



The Effects of the Global Financial Crisis on the Australian Building Construction Supply Chain

Ram Karthikeyan Thangaraj and Toong Khuan Chan (The University of Melbourne, Australia)

Abstract

This study involves a financial analysis of 43 publicly listed and large private companies in the building and construction supply chain from 2005 to 2010; straddling the period of the global financial crisis (GFC); and examines the impact of the GFC on the performance of these companies. The construction supply chain was divided into four sectors – material suppliers, construction companies, property developers and real estate investment trusts (REITs). The findings indicate that the impact was minimal for both material suppliers and construction companies, but especially severe for the more leveraged property developers and REITs. Building material suppliers and construction companies have benefitted substantially from the building economic stimulus packages provided by the Australian government to mitigate the effects of the GFC. Decreases in the valuation of assets have, to a large extent, reduced the profitability of property developers and REITs during the GFC but these companies have recovered quickly from these adverse conditions to return to a sound financial position by the end of the 2010 financial year. The results will inform investors, construction company managers and construction professionals in devising strategies for prudent financial management and for weathering future financial crises.

Keywords: Financial analysis, Business management, Construction, Global financial crisis, Australia

Introduction

The global financial crisis (GFC) is commonly believed to have begun in July 2007 when a loss of confidence by American investors in the value of sub-prime mortgages caused a liquidity crisis. By September 2008, the crisis had worsened with a sudden dramatic decline of stock prices around the globe. With a large number of borrowers defaulting on loans, banks were faced with a situation where the repossessed house and land was worth less on the market than the bank had loaned out originally. When Lehman Brothers collapsed in September 2008, governments around the world struggled to rescue large financial institutions as the fallout from the housing and stock market collapse worsened.

The Australian equity market was no different to many other countries in facing the GFC. The S&P/ASX200 index fell from a peak of 6700 in late 2007 to 3400 in November 2008. It was initially thought that Australia would fare much better as the local banks' exposure to collateralised debt obligations (CDOs) was relatively small in comparison with other countries. The housing market was also in a strong position with non-conforming loans in Australia accounting for only about 1% compared to 13% in the U.S. (Debelle 2008).

Despite the smaller exposure to toxic debts and a stronger housing market, the Australian gross domestic product (GDP) declined in the December quarter of 2008. Building construction commencements had reduced by 10% in the September 2008 quarter in response to the tightening of credit. Total building output for three subsequent quarters reduced as a consequence of the diminishing building commencements. Figure 1 below illustrates the change in GDP, building commencements and building output for each quarter between 2005 and 2010. The Australian property market was no different from any other industry facing the GFC. From the December 2007 quarter to the December 2008 quarter,

owner occupied housing commitments fell by 22% (ABS 2010). This can be attributed to an increase in the unemployment rate during that period, and reduced confidence in the market. A market report states that office property developers in Australia experienced a 20.6% decline in their revenue for the financial year 2007-08 (IBISWorld 2011a). The retail market was also affected, resulting from reduced consumer spending.

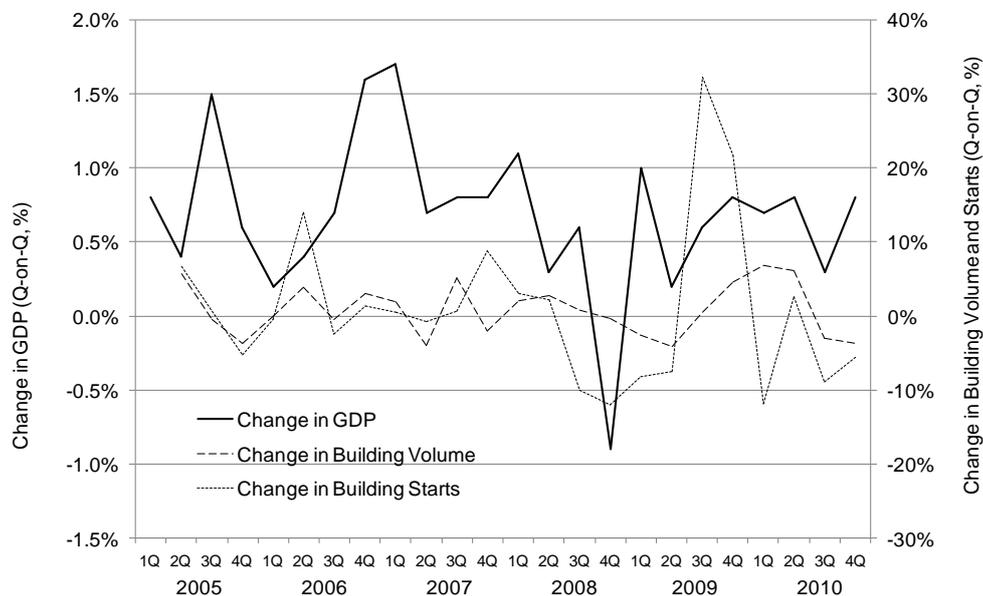


Figure 1 Changes in GDP, building starts and building volume (ABS 2010; ABS 2011)

Australia's Response to the GFC

The first significant macroeconomic policy response to the global financial crisis came from the Reserve Bank of Australia (RBA). On October 7, 2008, the RBA Board cut interest rates by 100 basis points to 6%. On October 12, the Australian Government announced it would guarantee all Australian bank deposits. Two days later, the Government announced an AUD10.4 billion stimulus package that included AUD1.5 billion to support housing construction. The housing aspect of the stimulus package – a time-limited grant to first home buyers – took effect immediately. To prepare for the possibility that the global financial crisis might be deeper and longer lasting than expected, the Government brought forward the commencement of large-scale infrastructure projects with a first tranche worth AUD4.7 billion announced in early December. On February 3, 2009 the Australian Government announced a second AUD42 billion stimulus package titled the Nation Building and Jobs Plan. As the global recession was expected to be deep and long, infrastructure spending played the central role with 70% of the second stimulus package to be spent on schools (AUD14.7 billion), social and defence housing (AUD6.6 billion), energy efficiency measures (AUD3.9 billion), and AUD890 million on road, rail and small-scale community infrastructure projects. More recent steps were contained in the 2009-10 Budget delivered in May 2009 where the Government introduced the third phase in its infrastructure program where an additional AUD22 billion was announced. The large increases in building starts in the third and fourth quarters of 2009 resulted from the initiation of stimulus packages earlier in the year. The Building the Education Revolution (BER), the single largest element of the Australian Government's Nation Building - Economic Stimulus Plan accounted for 23,600 projects.

