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The equity market impact of SA's transition from STC to dividend withholding tax: An event study

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ABSTRACT

For over 50 years academics have grappled with trying to understand and quantify the influence of dividend taxes on the behaviour of equity markets. As a shareholder, one should rationally be indifferent to receiving returns in the form of dividend payouts or value growth. Markets are, however, not perfectly efficient and investors are not completely rational. The purpose of this research project was to analyse and quantify the impact on the behaviour of South Africa's equity market, if any, resulting from the decision to replace the Secondary Tax on Companies system with the Dividend Withholding Tax regime at a higher effective tax rate. An events study methodology that was quantitative and causal in nature was used to test five hypotheses for three separate events that collaboratively indicate whether there was an impact from this change in dividend regulation or not. The results align with empirical evidence from international literature and indicate that there was indeed a significant, negative equity market impact resulting from the transition. The negative reaction is primarily attributable to the hike in the dividend tax rate rather than the reduction in regulatory complexity and was shown to be more significant for higher dividend yield firms.

KEYWORDS

1. Dividend Withholding Tax (DWT)
2. Secondary Tax on Companies (STC)
3. Event study
4. South Africa (SA)
5. Johannesburg Stock Exchange (JSE)

PLAGIARISM DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have, or will in due course, obtained the necessary authorisation and consent to carry out this research.

Ernie Visser

07 November 2016

Note: *Please see Appendix A for this research project's Turnitin Digital Receipt*.

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1. INTRODUCTION TO THE RESEARCH PROBLEM

a. Academic context of the problem

For over 50 years, academics have grappled with trying to understand and quantify the influence of dividend taxes on the behaviour of equity markets. As early as the 1960s, renowned economists such as Miller and Modigliani (1961) along with Harberger (1962) were investigating the relationship between the ability of companies to optimise their dividend policies to align with local dividend tax structures and the impact this had on the value of their shares. More recently, academics have investigated the interplay between dividends tax and capital gains tax (CGT) in determining the ideal dividend policy (Anagnostopoulos, Cárceles-Poveda, & Lin, 2012). There has also been extensive research into the impact of dividends tax on the cost of equity capital (Carroll, Hassett, & Mackie, 2003; Dhaliwal, Krull, Li, & Moser, 2005; Huber, 1994; Sinn, 1991) and the valuation impact of what has become termed the 'capitalisation' of dividend taxes into share prices (Dhaliwal, Erickson, Frank, & Banyi, 2003; Gentry, Kemsley, & Mayer, 2003; Hsieh & Chou, 2015; Sialm, 2009). In this vein, this study aims to investigate the 2012 transition from secondary tax on companies (STC) towards dividends withholding tax (DWT) on the South African equity market as a whole.

The reason for this persistent interest in the topic, along with the constantly conflicting empirical evidence that follows, is curious given that, theoretically, dividend policy and its impact on equity markets should be a relatively simple matter. As a shareholder, one should rationally be indifferent to receiving returns in the form of dividend payouts or value growth (M. H. Miller & Modigliani, 1961) given that the dividend policy has optimised investor returns by appropriately balancing the trade-off between dividend taxes and CGT. Whilst the matter is simple within the confines of rationality, evidence has repeatedly shown that markets are not perfectly efficient and investors are not completely rational (Bris, Goetzmann, & Zhu, 2007; Rubinstein, 2001; Thaler, 1999).

One proposed explanation as to the source of the confusion is that the observable effect of changes in the dividend tax regime on equity markets is dependent on a wide range of interrelated, company specific variables. These include considerations such as the business' historic dividend policy, the extent to which they employ debt finance,

whether one adopts the new or the traditional view of dividend taxes, and the profile of the marginal investor. Additional considerations may look at the emphasis on attracting foreign direct investment (FDI) for the business' financing activities, and the details of the new replacement tax regime (Carroll et al., 2003).

However, most of these considerations are at the company level, and therefore suggest that the significance of any dividend tax changes will be directly proportional to the company's specific dividend yield (Ayers, Cloyd, & Robinson, 2002). In the same vein, it stands to reason that if one adopts a high-level approach, rather than focusing on the individual companies, this will serve to aggregate the aforementioned variables such that the researcher can focus on the market-level impact of a change in the dividend tax regime (Binder, 1998). As such, this study, which is attempting to comprehend the transition on the equity market as a whole, essentially overcomes the aforementioned research caveats highlighted by Carroll (2003).

Local researchers have adopted an analogous approach in investigating similar topics with a deliberate emphasis on incorporating the unique aspects and context of South Africa (SA) and the Johannesburg Stock Exchange (JSE). For example, whilst De Wet and Das (2008) analysed the effect that the STC regime had on JSE listed companies' cost of capital and share prices, Erero and Gavin (2015) investigated the economy-wide impact of introducing the new DWT at a higher effective tax rate. Following on from De Wet and Das (2008), Toerien and Marcus (2014) conducted their research by considering both the STC and DWT systems to understand the impact that each had on investor perceptions of ex-ante returns and the resultant valuation of companies. It is important to note that while their research considers both the STC and DWT regimes, it does not analyse the impact of the transition from one tax system to the other. Toerien and Marcus (2014) merely state that "we predict that the relationship between Dividend Taxes, CGT and STC will change fundamentally under the new regime" (p. 907).

b. Brief background to the transition in SA tax regime

SA companies were subject to 19 years under STC regulations, from 1993 until 2012. The internationally unique feature of STC was that it operated at the company-level and did not accrue a direct tax liability against the shareholders, as is the international norm (Toerien & Marcus, 2014). By ultimately penalising dividend declarations, the STC regime (which was implemented towards the end of Apartheid) had a clear agenda to encourage investment in SA markets through re-investment of profits via retained earnings (Moraka, 2012). This was arguably a necessary strategy at a time when the economy was extremely fragile as a result of the impending revolutionary political change. STC was levied at a rate of 10% towards the end of its 19 year stint and was calculated using nett corporate dividends rather than absolute dividends.

In April 2012, STC was replaced with the internationally aligned, shareholder-level DWT regime. DWT effectively shifted the corporate incidence of STC to taxable shareholders by requiring the company declaring the dividend to withhold the appropriate tax on behalf of the shareholder, and pay it directly to the South African Revenue Service. Certain shareholders classes are, however, notably exempt from DWT in terms of the new legislation, or pay dividend taxes at a reduced rate (Toerien & Marcus, 2014). When the first official announcement of this transition was made on 23 February 2011, DWT was to be levied at a rate of 10%, identical to STC. On 22 February 2012, however, prior to the implementation planned for 01 April 2012 the Minister of Finance announced that DWT was to be implemented at an escalated rate of 15% (Venter, 2013).

According to the South African Revenue Service (2013), there were two primary objectives that motivated the transition from STC to DWT. Firstly, DWT was introduced to align SA with the international standards where the recipient of the dividend, not the company paying it, is liable for the dividend tax. Erero and Gavin (2015) argue in support of this decision by noting that the globalisation of trade and finance practices have powerful repercussions on the patterns of taxes and the ability of a country to market itself with foreign jurisdictions. The second motivation behind the move was to purportedly promote SA as a more attractive investment destination in the international market (South African Revenue Service, 2013). The reasoning behind this motivation is that the STC regime was viewed as a major detractor of FDI

as a result of taxation being vested at a company-level. The consequence was that in numerous cases, international double taxation agreements offered no protection for foreign investors, requiring them to ultimately pay local and foreign taxes on the same dividend (Venter, 2013). Furthermore the move to DWT would eliminate the perception of a higher effective corporate tax rate in SA which was associated with lower accounting profits (South African Revenue Service, 2013).

This motivation for the change in regime, whilst internationally aligned, can be argued to be counter intuitive and damaging to SA as a whole based on three primary observations (Erero & Gavin, 2015): first, dividend taxes, in general, supplement the income tax regulation's overall bias against investment and saving; second, shareholder-level dividend taxes drive up the cost of equity capital and therefore encourage corporations to rely more heavily on debt financing rather than equity (which makes them more vulnerable to bankruptcy in economic downturns); and third, the increased effective dividend tax rate of 15% once again reduces the incentive to pay out dividends in favour of retaining profits. This may in turn motivate corporate executives to invest in wasteful or unprofitable projects. Furthermore, the motivation of attracting FDI is also disputed in light of the decision to introduce the DWT at a higher effective tax rate. Higher tax rates have been shown to significantly deflect FDI (Desai, Foley, & Hines Jr., 2004).

In light of this scepticism, numerous counter arguments in defence of the transition have also emerged. Firstly, it is contended that an increase in the tax rate is rational when coupled with the benefits resulting from the international alignment of the transition. Lawless (2013) contends that SA had been classified by the World Bank as possessing a "complicated" tax regime under STC. The decision to implement DWT, given the alignment with international norms and the resultant reduction in perceived complexity of the tax system, results in a similar benefit to reducing the effective tax rate. She suggests that a 10% reduction in a country's tax regime complexity is comparable to a 1% reduction in the effective corporate tax rate and that either of these improvements would stimulate total FDI inflows by roughly 6% (Lawless, 2013). Furthermore, studies show that an increase in personal income tax rates can significantly stimulate local corporate investment demand, a reappraisal of domestic currency, and a nett capital import (Sinn, 1991). These opposing arguments

reinforce the academic need to provide empirical evidence of the equity market impact of SA's transition from STC to DWT.

c. Business impact of the transition

Attempting to establish the practical implications for business seems near impossible when one recognises that within the academic environment the impact of the change in tax regime is strongly disputed despite the theoretical arguments being supported by logic and rational reasoning. Whilst it is relatively simple to measure certain quantifiable manifestations of the transition (such as the shift in a business' market capitalisation and share price), the implications for management regarding the optimal dividend policy or capital structure is dependent on various company specific considerations (Carroll et al., 2003). Arguably, the most important consideration is the profile of the marginal shareholder as this directly influences the preferred returns mechanism based on individual dividend versus capital gains tax positions. The infamous quote from Fischer Black (1976) serves to encapsulate the intricacies involved: "The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together" (p. 5).

Despite not being able to provide an overarching repercussion for businesses as a whole, research into the markets' reaction to the transition (if any) can equip individual businesses to make more informed decisions within their given context. A better understanding of the sensitivity of the SA equity market to dividends as well as the extent of any reaction will assist business managers to recognise the potential repercussions of their own dividend related decisions. The findings will furthermore assist businesses to gauge the relative position of their marginal shareholders within the greater SA investment environment and make decisions that might attract a different shareholder profiles over time. Finally, the learnings around shareholder returns strategies could have repercussions on corporate capital structuring, the pursuit of tax shields and marketing investment opportunities to international stakeholders (Mackie-Mason, 1990).

Empirical evidence within this context will therefore inevitably have implications beyond merely contributing to the academic argument surrounding the transition. The

results of this research could inform what it ultimately means to invest and conduct business in SA. The purpose of this research project is therefore to analyse and quantify the impact on the behaviour of SA's equity market resulting from the decision to replace the STC system with the DWT regime at a higher effective tax rate.

The remainder of this study is structured as follows. Chapter 2, the literature review, starts with a consideration of the various theoretical viewpoints on how shifting dividend taxes influence equity markets and the cost of equity capital. The focus then narrows to consider this topic within the SA specific context and appropriate mechanisms for quantifying the impact. Chapter 3 presents the resulting hypotheses, supported by Chapter 4, which presents the methodology used for testing them. The results are then presented in Chapter 5 with a detailed discussion of the learnings in Chapter 6. The report is then concluded in Chapter 7 with a review of the critical findings and the scope for further research in this regard.

2. THEORY AND LITERATURE REVIEW

a. Theoretical viewpoints on how shifting dividend taxes influence equity markets

Changes in dividend taxes have a significant (yet often surprising) impact on equity market behaviour (Anagnostopoulos et al., 2012). While it is widely accepted that dividend taxes significantly influence market behaviour, literature reveals that there are three fundamental, conflicting viewpoints on the source and subsequent direction and magnitude of the impact.

The first approach, the so-called "traditional view", is based on Harberger's (1962) seminal work which argues that the dividend tax should be treated as a fundamental element of a company's overall corporate tax. The implication is that dividends therefore discriminate against capital investment in the corporate market. The logic behind this reasoning is that the cost of equity capital is directly affected by dividend taxation, and this in turn increases the required future return on new share issues. The result inevitably is a negative impact on corporate investment. A more recent yet virtually identical argument suggests that dividend tax cuts, contrary to CGT cuts, results in decreased investment because dividends ultimately increase the market value of existing capital. A higher market value of existing capital causes investors to demand a higher return to hold this additional wealth, reducing the overall supply of equity capital (Anagnostopoulos et al., 2012).

Over the last 50 years the traditional view has been criticised, as can be expected, on the basis that it fundamentally disregards the role of a company's financial policy (Huber, 1994). Harberger's approach implicitly assumes that a company solely finances its investment expenditure through equity issue. This ushered in what has been dubbed the "new view" (which is no longer considered new). The crucial distinction of the this second fundamental viewpoint is that it makes profoundly different assumptions about a company's financial decisions and, more specifically, a company's efforts to optimise their cost of capital (Sinn, 1991). Advocates of the new view argue that companies, in addition to equity issue, have two alternative sources of capital: debt and retained profits. When one incorporates these sources of capital, the distortionary effects of dividend taxes can essentially disappear and rather be

treated as a lump-sum tax. This new view therefore concludes that given an optimised capital structure, dividend taxes theoretically have a negligible impact on the equity market's behaviour (Sinn, 1991).

In their critique of the traditional approach, new view theorists continue by pointing out that, equally important to the discussion, is the distinction between the alternative uses of a company's after tax profits. Contrary to the disguised assumptions of the traditional view, profits are not limited to interest payments with the balance declared as dividends (Sinn, 1991). The traditional view supposedly ignores the possibility of profit retention and share buybacks, options that essentially alter the cost of capital. Whilst their arguments appear logical, research to support the new view continually reveals a negative impact of increased dividend taxes (Huber, 1994), findings that are unexpectedly in line with the traditional view of Harberger (1962).

The mismatch between the new view's theoretical argument and their empirical findings has led to the establishment of the third fundamental approach on how dividend taxes influence equity markets: the "tax capitalisation view". Supporters of the tax capitalisation view present a possible explanation for the conflicting empirical evidence uncovered by new view academics. Tax capitalisation researchers suggest that if companies predict continually increasing dividend tax rates in the near future, this will have the opposite effect to the theoretical predictions, and with good reason (Huber, 1994). Higher future dividend tax rates serve to encourage executives to rather declare dividends at the current, lower tax rate and this decision ultimately reduces the capital available for corporate investment. This, they claim, is the primary reason for the conflicting empirical evidence.

Tax-capitalisation academics further branch away from the "new view" in their argument that, in the absence of corporate expectations for future increases in dividend tax, an increase in the dividend tax rate actually causes companies to revise their dividend policy in favour of retaining and re-investing profits rather than declaring dividends (Huber, 1994). The result therefore of increased dividends tax rates is increased corporate investment, contrary to both the new and traditional views. The caveat in their argument, identical to new view research, remains the conflicting empirical evidence that suggests a reduction in corporate investment resulting from increased dividend tax rates.

