INSOLVENCY IN THE UK CONSTRUCTION SECTOR

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The construction industry has always tended to suffer a disproportionate share of both corporate insolvency and individual bankruptcy within Great Britain. This is particularly the case in the aftermath of economic recessions. The latest figures seem to indicate that almost a quarter of all corporate insolvencies in England and Wales involve Construction Companies. In Scotland, the situation is worse with almost one third of insolvencies coming from the sector. This is way out of line with construction's five to six per cent share of Gross Domestic Product. Because of the differing legal definitions between England and Wales and Scotland, the main analysis will use data from England and Wales. Scotland and Northern Ireland are excluded from the formal analysis. Time series data on insolvency by industry is available from 1969 through to 2008 for England and Wales. This period covers three major recessions; in the mid-1970s, the late-1980s and the current slump. In the case of Scotland the data is available from 1998 to 2009. This only includes one recession so will be of less use for the purpose of this analysis. This paper will seek to analyse the causes of this using time series data with a multiple regression model. The key variables tests will include level of profitability for construction companies, fluctuations in demand, and availability of working capital, and lagged general insolvency data to measure the domino effect. This is concerned with an insolvent company dragging down one or more members of its supply chain. The results proved somewhat counter intuitive in some aspects.

Keywords: bankruptcy, insolvency, liquidation.

INTRODUCTION

From the 1970s onwards, construction in the UK has been perceived to have a problem with insolvency. This was identified by Hillebrandt (1977) who showed that, during the recession of the mid-1970s, the failure rate of construction firms was double that of companies as a whole. This situation has continued through the slumps of the 1980s, the 1990s and the recent recession. More work was carried out by Hughes *et al.* (1998) in this area.

Construction tends to account for 15-20% of all insolvencies in the UK. The most recent statistics show that more construction companies become insolvent than for much larger sections such as manufacturing. The failure rate for construction remains roughly twice that which would be expected for an industry producing around 6% of gross domestic product. Recently the insolvency rate for industry as a whole is less than that experienced in the recession from the 1989-1992. In fact is it similar to that experienced in the downturn of the early 1980s.

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Lowe, J G. and Moroke, E (2010) Insolvency in the UK construction sector *In:* Egbu, C. (Ed) *Procs 26th Annual ARCOM Conference,* 6-8 September 2010, Leeds, UK, Association of Researchers in Construction Management, 93-100.

Overall insolvency rates appear to have peaked at the end of 2008 with a small drop into 2009 although construction insolvency rates appear to be still rising. Clearly as insolvency is a lagging variable, there could be more still to come especially if the recession ends up a double-dip similar to that experienced in the early 1990s.

INSOLVENCY

Introduction

There are two basic categories of insolvency.

1. Bankruptcy applies to individuals including the self-employed.
2. Liquidations apply to companies.

Figures for the above are published separately.

In addition there are legal differences between England and Wales and Scotland. This makes UK wide statistics unfeasible. The data is published separately for England and Wales, Scotland and Northern Ireland. There have been changes in the legal definitions in Scotland. Hence time series data in only available as far back as 1998.

Individual insolvency

This includes Bankruptcy Orders and Individual Arrangements and England and Wales. In Scotland this can take the form of Sequestrations and Protected Trust Deeds.

In the case of England and Wales here have been legal changes in the 1986 Insolvency Act and the 2002 Enterprise Act. This makes long-term time series data difficult to present by industry especially given the recent changes in the Standard Industrial Classification. Data is available from 1990 to 2005.

Corporate insolvency

This can take the form of Company Liquidations, Receivership Appointments, In Receivership (under Enterprise Act 2002), and Company Voluntary Arrangements.

Data is available from 1990 to 2009 Quarter 3. Data subdivided by industry is available for much of the period apart from Quarter 4 of 2006 and Quarters 1-2 of 2007. The problem related to changes in the Standard Industrial Classification (SIC, 2007). This had no major impact on construction.

These gaps were filled in by interpolation to complete the annual series from 1990 to 2009. Data from The Department of Trade and Industry from 1969 to 1989 to give a continuous data set.

Data for Corporate Insolvency

The data series for corporate insolvency and construction insolvency in England and Wales for 1969 to 2009 are presented in Figure 1.

This shows a general rise in both construction and general insolvency over the period studied. There are peaks and troughs but the underlying trends in both cases are definitely upward. The peaks in construction insolvency appear to occur in 1977, 1985, 1992, 2002, and 2009. The position for general corporate insolvency follows this pattern generally apart from the latter recently peaking in 2008.The situation in the double dip recession from 1989 to 2002 remains the most severe for both general insolvency and construction insolvency by some margin.

