Certain Investments in Debt and Equity Securities* (FASB, 1993). This statement provided guidance on the valuation of “investments in equity securities that have readily determinable fair values and for all investments in debt securities” (FASB, 1993:4). It required that firms declare their intentions with regard to investment instruments. Debt securities that are held-to-maturity were to be reported at amortised cost. Debt and equity investments that were designated as held-for-trading were to be reported at fair value, with any unrealised gains or losses included in earnings. Debt and equity securities not classified as held-to-maturity or held-for-trading were deemed to be available-for-sale, and also reported at fair value; with any unrealised gains or losses excluded from earnings, and reported in a separate component of shareholder’s equity. The FASB

added to the fair value discussion in late 2006 and early 2007 with the release of SFAS 157 *Fair Value Measurements* (FASB, 2006) and SFAS 159 *The Fair Value Option for Financial Assets and Financial Liabilities* (FASB, 2007).

The IASB also issued statements relating to fair value; namely, IAS 39 *Financial Instruments: Recognition and Measurement* (IASB, 1998). The IASB is responsible for developing IFRS, which formally replaced the South African Generally Accepted Accounting Principles (GAAP) in 2005. IFRS 13 *Fair Value Measurement* (IASB, 2011:1) defines fair value as the "price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date". To increase consistency and comparability in fair value measurements and related disclosures, IFRS 13 (IASB, 2011) established a fair value hierarchy that categorises valuation technique inputs used to measure fair value into three levels. Level 1 inputs are unadjusted quoted prices in active markets for identical assets or liabilities at the measurement date. These provide the most reliable evidence of fair value, and are to be used without adjustment. Level 2 inputs are inputs, other than the quoted prices in Level 1, that are observable for the asset or liability. These include quoted prices for similar items (in active markets or inactive markets) along with other observable inputs, such as interest rates, yields and credit spreads. Level 3 inputs are unobservable inputs, in situations where there is little or no market activity. These inputs reflect various subjective market assumptions regarding the pricing and risk of the asset or liability.

Only FVA adjustments for a financial instrument designated as held-for-trading – or designated on initial recognition as one to be measured at fair value, with fair value changes in the P&L – result in movements through the P&L. All derivative assets and liabilities, excluding those designated as hedging instruments, result in movements through the P&L. All other FVA adjustments are posted through other comprehensive income. As discussed by Lintner (1956), companies aim to pay out a certain percentage of earnings as dividends. As a result, this paper will focus solely on FVA adjustments posted through the P&L. Once these FVA adjustments form part of retained earnings, it may be difficult for management to separate which elements of the retained earnings are

realised and which are unrealised. The tests by Goncharov and Van Triest (2011) and De Jager (2015) also focused exclusively on these P&L-impacting FVA adjustments.

The link between reported earnings and dividends can be explained by dividend policy.

Dividend Policy

In 1956, John Lintner (Lintner,1956) developed a partial-adjustment model linking reported earnings with dividends. Lintner's (1956) theory is based on two important observations about dividend policy: that companies tend to set long-run target dividends-to-earnings ratios according to the number of positive net-present-value projects they have available; and that earnings increases are not always sustainable. As a result, in Lintner's (1956) model, dividend policy is not changed until managers can see that new earnings levels are sustainable. Therefore, according to this model, if FVA gains and losses are transitory, they should not result in an increase in dividend distributions.

DeAngelo, DeAngelo and Skinner (2004:453) found that dividends are highly concentrated among a small number of firms with substantial earnings. DeAngelo, DeAngelo, and Stulz (2005:227) found that the propensity to pay dividends is positively related to the ratio of retained earnings to total equity. In a later paper, DeAngelo, DeAngelo and Skinner (2008:253) emphasised that a firm's earnings and its profitable investment opportunities serve as the primary determinants of its chosen payout policy. Denis and Osobov (2007:62) provide strong positive association between a firm's earned- and/or contributed-equity mix and its propensity to pay dividends. In addition, Denis and Osobov (2007:62) find that dividends are concentrated among those firms with the greatest earnings.

As discussed, FVA adjustments for financial instruments designated as held-for-trading – or designated on initial recognition as one to be measured at fair value, with fair value changes in the P&L – result in movements through the P&L, and therefore affect retained earnings. Dividend theory links reported earnings with dividends; however, it notes that only permanent increases in earnings will lead to increased dividends, and that transitory gains or losses should not result in an increase in dividend distributions.

Recent tests of the impact of unrealised FVA gains, the transitory nature of these gains, and their effect on dividend policy have been performed by Chen and Gavious (2016) on Israeli firms; by Sikalidis and Leventis (2016), on Greek firms; by Goncharov and Van Triest (2011), on Russian firms; and by De Jager (2015), on South African banks. The content of these papers and results of any relevant analysis will now be detailed further.

Chen and Gavious (2016)

Chen and Gavious's (2016) study takes advantage of a change in Israel's accounting environment to explore adjustments in the dividend policy of companies, following the adoption of FVA rules. Prior to the adoption of IFRS, Israeli firms reported their financial statements in accordance with Israeli GAAP, which was mainly influenced by US GAAP. The recognition of unrealised earnings from the revaluation of assets and liabilities was not allowed in the pre-IFRS period. As the Israeli Corporate Law that allows a firm to distribute dividends from its retained accounting earnings does not distinguish between realised and unrealised earnings, following the adoption of IFRS in 2007 the amount of earnings that could be distributed as dividends could potentially increase, if firms now recognise unrealised FVA gains in retained earnings.

Chen and Gavious (2016) conduct multiple tests comparing the payout policies of firms in the post-IFRS period with those of the pre-IFRS period. Chen and Gavious (2016:219) sample 508 Israeli public companies that adopted IFRS in 2007, but exclude financial firms from the analyses, as these firms were not required to adopt IFRS at this particular time. Data of gains and losses arising from FVA changes of assets and liabilities was collected for the six years prior to the adoption of IFRS in Israel (2001-2006), and the six years following its adoption (2007-2012). Of the 508 sample firms, 168 firms (33 percent) are identified that distributed dividends from unrealised earnings, which Chen and Gavious (2016:219) refer to as DFU firms.

Chen and Gavious (2016:227) conduct a series of univariate tests to explore the levels of, and changes in, the firms' dividend payout policy during the pre-IFRS and post-IFRS periods. A comparison of the dividend payouts from earnings between the two periods reveals a significant increase in the payout ratio – from 33 to 47 percent, on average;

consistent with their prediction, that – all else being equal – a firm's dividend payments will increase following the recognition of unrealised gains. Univariate tests were conducted to determine whether the observed increase in the payout ratio is a result of dividend distributions from unrealised earnings. These showed that 33 percent of firms in the sample distributed dividends from unrealised earnings; and that on average, dividends were distributed from unrealised earnings three times during the six-year post-IFRS period. In the DFU-firm years, it was found that dividend payments as a percentage of realised earnings increased from an average of 32 percent in the pre-IFRS period to an average of 115 percent in the post-IFRS period, indicating that the firms distributed all of their realised earnings – including some unrealised earnings. By contrast, in the non-DFU-firm years, Chen and Gavious (2016:228) did not find evidence of a significant change in the dividend payout ratio compared to the pre-IFRS period.

Following this, Chen and Gavious (2016:231) ran a number of multivariate logit regressions to estimate the direct association between dividend payments from unrealised earnings and firm size; sales growth; realised and unrealised earnings; research and development expenditure; capital expenditure; cash; firm leverage; firm equity beta; the share ownership of managers, directors and beneficial owners of the firm; and a measure of taxable earnings management. The results indicate that – after controlling for time and industry effects – the likelihood of unrealised earnings increasing dividend payments rises with the firm's size, realised earnings, unrealised earnings, liquidity, leverage, and tax avoidance; and decreases with any increases in research and development expenditure, capital expenditures, and firm equity beta. In addition, the firm's sales growth and ownership concentration do not seem to be directly associated with the likelihood that the firm distributed dividends from unrealised earnings. Chen and Gavious (2016:237) also find that the likelihood that a firm will distribute dividends from unrealised earnings increases significantly with book earnings management; which highlights the possibility that a firm may manage its book earnings upwards to maintain stable dividend policies, or to meet dividend thresholds.

Lastly, Chen and Gavious (2016:237) supplemented their tests with multivariate dividend payout regressions to estimate the difference between DFU and non-DFU-firm years, and

examine the direct effect of FVA as per IFRS on the firms' dividend policies. The results are consistent with their hypothesis that an increase in earnings due to the recognition of unrealised earnings leads firms to increase their dividend payouts; and that the observed increase in dividend payout ratios following the adoption of FVA rules is directly associated with the recognition of unrealised gains.

Chen and Gavious (2016:243) conclude by referring to the concern that dividend distributions dilute a firm's real financial resources, thereby increasing firm leverage and risk. They point out that this increased risk is exacerbated when dividends are based on unrealised earnings, as these earnings do not create cash flows until they are realised – assuming they are realised at all.

Sikalidis and Leventis (2016)

Sikalidis and Leventis (2016) examined the impact of unrealised FVA adjustments on dividend policy in a Greek setting, where the Greek Oversight Board recommends (but does not mandate) the distribution of realised earnings only. This suggests that these regulators interpret unrealised FVA gains as transitory.

Sikalidis and Leventis (2016) examined the impact of FVA adjustments on dividend policy for a sample consisting of 693 firm-year observations of Greek listed firms, during the period 2006 to 2008. To examine the persistence of FVA gains on future earnings, Sikalidis and Leventis (2016:13) regressed future net income before FVA adjustments on current net income before revaluations, and current revaluation income from investment property and financial securities revaluations, while controlling for year and industry effects. The results show that FVA adjustments of investment properties are persistent, and therefore – referring to Lintner's (1956) model, in which dividend payouts should include only persistent income – distribution consequences are to be expected.

Sikalidis and Leventis (2016:18) next determined whether or not the revaluation component of net income has an impact on dividend payout. Their findings support their hypothesis that unrealised income from FVA adjustments of financial securities are transitory, and therefore have no impact on dividend policy; and unrealised income from FVA adjustments of investment properties is persistent, and therefore has an impact on

dividend policy. Sikalidis and Leventis (2016:24) observe that these findings show that managers perceive the persistence of the two FVA components correctly, only distributing FVA adjustments from investment properties – which is consistent with Lintner's (1956) framework. Sikalidis and Leventis's (2016:23) multivariate tests suggest that only positive FVA adjustments of investments affect dividend payout, despite the persistence of both positive and negative revaluations on earnings. Sikalidis and Leventis (2016:23) surmise that if negative adjustments do not have a material impact on future cash flows, managers will opt for a stable dividend policy.

Overall, Sikalidis and Leventis's (2016:24) tests demonstrate that managers perceive the predictability of FVA adjustments correctly, and that they are distributing these gains – thereby ignoring Greek Oversight Board recommendations. Lastly, they found that less optimistic managers, firms with a higher borrowing capacity, and firms with higher levels of insider ownership are more likely to increase dividend payouts from FVA adjustments resulting from investment-property revaluations.

Goncharov and Van Triest (2011)

Goncharov and Van Triest (2011) examined the impact of positive FVA adjustments on dividend policy in a Russian setting, where accounting standards mandate separate disclosure of unrealised FVA adjustments in income, emphasising that higher dividends increase leverage, and therefore risk.

Sampling 4 424 firm-year observations representing 1 179 listed Russian firms during the years 2003 to 2006 – a period of strong economic growth – Goncharov and Van Triest (2011:54) hypothesised that positive FVA adjustments have no distribution consequences. Their hypothesis (H1) has two underlying assumptions: that FVA adjustments are transitory, and that the relevant stakeholders (management and shareholders) will correctly assess the sustainability of the earnings levels. Therefore, if H1 is rejected, FVA gains may increase dividend payouts, resulting in increased risk.

As Russian firms are required to report unrealised FVA adjustments in income separately (disclosed in the footnotes to the financials), this allowed Goncharov and Van Triest (2011) to directly assess the economic implications of these adjustments.

Goncharov and Van Triest (2011:56) conducted a series of univariate tests, by evaluating the change in dividends of revaluing firms compared to non-revaluing firms. They accounted for scale differences across firms by regressing firm-level dividend changes on the natural logarithm of total assets, using the residual from this as the scale-adjusted dividend changes. In addition, variables were scaled by average total assets. Goncharov and Van Triest's (2011:57) results show that 36 percent of firms in the non-revaluation sample reported higher dividends, while only 14 percent of firms reporting positive FVA adjustments increased their dividends. The means of dividends provided the same result, in that dividends were significantly lower in the revaluation sub-sample. Company payout ratios were evaluated in an additional test; this test displayed similar results, in that firms reporting positive FVA adjustments had lower dividend changes-to-earnings ratios.

Goncharov and Van Triest (2011:58) followed on by conducting multivariate tests. As these tests were conditional on the persistence of FVA adjustments, the implications of upward FVA adjustments for future earnings was assessed by regressing net income on lagged net income before FVA adjustments and lagged FVA adjustments. No strong evidence was found to suggest that unrealised FVA adjustments are persistent. However, Goncharov and Van Triest (2011:58) replaced lagged FVA adjustments with an indicator variable, with a value of one if a company revalued financial assets upwards in the prior year, and zero if no revaluation occurred. The results of this test indicate the persistence of FVA adjustments – which, they determined, may contribute to a positive relationship between FVA adjustments and dividends.

Goncharov and Van Triest (2011:59) next evaluated the impact of the revaluation and historical cost components on dividends, by regressing a change in dividends on lagged dividends and current and lagged net income. Net income was then broken down further, into current and lagged net income before FVA adjustments in the next regression, including a variable for FVA adjustments. Again, all variables were scaled by total assets. Goncharov and Van Triest (2011:59) found that after controlling for the level of core earnings, the association between positive FVA adjustments and changes in dividends is negative – indicating that positive FVA adjustments are associated with relatively lower dividend payouts. This model is extended out further by including control variables for

other possible determinants of dividend policy. Variables are included to take into account the size of the firm; the financial leverage of the firm; the growth of the firm; and finally, its cash on hand. After including the additional control variables, Goncharov and Van Triest (2011:60) found that the negative association between FVA adjustments and changes in dividends becomes more pronounced. Goncharov and Van Triest's (2011:64) study therefore found that positive FVA adjustments are negatively related to changes in dividends.

De Jager (2015)

In De Jager (2015), the author further investigates the effects of "bad capital driving out good capital" (De Jager 2014:98), in the context of dividend policy in South African banks. De Jager (2015:157) states that:

"If FVA led to increased accounting profits with the recognition of transitory gains through profit and loss during the boom, and if those increased profits provided the rationale for increased dividends, then bank capital became riskier prior to the crisis, and this would have made the system more prone to failure."

De Jager's (2015:165) study repeated the investigation of Goncharov and Van Triest (2011:59), and in a similar fashion; but with model adjustments, and in the setting of South African banks.