A final attempt to explain the mismatch between theory and empirical evidence is that dividend taxes directly impact the signalling strength of dividends (Bernheim & Wantz, 1995). It is suggested that higher tax rates make dividends more informative about the companies' future value. The implication is that when companies decrease their dividend declarations, in light of the higher dividend tax rates, that this sends out a damaging message to investors that results in the negative impact revealed in the evidence. This logic is based on the inferences drawn from studies that show companies that pay dividends have higher earnings growth, suggesting that dividend payments reflect confidence in earnings growth as well as adequate profitability to internally fund expansion (Erero & Gavin, 2015).

Academics are justifiably sceptical of this argument and the findings have been challenged by strong believers in the traditional view, Ahimud and Murgia (1997). To prove their point, Ahimud and Murgia deliberately use data from European markets which are subject to significantly lower dividend tax rates than those present in the American data used in the contested research. Their findings indicate that higher taxation of dividends is not necessary to make dividends more informative. Dividend policy changes in Germany, with significantly lower dividend tax rates, generated identical market reactions as those in the United States. Whilst it is acknowledged that dividends are informative, the shortcoming in the tax capitalisation argument is that dividend signalling strength is not directly proportional to the tax rate (Amihud & Murgia, 1997).

It is important to note, however, that while the theoretical reasoning behind the impact that dividend taxes have on equity markets appears to be mixed, there is a general consensus that an impact does exist and is significant.

Regardless of the source of the impact, the defined aim of this research is to empirically measure the impact; an impact which the literature has acknowledged does indeed exist. The focus of this paper therefore shifts from the theoretical reasoning behind the root causes of the impact and rather considers the primary manifestation mechanism through which dividend taxes influence the equity markets – the cost of capital.

b. The influence of dividend taxation on the Cost of Equity Capital

The cost of capital is the minimum pre-tax return an investment must produce to be considered profitable (Miller & Modigliani, 1958). Once again, academics differ in their understanding of the influence that dividend taxes have on the cost of capital. The controversy among tax economists centres around the appropriate treatment of double taxation, a feature that is unique to shareholder returns (Sinn, 1991). Double taxation manifests itself in that corporate profits are firstly taxed at a fixed corporate tax rate before being supplemented by a second tax levied on both dividend declarations and/or CGT in the event of share repurchases. By way of contrast, debt only gets taxed once and the interest repayments are commonly considered tax exempt (Sinn, 1991). On the surface, it appears that the tax system discriminates heavily against corporate equity in this regard. Four decades of extensive research in this area have, however, produced no consensus amongst academics (Dhaliwal et al., 2005).

In line with conventional theory, Dhaliwal et al. (2003) employed a methodology where they estimated measures of implied cost of capital for a sample of companies and examined the effect of dividend taxes on those metrics, with the primary focus on the required rate of return. More specifically, by regressing the dividend tax premium on measures of dividend yield, company specific control factors and proportioned categories of institutional ownership, they tested hypotheses of the connection between dividend yield and the tax rates applicable to dividends and capital gains. Furthermore, they analysed the effect this had on the level of institutional ownership. The results aligned with the conventional theoretical predictions. Dhaliwal et al. (2003) concluded that dividend taxes explicitly increase the implied cost of capital. Their findings furthermore suggest that ownership by tax-exempt shareholders, does indeed serve to cushion this impact on company specific implied cost of capital and the associated dividend tax premium. Surprisingly though, the opposite is not necessarily true; ownership by conventional, tax paying institutions had no effect on these measures.

More contemporary thinkers highlighted however that the double taxation of dividends merely discriminates against a particular means of accumulating equity capital, not against equity capital itself. They argue that most large companies who have acknowledged this optimise their capital structures to enjoy a balanced tax

treatment of retained earnings versus interest income in pursuit of financial neutrality (Sinn, 1991). This, however, does not suggest that there is no benefit in researching distortions resulting from regulatory alterations in the treatment of tax on retained earnings, dividends, and interest income. Rather, their argument implies that the cost of capital for mature businesses is aligned to the market rate of return, and that this equips them with an array of technical advantages. One such advantage is that when the capital structure of a business has been efficiently optimised and aligned to take advantage of local compensatory tax reforms, the distortionary effects of corporate tax may be mitigated overall (Sinn, 1991). Ultimately, in this more contemporary view, it is not true that companies that pay dividend taxes suffer from a higher cost of capital. On the contrary, those that do not pay these taxes in favour of retaining their profits suffer most. The motivating argument for this conclusion is that the possibility of a deferral of dividend taxes, as suggested by the conventional approach, increases the cost of external equity finance over the long term (Sinn, 1991).

As with the previous section, the more contemporary argument here is marred by conflicting empirical evidence that once again advocates for the conventional approach of Dhaliwal et al. (2003). The results of two follow up studies by Dhaliwal et al. (2005) and Gentry et al. (2003) cast doubt on the aforementioned tax irrelevance hypothesis which argued that asset prices are actually determined by shareholders who are indifferent to tax rates. According to Dhaliwal et al. (2005) the ultimate question is whether company valuation and the subsequent share prices capitalise dividend taxes or not. They argue that if share prices change to incorporate (i.e. capitalise) dividend taxes, that this is undisputable evidence that dividend taxes do in fact influence a company's cost of equity capital. They suggest furthermore that their revised research approach was more reliable than previous studies to test for dividend tax capitalisation as they used ex-ante returns in combination with real returns. Lastly, in their follow-up study, they acknowledged a limitation in their previous research, namely that whilst higher tax rates on dividends increase the required return; dividends also possess information content that may decrease the required return. The aim was therefore to isolate the tax effects on dividends and so they examined the relation between the implied cost of equity capital and the dividend yield adjusted for tax. Their new results reaffirmed the previous findings that higher dividend tax rates increase the implied cost of equity capital and that the magnitude is directly proportional to the dividend tax penalty. They once again acknowledged that

aggregate institutional ownership can serve to mitigate the dividend tax premium, but that this is an exceptional case (Dhaliwal et al., 2005).

These conflicting viewpoints, when deliberated out of context, could certainly obscure the focus of this investigation and the associated analysis. It is important therefore to be reminded that the defined aim of this research is to empirically measure the impact of the transition from STC to DWT on the SA equity market. The aim is focussed on finding actual evidence. Whilst there is no outright consensus between the two primary conflicting views, the prevailing conventional argument is supported by empirical evidence and stresses that the cost of equity capital increases with increased dividend taxes. The fundamental reason behind this manifestation in the evidence does not influence the core purpose of this study.

The preliminary takeout from the conflicting literature is therefore that the transition from STC to DWT, in light of it being implemented at a higher effective tax rate, should be a quantifiable, negative impact on JSE share prices. Before reaching a conclusion on the expected impact though, it is important to revert to the scope of this study which is limited to SA equity markets. As such local research and empirical findings need to be incorporated with the overarching academic theory reviewed thus far.

c. Dividend taxes within the South African context

Two local supporters of the aforementioned conventional approach, championed by Dhaliwal et al. (2003; 2005), are Toerien and Marcus from the University of Cape Town. In their criticism of the contemporary tax irrelevance hypothesis, Toerien and Marcus (2014) boldly stated that “the assumption that dividend payout has no bearing on the extent of dividend tax capitalization, and that shareholders will value retained earnings as if they will be fully distributed and subjected to shareholder-level dividend taxes, is clearly invalid in the South African context” (p. 897). They continued by arguing that, historically under SA’s STC regime, dividend tax rates relative to CGT rates results in dividends having a positive effect on expected return (the only exclusion being tax exempt and non-resident shareholders). The motivation behind this argument is that the tax-induced hike in shareholder’s required returns manifests itself as a positive correlation between implicit cost of equity capital and positive

dividend yields; the ultimate outcome being decreased share prices (Toerien & Marcus, 2014). Empirical evidence based on their analysis of JSE listed companies supports this hypothesis of a negative tax impact on share price.

To better understand their reasoning within the South African context, it is important to note that under STC where the dividend tax vested with the firm, a company's reported retained earnings would have decreased by more than the nett profit distributed via a dividend declaration (Toerien & Marcus, 2014). When simultaneously considering both STC and CGT rates in the valuation process, the result is that non-taxable entities in SA would have had a definite preference for retained earnings and realising their returns in share price appreciation.

From the perspective of this unique clientele, a dividend declaration would unnecessarily reduce their overall return and this preference had a significant impact how SA investors approached the issue of capitalising dividend taxes into share prices (Toerien & Marcus, 2014). Under the new DWT regime, however, the dividend tax now vests at the shareholder-level and at an increased rate. Dividend declarations therefore only reduce nett profits by the dividend amount without an additional tax penalty. This change should logically alter shareholders' approach to the capitalisation of dividend taxes, their analysis of the cost of capital and finally impact business share prices.

This principle is reinforced when one considers that, within the context of DWT, the difference between a shareholder's return when a company decides to declare a dividend and the return when no dividends are paid is denoted as (Toerien & Marcus, 2014):

$$\text{Increase in return from dividends} = N_i \times p \times (t_{cg} - t_d)$$

where:
- N_i = nett income
- p = payout ratio
- t_{cg} = effective capital gains tax rate
- t_d = dividend tax rate

Under the new DWT regime, it now becomes apparent that a dividend declaration is only beneficial from an investor's point of view if that shareholder's rate of CGT is

higher than their DWT rate. In terms of DWT, there are two primary rates proposed under the new regime: 15% for taxable shareholders and 0% for tax exempt shareholders (South African Revenue Service, 2013). The major DWT exempt shareholders under the new legislation include: resident companies, the SA government, public benefit organisations and pension/provident/retirement annuity funds (Erero & Gavin, 2015). All of these exempt shareholders should therefore considerably prefer to receive dividends compared to accumulating returns from capital gains; the opposite of the preference under STC. Most taxable shareholders, on the other hand, would prefer to pay CGT, dependant on their individual CGT rates (Toerien & Marcus, 2014). The DWT regime in SA has therefore created a virtual rift in the preferred dividend policy which executives must now carefully align with the characteristics of their marginal shareholders. This major paradigm shift from STC to DWT should have a noteworthy impact on market behaviour. The impact expected is then further amplified by the increased dividend tax rate under DWT.

It now becomes apparent that the transition from STC to DWT contains two separate sources of potential market impact: the shift in the taxable party, and the increase in the dividend tax rate. On the one hand, the empirical evidence from Harberger (1962) and Dhaliwal et al. (2003; 2005) suggests an expected negative impact on share prices resulting from the 5% increase in the dividend tax rate; while on the other the shift regarding where the dividend tax vests itself should encourage businesses to declare more dividends than was the case under STC (Toerien & Marcus, 2014). This realisation creates a uniquely South African case that has not been investigated within the academic literature available. This fascinating dynamic between the two juxtaposed forces should result in a noticeable impact, regardless of the direction and magnitude.

From the perspective of tax irrelevance advocates, a counter argument is found in the aforementioned rationale that the significance of the change would be directly proportional to the local dividend yields (Ayers et al., 2002). Building on this, it has furthermore been shown that high individualism, low power distance, and low uncertainty avoidance are significantly associated with higher dividend yields (Fidrmuc & Jacob, 2010). SA, which does not meet these cultural criteria, should therefore be relatively shielded against major market shocks as a result of shifting

dividend tax structures whether in the form of tax rate hikes or dividend policy preferences.

That said, it is important to note that neither approach (neither for nor against an expected impact resulting from the transition) has published any empirical findings on the matter. This restricts the discussion of the impact within South Africa's unique context to plain speculation and reinforces the need for this paper to find some form of quantified, concluding evidence.

In order to achieve this, it is critical that this study thoroughly explore the correct metrics and methodology that can reveal whether or not this change in regulation did in fact result in a measurable, significant and negative impact on South Africa's equity market as is predicted by the literature. Before this can effectively be explored, however, it is imperative to first contextualise the identified problem within a structured framework that will facilitate the required analysis and lead to appropriate outcomes. In this vein, it already been established that there were three fundamental milestones in SA's transition from STC to DWT (Erero & Gavin, 2015):

1. On 23 February 2011, when the first official announcement was made of the transition to DWT at a rate of 10%.
2. On 22 February 2012, when the Minister of Finance announced that DWT was to be implemented at an escalated rate of 15%.
3. On 01 April 2012, when the new DWT system was officially implemented.

Closer inspection reveals that these milestones inherently provide a structure that favourably isolates the aforementioned juxtaposing forces that constitute this uniquely South African case. Given that on 23 February 2011 the transition to DWT was first announced at an identical dividend tax rate to STC, this event isolates the market's reaction to just the shift in tax liability from the company to the shareholder. The second announcement on 22 February 2012 isolates the impact of a tax rate hike given that the announcement did not introduce any new revelations regarding the stakeholder liable for paying dividends tax. Each of the first two events, therefore, effectively isolates one of the two intertwined sources of the expected impact. The final event on 01 April 2012 serves to combine both forces together as the disclosures from both announcements were ultimately implemented on this date. Logically though, the implementation date should have a relatively cushioned impact given that the two prior announcements had already informed the market of what to expect

(MacKinlay, 1997). With this structure in place, an appropriate methodology and associated metrics can now be investigated.

d. Appropriate methodologies and market metrics for quantifying the impact of changes in dividend tax rates

True to the purpose of this research, an event study is a statistical technique that estimates the share or market impact of identifiable micro- or macroeconomic events such as mergers, earnings announcements, regulation changes and so forth (Binder, 1998). The fundamental idea behind an event study is to disentangle the effects of two information classes: information that is specific to the share under question (e.g., dividend announcement) and information that effects share prices market-wide (e.g., change in interest rates). Since the methodology was endorsed by Eugene Fama in 1969, event studies have become tantamount with capital market analysis (Corrado, 2011). The basic approach to conducting an event study (more specifically, measuring abnormal returns as deviations from predefined ex-ante market returns), is largely the same as when first introduced by Fama in 1969. Accordingly, the objectives and scope of this research, coupled with the three distinguishable milestones that have been identified, advocate the use of an event study to measure the market impact of the transition from STC to DWT.

Despite its remarkable track record, however, the event study methodology has attracted some intense criticism. One such critic writes that research on dividend tax capitalisation has gravitated away from event study analyses in favour of regression testing centred on various tax inclusive valuation models (Toerien & Marcus, 2014). Instead, they promote utilising a residual income valuation model to investigate the relationship between price, taxes, and the various components of book value. From this one can then test whether investors discount the taxable components of book value upon distribution (namely retained earnings and net income) relative to contributed capital and the tax exempt components thereof (Toerien & Marcus, 2014).

Every methodology has its pros and cons however. Studies by Hanlon, Myers, and Shevlin (2003) as well as Dhaliwal et al.(2003), have critiqued the suggested residual income valuation model approach, its flawed assumptions and subsequently unreliable conclusions. In their rebuttal, these studies emphasise that event studies are applied in an extremely wide range of situations, and as such, no single event

study method dominates or even applies to all possible settings. Criticism of the event study methodology as a whole is, therefore, baseless when taken out of context. As an example, for regulatory events where the event date is unknown, the event study methodology may have limited statistical power to detect the abnormal returns as a result of unmeasurable anticipation of the event by the market (Toerien & Marcus, 2014). The results of various studies, such as those conducted by Brown and Warner (1980) and Chandra and Balachandran (1992), however, indicate that the event study methodology is, with some minor corrections, and given a known event date, a particularly powerful tool to detect abnormal returns and significant changes both pre- and post the event (Corrado, 2011). The valuable insight regarding this argument is that all methodologies possess inherent strengths and weaknesses; one just needs to acknowledge the caveats and cater for these appropriately. If this is done effectively, the analysis and subsequent findings should be sound.

