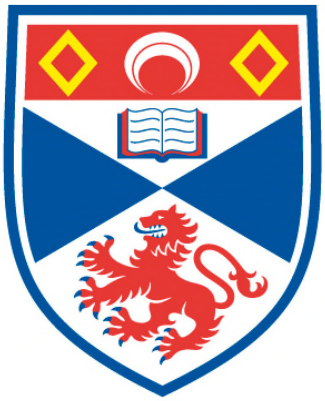
FOUR ESSAYS ON UK TAKEOVERS
EVIDENCE FROM MATCHING ANALYSIS

Samer Adra

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



2015

Four Essays on UK Takeovers

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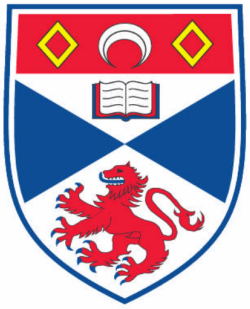

This thesis is submitted in partial fulfilment for the degree of Doctor of Philosophy in Economics

University of St Andrews

1 May 2015

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I, Samer Adra, received assistance in the writing of this thesis in respect of language and grammar, which was provided by Ruth Masson and Dr. Faten Hammoud.

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Abstract

In four empirical chapters, matching analysis is employed to estimate the effects of specific contractual and regulatory arrangements on particular deal outcomes in the UK takeover market. The first chapter highlights the positive effect of earnout financing on the acquiring firms' returns in private target acquisitions. Furthermore, this chapter offers a detailed example of how the non-parametric Propensity Score Matching, despite its growing popularity in financial research, can lead to inaccurate inferences when relevant private-target-specific factors are omitted from the analysis. The second chapter provides the first empirical examination of the effect of the earnout's terms on the premium offered to the target firm's shareholders, and how information asymmetry concerns influence this premium. Additionally, the findings indicate that increases in the premia are negatively interpreted by the market in non-earnout financed deals. However, this negative effect is neutralised in comparable earnout financed deals. The third chapter provides the first empirical contribution that highlights the deal- and firm-related factors that contribute to the growing reliance on the Scheme of Arrangement, as a substitute for the Contractual Offer, in conducting UK public target deals. Despite the concerns raised in the legal literature about the limited bargaining power of the target shareholders under the Scheme, the robust conclusions indicate that such shareholders manage to receive premia that are at least as high as the premia received by shareholders in comparable Offer deals. The fourth chapter employs a hand-collected dataset that covers the incidences of termination fee use in the UK takeover market. The main result is that, in the period preceding the ban that The Panel on Takeovers and Mergers had imposed on termination fees, the inclusion of these fees had a beneficial, or at worst neutral, effect on target shareholders' wealth. Consequently, it is recommended that the Panel ends its ban.

To my grandmother Fadila

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Samer Adra
May 2015

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Introduction

The United Kingdom's (UK) takeover market is the most active European market for corporate control (Faccio and Masulis, 2005). The study of the various contractual and regulatory arrangements in this market, their related innovations, and their impacts on the shareholders' wealth represent a fruitful area of research that is of great interest to both regulators and market participants. On the regulatory front, the UK constitutes a successful model whereby self-regulation is presented as an efficient alternative to both direct litigation and formal government-led interference in addressing takeover-related challenges (Armour and Skeel, 2007). Along these lines, a detailed analysis of the particular takeover-related arrangements imposed by The Panel on Takeovers and Mergers, which is the self-regulatory body in charge of addressing takeover-related matters in the City of London, is highly valued by European regulators that aim to emulate the UK model (Armour et al., 2009). Furthermore, given the presence of various forms of contractual innovations that are used to address information asymmetry problems in the UK market, merger advisors and stock market investors would value additional guidance on the determinants of the decision to introduce particular contractual tools in takeovers. These market participants would also value a detailed analysis of the wealth effects that arise from the introduction of these specific contractual innovations in mergers deals.

This thesis provides a detailed investigation of three critical aspects of the UK takeover market. These aspects are: (a) the use of earnouts in the financing process of private target acquisitions, (b) the emergence of the Scheme of Arrangement as the main takeover method in public target acquisitions, and (c) the inclusion of target termination fees in public target deals along with the ban that The Panel on Takeovers and Mergers imposed on the use of these fees. In the following lines, the relevance of each of these aspects is discussed and the research questions and main findings are summarised.

Earnout financing is a mechanism by which the acquisition deal has a two-payment structure: (a) an initial upfront payment settled at the time of the deal's announcement, and (b) a deferred payment linked to the target firm's satisfaction of pre-determined performance requirements before a pre-specified date following the acquisition's announcement (Kohers and Ang, 2000). By deferring a significant portion of the deal payment and linking its settlement to the target's performance, the acquirer reduces the likelihood of overpaying the target (Barbopoulos and Sudarsanam, 2012; Datar et al., 2001). Along these lines, earnouts are more likely to be employed when acquiring private targets, which are hard to value due to a lack of frequently audited financial statements and an absence of market valuation for their shares (Capron and Shen, 2007). Furthermore, the presence of a deferred payment incentivises the

target firm's experienced owners and skilled managers to keep running their firm as a subsidiary of the acquirer (Datar et al., 2001; Ragozzino and Reuer, 2009).

The examination of the earnout's wealth effect on a sample that is limited to private target deals is relevant given the challenging lack of publicly available private-target-specific information to be introduced in the form of covariates in the analysis. The previous UK-based study of Barbopoulos and Sudarsanam (2012) confirms the positive wealth effects enjoyed by the acquirers in the presence of earnout financing due to the earnout's usefulness in addressing information asymmetry concerns. However, these results are based on the parametric regression analysis on a sample that covers public, private and subsidiary targets. Furthermore, the wealth effect of earnout financing in the Barbopoulos and Sudarsanam (2012) study is insignificant or at best significant at the 10% level in the analysis of private target deals. In Chapter Three, I aim to examine whether the use of the non-parametric Propensity Score Matching (PSM) method that has a growing popularity in financial research on a sample of private target deals, after introducing private-target-specific data to the analysis, would yield different economic conclusions about the wealth effects of earnout financing. In estimating the effect of a business strategy or a financial instrument on a particular outcome, PSM limits the empirical analysis to the evaluation of comparable observations which have close propensity scores estimated using a Logistic model that predicts the use of the particular strategy or instrument. This non-parametric method is supposed to allow more accurate estimations of treatment effects compared to the alternative parametric methods applied to samples containing observations that are not necessarily comparable (Dehejia and Wahba, 2002; Ho et al., 2007).

Moreover, several important issues are still to be addressed in order to offer a clearer guidance to market participants on how an earnout contract is structured and how this structure influences the wealth effect of both the acquiring and the target firms. By how much should the offered premium increase to incentivise the target firm's shareholders to accept the deferral of a larger part of the deal's payment, for an even longer period, than the already agreed upon ones? Should the acquiring firm offer a high initial payment to the target firm's shareholders in order to motivate them to accept the deal? Does the market interpret the increase in the premia in earnout financed deals as a signal of overpayment, thus leading to lower acquirer abnormal returns? These questions are carefully addressed in Chapter Four.

After presenting a detailed summary of the main assumptions behind the PSM, Chapter Three shows that a merger consultant who relies on this method in the presence of a deficient dataset is likely to underestimate the wealth effects of earnout financing in private target deals. Consequently, this consultant will not recommend the use of earnout financing under conditions in which such a use can add significant wealth to the acquiring firm's shareholders. As the

Logistic model estimating the propensity scores necessarily includes only observed covariates, PSM is a method that exclusively addresses the treatment effect estimation bias that is due to 'selection on observables'(p. 243) (Heckman and Robb, 1985). Chapter Three demonstrates how, when 'selection on unobservables' is the main source of bias, PSM can lead to inaccurate inferences.

To emphasise this point, I re-apply PSM after introducing to the analysis a hand-collected variable that reflects the target firm's pre-acquisition performance in order to make the matched deals relatively more comparable. After balancing the propensity scores and most of the key covariates on the matched sample, my results indicate that earnout financing leads to a significant 2.4% increase in the acquiring firm's Cumulative Abnormal Returns (CAR). These results are due to the change in the structure of the matched samples: a significantly high portion of the non-earnout financed deals that end up in the matched sample when a private-target-specific covariate is included in the matching do not end up in the matched sample when this covariate is excluded.

Given that the researcher does not have *a priori* certain knowledge of whether 'selection on observables' or 'selection on unobservables' is the main source of bias to be addressed, Chapter Three advocates combining the use of PSM with the sensitivity analysis developed by Rosenbaum (2002). This analysis quantifies the effect that a missing covariate should have in the Logistic model which estimates the propensity scores in order to alter the PSM's conclusions. Indeed, the results of this sensitivity analysis indicate that, when the private target's pre-acquisition performance measure is not included in the matching exercise, the conclusions of PSM indicating an insignificant wealth effect of earnout financing are highly sensitive to the effect of a missing covariate. However, the conclusions resulting from the matching exercise that controls for the target's pre-acquisition performance are far less sensitive to the effect of a missing covariate. Surprisingly, despite the growing popularity of PSM in financial research, very few financial studies combine its use with a sensitivity analysis (Core, 2010). Following the emphasis on the guidance provided by the sensitivity analysis developed by Rosenbaum (2002), this analysis is applied alongside PSM in Chapters Four, Five, and Six.