As discussed by De Jager (2015:165), IFRS 7 *Financial Instruments: Disclosure* (IASB, 2005), which has been adopted in South Africa, does not require firms to disclose separately the realised or unrealised FVA adjustments in the P&L. As a result, once FVA adjustments form part of the bottom-line P&L figure (and therefore, retained earnings), management cannot separately identify which parts of the FVA adjustment are unrealised – which could increase risk, if paid out as dividends.

De Jager (2015:165) used three proxies for FVA gains in place of the direct measurement available to Goncharov and Van Triest (2011:54). The first proxy is the difference between net profit after tax and broad cash flow from operations (after tax and working-capital adjustments). The second proxy is the difference between net profit after tax and narrow

cash flow from operations (before tax and working-capital adjustments). The third proxy used is the total of extraordinary items in income.

Using annual financial statement data from the five largest listed South African banks, and covering the period 1994 to 2010, De Jager (2015:173) performed a similar dividend analysis to Goncharov and Van Triest (2011:59) – by computing a panel data regression of the change in dividends on lagged dividends; current and lagged net profit after tax, but before one of the three proxy variables; FVA adjustments as estimated by one of the three proxy variables; and control variables to take into account the size of the bank, the financial leverage of the bank, and the growth of the bank. Variables are deflated for size by using average market capitalisation. De Jager (2015:174) found that in contrast to the Goncharov and Van Triest (2011:59) finding, no significant negative relationship between the proxy variables and change in dividends exists. It was also found that in some cases (in four out of the six models used), the change in dividends is positively influenced by the proxy for transitory FVA adjustments of the bank. However, De Jager (2015:176) states that this evidence does not imply that South African banks have been paying dividends from FVA gains, as the profit measures used in these initial models exclude the proxies for FVA gains.

De Jager (2015:177) points out that if South African banks were using total profit inclusive of FVA adjustments in determining dividend payment, then the models could be improved: by replacing net profit after tax but before the proxies for FVA adjustments, with net profit after tax inclusive of the relevant proxies for FVA adjustments. This improves model fit in all models; and the profit variables are larger, with statistically significant increased coefficients when compared to those in dividend analysis using net proxy before FVA adjustments as a variable. De Jager (2015:177) emphasises that if dividend decisions by bank managers had been made based on net profit excluding FVA gains, then these coefficients should have decreased. As a result of the increase in the coefficients of the profit variables including FVA adjustments, when compared to the profit variables excluding FVA adjustments, De Jager (2015:177) deduces that “South African banks are using profit levels inclusive of FVA gains to justify increased dividend payouts”.

To determine the materiality of FVA gains on bank profits during the period under review (2001 to 2010), De Jager (2015:179) performed a co-integrated regression of the monthly net profit of the total South African banking sector. This co-integration refers to the long-run relationship that De Jager (2015:172) implies between the net profit of the financial sector and the gross domestic product (GDP) of the country, which is often procyclical. De Jager (2015:172) hypothesises that because of this procyclical relationship, net profit is expected to overshoot its long-run relationship with GDP during the economic upswing, and undershoot during the downturn; and that FVA adjustments are not required to effect this overshooting or undershooting. This over/undershooting is quantified by using three period dummies for the various economic cycles: where the economy is not in a strong upswing, during a strong upswing, and during the global financial crisis. De Jager (2015:179) compares the coefficients of these period dummy variables before mark-to-market adjustments to the coefficients after mark-to-market adjustments. These FVA/mark-to-market gains or losses are obtained from the Bank Supervision Department of the South African Reserve Bank. De Jager (2015:181) finds these coefficients changed materially, indicating that FVA adjustments increased net profits of the South African banking sector materially. As the proportion of dividends on net profit did not decrease, these tests highlight that banks did not decrease their dividends in response.

De Jager (2015:184) concludes that when unrealised FVA gains are posted through the P&L and end up in retained income, South African bank managers view and treat this new capital as risk-free.

Why FVA gains may lead to increased dividend payments

Prior studies indicate that generally, managers seek to smooth their dividend payments and maintain a relatively stable dividend policy (Brav, Graham, Harvey and Michaely, 2005:483; Daniel, Denis and Naveen, 2008:2; Leary and Michaely, 2011:3197). Baker and Powell (2000:29) surveyed New York Stock Exchange-listed United States firms to establish their managers' views on the determinants of dividend policy, and found that two factors have the most influence: the level of current and expected future earnings, and the pattern or continuity of past dividends. Julio and Ikenberry (2004:89) found that firms may choose to use dividends as a signal of confidence to investors, to ease investor

concerns over corporate governance. Judging by numerous studies regarding stable dividend policy, we can expect there to be an incentive to managers to maintain a smooth dividend policy. Therefore, if earnings increase, we would expect that (all else being equal) there will be a similar increase in dividend payments, to maintain the dividend payout ratio.

Goncharov and Van Triest (2011:52) state that:

"If firm management correctly assesses the implications of transitory fair value increments for future earnings, fair value adjustments are not distribution relevant, and no relationship between fair value adjustments and dividends is expected. However, if management judges the adjustments to be persistent, this may impact dividend distributions."

Jagannathan, Stephens and Weisbach (2000:355) measured the manner in which stock repurchases and dividends are used in United States corporations. They found that dividends are paid by firms with higher permanent operating cash flows and profits. This is consistent with Lintner's (1956) dividend policy model, in which dividend payouts are not changed until managers can see that new earnings levels are sustainable. FVA introduced additional transitory components in the income statement. If managers do not accurately assess the transitory nature of these adjustments – and instead, over-estimate the persistence of FVA adjustments – transitory FVA gains may be distributed as dividends.

Based on the possible need for managers to maintain a stable dividend policy to provide positive signals to investors (Bhattacharya, 1979:259; Gunasekarage and Power, 2002:131), firms could pay dividends from unrealised gains, to signal to the market that they do not expect these earnings to reverse in the future. If the FVA adjustments are temporary, there is also the possibility that managers may incorrectly assess their transitory nature. This leads to the following two hypotheses:

H0: All else being equal, FVA adjustments do not result in persistent changes in earnings, and are therefore fully transitory.

H1: All else being equal, FVA gains do not result in increased dividend payments for South African firms.

The Way Forward

The aim of this paper is to further the study of De Jager (2015), by extending the investigation of the dividend relevance of FVA gains to South African firms. De Jager (2015:159) states that his study repeats as far as possible the investigation of Goncharov and Van Triest (2011), however, with a focus on the five largest South African banks. In any economy, prominent banks pose systemic market risk; i.e. the risk of a breakdown of the entire system, rather than simply the failure of individual parts. If the risks to these banks increase, so does the systemic risk to the economy as a whole. However, as highlighted by Pirrong (2015:4):

"In the aftermath of the Great Financial Crisis, macroprudential regulatory authorities have undertaken a searching review of firms throughout the financial markets to identify those that could pose systemic risks. This review has extended beyond large banks to encompass money-market mutual funds, insurance companies, finance companies, and asset managers. It has even extended to include firms not typically thought of as part of the financial sector, even broadly construed."

There are a wide range of investors who have a stake in either individual firms or indices, which agglomerate firms from a variety of sectors. As a result, the risks from large non-financial firms are becoming less idiosyncratic, and are tending more towards systemic risk. The effects of FVA on dividend policy and the possibility of it increasing risk therefore extend beyond only the banking sector.

This paper focuses on the FTSE/JSE Top 40 Index, which consists of the largest 40 companies ranked by full market value in the FTSE/JSE All-Share Index.

"The FTSE/JSE Africa Index Series is designed to represent the performance of South African companies, providing market participants with a comprehensive and complementary set of indices, which measure the performance of the major capital and industry segments of the South African market." (FTSE Group, 2015).

By extending the investigation of the dividend relevance of FVA gains to the companies in the FTSE/JSE Top 40 Index, the effects of the possible increase in risk to the South African market as a whole are effectively captured.

3. Research Method

Goncharov and Van Triest (2011:54) were able to directly test the effects of unrealised FVA adjustments on dividend payments due to the unique disclosure requirements in Russia, where accounting standards mandate separate disclosure of unrealised FVA adjustments in income. IFRS 7 *Financial Instruments: Disclosure* (IASB, 2005), which is applied in South Africa, requires disclosure of only the combined total of realised and unrealised FVA adjustments.

In his regression analysis, De Jager (2015:165) used three proxies to explain changes in dividends, in place of a direct measurement of unrealised FVA adjustments. Likewise, this paper will use various proxies as alternatives for a direct measure of unrealised FVA adjustments. A total of four proxies will be used.

The first proxy will be the difference between earnings before interest, tax, depreciation and amortisation (EBITDA), and cash generated from operations, before finance costs, tax, and working capital movements. EBITDA is used as it excludes depreciation and amortisation, which are likewise excluded from cash generated from operations, as they represent non-cash movements. EBITDA also excludes finance costs and tax, which were excluded from cash generated from operations in the annual financial statements reviewed.

The second proxy will be the difference between EBITDA and cash generated from operations before finance costs and tax, but after working capital movements.

The third proxy will be the difference between net profit after tax (NPAT) before depreciation and amortisation, and cash flows from operating activities. Cash flows from operating activities include cash movements for finance costs, tax, and working capital movements. Depreciation and amortisation are added back to NPAT, as these represent non-cash items and are excluded from cash flows from operating activities.

As any unrealised FVA gains will not result in an inflow of cash to the company, all else being equal, an unrealised FVA gain included in earnings should result in net profit that is greater than cash flow from operations. Likewise, an unrealised FVA loss included in earnings should result in net profit that is less than cash flow from operations.

The fourth proxy will be the taxable or deductible temporary difference for the year. FVA movements result in taxable/deductible temporary differences, due to treatment differences for accounting and tax purposes. As De Jager (2015:165) mentions, a disadvantage of using these proxies is that they will contain 'noise' from sources other than FVA adjustments.

Firstly, a regression analysis will be performed; to test the implications of unrealised FVA adjustments for future earnings, and therefore the H0 hypothesis. In this paper it will be referred to as the Earnings Persistence Analysis. As far as possible, the Earnings Persistence Analysis will attempt to duplicate the model used by Goncharov and Van Triest (2011:58). Following this, a regression analysis will be performed, in an endeavour to explain the implications of unrealised FVA adjustments on changes in dividend, and therefore the H1 hypothesis. In this paper it will be referred to as the Dividend Analysis. As far as possible, it will attempt to duplicate the key model used by both De Jager (2015:173) and Goncharov and Van Triest (2011:59).

Next, the data for both the Earnings Persistence Analysis and the Dividend Analysis will be presented, including statistical considerations.

Data and Analysis Variables

Annual financial statements were obtained for the companies included in the FTSE/JSE Top 40 Index as at 31 December 2014. These financial statements were sourced from the Bloomberg Professional database (Bloomberg), and cover the years 2005 to 2014 (a ten-year period). The five banks[1] tested by De Jager (2015) were not included in the FTSE/JSE Top 40 Index list of companies analysed, resulting in an analysis of 35 companies[2]. A small number of companies in the sample were not in existence for the

[1] The five banks are ABSA, FNB, Investec, Nedbank and Standard Bank.

entire period of the data range (2005 to 2014); because of this, 22 observations were not available and therefore excluded. As a result, a total of 328 firm-year observations were tested over the 10-year data range period. A limitation of including firms as at a specific date is that survivorship bias may affect the test results.

The dependent variable in the Earnings Persistence Analysis is NP_{it}, which is the net profit after tax of company *i* in year *t.* The independent variables will be $NPBPROXY?_{it-1}$, which is the net profit after tax of company *i* in year *t-1* before one of the four proxies for unrealised FVA adjustments; and $PROXY?_{it-1}$, which represents one of the four possible proxies for unrealised FVA adjustments of company *i* in year *t-1*, as detailed in Table 1.

The dependent variable in the Dividend Analysis is ΔDIV_{it}, which is the change in dividends declared by company *i* in year *t*. The independent variables will be $DIV_{it-1,}$ which is the dividend declared by company *i* in year *t-1*; $NPBPROXY?_{it}$, which is net profit after tax of company *i* in year *t* before one of the four proxies for unrealised FVA adjustments; $NPBPROXY?_{it-1}$, which is net profit after tax of company *i* in year *t-1* before one of the four proxies for unrealised FVA adjustments; and $PROXY?_{it}$, which represents one of the four possible proxies for unrealised FVA adjustments of company *i* in year *t*, as detailed in Table 1.

The four proxies for unrealised FVA adjustments are:

- $PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements.
- $PROXY2_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements.

[2] The 35 companies from the FTSE/JSE Top 40 Index as at 31 December 2014 are BHP Billiton PLC, British American Tobacco PLC, SABMiller PLC, Naspers Ltd, Cie Financiere Richemont SA, MTN Group Ltd, Anglo American PLC, Sasol Ltd, Vodacom Group Ltd, Aspen Pharmacare Holdings Ltd, Old Mutual PLC, Sanlam Ltd, Steinhoff International Holdings Ltd, Remgro Ltd, Mr Price Group Ltd, The Bidvest Group Ltd, Shoprite Holdings Ltd, Anglo American Platinum Ltd, Mondi Ltd, Mondi PLC, RMB Holdings Ltd, Mediclinic International Ltd, Intu Properties PLC, Kumba Iron Ore Ltd, Woolworths Holdings Ltd, Tiger Brands Ltd, Discovery Ltd, Growthpoint Properties Ltd, Netcare Ltd, Capital & Counties Properties PLC, Reinet Investments SCA, Impala Platinum Holdings Ltd, Life Healthcare Group Holdings Ltd, AngloGold Ashanti Ltd, and Imperial Holdings Ltd.

- $PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities by company *i* in year *t*. Cash flows from operating activities include cash movements for finance costs, tax and working capital movements.
- $PROXY4_{it}$ is the taxable or deductible temporary difference for the year by company *i* in year *t*.

All of these variables have been deflated for size by using the company market capitalisation as at the specific company year-end for each year in the data range. These market capitalisation values (in South African Rand) were obtained from Bloomberg.

Easton and Sommers (2003:26) refer to the overwhelming influence of the largest firms in a data set as the 'scale effect'. Easton and Sommers (2003:27) find that observations for the larger firms have a significant influence on the regression residuals, as most variables are large for large firms, and the size of these variables influences the regression inferences. Since the largest firms in the sample have significant influence, inferences from the regression using all firms will reflect mostly the relations between the market capitalisation and the financial statement data of the larger firms. Easton and Sommers (2003:28) address the possibility of removing scale effects by expressing each of the variables in ratio form. To this effect, the dependent and independent variables in this study have been deflated for size by using company market capitalisation as at the specific company year-end for each year in the data range.

A small number of the companies under review reported their results in currencies other than South African Rand. Where company financials have been presented in a currency other than South African Rand, the market capitalisation values for that entity used to scale the relevant variables have been converted to the reporting currency of the entity, based on the spot rate at each specific company year-end date for each year in the data range. These spot rates were obtained from the South African Reserve Bank[3]. A limited number of companies in the sample were not listed as public companies for the entire length of the data range, and therefore did not have market capitalisation values available

[3] Available at www.resbank.co.za/Research/Rates/Pages/SelectedHistoricalExchangeAndInterestRates.aspx

for all years under review. Total year-end asset values, as reported in the annual financial statements, were used as the deflator in place of market capitalisation in these cases (a total of 19 observations).

