WHAT DETERMINES TAKEOVER LIKELIHOOD? A REVIEW AND PROPOSITIONS FOR FUTURE RESEARCH

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Abstract

Prior takeover prediction research has advanced eight hypotheses to explain why specific firms are targeted through takeovers (Palepu, 1986; Powell, 2001; Tunyi, 2021a). However, takeover targets remain difficult to empirically predict *ex-ante*, perhaps because these established sets of hypotheses do not substantially explain takeover likelihood (Danbolt, Siganos, & Tunyi, 2016). This paper reviews the literature on takeover prediction, particularly focusing on theory, propositions and testable hypotheses on the factors that drive firms' takeover likelihood. Drawing from prior research outside this literature, the paper then develops conceptual arguments underlying six new predictors of firms' takeover likelihood including; information asymmetry, mergers and acquisitions (M&A) rumours, financial distress, payroll synergies, share repurchases and industry competition. Specifically, we predict that a firm's likelihood of receiving future takeover bids increases with merger rumours and industry competition and declines with information asymmetry and share repurchases. Additionally, takeover likelihood plausibly has an inverse U-shaped relationship with payroll excesses and the level of financial distress.

Keywords: M&A Targets, Target Characteristics, Takeover Prediction, Conceptual Hypotheses, Literature Review

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1. INTRODUCTION

Mergers and acquisitions (M&A) has remained a ubiquitous feature of the corporate landscape. As documented in prior research, over the last five decades, major economies (including the G7 countries) have witnessed significant growth in M&A activity, captured by the number and value of M&A deals completed (Alexandridis, Antypas, & Travlos, 2017; Brooks, Chen, & Zeng, 2018; Renneboog & Vansteenkiste, 2019; Tunyi, 2021b). The growth in M&A activity has spurred substantial growth in M&A research focusing on understanding the phenomenon and explaining managerial decisions around M&A. One important strand of the research — the takeover prediction literature —

focuses on explaining why takeovers occur and how acquiring firms select their targets (Brar, Giamouridis, & Liodakis, 2009; Danbolt et al., 2016; Hasbrouck, 1985; Palepu, 1986; Powell, 2001; Tunyi, Ntim, & Danbolt, 2019). The current study aligns with this literature.

The profiling of takeover targets is important for several reasons. From an investment stance, the takeover literature has recurrently documented the fact that significant abnormal returns accrue to merger targets while acquirers earn near-zero abnormal returns from merger activity (Alexandridis et al., 2017; Danbolt et al., 2016; Faccio, McConnell, & Stolin, 2006; Franks & Harris, 1989; Goergen & Renneboog, 2004; Gregory & O'Donoboe, 2014; Jaffe, Jindra, Pedersen, & Voetmann, 2015; Jensen & Ruback, 1983; Renneboog & Vansteenkiste, 2019; Tunyi & Machokoto, 2021; Wang & Lahr, 2017; Xu, 2017). Prior studies exploring returns to targets suggest that these firms earn between 19% and 31% abnormal returns in the days and months around the takeover announcement (Franks & Harris, 1989; Jensen & Ruback, 1983). Presumably, if a profile for takeover targets can be established, then investors can enjoy these abnormal returns by predicting and investing in firms that can potentially become takeover targets. This issue — the development of a profitable investment strategy based on target profiling — has been the focus of several prior studies in the M&A literature (Ambrose & Megginson, 1992; Barnes, 1999, 2000; Brar et al., 2009; Danbolt et al., 2016; Espahbodi & Espahbodi, 2003; Palepu, 1986; Pasiouras, Tanna, & Zopounidis, 2007; Powell, 1997, 2001, 2004; Rodrigues & Stevenson, 2013).

Palepu (1986) is regarded as a seminal study in this literature. Amongst other things, the study advanced six hypotheses for target profiling (including management inefficiency, growth resource mismatch, industry disturbance, size, market-to-book and price-earnings hypotheses). While these characteristics have recurrently been used by prior studies seeking to develop target prediction models, it is now widely accepted that prediction models based on these characteristics have low predictive power (Ambrose & Megginson, 1992; Barnes, 1999, 2000; Danbolt et al., 2016; Espahbodi & Espahbodi, 2003; Powell, 1997, 2001; Tunyi, 2019). Several studies have called for further research into the factors that drive takeovers and shape the selection of target firms (Danbolt et al., 2016; Tunyi, 2019; Tunyi et al., 2019). This study responds to these calls.

This conceptual paper proposes new theoretically grounded hypotheses for researchers to consider in developing prediction models. We advance six new hypotheses including information asymmetry, payroll synergies, merger rumours, financial distress, share repurchases and industry competition hypotheses of takeovers. Specifically, we predict that a firm's likelihood of receiving future takeover bids increases with merger rumours and industry competition and declines with information asymmetry and share repurchases. Additionally, takeover likelihood plausibly has an inverse U-shaped relationship with payroll excesses and the level of financial distress.