By applying a parametric analysis on a matched sample established via PSM, Chapter Four shows that the magnitude of the compensations required by the target's shareholders for accepting earnout financing is not homogenous across all earnout financed deals but is rather strongly dependent on the terms of each earnout contract. More specifically, an additional 10% increase in the relative earnout size is associated with, on average, a 6.45% higher premium.[1] Moreover, my results indicate that a 1-month increase in the length of the earnout period is, on average, associated with a 0.6% higher premium. This chapter also shows that, when designing

[1] The relative earnout size is the maximum size of the deferred payment relative to the total deal value.

an earnout contract, moral hazard and adverse selection considerations lead to a specific rule of thumb based on which the merging firms divide the deal payment between initial and deferred payments. Specifically, despite the offering of a higher premium in an earnout financed deal relative to a comparable non-earnout financed one, moral hazard and adverse selection considerations lead the acquiring firm to insist on setting the initial payment in an earnout financed deal at a level that is lower than, or equal to, the full deal payment in a comparable non-earnout financed deal. This rule: (a) incentivises the target firm's managers to co-operate with the acquirer and achieve the main objectives of the merger during the earnout period, and (b) limits the target managers' incentives to exaggerate the extent of valuation disagreements in order to induce the use of the earnout as, otherwise, the initial payment they receive would remain considerably lower than, or at most equal to, the full single-payment in a non-earnout financed deal.

If earnout financing allows the acquirer to ensure the deal's completion while hedging against the risk of overpaying the target, the negative relationship between the premium and the acquirer's short-run abnormal returns should be limited to non-earnout financed deals. My results are consistent with this view: an increase in the premia in non-earnout financed deals, which are comparable to earnout financed ones as identified via the PSM method, is interpreted as a signal of overpayment. This interpretation should lead to lower short-run abnormal returns for the acquirers' shareholders (Alexandridis et al., 2013; Mueller and Sirower, 2003). However, the negative relationship between the premium and the acquirer's abnormal returns is fully neutralised in earnout financed deals, as evidenced by the insignificant effect of the premium on the acquirer's abnormal returns.

The Scheme of Arrangement is a court-administered takeover method by which the public target's shareholders are split, based on pre-determined criteria, into separate groups in which voting takes place to accept or reject a takeover bid (The Panel on Takeovers and Mergers, 2011). The procedures, regulations, ownership and tax ramifications characterising this method differ from those which characterise the traditional Contractual Offer. In particular, via the Contractual Offer, without the intervention of the court, the acquirer directly asks the target's shareholders to tender their shares at the announced offered price. The guaranteed ownership of 100% of the target's shares and the absence of the stamp duty taxes when the Scheme is used, combined with the recent procedural clarifications provided by both The Panel on Takeovers and Mergers and the courts, are contributing to the growing popularity of this takeover method (Boardman, 2012). However, Payne (2011) analyses the Scheme-related regulations and the attitude of the court to highlight the limited ability of the dissenting target shareholders to influence the takeover outcomes under this method.

Chapter Five, in addition to summarising the various regulatory and financial characteristics of the Scheme, examines the deal- and firm-related factors that make the use of this takeover method more likely. Additionally, this chapter provides the first empirical examination of the Scheme's wealth effect on both the acquiring and the target firm's shareholders in order to assess the validity of the concerns raised by Payne (2011).

The evidence that is presented in this chapter suggests that the likelihood of using the Scheme as a takeover method is positively influenced by the fraction of the deal's stock financing. Given that detailed business- and synergy-related information are revealed by the acquiring firm to convince the target's board of directors to accept stock financing, the immediate guarantee of an explicit completion of the deal through the sale of 100% of the target shares sets the Scheme as the favourable takeover method. Furthermore, the likelihood of the Scheme being used is influenced by the size of the target firm. More specifically, as the acquirers using the Scheme, rather than the Offer, do not pay the stamp duty that amounts to 0.5% of the deal value, the size of deal presents an important factor that is positively affecting the use of the Scheme takeover method. Likewise, the previously mentioned taxation, ownership, and guaranteed deal completion features of the Scheme make it more likely to be used: (a) in acquisitions initiated by private equity acquirers, and (b) when the target's board of directors signs a binding termination fee agreement.

Regarding the premia offered in Scheme and Offer deals, my initial multivariate analysis shows that, on average, the target shareholders in Scheme deals receive almost 7% higher premia than their counterparts in Offer deals. When matching analysis is employed, the effect of the takeover method on the offered premia becomes statistically and economically insignificant. Based on the Rosenbaum (2002)-bounds sensitivity analysis, the conclusions based on the latter analysis are found to be relatively insensitive to the effect of a missing covariate. These findings clearly indicate that the target shareholders, despite their theoretically weak relative bargaining power on the books, manage to receive premia that are at least as high as the premia received by their counterparts in comparable Offer deals.

With respect to the acquiring firm's returns, my analysis indicates that the abnormal returns gained by acquirers in Scheme and Offer deals are not significantly different from each other. However, I document significant differences in the acquirers' abnormal returns between the optimal and the sub-optimal use of the Scheme relative to the Offer. Specifically, before the year 2008 (the time at which the Panel issued formal clarifications of the Scheme's procedures and timetable) the sub-optimal use of the Scheme was associated with at least 2.5% decline in the abnormal returns gained by acquirers. Hence, when the Scheme is not properly codified, its use in circumstances in which such a use is not recommended leads its economic costs (i.e.

delay in firms' integration) and advisory fees to exceed its tax benefits, thus leading to lower abnormal returns.

By including a Target Termination Fee Provision in the acquisition deal, the target firm's board commits to pay the acquirer a sum that is capped at 1% of the announced deal value if the target firm's shareholders eventually decide not to consummate the proposed deal (The Panel on Takeovers and Mergers, 2011). A growing body of empirical contributions based on takeover data from the United States (US) and Canada emphasises the beneficial, or at worst neutral, effects of Target Termination Fee Provisions on the premia received by the target shareholders (André et al., 2007; Bates and Lemmon, 2003; Boone and Mulherin, 2007; Damian and Rich, 2013; Officer, 2003). Nevertheless, The Panel on Takeovers and Mergers banned the inclusion of these provisions after claiming that their presence limits the options of the target boards during the takeover negotiations and, consequently, reduces the gains of the target shareholders (The Panel on Takeovers and Mergers, 2010).

Chapter Six is the first study that examines: (a) the determinants of the inclusion of Target Termination Fee Provisions in UK public target acquisitions, and (b) the effect of such provisions on the premia received by the target shareholders. On the one hand, the dataset that is employed allows the analysis of the relationship between two alternative forms of commitments: those that are directly made by the target shareholders to accept the takeover bids and the Target Termination Fee Provisions granted by the boards. On the other hand, the examination of the effect of the Target Termination Fee Provisions on the premia provides the first investigation of whether the granting of these provisions reduces the gains of the target shareholders and, consequently, whether the Panel's ban has empirical merits or not.

As the Target Termination Fee Provision binds the entire company rather than a particular group of shareholders, the evidence that I present suggests that the target's board accepts the inclusion of this provision in order to motivate the bidder to proceed with the deal when the shareholders are reluctant to make fully binding commitments. However, a loyal target board would be hesitant to grant a termination fee provision unless the target's shareholders agree in principle to complete the deal. Along these lines, I show that Target Termination Fee Provisions are more likely to be granted when the target shareholders offer weakly binding commitments that expire under particular conditions. This finding is relevant to the overall termination fees-related literature. While previous contributions mainly document either complementary (Jeon and Ligon, 2011) or trade-off (Boone and Mulherin, 2007) relations between the presence of a Target Termination Fee Provision and the target shareholders' commitments, no previous studies examine how the degree to which these shareholders' commitments are binding influences the decision to include a Target Termination Fee Provision.

With respect to the effect of Target Termination Fee Provisions on the premia, my findings suggest that the inclusion of these provisions in the acquisition deals is not to the detriment of the target shareholders. Particularly, the shareholders in deals which include these provisions receive premia that are, at least, as high as the premia paid in comparable deals which do not include these provisions. Furthermore, these provisions facilitate the consummation of acquisition deals with private acquirers that are willing to pay relatively high premia. Consequently, I recommend that the Panel end its ban.

The remainder of this thesis consists of a general literature review related to the use of earnouts in addition to the four empirical chapters discussed above. Accompanying tables and appendices follow each chapter. Moreover, each chapter has its own conclusion section. Finally, some concluding remarks discussing the economic, regulatory and methodological ramifications of the findings are provided before presenting a detailed list of references.

Chapter Two
Literature Review on Earnouts

2.1. Introduction

Reflecting the importance of takeovers in shaping the modern corporation, an influential body of literature studies how the methods of payment in Mergers and Acquisitions (M&A) allocate risks and rewards between the merging parties (Faccio and Masulis, 2005; Fuller et al., 2002; Hansen, 1987; Kohers and Ang, 2000; Travlos, 1987).[2] Among the many important aspects associated with this literature, the incentives of the owners of the target firm to reveal private information to the acquirer and to work in line with the objectives of the new entity resulting from the merger are considerations that receive increasing attention. Particularly, a growing array of studies examines the determinants of the merging parties' decision to rely on contingent payments, i.e. earnouts, in the deal financing process (Datar et al., 2001; Kohers and Ang, 2000; Ragozzino and Reuer, 2009). Many of these contributions also examine the extent to which including an earnout in the deal provides additional gains to the shareholders of the merging firms compared to the case in which the earnout is not included (Barbopoulos and Sudarsanam, 2012; Cadman et al., 2014; Kohers and Ang, 2000).