The following control variables will be used in the Dividend Analysis:

- $SIZE_{it}$ is the natural logarithm of total assets of company *i* in year *t*;
- LEV_{it} is the financial leverage, defined as the ratio of total debt to total assets of company *i* in year *t*;
- $GROWTH_{it}$ is the percentage change in total assets of company *i* in year *t*;
- $CASH_{it}$ is the net cash balance (total cash and cash equivalents, less any bank overdraft) for company *i* in year *t*, scaled by market capitalisation as at the specific company year-end.

Table 1 details a list of the variables used in the Earnings Persistence Analysis in this study, compared to those used by Goncharov and Van Triest (2011:58).

Table 2 details a list of the variables used in the Dividend Analysis in this study, compared to those used by De Jager (2015:166) and Goncharov and Van Triest (2011:59). The dependent and independent variables used in this study are compared to those used by De Jager (2015:166) because of the similarities in proxy variables used, as both research settings are in South Africa. The control variables used in this study are compared to those used by Goncharov and Van Triest (2011:59) because of the similarities in these variables, as both studies focus on listed firms from a variety of industries.

Table 1: List of variables used by Goncharov and Van Triest (2011:58), and the variables used in the Earnings Persistence Analysis in this study.

Category	Goncharov and Van Triest (2011)	This Study
Dependent Variable	NI_{it} is net income of company *i* in year *t*	NP_{it} is the net profit after tax of company *i* in year *t*
Independent Variables	$NIBREV_{it-1}$ is net income before FVA adjustments of company *i* in year *t-1*	$NPBPROXY?_{it-1}$, is the net profit after tax of company *i* in year *t-1,* before one of the four proxies for unrealised FVA adjustments
	REV_{it-1} is the FVA adjustments on short-term and long-term financial assets of company *i* in year *t-1*	$PROXY1_{it-1}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t-1,* before finance costs, tax and working capital movements
		$PROXY2_{it-1}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t-1,* before finance costs and tax, but after working capital movements
		$PROXY3_{it-1}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t-1*
		$PROXY4_{it-1}$ is the taxable or deductible temporary difference for company *i* in year *t-1*

Table 2: Comparison of variables used by De Jager (2015:166) and Goncharov and Van Triest (2011:59) and the variables used in the Dividend Analysis in this study.

Category	De Jager (2015:166)	This Study
Dependent Variable	ΔDIV_{it} is the change in dividends by bank *i* in year *t*	ΔDIV_{it} is the change in dividends by company *i* in year *t*
Independent Variables	DIV_{it-1} is the dividend for bank *i* in year *t-1*	DIV_{it-1} is the dividend for company *i* in year *t-1*
	NP_{it} is the net profit after tax of bank *i* year *t*	NP_{it} is the net profit after tax of company *i* in year *t*
	NP_{it-1} is the net profit after tax of bank *i* year *t-1*	NP_{it-1} is the net profit after tax of company *i* in year *t-1*
	$NPBPROXY?_{it}$ is the net profit after tax of bank *i* in year *t,* before the proxies for FVA adjustments	$NPBPROXY?_{it}$ is the net profit after tax of company *i* in year *t,* before the proxies for unrealised FVA adjustments
	$NPBPROXY?_{it-1}$ is the net profit after tax of bank *i* in year *t-1,* before the proxies for FVA adjustments	$NPBPROXY?_{it-1}$ is the net profit after tax of company *i* in year *t-1,* before the proxies for unrealised FVA adjustments
	$PROXY1_{it}$ is the difference between net profit after tax and a broad measure of cash generated for bank *i* in year *t*	$PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements
	$PROXY2_{it}$ is the difference between net profit after tax and a narrow measure of cash generated for bank *i* in year *t*	$PROXY2_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements
	$PROXY3_{it}$ is the total of extraordinary items for bank *i* in year *t,* including mark-to-market values	$PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*
		$PROXY4_{it}$ is the taxable or deductible temporary difference for company *i* in year *t*

Category	Goncharov and Van Triest (2011:59)	This Study
Control Variables	$SIZE_{it}$ is the natural logarithm of total assets at the beginning of the year for company *i* in year *t*	$SIZE_{it}$ is the natural logarithm of total assets for company *i* in year *t*
	LEV_{it} is the financial leverage for company *i* in year *t,* defined as a ratio of total debt to total assets	LEV_{it} is the financial leverage for company *i* in year *t,* defined as a ratio of total debt to total assets
	$GROWTH_{it}$ is the percentage change in sales for company *i* in year *t*	$GROWTH_{it}$ is the percentage change in total assets for company *i* in year *t*
	$CASH_{it}$ is the scaled cash balance for company *i* in year *t*	$CASH_{it}$ is the cash balance for company *i* in year *t,* defined as net cash (total cash and cash equivalents less any bank overdraft)

Table 3 presents descriptive statistics for the variables detailed in Table 2. These variables will be used in the Earnings Persistence Analysis and the Dividend Analysis. The independent variables and the $CASH_{it}$ control variable have been scaled by company market capitalisation as at the specific company year-end for each year in the data range. Where market capitalisation was not available, the total financial year-end company asset values from the annual financial statements have been used as the deflator.

As the observations consist of cross-sectional data collected over a number of time periods, a panel data regression using the ordinary least squares (OLS) method is performed for both the Earnings Persistence Analysis and the Dividend Analysis.

Table 3: Descriptive statistics of the independent and control variables used in the Earnings Persistence Analysis and the Dividend Analysis

Unadjusted for Outliers					
Variable	**Mean**	**Median**	**Standard Deviation**	**Minimum**	**Maximum**
DIV_{it}	0.0323	0.0266	0.0322	0.0000	0.1920
NP_{it}	0.0619	0.0710	0.1334	-1.4528	0.3555
$NPBPROXY1_{it}$	0.0602	0.0575	0.3106	-1.6438	4.9535
$NPBPROXY2_{it}$	0.0585	0.0535	0.1135	-0.7772	0.7920
$NPBPROXY3_{it}$	0.0783	0.0633	0.0799	-0.0862	0.6214
$NPBPROXY4_{it}$	0.0633	0.0645	0.1309	-1.3406	0.6686
$PROXY1_{it}$	0.0017	0.0019	0.3303	-4.7328	1.6360
$PROXY2_{it}$	0.0034	0.0070	0.1745	-1.5808	0.9798
$PROXY3_{it}$	-0.0164	0.0003	0.1458	-1.4994	0.3229
$PROXY4_{it}$	-0.0014	0.0020	0.0575	-0.5470	0.1528
$SIZE_{it}$	24.1000	24.2355	1.1944	21.0187	27.1388
$CASH_{it}$	0.0870	0.0579	0.1081	-0.0571	0.9249
LEV_{it}	54%	53%	0.2243	2%	132%
$GROWTH_{it}$	19%	13%	0.5587	-46%	704%
95% Winsorised					
Variable	**Mean**	**Median**	**Standard Deviation**	**Minimum**	**Maximum**
DIV_{it}	0.0318	0.0266	0.0297	0.0000	0.1505
NP_{it}	0.0698	0.0711	0.0584	-0.1366	0.2039
$NPBPROXY1_{it}$	0.0527	0.0577	0.0852	-0.3088	0.2251
$NPBPROXY2_{it}$	0.0599	0.0535	0.0648	-0.1062	0.2688
$NPBPROXY3_{it}$	0.0768	0.0629	0.0676	-0.0042	0.3596
$NPBPROXY4_{it}$	0.0682	0.0646	0.0593	-0.0866	0.2243
$PROXY1_{it}$	0.0033	0.0019	0.2764	-4.7328	0.4251
$PROXY2_{it}$	0.0058	0.0068	0.0992	-0.4223	0.3006
$PROXY3_{it}$	-0.0094	0.0005	0.0786	-0.3409	0.1317
$PROXY4_{it}$	0.0023	0.0019	0.0300	-0.1106	0.0713
$SIZE_{it}$	24.0997	24.2548	1.1712	21.6370	26.5372
$CASH_{it}$	0.0849	0.0580	0.0945	-0.0038	0.4614
LEV_{it}	54%	53%	0.2189	6%	96%
$GROWTH_{it}$	15%	13%	0.2062	-24%	82%

Note: The data sample represents 328 annual observations, from 2005 to 2014. Companies included in the FTSE/JSE Top 40 Index as at 31 December 2014 were analysed. Data was sourced from Bloomberg. DIV_{it} is the dividends by

company *i* in year *t*. NP_{it} is the net profit after tax of company *i* in year *t*. $NPBPROXY1_{it}$ is the net profit after tax of company *i* in year *t* before $PROXY1_{it}$. $NPBPROXY2_{it}$ is the net profit after tax of company *i* in year *t* before $PROXY2_{it}$. $NPBPROXY3_{it}$ is the net profit after tax of company *i* in year *t* before $PROXY3_{it}$. $NPBPROXY4_{it}$ is the net profit after tax of company *i* in year *t* before $PROXY4_{it}$. $PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements. $PROXY2_{it;}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements. $PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*. $PROXY4_{it}$ is the taxable or deductible temporary difference for the year by company *i* in year *t*. All independent variables have been deflated for size by company market capitalisation or total assets as at the specific company year-end for each year in the data range. $SIZE_{it}$ is the natural logarithm of total assets of company *i* in year *t*. LEV_{it} is financial leverage defined as the ratio of total debt to total assets of company *i* in year *t*. $GROWTH_{it}$ is the percentage change in total assets for company *i* in year *t*. $CASH_{it}$ is the cash balance for company *i* in year *t,* defined as net cash (total cash and cash equivalents less any bank overdraft), scaled by market capitalisation or total assets as at the specific company year-end for each year in the data range. In the bottom half of the table, a winsorisation of 95% has been applied to all variables.

Panel Data Regression

Panel data combines the two dimensions of time series and cross-sectional elements. It allows the researcher to control for the unobservable that would otherwise create bias in a regression estimation. This can dramatically reduce the potential impact of omitted correlated variables on the statistical inference (O'Connell, 2007:372). In addition, panel techniques allow the testing of hypotheses when a reasonably small number of observations are available on a range of firms.

The most efficient way to test panel data is to estimate a panel data regression using the OLS method. However, this does have certain limitations. Most importantly, panel data OLS regressions assume that the average values of the variables and the relationships between them are constant over time, and across all of the cross-sectional units in the sample, while giving equal weight to all observations. OLS regressions seek to minimise residuals, and in turn produce the smallest possible standard errors. One of the underlying assumptions of the OLS regression is that the error terms for all observations have a common variance; in other words, they are homoscedastic. In contrast, varying variance errors are said to be heteroscedastic.

"A first step in using panel data regression would be to test the errors resulting from a normal regression (where the data consists of observations from cross-sections over time) for heteroscedasticity. If heteroscedasticity is found, one should test for the appropriateness or not of fixed or random effects." (De Jager, 2015:169).

If an unobserved variable varies across one dimension of the panel but not across the other, fixed effects can be used to account for the omitted variable. “With fixed effects models, the differences across firms are dealt with by allowing firm and/or time varying intercepts when estimating the regression model” (O'Connell, 2007:373). According to Baltagi (2005:14), the fixed-effect model is an appropriate specification if a specific set of firms is focused on and inferences are restricted to the behaviour of these firms.

The Earnings Persistence Analysis is now run, by estimating a panel data regression using the OLS method.

4. Results

Earnings Persistence Analysis

To assess the implications of unrealised FVA adjustments on future earnings, net profit is regressed on lagged net profit before each proxy for unrealised FVA adjustments and lagged unrealised FVA adjustments, as determined by each proxy. This Earnings Persistence Analysis model is defined as:

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY?_{it-1} + \beta_2 PROXY?_{it-1} + \varepsilon_{it} \quad (1.1)$$

where *i* and *t* represent companies and years. NP_{it} is the net profit after tax of company *i* in year *t*. $NPBPROXY?_{it-1}$ is the net profit after tax of company *i* in year *t-1* before one of the four proxies for unrealised FVA adjustments. $PROXY?_{it-1}$ represents one of the four possible proxies of company *i* in year *t-1*, as detailed in Table 1.

Model (1.1) is run without fixed effects, and uses the best-fitting proxy (based on R-squared) of the four proxies. Proxy 3 provides the best fit based on R-squared. The null hypothesis for an OLS regression is that the error terms for all observations are homoscedastic. Model (1.1) was tested for heteroscedasticity using the White heteroscedasticity test, including White cross-terms. “It is well known that the presence of heteroscedasticity in the disturbances of an otherwise properly specified linear model leads to consistent but inefficient parameter estimates and inconsistent covariance matrix estimates” (White, 1980:817).

The results of this test are shown in Figure 1. The test results indicate significant chi-squared p-values; therefore, the null hypothesis of homoscedasticity is rejected. To account for heteroscedasticity and to ensure the conclusions are more conservative, models (1.2) to (1.5) are run with White diagonal standard errors and covariance (degrees of freedom corrected).

Model (1.1) - Proxy 3			
Heteroscedasticity Test: White			
F-statistic	0.8161	Prob. F(5,322)	0.5389
Obs*R-squared	4.1045	Prob. Chi-Square(5)	0.5345
Scaled explained SS	243.4083	Prob. Chi-Square(5)	0.0000

Figure 1: White's (1980) test for heteroscedasticity for Model (1.1)

Panel data regressions were run for models (1.2) to (1.9). Cross-sectional and period fixed effects were tested for in these models. The results of these are shown in Figure 2 for the unadjusted data models (1.2) to (1.5), and in Figure 3 for the winsorised data models (1.6) to (1.9). The fixed effects test results for models (1.2) to (1.5) indicate that cross-sectional fixed effects are valid; however, period fixed effects are not. The fixed effects test results for models (1.6) to (1.9) indicate that both cross-sectional and period fixed effects are valid. Therefore, models (1.2) to (1.5) are run with cross-sectional fixed effects only, while models (1.6) to (1.9) are run with both cross-sectional and period fixed effects.