The paper makes several important contributions to the literature. Firstly, it is the only study to significantly extend the Palepu (1986) takeover prediction hypotheses, which have been recurrently used in the literature despite evidence that models that rely on these hypotheses have low predictive power (Danbolt et al., 2016; Powell, 2001). Secondly, and in relation to the first contribution, the paper responds to several calls for further research into the determinants of takeovers (Danbolt et al., 2016; Powell, 2001; Tunyi, 2019) and offers researchers a timely extension to the standard prediction modelling framework. This potentially creates opportunities for further empirical work that tests the validity of the propositions. Thirdly, the paper draws on established theory and evidence from the takeover prediction literature and explains how these have bearing on takeovers. By so doing, the paper extends various research literature and demonstrates how ideas developed out of particular literature can be generalised and extended to make inferences in other areas.

The rest of the paper is organised as follows. Section 2 discusses the determinants of firms' takeover likelihood based on prior research. Section 3 advances a new hypothesis for takeover prediction or likelihood modelling. Finally, Section 4 presents closing remarks.

2. LITERATURE REVIEW

2.1. Background on modelling takeover likelihood

The process of modelling takeover likelihood — the probability that a certain firm i will receive a takeover bid in a period t — starts with identifying determinants of takeover likelihood. Specifically, researchers start by identifying firm characteristics that make them susceptible to takeovers or more attractive to potential bidders. Takeover likelihood is then empirically modelled as a probit or logit function of a set of these firm characteristics. A similar process is followed when predicting other corporate events such as bankruptcy, credit rating changes, and large lay-offs, amongst others (Danbolt et al., 2016; Powell & Yawson, 2007; Taffler, 1984).

Early takeover prediction studies (Monroe & Simkowitz, 1971; Stevens, 1973) employed step-wise processes, sometimes combined with factor analysis to select suitable variables for inclusion in the model. In most instances, the choice of variables was unclear and was not theoretically supported. Palepu's (1986) study introduced a systematic process for selecting variables for inclusion, backed by theory. In essence, Palepu (1986) advanced six hypotheses for takeover prediction. These hypotheses include management inefficiency, growth-resource mismatch, industry disturbance, firm size, market-to-book and price-earnings hypotheses. Other studies (Ambrose & Megginson, 1992; Brar et al., 2009; Powell & Yawson, 2007; Powell, 1997) have proposed further hypotheses for prediction such as the tangible property, free cash flow and firm age hypotheses. We briefly summarise these hypotheses and their proxies in Table 1.

Table 1. Determinants of takeover likelihood from prior research

Hypotheses	*Theory and underlying rationale*	*Proxies*	*References*
Inefficient management	Consistent with the market for corporate control theory, firms run by underperforming managers are more likely to face takeover challenges from better quality managers.	Accounting (profitability) and stock market (abnormal returns) measures of performance	Manne (1965), Palepu (1986), Tunyi et al. (2019)
Undervaluation (relatively)	Undervalued firms are more likely to be targeted by bidders seeking to buy cheap assets.	Tobin's Q and market-to-book ratio	Dong, Hirshleifer, Richardson, and Teoh (2006), Palepu (1986)
Growth-resource mismatch	Firms exhibiting a mismatch between their growth prospects and the resources at their disposal are more likely to be acquired by bidders seeking to derive value through complementarity and synergy.	Sales growth, liquidity and leverage	Palepu (1986), Danbolt et al. (2016)
Industry disturbance	Completed takeovers within an industry incentivises other firms to engage in subsequent takeovers either to retain their competitive position or as a way of mimicking their peers.	Disturbance dummy which captures prior takeover activity within the industry	Palepu (1986), Tunyi (2019)
Firm size	Due to transaction cost constrains and the challenges of post-merger integration, smaller firms within an industry are likely to face higher takeover pressures compared to their larger counterparts.	Measures of firm size such as total assets or market value	Palepu (1986), Tunyi (2021a)
Firm cash flow	Acquirers plausibly seek targets with more free cash flow as they can use this free cash flow to offset the cost of the acquisition in the short term. Free cash flow also signals that firms lack suitable investment to opportunity for a bidder to create value by redeploying the cash flows into profitable investment projects.	Free cash flow is computed from cash flows from operations, investment and financing activities	Powell (1997), Jensen (1986), Danbolt et al. (2016)
Tangible assets	Acquirers can use their targets tangible assets as collateral to raise cash to finance the acquisition. Also tangible assets are easy to value hence reducing the acquirers' risk of overvaluing or overpaying for the target.	Property plant and equipment	Ambrose and Megginson (1992), Danbolt et al. (2016)
Firm age	Younger firms have new technologies, products and markets making them attractive targets to older firms seeking to re-invent themselves.	Age of the firm in years	Loderer and Waelchli (2015), Agarwal and Gort (2002)

2.2. Theoretical background and empirical evidence

Table 1 summarises the arguments underlying hypotheses for predicting targets proposed by prior studies. This section briefly discusses the empirical evidence in relation to these hypotheses. A more detailed discussion of these issues is presented in Tunyi (2021a).