When a deal includes an earnout, the selling firm receives only a portion of the deal payment at the time of the deal's announcement. Under such an arrangement, the receipt of the remaining portion of the deal payment is conditional on the satisfaction of pre-specified performance requirements within a pre-determined period, i.e. the earnout period (Caselli et al., 2006).[3] Extant literature shows that relying on this contractual arrangement helps achieve many objectives to the benefit of both the acquiring and the target firms.

First, by deferring a significant portion of the payment, the acquiring firm limits her exposure to the risk of target overvaluation during the deal's announcement period (Kohers and Ang, 2000). Such a consideration is especially relevant when the acquiring firm has relatively limited financial resources and is consequently vulnerable to the effects of overpayment in the deal (Datar et al., 2001). In addition to this, the target overvaluation risk is likely to be prevalent

[2] Hansen (1987) develops a theoretical model which predicts the choice of the method of payment used, i.e. cash or stocks, while addressing the information asymmetry concerns of both the acquirer and the target. Faccio and Masulis (2005) develop empirical models which predict the choice of the payment method. In turn, Travlos (1987) and Fuller et al. (2002) empirically examine the effect of the choice of the payment method on the announcement period gains of the acquiring firms. Kohers and Ang (2000) present the first empirical contribution examining the determinants of the choice to defer a part of the deal payment to a future date.

[3] These requirements are usually related to the target firm's earnings, sales, and other company related measures (Datar et al., 2001). However, the settlements of the deferred payment in a minority of earnout contracts can be linked to the satisfaction of a non-performance-related requirement such as the regulatory approval of a particular drug (Cadman et al., 2013). Moreover, in the particular acquisition announcements that I cover in Chapters Three and Four, the settlement of the remaining payment is deferred for just a few months until the end of the auditing process of the target company.

in M&A deals in which the acquirer has limited knowledge of the target's business activities (Ragozzino and Reuer, 2009).

Second, the use of earnouts in the deal financing process facilitates the retention of the target's specialised human capital in the acquiring company, at least during the earnout period (Datar et al., 2001; Kohers and Ang, 2000). More precisely, in order to receive the remaining portion of the deal payment, the selling firm's owners usually keep running their business as an independent subsidiary of the acquiring firm during the integration period and employ their expertise in line with the acquisition's objective (Datar et al., 2001). This managerial retention aspect of earnout financing is highly relevant given the informational advantage that these owners can have with respect to the target firm's customers, suppliers and overall business environment (Coff, 2002).

Third, by bridging the valuation gap between the acquiring and target firms, the use of earnouts is an example of how specific contingent contractual arrangements help the market participants overcome the Akerlof (1970) scenario. Specifically, when the merging parties disagree about the accurate valuation of the target's business, the earnout allows these parties to complete the transaction by making the settlement of a significant part of the deal that is subject to disagreement linked to future performance. By providing a context in which the merging parties can complete the deal while 'agreeing to disagree' (p. 445) (Kohers and Ang, 2000) without ending the acquisition negotiations, the earnout allows the acquiring firm to benefit from a business opportunity judged to be profitable by its directors. Furthermore, by addressing this valuation risk, the earnout is presented as a contractual tool dealing with the adverse selection problem: only the target owners that are confident with respect to the future prospects of their companies will accept the deferral of significant portions of their deal payments (Ragozzino and Reuer, 2009). Along similar lines, accepting the presence of earnout financing provides a valuable opportunity for the owners of unlisted companies that lack access to capital markets to sell their firms, especially when these owners face difficulties in signalling their value to investors (Becchetti and Trovato, 2002).

In this brief chapter, I review the previous literature related to: (a) the determinants of the merging parties' decision to use the earnout, (b) the determinants of the variation in the terms of the earnout contract, (c) the acquiring and the target firms' wealth effects arising from using earnouts in the deal financing process, and (b) the settlement of the earnout payment at the end of the earnout period as well as the fate of the target firm's retained managers.

2.2. Determinants of the Earnout's Presence

This section provides an overview of the acquirer-, target-, and deal-related factors influencing the use of earnouts. It also highlights the earnout's association with the use of the acquiring firm's stocks as a payment method in the deal, especially as this form of financing represents an alternative form of contingent payment.[4]

2.2.1. The earnout's presence

Stressing the relevance of valuation difficulties which characterise the acquisition of unlisted firms, earnout financing is more likely to be used in the acquisitions of private firms and in deals in which the target is a subsidiary that is being divested by its parent company (Barbopoulos and Sudarsanam, 2012; Datar et al., 2001; Kohers and Ang, 2000). In both cases, the valuation difficulties are driven by the absence of a target-specific market value (Kohers and Ang, 2000). Furthermore, the lack of frequently updated financial statements in the case of private targets, and the lack of such statements evaluating the divested subsidiary's performance outside the scope of the parent's business activities, also increase the magnitude of valuation difficulties and hence the favourability of earnout financing (Datar et al., 2001; Kohers and Ang, 2000). Similarly, earnouts are more likely to be used in the acquisition of new ventures with limited financial history rather than the acquisition of established mature companies (Ragozzino and Reuer, 2009).

Small acquirers have limited resources and are therefore more vulnerable to the consequences of target overvaluation (Kohers and Ang, 2000). Hence, earnout financing tends to be used in acquisitions announced by small acquirers and firms acquiring relatively large targets (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000).[5,6] These estimation-based results are complemented by the responses provided by the acquiring companies' managers in the survey reported by Datar et al. (2001). Particularly, these managers present the overcoming of valuation differences as the main objective for relying on earnout financing in 51.85% of the cases (14 out of 27 cases covered).

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[4] The papers reviewed in this chapter are based on different samples. The Kohers and Ang (2000) sample contains 7,072 acquisitions of US private and subsidiary targets between January 1st 1984 and June 30th 1996, the Datar et al. (2001) sample contains 8,298 acquisitions of US and non-US public, private and subsidiary targets announced by US public acquirers between January 1st 1990 and December 31st 1997, the Ragozzino and Reuer (2009) sample contains 1,174 private target acquisitions covered in the Secutiries and Data Corporation database between January 1st, 1993 and December 31st 2000, the sample covered by Cain et al. (2011) contains 725 acquisitions of US and non-US public, private and subsidiary targets announced by US public acquirers between January 1st 1994 and December 31st 2003, and the sample covered by Barbopoulos and Sudarsanam (2012) contains 4788 acquisitions of private, subsidiary and public targets by UK public acquirers between 1986 and 2008. Finally, the sample covered by Cadman et al. (2013) contains 10,816 acquisitions of private and non-private targets by US public firms between July 1st 2006 and June 30th 2011.

[5] Barbopoulos and Sudarsanam (2012) also show that the earnout is more likely to be used in the acquisitions announced by young acquirers that usually lack the acquisition experience and know-how needed to accurately value and integrate their targets.

[6] Ragozzino and Reuer (2009) also highlight the trade-off between earnout financing and minority equity ownership as alternative strategies for hedging against the valuation risk.

As recognised by Kohers and Ang (2000), the earnout's functions of addressing valuation difficulties and retaining the target's valuable human capital are not mutually exclusive. In particular, a critical part of the target's value can be driven by the future performance of its human capital.[7] This applies to high R&D and high growth companies which, in addition to being characterised by significant amounts of unrecorded and intangible assets, require the skills of specialised human capital in managing their day-to-day activities (Datar et al., 2001). Likewise, the evidence suggesting that earnouts are likely to be used in cross-industry acquisitions whereby the acquirer have limited knowledge of the target's valuation and working environment, and consequently has to rely on the efforts of the target's management team in the post-acquisition period, supports this notion (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000; Ragozzino and Reuer, 2009).

Nonetheless, as emphasised by Eckbo et al. (2009), poorly designed earnouts could distort the incentives of the merging partners. On the one hand, the target firm can focus on short-term performance to satisfy the earnout's requirement at the expense of the long-term objectives of the acquiring firm. On the other hand, the acquiring firm can manipulate the target's post-acquisition reported earnings in order to lower the likelihood of satisfying the earnout's performance requirement, and consequently avoid the delivery of the deferred payment. Accordingly, the evidence presented by Kohers and Ang (2000) suggests that the use of earnouts in cross-border acquisitions takes place only when the acquiring firm belongs to a country with the same Common Law legal tradition as that of the targets in their sample. This finding emphasises the necessity of a homogenous legal framework in which potential disagreements can be solved as a critical determinant of the decision to rely on earnouts.

2.2.2. The size of the earnout's payment

The relative size of the earnout payment, represented by the maximum size of the stated deferred payment scaled by the total deal value which is the sum of both the initial upfront and the maximum deferred payments, also received specific attention in the literature. In particular, the previously mentioned factors that represent valuation uncertainty and the importance of human capital are documented to have an effect on this variable that is qualitatively similar to their effect on the likelihood of the earnout's use (Cain et al., 2011; Kohers and Ang, 2000; Ragozzino and Reuer, 2009).

