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AUTHORS	J. P. Fenech

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Jean Pierre Fenech (Australia)

The stock market reaction to Australian convertible debt issues: new evidence

Abstract

This paper examines the stock price reaction to the announcement of convertible debt issuance in Australia. A significant positive price reaction is recorded and this result is in contrast to market price reactions in other countries. It also contrasts with previous Australian studies that used an early dataset. A possible reason for such a different result is the change in institutional environment that came about at the turn of the century that caused investors to react differently to firms that issue convertible debt. This change in market reaction has also been evidenced in other jurisdictions (Japan and the Netherlands) where institutional changes occurred. An analysis of the determinants of the announcement effect yields a number of contributions. The agency and informational hypothesis does not fully support the positive market reaction. In fact the market reaction is in contrast with the Myers and Majluf (1984) equity information asymmetry model where larger issues result in larger positive abnormal returns. The growth proxy yielded positive returns and this is in line with the equity information asymmetry model of Ambarish (1987). Similar results were recorded with the level of institutional involvement and results are in line with the Brous and Kini (1994) equity effective monitoring hypothesis. No support was found for the Lucas and McDonald (1990) preannouncement price runup as insignificant results were reported. Furthermore the financial distress hypothesis and the tax benefit hypothesis were found to suggest that they significantly infer the size and magnitude of the market reaction to firms that issue CD.

Keywords: convertible debt, announcement effect, event study.
JEL Classification: G14; G32.

Introduction

The impact of changes in capital structure on stock price has been extensively analyzed both in the US and other countries. Most of the attention has been focused around straight debt and straight equity. In the US market, empirical evidence suggests that stock price reaction is not significant to new debt issuance announcement and is significantly negative to new equity issuance announcement. Convertible debt (CD hereafter) securities have both debt and equity like features and the stock market reaction to such securities has been a contentious issue. There is no consensus amongst academics and practitioners as to how the market should react to such securities.

This lack of agreement opens up a gap in finance literature especially when there seems to be very little consistent theoretical explanation with respect to this phenomenon. The empirical research is conflicting, with significantly negative reaction from US and the UK markets and positive reaction in other countries like Japan and the Netherlands. The reason for such opposite results was attributed to different institutional environments. This should be a concern for investors because in accordance with the efficient market hypothesis, the market is constantly updating and revaluing the new information related to the issuance of any security.

In view of the above, the main research question in this paper is 'What is the market reaction to the issuing of convertible debt in Australia?' There are various motivations for such a question: 1) current empirical evidence is inconsistent, 2) theoretical evidence to support CD issuance is based on many theories that are not mutually exclusive, 3) event study methodology is a well accepted one to study market reactions, and 4) inter-country comparisons are limited since institutional environments vary.

Furthermore, in Australia the stock market reaction 'puzzle' to CD has been further complicated by changes within the institutional framework. Most changes commenced from 2001 where new tax rules and changes in the Corporation Act were introduced. By 2005, Australia adopted the International Accounting Standards, which unilaterally impacted the CD classification. So far the only study to capture the short-term market reaction in Australia has been carried out by Suchard (2007) which utilized a dataset that stopped at 2002. Most of the significant institutional changes occurred post 2002 and therefore this study's main contribution is to analyse the market reaction post the 2002 era. The purpose of the study is to expand on the seasoned capital raising finance literature by looking into the stock market reaction to Australian's CD. This study also examines the independent variables that infer on the cumulative abnormal returns of the firms that issue CD.

The market model was used to calculate the cumulative abnormal return for CD. The results reveal a significant positive reaction which is in contrast with the earlier studies carried out in

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Australia. This evidence suggests that the institutional changes; changes in tax rules, corporation law and the introduction of accounting standards had an impact on investor's perceptions regarding CD. The cross sectional results do not fully support the notion that agency cost theory has an effect on abnormal returns. Conversely the financial distress and tax benefit hypotheses return a statistically significant impact on short-term market reaction.

The paper proceeds as follows with section 2 looking into the Australian institutional environment, followed by a literature review and hypotheses development on the use of CD. Section 4 discusses the research design and section 5 transcribes the results. The last section concludes the paper.

1. The Australian institutional environment

Traditionally Australian corporations have resorted to the banking sector to raise funds. As of June 1999[1], 82% of total corporate debt was raised from banks, 17% from other sources and only 1% was being raised via CD. By June 2004 the situation changed with 40% of corporate debt being financed through CD. Table 1 shows the gross issuance of the CD market divided into the domestic and offshore markets.