Building on the agency (Jensen & Meckling, 1976) and the market for corporate control theories (Manne, 1965), the efficient management hypothesis predicts that underperforming firms will have a higher takeover likelihood as management teams compete for the control of limited shareholder resources. Several studies in the takeover prediction literature have explored this hypothesis with mixed results. Consistent with the hypotheses, some studies find that targets report lower accounting and stock market performance ahead of takeovers (Barnes, 1999; Ouzounis, Gaganis, & Zopounidis, 2009; Pasiouras et al., 2007; Powell & Yawson, 2007). However, others find no significant difference between targets and non-targets in terms of accounting profitability and stock market performance (Ambrose & Megginson, 1992; Powell, 1997). Further, some researchers report mixed results from different proxies (Brar et al., 2009; Palepu, 1986; Tunyi et al., 2019).

Drawing from the valuation theory of mergers (Trautwein, 1990) and the misvaluation hypothesis (Dong et al., 2006; Shleifer & Vishny, 2003), the firm undervaluation hypothesis predicts that takeover likelihood increases with firm undervaluation, as bidders seek to profit by acquiring cheap targets. Prior studies have documented empirical support for this hypothesis. Specifically, several studies (Hasbrouck, 1985; Palepu, 1986; Powell, 1997; Walter, 1994) have shown that takeover likelihood declines with firms' market-to-book ratio. Walter (1994) contends that the market-to-book ratio is the most important ratio when differentiating between targets and non-targets.

The neoclassical view of mergers holds that mergers are perpetrated to create value through synergies and complementarities (Manne, 1965; Trautwein, 1990; Tunyi & Ntim, 2016). Merging firms can also create synergies in operations through economies of scale and scope, the elimination of redundancies and the optimisation of the use of equipment, facilities and resources. Managerial synergies, for example, can be achieved when the bidder has superior management capability (in, for example, planning, controlling, or monitoring) which can improve the target's operations (Trautwein, 1990). Building on the neoclassical motive of takeovers (Manne, 1965; Palepu, 1986; Trautwein, 1990), the growth-resource mismatch hypothesis asserts that M&A are pursued by resource-rich or resource-poor bidders looking for strategic partners (resource-poor or resource-rich targets, respectively) to complement. For example, resource-rich bidders with low growth opportunities

generate growth opportunities by acquiring resource-poor targets with high growth opportunities. Such an alliance creates synergies as the bidder's excess resources are used to pursue the target's growth opportunities. While a few studies (Espahbodi & Espahbodi, 2003; Palepu, 1986) find some evidence that a firm's takeover likelihood increases with a mismatch between growth opportunities and firm resources, several studies (Danbolt et al., 2016; Tunyi, 2019; Tunyi et al., 2019) find no empirical support for this hypothesis.

The industry disturbance hypothesis stems from the economic disturbance theory (Gort, 1969) and is consistent with institutional theory (DiMaggio & Powell, 1983). The hypothesis suggests mergers tend to cluster at the industry level because a firm's incentive to merge (as a strategy to improve its capacity to compete) increases when other firms within the industry merge. As suggested by Tunyi (2021b), following mergers, rival firms have an incentive to mimic their peers by also initiating acquisitions so as to maintain legitimacy (DiMaggio & Powell, 1983). Empirical support for this hypothesis is, however, weak. Specifically, several studies (Danbolt et al., 2016; Palepu, 1986) find no evidence that prior takeovers within an industry increase the propensity to observe further takeovers in the short run.

Palepu (1986) argues that takeover probability is decreasing in firm size, with small firms highly susceptible to takeover bids. The hypothesis is built on the premise that several size-related transaction costs are associated with acquiring a target and, therefore, the number of viable bidders for a target decreases as its size increases (Gorton, Kahl, & Rosen, 2009; Palepu, 1986). Prior empirical evidence (Brar et al., 2009; Palepu, 1986) broadly supports this hypothesis although (Tunyi, 2019) shows that in the absence of sampling biases; firm size has an inverse U-shaped relationship with takeover likelihood.