Cadman et al. (2013) show that the relation between the maximum stated earnout payment and the fair valuation of the earnout provides further insights on how earnout

[7] The results of the Datar et al. (2001) survey indicate that in 26.92% of the cases (7 out of 27 cases covered) the retention of the target's human capital is the primary motive behind earnout financing while in 22.22% of the cases (6 out of 27) both the overcoming of valuation difficulties and the retention of the target's human capital are primary motives.

contracts are designed to address information asymmetry problems. Mainly, the fair value of the earnout represents the present value of the earnout payment based on the acquiring firm's assessment.[8] The authors' findings indicate that, when the earnout is used to incentivise the target managers to work in line with the acquirer's objective, the earnout's fair valuation lies in the midrange between 0 and the maximum earnout payment.[9] The interpretation of this result is that when the fair value of the earnout is very low or very high relative to the maximum value of the earnout, the target managers are not incentivised to work in line with the acquisition's objectives as they are confident that they will not receive any relevant deferred payments in the former case and assured that they will receive relatively high deferred payments in the latter. In turn, when the earnout is used to overcome valuation difficulties, the earnout's fair value is set at a relatively low level compared to the maximum earnout payment. Such a result is expected given that the target firm's valuation of its own assets is likely to be close to the maximum earnout value while the acquiring firm's valuation is reflected in the earnout's stated fair value.[10] Furthermore, when the earnout is used as a compensation bonus to the retained target managers rather than a contractual tool to deal with valuation differences, the authors find that the earnout's fair value is relatively close to the maximum deferred payment.

2.2.3. The length of the earnout period

The length of the earnout period has also received attention in the literature. Cain et al. (2011) show that that this length is negatively influenced by the target industry's average returns and market-to-book value while it is positively related to the target industry's average R&D-to-sales expenditures.

The findings related to the effect of the target industry's returns are in line with the results of the literature emphasising the negative relation between the degree of uncertainty that characterise a transaction and the contract's length (Brickley et al., 2006; Flannery, 1986).[11] Furthermore, following Datar et al. (2001), I note that the high market-to-book values reflect the presence of a significant portion of unrecorded assets. This complicates the measurement of the target's performance and, as a result, limits the period in which this performance can be monitored. In turn, the finding related to the positive impact of the target industry's R&D-to-sales expenditures on the length of the earnout period is in line with the emphasis of Cain et al.

[8] The disclosure of the fair earnout value is mandated by a Statement of Financial Accounting Standards in 2007.
[9] The author's findings hold for the case of private and cross-industry targets in which the services offered by the target's managers are likely to be valuable for the acquirer.
[10] Accordingly, the authors show that the higher the degree of information asymmetry between the merging firms, as represented by the target's research expenses-to-sales ratio, the lower the size of the earnout's fair value relative to the earnout's maximum value.
[11] Flannery (1986), for example, argues that in the presence of large information asymmetries, firms issue short term debt contracts to avoid the information costs of long term debt contracts.

(2011) on the notion that stronger reliance on specialised human capital should lead to longer contracts in order to benefit from the services of the target's managers.

2.2.4. Relationship with stock financing

The use of earnouts and the settlement of the deal payment using the acquiring firm's securities are both characterised by a contingent aspect. Mainly, in both cases, the target firm's owners realise higher gains when the company resulting from the merger performs better compared to the gains realised when this company has a poor performance. In the case of the earnout, the strong performance of this company increases the likelihood of satisfying the earnout's performance requirement and, consequently, receiving the deferred payment. In the case of stock financing, the strong performance of the merged company is reflected by a high valuation of this company's stocks and, accordingly, strong gains for the holders of these stocks. However, particular factors influence the favourability of one method over the other.

First, as recognised by Hansen (1987), the contingent pricing function of stock financing becomes less relevant with the increase in the acquiring firm's size relative to that of the target firm and hence with the reduction of the latter firm's impact on market performance of the company resulting from the merger. Such concerns are less relevant in the case of earnout financing considering that the target firm operates as an independent subsidiary that aims to satisfy an accounting-based performance requirement (Datar et al., 2001). Furthermore, the information asymmetry with respect to the valuation of the acquiring firm's securities creates a double lemons problem: while the acquirer might have concerns regarding the target's true valuation, the target firm's owners may well have concerns with respect to the use of overvalued securities by the acquirer in the acquisition's financing process (Myers and Majluf, 1984; Travlos, 1987). As the deals that include earnouts are mostly settled with cash payments, the previously mentioned double lemons problem is less likely to be present in earnout financed deals (Ragozzino and Reuer, 2009).

Second, the empirical literature shows that equity financing is less likely to be used when a shareholder who controls a weak majority in the acquiring firm runs the risk of losing her dominant position with the introduction of a new block of equity owners (Faccio and Masulis, 2005).[12] Since the deals that include earnouts are not usually financed with stocks, such ownership concerns become less relevant.

In another context, Reuer et al. (2004) examine the determinants of the use of stock financing or earnouts, put together as a single method described as 'contingent pay-outs' (p. 19),

[12] The authors stress that these concerns do not hold when the percentage of shares owned by the controlling shareholder is too low (below 16%) or too high (above 60%).

compared to single cash payments in cross-border transactions made by US firms between 1995 and 1998. The authors' main finding is that, in cross-border transactions, contingent pay-outs are more expected to be used in the acquisitions of the hard-to-value high-tech and service companies. Furthermore, in line with emphasis of Kohers and Ang (2000) on the homegenity of the legal system, Reuer et al. (2004) find that 'contingent pay-outs' are more likely to be used than single upfront cash payments in acquisitions of targets in Common Law countries.

2.3. Wealth Effects of Earnout Financing

In this section, I review the empirical findings related to the: (a) premia that are offered to the target firms' owners in the deals that include earnouts compared to the deals that do not include earnouts, (b) short-run abnormal returns earned by the acquiring firm's shareholders when the earnout is used, and (c) long-run abnormal returns of these shareholders.

2.3.1. The target's premium

The field of peer-reviewed empirical analysis of earnout financing's effect on the premia is limited to the contribution of Kohers and Ang (2000). The authors' findings, based on a sample of private target deals, support the notion that the target owners in earnout financed deals receive higher premia, compared to deals financed with single upfront payments. Such increases in premia, in addition to reflecting potentially high synergies due to addressing the information asymmetry concerns between the merging partners, are also presented as a form of compensation for the target firms' owners for accepting to share the post-acquisition business risk with the acquirers (Kohers and Ang, 2000). In particular, the offer-to-book ratio in earnout financed deals, with the offer value covering the sum of both the initial upfront payment and the earnout payment, exceeds its equivalent in deals with single upfront payments that are cash-financed and stock-financed at both the mean and median levels.[13] More precisely, the respective values of the mean (median) offer-to-book value documented in the private target sample of Kohers and Ang (2000) are 10.16 (5.6), 5.24 (2.2) and 6.42 (2.3) for earnout financed deals and non-earnout financed deals with payments settled in cash and stocks respectively. Another interesting observation based on these results is that in earnout financed deals, even if the earnout payment is excluded from the offer price in estimating the premium, the premium received by the target owners remains higher than the premium in deals financed by single upfront payments. These results and their ramifications are presented and discussed in detail in Chapter Four.

[13] The premium estimates of Kohers and Ang (2000) are made on a sample of private target deals that include: 104 earnout financed deals, 283 deals with a single upfront cash payment, and 379 deals with a single upfront payment settled using the acquiring firm's securities.

In addition to the premia received by private target owners, the abnormal returns of the public firms selling subsidiaries in earnout financed deals represent an alternative measure of the gains received by the target firm owners in earnout financed deals as a compensation for deferring their payments. Accordingly, the sold subsidiary's owners are documented as receiving significant abnormal returns in the two-day (0, 1) period around the acquisition announcement: the documented two-day Cumulative Abnormal Returns (CAR) by Kohers and Ang (2000) is 2.70% and significant at the 1% level.

2.3.2. The acquirer's short-run abnormal returns

Given that the earnout is a mechanism that allows the acquiring firm to limit her exposure to the risk of overpaying the target while, at the same time, benefiting from the retention of the target's human capital, it is expected that the use of earnout financing will be associated with additional wealth gains to the acquiring firm. Along these lines, strong empirical evidence highlights the overall positive wealth effect of earnout financing on the acquiring firm under particular conditions.

In private target acquisitions, the published evidence documents that earnout financing adds further acquirer abnormal returns (Kohers and Ang, 2000). Specifically, the wealth effects associated with earnout financed deals exceed those associated with deals of a similar size which are financed with single upfront payments.[14,15] Such a difference becomes more apparent when the abnormal returns of earnout financed deals are compared to the abnormal returns of non-earnout financed deals in the subgroups of transactions likely to include earnout payments i.e. hi-tech, service, cross-industry and cross-border deals. Such a positive wealth effect is especially relevant when the acquirer is a small company vulnerable to the consequences of target overvaluation.[16,17]

However, in cross-border acquisitions, unlike the case of domestic ones, earnouts are found to yield lower acquiring firm abnormal returns compared to the alternative strategy of running joint ventures.[18] The advantage of the latter strategy over earnouts becomes more

[14] For instance, the announcement day abnormal returns estimated via a market model by Kohers and Ang (2000) are 1.348%. They significantly exceed the abnormal returns of non-earnout financed deals settled with cash (0.867%) and stocks (0.868%).

[15] The matched control deals are those that have deal values within two standard deviations of the average deal value of the earnout financed deals.

[16] In each of these four subgroups, Kohers and Ang (2000) document that the two-day (0, 1) CAR of earnout financed deals exceed those of both cash- and stock-financed deals that do not include earnouts.

[17] In the case of the acquisition of divested subsidiaries, despite the CAR of earnout financed deals exceeding the CAR of both cash- and stock-financed deals, Kohers and Ang (2000) find these differences in CAR not significant.

