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Making Tomorrow a More Resilient Place: On Black Swans in The Project-Based Firm

Abstract

Black Swan events are defined in the literature as events which have a major impact, which lie outside the bounds of prediction, and which are only rationalised in retrospect. While some may disagree, almost all failures, even catastrophic ones, are not really Black Swan events but a series of failures that alone may have a negative impact on the immediate outcomes but combined lead to catastrophic failure. It is surprising how often experienced managers of project-based firms, ignore the early warning signs of these failures and move forward despite serious problems in many areas that are keys to the firm's success. This will ultimately lead to the Black Swan event materializing. Through a case study on the collapse of construction giant "Carillion", this study finds that Carillion's liquidation was an endogenous Black Swan, brought about by directorial negligence manifested in a failure to respond to early warning signs, a lack of a culture of organisational learning, and an inherently fragile business model. The study concludes that the liquidation would have been avoidable if the early warning signs had been seen in time, and had corrective action been taken. The case offers significant areas in which lessons can be learnt. Firstly, organisations need to identify indicators to serve as early warning signs of trouble. Secondly, organisations must embed organisational learning across all activities, to spread best practice and prevent the recurrence of errors. Thirdly, the government, with its twofold role of largest client and of regulator, has a responsibility to take action to ensure that the environment in which these firms operate does not allow the Carillion model to operate by fostering a culture of innovation, ending the practice of accepting the lowest bids for work, and building a reporting framework with transparency and objectivity at its heart.

Keywords: *Project-based firms; Black Swan; Early warning signs*

1. Introduction

From the 1990s and onward the construction industry has faced strong critique, mainly addressed to its unsatisfactory financial performance and working culture (Egan 1998, Aarseth et al. 2012). This is due to several common causes among which lack of effective engagement with stakeholders, lack of effective integration between clients, the supplier team and the supply chain (Office of Government Commerce 2007, Kivrak and Arslan 2008). Budgetary and macroeconomic issues have been argued to represent as much as 83% of the reasons for construction company failures (Arditi et al. 2008). This indicates that firms that take effective and dynamic administrative measures to address budgeting issues and also react timely to economic conditions by implementing appropriate strategic policies should be able to avoid failure (Arditi et al. 2008). In the UK, the dominant main contractor business model has focused on survival as the priority and seeking growth and profitability as a secondary goal, leading to companies' tendency to be reactive to market trends rather than driving change (Smyth 2018). In 2017/2018 financial year, 2,764 insolvencies occurred among building firms in the UK. Poor management practices, unqualified subcontractors, and lack of communication are among the factors that can negatively affect the business in construction and thus result in failure (Kivrak and Arslan 2008). Holt (2013), refers to elements leading to failure of construction businesses as failure agents. The generic failure agents identified by Holt are managerial, financial, company characteristics, and macroeconomic.

In early 2018, Carillion collapsed into liquidation in a spectacular way. In the previous six months, there had been wide speculation about its long term prospects following a catastrophic profit warning in which it wrote down its earnings by almost £1 billion, (Carillion plc, 2017c) Carillion was a key supplier to the UK government. It was delivering hundreds of contracts

across the UK and overseas, (National Audit Office, 2018). It employed approximately 50,000 people, and had tens of thousands of sub-contractors (BuildUK, 2018That it could fail so suddenly and so dramatically came as a shock to many. The consequences of the collapse were hugely impactful and wide ranging. Carillion liquidated with in excess of £7 billion in liabilities, including trade creditors, a pension deficit and bank loans. Sub-contractors went out of business, and employees lost their jobs (House of Commons, 2018).

The case makes fertile ground for a study into the project-based firm, in order to better understand what happened and to seek lessons to be learnt in order that firms may improve their practice and avoid suffering the same circumstance themselves. The main aim of this research is to develop an understanding of Black Swan events in project-based firms. Carillion's liquidation has provided an illustrative case study through which the metaphor of the Black Swan can be scrutinised in order to provide insights into the way in which such events can be avoided in the future. Ultimately, the research seeks to contribute to the knowledge base surrounding Black Swan events, particularly in project-based firms in the construction sector.

The objectives of the research are threefold. The first objective is to examine whether or not the Carillion case can be considered a Black Swan event, thus testing whether the metaphor is a useful one to use in the circumstance and as a means of analysis. The second objective is to consider whether the liquidation of Carillion was inevitable, or whether it could usefully have been avoided. The final objective is to elicit lessons to be learnt from the case of Carillion, through a consideration of both the firm and the environment in which it operated.

This paper is structured as follows. First, a review of relevant literature is presented to provide a theoretical underpinning to the study. Subsequently, the findings of the research are presented in the form of a case study based on publicly available data including financial statements,

inquiry papers, news reports, and other relevant documentation. There then follows a discussion section wherein the research questions are considered in the light of the case study findings and the review of the literature. The final section summarises the conclusions of the research and makes recommendations for policy and for future research.

2. Literature review

Black Swans

The Black Swan is according to Taleb (2007), the "Impact of the Highly Improbable". A Black Swan event is beyond the domain of expectation and carries an extreme impact. It is subject to post-hoc rationalisation, or 'retrospective predictability' (Taleb, 2007). Such an event may have positive or negative consequences, and the non-occurrence of a highly expected event can also be considered a Black Swan.

Since the introduction of this phenomenon, a broad range of events have been categorised as Black Swans, notably tending towards the negative outcome over the positive one. Examples include the collapse of Arthur Andersen (Aon, 2011), the Fukushima disaster (Paté-Cornell, 2012) and the failed implementation of an Enterprise Resource Planning (ERP) system at Levi Strauss (Buhl, 2012). In each of these cases, a Black Swan was observed: an unexpected turn of events with a highly deleterious effect on the organisation which retrospective analysis showed to have been avoidable.

Much of the literature has focused on how Black Swans can be avoided; this represents a misunderstanding of the concept, as it neglects the essential third part of the definition – that the Black Swan is only retrospectively predictable (Taleb, 2007). To examine this further, it is necessary to unpack the difference between risk and uncertainty. Knight (1921) identified that risk is something that can be determined and quantitively analysed, such as the roll of a die,

whereas uncertainty cannot be measured in this way, and cannot therefore be subjected to probabilistic analysis. As Bogle (2008) highlights, the term risk, according to Knight, can only be applied when the population to which it applies it sufficiently homogenous. In business and enterprise, and by extension, projects, this is rarely the case.

Robust and fragile organisations

Taleb (2012) asserts that in order to guard against negative Black Swans (and to increase exposure to positive Black Swans) antifragility is required. He sees antifragility as the antithesis to fragility, as opposed to robustness, which does not go far enough. To be antifragile to Black Swans means reducing exposure to failure, rather than trying to predict the future.