Remaining with event studies as the most appropriate methodology for this research agenda (given that appropriate controls are put in place), a theoretically more pertinent concern is which metric is most appropriate to form the basis of the test statistic being analysed. When considering event studies, most research is interested in testing hypotheses about the average or cumulative average abnormal returns (Binder, 1998). The rudimentary approach to measure the effect of an event on share *i*, is to analyse the relation between the return on *i* during period *t*, denoted R_{it}, and the return of a predefined market-level estimate during the same period, denoted R_{mt}. That is, using a sample of monthly (or even daily) return data leading up to the event, a period referred to as the estimation window, one can estimate the parameters of the following ex-ante model for each individual share *i* in the chosen sample (Binder, 1998):

$$\boldsymbol{R_{it} = \alpha_i + \beta_i R_{mt} + u_{it}}$$

where:
- R_{it} = return for share *i* during period *t*
- R_{mt} = return for market-level estimate during period *t*
- α_i = return for share *i* relative to the market-level estimate
- β_i = the volatility of share *i* relative to the market-level estimate
- u_{it} = residual for share *i* during period *t*

When formulating this ex-ante model it is critical to note that should the event period (t=0) be erroneously included in the estimation window used to estimate the coefficients, the results will be biased as a result of the disturbances caused by the event being incorporated into the ex-ante return (Binder, 1998). Subsequently, the abnormal returns will then be inaccurate and the significance of the event supressed. The correct approach is therefore to ensure that the ex-ante model be calculated exclusively using data prior to the event period. A further recommendation is to select an estimation window that contains enough sample periods to accurately model the predicted returns (typically six months or more of trading data) but that does not overlap with the event window (the number of periods before and after the event period used to calculate abnormal returns). In this way, the events study methodology theoretically removes the effects of the event and other market-wide factors from the return on share *i*, effectively isolating the portion of the return directly attributable to the company (MacKinlay, 1997).

When continuing with the analysis following the event period, the difference between the actual return of share *i* during period *t* and the ex-ante model's return in the same period, is equal to the abnormal return, denoted AR_{it}. The estimator for the average abnormal return across the sample for period *t*, AAR_t, is then defined as:

$$AAR_t = \sum_{i=1}^{N_t} \frac{AR_{it}}{N_t}$$

where: AR_{it} = the abnormal return for share *i* in period *t*
N_t = number of companies in the sample during period *t*

The estimated average abnormal returns can then be summed across all periods in the event window to measure the Cumulative Average Abnormal Return, denoted CAAR. When determining the appropriate event window length, Krivin, Patton, Rose and Tabak (2003) note that for studies with a large sample of shares (in order to determine a market-wide impact of an event) it is appropriate to use a fixed event window for the entire sample. The consistency across the sample is more important than the exact length of the event window; a crucial variable when analysing a single

company-specific event. Nonetheless, a maximum event window of 41 trading days (i.e. 20 trading days before and 20 trading days after the event date) is recommended (Krivin et al., 2003).

The accuracy of this rudimentary approach, within specific analysis conditions, has been questioned, even by advocates of the event study methodology such as Da Graca and Masson (2012). In their paper, they argue that as individual shares increase in volatility over time, this reality reduces the statistical power of basic event study approaches. They present an improved approach for event studies, the Generalised Least Squares (GLS) estimator, which they claim drastically improves the power of the test. In their research though, they identify two major subcategories for event studies: contemporaneous events such as changes in the regulation of a country and non-contemporaneous events like mergers. The results of their study reveal that GLS modelling showed little efficiency gains for contemporaneous events but significant power improvements for non-contemporaneous events.

Given that the focus of this research paper is analysing a market-wide impact resulting from a change in national regulation (i.e. a contemporaneous event), the GLS method recommended by Da Graca and Masson (2012) appears to be of little value here. This conclusion is supported by Malatesta (1986) who empirically shows that econometrically modelling contemporaneous correlations, as suggested above, does not improve the quality of the study. As such, the aforementioned rudimentary approach is deemed adequate for this research objective and scope.

Furthermore, as previously noted, event studies are so flexible that no single method dominates or applies to all possible settings. It is worth noting, however, that the use of multiple metrics to test the same event's significance serves to bolster the relevance of the findings (Corrado, 2011). With this in mind, a complimentary approach to addressing the aforementioned concerns around the accuracy of the ex-ante model and the subsequent calculation of the abnormal returns is to incorporate a number of locally relevant financial controls. For SA companies, and more specifically those listed on the JSE, appropriate controls to improve the accuracy of calculated abnormal returns include: company specific betas, company size, industry classification and whether the share falls within the value or growth category (Muller & Ward, 2013). These enhanced measurements of abnormal returns are labelled here as 'refined' abnormal returns which can be aggregated, as before, to calculate the

Refined Average Abnormal Returns, denoted $RAAR_t$. Furthermore, these results can then be amalgamated to estimate their cumulative aggregate, denoted RCAAR. These two refined metrics can serve as supplementary test statistics that will reinforce the findings from the traditional average and cumulative average abnormal returns if they produce similar results.

Finally, a third complimentary metric is offered within financial market research literature. The incorporation of this measure should serve to further strengthen the findings of this study, assuming the statistical tests yield similar results. The proposed statistic was originally developed by Elton and Gruber (1970) and represents the ex-dividend behaviour that would cause a shareholder with a particular set of tax rates to be indifferent to accumulating wealth through dividends or share value growth. If this ratio is significantly altered by the introduction of the new DWT regime, it will be an indication of a significant impact on market behaviour. The ratio is termed the Point of Diminishing Returns (PDR) by some academics (Chinhema & de Jager, 2016) and is calculated as follows:

$$\boldsymbol{PDR = \frac{P_B - P_A}{D} = \frac{1 - t_d}{1 - t_{cg}}}$$

where:
- P_B = price per share before it goes ex-dividend
- P_A = price per share on the day it goes ex-dividend
- D = the amount of the dividend
- t_d = the dividend tax rate
- t_{cg} = the capital gains tax rate

Rather than limiting the investigation to share price variations (as is the case in traditional event studies), this PDR metric quantifiably measures market perception of dividend policy and alludes to the behaviour and preferences of the marginal shareholder (Elton & Gruber, 1970). This unique integration of both the balance between dividends tax and CGT, along with the impact on shareholder valuation resulting from a dividend declaration, makes this metric particularly useful for this study's objectives and serves to once again bolster the reliability of any findings.

In order to detect a significant shift in the ratio, the metric first needs to be calculated separately for each sample share, both before and after the event being tested. The suggested analysis period for both before and after the relevant event is one calendar year as the calculation requires both the share price before and after a share goes ex-dividend. The array of PDR values from the period before the event can then be compared using an appropriate statistical test to the array of values post the event to determine any significance in the change (Chinhema & de Jager, 2016).

With this third and final metric, a cohesive suite of test statistics has been identified to collectively measure and reliably test the market impact of SA's transition from STC to DWT. As such, the appropriate hypotheses can now be constructed within the confines of the expected impact ascertained from the preceding literature.

3. RESEARCH HYPOTHESES

The purpose of this research is to analyse and quantify the impact on SA's equity market resulting from the decision to replace the STC tax system with the DWT regime at a higher effective tax rate. The preceding literature review has confirmed the theoretical relevance of this study along with the most appropriate approach to find a dependable result. Given that numerous test statistics have been identified through this review, multiple hypotheses are necessary to analyse the impact that each of the events had on the market.

For the vast majority of events studies, the appropriate structuring of the null hypothesis makes the assumption that the abnormal returns are negligible and therefore no significant change has resulted from the event (Da Graca & Masson, 2012; MacKinlay, 1997). With this, either a mean effect or a variance effect will represent a violation of the null hypothesis (MacKinlay, 1997) and therefore a significant impact of the event. This logic applies to both the average abnormal returns throughout the event window as well the cumulative total thereof (Binder, 1998).

Before formally constructing the alternative hypothesis, however, it is worth restating that the tax regime transition under investigation here consists of three separate events that would not necessarily have identical impacts on the market. Whilst the empirical evidence from both the international (Amihud & Murgia, 1997; Harberger, 1962; Huber, 1994) and local (Erero & Gavin, 2015; Toerien & Marcus, 2014) literature supports the conclusion that the transition should have resulted in a negative impact on share prices as a result of the increased tax rate, this expectation cannot be imputed to all three events. In light of this, it is appropriate that the alternative hypothesis, specifically for the second event, be directional, predicting a significantly negative shift in the market's abnormal returns. As such, a one-sided test (MacKinlay, 1997) is required to indicate whether the announcement of the tax hike did indeed have a significant negative impact or not.

This approach is not necessarily applicable to the first and third events, however, where the expected directionality of the impact was not unequivocally obtainable from literature. As such, the first and third events require a non-directional, two-sided test (MacKinlay, 1997) to rather indicate whether these events had a significant impact on the market or not, regardless of direction. This set of null and alternative hypotheses

is applicable to the first four abnormal return based test statistics gleaned from literature.

For the final test statistic, PDR, the metric indicates the ex-dividend behaviour that would cause a shareholder with a particular set of tax rates to be indifferent to accumulating wealth through dividends or share value growth (Elton & Gruber, 1970). If the ratio is significantly altered by one of the events, it will indicate of a significant impact of the event on the market (Chinhema & de Jager, 2016). As such, the null hypothesis will assume that the aggregated sample's PDR value remains unchanged following the event.

For the alternative hypothesis, given that the PDR ratio considers both the shareholder dependant balance of capital gains versus dividend tax as well as preference in dividend policy (which is directly dependant on each shareholder's personal tax exemption status), it would be problematic to try and justifiably predict the directionality of the impact for Event 1 and Event 3. For Event 2, where the fundamental message to the market was an increase in the dividend tax rate, one would expect a reduced PDR as the numerator of the ratio is reduced. The alternative hypothesis for Event 1 and Event 2 are therefore structured as a non-directional, two sided test to determine whether the ratio significantly change after an event, regardless of direction. For Event 2, however, it is appropriate that the alternative hypothesis be directional, predicting a significantly negative shift in the PDR value.

a. Event 1 Hypotheses

To test for a significant market impact of the first official announcement of the transition to DWT on 23 February 2011, the following hypotheses are presented:

Hypothesis (1a): Average abnormal returns throughout the event window:

$$H1a_0: AAR_t = 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H1a_A: AAR_t \neq 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (1b): Cumulative average abnormal returns throughout the event window:

$$H1b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H1b_A: \sum_{t=-20}^{20} AAR_t = CAAR \neq 0$$

Hypothesis (1c): Refined average abnormal returns for each period in the event window:

$$H1c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H1c_A: RAAR_t \neq 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (1d): Cumulative average abnormal returns throughout the event window:

$$H1d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H1d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR \neq 0$$

Hypothesis (1e): The sample's aggregated PDR before the event versus the aggregated PDR after the event:

$$H1e_0: PDR_{before} = PDR_{after}$$

$$H1e_A: PDR_{before} \neq PDR_{after}$$

b. Event 2 Hypotheses

To test for a significant market impact of the official announcement on 22 February 2012 that the transition to DWT would be at an escalated dividend tax rate of 15%, the following hypotheses are presented:

Hypothesis (2a): Average abnormal returns throughout the event window:

$$H2a_0: AAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H2a_A: AAR_t < 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (2b): Cumulative average abnormal returns throughout the event window:

$$H2b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H2b_A: \sum_{t=-20}^{20} AAR_t = CAAR < 0$$

Hypothesis (2c): Refined average abnormal returns for each period in the event window:

$$H2c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H2c_A: RAAR_t < 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (2d): Cumulative average abnormal returns throughout the event window:

$$H2d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H2d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR < 0$$

Hypothesis (2e): The sample's aggregated PDR before the event versus the aggregated PDR after the event:

$$H2e_0: PDR_{before} = PDR_{after}$$

$$H2e_A: PDR_{before} > PDR_{after}$$

c. Event 3 Hypotheses

Hypothesis (3a): Average abnormal returns throughout the event window:

$$H3a_0: AAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H3a_A: AAR_t \neq 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (3b): Cumulative average abnormal returns throughout the event window:

$$H3b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H3b_A: \sum_{t=-20}^{20} AAR_t = CAAR \neq 0$$

Hypothesis (3c): Refined average abnormal returns for each period in the event window:

$$H3c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H3c_A: RAAR_t \neq 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Hypothesis (3d): Cumulative average abnormal returns throughout the event window:

$$H3d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H3d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR \neq 0$$

Hypothesis (3e): The sample's aggregated PDR before the event versus the aggregated PDR after the event:

$$H3e_0: PDR_{before} = PDR_{after}$$

$$H3e_A: PDR_{before} \neq PDR_{after}$$

4. RESEARCH METHODOLOGY AND DESIGN

a. Choice of methodology

A critical insight gleaned from the literature was that all methodologies possess inherent strengths and weaknesses. To produce reliable research results, one would need to acknowledge the caveats in the selected methodology and cater for these appropriately. If this is done effectively, the analysis and subsequent findings should be sound. It was furthermore established in the previous chapter that an event study, which is a statistical technique that estimates the share or market impact of identifiable micro- or macroeconomic events (Binder, 1998), was the most appropriate methodology to analyse the impact of the identifiable shift in tax regime on the equity market in SA.

The nature of the research therefore necessitated an events study methodology that was quantitative and causal in nature (Saunders & Lewis, 2012). Given that the financial data was time based, it needed to be segmented in order to perform the appropriate time series analysis. This segmentation approach is corroborated by the observations of Muller and Ward (2013) that abnormal return correlations with equity capital tend to be short term and therefore oblige the researcher to observe the returns over reduced time periods.

b. Population

The universe applicable to this research included all private and public companies registered in the Republic of South Africa as these were the only official entities that would be influenced by the transition in dividend tax legislation. Private company shares are not freely traded, however, and therefore did not possess the daily share price data required to perform a reliable event study. Private companies were thus excluded from the population. In light of this, the population under study was limited to all SA companies participating in the public equity market or more specifically, all businesses listed on the JSE between January 2006 and April 2012 (the overall combined estimation and event windows).

It should furthermore be noted that this criteria applied to any company who at any stage between January 2006 and May 2012 was listed on the JSE, irrespective of their eventual state or potential delisting from the market. It is therefore noted that survivor bias was potentially introduced into the study.

c. Unit of analysis

Five key metrics had been identified from literature (Binder, 1998; Elton & Gruber, 1970; MacKinlay, 1997; Muller & Ward, 2013) for the purpose of measuring and testing the significance of the impact on equity markets as a result of the transition from STC to DWT at a higher effective rate:

1. The average abnormal returns for each period *t* in the event window, AAR_t;
2. The cumulative average abnormal returns across the event window, CAAR;
3. The refined average abnormal returns for each period *t* in the event window, $RAAR_t$;
4. The refined cumulative average abnormal returns across the event window, RCAAR; and
5. The Point of Diminishing Return for dividend declarations from a shareholder perspective, PDR.