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (1.2)			Model (1.3)			Model (1.4)			Model (1.5)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.0463	(34,282)	0.0009	2.0252	(34,282)	0.0011	1.8650	(34,282)	0.0035	2.0457	(34,282)	0.0009
Cross-section Chi-square	72.3272	34	0.0001	71.6579	34	0.0002	66.5258	34	0.0007	72.3091	34	0.0001
Period F	1.0020	(9,282)	0.4385	1.0159	(9,282)	0.4273	1.0140	(9,282)	0.4288	1.0332	(9,282)	0.4135
Period Chi-square	10.3248	9	0.3248	10.4660	9	0.3141	10.4465	9	0.3156	10.6414	9	0.3011
Cross-Section/Period F	1.8053	(43,282)	0.0026	1.7906	(43,282)	0.0030	1.6646	(43,282)	0.0084	1.8030	(43,282)	0.0027
Cross-Section/Period Chi-square	79.7574	43	0.0006	79.1809	43	0.0006	74.1912	43	0.0022	79.6655	43	0.0006

Figure 2: Validity of fixed effects tests for model (1.2) to model (1.5) of the Dividends Analysis

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (1.6)			Model (1.7)			Model (1.8)			Model (1.9)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	3.1970	(34,282)	0.0000	3.1406	(34,282)	0.0000	3.1467	(34,282)	0.0000	3.2499	(34,282)	0.0000
Cross-section Chi-square	106.9363	34	0.0000	105.3239	34	0.0000	105.4987	34	0.0000	108.4441	34	0.0000
Period F	3.4090	(9,282)	0.0005	3.4648	(9,282)	0.0004	3.4357	(9,282)	0.0005	3.4612	(9,282)	0.0005
Period Chi-square	33.8742	9	0.0001	34.4013	9	0.0001	34.1265	9	0.0001	34.3670	9	0.0001
Cross-Section/Period F	3.2375	(43,282)	0.0000	3.2278	(43,282)	0.0000	3.2115	(43,282)	0.0000	3.2977	(43,282)	0.0000
Cross-Section/Period Chi-square	131.6035	43	0.0000	131.2801	43	0.0000	130.7328	43	0.0000	133.6126	43	0.0000

Figure 3: Validity of fixed effects tests for model (1.6) to model (1.9) of the Dividends Analysis

Models (1.2) to (1.5) are detailed as follows:

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY1_{it-1} + \beta_2 PROXY1_{it-1} + \mu_i + \varepsilon_{it} \quad (1.2)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY2_{it-1} + \beta_2 PROXY2_{it-1} + \mu_i + \varepsilon_{it} \quad (1.3)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY3_{it-1} + \beta_2 PROXY3_{it-1} + \mu_i + \varepsilon_{it} \quad (1.4)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY4_{it-1} + \beta_2 PROXY4_{it-1} + \mu_i + \varepsilon_{it} \quad (1.5)$$

Models (1.6) to (1.9) are detailed as follows:

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY1_{it-1} + \beta_2 PROXY1_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1.6)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY2_{it-1} + \beta_2 PROXY2_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1.7)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY3_{it-1} + \beta_2 PROXY3_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1.8)$$

$$NP_{it} = \alpha_0 + \beta_1 NPBPROXY4_{it-1} + \beta_2 PROXY4_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1.9)$$

The sign and the magnitude of β_2 in models (1.2) to (1.9) depends on the persistence of unrealised FVA adjustments. If the unrealised FVA adjustments are fully transitory, the coefficient on $PROXY?_{it-1}$ is predicted to be zero. If these adjustments are persistent and

result in increases in future earnings, β_2 should be larger than zero. Alternatively, β_2 should be less than zero if the adjustments indicate a deterioration in future earnings. The results of these tests are detailed in Table 4.

Model (1.1) is an unadjusted data model, run without fixed effects. The fixed effect tests detailed in Figure 2 indicate that cross-sectional fixed effects are appropriate for models (1.2) to (1.5). Coefficient estimates and associated t-values from model (1.1) are therefore unreliable. Model (1.2) has the best model fit, as measured by R-squared, of the unadjusted data models. The residual graph of model (1.2) is available in the appendix. Model (1.9) has the best model fit, as measured by R-squared, of the winsorised data models. The residual graph of model (1.9) is available in the appendix.

In models (1.2) to (1.5) there is no strong evidence to suggest that FVA adjustments are persistent. The coefficients on β_2 reported for all proxies in the unadjusted data models (1.2) to (1.5) do not indicate any statistical significance. However, model fit is greatly improved by the winsorisation of the data in models (1.6) to (1.9). The coefficients on β_2 reported for all proxies in the winsorised models are positive, and slightly statistically significant. This indicates that unrealised FVA adjustments may have implications for future earnings, and therefore include persistent elements. According to Lintner's (1956) model, if FVA gains result in persistent increases in income, they will have a positive relationship with dividends. The null hypothesis of H0 is therefore rejected.

The next test to be performed will be the Dividend Analysis, in an effort to explain the changes in dividends. This test will attempt to duplicate, as far as possible, the key model used by De Jager (2015:173) and Goncharov and Van Triest (2011:59).

Table 4: Regression results of the Earnings Persistence Analysis

Regressor	Model (1.1)	Model (1.2)	Model (1.3)	Model (1.4)	Model (1.5)
Unadjusted Data					
c	0.0435*** (5.0481)	0.0655*** (13.9634)	0.0643*** (13.3085)	0.0645*** (10.1242)	0.0643*** (11.9017)
NPBPROXY?$_{it-1}$	0.2991*** (3.6045)	-0.0057 (-0.1501)	0.0151 (0.2720)	0.0107 (0.1551)	0.0126 (0.3951)
PROXY1$_{it-1}$	NA	0.0108 (0.2813)	NA	NA	NA
PROXY2$_{it-1}$	NA	NA	0.0089 (0.2358)	NA	NA
PROXY3$_{it-1}$	0.1195*** (2.6857)	NA	NA	0.0086 (0.2287)	NA
PROXY4$_{it-1}$	NA	NA	NA	NA	-0.0263 (-0.1552)
Fixed Effects	No	Yes (cross-sectional)	Yes (cross-sectional)	Yes (cross-sectional)	Yes (cross-sectional)
White diagonal standard errors and covariance	No	Yes	Yes	Yes	Yes
N	328	328	328	328	328
R-squared	0.0435	0.2146	0.2124	0.2124	0.2127
Adj. R-squared	0.0376	0.1174	0.1150	0.1150	0.1154

Winsorised Data				
Regressor	**Model (1.6)**	**Model (1.7)**	**Model (1.8)**	**Model (1.9)**
c	0.0594*** (8.9179)	0.0585*** (8.6297)	0.0610** (8.9664)	0.0600*** (8.8418)
NPBPROXY?$_{it-1}$	0.1652* (1.8574)	0.1804* (1.9595)	0.1463 (1.6393)	0.1557* (1.7759)
PROXY1$_{it-1}$	0.1686* (1.9102)	NA	NA	NA
PROXY2$_{it-1}$	NA	0.1653* (1.9162)	NA	NA
PROXY3$_{it-1}$	NA	NA	0.1720* (1.9528)	NA
PROXY4$_{it-1}$	NA	NA	NA	0.2463* (1.7622)
Fixed Effects	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance	Yes	Yes	Yes	Yes
N	328	328	328	328
R-squared	0.5195	0.5198	0.5201	0.5213
Adj. R-squared	0.4428	0.4432	0.4436	0.4449

Note: The data sample represents 328 annual observations, from 2005 to 2014. Companies included in the FTSE/JSE Top 40 Index as at 31 December 2014 were analysed. Data was sourced from Bloomberg. NP_{it} is the regressand and is the net profit after tax of company *i* in year *t*. $NPBPROXY?_{it-1}$ is the net profit after tax of company *i* in year *t-1,* before the relevant proxy for FVA adjustments. $PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t*, before finance costs, tax and working capital movements. $PROXY2_{it;}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t*, before finance costs and tax, but after working capital movements. $PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*. $PROXY4_{it}$ is the taxable or deductible temporary difference for the year by company *i* in year *t*. These variables have been deflated for size by company market capitalisation or total assets as at the specific company year-end for each year in the data range. A winsorisation of 95% has been applied to all the variables in models (1.6) to (1.9).
*,**,***, significant at the threshold of 10%, 5% and 1%, respectively (t-test). T-values are shown in parentheses.

Dividend Analysis

The following initial model was fitted to the data:

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NPBPROXY?_{it} + \beta_3 NPBPROXY?_{it-1}$$
$$+ \beta_4 PROXY?_{it} + \beta_5 CONTROLS_{it} + \varepsilon_{it} \quad (2.1)$$

where ΔDIV_{it} is the change in dividends by company *i* in year *t*. $NPBPROXY?_{it}$ is the net profit after tax, but before one of the four proxies for unrealised FVA adjustments of company *i* in year *t*. $NPBPROXY?_{it-1}$ is the net profit after tax, but before one of the four proxies for unrealised FVA adjustments of company *i* in year *t-1*. $PROXY?_{it}$ represents one of the four possible proxies for unrealised FVA adjustments of company *i* in year *t*, as detailed in Table 2. $CONTROLS_{it}$ represents the control variables of $SIZE_{it}$, LEV_{it}, $GROWTH_{it}$ and $CASH_{it}$, of company *i* in year *t*, as detailed in Table 2.

Model (2.1) is run without fixed effects, and uses the best-fitting proxy (based on R-squared) of the four proxies. Proxy 1 provides the best fit based on R-squared. Model (2.1) was tested for heteroscedasticity using the White heteroscedasticity test, including White cross-terms. The results of this test are shown in Figure 4. The test results indicate significant p-values; therefore, the null hypothesis of homoscedasticity is rejected.

Model (2.1) - Proxy 1			
Heteroscedasticity Test: White			
F-statistic	1.8077	Prob. F(44,283)	0.0024
Obs*R-squared	71.9600	Prob. Chi-Square(44)	0.0049
Scaled explained SS	492.9970	Prob. Chi-Square(44)	0.0000

Figure 4: White's (1980) test for heteroscedasticity for Model (2.1)

To account for heteroscedasticity, and to ensure the conclusions drawn are conservative, models (2.2) to (2.9) are run with White diagonal standard errors and covariance (degrees of freedom corrected).

Panel data tests were run for Models (2.2) to (2.9). Cross-sectional and period fixed effects were implemented in these models. These fixed effects were tested for, and found

to be valid. The results of these tests are shown in Figure 5, for models (2.2) to (2.5), and in Figure 6, for models (2.6) to (2.9).

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (2.2)			Model (2.3)			Model (2.4)			Model (2.5)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.4399	(34,276)	0.0000	2.6742	(34,276)	0.0000	2.4268	(34,276)	0.0000	2.8472	(34,276)	0.0000
Cross-section Chi-square	86.1982	34	0.0000	93.3991	34	0.0000	85.7914	34	0.0000	98.6154	34	0.0000
Period F	2.7905	(9,276)	0.0038	3.1002	(9,276)	0.0014	3.3851	(9,276)	0.0006	2.9269	(9,276)	0.0025
Period Chi-square	28.5657	9	0.0008	31.5873	9	0.0002	34.3436	9	0.0001	29.8998	9	0.0005
Cross-Section/Period F	2.6551	(43,276)	0.0000	2.8861	(43,276)	0.0000	2.7123	(43,276)	0.0000	3.0207	(43,276)	0.0000
Cross-Section/Period Chi-square	113.5480	43	0.0000	121.7945	43	0.0000	115.6090	43	0.0000	126.5036	43	0.0000

Figure 5: Validity of fixed effects tests for model (2.2) to model (2.5) of the Dividends Analysis

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (2.6)			Model (2.7)			Model (2.8)			Model (2.9)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.7455	(34,276)	0.0000	2.5721	(34,276)	0.0000	2.5383	(34,276)	0.0000	2.9379	(34,276)	0.0000
Cross-section Chi-square	95.5590	34	0.0000	90.2798	34	0.0000	89.2429	34	0.0000	101.3163	34	0.0000
Period F	3.5879	(9,276)	0.0003	3.8657	(9,276)	0.0001	4.0005	(9,276)	0.0001	3.8016	(9,276)	0.0002
Period Chi-square	36.2915	9	0.0000	38.9407	9	0.0000	40.2181	9	0.0000	38.3313	9	0.0000
Cross-Section/Period F	3.0395	(43,276)	0.0000	2.8878	(43,276)	0.0000	2.8386	(43,276)	0.0000	3.3348	(43,276)	0.0000
Cross-Section/Period Chi-square	127.1561	43	0.0000	121.8544	43	0.0000	120.1139	43	0.0000	137.2387	43	0.0000

Figure 6: Validity of fixed effects tests for model (2.6) to model (2.9) of the Dividends Analysis

Models (2.2) to (2.5) are detailed as follows:

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NPBPROXY1_{it} + \beta_3 NPBPROXY1_{it-1} + \beta_4 PROXY1_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.2)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NPBPROXY2_{it} + \beta_3 NPBPROXY2_{it-1} + \beta_4 PROXY2_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.3)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NPBPROXY3_{it} + \beta_3 NPBPROXY3_{it-1} + \beta_4 PROXY3_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.4)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NPBPROXY4_{it} + \beta_3 NPBPROXY4_{it-1} + \beta_4 PROXY4_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.5)$$

Model (2.6) is model (2.2) with winsorised observations; likewise, model (2.7) is model (2.3) with winsorised observations, model (2.8) is model (2.4) with winsorised observations, and model (2.9) is model (2.5) with winsorised observations.

The results of model (2.1) to model (2.9) are presented in Table 5.

Table 5: Regression results of the Dividend Analysis models (2.1) to (2.9)

Unadjusted Data					
Regressor	**Model (2.1)**	**Model (2.2)**	**Model (2.3)**	**Model (2.4)**	**Model (2.5)**
c	-0.0079 (-0.2989)	0.0402 (0.3112)	0.0310 (0.2390)	0.0174 (0.1309)	0.0397 (0.3060)
DIV_{it-1}	-0.3860*** (-9.3693)	-0.6654*** (-6.2732)	-0.7051*** (-6.9917)	-0.7122*** (-7.1102)	-0.7201*** (-7.0210)
$NPBPROXY?_{it}$	0.0476*** (3.8410)	0.0326 (1.3582)	0.0558 (1.5661)	0.0881** (2.5549)	0.0215 (0.7012)
$NPBPROXY?_{it-1}$	-0.0114*** (-2.7244)	-0.0066* (-1.8962)	-0.0034 (-0.2256)	0.0171 (0.5861)	0.0166 (1.2198)
$PROXY1_{it}$	0.0249** (2.1348)	0.0150 (0.6128)	NA	NA	NA
$PROXY2_{it}$	NA	NA	0.0207 (0.7683)	NA	NA
$PROXY3_{it}$	NA	NA	NA	0.0180 (0.7223)	NA
$PROXY4_{it}$	NA	NA	NA	NA	0.0044 (0.1228)
$SIZE_{it}$	0.0007 (0.6119)	-0.0008 (-0.1514)	-0.0005 (-0.0945)	-0.0002 (-0.0323)	-0.0009 (-0.1680)
LEV_{it}	0.0001 (0.0171)	-0.0103 (-0.9502)	-0.0114 (-1.0267)	-0.0086 (-0.7530)	-0.0106 (-0.9455)
$GROWTH_{it}$	-0.0033 (-1.4903)	-0.0044** (-2.0591)	-0.0046** (-1.9907)	-0.0048** (-2.0213)	-0.0046* (-1.9681)
$CASH_{it}$	0.0233* (1.7014)	0.0562** (2.3072)	0.0848*** (2.7297)	0.0831** (2.4396)	0.0995*** (3.4991)
Fixed Effects	No	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	No	Yes	Yes	Yes	Yes
N	328	328	328	328	328
R-squared	0.3467	0.5379	0.5097	0.5199	0.5041
Adj. R-squared	0.3303	0.4525	0.4191	0.4312	0.4124