These developments provided the motivation to develop a broader understanding of the effects of this recent financial crisis on the construction supply chain. The analysis focused on characterizing the impact of the GFC on the financial performance of companies within four sectors of the industry: building material suppliers, building contractors, property

developers and Australian Real Estate Investment Trusts (A-REITs). The key points examined are the severity of the impact by means of ratio analysis, changes in cost structure and financial distress. The predicament of firms that were most affected was discussed in order to explore possible common characteristics of distress or failure. The findings will inform investors, managers and construction professionals in devising strategies for prudent financial management and for weathering future financial crises.

Background

Investigations into the financial performance of construction companies were initially reported in the 1970's. Sales turnover was identified to have a great impact on the profitability of the enterprise (Fadel 1977). A detailed industry level analysis of UK construction industry identified the similarities and differences in profits across general contractors and home builders (Akintoye and Skitmore 1991). Pre-tax profit margins among eighty general contractors hovered around 3.23% over the analysed period. Though uncorrelated with firm size, home builders' profit margin was observed to be four times more than general contractors. Low (1997) examined the performance of property companies in the Singapore stock exchange over a period of twenty one years and concluded that their performance was not better than the stock market and was highly correlated with the property market itself. Other researchers yielded the same findings in different countries (Abdul-Rasheed and Tajudeen 2006). On the contrary, Balatbat et al. (2011) reported that the performance of thirty Australian Securities Exchange (ASX) listed construction firms operating in civil infrastructure, residential and non-residential sectors over a 10 year period performed better than the All Ordinaries Index and a pool of blue chip companies. This was due to construction companies' higher efficiency in the utilisation of assets for revenue generation. A study (Cheah et al. 2004) on global construction firms indicates that business strategy has to account for efficiency in financial, operational, technical and human factors, and that corporate failure was largely due to failures in or two critical factors.

It is generally accepted practice to assess company performance using financial ratios – the analysis of these ratios over a period of time may provide substantial and reliable information on a company's financial health. Early statistical models based on these financial ratios were developed to analyse company failures. Beaver (1966) identified differences based on thirty financial ratios among groups of failed and non-failed firms as early as five years before the firms failed. The differences became more significant as firms approached failure. Altman (1968) combined ratio analysis and multiple discriminant analysis to formulate a statistical tool for prediction of company failure. This methodology analysed a combination of ratios, thereby eliminating possibilities of uncertainty in relying on single ratios. From a sample of sixty six manufacturing companies, of which half of them had filed for bankruptcy from 1946-1965, Altman derived a set of ratios covering liquidity, profitability, leverage, solvency and activity ratios. Many variations of this model have been created over time for specific industry segments in various regions: construction in the UK (Mason and Harris 1979; Abidali and Harris 1995), and for construction in China (Ng et al. 2011). Macroeconomic factors such as low construction activity, high interest rates, rise in inflation, and reduction in consumer spending have been identified by researchers to be significant factors that can drive companies towards failure (Kangari 1988; Arditi et al. 2000).

Both Beaver (1966) and Altman (1968) are of the view that financial ratios, based solely on financial statements, are an indicator of a company's past performance, and future performance is beyond prediction. Mason and Harris (1979) went on to declare that their model is able to identify companies that are 'at risk' of failure but cannot forecast whether a company will actually fail. It is worth pointing out at this stage that these tools only give an indication, and at any point changes in a company's strategy can transform a company from poor performance to market dominance. Langford et al. (1993) recognised that these analytical tools, along with the company's financial performance have to be used in combination for greater understanding of corporate performance. Similar views have been

echoed by Chan et al. (2005) when analysing the impact of the Asian financial crisis on construction companies in Hong Kong.

Recent studies (Abdul-Rasheed and Tajudeen 2006, Chen 2009, Balatbat et al. 2010, Balatbat et al. 2011) have excluded building material suppliers and real estate investment trusts (REITs) in the review of financial performance, ignoring their importance within the building construction industry. An industry report estimates about 6,100 establishments to be operating in the materials supply sector in 2010-11 generating an estimated AUD20.5 billion in annual revenues (IBISWorld 2011b). Understanding the performance of the building material suppliers and REITs, in comparison with the builders and developers, is vital to the construction industry's resilience to future market downturns.

REITs came into existence in the US in 1960 (NAREIT 2011) to enable retail investors to invest in large scale real estate assets. Australian Real Estate Investment Trust (A-REIT) was established a decade later in 1971. The Australian Securities Exchange defines A-REITs as professionally managed and diversified portfolio of commercial real estate. Investors gain exposure to both the value of the real estate the trust owns, and the regular rental income generated from the properties.

Data and Methodology

In this study, the supply chain for building construction was limited to 4 sectors: building material suppliers, building contractors, property developers and A-REITs. A list of companies in each sector was determined by examining companies listed in the Australian Securities Exchange under Global Industry Classification Standards (GICS) capital goods and real estate industry groups. The next selection criteria for these companies were as follows to ensure that these companies were representative of the local economy; (i) listed in the ASX prior to 2006 financial year, (ii) more than 50% of their revenues were generated from Australian operations, and (iii) more than 50% of their revenue were generated from the sectors they represent, respectively. This filter resulted in a total of only 36 companies with only one operating exclusively as a building contractor. This is because most public listed building construction companies in Australia were concurrently operating in both construction and development. Hence in order to obtain a representative sample of the building contractors, the search was enlarged to include large (revenues exceeding AUD25 million) private construction companies that were required to file annual report to the Australian Security Investment Commission (ASIC). This search identified 51 companies of which only 16 had filed Form 388 for the years 2006 to 2010. Among the 16, only 7 companies were predominantly engaged in building construction. The other firms that were involved in either development or infrastructure works along with construction were not taken into consideration. The lack of local investment opportunities has seen Australian REITs seeking international property investments in 2000s. While this strategy brings about diversification gains, international property introduces additional currency, political and economic risks. Many of the A-REITs with large total assets were excluded from this analysis as these comprised significant international properties. A full list of the companies analysed is listed in Table 1.