Table 1. Gross issuance of the CD market divided into the domestic and offshore markets

Year of issuance	Domestic market $ mn	Offshore market $ mn	Total market $ mn
1998	1,461	2,203	3,664
1999	6,963	0,49	7,453
2000	1,2	1,002	2,202
2001	3,328	2,112	5,44
2002	5,004	0,787	5,791
2003	4,539	5,345	9,884
2004	4,362	2,993	7,355
Total	26,857	14,932	41,789

Notes: CD securities are issued on both the local and foreign markets, where securities are issued in both local and foreign currencies. As expected, the total local market over the period of 1998-2004 is greater than the offshore market. The yearly value of local and foreign market varies from year to year and this results from market expectation of the changes in legislation that will be occurring. In the year 2000 there was a drop in CD since the market was waiting for the DE tax legislation to be introduced.

Source: Reserve Bank of Australia.

[1] Source: Reserve Bank of Australia web-site, www.rba.gov.au

Table 2. The gross issuance divided into the financial and non-financial sectors

Year of issuance	Financial $ mn	Non-financial $ mn	Total market $ mn
1998	2,444	1,22	3,664
1999	5,295	2,158	7,453
2000	0,295	1,907	2,202
2001	1,035	4,405	5,44
2002	3,464	2,327	5,791
2003	6,47	3,414	9,884
2004	4,489	2,866	7,355
Total	23,492	18,297	41,789

Notes: 1. Over the period of 1998-2004, the total amount of banking firms issuing CD exceeded the total amount of non-banking firms. This evidence suggests that banks are very active in the CD market and considering that there is a handful of banking firms this result is quite significant. The motivation for firms to use CD is the low cost compared to equity costs and the acceptance from APRA as tier 1 capital.
2. Prior to 1999, there were only a couple of firms issuing CD in Australia.

Source: Reserve Bank of Australia.

Tables 1 and 2 indicate the radical changes that the Australian market embraced over the years. Up till 2000 the classification of CD was not regulated by tax rules nor accounting standards and this environment allowed firms to manipulate the debt/equity classification. This inconsistency could potentially send conflicting messages to the market, resulting in confounding effects. For example, firms with high gearing ratios could masquerade the CD as equity, pushing down leverage ratios and still raise the necessary funds. By 2001 the Debt/equity (DE hereafter) tax rules were implemented. This was the first attempt by the authorities to outline clear guidelines with respect to CD classification, reducing the opportunity for misclassification of the CD security.

Tax and legal issues were not the only changes affecting CD. The introduction of the International Accountancy Standards (IAS) on January, 1st 2005 was another significant event, where under the new accountancy rules, some CD would cease to be classified as equity and reclassified as debt on their balance sheet. The new standard stipulated that when an issuer can settle an obligation by delivery of a variable number of shares, the security is classified as debt, hence some Australian firms had to reclassify parts of their equity to debt. Most CD vary widely as they are designed to obtain the right characteristics (tax, regulatory, accounting, rating agency and legal implications) for the best price – coupon rate. As a basic rule though, issuers include enough equity-like components for the security to be equity in the eyes of accountants and ratings

agencies to pass the equity test when computing gearing ratios. At the same time, the structures aim to sufficiently resemble debt so that issuers' distributions to investors are tax deductible and to ensure investors consider them as debt.

2. Literature review and hypotheses development

On an empirical and practical level, issues surrounding capital structure decisions have been controversial for decades. The theoretical underpinnings that affect the short-term market reaction to CD are discussed in this section with the related hypotheses annexed at the end of each subsection. When firms issue CDs there might be several reasons for doing so, therefore this study does not discriminate amongst various hypotheses and assumes that the following hypotheses are not mutually exclusive.

The literature goes back to 1958, when Modigliani and Miller (MM hereafter) advanced capital structure irrelevance hypothesis, showing that in a perfect market, capital structure does not affect firm value. However, in the real world, imperfections such as taxes, agency costs, bankruptcy costs and information asymmetry do exist and cast doubt on the robustness of the MM hypotheses. As corporate financing choices tend to deviate from MM's theoretical explanations, extensive studies have been conducted to investigate which factors influence corporate financing decisions. This has led to the development of two classic models. The static-trade off model and the pecking order model. The former explains a firm's financing choices based on taxes, financial distress and agency costs and the latter is based largely on asymmetric information between managers and investors and predicts corporate financing behavior. Table 3 highlights the different market reactions to the issue of CD in several jurisdictions.

Table 3. 2-day cumulative abnormal return calculated over various studies

Study	Issue type	Market	Sample size	2-day abnormal return
Dann and Mikkelson (1984)	Public	US	132	-2.31
Eckbo (1986)	Public	US	75	-1.25
Mikkleson and Partch (1986)	Public	US	25	-1.39
Janjigian (1987)	Public	US	234	-1.71
Hansen and Crutchley (1990)	Public	US	67	-1.50
Long and Sefcik (1990)	Public	US	134	-0.61
Billingsley, Lamy and Smith (1990)	Public	US	106	-4.29
Davidson, Glasock and Koh (1993)	Public	US	146	-1.44
Lewis, Rogalski and Seward (1999)	Public	US	203	-1.51
Burlacu (2000)	Public	France	141	-0.23
Kang and Stulz (1996)	Public	Japan	561	1.05
De Roon and Veld (1998)	Public	Netherlands	47	0.16
Abbyankar and Dunning (1999)	Rights	UK	53	-0.95
Eckbo (1986)	Rights	US	14	-0.80
Fields and Mais (1991)	Placement	US	61	1.80
Abhyanker and Dunning (1999)	Placement	UK	47	-0.02
Suchard (2007)	Rights	Australia	58	-0.61

Note: These studies have been mainly carried out in the US, but there are also studies conducted in France, Netherlands, Japan, UK and Australia.