Winsorised Data				
Regressor	**Model (2.6)**	**Model (2.7)**	**Model (2.8)**	**Model (2.9)**
c	-0.0287 (-0.2953)	-0.0184 (-0.1872)	-0.0488 (-0.4784)	-0.0288 (-0.2962)
DIV_{it-1}	-0.7201*** (-8.3120)	-0.6987*** (-8.2281)	-0.7030*** (-8.5772)	-0.7454*** (-9.0847)
$NPBPROXY?_{it}$	0.2182*** (5.9729)	0.2377*** (6.3408)	0.2587*** (6.5733)	0.1839*** (4.7814)
$NPBPROXY?_{it-1}$	0.0065 (0.3034)	-0.0044 (0.1808)	0.0025 (0.0865)	0.0610* (1.7436)
$PROXY1_{it}$	0.1679*** (4.6734)	NA	NA	NA
$PROXY2_{it}$	NA	0.1777*** (5.1828)	NA	NA
$PROXY3_{it}$	NA	NA	0.1770*** (5.5515)	NA

$PROXY4_{it}$	NA	NA	NA	0.1731*** (2.7467)
$SIZE_{it}$	0.0016 (0.4123)	0.0011 (0.2775)	0.0022 (0.5477)	0.0015 (0.3767)
LEV_{it}	-0.0047 (-0.3914)	-0.0034 (-0.2763)	-0.0030 (-0.2470)	-0.0110 (-0.2539)
$GROWTH_{it}$	-0.0225*** (-3.2426)	-0.0249*** (-3.4235)	-0.0259*** (-3.5569)	-0.0252*** (-3.5434)
$CASH_{it}$	0.0471* (0.0792)	0.0438 (1.5579)	0.0460* (1.8992)	0.0632** (2.5021)
Fixed Effects	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	Yes	Yes	Yes	Yes
N	328	328	328	328
R-squared	0.5797	0.5831	0.5909	0.5746
Adj. R-squared	0.5020	0.5060	0.5153	0.4960

Note: The data sample represents 328 annual observations from 2005 to 2014. Companies included in the FTSE/JSE Top 40 Index as at 31 December 2014 were analysed. Data was sourced from Bloomberg. Change in dividends (ΔDIV_{it}) is the regressand. DIV_{it} is the dividends by company *i* in year *t*. $PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements. $PROXY2_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements. $PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*. $PROXY4_{it}$ is the taxable or deductible temporary difference for the year by company *i* in year *t*. Model (2.1) includes $NPBPROXY1_{it}$, which is net profit after tax of company *i* in year *t* before $PROXY1_{it}$. This model was run without fixed effects. Models (2.2) and (2.6) include $NPBPROXY1_{it}$ which is net profit after tax of company *i* in year *t,* before $PROXY1_{it}$. Models (2.3) and (2.7) include $NPBPROXY2_{it}$ which is net profit after tax of company *i* in year *t,* before $PROXY2_{it}$. Models (2.4) and (2.8) include $NPBPROXY3_{it}$, which is net profit after tax of company *i* in year *t,* before $PROXY3_{it}$. Models (2.5) and (2.9) include $NPBPROXY4_{it}$, which is net profit after tax of company *i* in year *t,* before $PROXY4_{it}$. All independent variables have been deflated for size by company market capitalisation or total assets as at the specific company year-end for each year in the data range. $SIZE_{it}$ is the natural logarithm of total assets of company *i* in year *t*. LEV_{it} is financial leverage, defined as the ratio of total debt to total assets of company *i* in year *t*. $GROWTH_{it}$ is the percentage change in total assets for company *i* in year *t*. $CASH_{it}$ is the cash balance defined as net cash (total cash and cash equivalents, less any bank overdraft) for company *i* in year *t,* scaled by market capitalisation or total assets as at the specific company year-end for each year in the data range. A winsorisation of 95% has been applied to all the variables in models (2.6) to (2.9).

*,**,***, significant at the threshold of 10%, 5% and 1%, respectively (t-test). T-values are shown in parentheses.

Model (2.1) suffers from heteroscedasticity, and the fixed effect tests detailed in Figure 5 indicate that the use of period and cross-sectional fixed effects are appropriate. Coefficient estimates and associated t-values from model (2.1) are therefore unreliable.

Models (2.2) to (2.9) are panel data models, with cross-sectional and period fixed effects. They are run with White diagonal standard errors and covariance (degrees of freedom corrected). Of the unadjusted data models, model (2.2) has the best model fit as measured by R-squared. The residual graph of model (2.2) is available in the appendix. Of the winsorised data models, model (2.8) has the best model fit as measured by R-squared, and accounts for 59 percent of the variance in the dependent variable. The residual graph of model (2.8) is available in the appendix. Model fit is improved by the winsorisation of the data, as evidenced by the improved R-squared values. The residuals in the winsorised models also have fewer outliers, compared to the unadjusted data models.

Models (2.1) to (2.9) were not tested for serial correlation, as the time-series observations available per cross-section are too few to test robustly for this. Thompson's (2011) paper describes a method for computing standard errors that are robust to correlation along two dimensions; in other words, clustered standard errors that are robust to correlation across both firms and time. Thompson (2011:2) refers to this as "double-clustered standard errors". This is necessary, as "a typical finance panel data set contains observations on multiple firms across multiple time periods." Thompson (2011:1). However, Thompson (2011:2) finds that when the sample size is small, the more robust standard errors can lead to incorrect statistical significance; and that double clustering is probably most useful in data sets with significant and similar numbers of time and firm components. Using Monte Carlo experiments to evaluate how large a sample size must be for effective double clustering, Thompson (2011:2) suggests that standard errors are reliable in data sets with at least 25 firm observations over 25 time periods. As the data set used for models (2.1) to (2.9) of the Dividend Analysis contains only 10 annual-period data observations, double clustering will not be reliable.

Consistent with the findings of Goncharov and Van Triest (2011:60) and De Jager (2015:175), the results for models (2.2) to (2.5) consistently indicate a negative coefficient

on lagged dividends with statistical significance. In model (2.4), $NPBPROXY3_{it}$ was found to have a positive coefficient with statistical significance. Lagged income has a negative coefficient with slight significance in model (2.2). De Jager (2015:175) found a slightly significant positive coefficient for the proxy variables in only one of his non-winsorised data models. This was in contrast to the findings of Goncharov and Van Triest (2011:60), who reported a statistically significant negative association between FVA adjustments and the change in dividends. The results of models (2.2) to (2.5) indicate no significant relationships between any of the four proxy variables and the change in dividends. Of the four control variables, $GROWTH_{it}$ and $CASH_{it}$ have statistically significant coefficients. In models (2.2) to (2.5), $CASH_{it}$ has a positive coefficient with statistical significance, and $GROWTH_{it}$ a negative coefficient with statistical significance.

Model fit based on R-squared is improved by the winsorisation of the data in models (2.6) to (2.9). The results for these models again indicate a negative coefficient on lagged dividends with statistical significance. Consistent with the findings of Goncharov and Van Triest (2011:60) and De Jager (2015:175), net profit before the relevant proxy variable has a positive coefficient with statistical significance in models (2.6) to (2.9), indicating that a firm's dividend payments increase as net profit before the relevant FVA proxy increases. All proxy variables now have positive coefficients with statistical significance in the winsorised data models; which is in line with the findings of De Jager (2015:175), whose winsorised data tests found positive coefficients with slight statistical significance for all proxy variables. This is an indication that South African firms may be paying dividends from unrealised FVA adjustments, as determined by the proxy variables. This is in contrast to the findings of Goncharov and Van Triest (2011:60), who reported a statistically significant negative association between FVA adjustments and change in dividends.

Of the control variables, $GROWTH_{it}$ again has a negative coefficient with statistical significance in all four models, while $CASH_{it}$ has a positive coefficient with statistical significance in three of the four models. The negative $GROWTH_{it}$ coefficient indicates that firms in a high-growth phase may reinvest cash on hand into additional assets and/or projects to facilitate this growth, in lieu of additional dividend payments. The positive

coefficient of $CASH_{it}$ is to be expected, as – all else being equal – a firm with additional cash available is likely to pay a higher dividend.

The results from models (2.6) to (2.9) indicate that the change in dividend can be explained by the following variables in the Dividend Analysis model previously specified: the company declaring the dividend, the specific year in which the dividend was declared, the immediate preceding dividend, the current profitability of the company before any unrealised FVA adjustments, the level of unrealised FVA adjustments as determined by each proxy variable, the growth of the company, and the cash balance of the company at year end.

If the annual dividends decided on by management of South African companies is determined using total profit, including FVA adjustments, the Dividend Analysis models can be improved by replacing profit before FVA adjustments with profit after FVA adjustments. In models (3.1) to (3.9), the $NPBFPROXY?_{it}$ and $NPBFPROXY?_{it-1}$ variables are replaced with NP_{it} and NP_{it-1}, where ΔDIV_{it} could be influenced by profit after tax inclusive of FVA adjustments.

By replacing the $NPBFPROXY?_{it}$ and $NPBFPROXY?_{it-1}$ variables with NP_{it} and NP_{it-1}, the following initial model was fitted to the data:

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NP_{it} + \beta_3 NP_{it-1} + \beta_4 PROXY?_{it} + \beta_5 CONTROLS_{it} + \varepsilon_{it} \quad (3.1)$$

where ΔDIV_{it} is the change in dividends by company *i* in year *t*. NP_{it} is the net profit after tax of company *i* in year *t*. NP_{it-1} is the net profit after tax of company *i* in year *t-1*. $PROXY?_{it}$ represents one of the four possible proxies for unrealised FVA adjustments of company *i* in year *t*, detailed in Table 2. $CONTROLS_{it}$ represents the control variables of $SIZE_{it}$, LEV_{it}, $GROWTH_{it}$ and $CASH_{it}$, of company *i* in year *t*, as detailed in Table 2.

Model (3.1) is run without fixed effects and uses the best-fitting proxy (based on R-squared) of the four proxies. Proxy 1 provided the best fit based on R-squared. Model (3.1) was tested for heteroscedasticity using the White heteroscedasticity test, including White cross-terms. The results of this test are provided in Figure 7. The test results

indicate significant p-values; therefore, the null hypothesis of homoscedasticity is rejected.

Model (3.1) - Proxy 1			
Heteroscedasticity Test: White			
F-statistic	1.7048	Prob. F(44,283)	0.0057
Obs*R-squared	68.7241	Prob. Chi-Square(44)	0.0100
Scaled explained SS	434.0850	Prob. Chi-Square(44)	0.0000

Figure 7: White's (1980) test for heteroscedasticity for Model (3.1)

To correct the standard errors to account for heteroscedasticity and to ensure the conclusions are conservative, models (3.2) to (3.9) are also run with White diagonal standard errors and covariance (degrees of freedom corrected).

Panel data tests were run for Models (3.2) to (3.9). Cross-sectional and period fixed effects were implemented in these models. These fixed effects were tested for in Models (3.2) to (3.9), and found to be valid. The results of these tests are shown in Figure 8, for models (3.2) to (3.5); and in Figure 9, for models (3.6) to (3.9).

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (3.2)			Model (3.3)			Model (3.4)			Model (3.5)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.7013	(34,276)	0.0000	2.8506	(34,276)	0.0000	2.5369	(34,276)	0.0000	2.8754	(34,276)	0.0000
Cross-section Chi-square	94.2199	34	0.0000	98.7174	34	0.0000	89.1979	34	0.0000	99.4575	34	0.0000
Period F	2.4349	(9,276)	0.0112	2.8401	(9,276)	0.0033	3.0093	(9,276)	0.0019	2.8962	(9,276)	0.0027
Period Chi-square	25.0607	9	0.0029	29.0517	9	0.0006	30.7035	9	0.0003	29.6003	9	0.0005
Cross-Section/Period F	2.7686	(43,276)	0.0000	2.9977	(43,276)	0.0000	2.7523	(43,276)	0.0000	3.0191	(43,276)	0.0000
Cross-Section/Period Chi-square	117.6253	43	0.0000	125.7033	43	0.0000	117.0427	43	0.0000	126.4482	43	0.0000

Figure 8: Validity of fixed effects tests for model (3.2) to model (3.5) of the Dividends Analysis

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

	Model (3.6)			Model (3.7)			Model (3.8)			Model (3.9)		
Effects Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.8292	(34,276)	0.0000	2.6673	(34,276)	0.0000	2.6210	(34,276)	0.0000	2.7820	(34,276)	0.0000
Cross-section Chi-square	98.0755	34	0.0000	93.1870	34	0.0000	91.7784	34	0.0000	96.6593	34	0.0000
Period F	3.3702	(9,276)	0.0006	3.6807	(9,276)	0.0002	3.8093	(9,276)	0.0001	3.8845	(9,276)	0.0001
Period Chi-square	34.1998	9	0.0001	37.1787	9	0.0000	38.4047	9	0.0000	39.1186	9	0.0000
Cross-Section/Period F	3.1918	(43,276)	0.0000	3.0661	(43,276)	0.0000	2.9906	(43,276)	0.0000	3.2211	(43,276)	0.0000
Cross-Section/Period Chi-square	132.3967	43	0.0000	128.0788	43	0.0000	125.4570	43	0.0000	133.3936	43	0.0000

Figure 9: Validity of fixed effects tests for model (3.6) to model (3.9) of the Dividends Analysis

Models (3.2) to (3.5) are detailed as follows:

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NP_{it} + \beta_3 NP_{it-1} + \beta_4 PROXY1_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3.2)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NP_{it} + \beta_3 NP_{it-1} + \beta_4 PROXY2_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3.3)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NP_{it} + \beta_3 NP_{it-1} + \beta_4 PROXY3_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3.4)$$

$$\Delta DIV_{it} = \alpha_0 + \beta_1 DIV_{it-1} + \beta_2 NP_{it} + \beta_3 NP_{it-1} + \beta_4 PROXY4_{it} + \beta_5 CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3.5)$$

Model (3.6) is model (3.2) with winsorised observations; likewise, model (3.7) is model (3.3) with winsorised observations, model (3.8) is model (3.4) with winsorised observations, and model (3.9) is model (3.5) with winsorised observations. The results are presented in Table 6.

Model (3.1) suffers from heteroscedasticity, and fixed effect tests detailed in Figure 8 indicate that period and cross-sectional fixed effects are more appropriate. Coefficient estimates and associated t-values from model (3.1) are therefore unreliable.

Models (3.2) to (3.9) are panel data models with cross-section and period fixed effects. They are run with White diagonal standard errors and covariance (degrees of freedom corrected). Model fit has improved in models (3.2) to (3.8) when compared respectively with corresponding models (2.2) to (2.8). Of the unadjusted data models, model (3.2) has the best model fit as measured by R-squared. The residual graph of model (3.2) is available in the appendix. The results for models (3.2) to (3.5) consistently indicate a negative coefficient on lagged dividends with statistical significance, and a positive coefficient with statistical significance on lagged net profit. In model (3.4) net profit was found to have a positive coefficient with statistical significance. Models (3.2) and (3.4) now indicate a negative coefficient with statistical significance for $PROXY1_{it}$ and $PROXY3_{it}$ respectively. $GROWTH_{it}$ has a negative coefficient with statistical significance, while $CASH_{it}$ has a positive coefficient with statistical significance in models (3.2) to (3.5).