Gallop et al. (2016) go some way to advancing a Black Swan avoidance theory based on using creative ideation approaches to building a risk register, rather than relying on historical information to provide what are only predictable, typical risks. Yet this still, like Kendrick (2008), assumes that all risks are manageable, if only we could 'know' them. Simply adding items to a risk register does not prevent the negative consequences that arise should they manifest themselves. Hajikazemi et al. (2016) suggest that potential Black Swans may be caught in their infancy through organisational learning and the leveraging of early warning signs. This is a more insightful way of confronting the Black Swan than that proposed by Kendrick (2008) as it reflects the need for organisational agility in order to respond to an emergent crisis. However, it remains to be seen how a Black Swan early warning sign can be identified before the fact: Black Swans are characterised by post hoc rationalisation, and it is all too easy to spot these early warning signs in retrospective analysis.

Baumard and Starbuck (2005) note that large failures are often perceived to result from idiosyncratic and exogenous factors, a supposition not usually levied against large successes. There is thus a certain domain dependency or cognitive bias which leads people to infer that failures

(or negative Black Swans) are externally driven, but successes (or positive Black Swans) result from internal factors.

Brady and Davies (2004) explore the ways in which organisational learning can take place in the project organisation, and specifically how an organisation transitions from a state of exploration, where learning takes place, and exploitation, where the benefits of learning are realised. This has a particular relevance in the study of how learning can transcend the project boundaries in order to be made use of in other projects across the organisation.

In summary, a fragile organisation is one which is more exposed to Black Swan events by virtue of responding poorly to external volatility. Fragility, and hence Black Swan exposure, can be reduced in a number of ways, chief among which are the embedding of organisational learning, the implementation of systems to identify early warning signs, and the development of innovative risk management practices.

The construction sector in the UK

Construction is a low-margin, high-risk sector (The Institute of Chartered Accountants in England and Wales, 2019) and hence presents different challenges as compared with other industries and sectors. Additionally, it is also one of the most competitive industries (Lowe, 2011).

Simard et al. (2018) argues that Carillion was in fact a delayed casualty of 2008's global financial crash, and the resultant drive in the public sector towards the lowest possible cost. Meanwhile, Sweet (2018a) suggests that it was individual, poorly-performing projects that led to the collapse. Thus, there is a tendency to lay the blame on project-level failure and accounting rather than considering the broader programme management.

Smyth's 2018 report, Castles in the Air, which was published just as Carillion fell into liquidation, gives a history of the UK construction firm from the Second World War up to the present day. It concludes that many of the issues relating to the sector, such as poor productivity and a lack of investment in capability, can be traced back to the way in which the firms responded to their response to the requirements of that war, and how government interacted with them then and subsequently.

The aforementioned reflects Mazzucato (2016), which argues that the shareholder-value model leads to decisions being taken which are in the long term harmful to the business; for example, directing funds away from research and development to maintain dividend payments in the short term stifles innovation in the long term.

Given that the UK government is the largest client of the national construction sector (Smyth, 2018), and is responsible for the regulation of the same, it has an outsized role to play in the shaping and development of the sector. This is the focus of Sweet (2018b), which argues that government should drive change by both insisting upon and paying for best practice and innovation.

The construction sector is a risky one, and one which is less developed in terms of management than others, despite being the birthplace of project management methodology. Construction firms nowadays are too preoccupied with survival to be able to innovate, and the government as chief customer and regulator must play a role in the development and improvement of the sector.

3. Research Method

This research was designed as a qualitative study, as follows from the interpretivist philosophy adopted by the researcher. It has taken an abductive approach, leveraging a case study supported by a theoretical grounding from a review of the literature. we have explored Black Swan

theories using Carillion plc as a case study. The case study was viewed in the light of theories arising from the literature in order to draw new insights and provide practical implications for project organisations.

The research was based entirely on secondary textual and documentary data. The use of secondary data has a number of concomitant advantages, namely that it allows much more time to be spent on the analysis of the data rather than the collection of it, and that it is an unobtrusive way of gathering information (Saunders et al., 2012). Moreover, the study of secondary data allows the existing body of knowledge to be expanded by redeploying the data to seek new findings in addition to those of the original researchers (Hakim, 1982).

The research involved the production of a case study based on a number of secondary data sources, viz.:

- Transcripts, correspondence, documentation, and reports from the 2018 House of Commons inquiry into the collapse of Carillion plc.
- Carillion plc public financial statements including annual reports and mid-term financial statements as available on Companies House.
- Aggregated financial data relating to Carillion plc from Bloomberg.
- Reputable news reports relating to Carillion (i.e. from the Financial Times).

This case study was then analysed in the light of the reviewed literature in order to generate conclusions and recommendations for policy.

There are indeed disadvantages to the exclusive use of secondary data. Difficulty of access is often cited as a primary disadvantage (Hair et al., 2016). Additionally, there is a potential issue surrounding bias: while Carillion's financial statements were prepared according to the reporting standards then in force, there is the potential for inaccuracy resulting from the subjective

nature of many of the figures therein presented. While this is true in any organisation, it is particularly pertinent here due to the fact that Carillion did write down its profits substantially in the latter years of its existence. Finally, the study could be limited by the fact that it is taking a purely retrospective view, as opposed to using real time data. However, as it is effectively a post mortem study, this limitation is not considered to impact upon the work.

4. Findings

This section represents the key findings of the research. The case study begins with a brief history of the company before considering various financial metrics using data from the published annual reports and aggregate data retrieved from Bloomberg. It then considers in more detail a number of high profile projects before exploring the relationship between the firm and the UK government.

A short history: Carillion's brief existence

The formation of Carillion, in 1999, occurred at a time of increasing public infrastructure spending in the UK. In 1992, Major's Conservative government introduced the private finance initiative (PFI) as a new way of funding these projects. The PFI sought to transfer some of the risks associated with large construction projects into the private sector (Allen, 2001) by creating special vehicles called public-private partnerships (PPPs). It was in line with governments demand for private sector partners that Carillion was formed.

By the end of its first financial year, Carillion was already turning over almost £2 billion (Carillion plc, 2001).by the end of this first full year of trading, Carillion was responsible for eight operational PFI projects, with a further six in construction (Carillion plc, 2001). Additionally, it had, by this time, been listed on the London Stock Exchange. Carillion's turnover remained

steady at around £2 billion per annum until 2006 when it acquired Mowlem plc. Its 2006 accounts report ‘greater than expected’ benefits arising from the acquisition (Carillion plc, 2007), especially that of becoming one of the largest support services firms in the UK.