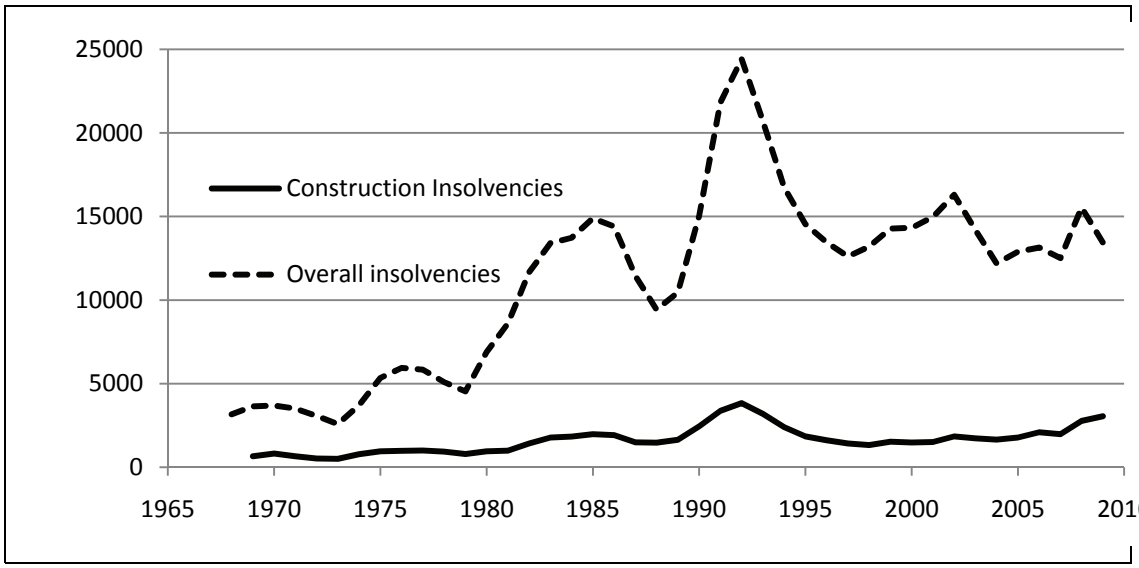

Figure 1: Corporate Insolvency in England and Wales 1969-2009

FACTORS TRIGGERING INSOLVENCY

Introduction

The factors responsible for insolvency are many and varied. They can be divided into factors that can trigger insolvency – such as poor profitability or cash flow problems – and the more long term underlying causes which are more specific to construction (Lowe, 1997).

Profitability

A potential trigger for insolvency is low profitability. Any company not making an adequate return on capital invested will likely be vulnerable to insolvency. A period of low profitability or even losses may be overcome but this is unlikely to be sustained into the long term.

Construction is a very competitive sector of the economy with few barriers to entry of new firms. This will usually involve few barriers to exit from the market.

Cash flow issues

Cash flow problems are another trigger factor for insolvency. It is perfectly possible for profitable firms to become insolvent if they have cash flow problems. This effectively involves a company being squeezed between slow paying clients and impatient suppliers and subcontractors. Insolvency can be the outcome of such situations if their bankers are unwilling to fill the gap.

Companies that are short of working capital or who have poor credit ratings will be particularly susceptible to this issue. See Kenley (2003) for more details on the issue of working capital.

Domino theory

This involves situations where the insolvency of one company leads to other companies being dragged down as well. For example, if a client goes bust while owing large sums of money to a contractor, this could lead to insolvency for the contractor. In addition it is possible that if the contractor owed money to one or more subcontractors, the chain of events could continue.

UNDERLYING CAUSES OF INSOLVENCY

Fluctuating demand

It has often been argued that construction can suffer from short-term fluctuations in demand to a greater extent than other sectors. This was traditionally blamed on the use of construction as an economic regulator by successive governments (Lean and Goodall, 1966) (NEDO, 1975).

Aside from this traditional macroeconomic theory suggests that as construction is largely a provider of capital goods, demand will fluctuate more so than industries dealing with consumption goods. This mechanism is known as the accelerator.

It this linkage is demonstrated, it may explain why construction does suffer from insolvency more than other sectors.

Availability of credit

Lack of availability of credit is a major factor in insolvency triggered by cash flow. This might arise as a result of a general shortage of credit as illustrated by the credit crunch that was a major factor at the start of the recent recession. Credit squeeze was a means of macroeconomic management used in the UK up to the late 1970s. Both have the outcome of making bank borrowing harder.