Prior research suggests that excess free cash flow can increase takeover likelihood — the free cash flow hypothesis — for two reasons. Firstly, excess free cash flow (not returned to shareholders) is likely to exacerbate the agency problem (Jensen, 1986), thereby forcing a response from the market for corporate control (Manne, 1965). Secondly, acquirers are attracted to firms with excess free cash flow as this cash can be used to reduce the net cost of acquisition. There is mixed empirical support for the hypothesis. Consistent with the hypothesis, some studies (Espahbodi & Espahbodi, 2003; Powell, 1997) find that targets have comparatively higher levels of free cash flow when compared to bidders. Nonetheless, other studies (Brar et al., 2009; Powell & Yawson, 2007) do not find a significant difference between the levels of free cash flows in targets and non-targets.

Assets provide financial slack to firms, enabling them to raise debt capital (rather than turn to the stock market) when needed (Myers & Majluf, 1984). Stulz and Johnson (1985) and Ambrose and Megginson (1992) contend that the level of tangible fixed assets (property, plant and equipment) within a firm can proxy its debt capacity. Hence, a firm with a high proportion of tangible fixed assets in its asset portfolio (i.e., high debt capacity) is likely to be a more attractive takeover target. This is because the tangible assets can be used as collateral security by a prospective bidder to raise some of the funds needed to finance the proposed takeover. Prior research generally finds support for this hypothesis. Specifically, prior studies (Ambrose & Megginson, 1992; Espahbodi & Espahbodi, 2003; Powell, 1997) find that takeover probability increases with the proportion of tangible assets in a firm's total asset portfolio.

Finally, prior literature frequently attributes firm survival (age) to the ability of firms to learn actively or passively over time (Bhattacharjee, Higson, Holly, & Kattuman, 2009; Pakes & Ericson, 1998). In line with the learning perspective, Bhattacharjee et al. (2009) contend that exit rates (due to the hazard of takeovers or bankruptcies) should decrease with age. Prior studies, therefore, hypothesise that takeover likelihood should increase with age and find some evidence in support (Brar et al., 2009; Danbolt et al., 2016).

2.3. A note on the determinants of acquisition likelihood

While the focus of this paper is on takeover target prediction, it is worth briefly noting some developments in the literature on modelling acquisition likelihood — the probability that firms will seek to acquire others.

Acquisitions are resource-intensive projects as significant resources are required to purchase and integrate the target within the acquirer's operational framework. This suggests that comparatively older and larger firms, with significant financial resources (cash flows and reserves) or, at least, access to the same, are more likely to engage in acquisitions (Ambrose & Megginson, 1992; Harford, 1999; Tunyi, 2021b). In terms of access to debt finance, firms with low leverage and significant intangible assets can use these assets as collateral to secure debt finance Tunyi (2021b).

The free cash flow hypothesis suggests that firms with excess cash flows (over and above the level needed to invest in all positive net present value projects) may deploy this excess free cash in acquisitions, albeit wastefully (Jensen, 1986). Harford (1999), for example, finds that cash-rich firms are more likely to engage in acquisitions when compared to their cash-poor counterparts. They may create synergies by acquiring cash-poor targets (Danbolt et al., 2016). However, the empirical evidence suggests that these firms destroy value through acquisitions, partly by engaging in diversifying acquisitions (Harford, 1999) but also by generally over-paying for their targets (Malmendier & Tate, 2008).

Several firms engage in M&A to either improve their market power or use leverage the same to generate value for their shareholders (Hussain, Tunyi, Sufyan, & Shahab, 2022). Firms operating in highly competitive industries can plausibly improve their competitive positioning and strengthen their market power by consolidating, merging with or acquiring other actors within their industry (Hussain et al., 2022; Powell & Yawson, 2007).

Prior studies have explored how firm valuation considerations drive takeover decisions (Dong et al., 2006; Draper & Paudyal, 2008; Shleifer & Vishny, 2003). One school of thought is that firms

that are overvalued have an incentive to use their overvalued stock as cheap currency to acquire targets that are relatively undervalued (Dong et al., 2006). This theory explains why certain acquirers may be motivated to engage in cash acquisitions. On the flip side, Draper and Paudyal (2008) argue that firms that are undervalued due to high information asymmetry may engage in M&A to attract investor attention, address the information asymmetry problem and, possibly, stimulate a positive stock revaluation.

3. DISCUSSION

In this section, we discuss new hypotheses for takeover target prediction by drawing from research outside the takeover prediction literature.

3.1. An information asymmetry hypothesis of takeovers

We first contend that the value created by the acquirer through takeovers systematically decreases with target information asymmetry and hence, firms with high levels of information asymmetry are less likely to attract takeover bids. Information asymmetry arises when agents have unequal access to information required to make an informed decision such that one party (in our case, acquirers) relies on probabilities of the true state. The role played by information asymmetry — the information asymmetry hypothesis — has been studied in contexts outside takeover prediction. Krishnaswami and Subramaniam (1999), for example, use the information asymmetry hypothesis to explain why corporate spin-offs (and not many other restructuring activities) create value for shareholders.