The general trend in the US seems to follow a negative path although there are some inconsistencies in other countries. Dann and Mikkelson (1994) report a negative result in the US, Simon (1999) also reports a similar result in the UK. In other jurisdictions though, de Roon and Veld (1998) from the Netherlands report a positive stock reaction. Kang and Stulz (1996) in Japan also report a positive reaction. In both cases, i.e. in the Netherlands and Japan these studies were carried out after changes in their institutional frameworks. Kang and Stulz (1996) and De Roon and Veld (1998) noted that the reason for positive reactions could possibly be due to the changes within the institutional set up. In view of the Australian CD market undergoing significant changes (as indicated in section 2) investors' perception may have changed from the previous study carried out by Suchard (2007), and therefore a posi-

tive reaction to firms that issue CD may be expected. It is hard to predict which way the market is going to react but based on the previous empirical studies carried out post institutional changes, the following is being recommended.

Hypothesis 1: The stock price reacts positively to the announcement of CDs issuance in Australia.

2.1. The agency and information asymmetry hypothesis. Proxies have been identified to capture the impact of agency and information asymmetry hypothesis. Firm size, underwriting cost, institutional level and runup prices have been chosen as indicators to represent the above mentioned hypothesis.

Chang et al. (2004) find that firm size increases the negative abnormal stock return. This result is in conflict with the informational asymmetry theory of Myers and Majluf (1984) and the results by De Roon and Veld (1998) in Netherlands. Eckbo (1985) in the US finds no relationship with the issuance size and this is inconsistent with the Asquith and Mullins (1986) model in which the offerings size has a negative correlation with the stock abnormal return. Kang and Stulz (1996) in Japan test the relationship between the positive abnormal return and the characteristics of the issuing firm.

The second proxy is growth options and Stein's (1992) prediction suggests that firms' growth options have positive relationships with the abnormal stock return. Firms with low growth options (larger BM) have more negative stock reaction to the CD issuance announcement as found in Japan during 1996 and 2002. In the equity information asymmetry model of Ambarish and Williams (1987), the stock price response to new financing depends on the growth prospects (GROWTH) for the issuing firm. A negative response is predicted for mature firms having limited growth opportunities (less investment opportunities) and a positive response for growth firms.

With respect to institutional levels of investment in firms that issue CD, Brous and Kini (1994)'s equity effective monitoring hypothesis suggests that higher institutional ownership gives institutional investors greater incentives to protect their investment in the firm's equity. Thus the level of institutional ownership (INSTITUTION) is positively related to the announcement effect.

Runup is another proxy and it consists of the change in stock price before issuance of the CD. Eckbo (1985) studies the stock effect on corporate debt offerings including the convertible debts during the period of 1964 through 1981. Eckbo (1985) finds the two-day (day -200 to day 0) abnormal return to the initial announcement of the CD issuance to be significantly negative. A result of no relationship with bonds rating has been recorded and is inconsistent with the theory of Myers and Majluf (1984). Lucas and McDonald (1990) suggest that the preannouncement price runup (RUNUP) should be negatively correlated with the adverse selection effect of an equity offer.

Underwriting agreements is the last proxy for agency costs and Smith (1977) views agency costs increasing as management incur in underwriting. Thus, underwriting costs (UW COST) are an agency cost borne by stockholders and would therefore lead to more negative price reactions.

Hypothesis 2: The stock reaction to the announcements of CD should be negatively associated with issue size.

Hypothesis 3: The stock reaction to the announcements of CD should be positively associated with the firm's growth opportunities.

Hypothesis 4: The stock reaction to the announcements of CD should be positively associated with the institutional level.

Hypothesis 5: The stock reaction to the announcements of CD should be negatively associated with RUNUP.

Hypothesis 6: The stock reaction to the announcements of CD should be negatively associated with UW costs.

2.2. Financial distress hypothesis. Proxies have been identified to capture the impact of the financial distress hypothesis. Leverage levels and Altman's z-score have been chosen as indicators to represent the above mentioned hypothesis.