This will be more of a problem for firms with poor credit ratings and those who lack collateral for loans. Construction companies have less in the form of fixed capital assets to use as collateral than those in other sectors of the economy. If the inherent susceptibility of construction to fluctuating demand is taken into account it would not be surprising if construction companies were considered as worse credit risks than for other industries.

DATA USED FOR STATISTICAL ANALYSIS

Dependent variable

Of the various datasets on insolvency available, it was decided to use Company Insolvencies for England and Wales as the dependant variable. This set was used because it provided the longest continuous time series of insolvency presented by industry. The figures for individual bankruptcy tend to follow a very similar pattern to company liquidations.

The analysis is restricted to England and Wales because of the limitations in the data availability for Northern Ireland and the different legal definitions for Scotland. This leaves a problem as most of the macroeconomic data that will be used for the independent variables will be for the whole of the UK. This should not present a major problem for the analysis as England and Wales constitute the largest sector of the UK economy. In any event many of the firms operating in Scotland are headquartered down south and the economic climate is similar. The increasing internationalization of the UK construction sector could have implications for future analysis but this is not an issue at the moment. The data is taken from the Government's Insolvency Service website.

Independent variables

The analysis is based on four independent variables

1. Profitability of the UK construction sector: This is measured using the percentage return on capital invested. That is total company profits and surpluses divided by capital employed (fixed and variable capital). The data

was for profits was taken from the UK National Accounts while that for the capital employed by derived from the same source (Lowe, 1992).

2. Working capital used: This is the ratio of working capital employed in the UK construction sector divided by value added. This is lagged by one year to take account of nature of insolvency as a lagging variable. The data was taken from UK National Accounts.
3. The Domino theory: This uses the overall corporate insolvency figures for all industries lagged by one year. This data was taken from the Government's Insolvency Service.
4. Fluctuating demand: This uses the year on year percentage change in construction value added. This was taken from Economic Trends Annual Supplement.

ANALYSIS

The variables used

The variables used in the analysis are listed in Table 1.

Table 1: The variables used in the model

Number	Variable	Source	Variable	Notes
1	Construction insolvency	The Insolvency Service	C	Dependent variable
2	Return on capital	UK National Accounts	R	Lagged one year
3	Working capital ratio	UK National Accounts	W	Lagged one year
4	Domino theory	The Insolvency Service	L	Lagged one year
5	Change in output	Economic Trends	ΔQ	

The regression model

The analysis employed a standard multiple regression model of the form:

$$\acute{Y} = \alpha + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \ldots\ldots + \beta_n X_n$$

Where $\acute{Y}$ = Estimate of dependent variable Y

X_i = Independent variable i

α = Intercept value

β_i = Coefficient for independent variable i

The model was run using the regression function on Excel for the years 1969 to 2008 using the data included in Table 3. The results indicated that the model had an R^2 value of 79.6% and an adjusted R^2 value of 77.3%. This suggests that just short of 80% of the variation in construction insolvency is apparently explained by the four independent variables used in the model. The results for each variable are tabulated below:

Table 2: Results from the regression model

Number	Factor	Variable	Coefficient	P-value	Different from zero
	Intercept	C	- 370.43	0.5889	Not significant
2	Return on capital	R	1490.24	0.0213	Not significant
3	Working capital ratio	W	128.05	0.9238	Not significant
4	Domino theory	L	0.1338	0.0000	Significant
5	Change in output	ΔQ	-5120.85	0.0010	Significant

The working capital ratio appeared to have no real impact on construction insolvency.

Profitability does appear to have a measurable impact on construction productivity. However the regression sign is positive rather than the expected negative value. The

regression coefficient for profitability is different from zero at a level of confidence of 98% with a p-value of 0.013.

The domino effect does appear to have a significant impact on construction insolvency with the expected positive coefficient. The very low p-value of 5.09E-13 indicates that this coefficient is certainly statistically different from zero to a very high level of confidence.

Fluctuating demand also seems to have a significant effect on construction insolvency with the expected negative regression coefficient sign. This is different from zero with a level of confidence of 99.9%.

CONCLUSIONS

The results of the analysis are partially counter intuitive. Profitability does appear to impact on insolvency but the sign on the regression coefficient is positive. This suggests that insolvency is associated with higher levels of profitability. The figures show the underlying trends of insolvency on a generally upward trajectory over the period studied. The more recent years show increased economic activity in construction, higher profitability and higher insolvency. The most likely explanation is that the risk inherent in the construction sector is increasing over the period studied. High returns on capital invested are the rewards for risk taking, while insolvency is the downside. Hence as risk increases both returns on capital and insolvency have also increased.