The primary difference between the conventional abnormal returns and the 'refined' abnormal returns calculation is that with the latter, instead of simplistically calculating abnormal returns as the difference between actual returns and a market level ex-ante forecast, here the calculation incorporated controls for variables such as company specific betas, company size, industry classification and whether the share fell within the value or growth category. The returns data used for these refined calculations was also adjusted for unbundling, mergers, share splits and dividend pay-outs. This refinement approach was consistent with the fundamental rationale behind an event study, in that the refinement adjustments facilitated the effective nullification of even more market-wide fluctuations than the conventional calculation of individual share returns, and should therefore be a more reliable metric for an events study.

PDR, on the other hand, is a metric that indicates the ex-dividend behaviour that would cause a shareholder with a particular set of tax rates to be indifferent to

accumulating wealth through dividends or share value growth (Elton & Gruber, 1970). This metric would thus indicate a shift in shareholder dividend policy preferences.

d. Sampling method and size

To ensure the analysis was representative of the market-wide impact of the transition under study, the chosen sample comprised all companies that had sufficient market capitalisation to be included in the JSE's All Share Index (ALSI) between January 2006 and May 2012 (the combined estimation and event windows). The ALSI consisted of approximately 160 companies at any given time during this period. The exact number of companies fluctuated slightly due to new share listings, delistings and mergers. The ALSI was an appropriate and representative sample of the chosen population as it effectively represented 99% of SA's market capitalisation over the period (Ward & Muller, 2012).

Whilst the sample of ALSI companies was analysed collectively to represent the SA equity market, the sample was furthermore subdivided to analyse the impact that each event had on high- versus medium- versus low-dividend yield companies. This subdivision was useful in testing Ayers et al.'s (2002) observation that the impact of dividend regulation changes is directly proportional to dividend yield. The confirmation or negation of this theory would have implications for the interpretation of results on a market-level.

As such, the sampling technique employed in this study was judgement sampling (Saunders & Lewis, 2012). Judgement sampling was an appropriate sampling technique given the automated, quantitative nature of the analysis (Zikmund, Babin, Carr, & Griffin, 2012) that furthermore circumvented criticism by encompassing 99% of the weighted population under study. Ward and Muller (2015) furthermore corroborate this sampling approach by noting that any results would be significantly skewed if the entire population (i.e. including the highly illiquid shares with insufficient market capitalisation to qualify for the ALSI) are afforded equal consideration in the analysis.

e. Data gathering process

The nature of this research meant that secondary financial data was sufficient to perform majority of the required calculations for the abnormal returns and PDR based analysis. The decision to limit the population to JSE listed companies meant that the required daily financial price data was publicly available. As such, all the required data, such as daily share prices, market index prices and dividends declarations, was sourced from the Sharenet subscription-based website.

For the calculation of the refined abnormal returns, however, publicly available financial data was not sufficient. The primary data source utilised to access this unique information was the Ward and Muller (2016) Financial Style Engine. The Ward and Muller Financial Style Engine contains financial data that has been accumulated over several decades and reflects the necessary share returns' appreciations and depreciations in addition to a vast array of other useful financial metrics. What makes this data source so distinctive and dependable is that it has been appropriately adjusted, based on Sharenet information, to accommodate unbundlings, mergers, share splits and dividend pay-outs on a daily basis. This data source furthermore contains information for shares that had been delisted from the JSE and therefore reduced the effects of survivorship bias present in the calculation of the AAR_t. The database is maintained using both Microsoft Excel and Microsoft Access by Muller, the co-owner of this invaluable IP.

f. Analysis approach

The rudimentary approach to calculating abnormal returns involves assessing the relation between the actual returns on a share *i* during each period *t* within the event window and the expected return of a predefined market-level estimate during the same period (Binder, 1998). That is, using a sample of historical return data leading up to the event, a period referred to as the estimation window, one would construct an ex-ante model for the chosen sample. Any variance between the actual returns and this ex-ante model would constitute an abnormal return.

To improve the accuracy and reliability of this conventional (somewhat criticised) approach, the calculation of the AAR_t in this study employed the multi-variate

regression model framework suggested by Binder (1998). The real advantage gained from adopting this framework lay in its ability to allow the abnormal returns to differ across the various companies in the sample. More specifically, this approach allowed abnormal returns to differ in sign which circumvents cushioning problems present in the conventional approach upon aggregation into CAAR. This approach essentially required calculating the ex-ante model for each share individually rather than a universal market prediction for all of the sample shares actual returns to be measured against. In this way, the abnormal return for each individual share was enhanced as it was measured against a more relevant prediction based on its own historic data over the estimation window. By adopting this approach, each event's aggregated ex-ante model correlation coefficient with the actual returns during the chosen estimation window (which was 60 months of monthly returns data leading up to the event window) was improved from:

- 0.1639 to 0.3268 for Event 1,
- 0.1415 to 0.3347 for Event 2, and
- 0.1677to 0.3293 for Event 3.

The primary market level index that was used as the basis for calculating these original multi-variate regression models was the JSE's market index that encompassed all of the shares within the chosen sample: the ALSI or J203. With this in mind, a further improvement was achieved by expanding the number of indices used to calculate each individual share's model parameters to additionally include the Industrial (J257), Resource (J258), Financial (J580), Value (J330) and Growth (J331) indices where applicable based on the characteristics of the individual share. This enhancement was relatively simplistic but the improved accuracy was noteworthy. Each event's aggregated ex-ante model correlation coefficient with the actual returns during the chosen estimation window was improved from:

- 0.3268 to 0.5746 for Event 1,
- 0.3347 to 0.5429 for Event 2, and
- 0.3293 to 0.5891 for Event 3.

With this improved model established, the actual returns for each company in the sample was analysed relative to its corresponding ex-ante returns to determine the abnormal return. This was repeated using daily data for all 41 days within the event

window. The sample's results were then aggregated for each period in the event window to calculate the period specific AAR_t.

In line with the conventional events study approach (MacKinlay, 1997), the CAAR was then calculated across the event window starting with each event date (t=0) as the pivot point. Each period's $RAAR_t$ value was therefore progressively summed on either side of the applicable event date to get a cumulative average abnormal return across the event window.

A comparable approach was employed by the Ward and Muller (2016) Financial Style Engine to calculate the $RAAR_t$ values for each period across all three event windows. The principal difference was that these ex-ante models incorporated an array of additional financial controls to improve their accuracy even further. For this refined approach, each event's aggregated ex-ante model correlation coefficient with the actual returns during the chosen estimation window was remarkably improved from:

- 0. 5746 to 0.9201 for Event 1,
- 0. 5429 to 0.8885 for Event 2, and
- 0. 5891 to 0.8877 for Event 3.

In light of this drastic improvement, and despite the conventional (and enhanced) AAR and CAAR possessing sufficient statistical power to generate reliable results, the analysis outcomes from the superior RAAR and RCAAR should be given more weight when interpreting the event study's results and making the subsequent inferences.

The fifth and final metric, the PDR test statistic, was calculated individually for each sample company in the chosen sample, both before and after each event. Aligned to the traditional approach, the PDR calculation used the share price before and after a share went ex-dividend within 365 days on either side of each event (Elton & Gruber, 1970).

With all five metrics successfully calculated across each event's sample, the hypotheses were statistically tested using IBM's SPSS software. For the AAR, RAAR and PDR metrics', the appropriate statistical test needed to detect a significant mean variance between sets of directly dependant sample data. With this in mind, the most appropriate statistical test was the paired samples t-test (Saunders & Lewis, 2012). It

was acknowledged, however, that abnormal returns are often not normally distributed (Corrado, 2011) and as such warranted the additional deployment of the Wilcoxon signed-rank test (the non-parametric equivalent of the paired samples t-test). If a significance of 95% (p=0.05) was achieved in both of the statistical tests, for all three metrics, it would irrefutably indicate a significant impact of the associated event on the equity market.

To analyse the CAAR and RCAAR however, a traditional statistical test to detect a mean variance would be inappropriate (MacKinlay, 1997). Instead, 95% confidence intervals for the collective sample were established for the event window based on 150 randomised events within the 365 calendar days leading up to the actual event being tested. If the CAAR or RCAAR values intersected these confidence intervals at any time during the event window it would indicate a significant (p=0.05) variation from the samples expected behaviour.

g. Limitations

Perhaps the most obvious limitation with the chosen approach is that, given the strictly South African context of this research, attempting to make inferences about international equity markets would be problematic. The South African scope of this research furthermore significantly reduces the available literature that is supporting with empirical data from the JSE. Furthermore, given the chosen sample of ALSI listed businesses, private companies which are also influenced by dividend tax legislation were not accounted for and the impact on this sector completely neglected.

Survivorship bias was effectively eliminated from the RAAR, RCAAR and PDR metrics through the inclusion of any delisted shares. For the AAR and CAAR, however, survivorship bias would have applied to any shares that delisted during one of the event windows. Within the greater sample the impact of this bias would be extremely small, but its presence deserves mentioning nonetheless.

The most significant limitation, however, is highlighted as a concern by Toerien and Marcus (2014) in their reflection on their own results: a shareholder's perception of the new DWT regime is directly dependant on their individual trade-off between CGT and DWT. As these rates vary amongst different shareholder classes, they

recommend any future empirical testing in this field be directly dependant on knowing the extent to which each company is held by each class of taxpayer; information that is not readily available. Whilst this concern does not impact the validity of the findings from the proposed methodology, it does limit the ability to interpret the fundamental reasons for the observed results.

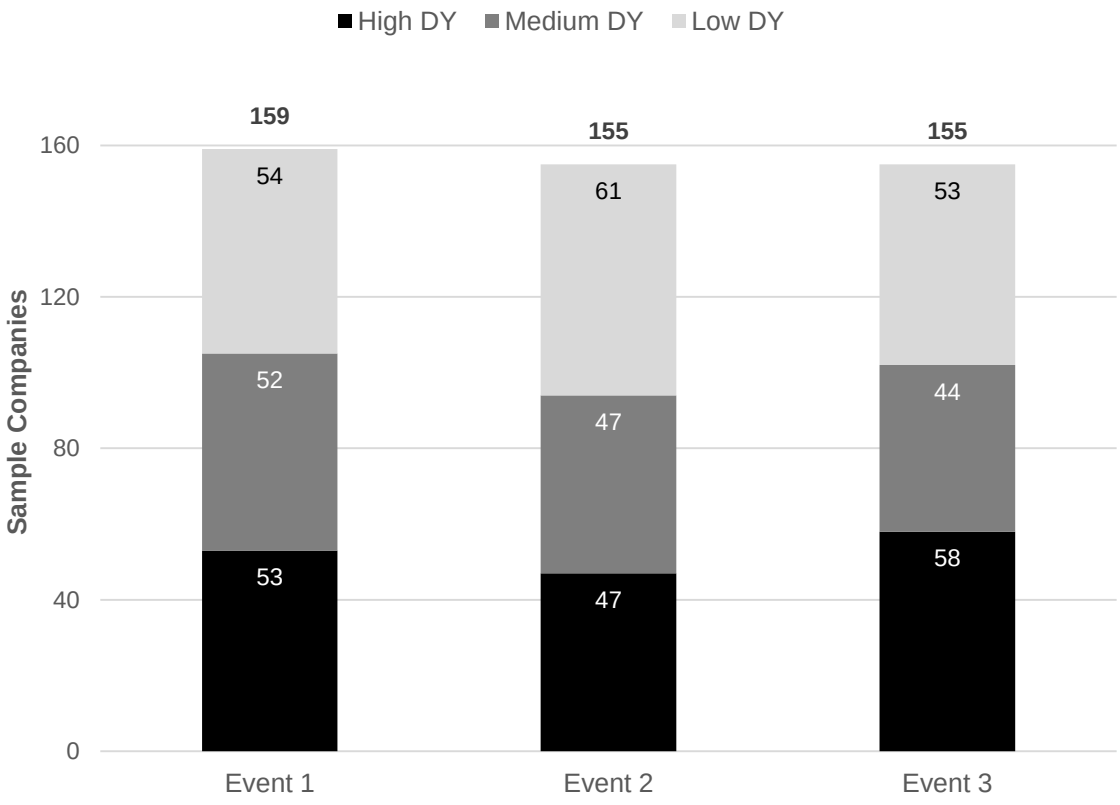
Finally, it should be noted that the results of this study do not necessarily hold for market behaviour into the future. This is due to the possibility of future unexpected macroeconomic occurrences which may alter SA's relationships between dividend taxes and the market's cost of equity. The results therefore apply only for the event periods under study even though the findings may inform future dividend policy and legislative decisions.

5. RESULTS

a. Sample Description

The chosen sample comprised all companies that had sufficient market capitalisation to be included in the JSE's All Share Index (ALSI) between January 2006 and May 2012 (the combined estimation and event windows across all three events). The ALSI consisted of approximately 160 companies at any given time during this period. The exact number of companies for each event, depicted in Figure 5.1, fluctuated due to new share listings, delistings and mergers.

Figure 5.1: Sample composition per event



The classification of each share into high, medium or low dividend yield is based on its relative position within the sample. Shares within the first tertile sorted by their dividend yield were classified low yield, the second tertile categorised medium yield whilst the third tertile indicated high relative yield within the sample.

b. Reliability and Validity

The validity of this study refers to whether or not the chosen analysis mechanism used to measure this phenomenon does indeed measure the phenomenon under investigation (Field, 2013). The primary analysis mechanism employed in this study, namely the events study methodology with the associated metrics, has repeatedly been verified as statistically powerful and appropriate for capital market research (Binder, 1998; Corrado, 2011; MacKinlay, 1997).

The validity of this study might furthermore be questioned on the basis that the chosen sample of roughly 160 shares was not necessarily representative of the SA equity market which consisted of over shares 400 listed shares in 2012. This concern is, however, mitigated by recognising that the ALSI effectively represented 99% of SA's market capitalisation over the period (Ward & Muller, 2012) and was therefore representative of the population under study.

In terms of reliability, which has validity as a fundamental prerequisite, the question is whether the results are repeatable given identical conditions (Field, 2013). Repeatability of financial market research is implausible as markets are directly dependant on an array of interdependent macroeconomic fluctuations, the exact conditions of which would will never again be repeated in the future. In this research, however, share returns and their aggregated relativity to the market was analysed. The use of market-relative metrics essentially renders systemic fluctuations inconsequential (Binder, 1998) and results in a considerably improved reliability of research outcomes.

c. Data Transformations

For the calculation of the AAR_t and CAAR metrics, no data transformations were required other than those involved with incorporating additional market indices to improve the calculation of the ex-ante model's dependant parameters. For the $RAAR_t$, RAAR and PDR metrics, however, the Ward and Muller (2016) Financial Style Engine introduced an array of financial controls to improve the accuracy of the residual return

calculations. These transformation included the appropriate incorporation of company specific betas, company size, industry classification, value versus growth categorisation and daily adjustments to mitigate distortionary effects from unbundlings, mergers, share splits and dividend pay-outs (Muller & Ward, 2013).

d. Statistical Results

i. AAR significance tests - Hypotheses H1a, H2a and H3a

The AAR metric indicates the sample's aggregated return variance from predicted return in each period of the event window. Figure 5.2, Figure 5.3 and Figure 5.4 show the multi-regression model's forecast return, the actual return and the difference (AAR) for all 41 trading days in the event windows for Event 1, Event 2 and Event 3 respectively.