The financial performance of all selected companies was calculated over the 2006-10 period, both years inclusive. Despite its many drawbacks, the most precise information on these companies can only be determined by relying on audited financial statements (Langford et al. 1993). In order to assess the impact of the GFC on the performance of these companies, the values for every consecutive year was compared in a trend analysis. The cost structure for the four sectors has been examined with cost of goods sold (COGS), expenses, depreciation, amortization, interest and profit displayed as a percentage of revenue. Items such as rent, utilities, wages and purchases were not always discernable or available and were considered as part of expenses. A distress analysis was conducted using

the Altman's Z-index (1968). This was considered to be the most appropriate model to compare the risk of failure across the four different sectors.

<p>Material Supplier</p> <p>Adelaide Brighton Limited (ASX:ABC) Alesco Corporation Limited (ASX:ALS) Boral Limited (ASX:BLD) Bluescope Steel Limited (ASX:BSL) Brickworks Limited (ASX:BKW) CSR Limited (ASX:CSR) Gunns Limited (ASX:GNS) GWA Group Limited (ASX:GWA) Reece Australia Limited (ASX:REH)</p>	<p>Building Construction</p> <p>Badge Constructions (SA) Pty Ltd Hooker Cockram Corporation Pty Ltd J. Hutchinson Pty Ltd Masterton Corporation Holding Company Pty Ltd Pellicano Builders Pty Ltd Reed Constructions Australia Pty Ltd St.Hilliers Construction Pty Ltd Tamawood Limited (ASX:TWD)</p>
<p>Property Developer</p> <p>AHC Limited (ASX:AHC) Australand Property Group (ASX:ALZ) AVJennings Limited (ASX:AVJ) Becton Property Group (ASX:BEC) Cedar Woods Properties Ltd (ASX:CWP) CIC Australia Limited (ASX:CNB) Devine Limited (ASX:DVN) Finbar Group Limited (ASX:FRI) FKP Property Group (ASX:FKP) Geo Property Group (ASX:GPM) International Equities Corp Ltd (ASX:IEQ) Lend Lease Group (ASX:LLC) Metroland Australia Limited (ASX:MTD) Mirvac Group (ASX:MGR) Payce Consolidated Limited (ASX:PAY) Peet Limited (ASX:PPC) Stockland (ASX:SGP) Sunland Group Limited (ASX:SDG)</p>	<p>AREIT</p> <p>Abacus Property Group (ASX:ABP) APN Property Group Limited (ASX:APD) Aspen Group (ASX:APZ) BWP Trust (ASX:BWP) CFS Retail Property Trust (ASX:CFX) Charter Hall Group (ASX:CHC) Commonwealth Property (ASX:CPA) Cromwell Property Group (ASX:CMW) Goodman Group (ASX:GMG) GPT Group (ASX:GPT) Trafalgar Corporate Group (ASX:TGP)</p>

Table 1 List of Companies studied

Performance Analysis of Companies

The best gauge for measure of a recession, next to GDP is the stock market. The market index is a reliable tool to plot the timeline of recession right from start to recovery. The primary investable benchmark in Australia, the S&P/ASX200, fell from its peak of 6748 in October 2007 to 3145 in March 2009, losing 46% of its valuation. Since then the markets have recovered and remained fairly buoyant at 4500 until the end of 2010. With the market as a reliable pointer, the period of analysis has been set from financial year 2006 to 2010 to cater for the boom, fall and recovery due to the GFC in Australia.

In terms of revenue, property developers and A-REITs exhibited significant decline in revenues in 2008 and 2009, and in the case of developers, continuing into 2010. The building material sector exhibited a marginal contraction of 2.8% in 2009 followed by a further reduction of nearly 7% in 2010. On the contrary, revenues for building contractors continued to increase, albeit by only 1.6% in 2009 and 0.8% in 2010 despite the slump in building starts in late 2008. The nature of the building construction business is that builders are not immediately affected by a downturn due to continuing construction projects awarded a couple of years earlier. The launch of a number of stimulus packages; bringing forward spending on large-scale infrastructure and additional spending on new school buildings in late 2008 and early 2009 by the Australian government to mitigate the effects of the GFC on the local construction market have maintained building starts at a level of AUD81.5 billion and AUD75.6 billion in 2008 and 2009, respectively (ABS 2010; ABS 2011).

Table 2 indicates that the total net assets of all the companies analysed have increased in the period examined. In fact, net assets for building contractors have more than doubled compared to 2006 with other sectors averaging an increase of 50%. This is notwithstanding the small decreases in net assets for property developers and A-REITs that had to revalue some of their assets in 2009 and 2010. Net asset in this table is usually equal to the shareholders' equity in the company balance sheet or total assets minus total liabilities.

Year	2006	2007	2008	2009	2010
Sales Revenue					
Building Material Suppliers (Change, % year-on-year)	19,926	20,961 5.2%	24,454 16.7%	23,775 -2.8%	22,136 -6.95
Building Contractors (Change, % year-on-year)	1,506	2,068 37.3%	2,455 18.7%	2,495 1.6%	2,514 0.8%
Property Developers (Change, % year-on-year)	7,205	9,323 29.4%	7,827 -16.1%	6,903 -11.8%	6,810 -1.4%
A-REITs (Change, % year-on-year)	1,636	2,762 68.8%	2,294 -16.9%	1,331 -42.0%	1,493 12.2%
Net Assets					
Building Material Suppliers (Change, % year-on-year)	10,404	11,936 14.7%	12,725 6.6%	15,105 18.7%	15,731 4.1%
Building Contractors (Change, % year-on-year)	152	248 63.1%	301 21.2%	329 9.5%	357 8.4%
Property Developers (Change, % year-on-year)	13,137	17,676 34.6%	18,760 6.1%	18,693 -0.4%	19,705 5.4%
A-REITs (Change, % year-on-year)	6,187	8,102 30.9%	10,134 25.1%	9,521 -6.0%	9,132 -4.1%