[18] By establishing joint ventures, two or more companies jointly operate particular assets without merging.

evident when the targets operate in business environments characterised by investment uncertainty and country investment risks (Mantecon, 2009).[19]

The Barbopoulos and Sudarsanam (2012) results also highlight the positive earnout wealth effect at both the univariate and multivariate levels. In particular, they document the presence of 0.41% higher 5-day CAR in earnout financed deals in their univariate analysis and 1.21% higher CAR in their multivariate analysis. The authors also indicate that the wealth effect of earnout financing becomes more apparent when the earnout's use is optimal. To put it more accurately, based on the authors' Correct Currency methodology, when the probability retrieved from the Logistic model exceeds the sample proportion of earnouts (26.1%) and the earnout financing ends up being a part of the deal financing process, the earnout is set to be optimally used. When the probability retrieved from the Logistic model does not exceed the proportion of the earnout in the sample and the earnout is included in the financing process, the use of the earnout is judged to be sub-optimal. The authors also expand the use of the Correct Currency methodology to the industry level: they introduce a Correct Currency Industry variable that takes the value of 1 when the earnout is used in an industry in which the probability of its use exceeds 50% based on the Logistic model, and 0 otherwise.[20] Accordingly, both measures of optimal earnout use indicate a positive wealth effect of this deal structuring method based on both the univariate and multivariate levels.[21]

However, both the matching analysis conducted by Kohers and Ang (2000) and the estimation of optimal earnout use by Barbopoulos and Sudarsanam (2012) do not account for the effect of the private target-specific pre-acquisition performance. More specifically, the matching exercises in the former contribution and the estimations of the Logistic models in the latter are exclusively based on acquiring firm- and deal-specific covariates. In Chapter Three, I emphasise the relevance of the inclusion of the target's pre-acquisition performance in the analysis of the wealth effects arising from earnout financing in private target acquisitions. Moreover, I demonstrate how the lack of access to such a dataset influences the choice of the econometric method employed in estimating these wealth effects.

[19] The author's results are based on the analysis of the variation in the three-day (-1, 1) CAR using various proxies of valuation uncertainty (e.g. limited buyer acquisition experience, high target R&D-to-sales ratio, cross-industry acquisitions…) and country investment risk (e.g. the level of contract enforcement, degree of economic openness…).
[20] The industries where the earnout is optimally used are: Media and Entertainment, Consumer Products, High Technology, Healthcare and Telecommunications.
[21] At the univariate level, the overall (sector-level) optimal earnout use is associated with 0.41% (0.54%) higher 5-day (-2, 2) CAR with significance at the 5% level. At the multivariate level, this effect is 1.1% (0.5%) with significance at the 5% (1%) level.

2.3.3. The long-run abnormal returns

Extant literature shows that the positive short-run effects arising from the use of earnouts on the acquiring firm's shareholders are not reversed in the long-run. In particular, the findings of both Kohers and Ang (2000) and Barbopoulos and Sudarsanam (2000) indicate an insignificant long-run wealth effect of earnout financing.[22] Nevertheless, further evidence presented by Barbopoulos and Sudarsanam (2012) shows that, when optimally used, earnouts are associated with higher first year and second year buy-and-hold abnormal returns compared to the case in which their use is suboptimal (Barbopoulos and Sudarsanam, 2012).[23] In turn, during the period following the acquisition's announcement, Cadman et al. (2013) find that the releases of earnout fair value adjustments are associated with higher acquirer buy-and-hold abnormal returns around their announcement periods. This result indicates that the market welcomes the revisions in the target's valuation based on updated information, and consequently the reduction in uncertainty through the framework provided by earnout contracts.

2.4. The Post-Earnout Period

The survey-based evidence reported in the previous literature also sheds some light on: (a) the settlement of the earnout payment at the end of the earnout period, and (b) the fate of the target firm's managers in the period following this settlement.

With respect to the settlement of the earnout payment, Kohers and Ang (2000) report that the target owners receive all or part of the earnout payment in 91.13% of the deals (72 out of 79 cases covered). The full payment is received in 50% of these cases. Along similar lines, the authors document that, on average, 62% of the stated earnout payment is eventually paid. This empirical evidence suggesting a variation in the portion of the earnout payment confirms the presence of divergent views with respect to the target's future performance when the earnout contract is signed. This evidence also highlights the relevance of the framework provided by earnout contracts in facilitating the completion of the deals despite the presence of disagreements.

With regard to the fate of the target owners/managers, these survey-based results indicate that the earnout, in addition to incentivising them to stay with the acquirer during the earnout period, initiates a long-term employer-employee relationship between them and the acquirer. While Datar et al. (2001) show that target firms' owners stay with the acquirer in

[22] The post-acquisition abnormal return in this method is the intercept in the regression of the portfolio returns of earnout financed deals on the three Fama and French (1993) factors.

[23] In the first year following the acquisition, the calendar time portfolio returns under the optimal (suboptimal) use of earnouts are 0.51% (0.02%). In the second year following the acquisition, these returns are 0.20% (-0.25%). The same authors also report long-run results based on buy-and-hold abnormal returns supporting the notion of the additional wealth created by earnout financing. However, in particular specifications, the optimal use of earnout financing has insignificant long term wealth effect in the acquisitions of unlisted targets.

72.13% of cases (44 out of 61 cases covered), the evidence presented by Kohers and Ang (2000) shows that in 69.23% of the cases (37 out of 56 cases covered), the target firm's managers stay with the acquiring company after the end of the earnout period. The evidence that 97.29% (36 out of 37 cases covered) of these managers receive part or all of the deferred payment suggests that the satisfaction of the earnout's performance requirement represents an opportunity for these managers to signal their capabilities to the acquirer. This finding supports the notion that the target firm's owners view the acquisition as the beginning of a 'courtship' (p. 367) as they form a long-run organisational rapport with the acquirer (Graebner and Eisenhardt, 2004).[24] Nevertheless, the monitoring of the target firm's performance during the earnout period allows the acquiring firm's management to determine whether the target firm fits the requirements needed to become part of the acquirer's long-term business strategy. Along these lines, Kohers and Ang (2000) document that in 9% of the cases (10 out of 110 cases covered) the acquiring firm divests the target at the end of the earnout period.

2.5. Conclusion

This brief chapter presented an overview of previous literature related to the use of the earnout and its impact on various deal outcomes. The earnout is shown to be used when information asymmetry concerns are likely to be relevant in valuing the target company and ensuring its integration within the acquiring firm. The earnout is also found to provide additional wealth gains for the owners of both the acquiring and the target firms. Chapters Three and Four build on these findings. Furthermore, the review that I presented suggests that the earnout has a strategic function that is not limited to short-run valuation concerns. In particular, a carefully designed earnout contract whose conditions are properly met can initiate a long-term organisational rapport between the acquiring and the target firm's managers.

[24] The authors show that the 12 knowledge-intensive target firms they study are more profitable relative to their industry peers. Yet, such firms still prefer to be acquired when: (a) they face strategic hurdles (e.g. need for funding), (b) their managers need further personal benefits and/or face personal challenges in running the business, and (c) they find an opportunity for high-quality organisational rapport based on trust, personal and cultural fit with a potential acquirer. Such conclusions indicate that the target firm's owners take into account timing and employment factors, in addition to the premium.

Chapter Three

The Limitations of the PSM Method:

Earnout Financing in Private Target Acquisitions

Abstract

I present new evidence from the earnout financing literature on the precision of the Propensity Score Matching (PSM) method. Without the guidance of a sensitivity analysis and the inclusion of private-target-specific variables, PSM leads to erroneous inferences about the earnout's impact on the acquiring firm's gains in private target deals. Such inferences could lead the acquiring firm to disregard the use of earnout financing under circumstances in which such a use could add significant positive gains to this firm's shareholders.

3.1. Introduction

A survey of recent studies indicates that PSM has become a popular approach in estimating treatment effects in financial research.[25] In analysing the outcome of adopting a new policy or employing a particular financial instrument, the non-parametric PSM consists of estimating the treatment effect on a sample of observations that have close levels of propensity scores. The propensity scores represent the probabilities of the treatment's presence and are estimated via a qualitative response model. Accordingly, on the matched sample, the untreated observations are considered as representatives of the counterfactual cases in which the treatment is not assigned. By limiting the analysis to comparable observations within an accurately constructed domain, i.e. the matched sample, the non-parametric PSM is presented as a method that provides a more accurate evaluation of treatment effects compared to the alternative parametric methods applied to samples containing observations that are not necessarily comparable (Dehejia and Wahba, 2002).

In this chapter, in line with the statement by Smith and Todd (2005) that PSM is no 'magic bullet' (p. 307), I present a contribution to the literature related to contractual arrangements in Mergers and Acquisitions (M&A) as an example of PSM's limitations. Given that this method exclusively addresses the bias due to 'selection on observables' (Heckman and Robb, 1985), its use when 'selection on unobservables' is the main source of bias leads to inaccurate inferences. This limitation of PSM, as illustrated in the analysis of the earnout financing's impact on the abnormal returns gained by acquirers in private target acquisitions, is the focus of this chapter. Specifically, I investigate the wealth effect, i.e. outcome, of the use of earnout financing, i.e. treatment, on the abnormal returns gained by acquirers of privately held target firms. The analysis focuses on the UK market because, while the use of earnouts is limited to 8.7% of US private target deals (Officer et al., 2009), this contractual arrangement represents the second most popular deal financing method in UK private target deals after single payment cash financing with respective percentages of 38% and 40% (Barbopoulos and Sudarsanam, 2012).