Figure 5.2: Average Abnormal Returns – Event 1

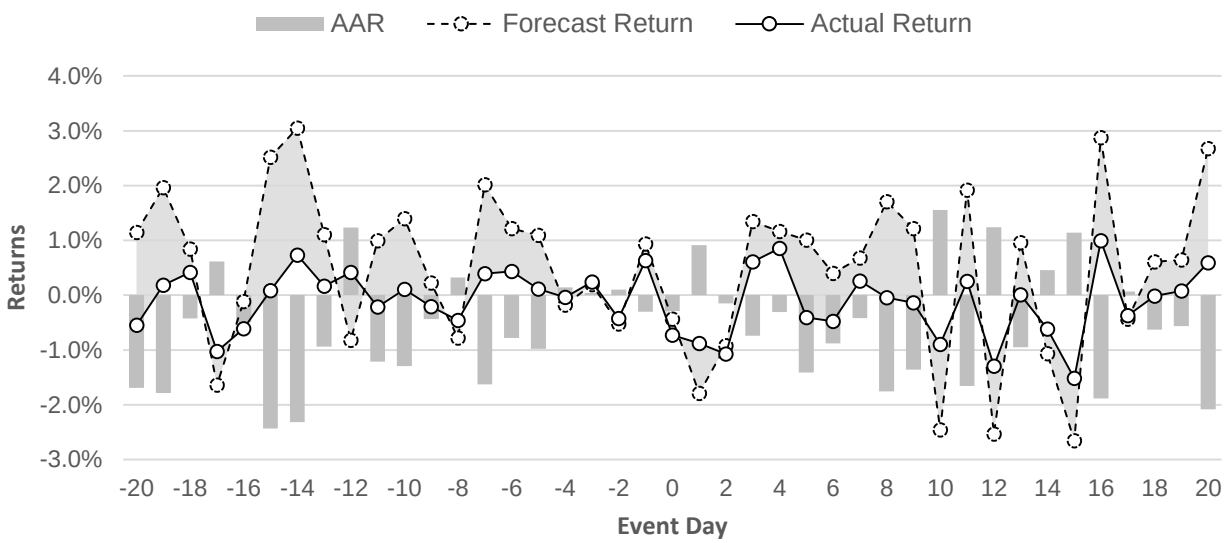


Figure 5.3: Average Abnormal Returns – Event 2

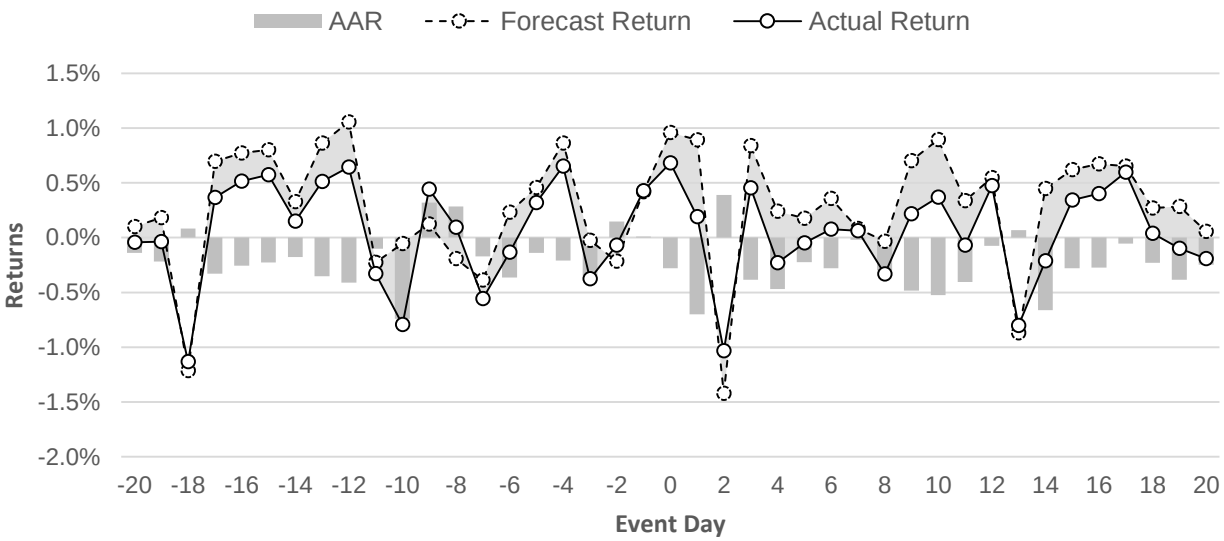
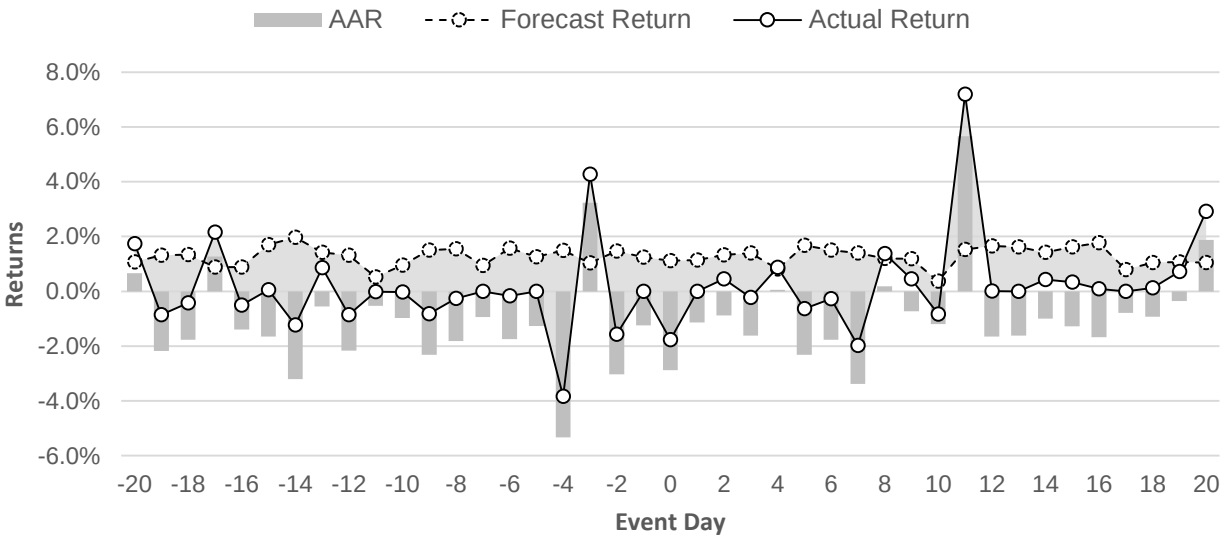


Figure 5.4: Average Abnormal Returns – Event 3



These graphs are particularly useful for visually contextualising the results of each event. For instance, it is easy to see that there is a consistently negative abnormal return manifesting throughout all three events. One can also sense a basic correlation between the forecast and actual returns in most periods, reassuring the accuracy of the ex-ante returns model. Based on the graphs, however, the statistical significance of such deductions are speculative at best and require the quantitative results from

the paired samples t-test and the Wilcoxon Signed Ranks Test to substantiate the meaningfulness of these suppositions. The results from these tests are presented in Table 5.1 and Table 5.2.

Table 5.1: AAR Paired Samples T-Test Results

Metric	Event 1	Event 2	Event 3
Mean AAR Before Event	12.42%	2.81%	3.12%
Mean AAR After Event	12.36%	3.10%	2.85%
σ AAR Before Event	1.85%	0.26%	0.44%
σ AAR After Event	2.24%	0.44%	0.39%
t Test Statistic	0.098	-2.591	1.926
Significance (p-value)	**0.417***	**0.018****	**0.035***

** Significance is based on a 2-tailed / non-direction test*
*** Significance is based on a 1-tailed / direction test*

Table 5.2: AAR Wilcoxon Signed Ranks Test Results

Metric	Event 1	Event 2	Event 3
Mean AAR Before Event	12.42%	2.81%	3.12%
Mean AAR After Event	12.36%	3.10%	2.85%
σ AAR Before Event	1.85%	0.26%	0.44%
σ AAR After Event	2.24%	0.44%	0.39%
Z Test Statistic	-0.149	-2.240	-1.605
Significance (p-value)	**0.449***	**0.012****	**0.057***

** Significance is based on a 2-tailed / non-direction test*
*** Significance is based on a 1-tailed / direction test*

It is worth reiterating from Chapter 3 that for Event 1 and Event 3 a 2-tailed, non-directional statistical significance is applicable, whilst for Event 2 a 1-tailed, directional statistical significance is appropriate.

ii. CAAR significance tests - Hypotheses H1b, H2b and H3b

Each period's AAR value was progressively summed on either side of the applicable event date to get a CAAR across the event window. The CAAR for all three events along with their 95% confidence intervals are depicted in Figure 5.5, Figure 5.6 and Figure 5.7. The aggregated median return from the 150 randomised events is also indicated.

Figure 5.5: Cumulative Average Abnormal Returns – Event 1

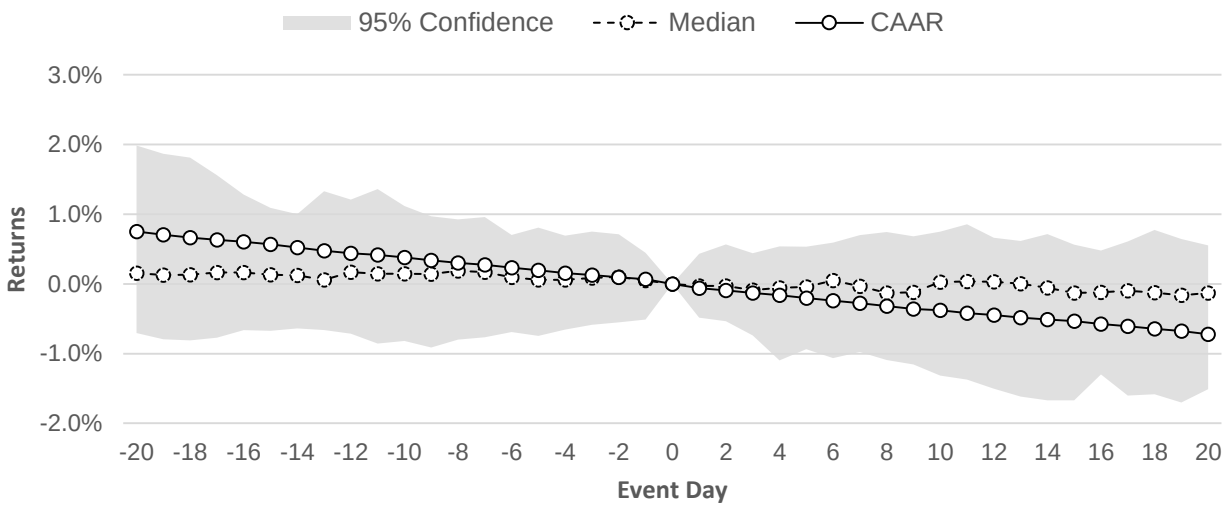


Figure 5.6: Cumulative Average Abnormal Returns – Event 2

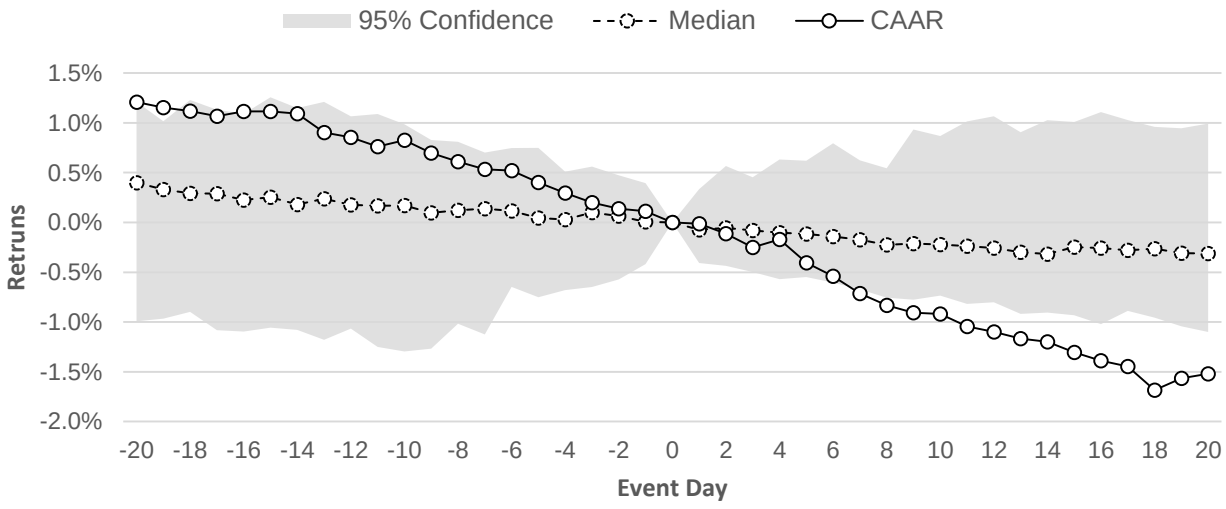
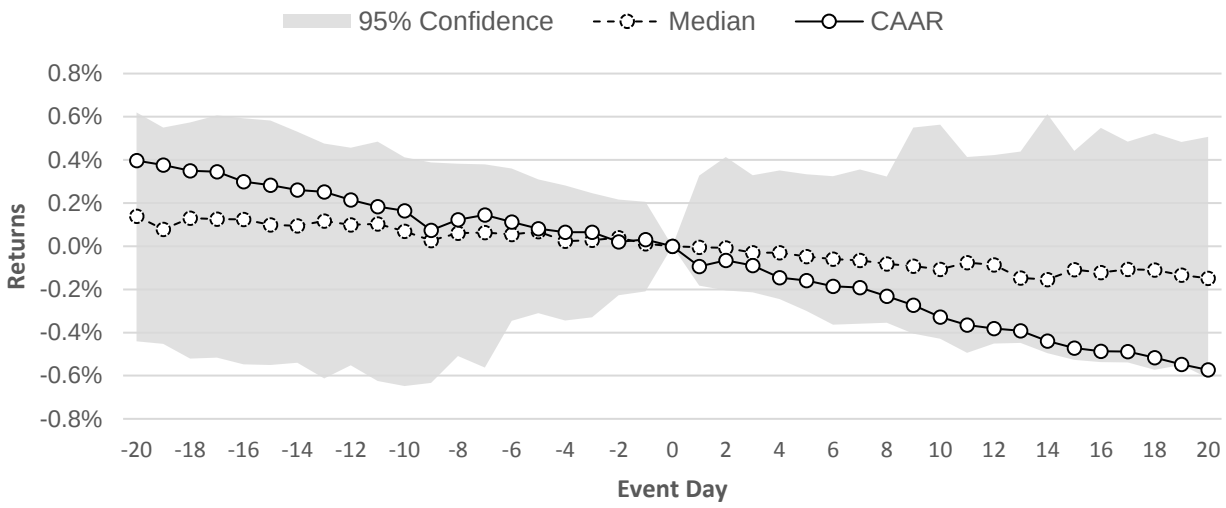


Figure 5.7: Cumulative Average Abnormal Returns – Event 3



When reviewing the results contained in these graphs, it is worth highlighting that any breach of the confidence interval range by the CAAR indicates a significant result. Furthermore, according to MacKinlay (1997) the gradient of CAAR indicates either a negative impact (downward slope) or positive impact (upward slope) of the event.

iii. RAAR significance tests - Hypotheses H1c, H2c and H3c

Analogous to the approach adopted for the AARs, Figure 5.8, Figure 5.9 and Figure 5.10 show the Ward and Muller (2016) Financial Style Engine's forecast return, the actual return and the difference (RAAR) for all 41 trading days in the event windows for Event 1, Event 2 and Event 3 respectively.