They argue that spin-offs create value by reducing information asymmetry between the firm and its investors—the restructuring of the firm into smaller more focused units allows investors to better understand its position (Krishnaswami & Subramaniam, 1999). Empirically, Krishnaswami and Subramaniam (1999) show that the gains from spin-offs are positively related to the level of information asymmetry before the spin-off.

The role of information asymmetry in M&A decision making has been explored by prior researchers. Draper and Paudyal (2008), for example, show that bidders engage in acquisitions to reduce information asymmetry between themselves and the market — M&A bids spur investors to reassess the value of the bidder. Hansen (1987) argues that it is optimal for bidders to use stock as acquisition currency when the level of information asymmetry between target and bidder is high as this allows the bidder to share acquisition risk with target shareholders. Consistent with this view, Officer, Poulsen, and Stegemoller (2009) contend that bidders gain more from acquisitions when they use stock as transaction currency when acquiring difficult-to-value takeover targets as this mitigates some of the problems caused by information asymmetry.

Despite the substantial research on the causes and consequences of information asymmetry, there is little established theory on how information asymmetry moderates a firm's takeover likelihood. Specifically, to our knowledge, no prior study has considered how information asymmetry moderates a firm's acquisition likelihood. We anticipate that, on average, bidders will prefer to acquire targets that they understand, i.e., low information asymmetry between target and bidder. This is, perhaps, the case as information asymmetry will lead to systematic overvaluation of targets by the bidder, and hence, a decline in the post-merger value of the combined firm. We illustrate this below.

By definition, synergies (V_S) are created when the value of the combined firm or the post-merger value of the bidder (V_C) exceeds the sum of the pre-merger values of the target (V_T) and bidder (V_B) pre-merger. V_T and V_B are the intrinsic values of the target and the bidder (respectively) known only to their managers. The bidder evaluates the target as part of the merger process and assigns the target a value (V_X). In the absence of information asymmetry between the bidder and target management, $V_X = V_T$. That is, the bidder's valuation of the target is equal to the target's intrinsic value — its true value excluding any potential synergies created through a merger. However, when there is information asymmetry between bidder and target management, $V_X - V_T > 0$. That is, the bidder's valuation of the target will be higher than the target's intrinsic value. With information asymmetry, the bidder systematically over-values (but never undervalues) the target. Specifically, in completed deals, $V_X - V_T < 0$, is not observed (on average) as the target's management is unlikely to accept any bids below the intrinsic value of the target.

A proportion of the value created through the merger is shared with the target shareholders through the payment of a merger premium (V_P). The value of the combined firm (V_C), irrespective of the method of payment (cash, equity or mixed) is given by equation (1) as follows:

$$V_C = V_B + V_T + V_S - (V_X + V_P) \quad (1)$$

As in equation (1), the post-merger value of the combined firm (V_C) is equal to the sum of the value of the bidder (V_B), target (V_T) and synergies created (V_S) less acquisition expenditure ($V_X + V_P$). Equation (1) can be rearranged as follows:

$$V_C = V_B + V_S - (V_X - V_T) - V_P \quad (2)$$

The term $V_X - V_T$, which is the difference between the bidder's valuation and the intrinsic value of the target, is an overpayment due to information asymmetry. This difference increases with the level of information asymmetry as the bidder is likely to highly overvalue a more opaque target than a less opaque target. In the absence of information asymmetry, $V_X - V_T = 0$ and the value of the combined firm (V_C) is given by equation (3) as follows:

$$V_C = V_B + V_S - V_P \quad (3)$$

Hence, information asymmetry between the bidder and target leads to a reduction in the bidder's post takeover value (or value of the combined firm), with the value-reduction increasing

with target opaqueness or the level of information asymmetry. Therefore, bidders are plausibly attracted to less opaque as this allows the bidder to achieve a higher post-merger value. From a neoclassical stance, information asymmetry should reduce a firm's likelihood of receiving a bid (from a value maximising bidder), all things being equal.

3.2. A payroll synergies hypothesis of takeovers

The potential for mergers to create synergies is generally touted by managers as the main rationale for engaging in mergers. These synergies appear to be mainly generated by cutting operating costs (Devos, Kadapakkam, & Krishnamurthy, 2009), which mostly constitute personnel costs (Haynes & Thompson, 1999). Haynes and Thompson (1999), by reviewing the case of UK mutual funds, find that takeovers are followed by three years of negative effects on the demand for labour. This finding — a decline in demand for labour post acquisitions — has been replicated across different studies and institutional settings (Conyon, Girma, Thompson, & Wright, 2002; Kubo & Saito, 2012; Lehto & Böckerman, 2008). Shleifer and Summers (1987) argue that much of the benefits to merging firms come from the termination of long term contracts with employees. After investigating nine bank mergers in the US, Rhoades (1998) finds that staff reduction constituted the largest element of cost reduction and synergy creation in bank mergers. In their sample, on average, over 50% of total cost savings post-merger are in payroll reductions (Rhoades, 1998). The evidence, therefore, suggests that payroll savings constitute one of the main forms through which synergy can be achieved through mergers. However, prior takeover prediction studies do not consider how payroll costs, given their role in the generation of synergies, affect a firm's takeover propensity.