The examination of the earnout's wealth effect on a sample that is limited to private target deals is relevant given the challenging lack of publicly available private-target-specific information to be introduced in the form of covariates in the matching analysis. The previous UK-based study of Barbopoulos and Sudarsanam (2012) confirms the positive wealth effects

[25] The PSM method has been used recently to estimate the causal effects of banking- and corporate policy-specific outcomes (Bartram et al., 2011; Behr and Heid, 2011; Carbo-Valverde et al., 2012; Casu et al., 2013; Saunders and Steffen, 2011). For instance, Bartram et al. (2011) use PSM to examine the effect of the firm's reliance on derivatives on a set of risk measures (e.g. cash flow volatility and variation in stock returns). Others have also used the PSM method to examine: the effect of the choice of common advisors on many aspects of the mergers (Agrawal et al., 2013), the effect of hiring a big 4 or a top 4 mid-tier auditor instead of smaller auditors on the accounting premiums paid by private companies (Peel and Makepeace, 2012), the effect of bank securitisation on a set of measures related to the bank's performance (Casu et al., 2013), and the difference in loan costs between private firms and comparable public ones (Saunders and Steffen, 2011).

enjoyed by the acquirers in the presence of earnout financing due to the earnout's usefulness in addressing information asymmetry concerns. However, these results are based on parametric regression analysis on a sample that covers public, private and subsidiary targets. Furthermore, the wealth effect of earnout financing in the Barbopoulos and Sudarsanam (2012) study is insignificant, or at best significant at the 10% level, in the analysis of private target deals. In this chapter, I aim to examine whether the use of the non-parametric PSM on a sample of private target deals yields different economic conclusions about the wealth effects of earnout financing.

Along these lines, the PSM-based conclusions that I present after balancing a large set of deal-, firm-, and sector-related covariates discussed in the previous literature indicate that earnout financing has no significant wealth effects on the acquiring firms. In this case, the derived conclusion would be that the acquiring firms in a significantly large portion of private target deals invest substantial resources in designing earnout contracts and monitoring their targets' performance with no particular wealth benefits. This conclusion, however, is highly sensitive to the effect of a missing covariate. As indicated by the Rosenbaum (2002) bounds sensitivity analysis (RB analysis), a missing covariate needs to have a minor effect in the Logistic model to make the earnout's wealth effect highly significant. Such an effect is equivalent to making the odds of earnout financing in one deal only 2% higher than its match.

I re-apply PSM on my sample after introducing to the analysis a hand-collected variable that reflects the target firm's pre-acquisition performance in order to make the matched deals relatively more comparable. After balancing the propensity scores and most of the key covariates on the matched sample, my results indicate that earnout financing leads to a significant 2.4% increase in the acquiring firm's Cumulative Abnormal Returns (CAR). My results are due to the change in the structure of the matched samples: a significantly high portion of the non-earnout financed deals that end up in the matched samples when a private-target-specific covariate is included in the matching do not end up in the matched samples when this covariate is excluded. These results are relatively insensitive to the effect of a missing covariate. In particular, for two matched deals, such a covariate need to make the odds of earnout financing in one deal 50% higher than its match in order to alter the conclusion of a positive and significant wealth effect of earnout financing.

The evidence that I present suggests that a merger advisor who relies on PSM could have mistakenly recommended disregarding the use of earnout financing under circumstances in which such a use could have created additional wealth for the acquiring firms. Due to the lack of formal guidance on the choice of covariates to be used in the matching (Heckman and Navarro-Lozano, 2004; Smith and Todd, 2005), my findings highlight the usefulness of guidance provided by the quantification of the missing covariate's effect in estimating the propensity scores.

These results, however, should be treated with caution. In particular, I do not suggest that insensitive PSM results are necessarily more reliable than sensitive ones, irrespective of whether the key covariates and the propensity scores are balanced on the matched sample or not. Rather, in estimating the propensity scores, I emphasise the relevance of choosing Logistic model specifications that balance these variables on the matched samples. Then, in the presence of conflicting PSM-based results and various specifications that balance the key covariates, the RB analysis provides a useful framework that allows the researcher to derive the appropriate inferences with respect to the sign and magnitude of the treatment effect.

I proceed as follows: Section 3.2 presents the dataset and the key covariates used in the analysis, Section 3.3 discusses the general problem of selection bias with its application to the case of earnout financing, Section 3.4 presents the PSM method, Section 3.5 presents the PSM-based results in addition to the appropriate sensitivity analyses, and Section 3.6 concludes.

3.2. Dataset and Variables

3.2.1. Dataset

My sample includes acquisitions involving private target firms that are announced between January 1996 and December 2010 (inclusive) and recorded by the Securities Data Corporation (SDC) Thomson ONE database.[26] For a deal to remain in the sample it must satisfy the following criteria: (a) the acquirer is a UK public firm listed in the London Stock Exchange and has a market value of at least £1m four weeks prior to the announcement of the deal; (b) the target firm is privately held and is based in either the domestic or the foreign market; (c) the deal value should be at least £1m, excluding fees; and (d) the acquirer should aim to control at least 50% of the target firm's assets after the transaction. Furthermore, to avoid the inseparable effects of multiple deals on acquirers' gains, deals that are announced by same acquirer within 5 days, i.e. the event window analysed, are excluded from the sample.

The lack of publicly disclosed and updated accounting-related information is a stylised feature of privately listed firms (Ekkayokkaya et al., 2009; Officer et al., 2009). Even in the presence of such information, Ball and Shivakumar (2005) highlight their low quality and argue that private firms give insiders, i.e. potential acquirers or lenders, more detailed and accurate information relative to the ones they disclose. As a result, I examine the acquisition announcements from Nexis UK and the InvestEgate Financial Press in order to obtain target-related measures that the acquiring firms are prepared to report to their shareholders, after detailed due diligence with the private target's owners. In the acquisition announcements that I

[26] The choice of the starting date is based on the observation of Faccio et al. (2006) that the SDC coverage of deals outside the United States becomes more accurate after 1996.

screened I found that the acquirers often report the target firm's pre-acquisition Audited Profits Before Taxes (PBT). I identify 445 completed deals for which the PBT is available.[27]

3.2.2. Sample statistics

Table 3.1 records the annual distribution of the sample according to the payment method that is used to finance the deal. The same table records the annual distributions of the sampled deals in which the acquirer aims to control 100% of the target (FULL) in addition to cross-border acquisitions (CBA). In this sample, the earnout is the most frequently used financing method (70.5% of the transactions) followed by acquisitions financed in single payments in cash (CASH) (18.65%). This result differs from the statistics of Barbopoulos and Sudarsanam (2012) where the authors report that 38.7% of their sampled UK deals include earnouts and 40.51% include cash payments. Given that the sample is limited to deals covering the target-specific pre-acquisition performance, a potential explanation for this result is that, as earnout financing requires the measurement of the target's performance after the deal's announcement, the acquirers are more often prepared to report target-specific information in earnout financed deals compared to non-earnout financed ones. I operate within this constraint.[28]

Table 3.1: Distribution of the sample by deal characteristics and methods of payment

YEAR	ALL	CASH	STOCK	MIXED	EA	NEA	FULL	CBA	DVRD
1996	29	9	0	4	16	13	28	4	10
1997	38	8	4	2	24	14	37	14	16
1998	38	9	0	7	21	17	38	11	16
1999	36	8	2	3	24	12	36	7	23
2000	35	10	0	2	23	12	35	12	20
2001	28	2	0	0	26	2	28	4	15
2002	13	1	1	0	11	2	13	2	9
2003	11	1	0	1	9	2	10	2	7
2004	18	1	0	2	15	3	18	2	11
2005	36	3	0	1	32	4	35	5	20
2006	32	2	0	3	27	5	31	6	20
2007	40	2	1	2	35	5	40	6	28
2008	22	8	0	0	14	8	22	8	11
2009	24	5	1	7	11	13	24	8	12
2010	45	14	2	6	23	22	40	17	24
N	445	83	11	40	311	134	435	108	242
%	-	18.65	2.47	8.99	69.89	30.11	97.75	24.27	54.38

Note: This table represents the annual distribution of private target M&A announced by UK public acquirers between January 1st, 1996 and December 31st, 2010. The distribution of these samples is presented according to the deal financing method (earnout financing (EA) or non-earnout financing (NEA) with single payments settled in cash (CASH), stock (STOCK) or mixes of both (MIXED)), whether the acquisition is classified by SDC as a full acquisition (FULL) where the acquirer controls 100% of the target once the acquisition becomes effective, whether the acquisition is classified by SDC as a cross-border transaction (CBA) where the target is not registered as a UK company and whether the acquisition is classified as a diversifying one (DVRD) where the acquirer and the target have different 2-digit SIC codes.

[27] Other measures like book values and operating profits are not as frequently reported as PBT. Such information is present in less than 100 deals among the ones that I screened. Such a constraint makes the application of a matching analysis less feasible. The proportion of the sample that I employ in this chapter relative to the initial SDC sample of 2797 deals is 16%, which is equal to the proportion reported by the private-target-related study of Officer et al., (2009).

[28] In alternative estimations, I do not find that the announcement of target-specific information influences the acquiring firm's abnormal returns in earnout and non-earnout financed deals.