Figure 5.8: Refined Average Abnormal Returns – Event 1

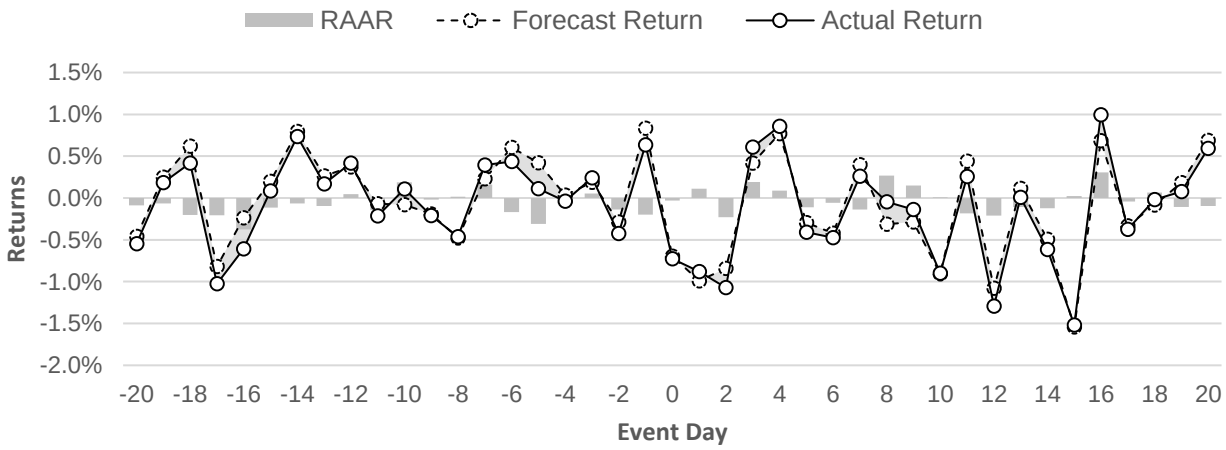


Figure 5.9: Refined Average Abnormal Returns – Event 2

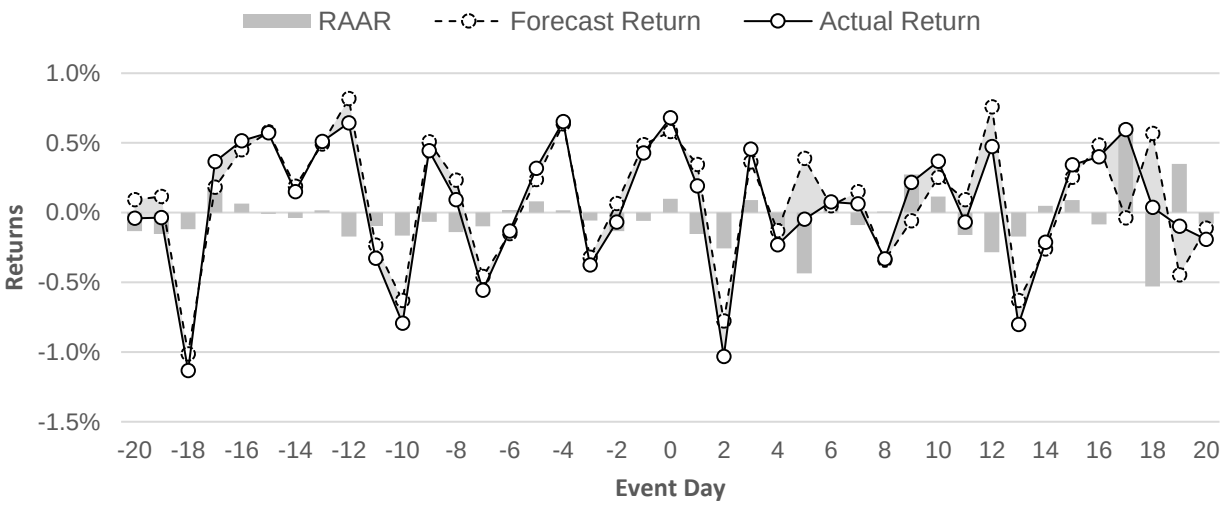
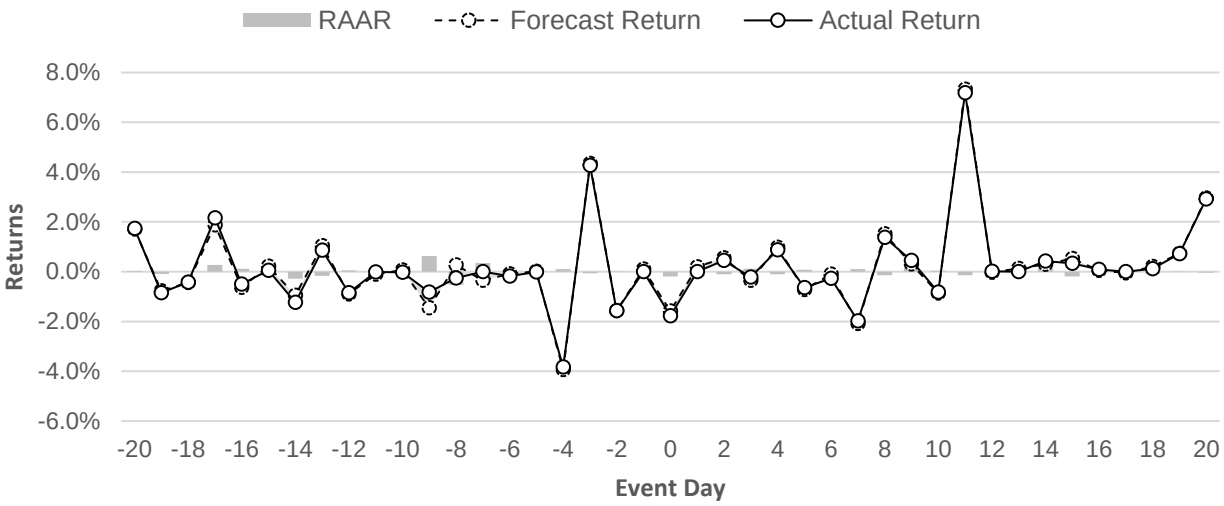


Figure 5.10: Refined Average Abnormal Returns – Event 3



As expected, the distinctive correlation between the forecast and actual returns is evident in these graphs and reveals the superiority of this model's accuracy in producing ex-ante returns from which to measure abnormal behaviour. Despite this improvement, the statistical significance of these results is still vague and require the quantitative results from the paired samples t-test and the Wilcoxon Signed Ranks Test to substantiate the meaningfulness of any event impact. The results from these statistical tests are presented in Table 5.3 and Table 5.4.

Table 5.3: RAAR Paired Samples T-Test Results

Metric	Event 1	Event 2	Event 3
Mean RAAR Before Event	3.12%	2.61%	2.36%
Mean RAAR After Event	2.64%	2.24%	2.52%
σ RAAR Before Event	0.44%	0.35%	0.49%
σ RAAR After Event	0.64%	0.48%	0.35%
t Test Statistic	-2.449	-2.818	0.916
Significance (p-value)	**0.013***	**0.006****	**0.187***

** Significance is based on a 2-tailed / non-direction test*
*** Significance is based on a 1-tailed / direction test*

Table 5.4: RAAR Wilcoxon Signed Ranks Test Results

Metric	Event 1	Event 2	Event 3
Mean RAAR Before Event	3.12%	2.61%	2.36%
Mean RAAR After Event	2.64%	2.24%	2.52%
σ RAAR Before Event	0.44%	0.35%	0.49%
σ RAAR After Event	0.64%	0.48%	0.35%
Z Test Statistic	-2.374	-2.575	-0.781
Significance (p-value)	**0.008***	**0.004****	**0.229***

** Significance is based on a 2-tailed / non-direction test*
*** Significance is based on a 1-tailed / direction test*

As before, Event 1 and Event 3 employed a 2-tailed, non-directional statistical significance, whilst Event 2 required a 1-tailed, directional statistical significance.

iv. RCAAR significance tests - Hypotheses H1d, H2d and H3d

Once again, to remain consistent with the approach implemented for the CAAR, each period's RAAR value was progressively summed on either side of the applicable event date to get a RCAAR across the event window. The RCAAR for all three events along with their 95% confidence intervals are depicted in Figure 5.11, Figure 5.12 and

Figure 5.13. The aggregated median return from the 150 randomised events is also indicated.

Figure 5.11: Cumulative Refined Average Abnormal Returns – Event 1

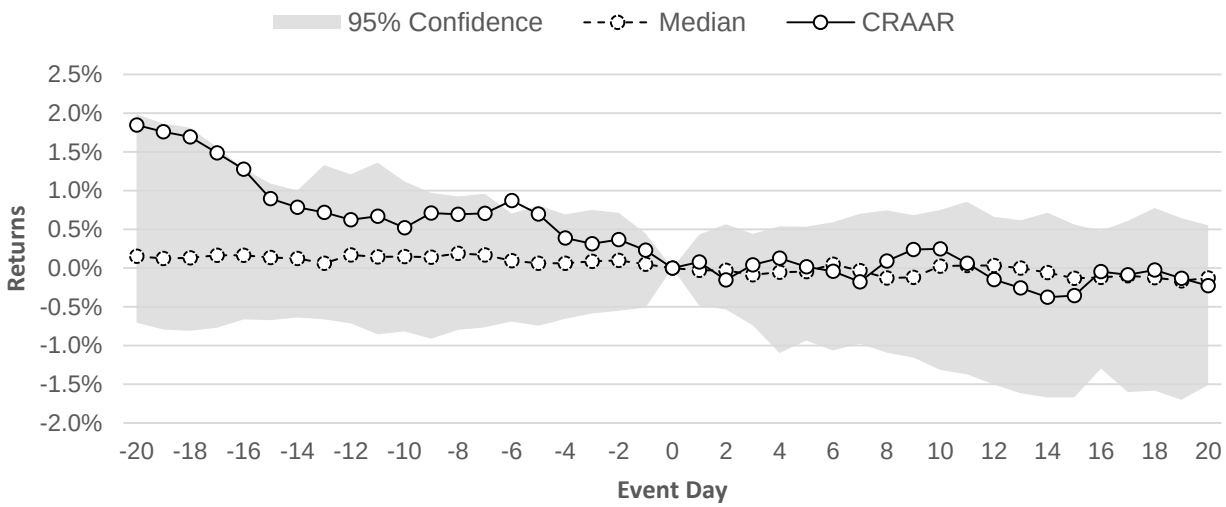


Figure 5.12: Cumulative Refined Average Abnormal Returns – Event 2

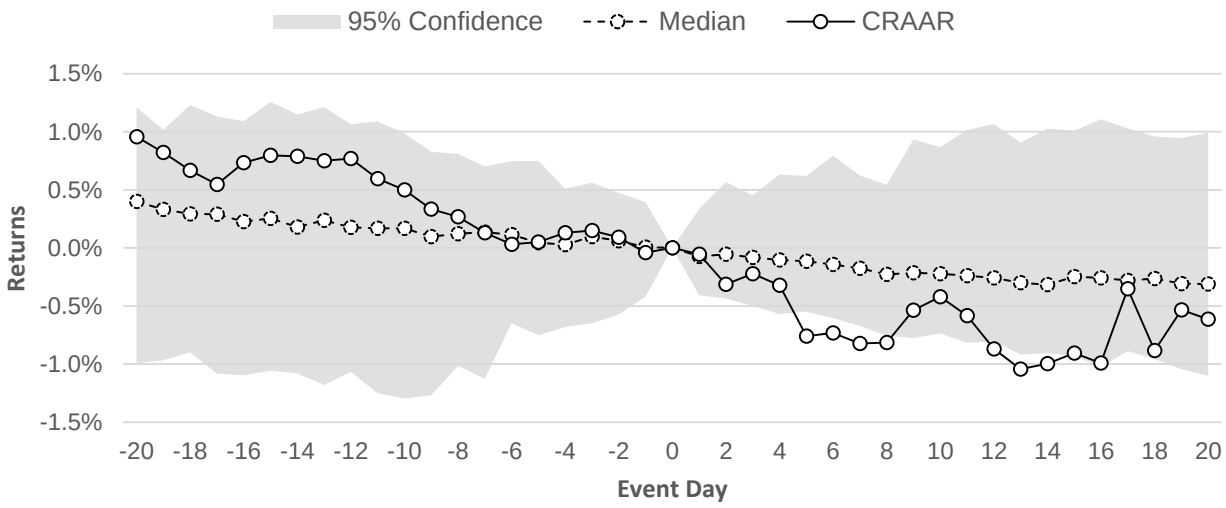
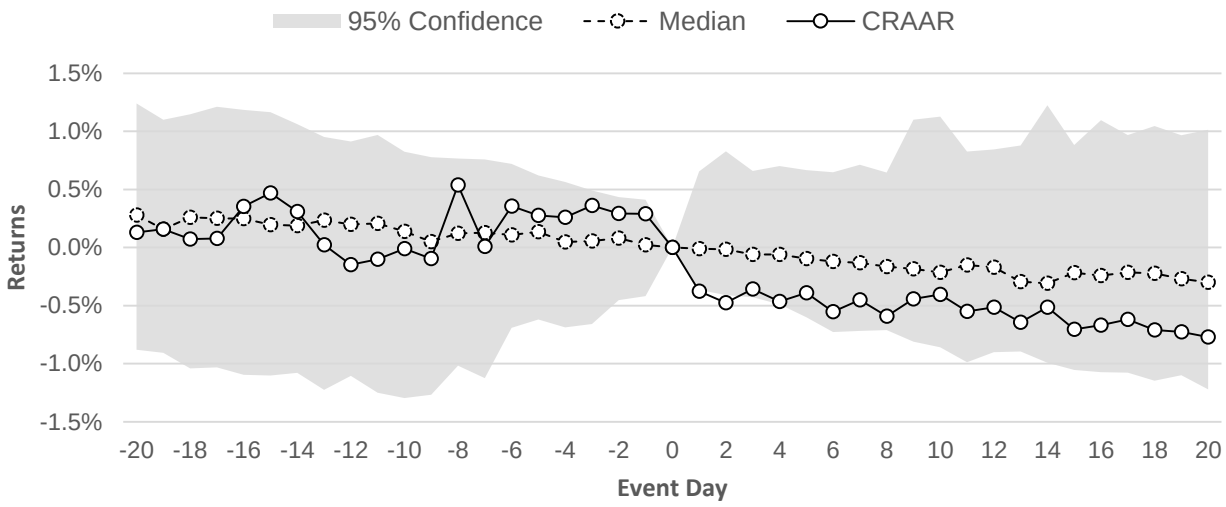


Figure 5.13: Cumulative Refined Average Abnormal Returns – Event 3



Given the improved accuracy of this approach, it is evident that the RCAAR is much more sensitive to market behaviour than the conventional CAAR. Once again, any breach of the confidence interval range by the RCAAR indicates a significant result with the overall gradient indicating the directionality of the event's impact.