The acquisition of Mowlem marked a step-change in Carillion’s growth strategy which thereafter tended towards further large acquisitions. 2008 saw the purchase of Alfred McAlpine (Carillion plc, 2009), and in 2011, Carillion acquired energy firm Eaga (Carillion plc, 2012). In 2014, Carillion attempted to merge with rival construction firm Balfour Beatty several times (Barrett, 2014) but the deal was repeatedly rejected.

The financial crash of 2007/08 prompted a significant decline in public infrastructure spending in the UK (Smyth, 2018). Carillion responded by increasing its overseas work, particularly in the Middle East and Canada (Carillion plc, 2009).

In July 2017, following a review of contracts, Carillion issued a profit warning of £845 million (Carillion plc, 2017b), causing its share price to fall by almost 40 per cent and prompting the immediate departure of its long-standing Chief Executive Officer, Richard Howson (Sullivan and Martin, 2017). Astonishingly, the following week it was awarded a £1 billion contract by the UK government for work on the High Speed 2 rail link. Carillion’s share price, however, would never recover.

About six months later, in January 2018 the Chairman of the Carillion board, request a short-term bridging loan to allow the company to continue operating, which was denied. which of the public they serve. Two days later, Carillion was forced into liquidation.

Income

Figure 1 shows Carillion’s net income and cash from operations for each full financial year of its existence for which it published annual accounts.

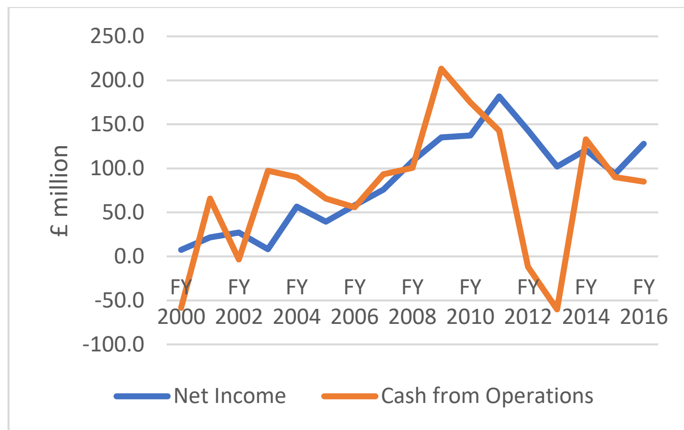

Figure 1: Net income compared with cash from operations (years 2000-2016)

In several years, the net income stated diverges from the cash from operations reported. This is particularly apparent in 2012 and 2013. The implications of this divergence are twofold: firstly, that the company may tend to account for revenue before it is received in cash; secondly, that the company may be investing or otherwise deploying the cash received from operations in order to generate cash from financing activities.

Liquidity

A firm's current ratio is a measure of its liquidity indicating its ability to cover short-term liabilities with its current assets. Figure 2 shows Carillion's current ratio from 2000 until 2016 (the last year for which it published financial accounts).

The graph shows that Carillion's current ratio peaked in 2004 at 1.15, and had been stagnant at just over 1.00 in the three years preceding the liquidation. Additionally, we see that between 2005 and 2012 the company had an almost unbroken period of achieving a current ratio of less than one: during this period, Carillion's current assets were less than its current liabilities.

Having such a low current ratio means that Carillion was a fragile company: it had very little 'wiggle room' (House of Commons, 2018). Thus, it was vulnerable to such events as project

cost overruns and non-payment by creditors. Figure 3 shows current liabilities (in red) for each financial year superimposed on current assets (in blue).

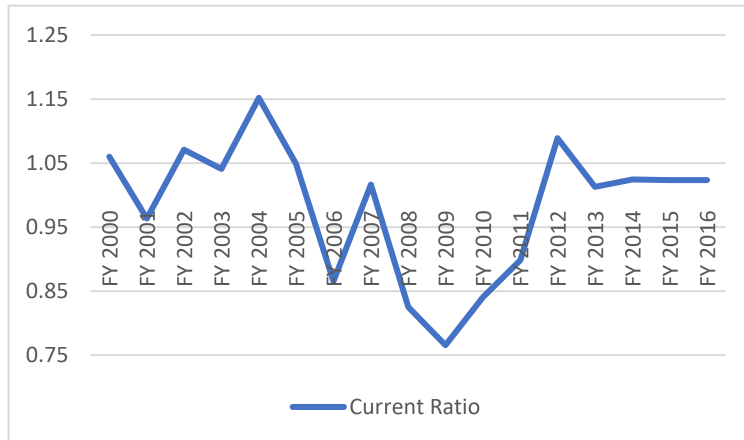

Figure 2: Current ratio (years 2000-2016)

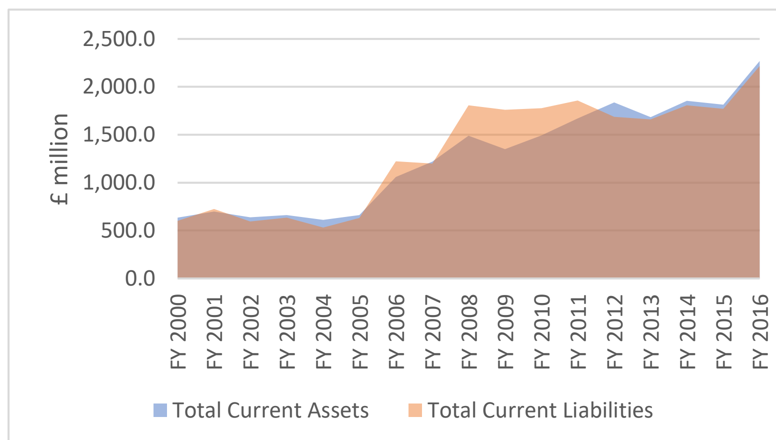

Figure 3: Total current assets compared with total current liabilities (years 2000-2016)

This graph offers a different visualisation of essentially the same metric as in Figure 2: for the period between 2005 and 2012 current liabilities overtake current assets.

It is clear that Carillion was sailing very close to the wind - and not just towards the end of its life, but throughout it. Carillion was bidding for contracts at margins that were barely sustainable. It did this in order to enable it to grow, especially from 2012 onwards, as it could no longer afford to grow through acquisitions (House of Commons, 2018).

Debt

The above-referenced period of 2005 to 2012 coincides with a period of increased activity in mergers and acquisitions. In 2006, Mowlem was acquired for £350 million, in 2008 Alfred McAlpine was acquired for £555 million and in 2011 Eaga was acquired for £298 million (Carillion plc, 2007; Carillion plc, 2009; Carillion plc, 2012).

In total, Carillion borrowed £528 million in respect of these acquisitions (Carillion plc, 2012). This borrowing had a dramatic impact on Carillion's total debt, as demonstrated in Figure 4.