Table 6: Regression results of the Dividend Analysis models (3.1) to (3.9) with *NPBFPROXY?$_{it}$* and *NPBFPROXY?$_{it-1}$* variables replaced by *NP$_{it}$* and *NP$_{it-1}$*

Unadjusted Data					
Regressor	**Model (3.1)**	**Model (3.2)**	**Model (3.3)**	**Model (3.4)**	**Model (3.5)**
c	-0.0033 (-0.1238)	0.0460 (0.3620)	0.0379 (0.2944)	0.0310 (0.2349)	0.0452 (0.3495)
DIV_{it-1}	-0.4297*** (-10.6170)	-0.7050*** (-7.3378)	-0.7211*** (-7.2728)	-0.7138*** (-7.3881)	-0.7201*** (-7.0347)
NP_{it}	0.0481*** (3.8607)	0.0345 (1.4142)	0.0540 (1.5459)	0.0858** (2.5263)	0.0210 (0.7039)
NP_{it-1}	0.0205** (2.1369)	0.0185* (1.6690)	0.0209* (1.9087)	0.0218** (1.9998)	0.0218** (1.9933)
$PROXY1_{it}$	-0.0246*** (-5.9195)	-0.0185*** (-4.2760)	NA	NA	NA
$PROXY2_{it}$	NA	NA	-0.0333 (-1.5884)	NA	NA
$PROXY3_{it}$	NA	NA	NA	-0.0676*** (-2.8635)	NA
$PROXY4_{it}$	NA	NA	NA	NA	-0.0117 (-0.2971)
$SIZE_{it}$	0.0004 (0.3968)	-0.0011 (-0.2184)	-0.0009 (-0.1715)	-0.0008 (-0.1503)	-0.0011 (-0.2204)
LEV_{it}	0.0013 (0.2045)	-0.0081 (-0.7456)	-0.0095 (-0.8478)	-0.0070 (-0.6046)	-0.0100 (-0.8892)
$GROWTH_{it}$	-0.0037 (-1.6199)	-0.0045** (-2.0622)	-0.0046** (-1.9979)	-0.0048** (-1.9872)	-0.0048** (-2.0095)
$CASH_{it}$	0.0220 (1.6031)	0.0617** (2.4496)	0.0920*** (2.9993)	0.0910** (2.5913)	0.1039*** (3.5828)
Fixed Effects	No	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	No	Yes	Yes	Yes	Yes
N	328	328	328	328	328
R-squared	0.3409	0.5395	0.5174	0.5271	0.5076
Adj. R-squared	0.3244	0.4545	0.4282	0.4397	0.4166

Winsorised Data				
Regressor	**Model (3.6)**	**Model (3.7)**	**Model (3.8)**	**Model (3.9)**
c	-0.0325 (-0.3377)	-0.0235 (-0.2425)	-0.0526 (-0.5278)	-0.0258 (-0.2627)
DIV_{it-1}	-0.7464*** (-8.8034)	-0.7343*** (-8.8341)	-0.7377*** (-9.2118)	-0.7379*** (-8.9004)
NP_{it}	0.2088*** (5.7140)	0.2275*** (6.0070)	0.2487*** (6.2917)	0.1813*** (4.8613)
NP_{it-1}	0.0431 (1.4496)	0.0411 (1.4130)	0.0470 (1.6436)	0.0508* (1.7201)
$PROXY1_{it}$	-0.0476** (-2.1667)	NA	NA	NA
$PROXY2_{it}$	NA	-0.0573** (-2.5790)	NA	NA
$PROXY3_{it}$	NA	NA	-0.0805*** (-3.9478)	NA

$PROXY4_{it}$	NA	NA	NA	-0.0066 (-0.1147)
SIZEit	0.0017 (0.4340)	0.0012 (0.3147)	0.0023 (0.5778)	0.0013 (0.3386)
LEVit	-0.0043 (-0.3552)	-0.0032 (-0.2587)	-0.0027 (-0.2216)	-0.0023 (-0.1858)
GROWTHit	-0.0226*** (-3.2828)	-0.0248*** (-3.4605)	-0.0258*** (-3.5990)	-0.0263*** (-3.6560)
CASHit	0.0543** (2.1699)	0.0488* (1.8980)	0.0521** (2.1852)	0.0690*** (2.8148)
Fixed Effects	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	Yes	Yes	Yes	Yes
N	328	328	328	328
R-squared	0.5829	0.5861	0.5950	0.5706
Adj. R-squared	0.5058	0.5096	0.5202	0.4913

Note: The data sample represents 328 annual observations, from 2005 to 2014. Companies included in the FTSE/JSE Top 40 Index as at 31 December 2014 were analysed. Data was sourced from Bloomberg. Change in dividends (ΔDIV_{it}) is the regressand. DIV_{it} is the dividends by company *i* in year *t*. NP_{it} is the net profit after tax of company *i* in year *t*. NP_{it-1} is the net profit after tax of company *i* in year *t-1*. $PROXY1_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements. $PROXY2_{it}$ is the difference between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements. $PROXY3_{it}$ is the difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*. $PROXY4_{it}$ is the taxable or deductible temporary difference for the year by company *i* in year *t*. Model (3.1) includes $NPBPROXY1_{it}$ which is net profit after tax of company *i* in year *t* before $PROXY1_{it}$. This model was run without fixed effects. Models (3.2) and (3.6) include $NPBPROXY1_{it}$ which is net profit after tax of company *i* in year *t* before $PROXY1_{it}$. Models (3.3) and (3.7) include $NPBPROXY2_{it}$ which is net profit after tax of company *i* in year *t* before $PROXY2_{it}$. Models (3.4) and (3.8) include $NPBPROXY3_{it}$ which is net profit after tax of company *i* in year *t* before $PROXY3_{it}$. Models (3.5) and (3.9) include $NPBPROXY4_{it}$ which is net profit after tax of company *i* in year *t* before $PROXY4_{it}$. All independent variables have been deflated for size by company market capitalisation or total assets as at the specific company year-end for each year in the data range. $SIZE_{it}$ is the natural logarithm of total assets of company *i* in year *t*. LEV_{it} is financial leverage, defined as the ratio of total debt to total assets of company *i* in year *t*. $GROWTH_{it}$ is the percentage change in total assets for company *i* in year *t*. $CASH_{it}$ is the cash balance, defined as net cash (total cash and cash equivalents, less any bank overdraft) for company *i* in year *t,* scaled by market capitalisation or total assets as at the specific company year-end for each year in the data range. A winsorisation of 95% has been applied to all the variables in models (3.6) to (3.9).

*,**,***, significant at the threshold of 10%, 5% and 1%, respectively (t-test). T-values are shown in parentheses.

Once again model fit is improved by the winsorisation of the data, as evidenced by the improved R-squared values of models (3.6) to (3.9) when compared respectively to corresponding models (3.2) to (3.5). Model (3.8) has the best model fit as measured by R-squared, and now accounts for 60 percent of the variance in the dependent variable. The residual graph of model (3.8) is available in the appendix. The results for models (3.6) to (3.9) again indicate a negative coefficient on lagged dividends, with statistical significance. Consistent with the findings of De Jager (2015:178) and Goncharov and Van Triest (2011:60), net profit has a positive coefficient with statistical significance in models (3.6) to (3.9), indicating that a South African firm's dividend payments increase as net profit inclusive of unrealised FVA gains increases. The proxy variables in models (3.6) to (3.8) have negative coefficients with statistical significance; which is in line with the findings of Goncharov and Van Triest (2011:60), who found a negative association between positive FVA adjustments and the change in dividends. However, De Jager (2015:178) did not find any statistical significance in the proxy variables used. As per the previous Dividend Analysis models, $GROWTH_{it}$ has a negative coefficient with statistical significance in models (3.6) to (3.9), while $CASH_{it}$ has a positive coefficient with statistical significance.

A comparison between the statistically significant results of Goncharov and van Triest (2011:60), De Jager's (2015:178) Dividend Analysis using 95% winsorised data and those of models (3.6) to (3.9) of this study is presented in Table 7.

Table 7: Comparison between the statistically significant results of the Dividend Analysis studies

Statistically Significant Variable	Goncharov and van Triest (2011:60)	De Jager (2015:178)	This Study
Lagged Dividends (DIV_{it-1})	Negative coefficient with statistical significance	Negative coefficient with statistical significance in all models	Negative coefficient with statistical significance in all models
Net Profit (NP_{it})	Positive coefficient with statistical significance	Positive coefficient with statistical significance in all models	Positive coefficient with statistical significance in all models
Lagged Net Profit (NP_{it-1})	Positive coefficient with statistical significance	Positive coefficient with statistical significance in all models	Positive coefficient with slight statistical significance in model (3.9) only
Positive FVA Adjustments	Negative coefficient with statistical significance	N/A	N/A
Proxy 1 ($PROXY1_{it}$)	N/A	Statistically insignificant	Negative coefficient with statistical significance
Proxy 2 ($PROXY2_{it}$)	N/A	Statistically insignificant	Negative coefficient with statistical significance
Proxy 3 ($PROXY3_{it}$)	N/A	Statistically insignificant	Negative coefficient with statistical significance
$SIZE_{it}$	Slightly positive coefficient with statistical significance	Negative coefficient with statistical significance in all models	Statistically insignificant
LEV_{it}	Positive coefficient with statistical significance	Statistically insignificant	Statistically insignificant
$GROWTH_{it}$	Slightly negative coefficient with statistical significance	Statistically insignificant	Negative coefficient with statistical significance in all models
$CASH_{it}$	Statistically insignificant	N/A	Positive coefficient with statistical significance in all models

The change in dividends is better explained by total profit levels, rather than profit levels before proxy variables. The winsorised data models (3.6) to (3.9) provide the best fit based on R-squared. The results of these models therefore provide the best explanation for changes in dividends, and indicate that the association between net profit inclusive of unrealised FVA gains and the change in dividends is positive, and the association between FVA adjustments and the change in dividends is negative. This implies that dividend payments for South African firms are determined by net profit inclusive of unrealised FVA gains, less a portion of the FVA gain, as determined by the proxy variables. The outcome of these results, that dividend payments for South African firms contain a portion of unrealised FVA gains, are in contrary to the findings of De Jager (2015:177) whose study indicated that the change in dividends is explained by net profit inclusive of the full amount of any unrealised FVA gains. De Jager (2015:177) found that South African banks are using profit levels inclusive of full FVA gains to determine dividend payouts.

The results of this study lead to the rejection of the H1 hypothesis. Due to the potential noise in these proxy variables, the results may be influenced by factors other than FVA adjustments.

To provide additional support for these results, the following robustness test was performed.

Robustness Test

An additional test was conducted, to assess the robustness of the results of the Dividend Analysis. The model specification was adjusted to include only positive proxies for FVA adjustments. Models (4.1) to (4.4) correspond to models (2.6) to (2.9) respectively; and models (4.5) to (4.8) to models (3.6) to (3.9) respectively. However, in models (4.1) to (4.8), $POSPROXY1_{it}$ is the positive difference only between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs, tax and working capital movements; $POSPROXY2_{it}$; is the positive difference only between EBITDA and cash generated from operations by company *i* in year *t,* before finance costs and tax, but after working capital movements. $POSPROXY3_{it}$ is the positive difference only between NPAT (before depreciation and amortisation) and cash flows from operating activities (after

finance costs, tax and working capital) by company *i* in year *t*. $POSPROXY4_{it}$ is the taxable temporary difference for the year by company *i* in year *t*. $NPBPOSPROXY?_{it}$ is the net profit after tax of company *i* in year *t,* before the relevant positive proxy for FVA adjustments. $NPBPOSPROXY?_{it-1}$ is the net profit after tax of company *i* in year *t-1,* before the relevant positive proxy for FVA adjustments. The results of these models are presented in Table 9.

As per the winsorised data models in Table 5, models (4.1) to (4.4) consistently indicate a positive coefficient with statistical significance on net profit before the relevant positive proxies for unrealised FVA adjustments. Models (4.1), (4.2) and (4.4) indicate a positive coefficient with statistical significance on the positive proxy variables. These results reaffirm the earlier findings of models (2.6) to (2.9), that dividend payments for South African firms are influenced by net profit before FVA gains plus a portion of the FVA gains, as determined by the relevant proxy variables.

As per the winsorised data models in Table 6, models (4.5) to (4.8) consistently indicate a positive coefficient with statistical significance on net profit after the relevant positive proxies for FVA adjustments. Models (4.5) and (4.7) indicate a negative coefficient on the relevant positive proxy variables with slight statistical significance. These reaffirms the earlier findings of models (3.6) to (3.9), that dividend payments for South African firms are determined by net profit inclusive of unrealised FVA gains less a portion of the FVA gain.