Table 3.2 reports the annual distribution of the sampled deals according to the target firm's sector. Private targets from the Consumer Products and Services (CPS) sector are more often involved in acquisitions (24.5%) in the sample. They are followed by private targets in the High-Technology (HT) sector with a share of 22.7%. Consistent with earlier studies, these statistics show that earnout financing is more likely to be present in deals involving private targets from the hi-tech and other service-related sectors in which the value of the firm is dependent on the knowledge, skill, creativity, and efforts of a few personnel (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000). On the contrary, the target sectors with the lowest acquisition activity in the sample are the Energy and Power (EPW) with a share of 0.68% and the Real Estate (RST) one with a share of 0.90%. Potentially, the design of flexible earnout contracts is not feasible in these regulation-intensive sectors.[29]

Table 3.2: The distribution of the sample by target sector

YEAR	IND	HCR	CST	MAT	MED	RTL	CPS	HT	EPW	TLC	FIN	RST
1996	10	0	4	4	1	0	1	6	0	2	0	1
1997	12	1	3	2	3	1	7	6	0	1	1	1
1998	8	0	0	4	2	3	12	8	0	0	1	0
1999	5	0	3	6	2	2	5	11	0	0	2	0
2000	3	1	1	3	4	1	10	11	0	1	0	0
2001	1	0	2	0	3	0	10	9	0	1	2	0
2002	2	1	0	0	2	0	3	2	0	1	2	0
2003	3	1	0	0	4	0	1	2	0	0	0	0
2004	1	0	1	0	6	0	4	3	0	1	1	1
2005	7	6	1	0	3	1	8	6	0	1	3	0
2006	6	1	0	0	2	1	11	10	0	0	1	0
2007	6	1	1	2	4	0	11	9	1	1	4	0
2008	2	1	1	1	1	1	8	4	0	0	3	0
2009	2	0	0	1	2	2	8	5	0	1	2	1
2010	6	3	0	2	5	2	10	9	2	5	1	0
N	74	16	17	25	44	14	109	101	3	15	23	4
%	16.63	3.60	3.82	5.62	9.89	3.15	24.5	22.70	0.68	3.37	5.17	0.90

Note: This table represents the annual distribution of private target M&A announced by UK public acquirers between January 1st, 1996 and December 31st. The 12 reported sectors, that exclude Government Agencies and Utilities, are: Industrials (IND), Healthcare (HCR), Consumer Staples (CST), Materials (MAT), Media and Entertainment (MED), Retail (RTL), Consumer Products and Services (CPS), High Technology (HT), Energy and Power (EPW), Telecommunications (TLC), Financials (FIN) and Real Estate (RST).

3.2.3. Key covariates

As suggested by Smith and Todd (2005), I rely on the previous literature to employ a large set of factors that influence the merging firms' decision to rely on earnout financing. I add to the analysis the portion of the deal payment financed with stock (STOCK_PERC) in order to reflect the possible trade-off between stock and earnout financing, given that they both have contingent payment properties (Chang, 1998; Datar et al., 2001; Officer et al., 2009). To emphasise the importance of balancing the portions of domestic and cross-border deals in the matched sample, I also include in my estimations a dichotomous variable (CBA) that is assigned the value of 1 if the target is not a UK company and 0 otherwise. The introduction of this variable is relevant due

[29] Following the external examiner's remark, I repeated the estimations in this thesis after excluding both financial acquirers and financial targets. When it comes to the robustness and the magnitudes of the various treatment effects, the overall results remain qualitatively similar to the ones reported.

to the emphasis of Mantecon (2009) that alternative strategies like the operation of joint ventures are more profitable than earnout financed acquisitions in cross-border acquisitions.

Furthermore, cultural and societal values can be a strong factor that influences the post-acquisition integration process, especially in cross-border deals. Hence, I employ a Culture Index (CULT_IND) that allows me to control for the effect of the influence of cultural heterogeneity between the merging firms on the challenges/difficulties faced during the integration process. This index is based on the graphical presentation presented by Radebaugh, Gray, and Black (2006) which, in turn, is based on the traditional classification of country groups based on cultural and societal values by Gray (1988). CULT_IND increases when the target firm's country group puts less emphasis on flexibility and more emphasis on uniformity in dealing with the accounting and organisational issues that might arise in a takeover. In this context, the use of contractual tools that require precise measurement of the target's performance, like earnout financing, becomes less feasible. This variable is properly defined in Appendix 1. To emphasise the favorability of earnout financing in particular industries characterised by the relevance of retaining the skilled human capital, I introduce the dichotomous variable IND. This variable is assigned the value of 1 if the target firm operates in the sectors in which Barbopoulos and Sudarsanam (2012) highlight the relevance of intellectual property and the reliance on science and technology, and 0 otherwise. These sectors are Media and Entertainment (MED), Consumer Products and Services (CPS), High Technology (HT), Healthcare (HTC) and Telecommunications (TLC).

I also control for the presence of frequent acquirers (FREQ), which allows me to account for the acquirers' experience in engaging in M&As as well as their experience in assessing synergies and evaluating the success of their deals. I also balance the continuous variables representing the acquirer's market value (MV) and age (AGE) as in Barbopoulos and Sudarsnam (2012) to proxy for the acquiring firm's resources and market experience, respectively. Along these lines, large established acquirers with significant takeover experience can have the resources and expertise that make them less vulnerable to the negative ramifications of target overvaluation and might be less likely to use earnout financing compared to smaller acquirers with limited market experience. Alternatively, these acquirers can have the resources required to design earnout contracts and monitor their target's performance. Such aspects might make them more likely to exploit the usefulness of earnouts in addressing information asymmetry concerns.

Finally, having balanced the acquirer's sizes, and to ensure that the targets in the matched sample have close sizes relative to their acquirers, I balance the dichotomous variable DUMMYRS which is assigned the value of 1 if the relative size of the deal value to the acquirer's market value exceeds 17%, which is the third quartile in the initial SDC sample, and 0 otherwise.

Given that the deal value is an outcome variable that should not be included as a covariate in the matching (Smith and Todd, 2005), the use of DUMMYRS allows me to balance the portions of relatively large targets in the matched sample between earnout and non-earnout financed deals without necessarily balancing the continuous measure of the deal value.

Table 3.3: Descriptive statistics

	MV(£m)		DV(£m)		AGE (days)		STOCK_PERC (%)		RS		CULT_IND	
	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
ALL	298	70	12	5	4,755	3,275	12	0	0.4	0.1	1.3	1.0
CASH	388	95	12	3	6,321	5,267	0	0	0.2	0.1	1.8	1.0
STOCK	242	83	37	5	1,719	1,144	100	100	0.4	0.1	1.6	1.0
MIXED	380	48	9	4	5,694	4,445	32	28	0.3	0.1	1.6	1.0
EA	265	57	12	6	4,322	2,566	10	0	0.3	0.1	1.2	1.0
NEA	374	79	13	6	5,756	4,065	17	0	0.9	0.1	1.7	1.0
DOM	481	131	10	5	4,100	2,270	12	0	0.5	0.1	1.0	1.0
CBA	239	62	19	9	6,769	5,581	12	0	0.3	0.1	2.4	1.0
FCSD	345	68	13	5	4,160	2,549	13	0	0.3	0.1	1.3	1.0
DVRD	241	72	12	5	5,463	3,880	12	0	0.6	0.1	1.3	1.0

Note: This table represents the mean and median values of a set of continuous covariates. The covariates are the acquirer's market value (MV), the deal value (DV), the acquirer's age (AGE), the percentage of the deal value financed with stocks (STOCK_PERC), the relative size of the deal value compared to the acquirer's market value (RS), the Culture Index (CULT_IND) defined in Appendix 1. These measures are reported for all the transactions (ALL), transactions fully financed with cash (CASH), transactions fully financed with stocks (STOCK), transactions fully financed with a mix of cash and stock with no inclusion of earnouts (MIXED), transactions financed with earnouts (EA) and the general group of non-earnout financed deals (NEA). The table also presents the means (medians) of these variables based on the geographic scope of the transaction (domestic transactions (DOM) and cross-borders transactions (CBA)) and sector relatedness (focused transactions (FCSD) and diversifying transactions (DVRD)). Please refer to Appendix 1 for an accurate description of the variables.

Table 3.3 records sample statistics of acquirer- and deal-specific features. Acquirers in earnout deals are smaller than their counterparts in non-earnout ones with mean market values of £265m and £374m. Moreover, acquiring firms in earnout deals are younger with a mean (median) age of 11.48 (7.03) years, compared to 15.76 (11.13) years in non-earnout deals. Consistent with earlier studies such as Kohers and Ang (2000) and Barbopoulos and Sudarsanam (2012), these figures suggest that mature and large acquirers are less likely to use deferred payments as they might already have the necessary expertise to successfully manage the target into the new firm's business environment, even in the presence of coordination difficulties. Moreover, larger acquirers may have the financial resources not only to absorb the losses of possible misevaluations but also to hire skilled human capital, and consequently reduce the dependence on the targets' managers in the post-acquisition period. Compared to the mean (median) deal value of £435m (£35m) for the public target deals in the sample of Barbopoulos and Sudarsanam (2012), my results indicate that private target deals are considerably smaller than public target ones with a mean of £12m.