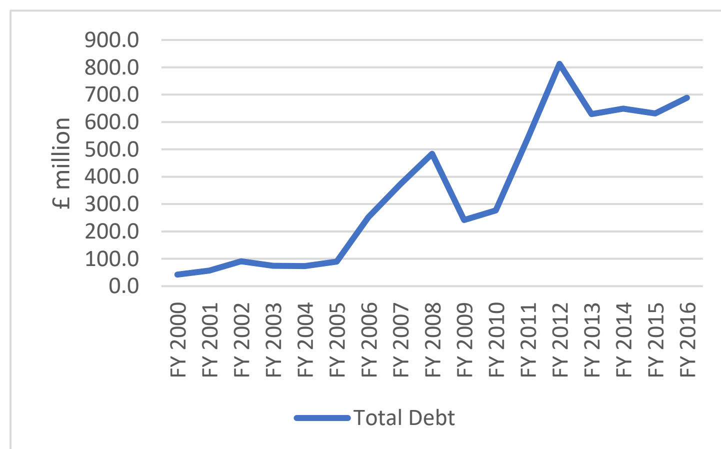

Figure 4: Total debt (Years 2000-2016)

After 2005, total debt tends upwards, and peaks first in 2008, then in 2012. Carillion's expansionist ambitions continued: in 2014 it attempted to merge with Balfour Beatty. However, the

attempted merger was rejected three times by Balfour shareholders, who failed to accept the benefits projected by Carillion's board (Barrett, 2014).

Goodwill

When one company acquires another, the difference in the price paid for the company and the value of its tangible assets is accounted for as 'goodwill'. It represents the value of all the intangible assets of the acquired company, such as its brand, its customers, and its organisational knowledge. As a result of Carillion's M&A activity, it amassed a significant amount of goodwill. Figure 5 below shows the goodwill declared on Carillion's balance sheets from 2000 until 2016.

Figure 5 shows that across the lifetime of the company, the amount of goodwill amassed by Carillion increased. Furthermore, there was a trend for the proportion of the balance sheet it represented to increase. Carillion never made any significant impairment to the value of the goodwill it declared in its published accounts. While the ongoing carrying-over of the value of the goodwill was highlighted as a risk by the auditor, KPMG, in the published accounts, it did not lead them to withhold their approval of the financial statements.

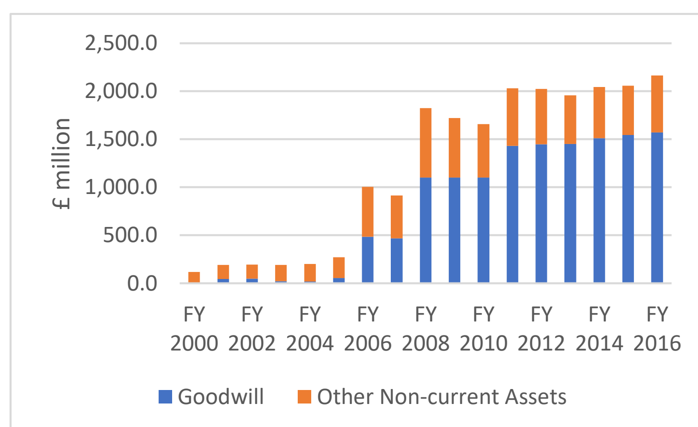

Figure 5: Non-current assets with the proportion of goodwill highlighted (years 2000-2016)

Pension liabilities

In addition to the goodwill Carillion was accumulating as a result of its mergers and acquisitions, it was also taking on the pension liabilities of the acquired companies. Figure 6 shows Carillion's year-on-year pension obligations.

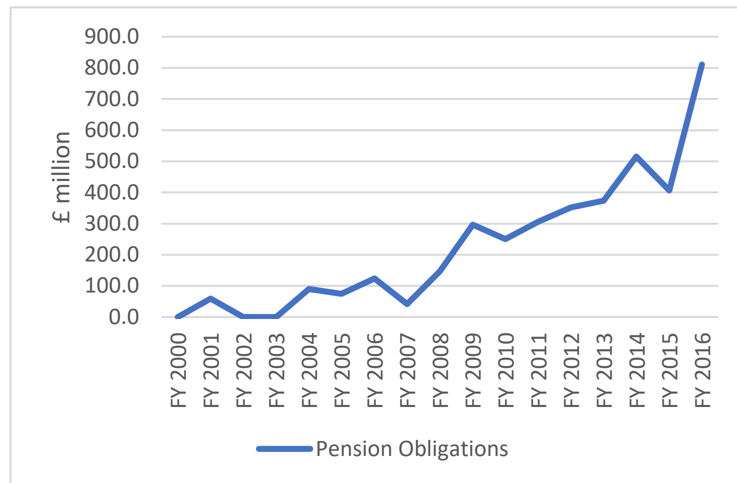

Figure 6: Pension liabilities (years 2000-2016)

The general trend is upwards, and the larger the deficit becomes, the quicker it grows. The enormous rise between 2015 and 2016, for example, shows how the deficit became increasingly unmanageable. It is interesting to note that the directors of Carillion seem to paint a rather different picture of their fiscal situation in their conversations with the Pensions Regulator, as compared with that which it presents in its financial reports. For example, in 2008, the regulator requested an annual payment of £35 million towards the deficit but Carillion argued it could only pay £23 million. Similarly, in 2011, the regulator asked for £65 million, and Carillion claimed only to be able to afford £33 million (House of Commons, 2018). Carillion thus consistently treated the pension deficit as a low priority issue, preferring to claim it could not afford to pay it rather than electing to prioritise it over other payments, such as its dividend, for example.

Dividends

While Carillion was unable to pay down its pension deficit, the upwards trend of which contributed to the substantial liabilities at the point of liquidation, it was consistently able to fund its dividend. Indeed, successive annual reports make a point of highlighting the fact of increasing the dividend in every year of operation (e.g. Carillion plc, 2015; Carillion plc, 2016; Carillion plc, 2017a). Figure 7 below shows the year-on-year total dividend payment made by Carillion and the percentage of that year's net income that the dividend payment represents.

Carillion's dividend was calculated on the basis of 'underlying earnings' rather than on the basis of, for example, net income. As such, it grew regardless of whether the company was or was not performing well; by acquiring companies and becoming bigger and bigger, Carillion's directors caused the dividend to rise. For example, in 2013, the net income fell by almost a third compared to the previous year, but the dividend payment rose by six per cent.

We can therefore surmise that the dividend payments were not linked to improvements in productivity or profitability, but rather were linked to the sheer size of the organisation. The directors of the company, many of whom were also shareholders, were thus incentivised to prioritise growth above all else.