Two types of synergies — cost synergies and revenue-enhancing synergies — are created through mergers (Capron, 1999; Comment & Jarrell, 1995; Houston, James, & Ryngaert, 2001). Cost synergies are generally achieved through asset divestitures (including personnel cutbacks) while revenue-enhancing synergies are achieved through the efficient redeployment of resources (physical assets and personnel) to improve corporate earnings (Capron, 1999). In search of value, bidders may, therefore, seek firms with excess personnel as these firms offer opportunities for synergy creation through divestitures and/or redeployment. Prior evidence outside the prediction literature suggests that the potential to achieve such synergies may depend on the underlying institutional context. Gugler and Yurtoglu (2004), for example, find that European (including the UK) firms have a high labour-adjustment cost when compared to their US counterparts, primarily because European employment regulations provide stricter employment protection which makes it comparatively difficult to lay off staff, particularly through collective dismissals (Gugler & Yurtoglu, 2004). For this reason, some European firms carry excess labour due to the challenges (e.g., litigation) and costs (e.g., compensation and corporate reputation) of firing employees.

Corporate reorganisation through M&A is, perhaps, an effective way of achieving the desired restructuring (at least, in Europe) as a new management team is less likely to uphold existing employee contracts (Gugler & Yurtoglu, 2004; Shleifer & Summers, 1987). Also, the transfer of corporate ownership from the target to the bidder, perhaps, provides a strong argument for engaging in restructuring initiatives such as layoffs. Indeed, evidence from prior research (Gugler & Yurtoglu, 2004; Shleifer & Summers, 1988) suggests that some firms may deliberately engage in M&A (as a takeover target) to create shareholder value by shedding their excess human resources. Such a transaction also presents bidders with an opportunity to generate operational synergies through increased target efficiency. In such cases, bidders with higher technological know-how (such as the mechanisation of manual processes) are, potentially, able to extract rents from this knowledge and capability by acquiring labour-intensive firms and shedding the excess human resources. Given the empirical finding that a reduction in payroll costs is one of the main ways of generating synergies in mergers (Devos et al., 2009; Haynes & Thompson, 1999; Shleifer & Summers, 1987), a firm's takeover likelihood is likely to increase with its payroll costs.

Nonetheless, it is unlikely that the relationship between takeover likelihood and (excess) payroll costs persists linearly. While the redeployment and divestment (layoffs) of human resources can be a strategy to create synergies from mergers (Devos et al., 2009; Haynes & Thompson, 1999; Shleifer & Summers, 1988), the associated costs (e.g., compensation and reputational effects) might result in the creation of negative synergies at very high levels (Krishnan, Hitt, & Park, 2007). Besides increasing the complexity of the restructuring process, very large layoffs are likely to lead to significant or costly compensation schemes. Such layoffs are also likely to be met with stiff resistance from managers and employees with further effects on retained employee motivation and performance. Further, protracted litigation and court battles with damaging effects on corporate reputation cannot be ruled out. These arguments suggest that despite the potential for synergies, takeover likelihood will, perhaps, decline with payroll costs when the target has very high levels of payroll costs. This suggestion is consistent with Pagano and Volpin (2005) who argue that managers can use high employee wages and long-term contracts as a strategy to defend against unwanted takeovers.

Summarily, takeover likelihood plausibly increases with the potential for payroll synergies due to excess payroll in the target. However, this relationship is unlikely to be linear. Specifically, at high levels of excess payroll, negative synergies are created as the costs and reputational effects of asset divestitures become too high. The implication is an expectation of an inverse U-shaped relationship between corporate payroll and a firm's takeover probability.

3.3. A merger rumours hypothesis of takeovers

While there is seemingly an obvious relationship between takeover rumours and subsequent takeovers of rumoured targets, no prior empirical

studies explore the ability of takeover rumours to predict future takeovers. Oberlechner and Hocking (2004) define rumours as "allegations which are passed along accompanied by doubt rather than by evidence" (p. 420). Rumours bear the characteristics of news since rumours may be positive or negative and rumours explain important events (Oberlechner & Hocking, 2004). In their interviews with trading experts, Oberlechner and Hocking (2004) find that trading experts have to evaluate the validity of every piece of information (rumour) they received in order to outperform the majority of market participants who "just assume the news (rumour) is correct" (p. 421). This suggests that a robust takeover prediction model which incorporates but does not entirely depend on takeover rumour information might provide a way of deciphering rumours.