Mackie-Mason (1990) note that the use of tax shields increases shareholder's firms, too much debt though might push the firm towards insolvency. Altman (1968) was one of the first to argue that as firms keep on adding debt, the firm will reach an optimal capital structure. After that point there is no incentive for the firm to raise funds through debt. There is by no means a consensus of opinion with respect to the theoretical relevancy of insolvency costs to firm valuation. There is consensus on the existence of a firm's optimal capital structure where excessive use of debt causes financial distress[1]. In a more general sense, financial distress is a reduction

[1] The definition of financial distress relates to the difficulty that a firm encounters in meeting obligations to creditors, more broadly it refers to the adverse selection consequences or restrictions on behavior that result usually from excessive borrowing.

in the firm's financial efficiency that usually results from a shortage of profitability and later cash.

There are many ways how to measure financial distress and Altman's (1968) method is one way that has been used consistently throughout its inception[1]. Dann and Mikkelson (1984) find that the leverage related information hypothesis can't explain the negative results because their evidence shows that CD issuance increases the issuer's financial leverage. This finding contrasts with Ross's (1977) study of capital structure changes that there is positive relationship between leverage changes and stock price reaction.

In Ross (1977) and Heinkel (1982)'s information asymmetry signalling models, changes in leverage (LEVERAGE) signal management's inside information about expected changes in future firm performance. Assuming unbiased managerial expectations, the models predict that the change in expected future performance is significantly worse for firms that issue equity than for firms that issue convertible or straight debt. Alternatively, in agency cost models, Harris and Raviv (1990) and Stulz (1990) predict that LEVERAGE is positively associated with firm value. They suggest that an increase in outside ownership from an equity issue increases agency costs and therefore has a negative impact on firm value and found a significant positive market reaction. Masulis (1983) tax hypothesis is that leverage-increasing (decreasing) exchange offers increase (decrease) firm value because they increase (decrease) tax deductions. Masulis (1983) implicitly assumes that firms are undervalued. This argument is being presented in the following hypotheses, where the theoretical arguments are presented in the following two hypotheses.

Hypothesis 7: The stock reaction to the announcements of CD should be positively associated with change in z-score.

Hypothesis 8: The stock reaction to the announcements of CD should be positively associated with increase in leverage.

2.3. Tax-benefit hypothesis. Most of the literature with respect to the tax benefit hypothesis emanates from the US where there is a classical tax system[2], contrary to Australia that has an imputation tax system[3]. Although these are two different tax systems, some fundamental concepts remain the same. For example profitable firms that have limited non-debt tax shields (e.g. depreciation) and high effective marginal tax rates may possibly take advantage of direct tax benefits due to the interest payments emanating from debt-like hybrids. Mackie-Mason (1990) and Dhaliwal et al. (1992) address this issue and find that tax-exhausted firms move away from debt when nondebt tax shields are high. Ekman (1995) finds similar results for Swedish firms, as do Barthody and Mateus (2005) for Portuguese firms. Conversely firms that are profitable but have low effective marginal tax rates do not have an incentive to issue debt-like hybrids and therefore might consider issuing equity-like hybrids (Mackie Mason, 1990). Eckbo (1986) finds no relationship between CAR and tax shield. The results conflict with the findings of Masulis (1983) who investigated exchanging debt for common stock.

Hypothesis 9: The stock reaction to the announcements of CD should be positively associated with tax shields.

3. Data and research design

3.1. Data. A list of companies that issued CD securities was collected from two databases. Connect 4 New Issues and AspectHuntley Datanalysis, from 1999 to 2007. Information was initially downloaded from Connect 4 and later validated against the company announcements as evidenced from the Aspect Huntley database. The initial sample comprised of 142 CD. AspectHuntley was used to download the appendix 3B announcement statement[4] of each firm where details of the security are disclosed. In order to mitigate confounding effects, we eliminated firms that met any of the following criteria: (1) the CD offering was in conjunction with another offer like for example stapled securities; (2) more than one offering within a year prior to the offering; (3) the offering was for a merger and acquisition transaction; or (4) the event date of the offering or the explanatory variable data could not be confirmed with the Aspect 4 or Aspect Huntley. The final sample comprised 126 CDs. Banks were removed from the sample at the outset since banks simultaneously raise securities to satisfy their tier 1 obligations[1]. Table 4 reports the descriptive statistics regarding issue and issuer characteristics.

[1] The following are papers published using Altman's Z-score. Altman (1973), Altman (1976), Ohlson (1980), Collins (1981), Scott (1981), Jones (1987).

[2] A Classical Tax System initially takes company profits, and then also taxes any dividend income. This double taxation of dividends thus provides an incentive to retain profits.

[3] Arrangement by which investors who receive a dividend also receive a tax credit for corporate taxes that the firm has paid.

[4] This is the official document that each firm is required by the Corporations Act to publish via the stock exchange's web-site, to advise the market that the firm is about to issue a security. All the necessary information is found on this document and therefore it's vital to capture the market's reaction.