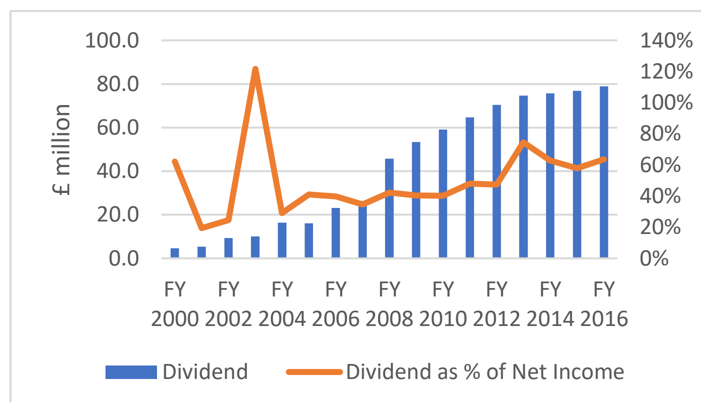

Figure 7: Annual dividend and dividend a s percentage of net income fo(years 2000-2016)

Projects

The profit warning of July 2017 centred around a number of projects for which Carillion had overstated the revenues, thus creating a shortfall in the financial statements previously published. The £845 million overstatement comprised £370 million in UK projects and £475 million in overseas ones. This followed a review of all of Carillion's significant contracts following what it termed a deterioration in cash flows (Carillion plc, 2017b). One immediate strategic response to this was to move to exit from UK public-private partnership construction projects and from construction projects located in the Middle East.

Carillion's former directors highlighted four projects which they believed had a pivotal role in the liquidation. They were the construction of the Midland Metropolitan and Royal Liverpool University Hospitals, the Aberdeen Western Peripheral Route, and the Msheireb Downtown Doha Project (House of Commons, 2018). Additionally, five further projects were identified in Carillion's final business plan (2018) as having significant risk attached, with a total net outflow of cash for the nine projects estimated at £371 million.

The prime reason, according to former Carillion directors, for the poor performance of the Royal Liverpool University Hospital construction project was a number of concrete beams which, at a late stage in the build, had been found to have cracked. This resulted in costly rework, which in turn caused delays to the timescale.

Regarding the project in Doha, directors highlighted having to face over 40,000 iterations of designs and specifications, and two changes in chief architect, during the project (House of Commons, 2018). The extent of the changes was later disputed by the client (Msheireb Properties, 2018) but it is clear that Carillion was unable to keep up with the level of scope change.

Furthermore, this generated issues in terms of costing the project, and with ensuring that agreement was reached on revised costs. This resulted in disputes, and the chief executive having to fly out to Qatar to seek payment (House of Commons, 2018).

Subcontractors

At the point of Carillion's liquidation, industry bodies estimated that approximately 30,000 sub-contractors would be impacted (BuildUK, 2018). A later survey found that on average, they were owed £375,000 each (The Construction Index, 2018). Despite being a key signatory of the Prompt Payment Code in 2013, Carillion began increasing the length of payment terms to its suppliers. While the Code stipulated a maximum of 60 days between invoicing and payment and an intention to work towards 30 days (Mor et al., 2018), Carillion was insisting suppliers agreed to payment terms of up to 120 days.

Carillion had arranged an early payment facility for its suppliers whereby the supplier could choose to effectively sell their invoice to the bank and receive payment within 45 days. This arrangement, known as 'reverse factoring' allowed Carillion to retain the cash for longer and at the cost of the supplier, while at the same time, thanks to a loophole in the financial reporting rules, keeping this credit facility out of its total debt figures (HoC briefing paper). Thus, Carillion had turned its supply chain into a credit facility, the use of which it did not have to report in its statements.

Investor relations

The aforementioned ever-rising dividend would certainly have made Carillion an attractive holding at first glance. institutional investors such as UBS and Standard Life held large stakes in the company. However, as early as 2015, these investors began divesting their positions. this was due to 'concerns on a number of issues including strategy, financial management and corporate governance' (Skeoch and Gilbert, 2018). In April 2017, it was reported that Carillion

had enjoyed an 18-month period of being the most shorted stock on the London Stock Exchange (McCrum and Johnson, 2017). Thus, there was a large number of investors betting against it, having perceived its weakness and considered it overpriced. One research institute highlights Carillion's high 'probability of default' rating, which consistently outstripped that of the wider UK construction sector, even before the July profit warning (Ning, 2017). The analyst goes on to highlight the UK government's decision to award further large contracts, such as the High Speed 2 contract, after this trading update, as a point of reassurance. Thus, there is evidence to suggest that many in the City did foresee trouble ahead for Carillion.

Carillion's relationship with the UK government

Throughout its short existence, Carillion enjoyed a close relationship with the UK government. UK government contracts accounted for 45 per cent of its UK revenues in 2016 (National Audit Office, 2018). Carillion held a large number of UK government contracts spanning construction, infrastructure and services. It was not just involved in high-profile PFI construction projects; rather, it had contracts across the country ranging from rail electrification in Scotland to school facilities management in Oxfordshire (National Audit Office, 2018).

The Cabinet Office approach to managing the risks associated with strategic suppliers was to rate them on a four-point scale: green (no issues), amber (some material concerns), red (significant material concerns) and black (high risk). Despite the enormity of the July 2017 profit warning having come as a surprise to the government, Carillion's risk score was not upgraded to red until September 2017, and was never placed at the highest level, black (National Audit Office, 2018).

In addition, the government continued to award significant contracts to Carillion after the July trading update, including a share of a £1.4 billion joint venture contract as part of the High Speed 2 rail link project (Plimmer and Walker, 2017). These contracts, which had in large part

been drawn up before the profit warning, were signed as they contained provisions for the other joint venture partner or partners to take over a greater share of the contract should a partner collapse or otherwise fail to meet its obligations (National Audit Office, 2018).

In the days preceding Carillion's liquidation, its directors petitioned the government to provide short-term financial support in the form of bridging loans and guarantees in order to secure the future of the business (Green, 2018). They also warned of the potential dangers associated with allowing the business to collapse.

Following analysis of the options by the Cabinet Office, the government declined to provide this support, citing amongst various things concerns with the long-term viability of the business, the potential for repeated funding requests, and the possibility of setting precedent (National Audit Office, 2018). Resultantly, the company fell into liquidation.

5. Discussion

To answer the question of whether or not the liquidation was a Black Swan, the question of predictability must be addressed. The review of the literature has identified early warning signs as a key element of managing Black Swan type risks and the case study offers fertile ground for exploration and discovery of such indicators. We shall first examine the early warning signs that can be identified, before then considering the accounting practices, standards and audits which should have highlighted such indicators. This will allow a conclusion to be drawn on the nature of the event, answering the question of whether or not Carillion's liquidation can be considered a Black Swan event.