Van Bommel (2003) examines an informed investor's motivation for spreading stock tips or rumours. Since rumours are imprecise, there is a likelihood that prices will be positively biased allowing the rumourmonger the opportunity to carry out two profitable trades — first when the rumourmonger has private information and next when the market overreacts (Van Bommel, 2003). Van Bommel (2003) finds that rumours are informative at equilibrium, thus allowing rumourmongers (as well as their followers) to outperform uninformed investors. However, rumours might carry honest information, no information or contrary information. Van Bommel (2003) shows that rumourmongers are more likely to spread honest rumours due to the moral hazard associated with bluffing or cheating. A rumourmonger who bluffs or cheats will benefit from misleading the market in the first instance but will be unable to "sell" rumours in the future.

Pound and Zeckhauser (1990) investigate the effects of takeover rumours from the "Heard on the street" column of the *Wall Street Journal (WSJ)* on stock prices. Pound and Zeckhauser (1990) conclude that the market is efficient in responding to this information as no significant returns can be made from investing in rumoured targets once the rumours are published. Importantly, Pound and Zeckhauser (1990) find that more than 40% (18 out of 42 firms) of the rumoured targets in their sample actually received a bid within one year of the rumour publication. Similarly, in their study of 362 tender offers between 1981 and 1995, Jindra and Walkling (2004) find that 7% of the takeovers are preceded by rumours. In line with the contention that rumours are informative at equilibrium (Van Bommel, 2003) and the finding that several tender offers are preceded by rumours (Jindra & Walkling, 2004; Pound & Zeckhauser, 1990), it is, therefore, plausible that a firm's takeover likelihood increases with the emergence of merger rumours.

3.4. A financial distress hypothesis of takeovers

Firms may take on excess debt levels as a way of shielding themselves from future takeovers. This increased debt, nonetheless, engenders a new risk — the risk of bankruptcy or financial distress — when the firm is unable to generate sufficient cash flows to meet its debt obligation. This risk of bankruptcy is likely to be faced mainly by poorly performing firms with high levels of leverage (Shumway, 2001). This suggests a potential interaction between leverage, financial distress risk and performance in moderating a firm's takeover risk.

The relationship between a firm's takeover likelihood and its probability of financial distress appears to be unclear. On the one hand, firms with a high likelihood of facing financial distress can be regarded as having inefficient management teams and, therefore, being suitable takeover targets. These firms are also likely to be more open to takeovers, which, perhaps, are a better alternative to bankruptcy (Powell & Yawson, 2007). On the other hand, financial distress caused by excessive leverage might make a firm an unattractive takeover target as the bidder is bound to inherit the debt and debt conditions of the target. Jones and Hensher (2007), for example, find that distressed firms that exit the industry through acquisitions have comparatively lower leverage when compared to distressed firms that go into administration, receivership and/or liquidation. This suggests that takeover likelihood may increase with financial distress up to a certain level of financial distress over which distressed firms become unattractive as takeover targets. Empirically, we hypothesise an inverted U-shaped relationship between takeover likelihood and financial distress.

3.5. A share repurchases hypothesis of takeovers

Firms sometimes engage in share repurchase programmes during which they buy back their shares from current shareholders. The use of share repurchases has increased significantly over time (Billett & Xue, 2007; Grullon & Michaely, 2002, 2004) as fewer firms are paying dividends over time (Fama & French, 2001). This suggests that share repurchase programmes are being used as a preferred means of distribution of excess cash to shareholders over dividends (Grullon & Michaely, 2002). Prior research asserts that share repurchases play several roles including the distribution of free cash flows, signalling of firm undervaluation, firm capital structure readjustment and takeover defence strategy (Billett & Xue, 2007; Brav, Graham, Harvey, & Michaely, 2005; Dittmar, 2000; Grullon & Michaely, 2002, 2004; Harris & Raviv, 1988; Jagannathan, Stephens, & Weisbach, 2000).