Table 4. Descriptive statistics for 142 CD of convertible debt by listed firms on the Australian Stock Exchange over 1999-2007. Full details of such variables may be found in section 4.2.3

	Mean	Median	Stand.dev.	Minimum	Maximum
Panel A					
Agency & inf. asym. hypothesis					
Issue size (AUD $ mn)	136	55	191,69	0,2	1000
Growth opportunities (%)	0,42	0,32	1,63	0,01	0,56
RUNUP (%)	29,41	15,26	47,79	14,67	35,34
Underwriting costs	3,12	3,01	5,31	2,75	4,35
Panel B					
Fin. distress hypothesis					
Z score	2,28	2,12	8,76	1,99	3,45
DE (%)	0,68	0,54	0,66	0,12	1,35
Panel C					
Tax shields (%)	0,3	0,24	0,15	0,1	0,43

3.2. Methodology. An event-study methodology is used to capture the market reaction to the company's announcement. This study is in line with seminal studies by Ball and Brown (1968). Several modifications of the basic methodology have been suggested. These modifications handle complications arising from violations of the statistical assumptions used in the early work and they can accommodate more specific hypotheses. Brown and Warner (1980, 1985) are useful studies that discuss the practical importance of many of these modifications. The 1980 study considers implementation issues for data sampled at a monthly interval and the 1985 paper deals with statistical issues handling daily data. Although there is no unique structure, the following steps provide a sequence of events:

Event definition: This is the 'event of interest' and in this study the event of interest is the announcement date that firms choose to announce their hybrid security issuing. This also requires defining event windows. These event windows are divided into four categories as depicted in Figure 1.

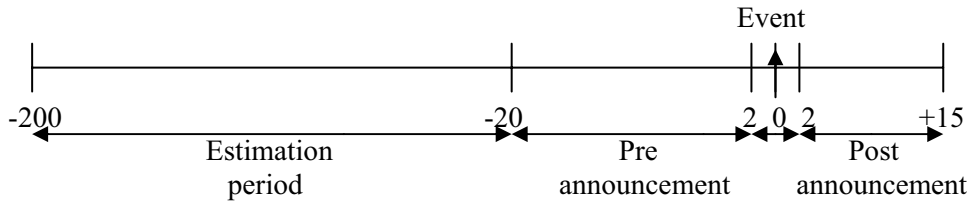

Fig. 1. Illustration of event window measured in days

Select criteria: After identifying the event of interest, it is necessary to determine the selection criteria for the inclusion of a given firm in the study. Section 4.1 has discussed in detail the restrictions imposed by data available.

Calculation[1] *of normal and abnormal returns:* The abnormal return is the actual *ex post* return of the security over the event window less the normal return of the firm over the event window. The normal return is defined as the return that would be expected if the event did not take place. For each firm i and event date τ we have:

$$\varepsilon^*_{it} = R_{it} - E[\frac{R_{it}}{X_t}], \qquad (1)$$

where ε^*_{it} is the abnormal return for time period t; R_{it} is the actual return for time period t; $E[R_{it}]$ is the normal return for time period t; X_t is the conditioning information for the normal performance model.

Estimation procedure: Once a normal performance model has been selected the parameters of the model must be estimated using a subset of the data known as the estimation window (-200 days to -20 days).

Testing procedure: With the parameter estimates for the normal performance model, the abnormal returns can be calculated. Next, a testing framework for the abnormal returns needs to be designed.

Empirical results: The presentation of the empirical results follows the formulation of the econometric design. The empirical results can be heavily influenced by one or two firms so every attempt will be made to push up the number of firms.

Interpretation and conclusions: Ideally the empirical results will lead to insights about the mechanisms by which the event affects security prices.

3.2.1. Test models. For statistical models it is conventional to assume that asset returns are jointly multivariate normal and independently and identically distributed over time. Inferences using the normal return models are robust to deviations from the assumption.

[1] Tier 1 capital is the amount of statutory capital required by the Reserve bank of Australia to cover the loan agreements with their customers.

Constant-mean-return model: Let μ_i be the *i*th element of μ, be the mean return for asset *i*. Then the constant mean return is:

$$R_{it} = \mu_i + \varepsilon_{it} . \quad (2)$$

Although the constant-mean-return model is perhaps the simplest one, Brown and Warner (1980, 1985) find it often yields results similar to those of more sophisticated models. This lack of sensitivity to the model choice can be attributed to the fact that the variance of the abnormal return is frequently not reduced much by choosing a more sophisticated model.