Early warning signs

In large organisations, and particularly in project-based organisations such as Carillion, some elements of financial statements increasingly tend towards a matter of judgement rather than necessarily a statement of fact. This is precisely the situation which led to Carillion's profit

warning in July 2017. Profit warnings are not in and of themselves rare events; they are a regulatory requirement which is activated when a company is likely to deviate by more than 10 per cent of its published forecasts. However, the magnitude of the Carillion profit warning was too large to be unable to locate. Moreover, the subsequently revised warning in September of the same year took the total to £1.15 billion, coincidentally equalling the sum of its profits for the previous nine years.

Notwithstanding the apparent surprise of the directors and of the shareholders, profit warnings do not emerge out of the blue: there is necessarily an event or series of events that causes the company to deviate beyond its stated expectations. During the inquiry into the liquidation, Carillion's directors pointed the finger at project-level events and at system-level events. However, the company was a project firm operating within a wider system. Thus, projects are, or should be, in the control of the firm, and the firm is, or should be, responsive to changes in its macroeconomic environment. In this case, it is necessary to take an outside view and examine the actions of the firm and the role it played in its own demise.

Accounting

In the years following 2011, there is a dramatic change of trend in the net income of the company. In only one of the years does it generate the cash to cover its stated net income, and even then only slightly. In 2012 and 2013, cash generation from operations crashes spectacularly. Looking back, this is a clear early warning sign of trouble in the firm.

This early warning sign is compounded by the introduction of Carillion's supply chain finance scheme, which begins in earnest in 2013. By reverse factoring suppliers' invoices, Carillion turned them into 120-day credit facilities, potentially providing it with a lifeline in a period of low cash generation. This management response to the cash flow problem is compelling evidence of a strategy tending increasingly to the short term: by dealing with the problem through

creative accounting rather than addressing its root cause, Carillion's management simply pushed it further down the road.

Another potential indicator from the financial statements comes in the year-on-year trend of the relationship between Carillion's current assets and current liabilities - its current ratio. Between the financial years of 2006 and 2011, Carillion's current ratio remained at less than one in every year bar one. This signifies that it was barely making enough money to make ends meet. This may go some way to explain its tendency towards large acquisitions during this period.

As Carillion grew in size, its debts grew with it. While much of its debt was used to fund acquisitions, the need for such substantial long-term borrowing is unclear. This is another indicator that the company's underlying performance was sub-optimal. The early warning sign here is perhaps beginning to become evident after 2013.

Until the financial year of 2006, goodwill represented a minor fraction of Carillion's balance sheet. The acquisition of Mowlem changed that: 2006 was the last year in which goodwill represented less than half of Carillion's non-current assets. This is significant because goodwill is an asset which in fact represents money that has already been spent: it is designed to account for the intangible benefits realised on acquisition. The retention of such vast amounts of goodwill may therefore be considered an early warning sign of the company's collapse; they were certainly an indicator of ill health. Had the company genuinely been generating substantial additional revenue as a result of the acquisitions, they would by definition be paying for themselves, and thus reduce the need to use the resultant goodwill to artificially inflate the company's financial position.

A tangential issue relating to the acquisition activity in which Carillion engaged is the growth of its pension liabilities. Carillion seems to have paid little regard to the growing deficit in its

pension funds. Moreover, it appears to have only two years, 2000 and 2003, in which its pension fund was not in deficit. Funding the pension pot was thus never an organisational priority for Carillion the firm was also overly focused on the short term: that it treated the paying down of the pension debt as a problem for another day is evident from its increasingly large deficit. The need for long term welfare for its employees was not compatible with its short term high-growth agenda. Thus, the increasing pension deficit may also be seen as a potential early warning sign.

Auditing and accounting standards

In March 2017, the board and the auditor, KPMG, approved the financial statements for 2016, which gave no explicit indication of the problems to come. Just three months later, the first profit warning, indicating a markdown of almost £1 billion, was given. It is surely inconceivable that there was no evidence of this impending situation, and yet the auditors failed to highlight anything to suggest that it may come about, and signed off the accounts on the basis of a going concern.

The second is that in that in Carillion's mid-term report for 2017, it was indicated that a further markdown of between £125 and £150 million would be required upon implementing reporting standard IFRS 15 from 2018. This is effectively a tacit admission that its accounting practices were so near to the borderline of acceptability that when a new and tougher standard was brought in they would have to restate their earnings in order to be compliant with them. This serves to underline the aggressive nature of their accounting practices.

Thus, Carillion's practices in regards to the presentation of its accounts were not necessarily in contradiction of the applicable regulations, but they certainly were evasive in terms of disclosing the reality of the situation. This is similarly reflected in the aforementioned discussions that

took place with the Pensions Regulator: twice, Carillion claimed to be unable to afford adequate pension deficit reduction plans, yet their published accounts presented a profitable, growing and successful company. There was a clear disjoint between appearance and reality.

Was the swan black, or just grey?

For the employees, suppliers and shareholders, liquidation must have seemed improbable indeed. An ever-rising dividend, and confidence wrought by the UK government – even in the face of an unprecedented profit warning – must have made these stakeholders feel secure. However, retrospective analysis seems to suggest that the directors of the company were either complicit in the causes of the liquidation, or so incompetent as to not have noticed them.

The company was being run with the goal of survival first, then growth at any cost. The long term seems not to have figured in the strategy. To label the liquidation as a Black Swan event would be to negate the complicity and culpability of the directors responsible for the good governance of the firm. Thus, the question of whether or not the liquidation was a Black Swan or not comes down to a matter of perspective. For those on the inside, it was foreseeable – if not necessarily inevitable. The directors of Carillion therefore faced perhaps a Grey Swan. They had access to early warning signs which indicated trouble ahead, but failed to act in order to attempt to change their course.

For everyone else, however, it can indeed be seen as a Black Swan, and an endogenous one at that. The extent of the impact was great and wide-ranging, and the immediate signs suggested that Carillion could be trusted. It seemed highly improbable that such a large and important contractor could simply disappear; yet, that was exactly what came to pass, in precipitate and costly fashion.

We have established that the liquidation of Carillion was not entirely improbable: there were early warning signs, but they were not heeded, and potentially not seen. However, the question

of its inevitability remains: had the early warning signs been noticed and acted upon, would it still have ended up in receivership? In order to answer this question, we shall consider why the early warning signs were either unseen or just ignored, how the organisation managed its programme of projects, and whether the business model it operated was a sustainable one.

Early warning signs: unseen or ignored?

Clearly, the main focus of the strategy driving the decision-making by the executives was to ensure that the company paid an increasingly large dividend every year. This is evidenced by the fact that it rose every year, regardless of decreasing profitability or increased leverage.