The level of working capital held by construction companies appears to have little or no impact on insolvency. This may be down to technical factors. As insolvency has increased the proportion of value added required as working capital has reduced. This may be down to contractors holding less inventory due to the increased use of 'just in time' approaches to material ordering. These changes could well be masking the real impact of the requirements for working capital impacting on insolvency.

The results for the domino effect seem to match the theory with a high positive association with insolvency. Similarly the test for fluctuations in output give the expected negative results with growth in output being associated with linked to lower levels of insolvency.

The one area that it was not tested was that of credit availability. This should be the main focus of a subsequent study. This is particularly the case as it generally held that cash flow factors do have a major impact on insolvency.

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Table 3: Data used for the analysis

Year	Construction Insolvency C	Overall Insolvency L	Profit (£m)	Capital (£m)	ROCE P	Working capital W	Index of output Q	Change ΔQ
1968	-	3,165	482	1,946	25%	41%	68.9	-
1969	650	3,641	522	2,114	25%	42%	68.4	-0.0073
1970	821	3,689	570	2,285	25%	43%	67.1	-0.0194
1971	651	3,506	716	2,481	29%	52%	68.3	0.0176
1972	518	3,063	1,146	2,784	41%	65%	69.5	0.0173
1973	500	2,575	1,502	3,149	48%	76%	71.2	0.0239
1974	776	3,720	1,482	4,186	35%	61%	63.8	-0.1160
1975	956	5,336	1,747	4,506	39%	58%	60.5	-0.0545
1976	977	5,939	1,747	5,020	35%	58%	59.6	-0.0151
1977	1,004	5,837	1,988	5,882	34%	53%	59.4	-0.0034
1978	929	5,086	1,928	7,390	26%	49%	63.4	0.0631
1979	789	4,537	2,698	9,009	30%	50%	63.9	0.0078
1980	949	6,890	2,944	9,771	30%	54%	60.4	-0.0579
1981	990	8,596	3,012	9,912	30%	58%	55.7	-0.0844
1982	1,422	11,667	3,471	10,111	34%	64%	60.1	0.0732
1983	1,776	13,406	4,320	10,275	42%	76%	63.9	0.0595
1984	1,831	13,721	4,606	10,624	43%	83%	66.9	0.0448
1985	1,975	14,898	5,427	11,540	47%	84%	67.2	0.0045
1986	1,914	14,405	5,974	12,396	48%	87%	69.9	0.0386
1987	1,490	11,439	7,656	13,512	57%	100%	78.1	0.1050
1988	1,471	9,427	10,282	15,747	65%	111%	84.9	0.0801
1989	1,638	10,456	10,808	18,274	59%	112%	89.4	0.0503
1990	2,445	15,051	8,376	21,256	39%	89%	92.0	0.0283
1991	3,373	21,827	3,363	21,385	16%	74%	84.6	-0.0875
1992	3,830	24,425	3,391	20,754	16%	72%	81.2	-0.0419
1993	3,189	20,708	3,923	19,303	20%	79%	80.3	-0.0112
1994	2,401	16,728	3,812	22,181	17%	73%	83.3	0.0360
1995	1,844	14,536	5,157	23,439	22%	75%	83.9	0.0072
1996	1,610	13,461	3,562	23,238	15%	77%	86.3	0.0278
1997	1,419	12,610	5,144	23,181	22%	78%	88.7	0.0271
1998	1,325	13,203	7,400	24,510	30%	75%	89.7	0.0111
1999	1,529	14,280	7,074	25,820	27%	82%	89.8	0.0011
2000	1,474	14,317	7,736	26,094	30%	80%	90.2	0.0044
2001	1,509	14,972	9,096	28,398	32%	86%	92.1	0.0206
2002	1,840	16,306	9,333	28,796	32%	93%	95.5	0.0356
2003	1,728	14,184	9,762	32,000	31%	93%	100.0	0.0450
2004	1,653	12,192	13,207	32,988	40%	104%	104.0	0.0385
2005	1,775	12,893	12,055	33,801	36%	105%	105.4	0.0133
2006	2,087	13,137	14,591	33,469	44%	113%	106.7	0.0122
2007	1,979	12,507	10,461	34,788	30%	112%	109.3	0.0238
2008	2,771	15,535	-	-	-	-	108.1	-0.0111