Market model: The market model is a statistical model which relates the return of any given security to the return of the market portfolio. The model's linear specification from the assumed joint normality of asset returns. For any security *I* we have:

$$R_{it} = \alpha + \beta_i R_{mt} + \varepsilon_{it} , \quad (3)$$

$$E[\varepsilon_{it}] = 0 \quad Var[\varepsilon_{it}] = \delta^2{}_{\varepsilon i} , \quad (3.1)$$

where R_{it} and R_{mt} are the period *t* returns on security *i* and the market portfolio, respectively, and ε_{it} is the zero mean disturbance term. α_i , β_i and $\sigma^2_{\varepsilon i}$ are the parameters of the market model. In applications a broad based stock index is used for the market portfolio. The market model represents a potential improvement over the constant mean return model.

Market-adjusted return model: Sometimes limited data availability may dictate the use of a restricted model such as the market adjusted return model. For some events it is not feasible to have a pre-event estimation period for the normal model parameters, and a market adjusted abnormal return is used. The market adjusted return model can be viewed as a restricted market model with α_i constrained to be 0 and β_i constrained to be 1. Since the model coefficients are prespecified, an estimation period is not required to obtain parameter estimates.

Therefore whichever model one chooses (i.e. either the market model or the market-adjusted return model) abnormal returns will be computed. Abnormal returns are calculated either daily or weekly but what is required is the average abnormal return. This is carried out by averaging the abnormal returns throughout the required period by using the following equation:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} , \quad (4)$$

where *AARt* is the average abnormal return for *N* securities in period *t*; *N* is the number of securities in the portfolio and $AR_{i,t}$ is the abnormal return for every single security.

Subsequent to calculating the average abnormal return, the cumulative abnormal return is required. This procedure is required to calculate the arithmetic mean as carried out by Fama, Fisher, Jensen and Roll (1969). The calculation is as follows:

$$CAR_{(j.k)} = \sum_{t=j}^{k} AAR_t , \quad (5)$$

where $CAR_{j,k}$ is the cumulative average residuals for *N* securities between time *j* and k, *N* is the number of securities in the portfolio, and AAR_t is the average abnormal return for *N* securities in period *t*.

To observe the effect of announcements at particular points in time, *CARs* are calculated for each point in time during the event period. *CARs* may be calculated for different periods. They may be (-10, +10), (-10, -1), (-1, 0), (-1, +1), (+2, +10). They may be calculated on both a daily or weekly basis.

3.2.2. Determinants of announcement effect. Three models are developed and estimated for CDs issues based on explanations proposed in the literature review which discussed specific CD models. Based on past research that has investigated the determinants of CD issues cross-sectional regression models are used to examine the association between the announcement period abnormal returns and a range of variables. The cross sectional regression models enhance the robustness of this research by using the proxies derived from the literature review.

The 1st model is as follows:

$$CAR_j = \alpha + \beta_{i1}X_{i1} + \beta_{i2}X_{i2} + \beta_{i3}X_{i3} + \\ + \beta_{i4}X_{i4} + \beta_{i5}X_{i5} + \beta_{i6}X_{i6} + \varepsilon_i , \quad (6)$$

where CAR_i – is the dependent variable, being the cumulative abnormal returns generated from the market model for the event window, *t*-1 to *t*+1 n for the *i*th firm; α – expected returns of sellers; X_{i1} – *ISSUE* – net proceeds of issue after underwriting costs divided by market value of equity before issue. X_{i2} – *GROWTH* – market value equity/book value of equity in regression 1. Book value is measured at the financial year end prior to the issue and is measured as market value of equity less the book value of equity plus total debt as a percentage of total assets. X_{i3} – *UW COST* – underwriting fee expressed as a percentage of the total issue. X_{i4} – *Z-SCORE* – Altman's z-score as a measure of credit risk. X_{i5} – *DE* – the debt ratio as the ratio of the book value of total debt to the market value of equity of the issuing firm for the fiscal year preceding the offering. X_{i6} – *TXSHIELD* – total amount of debt interest paid expressed as a percentage of operating income.

The 2nd model is similar to equation 6, however there are some changes. ISSUE is replaced by INSTITUTION, GROWTH by RUNUP. The new variables are as follows:

INSTITUTION – dummy variable = 1 if convertible debt has been taken over by institutional investors, 0 if taken over by non-institutional investor.

RUNUP – the total rate of return on the common stock of the issuing firm during the fiscal year preceding the offering.

The 3rd model is similar to equation 6, however the GROWTH variable is measured by using Tobin's Q and all the agency variables described in models 1 and 2 are amalgamated in model 3. Same variables remain for tax benefit and financial distress hypothesis variable.

4. Results

4.1. The announcement effect. The market model was employed to examine hypothesis 1. The market model regressions are estimated over the period of t = (-200, -20). Abnormal returns were calculated for -200 during the event window, where the abnormal returns of the 141 CDs issues around the announcement date (-10, +10), and the average abnormal return (AAR) together with their associated R-statistics are shown in Table 5. A cumulative average abnormal (CAR) return was also calculated to test cumulative effect of information for the market reaction. The most significant positive return occurs on day -5 (2.22), -2 (2.01) and 0 (3.45). The individual days post announcement and their respective cumulative abnormal return are not significant from zero therefore we accept the null hypothesis. These results are in contrast with the studies carried out in the US, UK and the Australian study by Suchard (2007) where a negative reaction was observed, but are in line with the studies carried out in Japan and the Netherlands where a significant positive market reaction was observed which came about due to institutional changes.