Table 2 Sales revenue and Net assets (AUD million) for years 2006 to 2010

Ratios measuring profitability, liquidity, activity, leverage and solvency are generally accepted as the most significant indicators of corporate performance. Table 3 lists at least one financial ratio in each of the categories above to evaluate the performance of the companies in the building construction supply chain. These ratios were weighted based on the annual revenues of the respective companies. In terms of profitability, the net profit margin (net profit divided by sales revenue) for material suppliers reduced progressively from more than 7% in 2006 to 0.8% in 2010. Net profit margin for building contractors was low at between 3-4% in 2006 and 2007, and reduced to a minimum of 1.6% during the depths of the financial crisis. It recovered slightly to 1.9% in 2010. The net profit margin for property developers was more than 30% before the onset of the GFC, but converted into a 59% loss in 2009. Similarly, A-REITs reported a net profit margin of 70% and 53% pre-GFC and a massive loss of 106% in 2009. Both the property developer and AREIT sectors returned to profitability and recovered to approximately one half their pre-GFC margins in 2010.

Return on average equity (ROE) measures the rate of return on the shareholders' equity and reflects the company's efficiency at generating profits from every dollar of equity. Defined as net profits divided by average equity, the building material supplier sector exhibited returns between 13% and 17% during the period examined but dropped to a low of 0.2% during 2009 when net profits were depressed by the effects of the GFC. Pre-GFC, the building contractors were achieving returns in excess of 40% but fell to 23.1% in 2008 and eventually to a low of 8.3% in 2010. This corresponded with the observed drop in net profit margin from more than 30% pre-GFC to less than 20% post-GFC. The property developers achieved an ROE of approximately 20% pre-GFC but suffered losses in 2009 to report an ROE of -24% during 2009 and recovering to a small 0.4% in 2010. The ROE for the A-REIT sector fell from 21% in 2006 to -13.9% at the pits of the GFC in 2009 but recovered when the sector returned to profitability in 2010.

The current ratio, defined as current assets divided by current liabilities, provides a measure of liquidity or the company's ability to pay back its short-term liabilities with cash, inventory and receivables. As can be seen from Table 3, the current ratios for both the building material suppliers and building contractors were between 1.5 and 1.9, indicating that these companies were adequately liquid and able to pay its obligations. The current ratios remained above 1.0 during the period of the financial crisis indicating that these companies were managing their cash flows prudently. A number of companies invested in additional property, plant and equipment, increasing debts and consequently reducing the current ratio slightly in 2008. Once the effects of the GFC were apparent, these companies sought ways to reduce their current liabilities with a slight improvement in current ratio in 2009. Property developers exhibited an increase in current ratios in 2007-08 as completed and unsold properties were accounted for under current inventories leading to a higher current asset value. Impairments to the value of properties in inventories and the increases in interest bearing liabilities resulted in higher current liabilities. These changes led to current ratios fluctuating between 1.4 and 2.3 during this period. The current ratio for AREITs ranged from 0.66 to 1.33 during this period, but was not considered further as this sector invested primarily in properties - a non-current asset.

Financial Year	2006	2007	2008	2009	2010
Building Material Suppliers					
Net profit margin	0.074	0.084	0.062	0.015	0.014
Return on Average Equity	0.149	0.173	0.134	0.002	0.012
Current Ratio	1.437	1.544	1.257	1.742	1.780
Working Capital Turnover	11.760	9.430	54.230	8.224	6.770
Quick Ratio	0.867	0.933	0.722	0.944	0.988
Debt Ratio	0.540	0.491	0.524	0.432	0.415
Times Interest Earned Ratio	93.172	12.231	10.252	3.604	8.059
Building Contractors					
Net profit margin	0.034	0.040	0.028	0.016	0.019
Return on Average Equity	0.477	0.439	0.231	0.122	0.083
Current Ratio	1.479	1.504	1.472	1.636	1.466
Working Capital Turnover	6.712	4.650	15.489	11.381	50.254
Quick Ratio	1.104	1.018	1.034	1.181	1.074
Debt Ratio	0.683	0.653	0.654	0.599	0.651
Times Interest Earned Ratio	1525	6295	10194	816	48
Property Developers					
Net profit margin	0.324	0.377	0.153	-0.587	0.144
Return on Average Equity	0.203	0.189	0.069	-0.237	0.004
Current Ratio	1.393	1.725	1.656	2.306	1.460
Working Capital Turnover	-2.214	0.911	-1.684	2.270	3.459
Quick Ratio	0.454	0.778	0.602	1.367	0.726
Debt Ratio	0.534	0.479	0.502	0.463	0.428
Times Interest Earned Ratio	20.462	15.609	5.621	-15.014	8.088
REITs					
Net profit margin	0.707	0.776	0.581	-1.057	0.371
Return on Average Equity	0.210	0.222	0.134	-0.139	0.048
Current Ratio	0.663	1.049	0.750	1.331	0.736
Working Capital Turnover	-1.227	-0.839	-0.083	-0.386	0.787
Quick Ratio	0.643	0.897	0.702	1.210	0.646
Debt Ratio	0.357	0.336	0.358	0.334	0.330
Times Interest Earned Ratio	10.663	13.324	8.294	-9.515	2.749

Table 3 Financial ratios (weighted on revenue)

The quick ratio, a more severe measure of liquidity, defines the company's ability to meet its short-term obligations with its most liquid assets. Inventory was excluded from the current assets because of the delays involved in turning inventory into cash. As expected, the quick ratios for material suppliers were less than the current ratio, but were observed to be slightly below 1.0 indicating that current liabilities were marginally higher than current assets. The increase in short term debt in 2008 resulted in a large drop in quick ratio to 0.722. Once these liabilities were restructured in response to the GFC, the quick ratio improved to previous levels. Recognising that building contractors operate on very tight but prudent cash flows, the quick ratios for this sector were all marginally above 1.0 during the entire period examined. The property developers and AREITs exhibited notably low quick ratios as properties were considered to be non-current assets. Again, some of these companies had to restructure their liabilities in 2009 leading to improved quick ratios for the year.