Table 8: Regression results of the Dividend Analysis models including only positive FVA proxies

Proxies in models (2.6) to (2.9) replaced by including only positive proxies for FVA adjustments				
Regressor	**Model (4.1)**	**Model (4.2)**	**Model (4.3)**	**Model (4.4)**
c	-0.0123 (-0.1438)	-0.0959 (-1.1577)	0.0079 (0.0892)	-0.1822** (-2.0770)
DIVit-1	-0.8574*** (-6.1907)	-0.7121*** (-5.3219)	-0.8429*** (-6.8872)	-0.6436*** (-7.8382)
NPBPOSPROXY?it	0.2283*** (4.4544)	0.2374*** (4.2420)	0.2980*** (2.8715)	0.2133*** (4.6894)
NPBPOSPROXY?it-1	0.0022 (0.0947)	-0.0031 (-0.1595)	0.0232 (1.2011)	0.0248 (0.5185)
POSPROXY1it	0.1293*** (2.6554)	NA	NA	NA
POSPROXY2it	NA	0.1777*** (3.8498)	NA	NA
POSPROXY3it	NA	NA	0.0718 (1.5892)	NA
POSPROXY4it	NA	NA	NA	0.3145*** (2.7319)
SIZEit	0.0008 (0.2250)	0.0039 (1.1271)	-0.0004 (-0.0989)	0.0069* (1.9126)
LEVit	0.0089 (0.6646)	0.0124 (0.9142)	0.0059 (0.3450)	0.0202 (1.5052)
GROWTHit	-0.0207** (-2.3483)	-0.0207*** (-3.0238)	-0.0084 (-1.1349)	-0.0188*** (-2.6402)
CASHit	0.0622 (1.3153)	0.0805* (1.8831)	0.0530 (1.1113)	0.0929** (2.6006)
Fixed Effects	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	Yes	Yes	Yes	Yes
N	180	212	167	193
R-squared	0.6545	0.6196	0.6985	0.6979
Adj. R-squared	0.5168	0.4984	0.5758	0.5886

Proxies in models (3.6) to (3.9) replaced by including only positive proxies for FVA adjustments				
Regressor	**Model (4.5)**	**Model (4.6)**	**Model (4.7)**	**Model (4.8)**
c	-0.0126 (-0.1475)	-0.0938 (-1.1409)	0.0065 (0.0731)	-0.1818** (-2.1106)
DIVit-1	-0.8417*** (-6.0648)	-0.7246*** (-5.3371)	-0.8204*** (-6.4246)	-0.6561*** (-7.9545)
NPit	0.2290*** (4.5444)	0.2366*** (4.3117)	0.2832*** (2.7850)	0.2096*** (4.6837)
NPit-1	-0.0106 (-0.3695)	0.0089 (0.3194)	-0.0010 (-0.0340)	0.0427 (0.8401)
POSPROXY1it	-0.1001* (-1.9244)	NA	NA	NA
POSPROXY2it	NA	-0.0592 (-1.4028)	NA	NA
POSPROXY3it	NA	NA	-0.2161** (-2.2066)	NA
POSPROXY4it	NA	NA	NA	0.1036 (0.9550)
SIZEit	0.0009 (0.2379)	0.0038 (1.0950)	-0.0003 (-0.0671)	0.0068* (1.9286)
LEVit	0.0084 (0.6358)	0.0127 (0.9387)	0.0055 (0.3261)	0.0203 (1.5358)
GROWTHit	-0.0207** (-2.3382)	-0.0207*** (-3.0343)	-0.0095 (-1.3090)	-0.0194*** (-2.7183)
CASHit	0.0616 (1.3830)	0.0808** (1.9999)	0.0603 (1.2932)	0.0973*** (2.7695)
Fixed Effects	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)	Yes (cross-sectional and period)
White diagonal standard errors and covariance (d.f. corrected)	Yes	Yes	Yes	Yes
N	180	212	167	193
R-squared	0.6546	0.6197	0.6962	0.6991
Adj. R-squared	0.5170	0.4985	0.5726	0.5903

Note: The data sample represents annual observations from 2005 to 2014. Companies included in the FTSE/JSE Top 40 Index as at 31 December 2014 were analysed. Data was sourced from Bloomberg. Change in dividends (ΔDIV_{it}) is the regressand. DIV_{it} is the dividends by company *i* in year *t*. NP_{it} is the net profit after tax of company i in year t. NP_{it-1} is the net profit after tax of company i in year t-1. $POSPROXY1_{it}$ is the positive difference between EBITDA and cash generated from operations before finance costs, tax and working capital movements by company *i* in year *t*. $POSPROXY2_{it}$ is the positive difference between EBITDA and cash generated from operations before finance costs and tax, but after working capital movements by company *i* in year *t*. $POSPROXY3_{it}$ is the positive difference between NPAT (before depreciation and amortisation) and cash flows from operating activities (after finance costs, tax and working capital) by company *i* in year *t*. $POSPROXY4_{it}$ is the taxable temporary difference for the year by company *i* in year *t*. Model (4.1) includes $NPBPOSPROXY1_{it}$ which is net profit after tax of company *i* in year *t* before $POSPROXY1_{it}$. Model (4.2) includes $NPBPOSPROXY2_{it}$ which is net profit after tax of company *i* in year *t* before $POSPROXY2_{it}$. Model (4.3) includes $NPBPOSPROXY3_{it}$ which is net profit after tax of company *i* in year *t* before $POSPROXY3_{it}$. Model (4.4) includes $NPBPOSPROXY4_{it}$ which is net profit after tax of company *i* in year *t* before $POSPROXY4_{it}$. In models (4.5) to (4.8) the $NPBPOSPROXY?_{it}$ and $NPBPOSPROXY?_{it-1}$ variables are replaced by NP_{it} and NP_{it-1}. All independent variables have been deflated for size by company market capitalisation or total assets as at the specific company year-end for each year within the data range. $SIZE_{it}$ is the natural logarithm of total assets of company *i* in year *t*. LEV_{it} is financial leverage defined as the ratio of total debt to total assets of company *i* in year *t*. $GROWTH_{it}$ is the growth in total assets of company *i* in year *t*. $CASH_{it}$ is the cash balance defined as net cash (total cash and cash equivalents less any bank overdraft)) for company *i* in year *t,* scaled by market capitalisation or total assets as at the specific company year-end for each year within the data range. *,**,***, significant at the threshold of 10%, 5% and 1%, respectively (t-test). T-values are shown in parentheses.

Possible causes of the negative relationship between FVA adjustments and dividends

Goncharov and Van Triest (2011:63) speculate that managers may realise that high sales growth is unlikely to persist over the long term, due to the general mean reversion of growth. Lintner's (1956) dividend model refers to the assumption that dividends paid are based on the sustainability of earnings, among other things – that is, a company may increase its earnings without increasing its dividend payouts until managers are convinced that the company will continue to maintain such earnings. Increases in unrealised FVA gains may result in managers deciding to reduce the level of dividend payments as a risk-averse reaction to the transitory nature of these adjustments.

An alternative theory put forward by Goncharov and Van Triest (2011:63) is that high growth leads to expansion and investment by firms. Using survey and interview data, Brav, Graham, Harvey and Michaely (2005:483) find that maintenance of a firm's dividend level is on par with investment decisions in terms of importance for company managers, and that the perceived stability of future earnings still affects dividend policy, as in Lintner's (1956) study. In addition, Brav, Graham, Harvey and Michaely (2005:489) find that dividend policy is very conservative, which is a result of the market's asymmetric reaction to dividend increases and decreases. Brav, Graham, Harvey and Michaely (2005:490) further speculate that as firms are reluctant to cut dividends, dividend conservatism affects both non-payers of dividends and dividend payers, who are both reluctant to initiate or increase dividend payments, due to the downward sticky nature of dividend payments as a result of market reactions to these movements. By not increasing dividends in response to unrealised FVA gains, managers maintain the flexibility to alter dividend payments in response to the availability of good investment opportunities. This may lead to the observed negative relationship between dividends and the proxies for unrealised FVA adjustments.

5. Conclusion

FVA has potentially provided firms with the opportunity to increase their dividend payouts from unrealised earnings. The question of the effect of FVA adjustments on the dividend

policy of South African firms was addressed in this study. First, a panel data regression was performed to determine the persistence of unrealised FVA adjustments on future earnings. The results of this test reveal that unrealised FVA adjustments do have a persistent influence on future earnings for South African firms. According to a model developed by Lintner (1956), a company may increase its dividend payments if its increase in earnings are expected to be persistent. A further panel regression of the annual dividends declared by these firms finds that the association between net profit inclusive of unrealised FVA gains and the change in dividends is positive, and the association between FVA gains and the change in dividends is negative. This implies that dividend payments for South African firms are determined by net profit inclusive of unrealised FVA gains, less a portion of the FVA gain, as determined by the proxy variables used in place of a direct measure of unrealised FVA adjustments. A negative aspect of using proxy variables is that they may contain a fair amount of noise from sources other than FVA adjustments. The outcome of the results reveal that dividend payments for South African firms contain a portion of unrealised FVA gains. If the portion of the FVA gains paid out as dividends consists of persistent gains, there should be no increase in risk to the firm, all else being equal. However, if the portion of the unrealised FVA gains paid out as dividends include transitory gains, it may increase the financial risk of the firm.

The results of this study differ to the recent relevant studies of Goncharov and Van Triest (2011) and De Jager (2015). Goncharov and Van Triest (2011:59) found that FVA gains do result in persistent increases in earnings for Russian firms, but that these FVA gains are negatively related to changes in dividends. De Jager (2015:177) found that South African banks are using profit levels inclusive of full FVA gains to determine dividend payouts.

Future research could investigate additional aspects of the payment of dividends from unrealised earnings in a South African setting, such as the effect of these dividend payments on a firm's solvency. Moving away from dividend payments, further research could also examine the effects of unrealised FVA adjustments on managerial compensation.

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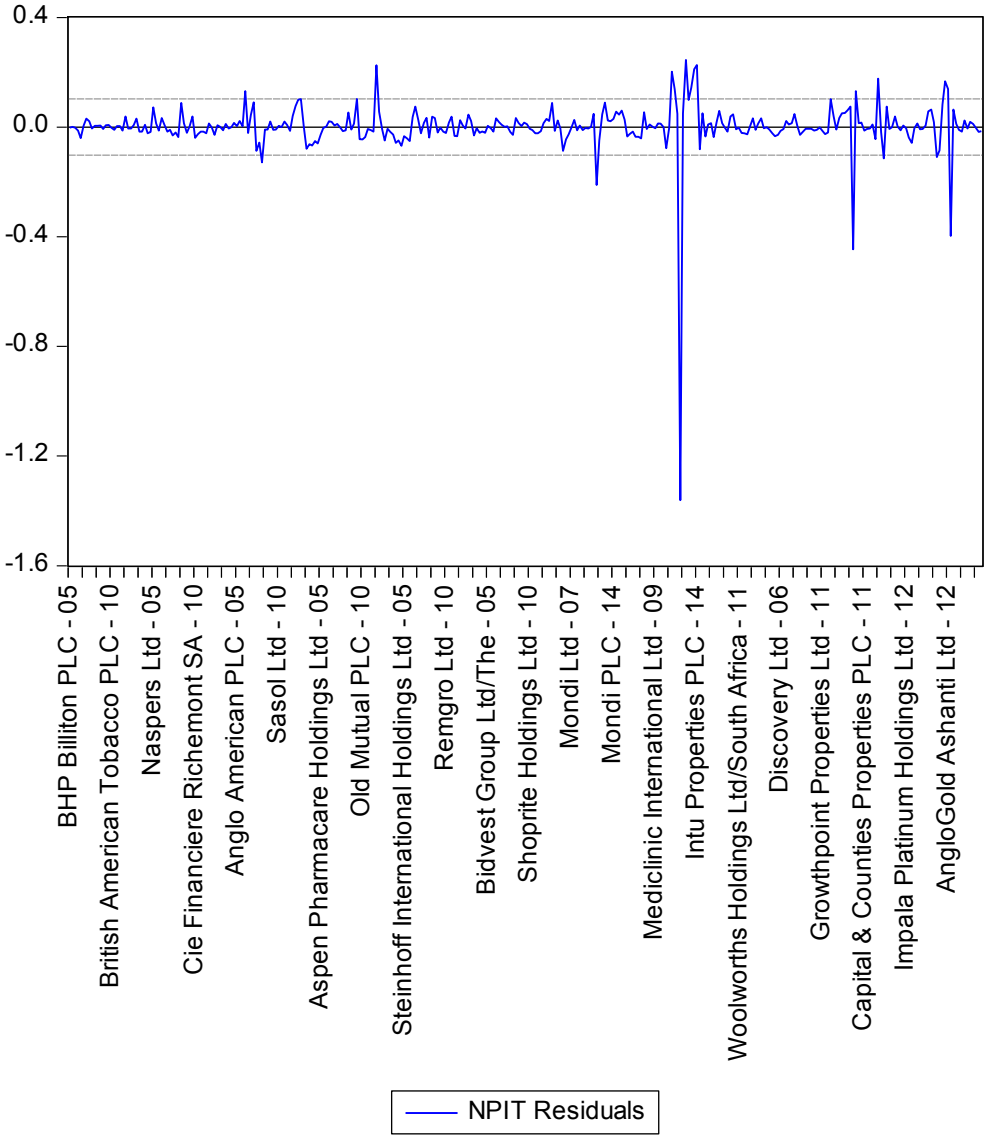
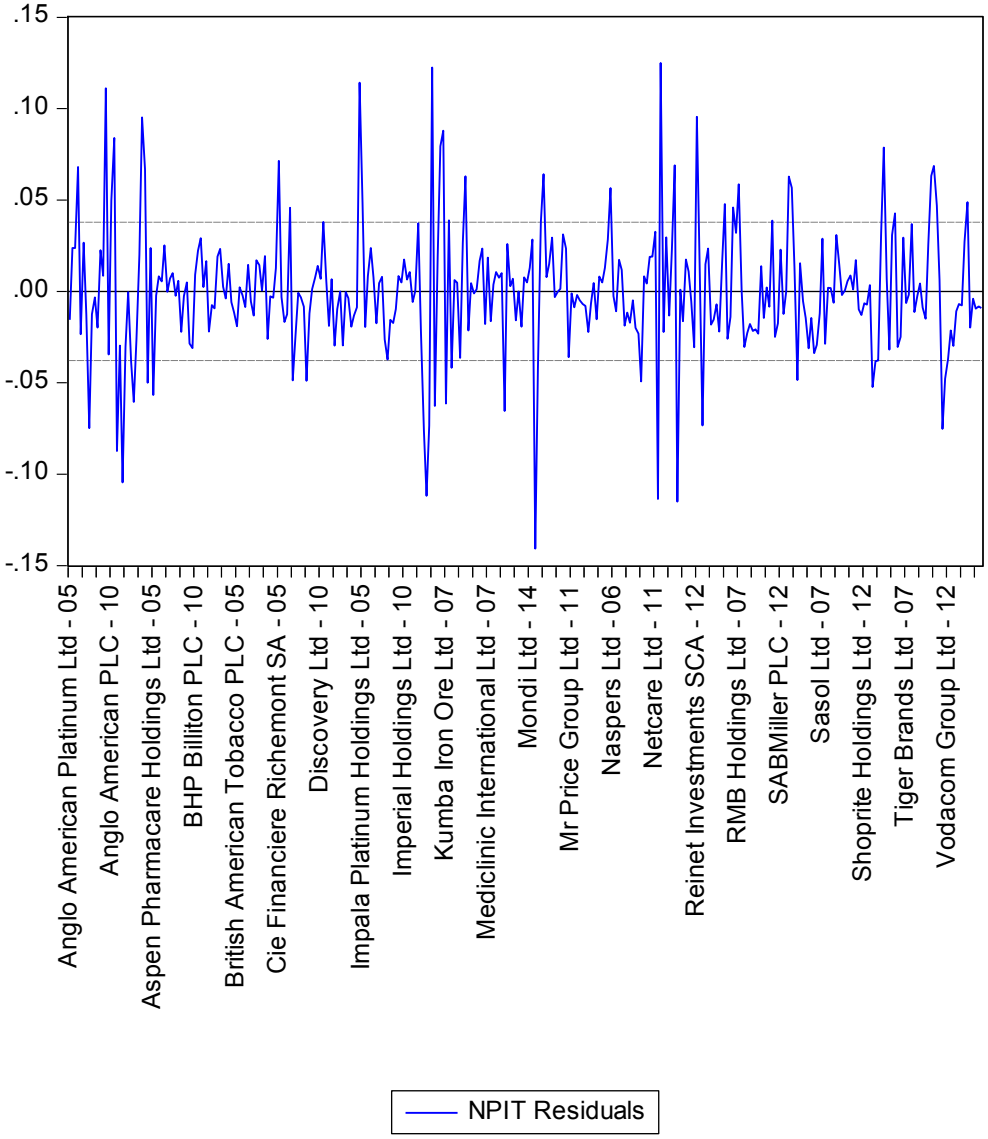
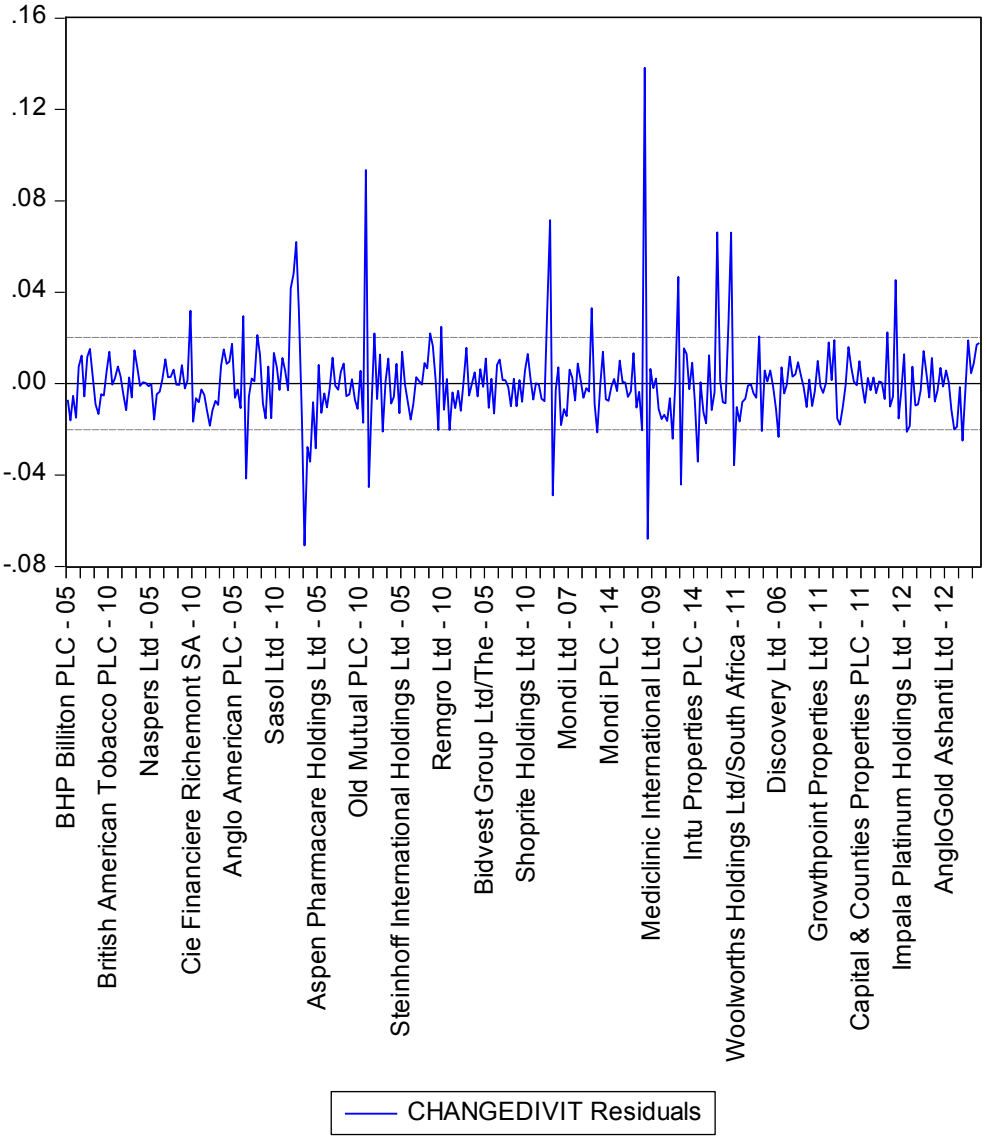
7. Appendix