In the Harris and Raviv (1988) model, firms defend against takeovers by issuing debt and using its proceeds to engage in share repurchases activity. Bagwell (1991) shows that share repurchases deter takeovers by reducing heterogeneous valuations amongst shareholders. Once a repurchase offer is made, those shareholders who perceive the value of their shares to be low will tender their shares for repurchase while those shareholders who perceive their shares to be of higher value will hold on to their shares (Bagwell, 1991). This deters takeovers by eliminating shareholders with a low perceived value, thus increasing the cost to be incurred by any potential bidder. Further, share repurchases effectively reduce the number of shares in free float. Following repurchases, shares become concentrated amongst institutional shareholders and other major shareholders (friendly shareholders) who are less likely to succumb to a takeover by tendering their shares (Harris & Raviv, 1988). This suggests that share repurchases reduce a firm's takeover

likelihood. Besides concentrating ownership amongst institutional shareholders, share repurchases also effectively reduce free cash flow available to management, and, therefore, its associated agency problems (Fama & French, 2001; Grullon & Michaely, 2004). Consistent with the management inefficiency hypothesis (Palepu, 1986), the absence of agency problems should further reduce a firm's takeover likelihood. Given the finding that share repurchases serve as a deterrent to takeovers and reduce agency problems, it is predicted that takeover probability should decline with the presence of share repurchase activity.

3.6. An industry competition hypothesis of takeovers

A concentrated industry consists of a few dominant firms or an oligopolistic industry structure. These firms generally control a large proportion of the market share and hence enjoy high market power. Highly concentrated industries generally have high barriers to entry for newcomers. Barriers to entry can come as a result of high advertising from incumbents, the need for high start-up capital, cost advantages to incumbents (in the form of proprietary technology, experience, distribution networks), a high degree of customer loyalty (or high switching barriers for customers in the form of contracts), government policy (protected industries), intellectual property rights (patents and trademarks) and inelastic demand, amongst others. Further, mergers in high concentration industries are generally contentious and the subject of antitrust regulations in Europe, the US, Canada and Australia, amongst others. These antitrust regulations reduce the likelihood that incumbent firms within such high concentration industries will be subject to takeover activity.

Given the limited number of market players, the level of competition between firms in high concentration industries is comparatively lower than that in low concentration industries. The effect of industry concentration on the market for corporate control, the incidence of takeovers and the agency problem has been discussed by several researchers.

Prior research argues that strong competition in the product markets (i.e., low industry concentration) is especially costly for inefficiently managed firms (Fama & Jensen, 1983; Shleifer & Vishny, 1997). This is mainly because competition between firms in a low concentration industry leads to the elimination of inefficiently managed and under-performing firms.

As opposed to firms in high concentration industries, firms in low concentration industries have limited control of the market, restricted market share, and low market power. Powell and Yawson (2005) suggest that low concentration industries are more likely to see higher takeover activity as incumbents (prospective bidders) compete to gain a greater share of the market. Again, struggling firms can solicit takeovers either as an alternative to impending bankruptcy (financial distress) or as a way of improving their market power and ability to compete more efficiently. Further, antitrust regulators are less likely to oppose mergers within low concentration industries. Given the above arguments, a firm's takeover likelihood plausibly increases as the concentration of its industry decreases (or the competitiveness of its industry increases).

4. CONCLUSION

Estimating firms' takeover likelihood — the probability that firms will be acquired in the future — is important for management, investors and regulators, yet factors that drive takeover likelihood are not fully understood. Several studies (Brar et al., 2009; Danbolt et al., 2016; Espahbodi & Espahbodi, 2003; Powell, 1997, 2001; Tunyi, 2019) rely on the set of hypotheses advanced by Palepu (1986) to develop their prediction models. These studies find that models developed from these hypotheses generally have low predictive power and call for further research into the antecedents of takeovers. This conceptual paper responds to this call. Specifically, the paper develops and advances six new hypotheses for takeover prediction including; information asymmetry, payroll synergies, merger rumours, financial distress, share repurchases and industry competition hypotheses of takeovers. These hypotheses predict that a firm's takeover likelihood will increase with the emergence of merger rumours and industry competition and will decline with information asymmetry and share repurchases. Additionally, the study predicts that takeover likelihood has an inverse U-shape (i.e., non-linear) relationship with payroll excesses and the level of financial distress.

There are several limitations of the current study and these open up opportunities for further research. Firstly, given the conceptual nature of this paper, the proposed hypotheses are not empirically tested here. However, the paper offers researchers a timely extension to the standard prediction modelling framework. Specifically, the advancement of these hypotheses potentially creates opportunities for further empirical work that tests the validity of the propositions. Importantly, future researchers may develop new prediction modelling frameworks which take account of these propositions to enhance the ability of prediction models to identify future takeover targets *ex-ante*.

Secondly, while the paper focuses on takeover likelihood, firms' acquisition likelihood — the probability that firms will make future acquisitions — is equally important, but beyond the scope of the current study while a few studies have explored this issue (Harford, 1999; Tunyi, 2021b), there is scope for further development in the area. Future researchers may consider developing new hypotheses to enhance existing models for predicting acquisition likelihood.

Finally, the six hypotheses suggested are not exhaustive. Future researchers may identify other, perhaps more relevant, hypotheses for improving current prediction models. Consequently, the current paper only offers a starting point for the development of more efficient prediction models.

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