One may surmise that the reason for this increasing dividend was an exercise in smoke and mirrors: the implication of an increasing dividend is good financial health, increasing revenues, improved cash conversion, and so forth. Thus, the executives may have intended to use their power to pay an ever larger dividend to mask the underlying issues. In effect, this served as an attempt to mask the early warning signs we have identified in the previous section. This, combined with Carillion's extensive use of 'alternative performance measures' (as opposed to regulated metrics) throughout its annual reports, sought to reassure investors that the company was on a stable footing, even though a deeper analysis of the figures suggested otherwise.

Nonetheless, not all investors and analysts were convinced by this. Even as far back as 2015, some were raising serious concerns about the management of the firm and about the truth of its finances. That it was the most shorted stock on the London exchange for such an extended period is testament to the fact that whether or not the management perceived trouble ahead, the markets certainly did. It is clear that the dividend payment was part of an incentive structure in place which encouraged the directors to run the business in the way they did, and hence not to respond to the early warning signs: after all, while no director was a member of the pension schemes, many were shareholders themselves.

Correspondingly, a decision to pay down the pension deficit instead of continuing to fund an increasingly unaffordable dividend would have a negative impact on them personally. Moreover, a cut in the dividend may have caused shareholders to have greater doubts about the company and thus seek to divest. So, the system in which Carillion was operating was one in which the short-term shareholder interest was most incentivised. Yet shareholders too lost out as a result of the lack of long term focus. Those who retained their shares until the end found them worthless, as the company was wound up. Whether the early warning signs were unseen or ignored, the fact that they were not acted upon reflects poorly on the corporate culture permeating the Carillion executive. By only focusing on the short term at the detriment of all else, the company was set on a path that doomed it to fail.

Projects and programmes: a spectrum of competency

Carillion's capability to manage projects successfully is writ large in its annual reports. It is not well evidenced in the case study. Rather, the picture is one of an organisation in which projects are treated as highly isolated units. This is very reflective of the theme of project distance as identified in the literature. Carillion's involvement in Qatar embodies the idea of project distance, both on a physical and metaphorical level. The increasing drive towards the engagement in projects in the Middle East was prompted in part by the diminishing demand for public and private works in the UK following the financial crash, and in part by a simple desire for growth. Correspondingly, the directors looked further afield to find new opportunities.

However, there is no evidence to suggest that Carillion had the competencies required to operate in this regional market. For example, as evidenced by the huge number of changes requested on the Doha project, the culture surrounding project change control was different to that of Carillion's native markets. They were unable to respond to this in an effective manner. Similarly, because of the difficulties in obtaining payment for the work, senior executives including

the CEO were spending an inordinate amount of time travelling to and from the region in order to chase payments in person. Thus, their activity in this market continually and consistently took the focus away from their core business as it forced attention away from other areas of management. Again, we see evidence that the making of a quick buck was prioritised over long term strategy, which eventually had disastrous consequences.

Meanwhile, the example of the Royal Liverpool Hospital reflects another theme from the literature: that of organisational learning. On the face of it, the failure of several concrete beams installed by a sub-sub-contractor seems to be a case of pure bad luck. After all, the directors were at pains to point out that their focus was on rectifying the mistake rather than covering up the cracks, as it were. However, that the issue was allowed to happen in the first place raises a key flaw in the way in which Carillion managed its projects. By depending so heavily on external sub-contractors, it failed to learn from its own projects – both successful ones and failures. Despite having expertise in the construction of hospitals, Carillion managed to fail quite catastrophically to execute the Royal Liverpool Hospital project.

However, the key issue with regards to Carillion's programme management is its lack of overall focus. Its construction projects ranged enormously in size and scope, from roads to railways, and from hospitals to hotels. And it was not just construction – Carillion carried out a range of other contracts, such as service delivery, besides.

It is not the case that Carillion was entirely incompetent at the project level; some of its projects were successful. However, there is no evidence to suggest that it was competent at programme level. Rather than maintaining a coherent and focused programme of projects, it seems that the company relied on new business in order simply to compensate for those projects on which it was losing money. That it ultimately had to issue a series of profit warnings is reflective of this incoherence.

Fragility: inherent or inherited?

Carillion operated a business model that was fundamentally fragile. Fragile organisations are essentially defined as those organisations which respond poorly to external volatility, as opposed to robust organisations which are resilient to volatility, and 'antifragile' organisations which respond well to volatility. Clearly, Carillion was ultimately unable to respond to the volatility of the environment in which it operated. Reliant on new contracts to pay for existing loss making ones, it was branded a 'legal Ponzi scheme' by the House of Commons inquiry.

Carillion's fragility was clearly manifested in the latter years of its existence, as its debts increased and it became unable to satisfy its liabilities with the little cash it was in reality generating. Issues such as the pension deficit, which was chronically underfunded, quickly became too great for the company to handle, and it showed no capability to recover. It was for this reason that the government declined to offer it financial support in order to keep going: it would simply be throwing good money after bad. However, it is not the case that it suddenly became fragile; rather, it is possible that it was fragile ever since its inception. The construction sector is a risky one; the risks inherent to construction projects are compounded by the low margins offered. Yet this has long been the case, and there are examples of successful construction project firms.

Thus, we must first consider the response of Carillion to the sectoral volatility, not the sectoral volatility in and of itself. It is clear that Carillion was incapable of responding effectively from the fact that it needed new business to survive.

We must now consider how the case of Carillion can be used to improve outcomes across the sector, by teasing out the lessons to be learnt, and by so doing, to gain some value from a collapse whose cost will ultimately be borne out by us all.

What can be learnt from the case?

A key takeaway from the event is that early warning signs must be identified and responded to at the earliest opportunities. In the case of Carillion, some of these indicators surfaced many years before the eventual liquidation; that they remained unchecked highlights a certain normalisation of deviance within the firm. From an external perspective, a key early warning sign was the increasing leverage, both in absolute and relative terms, being deployed across the organisation. From pension deficits to supply chain financing, the evidence was there that the trend was towards an increasing inability to cover outgoings and liabilities, and not that there was any credible plan to reverse this pattern.

For a public company, this should be a simple metric to analyse. Yet in the case of Carillion, significant portions of its debt were obscured through accounting techniques, in order to present a more attractive picture to shareholders: if anything, the divergence of appearance and reality — and a desire not to rock the boat, manifested amongst other things by a relentless drive for higher dividends despite volatile core metrics — is a fundamental early warning sign if it can be perceived.

From an internal perspective, the need to constantly acquire new contracts in order to fund poorly performing ones is a further early warning sign that can be more widely applied. Fundamentally, this indicator highlights a basic inability to forecast and to manage costs. In the case of Carillion, it may be argued that this was precipitated by its vertiginous growth which led to it becoming unmanageably large, and lacking a clear picture of what its core business was. One way in which the identification of early warning signs could be improved is through the adoption of tougher reporting standards, and reporting standards better suited to project organisations.