Furthermore, in an attempt to authenticate Ayers et al.'s (2002) logical reflection that the impact of dividend regulation changes should be directly proportional to dividend yield, the sample was subdivided as shown in Figure 5.1 and the RCAAR recalculated for each subdivision. Figure 5.14, Figure 5.15 and Figure 5.16 depict the results.

Figure 5.14: Dividend Yield Profiles for CRAAR – Event 1

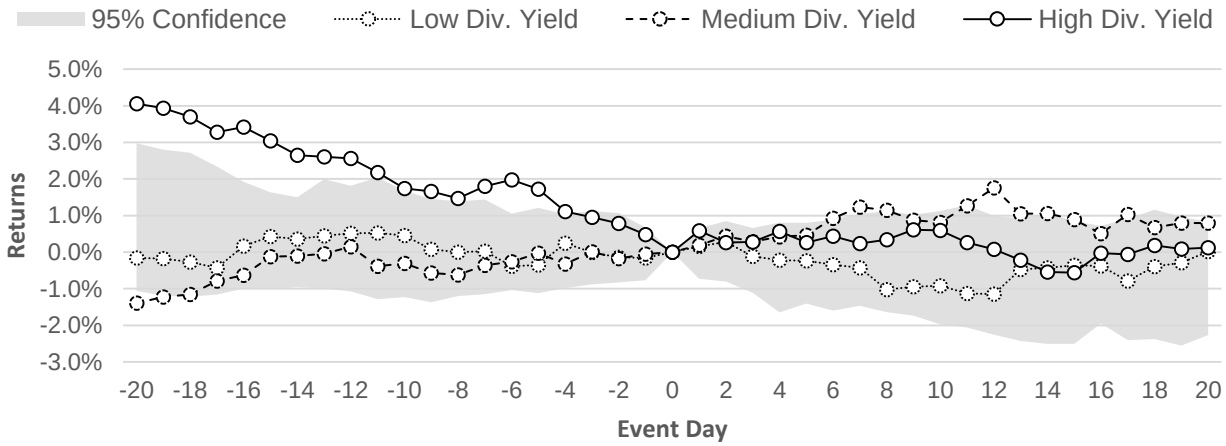


Figure 5.15: Dividend Yield Profiles for CRAAR – Event 2

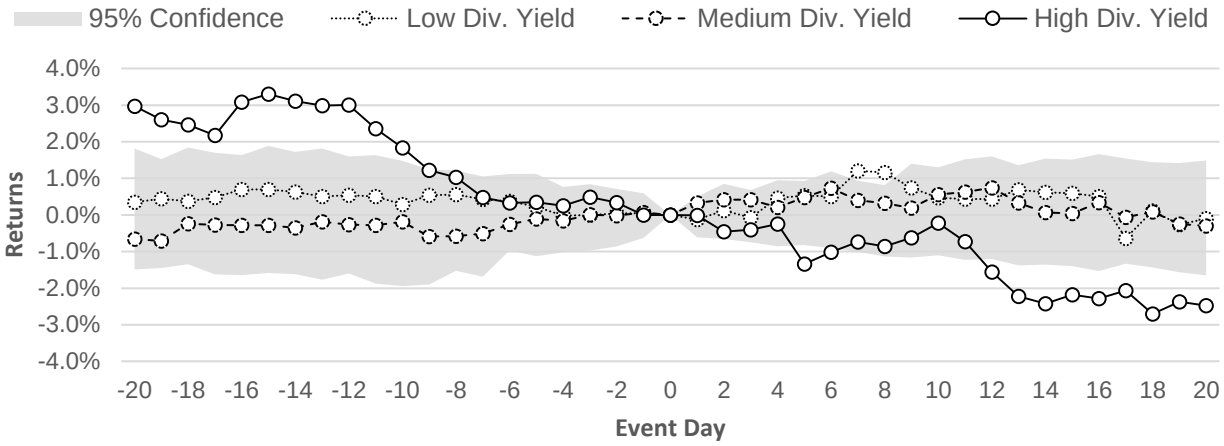
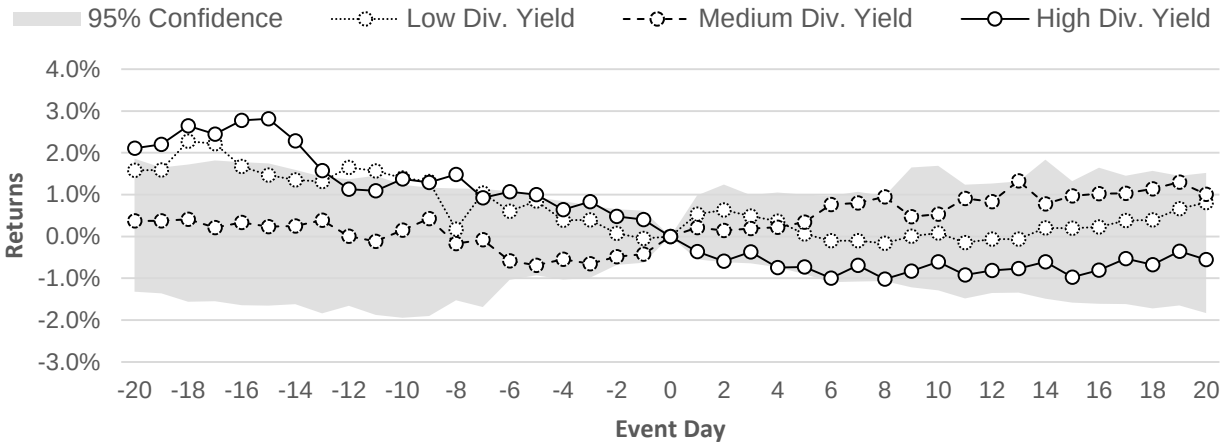


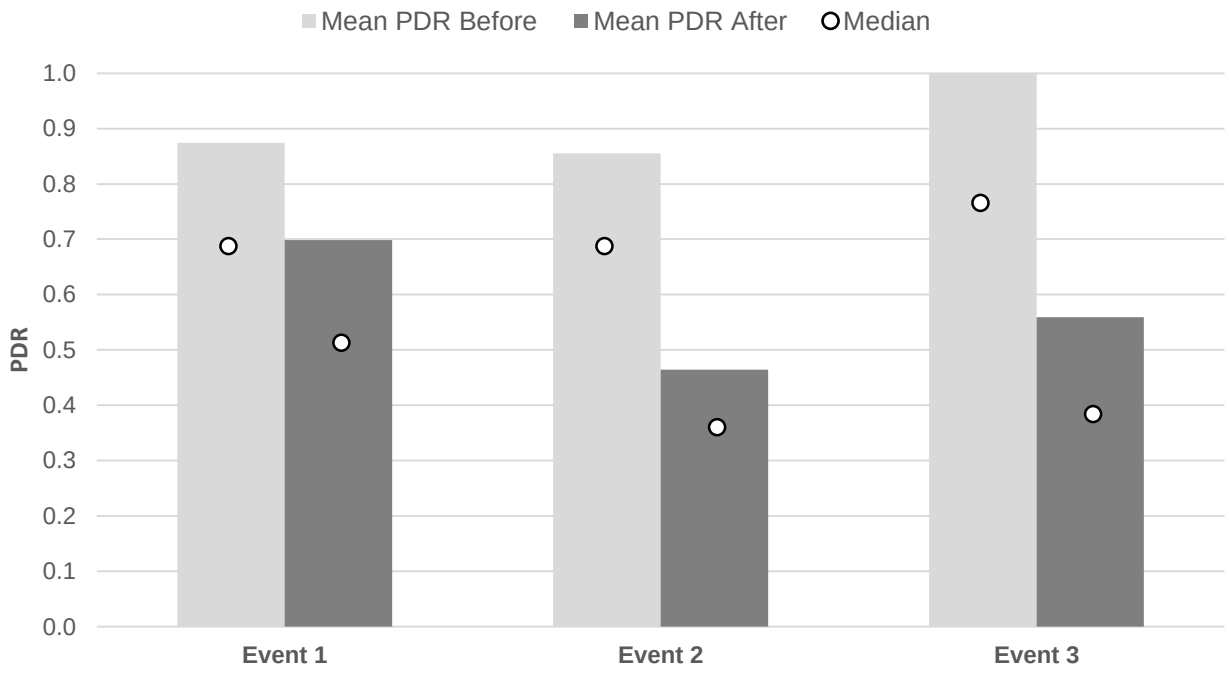
Figure 5.16: Dividend Yield Profiles for CRAAR – Event 3



v. PDR significance tests - Hypotheses H1e, H2e and H3e

The PDR metric represents the ex-dividend behaviour that would cause a shareholder with a particular set of tax rates to be indifferent to accumulating wealth through dividends or share value growth (Elton & Gruber, 1970). A shift in this ratio would indicate a nett impact on the tripartite equilibrium between: (1) the share price discount realised when a share going ex-dividend, (2) the average dividends amount across the sample or (3) the balance of the marginal shareholder's dividend tax rate versus CGT. The PDR value shift for all three events is shown in Figure 5.17.

Figure 5.17: Change in PDR Values for All Three Events



This graph is once again only valuable for contextualising the results of the statistical tests. The identical negative impact of all three events provides reassurance that this metric is aligned to the negative gradient inherent in all the abnormal return metrics reviewed thus far. The statistical significance this negative impact based on the graph is notional, however, and requires the quantitative results from the paired samples t-test and the Wilcoxon Signed Ranks Test to verify the relevance of the visual shifts. The results from these tests are presented in Table 5.5 and Table 5.6.

Table 5.5: PDR Paired Samples T-Test Results

Metric	**Event 1**	**Event 2**	**Event 3**
Mean PDR Before Event	0.874	0.855	1.002
Mean PDR After Event	0.699	0.465	0.559
σ PDR Before Event	0.866	0.856	1.194
σ PDR After Event	0.775	0.488	0.860
t Test Statistic	-2.044	2.545	1.300
Significance (p-value)	**0.052***	**0.006****	**0.098***

** Significance is based on a 2-tailed / non-direction test*

*** Significance is based on a 1-tailed / direction test*

Table 5.6: PDR Wilcoxon Signed Ranks Test Results

Metric	Event 1	Event 2	Event 3
Mean PDR Before Event	0.874	0.855	1.002
Mean PDR After Event	0.699	0.465	0.559
σ PDR Before Event	0.866	0.856	1.194
σ PDR After Event	0.775	0.488	0.860
Z Test Statistic	-1.536	-4.730	-3.237
Significance (p-value)	**0.062***	**0.000****	**0.100***

** Significance is based on a 2-tailed / non-direction test*

*** Significance is based on a 1-tailed / direction test*

As before, Event 1 and Event 3 employed a 2-tailed, non-directional statistical significance, whilst Event 2 required a 1-tailed, directional statistical significance.

6. DISCUSSION OF RESULTS

The empirical evidence from both the international (Amihud & Murgia, 1997; Harberger, 1962; Huber, 1994) and local (Toerien & Marcus, 2014) literature suggests that the increased dividend tax rate associated with the transition from STC to DWT should have resulted in a negative impact on SA equity markets. As revealed in the study of supplementary local literature, however, this transition is more intricate than merely an increase in the dividend tax rate. A substantial portion of investors (resident companies, the SA government, public benefit organisations and pension/ provident/ retirement annuity funds) are exempt from dividends taxes under the new regime (Erero & Gavin, 2015) and should therefore considerably prefer to receive dividends compared to accumulating returns from capital gains. This is a direct contrast of the preference under STC and contradictory to the expectation one has when isolating the increased tax rate component of the transition. This major shift in shareholder dividend policy preference when combined with the impact of the increased dividend tax rate from 10% to 15% made the anticipated, overarching impact indistinguishable.

Fortunately, the events study methodology, along with the five identified test statistics and the favourable structure provided by the three separate transitional milestones, provide an objective, quantitate setting for demystifying the impact. This chapter discusses the results presented in Chapter 5 with the consolidated outcomes considered in the concluding Chapter 7.

a. Discussion of Event 1 Hypotheses

The first recognised event associated with SA's transition from STC to DWT occurred on 23 February 2011, when the first official announcement was made by the Minister of Finance (Venter, 2013). At this point in time, the transition to DWT was planned at a rate of 10%. The two major disclosures contained in this announcement were consequently a shift in the tax liability from the company to the shareholder and an elaboration on which investors classes would be tax exempt and which would not. Literature did not justifiably define the directionality of the expected impact on the market with Torien and Marcus (2014) simply stating "we predict that the relationship

between Dividend Taxes, CGT and STC will change fundamentally under the new regime" (p. 907).

The first of five hypotheses for Event 1 centres around detecting significantly non-zero abnormal returns during the 41 day event window; an approach that is consistent with the traditional event study methodology for financial market research (MacKinlay, 1997):

$$H1a_0: AAR_t = 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H1a_A: AAR_t \neq 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

A combination of a graphical time series, a paired samples t-test (PST) and a Wilcoxon Signed Ranks (WSR) test reveal an insignificant negative impact on share prices (p_{PST} = 0.417; p_{WSR} = 0.449) with a slightly elevated volatility resulting from the event. These results fail to reject the null hypothesis $H1a_0$.

The second hypothesis, which is intrinsically interconnected with the first, was constructed to detect any significant deviation of the CAAR from zero:

$$H1b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H1b_A: \sum_{t=-20}^{20} AAR_t = CAAR \neq 0$$

A graphical time series with 95% confidence intervals (constructed from 150 random events during the 365 days leading up to the actual event window) assisted in determining the significance of the announcement based on this metric. Reassuringly the downward slope of the CAAR as well as its failure to breach the confidence interval are consistent with the first hypothesis: a non-significant negative impact on share prices. These results once again fail to reject the null hypothesis $H1b_0$.

Moving on from the AAR and CAAR, it was undeniably established that the accuracy of the ex-ante model employed by the Ward and Muller (2016) Financial Style Engine was far superior to the conventional (though enhanced) formulation of the AAR. The third hypothesis, which is fundamentally a complimentary counterpart

to the first hypothesis which examined the AAR, centred on detecting significantly non-zero 'refined' AARs:

$$H1c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H1c_A: RAAR_t \neq 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

As before, the combination of a graphical time series, a PST test and a WSR test were used to collectively determine the significance of any non-zero deviation. Interestingly, whilst the results show a similar negative impact throughout the event window, the refined metrics indicate that this was in fact significant (p_{PST} = 0.013 ; p_{WSR} = 0.008). These result therefore successfully reject the null hypothesis $H1c_0$.

The fourth hypothesis, which is once again intrinsically dependant on the third, was created to detect any significant deviation of the RCAAR from zero:

$$H1d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H1d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR \neq 0$$

The corresponding graphical time series, given the downward sloping RCAAR's breach of the 95% confidence interval six days before the event, further reinforces that this announcement had a significantly negative impact according to the refined model. These results therefore reject the null hypothesis $H1d_0$.

The final hypothesis for the first event was formulated to indicate whether or not there was a significant shift in the ex-dividend behaviour that would cause a shareholder with a particular set of tax rates to be indifferent to accumulating wealth through dividends or share value growth as a result of the announcement (Elton & Gruber, 1970):

$$H1e_0: PDR_{before} = PDR_{after}$$

$$H1e_A: PDR_{before} \neq PDR_{after}$$

The results of the statistical tests indicate a marginally insignificant reduction in the sample's aggregated PDR value resulting from the announcement (p_{PST} = 0.052; p_{WSR} = 0.062). The results therefore fail to reject the null hypothesis $H1e_0$.