The working capital turnover (WCT) ratio is an activity ratio which represents the number of times the working capital is turned over in the course of a year. A higher WCT ratio indicates the efficiency with which the working capital is being used to generate revenue. The building material suppliers exhibited a WCT ratio between 6.8 and 11.8 for the period examined except for 2008 when the ratio jumped to a high of 54. This was due to large current liabilities incurred by a number of companies leading to a reduced working capital. The large WCT ratio for building contractors between 2008 and 2010 was also due to reductions in working capital as the revenue was previously reported to be relatively constant over this period. The WCT ratio for both the property developers and AREITs did not provide much information as the values fluctuated between -2.2 and +3.5, most likely attributed to large changes in the levels of current assets and liabilities.

The use of debt to finance the company's assets was evaluated by examining the debt ratio which is defined as the ratio of total debt to total assets. The debt ratios remained fairly constant over the entire period examined for all four sectors although the building contractors showed the highest debt ratio at 65% whereas the AREITs had the lowest ratio of approximately 33%. Building contractors exhibited comparatively higher debt ratios due to high levels of short term trade debts payable to sub-contractors. When the debt ratio was examined together with the Times Interest Earned (TIE) ratio, it clearly indicated that although the building contractors were most highly leveraged, the debt amounts were small relative to the net profits earned by these companies. Building contractors were obviously able to meet its debt obligations many times over. It can be inferred from an examination of the combination of debt and the TIE ratios that most of the liabilities of the AREITs business structure are long term debts whereas building contractors incur short term debts. The TIE ratio for building material suppliers reduced drastically from 93 in 2006 to 3.6 in 2009 due to a drop in net profits. The effect of the GFC was evident in two sectors; the property developers and AREITs, where a majority of these companies suffered losses in 2009 leading to negative TIE ratios.

Industry Cost Structure

The industry cost structure was examined by comparing input costs to revenue for each sector. The cost of input materials (represented by cost of goods sold, COGS) and operating expenses are a significant component of the material supplier cost structure. From Figure 2a it can be observed that COGS and expenses have remained fairly consistent at 56-58% and 29-30%, respectively, leading up to the GFC. Other costs such as depreciation, amortization and interest expense accounts for very small percentages of the total revenue. The most significant effect of the GFC is the drop in profit from 8% in 2007 to 1% in 2010.

For the building construction sector, COGS represents close to 90% of total revenue with profits accounting for 3-4% pre-GFC as illustrated in Figure 2b. It can be seen that all the inputs have remained relatively stable with an evident squeeze on profits. Interest expense for the building construction sector is lowest amongst all four sectors at less than 0.1%

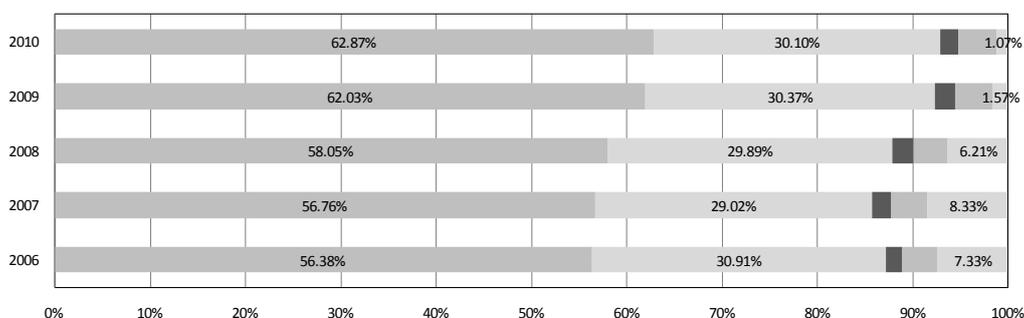
indicating that companies in this sector have insignificant bank loans. The cost structure for property developers include 70% for cost of goods and another 12-15% for operating expenses. Interest payments amount to approximately 3% of total revenues. In terms of profits, property development sector have reported large swings in figures in excess of 12% profit pre-GFC to losses amounting to approximately 20% of revenue in 2009. The increase in expenses was attributed to a write-down in the value of property assets held by these companies during the construction stage. It may be worthwhile to note that this sector recovered in 2010 reporting a profit of 7%.

Property investment companies and REITs have been relatively quick to react to the GFC compared to the other sectors in the supply chain. This is clearly due to a drop in value of the financial assets held by the investment companies and trusts. REITs operate in a similar manner as investment funds and do not report COGS. Interest payments amount to approximately 10% as this sector is heavily reliant on debt to finance the purchase of real estate assets. Figure 2d clearly indicates that REITs were amongst the most severely affected with a reported cost structure nearly three times that of the total revenue for 2009. This sector exhibited the highest profit margins with pre-GFC profit levels at 66% of total revenue. A decline was seen in the 2008 financial year, when the effects of the GFC started to affect the bottom line with a loss of 27%, and continuing the decline with a loss amounting to nearly 200% of total revenue in 2009. The effect of the GFC was two-fold: a loss of confidence in the property market meant that real estate valuations plunged requiring these investment companies and trusts to write-down assets values; and a drop in occupancy leading to a sharp decline in revenue.

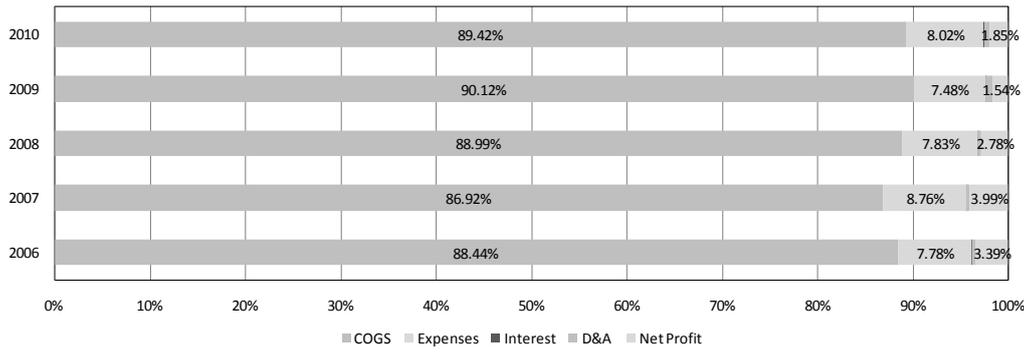
Distress Analysis

Altman (1968) used the multiple discriminant analysis model to combine several financial ratios into a single index, called the 'distress score' to discriminate between failed and no-failed groups. Altman's proposed Z-score, based on an analysis of 66 manufacturing companies of which 33 had failed in 1946, estimated the risk of bankruptcy within a period of two to three years. This analysis was performed to investigate the possibility of business failures in response to the GFC.