In view of the significant results on certain days prior to the actual announcement, it may be suggested that the issuance information could have been leaked to the market prior to the announcement on the stock exchange as the CAR over day -5 and -2 is significant with 2.22 and 2.01 respectively (test statistic 1.96). Day 0 is also a significant day where a CAR of 1.96% is reported. Day -3 to +1 is 2.22, CAR over windows (0, +3) and (-3, +3) are 2.85 and 0.29. When the event is extended beyond the standard window of (0,+1) CAR continues to record a positive announcement effect which is in contrast to the US, UK and past studies in Australia.

Table 5. Daily average market adjusted abnormal returns around the announcement day of 126 CDs by firms listed on the Australian Stock Exchange, 1999-2007

Day	Abnormal return (%)	Cumulative abnormal return (%)	R-statistics	Median	Standard deviation	Skewness
-10	0,08	0,08	1,34	-0,01	5,05	-0,73
-9	0,22	0,30	0,96	-0,37	4,08	2,13
-8	0,24	0,54	0,74	-0,02	3,87	-0,14
-7	1,28	1,82	1,10	0,38	4,00	1,73
-6	-0,58	1,24	0,76	-0,30	4,36	0,02
-5	-0,68	0,57	**2,22***	-0,23	6,65	-2,22
-4	0,31	0,88	1,55	-0,08	5,39	2,72
-3	0,23	1,11	1,60	0,04	7,19	-1,86
-2	0,16	1,27	**2,01***	-0,01	6,58	0,93
-1	-0,10	1,17	0,50	0,03	4,88	-1,25
0	0,79	1,96	**2,35***	0,00	4,07	3,45
1	1,14	3,10	0,22	0,24	5,70	4,20
2	1,55	4,65	0,42	-0,04	4,24	6,41
3	-0,63	4,02	0,52	0,01	3,94	-3,81
4	0,52	4,54	1,01	-0,03	3,99	0,41
5	-0,38	4,16	1,13	-0,10	5,32	0,82
6	0,17	4,33	0,93	-0,11	4,91	2,79
7	1,18	5,51	0,23	0,29	5,34	2,10

Table 5 (cont.). Daily average market adjusted abnormal returns around the announcement day of 126 CDs by firms listed on the Australian Stock Exchange, 1999-2007

Day	Abnormal return (%)	Cumulative abnormal return (%)	R-statistics	Median	Standard deviation	Skewness
8	-0,14	5,37	0,63	-0,11	3,17	-0,66
9	-0,39	4,98	1,23	-0,08	4,26	1,40
10	-0,58	4,40	0,29	-0,08	6,08	-3,12

Note: * significant at the 5% level.

4.2. Determinants of announcement effects. The cross sectional explanations for the days (-3, +1) cumulative average abnormal returns (CAAR) are presented in Table 6. Overall the three different regressions indicate a good fit with an R^2 of 0.46, 0.41 and 0.45 respectively. The F-statistic also suggests that the independent variables infer adequately the dependent variable.

Panel A: Issue size may be interpreted (Myers and Majluf, 1984) as a proxy for the amount of unfavorable information where a larger issue conveys more negative information and results in more negative stock prices. The empirical results are showing a different picture, where there is a positive but insignificant coefficient of 0.03, suggesting that although the larger issues attract more information, the market reaction is positive. Furthermore, Miller and Rock (1985) information asymmetry signalling model finds that changes in outside financing signal changes in the firm's current earnings where a large amount of external financing gives a more negative signal to investors. The empirical results are in contrast with the theoretical literature since CAR is yielding a positive return.

ISSUE variable was removed from regression 2 due to any multicollinearity issues that might exist with institutional ownership. In the U.K. market Abhyankar and Dunning (1999) find that the announcement abnormal return is unrelated to firm size, issuance size and market-to-book ratio. Firms with good growth opportunities (Ambarish, 1987) have been associated with positive market reactions, conversely firms with limited growth opportunities are associated with negative market reactions. A significant positive coefficient of 0.02 has been calculated across the three models suggesting that there is a positive relationship between the two variables.