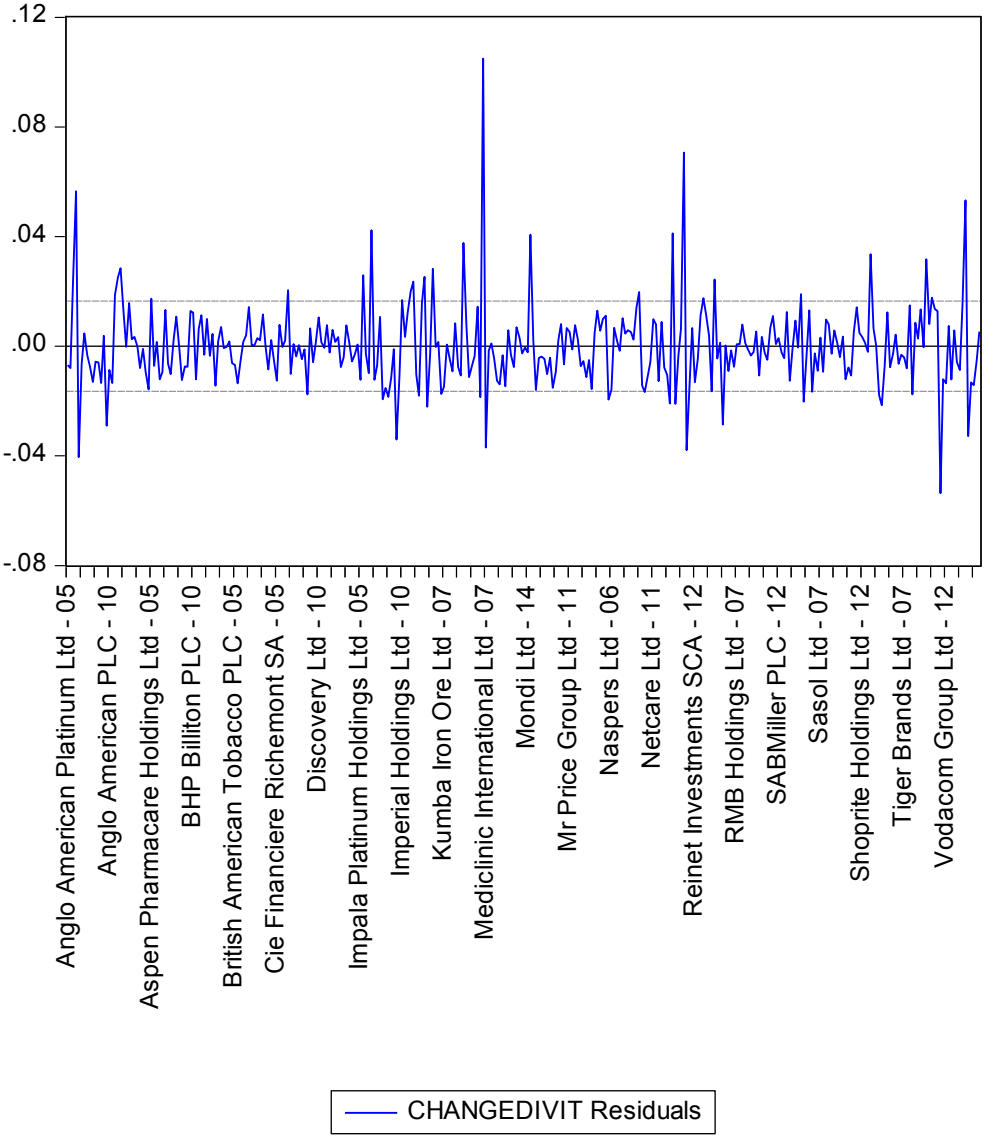
Appendix Figure 1: Residual graph for model (1.2)



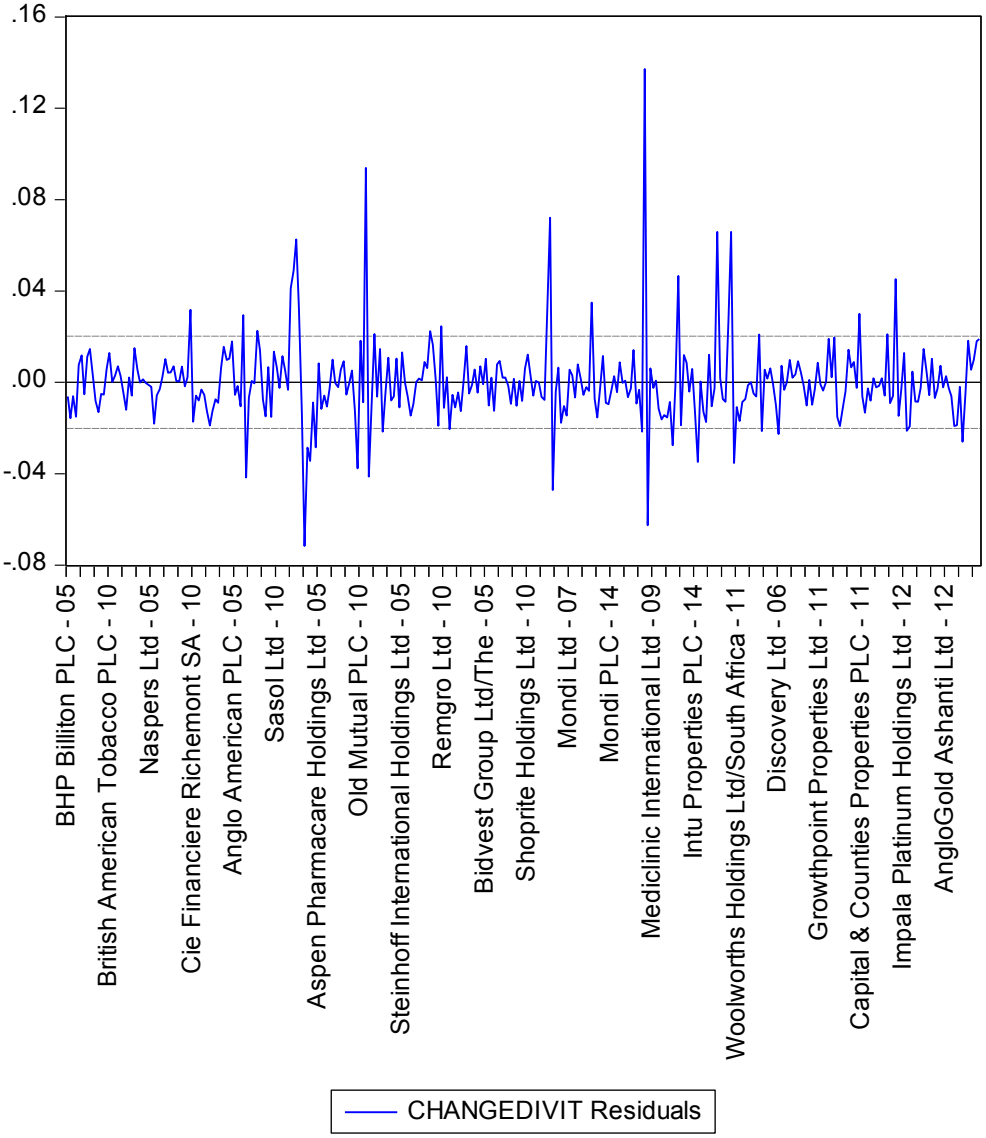
Appendix Figure 2: Residual graph for model (1.9)



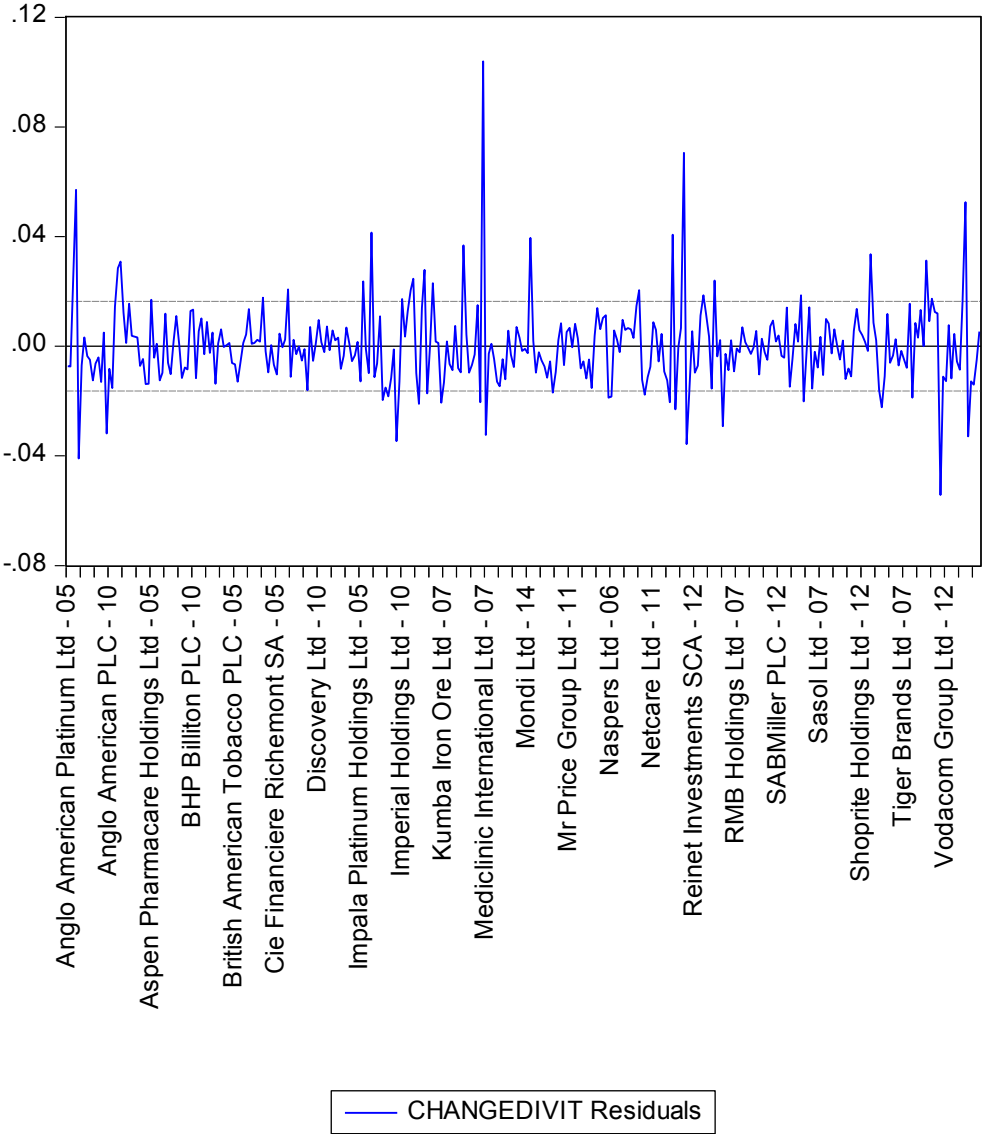
Appendix Figure 1: Residual graph for model (2.2)



Appendix Figure 2: Residual graph for model (2.8)



Appendix Figure 6: Residual graph for model (3.2)



Appendix Figure 9: Residual graph for model (3.8)