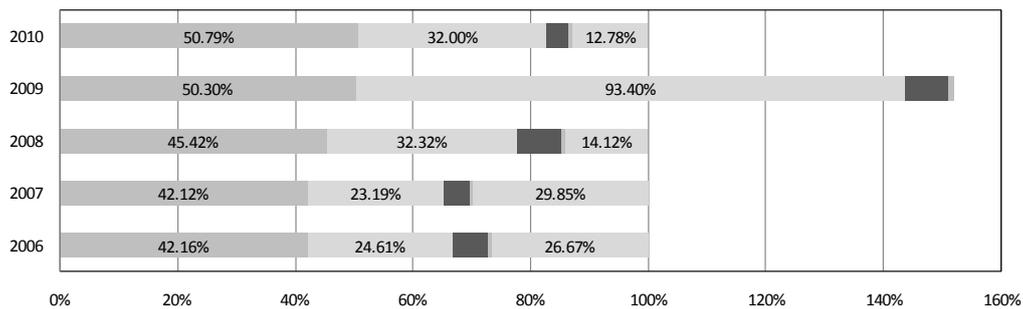
Table 4 indicates that building contractors have remained fairly stable and well above the 'at risk' score of 2.7 throughout the period of study. Material suppliers on the other hand exhibited excellent scores for 2006-08 but dipped slightly into the 'at risk' score for 2009-10 having suffered a drop in revenue and market value. Property developers and REITs were categorised as 'at risk' before the onset of the GFC but fell below the 'imminent failure' threshold of 1.8 in 2008. On examining the individual factors for the Z-score, it is clear that the fall from the safe level for property developers and REITs in 2008 has been influenced by a loss in profitability and productivity.



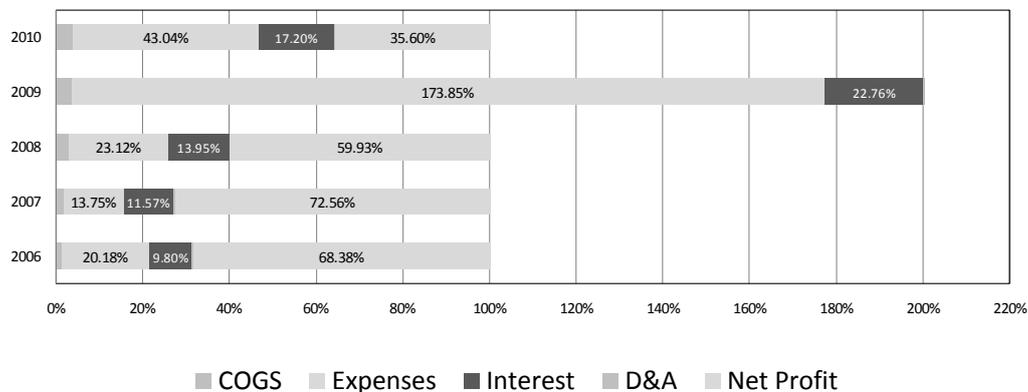
(a) Material suppliers



(b) Construction



(c) Property developers



(d) REITs

Figure 2 Cost structure for material suppliers, construction, property developers and REIT sectors (weighted based on revenue)

Property developers and REITs with higher returns initially have seen greater erosion in their profitability to the extent of negative earnings in 2009 whereas building supplies and building contractors have remained profitable throughout the period. For both developers and REITs, interest expenses, depreciation and amortization have remained fairly stable throughout the period. The reduction in profitability was significantly influenced by decreases in valuation of their assets and financial derivatives on hold, and impairment charges.

The distress analysis indicates that the building materials and contractors in Australia were financially sound and were able to accommodate the impact of the GFC. A similar analysis

of contractors in Hong Kong (Chan et al. 2005) reported Z-scores falling from 2.33 in 1997/98 to 1.41 in 2001/02 due to severe competition and reduced demand for property.

Financial Year	2006	2007	2008	2009	2010
Building Material Suppliers					
Z-score	2.79	3.40	2.83	2.22	2.50
Building Contractors					
Z-score	4.97	4.73	4.35	4.69	4.00
Property Developers					
Z-score	1.72	2.05	1.14	0.26	1.11
REITs					
Z-score	2.43	2.88	1.40	0.77	1.29

Table 4 Distress analysis (weighted on revenue)

Discussion of Results

The results indicate that each of the four sectors of the building supply chain was affected to different extents by the GFC. The building material suppliers were the least affected exhibiting a 3% year-on-year drop in revenue in 2009 and another 7% drop in 2010. These companies remained profitable albeit at a much reduced profit margin. Net assets of these companies continued to grow over the entire period of study. A number of these companies were in the business of manufacturing products for other sectors of the economy and were marginally affected by the decline in construction demand in 2008. The activity ratio for these companies remained relatively constant over the period. These companies were moderately leveraged with debt, but earned sufficient revenues to cover the interest payments many times over.

The building contractors sector exhibited increases in revenue despite the drop in total building starts in 2008 and the consequential drop in building volumes in 2009. This reflects the mode of operation of building contractors where the project duration delays the effects of a downturn to a couple of years after the onset of a fall in building starts. The net assets of the building contractors, although lowest of all four sectors, have more than doubled from 2006 to 2010, indicating that substantial additional investments were made into these companies. Profit margins which were initially low at 3% to 4% were further depressed by the competition for jobs during the lead up to the GFC. The profit margins shown in Table 3 for the building contractor sector were the lowest of all sectors examined. Although the profit margin was low, this sector remained profitable and financially liquid throughout the GFC period. The observed profit margin was not much different from the margin of 3.23% reported by Akintoye and Skitmore (1991) for an analysis of 80 general contractors in the UK. It also compares reasonable better than the 1% to 2% reported by Chan et al. (2005) for construction companies in Hong Kong immediately after the 1997 Asian Financial Crisis. The ROE ratios in excess of 40% confirms the perception that construction activities require relatively lower amounts of equity and that operations is normally funded through judicious utilisation of working capital. Construction companies, though exhibiting debt ratios approximately 60%, are able to repay the interests on their debts from their profits. In general, the financial ratios indicate that they have a well-founded financial position, and are not directly prone to demand fluctuations are generally perceived. A recent study by Balabat (2011) of thirty ASX-listed construction firms operating in the civil infrastructure, residential and non-residential sectors reported that these firms exhibited a 25% higher growth in share value compared to blue chip companies and 48% higher compared to the ASX-All Ordinaries Index.