GROWTH variable was removed from regression 2 due to any possible multicollinearity issues that might exist with RUNUP. It has been found that there is a positive relationship between the level of institutional ownership and positive market reaction. This is in line with Brous and Kini's (1994) equity effective monitoring hypothesis, where higher institutional ownership gives institutional investors greater incentives to protect their investment in the firm's equity. INSTITUTION replaces the ISSUE proxy due to any possible multicollinearity issues. Firms are more likely to have good investment projects when pre-issue stock returns are high. The empirical evidence is suggesting a positive relationship between RUNUP and announcement effect. RUNUP was not included in regression 1 due to any potential multicollinearity issues with GROWTH. The results yield an insignificant negative coefficient suggesting that we accept the null hypothesis. Underwriting costs are an agency cost borne by stockholders and would therefore lead to more negative price reactions. The empirical evidence is showing a positive relationship that is in conflict with Smith's (1977) views that agency costs arising from underwriting agreements would lead to more negative price reactions. A possible explanation for such a reaction may be the low underwriting costs of convertible debt compared to equity issues. Shareholders might view a convertible debt as a positive event.

Panel B: Harris and Raviv (1990) and Stulz (1990) predict that leverage is positively associated with firm value. The empirical evidence from all three models suggests that as firms increase their debt levels a positive reaction is obtained. The same result is achieved with the z-score measure which is a credit risk indicator. The positive reaction to leverage change is suggesting that the market perceives the CD as good news, indicating that the firms are not financially distressed and can utilize positively the extra debt within their capital structure.

Panel C: The greater the tax shield is the less need a firm has to increase its debt levels. The empirical evidence suggests that there is a significant positive market reaction to those firms that have low tax shields signalling the advantage to shareholders of adding further tax shields. Mackie-Mason (1990) and Dhaliwal (1992) address this issue and find that tax-exhausted firms move away from debt when nondebt tax shields are high. Ekman (1995) finds similar results for Swedish firms, as do Barthody and Mateus (2005) for Portuguese firms. The empirical results seem to be in line with the tax benefit hypothesis.

Table 6. OLS estimates of coefficients in linear cross sectional regressions with the announcement return over (-3,+1) as the dependent variable and issue and issuer characteristics as explanatory variables for 126 convertible debt by firms listed on the Australian Stock Exchange, 1999-2007

Independent variables	Regression (1)	Regression (2)	Regression (3)
Constant	0,02 (0,67)	0,03 (0,72)	0,02 (0,75)
Panel A: Agency and inf. asym. hypothesis			
ISSUE[a]	0,03 (0,84)		0,03 (0,92)
GROWTH[b]	0,02* (1,98)		0,03 (1,99)
INSTITUTION[c]		0,21* (2,23)	0,21* (2,23)
RUNUP[d]		-0,04 (0,14)	-0,04 (0,14)
UW COST[e]	0,06* (2,01)	0,06* (2,04)	0,06* (2,03)
Panel B: Financial distress hypothesis			
Z-SCORE[f]	0,09 (0.10)	0,09 (0.10)	0,09 (0.10)
DE[g]	0,12* (2,13)	0,12* (2,13)	0,12* (2,13)
Panel C: Tax benefit hypothesis			
TXSHIELD[i]	0,20* (2,26)	0,20* (2,26)	0,20* (2,26)
R^2	0,46	0,41	0,45
F statistics	2,35	2,31	2,54

Note: * significant at the 5% level.

Conclusion

This paper provides evidence of the short-term market reaction to the announcement effect of CD in the Australian market during the period of 1999 to 2007. Australia offers a unique environment for investigating announcement effects, because of the institutional changes that occurred over the years. The cumulative abnormal return around announcement date was examined using standard event study methodology. The announcements of CD were met with a significant positive stock market response, which is in contrast with US and UK findings, furthermore it also contradicts the findings by Suchard (2007) in Australia. It is being suggested that the changes within the institutional environment brought about such market behavior. Suchard's (2007) dataset fails to capture any institutional change since the dataset stops at 2002.

The results of the models developed are tested by the cross sectional regression and make a number of contributions: 1) the results for the impact of agency cost theory on abnormal returns are inconclusive, where the stock market reaction contradicts Myers and Majluf (1984) equity information asymmetry model – a positive abnormal return is reported. There is conformity with the equity information asymmetry model of Ambarish (1987) where firms with better growth opportunities yield positive returns. Results are in line with the Brous and Kini (1994) equity effective monitoring hypothesis where the higher the institutional input is the more positive is the abnormal return. The preannouncement price runup suggests that price runups result in positive abnormal returns in line with Lucas and McDonald (1990). The empirical results are in contrast with Smith's (1977) agency cost underwriting agreement theory where the UW proxy was not found to increase the agency costs; 2) the financial distress hypothesis was found to be consistent with Harris and Raviv (1990) findings where the proxies for financial distress had positive coefficients with increasing debt levels; 3) the tax benefit hypothesis seems to suggest that firms with low tax shields experience positive abnormal returns as they increase their tax shield.

Future research can investigate other proxies and test for the validity of other hypotheses, like, for example, risk estimation hypothesis, sequential financing hypothesis and underpricing hypothesis. The objective for testing other hypothesis is to infer the size, magnitude and significance of the cumulative abnormal return.

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