With all five hypotheses tested, one would be tempted to simply conclude that the first official announcement of the transition from STC to DWT on 23 February 2011 had no statistically significant impact on SA's equity market. The most noteworthy deduction revealed in the results, more specifically the time series analysis of the CRAAR in Figure 5.11, suggests that the market anticipated something in the days leading up to the event but thereafter quickly stabilized to align with the ex-ante model's predicted returns. That said, there are two potential explanations regarding the apparent insignificance of this event: (1) there was no substantial market reaction due to the inconsequentiality of the event from an investor perspective or (2) there were multiple conflicting reactions that when aggregated emulated an insignificant reaction. The results of the CRAAR in Figure 5.14 support the latter explanation. Aligned to the submission from Ayers (2002) that the dividend yield of a company will have an influence on its reaction to changes in dividend related policies, these results show a significant yet opposing reaction from high and medium dividend yield companies. With this in mind, the suggestion here is that whilst this first event had no overall, statistically significant impact on the SA equity market, it did have a considerable impact on certain elements of the market, namely medium and high dividend yield firms.

b. Discussion of Event 2 Hypotheses

The second major milestone in SA's transition from STC to DWT was on 22 February 2012 when the Minister of Finance announced that DWT was to be implemented at an escalated rate of 15%. Fortunately the announcement regarding the transition was made a full year prior to this and hereby isolated the impact of the increase in dividend tax as the only noteworthy change introduced by this event. As such, all five alternative hypotheses for this event predict a negative impact on share prices. This was the only substantial change in approach from that used to test Event 1 above.

As before, the first hypothesis related to Event 2 was therefore:

$$H2a_0: AAR_t = 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H2a_A: AAR_t < 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

The associated graphical time series, PST test and WSR test indicate that, as expected, there was a significantly negative impact on share prices (p_{PST} = 0.018; p_{WSR} = 0.012) resulting from the event. These results lead to a rejection of the null hypothesis $H2a_0$.

The second, directly dependant hypothesis aims to detect any significant deviance of the CAAR below zero.

$$H2b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H2b_A: \sum_{t=-20}^{20} AAR_t = CAAR < 0$$

The resultant graphical time series, which has an undeniable downward sloping CAAR, breaches the 95% confidence interval both before and after the event. This result further reinforces that this increase in the dividend tax rate had a significantly negative impact on equity prices. These results once again reject the null hypothesis $H2b_0$.

The improved measurement of these abnormal returns as contained in the Ward and Muller Financial Style Engine are hypothesised to reinforce the findings from the conventional model for abnormal returns.

$$H2c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H2c_A: RAAR_t < 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

The associated graphical time series, PST test and WSR test, for this event, fortunately support the findings of the conventional model. The results once again show a significantly negative impact from the announcement of the tax rate hike (p_{PST} = 0.006 ; p_{WSR} = 0.004). These result therefore successfully reject the null hypothesis $H2c_0$.

For the associated accumulation of the RAAR, the hypothesis tests for a negative impact aligned to the empirical findings in the literature review.

$$H2d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H2d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR < 0$$

The downward sloping RCAAR's repeatedly breaches the 95% confidence interval following the event, strengthening the previous findings and rejecting the null hypothesis $H2d_0$.

The final hypothesis for Event 2 expects a lower PDR following the event as the numerator of the ratio is reduced as a result of an increased dividend tax rate.

$$H2e_0: PDR_{before} = PDR_{after}$$

$$H2e_A: PDR_{before} > PDR_{after}$$

The results of the statistical tests indicate a statistically significant reduction in the sample's aggregated PDR value resulting from the announcement (p_{PST} = 0.006; p_{WSR} = 0.000). These results reject the null hypothesis $H2e_0$ and hereby result in the full suite of hypotheses for Event 2 to collaboratively conclude that there was a statistically significant negative impact on the SA equity market as a result of the announcement that DWT would be introduced at an escalated rate of 15%.

The two potential explanations associated with the findings of insignificance for Event 1, namely that the event was inconsequential for investors or that there were neutralising impacts from conflicting market reactions, do not apply to this result. If the latter phenomenon is present here, it would only serve to reveal an even more severe impact on certain market segments than originally thought. In this vein, the dividend yield profiles in Figure 5.15 reveal that the impact was indeed harsher for high dividend yield businesses with a significant (though predictable) benefit to low dividend yield firms shortly following the event. These empirical findings are closely aligned with the expectations from literature.

c. Discussion of Event 3 Hypotheses

The third and final milestone on 01 April 2012 was when the new DWT system was officially implemented. Given the prior announcements, along with all of the pertinent information regarding the transition from STC to DWT having been communicated already, there was arguably no expected impact for this event. Consistent with event study methodology, however, all identifiable events should be considered despite the researcher's unquantified perception of insignificance.

As such, the first hypothesis for this Event 3 was constructed to test for a non-directional impact of the official transition to DWT.

$$H3a_0: AAR_t = 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H3a_A: AAR_t \neq 0 \qquad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

Surprisingly, the corresponding graphical time series, PST test and WSR test indicate that a marginally significant reduction in share prices around this event (p_{PST} = 0.035; p_{WSR} = 0.049). These results unexpectedly lead to a rejection of the null hypothesis $H3a_0$.

For the associated CAAR hypothesis, the test is once again for a significant impact, regardless of direction.

$$H3b_0: \sum_{t=-20}^{20} AAR_t = CAAR = 0$$

$$H3b_A: \sum_{t=-20}^{20} AAR_t = CAAR \neq 0$$

The resultant graphical time series, which has an undeniable downward sloping CAAR, does not however breach the 95% confidence interval, neither before nor after the event. The result is marginal once again but advocates that the event was not statistically significant enough to reject the null hypothesis $H3b_0$.

As with the first event, the refined abnormal returns from the Ward and Muller Financial Style Engine (2016) are consulted here to provide a more definitive result concerning the significance of this event. The third hypothesis is centred on detecting significantly non-zero RAARs:

$$H3c_0: RAAR_t = 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

$$H3c_A: RAAR_t \neq 0 \quad \{t \in \mathbb{Z} \mid -20 \leq t \leq 20\}$$

The accompanying graphical time series, PST test and WSR test, for this event, contradict the marginal findings of the conventional model. These refined results show an insignificant, negative impact following the official transition date (p_{PST} = 0.187 ; p_{WSR} = 0.229). The result therefore fails to reject the null hypothesis $H3c_0$.

The fourth hypothesis, which is once again intrinsically dependant on the third hypothesis above, strives to detect any significant deviation of the CRAAR from zero across the event window:

$$H3d_0: \sum_{t=-20}^{20} RAAR_t = RCAAR = 0$$

$$H3d_A: \sum_{t=-20}^{20} RAAR_t = RCAAR \neq 0$$

The graphical time series of the CRAAR reveals some insight into the marginal results in the preceding three tests. The CRAAR is relatively flat throughout the event window with isolated spikes and drops on certain days. The most significant shift occurs from directly before to immediately after the event day and this is the only period in which the CRAAR breaches the 95% confidence interval. The CRAAR then stabilises for the remainder of the periods. This has unavoidably cushioned the aggregated result to appear marginally significant but is substantial enough here to reject the null hypothesis $H3d_0$.

The final hypothesis for the third event was formulated to indicate whether or not there was a significant shift in the PDR value as a result of the implementation of the regime transition:

$$H3e_0: PDR_{before} = PDR_{after}$$

$$H3e_A: PDR_{before} \neq PDR_{after}$$

This aggregated result has once again led to a verdict of market insignificance for the event (p_{PST} = 0.098; p_{WSR} = 0.100) and fails to reject the null hypothesis $H3e_0$. Interestingly though, Figure 5.16 shows a significantly negative impact on high and

low dividend yield share prices leading up the implementation date while medium yield shares appear relatively stable. This reaction prior to the event rather than after it is to be expected, however, in light of the fact that the market knew the planned implementation date long before the event actually occurred (Toerien & Marcus, 2014).

All things considered, it is evident that there was in fact a significant equity market impact resulting from SA's transition from SCT to DWT. The effect is primarily a negative reaction in response to the hike in the dividend tax rate from 10% to 15% rather than the reduction in regulatory complexity. The actual change in regulation was on an aggregated level insignificant, contrary to the theory of Lawless (2013), but did have a significant impact on the higher dividend yield firms as advocated by Ayers (2002).

7. CONCLUSION

a. Fundamental findings & academic contribution

Dividend policy and its impact on equity markets should be a relatively straightforward topic. Shareholders should rationally be indifferent to receiving returns in the form of dividend payouts or value growth (M. H. Miller & Modigliani, 1961). Markets are, however, not perfectly efficient and investors are not completely rational (Bris et al., 2007; Rubinstein, 2001; Thaler, 1999).

The expectations of SA's transition from STC to DWT was vague from an equity market perspective in light of conflicting academic arguments and a lack of empirical evidence from local research. International theorists can ultimately be categorised as either believing that the transition would have a negative impact on equity markets due to the implementation at a higher dividend tax rate (Dhaliwal et al., 2003; Dhaliwal et al., 2005; Gentry et al., 2003; Harberger, 1962), that there would be a positive impact resulting from the reduced complexity and/or the fact that businesses would pay additional dividends in light of a expectations that dividend taxes would be even higher in the future, and finally those that believe there would be a negligible impact as shareholders capitalise the dividends tax such that it is more of a lump sum cost (Huber, 1994; Sinn, 1991). Remarkably, the majority of the research, regardless of the researcher's beliefs, yielded evidence supporting the traditional view of Harberger (1962) that there would be a negative impact. Local researchers also generally fall within one of the abovementioned categories but valuably revealed that the transition is more complex than merely a hike in dividend tax rates (Erero & Gavin, 2015; Toerien & Marcus, 2014).

The identification of three critical milestones that embody the fundamental factors involved with the transition, namely the first announcement of the transition, the second announcement which revealed it would be implemented at an increased dividend tax rate and the actual implementation date, isolated the various counteracting forces identified within this SA unique scenario. This structure enabled the events study methodology to quantifiably analyse the impact of the transition on the equity market.

The results predictably align with the empirical evidence from international literature as there was indeed a significant, negative equity market impact resulting from SA's transition from SCT to DWT. The negative reaction is primarily attributable to the hike in the dividend tax rate from 10% to 15% rather than the reduction in regulatory complexity. The actual change in regulation was on an aggregated level found to be insignificant, contrary to the theory of Lawless (2013), but did have a significant impact on the higher dividend yield firms as advocated by Ayers (2002).

This research therefore contributes to academic literature by quantifiably showing that the SA equity market is efficient in its ability to capitalise dividend taxes into the cost of equity and responds consistently with the empirical findings in international markets regarding an increase in dividend tax rates. It furthermore contributes to local research by providing the first quantifiable evidence related to the transition to DWT and affirms the speculation of Toerien and Marcus (2014) that "the relationship between Dividend Taxes, CGT and STC will change fundamentally under the new regime" (p. 907).

b. Inferences for management

The first practical implication of the findings is that the SA equity market, namely the JSE, is notably sensitivity to dividend related decisions. Business executives, in light of the results, need to recognise the potential repercussions of their own dividend related decisions from the perspective of their marginal shareholder. The findings furthermore assist businesses to gauge the relative position of their marginal shareholders within the greater SA investment environment. This should assist them to make decisions that might attract a different shareholder profiles over time. Finally, the findings here around shareholder return strategies have repercussions on corporate capital structuring, the pursuit of tax shields and marketing investment opportunities to international stakeholders.

c. Limitations

Perhaps the most obvious limitation with the chosen approach is that, given the strictly South African context of this research, attempting to make inferences about international equity markets would be problematic. The South African scope of this research furthermore significantly reduces the available literature that is supporting with empirical data from the JSE. Furthermore, given the chosen sample of ALSI listed businesses, private companies which are also influenced by dividend tax legislation were not accounted for and the impact on this sector completely neglected.

Survivorship bias was effectively eliminated from the RAAR, RCAAR and PDR metrics through the inclusion of any delisted shares. For the AAR and CAAR, however, survivorship bias would have applied to any shares that delisted during one of the event windows. Within the greater sample the impact of this bias would be extremely small, but its presence deserves mentioning nonetheless.

The most significant limitation, however, is highlighted as a concern by Toerien and Marcus (2014) in their reflection on their own results: a shareholder's perception of the new DWT regime is directly dependant on their individual trade-off between CGT and DWT. As these rates vary amongst different shareholder classes, they recommend any future empirical testing in this field be directly dependant on knowing the extent to which each company is held by each class of taxpayer; information that is not readily available. Whilst this concern does not impact the validity of the findings from the proposed methodology, it does limit the ability to interpret the fundamental reasons for the observed results.

Finally, it should be noted that the results of this study do not necessarily hold for market behaviour into the future. This is due to the possibility of future unexpected macroeconomic occurrences which may alter SA's relationships between dividend taxes and the market's cost of equity. The results therefore apply only for the event periods under study even though the learnings may inform future dividend policy and legislative decisions.

d. Future research recommendations

Private company shares are not freely traded and the details such transactions are oftentimes considered to be extremely confidential. The chosen population was therefore limited to all SA companies participating in the public equity market or more specifically, all businesses listed on the JSE between January 2006 and April 2012. Future research in this field can expand this analysis to consider the impact that the transition had on private companies. This would be significant given the SA government's focus on developing small to medium sized enterprises as part of the National Development Plan (South African Presidency, 2011).

Furthermore, as highlighted by Toerien and Marcus (2014), a shareholder's perception of the new DWT regime is directly dependant on their individual trade-off between CGT and DWT. As these rates vary amongst different shareholder classes, it is recommended that future empirical testing incorporate a classification regarding the extent to which each company is held by each class of taxpayer. Such research will be able to elaborate on fundamental reasons behind the observed results and assist management to further refine their knowledge of various shareholder behaviour patterns.

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APPENDICES

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07 November 2016 The equity market impact of SA's transition from STC to dividend withholding tax: An event study Ernie Visser 28263962 Cell: 072 535 6232 E-Mail: ernie.visser@jcgroup.co.za Supervisor: Prof. Michael Ward A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration ABSTRACT For over 50 years academics have grappled with trying to understand and quantify the influence of dividend taxes on the behaviour of equity markets. As a shareholder, one should rationally be indifferent to receiving returns in the form of dividend payouts or value growth. Markets are, however, not perfectly efficient and investors are not completely rational. The purpose of this research project was to analyse and quantify the impact on the behaviour of South Africa's equity market, if any, resulting from the decision to replace the Secondary Tax on Companies system with the Dividend Withholding Tax regime at a higher effective tax rate. An events study methodology that was quantitative and causal in nature was used to test five hypotheses for three separate events that collaboratively indicate whether there was an impact from this change in dividend regulation or not. The results align with empirical evidence from international literature and indicate that there was indeed a significant, negative equity market impact resulting from the transition. The negative reaction is primarily attributable to the hike in the dividend tax rate rather than the reduction in

B. ETHICAL CLEARANCE LETTER

Gordon Institute of Business Science
University of Pretoria

Dear Ernustus Visser

Protocol Number: **Temp2016-00987**

Title: **The equity market impact of SA's transition from STC to dividend withholding tax: An event study**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

Adele Bekker