Apparently, both the building material supplier and building contractor sectors benefitted from the stimulus packages once the numerous building projects commenced in earnest in mid- to late-2009. These sectors remained profitable and solvent, exhibited insignificant

changes to leverage levels; the only indication of concern was a drop in net profits and interest coverage.

Property developers generally rely on internally generated funds and borrowings to finance their investment opportunities resulting in the largest net assets reported for the four sectors as shown in Table 2. Given that these developers in Australia were making healthy profits on the back of the property boom before the onset of the GFC, these companies tend to utilise more long-term debt to finance their business operations. Although the year-on-year falls in revenue between 2007 and 2009 were only 16% and 12%, respectively, a drop in the valuation of properties held or under-construction resulted in serious losses in 2009. Once the market recovered partially in 2010 and the revaluation of properties was conducted, these companies reported net profits and reverted to a healthy balance sheet.

The REITs in Australia engage in the acquisition and ownership of property and primarily derive their income from rental or leasing whereas property developers are mainly involved in the development and management of real estate properties. Given that rental revenues are usually relatively stable, REITs tend to be perceived as a low risk investment vehicle. This study observed net profit margins in excess of 70% during 2006 and 2007, before the onset of the GFC, to a substantial loss of 106% of revenue reported in the 2009 financial year for the REITs sector. However, a revaluation of its property portfolio post-GFC resulted in net profit margins recovering to 37% in 2010. Although property portfolios of the developers and REITs were similarly assessed each financial year, the impact of any upward and downward swings was greater for the REITs sector than the property development sector. Among the sub sectors being analysed, REITs were in a much better situation to cover for their current liabilities with the lowest debt ratios of 0.33 to 0.36. As the REITs' business risk is relatively lower than the other three sectors, these companies utilise more long-term debts to finance their investments in real estate. It may be worthwhile to note that the sample of REITs shown here have reduced the debt ratio from 0.36 in 2006 to 0.33 in 2010. Excessive levels of gearing have magnified the steep decline in asset values for a number of REITs during the GFC.

Conclusions

The financial analysis of the companies operating across the building construction supply chain in Australia indicates that all four sectors examined were susceptible to the global financial crisis. From the ratio and cost structure analyses, it was evident that building material suppliers were the least affected as these companies have remained profitable and solvent throughout the period examined. These companies have benefited substantially from the building economic stimulus package provided by the Australian government. The impact on building contractors was also limited, as they have also remained profitable albeit at significantly reduced levels. However, there is a very high likelihood that the findings may be different if the study period was extended beyond 2010 as the projects let under the stimulus package are completed.

Developers and REITs were the most affected sectors in this financial crisis where significant erosion in profitability was observed. The most severe drop in profitability was reported in 2009 when developers and REITs exhibited losses amounting to 25% and 105% of revenue, respectively. Decreases in the valuation of their assets and financial derivatives on hold, and impairment charges, have played a major role in reducing their profitability. The post-GFC recovery to profitability has been triggered by an increase in their asset valuation, more specifically, owned properties and those for sale in inventories. Since 2008, the Z-scores for developers and REITs have fallen below the 'distress' level, but it was encouraging to see an increase from 2009 and 2010 indicating that the worse was over. The GFC eroded the peak market capitalisation of Australian REITs from AUD147 billion in 2007 to its present value of AUD74 billion at the end of the 2010 financial year (ASX 2007; ASX 2011). The steep decline of asset values during the GFC was magnified by the high gearing

employed by the A-REIT sector. The level of debt has reduced slightly to 0.33 in 2010 indicating a more conservative and managed approach to gearing in this sector after the GFC.

Post Script

After this research project was completed, two companies in the list shown in Table 1 – Reed Constructions and St Hilliers Construction, were reported to be in financial distress.

Reed Constructions, based in NSW, was reported to be in financial distress, with up to \$80 million of bills outstanding, despite being allocated \$383.3 million under the Building the Education Revolution program (Moran, 2012a). On 15 June 2012, Reed Constructions Australia Pty Limited was placed in Voluntary Administration (Ferrier Hodgson, 2012) where debts were reportedly at \$182.1 million after suffering losses on several other government contracts. On 9 July 2012, Reed Constructions was placed in the hands of a liquidator following a successful winding up application filed in the NSW Supreme Court by a creditor, SCE Group (Schlesinger, 2012). Data for Reed Constructions indicate that revenues increased at a compounded annual growth rate of 25% from \$171 million in 2006 to \$466 million in 2011 with profit before tax at \$18 million and \$24 million, respectively for these two financial years. At the end of the 2011 financial year, net assets were at \$99 million, quick ratio at 1.12 and the debt ratio at 0.54 indicating that the company was reasonably healthy at that point in time. The 2011 financial statements indicate a \$47.1 million net cash outflow from its construction activities.

St Hilliers Construction Pty Limited was placed in Voluntary Administration on 16 May 2012 after a dispute over the funding of the \$350 million Ararat Prison project that it was constructing under a public-private partnership approach (Zappone, 2012). It was reported that St Hilliers Construction owed its creditors and employees a total of \$121 million (Moran, 2012b). The financial statements indicate that although the revenues increases from \$347 million in 2006 to \$515 million in 2008 and declined slightly to \$476 and \$492 million in 2009 and 2010, respectively, the company returned profits between \$5 million and \$12 million between 2006 to 2009. The company exhibited early signs on distress when it incurred a loss of nearly \$18 million, before tax, for the 2010 financial year mainly due to higher construction costs (or conversely, lower margins). Net assets remained positive as \$27 million, but its quick ratio deteriorated to 0.54 in 2010 compared to 1.00 the previous year. It suffered a net cash outflow of \$16.0 million in 2010 and a further \$13.3 million in the 2011 financial year.