When it comes to accounting, the accounting standard IFRS 15, to which Carillion was preparing to transition from January 2018, seeks to improve accounting practices relating to the management of contracts. It is telling that Carillion's 2017 mid-term financial statements included a £100 million write down in respect of the forthcoming changes: clearly, it was widely engaging in accounting practices that would soon have become unacceptable. Regardless of the statutory accounting standards, a firm with a genuine long term focus should seek to engage in accounting practices which present as true a picture as is possible. While the massaging of figures in the short term may assuage shareholders' doubts and avoid sufficiently critical scrutiny, it is not a solution which will ultimately add value: rather, it will perpetuate and compound problems, until the point that they become too great to handle.

As we have already examined, had these early warning signs been identified and acted upon, the liquidation may have been avoided. Many of the early warning signs originate long before the mid-2010s, when the tide was beginning to be seen to turn. Carillion's fate was not necessarily sealed in its very early years, but there was evidence even then that growth was pursued at the expense of real development.

Organisations wishing to reduce their exposure would benefit from considering early warning signs, especially at moments of significant business change such as a large acquisition. But it is not enough to watch for the early warning signs and respond. Organisations must also seek to avoid the causes of those early warning signs to prevent their very development. Organisational learning is one way of so doing.

Promoting organisational learning

Embedding organisational learning is not only a means of avoiding Black Swans, but it is also a vital means of adding value. Carillion claimed experience in a wide range of sectors but it is not clear how this experience was managed to ensure project success could be replicated. In

order to effectively embed a culture of organisational learning, it is necessary to have a certain cohesiveness to the portfolio of projects in the management of the firm. By ensuring that the programme is coherent, knowledge can be more directly applied across the various projects. Additionally, an organisation which manages learning effectively will be able to retain this knowledge for deployment in future, similar projects.

Again, this was not the case at Carillion. Instead, the company would take an indiscriminate approach to contract bidding, which meant their portfolio was highly diverse. A diverse portfolio is not necessarily a bad thing; a certain level of diversity is encouraged in order to manage the risk of being overexposed to any one sector. However, diversifying can also introduce new risks which in turn must be managed.

The real value that can be added by project-based firms such as Carillion is their expertise in managing projects, derived from a broad base of experience from their previous projects. This should allow them to effectively estimate costs and schedules, and bring expertise and knowledge to bear in the management of sub-contractors and project delivery.

Looking towards a more sustainable system

It must be acknowledged that, while Carillion's liquidation was primarily driven by internal forces, there is some culpability at a systemic level. There is necessarily a flaw in the system in which Carillion operated due to the fact that it was able to operate in the way it did for so long. The question that must be answered is whether the system merely enabled Carillion's bad practice to take place, or if it in fact encouraged it. The first aspect to consider is that of the impossibly low margins that Carillion seemed to accept on many of the contracts it signed. While not every circumstance can be foreseen, it is nonetheless key in any project to ensure that there is an adequate contingency fund.

Continually bidding low created the situation wherein Carillion was only ever just about making money, as evidenced by its consistently poor current ratio. This, combined with the examples of high profile loss making contracts, leads us to infer that in many cases, Carillion's new contracts were funding old, loss making ones. So, Carillion submitted low bids in order to win work, which it needed to keep existing projects going. These low bids were then accepted in order that projects be delivered at the lowest cost to the taxpayer. Yet ultimately the taxpayer has had to cover much of the liabilities left in the wake of Carillion's demise. Thus, the case shows the danger of operating a low-cost model: eventually, it ends up costing more.

For these companies, more patient capital is needed. Organisations must have the margin to be able to invest in themselves in order to develop. In this way, innovation can be encouraged, learning can take place, and outcomes can be improved. Construction in particular is not a short term game. The benefits of projects in this sector are realised over tens of years at least. The value of prioritising inward investment in ensuring that these benefits are indeed realised, rather than guaranteeing a reliable annual return for shareholders, is great.

This is not to say that the private sector has no place in the delivery of public projects. On the contrary, the private finance initiative has shown to improve outcomes of projects in general. But this must be managed in a sustainable way, delivered through genuine partnerships between the state and private enterprise. A new way of managing the relationship between the state as client and the private sector as supplier is needed. This should be a relationship based on sustainability, transparency and mutual accountability, wherein a culture of innovation is fostered and long term investment is incentivised.

One way in which this may be achieved is through the development of a framework through which project performance can be assessed which prioritises accuracy and transparency over

subjective judgement and opaqueness. In this way, comparable project level reporting can be achieved and made public, thereby ensuring project firms and government are held to account.

Thus, the collapse of Carillion should hasten a new era of sustainable contracting, which benefits both the firms and the wider public. As the largest customer and the regulator, the government should lead the way in ensuring that project contracts are awarded on the basis of sustainability and openness, rather than simply considering price alone. This, combined with a less shareholder-focused firm, should make the sector at large less fragile and unlock the ability to invest for the long term, instead of being focused only on the short term.

6. Conclusions and further research

The liquidation of Carillion can be considered a Black Swan event, and moreover, this is a useful metaphor through which to analyse it. As a result of exploring the collapse through this metaphorical lens, we have been able to draw deeper insights into its causation and the ways in which it may have been foreseen, through the use of early warning signs, and avoided, through the deployment of organisational learning.

We conclude that the liquidation of Carillion was potentially inevitable, by taking a retrospective study of its financial indicators. Had the identified early warning signs been addressed, then the situation may not have developed as it did. Nonetheless, by 2017, it was too late. The business model that Carillion was operating was flawed beyond redemption and ultimately, the liquidation had to happen as the company was no longer sustainable.

Although the collapse was costly and impactful, there can be some value extract from it as lessons are there to be learnt. Particularly, that project-based organisations must actively seek early warning signs of trouble ahead. They must respond to these indicators with decisive, corrective action. Organisations must leverage their intellectual resources by facilitating organisational learning at and between every level: outcomes are improved by learning from

failures and successes, and applying that learning to new and existing projects. Finally, the governmental approach to contracting must change in order not to encourage the existence of models such as that of Carillion. By stopping the practice of accepting only the lowest bids, and by encouraging sustainable, patient inward investment, the government can use its significant influence in the sector to effect positive change and improve outcomes for all.

This research prompts the need for further research into a framework through which the performance of public construction projects can be meaningfully and accurately assessed to enable strategic decision-making through transparency and meaningful accountability. Additionally, further research is necessary in the area of how project-based firms in the construction sector can learn from the project-based firms in other sectors, the productivity of which has dramatically outstripped that of constructors.

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