These two recent cases of financial distress is the subject of an ongoing study to further characterise the performance of the building and construction sector in these uncertain financial conditions: the results will follow in a future publication. Preliminary data seems to suggest that an adequate profit margin is required to provide a buffer against unforeseen project risks. The continued effects of the GFC will become more evident once financial statements and other pertinent corporate information are made available in the public domain.

References

- Abidali, A.F. and Harris, F. (1995) 'A Methodology for Predicting Company Failure in the Construction Industry', *Construction Management and Economics*, **13**, 189-196
- Abdul-Rasheed, A. and Tajudeen, A.B. (2006) 'Performance analysis of listed construction and real estate companies in Nigeria', *Journal of Real Estate Portfolio Management*, **12** (2),177-185
- Australian Bureau of Statistics (2010) '8752.0 Building Activity, December Quarter 2009', April 2010

- Australian Bureau of Statistics (2011) '5206.0 Australian National Accounts: National Income, Expenditure and Product, June Quarter 2011', September 2011
- Akintoye, A. and Skitmore, M. (1991) 'Profitability of UK Construction Companies', *Construction Management and Economics*, **9** (4), 311-325
- Altman, E.I. (1968) 'Financial ratios, discriminant analysis and the prediction of corporate bankruptcy', *The Journal of Finance*, **23** (4), 589-609
- Arditi, D., Koksal, A., and Kale, S. (2000) 'Business Failures in the Construction Industry', *Engineering, Construction and Architectural Management*, **7** (2), 120-132
- Australian Securities Exchange ASX. (2007) 'Listed Managed Investments (LMI) – Monthly Update – August 2007'
- Australian Securities Exchange (2011) 'Listed Managed Investments (LMI) – Monthly Update – August 2011'
- Balatbat, M.C., Lin, C-Y. and Carmichael, D.G. (2010) 'Comparative performance of publicly listed construction companies: Australian evidence', *Construction Management and Economics*, **28**, 919-932
- Balatbat, M.C., Lin, C-Y. and Carmichael, D.G. (2011) 'Management Efficiency Performance of Construction Business: Australian Data', *Engineering, Construction and Architectural Management*, **18** (2), 140-158
- Beaver, W.H. (1966) 'Financial Ratios as Predictors of Failure', *Journal of Accounting Research*, **4**, 71-111
- Chan, J. K., Tam, C. M., and Cheung, R. (2005) 'Monitoring Financial Health of Contractors at the Aftermath of the Asian Economic Turmoil: A Case Study in Hong Kong', *Construction Management and Economics*, **23**, 451-458
- Cheah, C.Y.J., Garvin, M.J. and Miller, J.B. (2004) 'Empirical Study of Strategic Performance of Global Construction Firms', *Journal of Construction Engineering and Management*, **130** (6), 808-817
- Chen, H.L. (2009) 'Model for Predicting Financial Performance of Development and Construction Corporations', *Journal of Construction Engineering and Management*, **135** (11), November 2009
- Debelle, G. (2008) 'A Comparison of the US and Australian Housing Markets. Reserve Bank of Australia Bulletin', June 2008
- Fadel, H. (1977) 'The Predictive Power of Financial Ratios in the British Construction Industry', *Journal of Business Finance & Accounting*, **4** (3), 339-352
- Ferrier Hodgson (2012) 'Reed Constructions Australia Placed in Administration', Media Release, Ferrier Hodgson, 15 June 2012, Retrieved August 28, 2012, from <http://www.ferrierhodgson.com>
- IBISWorld Pty Ltd. (2011a) 'Office Property Operators in Australia', Melbourne
- IBISWorld Pty Ltd. (2011b) 'Building Supplies Wholesaling in Australia', Melbourne
- Kangari, R. (1988) 'Business Failure in the Construction Industry', *Journal of Construction Engineering and Management*, **114** (2), 172-190
- Langford, D., Iyagba, R., and Komba, D. (1993) 'Prediction of Solvency in Construction Companies', *Construction Management and Economics*, **11** (5), 317-325
- Low, K. H. (1997) 'The Historical Performance of Singapore Property Stocks', *Journal of Property Finance*, **8** (2), 111-125
- Mason, R. and Harris, F. (1979) 'Predicting Company Failure in the Construction Industry', *Proceedings Institution of Civil Engineers*, **66**, 301-307

Moran, S. (2012a) 'Probe into Reed's handling of \$90m for BER', *The Australian*, 6 March 2012, Retrieved August 28, 2012, from <http://www.theaustralian.com.au/national-affairs/state-politics/probe-into-reeds-handling-of-90m-for-ber/story-e6frqczx-1226289882027>

Moran, S. (2012b) 'Administrators Moore Stephens seeking buyer for St.Hilliers by August', *The Australian*, 14 June 2012, Retrieved August 28, 2012, from <http://www.theaustralian.com.au/business/property/administrators-moore-stephens-seeking-buyer-for-st-hilliers-by-august/story-fn9656lz-1226394814547>

National Association of Real Estate Investment Trusts (2011) '*REIT Industry Timeline: Celebrating 50 years of REITs and NAREIT*', Retrieved September 1, 2011, from <http://www.reit.com/timeline/timeline.php>

Ng, S.T., Wong, J.M. and Zhang, J. (2011) 'Applying Z-Score Model to Distinguish Insolvent Construction Companies in China', *Habitat International*, **35**, 599-607

Schlesinger, L. (2012) 'Liquidator appointed for collapsed NSW builder Reed Construction', *Property Observer*, 11 July 2012, Retrieved August 28, 2012, from <http://www.propertyobserver.com.au/industry-news/liquidator-appointed-for-collapsed-nsw-builder-reed-construction/2012071155520>

Zappone, C. (2012) 'St Hilliers placed in voluntary administration after jail break', *The Sydney Morning Herald*, 16 May 2012, Retrieved August 28, 2012, from <http://www.smh.com.au/business/st-hilliers-placed-in-voluntary-administration-after-jail-break-20120516-1yprv.html>