The reported Logistic model in Table 3.4 presents results that are in line with the previous earnout-related research. The results confirm the trade-off between earnout financing and the portion of the deal value that is financed with stocks (STOCKPERC) (Datar et al., 2001). Earnouts are also likely to be included in the deal financing process when the target firm is

relatively large with respect to the acquirer (DUMMYRS) (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000). In such a case, the financial constraints of the acquiring firm lead to the deferring of a significant portion of the deal's payment (Kohers and Ang, 2000). In line with Mantecon (2009), my results highlight the limited popularity of earnout financing in cross-border deals. They also clearly show the relevance of cultural and organisational challenges in making the use of earnout financing less likely, as evidenced by the negative impact of CULT_IND. These results further indicate that large and frequent, though not old established, acquirers highly value the use of earnout financing. Finally, as predicted, the odds of earnout financing increase significantly when the target firm is located in a human-capital-intensive industry, as evidenced by the significant impact of IND.[30]

Table 3.4: Predicting the use of earnout financing

Variable	Intercept	ln(MV)	ln(AGE)	STOCKPERC	CBA	CULT_IND	DUMMYRS	IND	FREQ	McFadden R Squared
Coefficient (S.E)	1.157 (0.937)	0.187** (0.091)	-0.166* (0.099)	-0.016*** (0.004)	-0.631** (0.315)	-0.254** (0.121)	0.991*** (0.274)	0.681*** (0.230)	0.495* (0.299)	0.13

Note: This table presents the results of a Logistic model that predicts the use of earnout financing. The dependent variable (EA) is a dummy variable that is assigned the value of 1 if earnout financing is used in the deal, and 0 otherwise. As independent covariates, I include the variables discussed in Section 3.2. Please refer to Appendix 1 for an accurate description of the variables. ***,** and * represent significance at the 1%, 5% and the 10% levels respectively.

3.2.4. Cumulative abnormal returns

I estimate the abnormal returns of each acquiring firm by using the market-adjusted model as in earlier studies (Barbopoulos and Sudarsanam, 2012; Fuller et al., 2002):

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad \text{(A.1)}$$

$AR_{i,t}$ is the abnormal return of acquirer i on day t. $R_{i,t}$ is the percentage change of the return index, inclusive of dividends, of acquirer i on day t. $R_{m,t}$ is the percentage change in the FTSE-All Share return index on day t. Brown and Warner (1980) confirm that the use of a market-adjusted model in estimating the abnormal returns in an event study is robust, as the adjustment for the firm's systematic risk does not improve the precision of the short-term abnormal returns relative to the above model. The CAR in the 5-day window (t-2, t+2) surrounding the day 0 of the announcement of the bid are calculated using the following equation:

[30] In alternative estimations, I introduce variables that refer to the presence of cross-industry deals in addition to the acquiring firm's market-to-book value. I find that the effects of these variables on the likelihood of using earnouts are insignificant.

$$CAR = \sum_{t=-2}^{t=+2} AR_{i,t} \quad \text{(A.2)}$$

This variable is used as the dependent variable in the estimation presented in this chapter.[31]

3.3. Selection Bias in the Analysis of the Earnout's Wealth Effect

In assessing the wealth effect of earnout financing, two potential outcomes (CAR_{EA}, CAR_{NEA}) need to be analysed. CAR_{EA} is the acquiring firm's announcement period CAR when an earnout is involved in the deal's financing process. CAR_{NEA} is the acquiring firm's announcement period CAR when an earnout is not involved in the deal's financing process. The treatment variable, EA, is assigned the value of 1 if the deal includes an earnout, and 0 otherwise. Let V be the combined payoff of merging firms that decide to include an earnout in the financing process of the deal. We may then write:

$$V = \delta Z + U_V \quad \text{(B.1)}$$

$$EA = 1\ (V > 0) \quad \text{(B.2)}$$

with Z being the observed factors influencing the choice of including an earnout and U_V representing the effect of the unobserved factors. What (B.2) indicates is that, once the payoff exceeds a pre-determined threshold normalised at 0, both parties agree to rely on earnout financing.

CAR can be written in terms of the effects of the presence and absence of treatment, i.e. μ_{EA} when the earnout is used and μ_{NEA} when it is not used, in addition to a set of control functions, which are represented by v_{EA} when the earnout is used and v_{NEA} when it is not used. Each control function, in turn, can be divided into two components: (a) the function $h()$ of the observed variables X expressed as $h_{EA}(X)$ and $h_{NEA}(X)$in the presence and the absence of earnout financing, respectively, and (b) the unobserved variables, U_{EA} for the earnout financed deals and U_{NEA} for non-earnout financed ones. Consequently, the difference in outcomes is expressed as follows:

$$CAR_{EA} - CAR_{NEA} = (\mu_{EA} - \mu_{NEA}) + (v_{EA} - v_{NEA}) \quad \text{(B.3)}$$

with $v_{EA} = h_{EA}(X) + U_{EA}$, $v_{NEA} = h_{NEA}(X) + U_{NEA}$ and $E(U_{EA}) = E(U_{NEA}) = 0$.

[31] The conclusions reported in this thesis are not altered when each public firm's beta is controlled for in the analysis, as in Brown and Warner (1980).

Hence, $(\mu_{EA} - \mu_{NEA})$ is the individual level of the impact of the presence of earnout on the acquiring firm's CAR.

As indicated by Smith and Todd (2005), the most common evaluation parameter of interest is the Average Treatment Effect on the Treated (*ATT*) defined as:

$$ATT = E(CAR_{EA} - CAR_{NEA}|EA = 1) \quad \text{(B.4)}$$

This parameter represents the average impact of earnout financing on the acquirers' CAR relative to the counterfactual case in which the earnout is not used, i.e. single upfront payments.[32]

In estimating *ATT*, a missing data problem emerges: while we have access to the CAR of acquirers when the earnout is used, we do not have access to data representing the counterfactual case in which the earnout treatment is not assigned.[33] The following equation points out the evaluation problem (Heckman, 2010)

$$CAR = EA \times CAR_{EA} + (1 - EA) \times CAR_{NEA} \quad \text{(B.5)}$$

Following the Quandt (1972, 1958) switching regression framework, I refer to EA and $(1 - EA)$ as *switchers*: when $EA = 1$, only the CAR of the earnout financed deals is observed and when $EA = 0$, only the CAR of the non-earnout financed deals is observed.[34] A bias emerges in the estimation of *ATT* as the observed outcomeCAR_{NEA} when $EA = 0$ does not necessarily represent the counterfactual outcome to the case where $EA = 1$. This bias is expressed in the following representation:

$$Bias(ATT) = E(CAR_{NEA}|EA = 1) - E(CAR_{NEA}|EA = 0) \quad \text{(B.6)}$$

In clinical experiments, the randomised assignment of the treatment makes it independent of the potential outcomes and therefore ensures that $E(CAR_{NEA}|EA = 1) = E(CAR_{NEA}|EA = 0)$. Such a privilege is not available for researchers in observational studies which leads to the necessity of controlling for the effects of the various observed and unobserved factors causing this bias (Angrist and Pischke, 2008). The following section outlines PSM and the assumptions on which it relies to address this bias.

[32] Other evaluation-related parameters that can be estimated are: the Average Treatment Effect (ATE) which represents the effect of assigning the treatment to a randomly drawn unit of the population, the Average Treatment Effect on the Untreated (ATU) which is an effect parallel to ATT, the Average Treatment Effect of the Intent to Treat ($ATIT$) which represents the effect of the policymaker's decision to assign the treatment without necessarily proceeding with such assignment and the Local Average Treatment effect ($LATE$) which represents the average causal effect of the units that comply with the treatments (Guo and Fraser, 2010).

[33] The same applies to the case when the earnout is not assigned and the counterfactual case in which it is assigned.

[34] Holland (1986) refers to this missing data problem as the 'fundamental problem of causal inference' (p. 947).

3.4. Propensity Score Matching

3.4.1. Addressing selection bias

Rosenbaum and Rubin (1983) complement Rubin (1977) and introduce two assumptions in the forms of conditions that I express in the context of my analysis as follows:

Condition 1: $(CAR_{EA}, CAR_{NEA}) \perp\!\!\!\perp EA|W$ with $W = (X, Z)$

$\perp\!\!\!\perp$ represents independence given the conditioning set of variables, W. The economic interpretation of this assumption is that, conditioning on the observed variables X and Z, CAR is independent of the process by which the earnout is chosen in the financing process of the deal. The term 'selection on observables' introduced by Heckman and Robb (1985) is consistent with this property. This assumption is known as the 'Conditional Independence Assumption' (CIA): once the observed variables ($Z$and X) are controlled for, the assignment of an earnout to any given deal is equivalent to a random assignment.

Condition 2: $0 < \Pr(EA = 1|W) < 1$

This assumption is known as the 'Common Support Assumption' (Rosenbaum and Rubin, 1983). Specifically, while we assume the random assignment of the treatment after accounting for the observed factors, we still need to assume the presence of unobservable factors that influence the choice of the earnout. In particular, ruling out the perfect predictability of the treatment's presence is necessary in order to find appropriate matches for earnout financed deals.

Rosenbaum and Rubin (1985, 1983) show that conditioning on known propensity scores $P(W)$, with each propensity score representing the probability of a deal being financed with an earnout in the context of my analysis, is sufficient to remove the bias due to these observed covariates. Hence, CIA can be expressed as:

$$(CAR_{EA}, CAR_{NEA}) \perp\!\!\!\perp EA|P(W) \tag{C.1}$$

Under this condition, PSM is supposed to eliminate the bias in B.6 as:

$$E\big(CAR_{NEA}\big|EA = 1, P(W)\big) = E\big(CAR_{NEA}\big|EA = 0, P(W)\big) = E\big(CAR_{NEA}\big|P(W)\big) \tag{C.2}$$

Angrist and Pischke (2008) argue that there is very limited theoretical distinction between regression and matching analyses. Particularly, as regression analysis also assumes

that the model is correctly specified by controlling for the effect of exogenous variables, in the presence of a rich dataset and precisely measured variables, the inferences from both PSM and regression analysis should not differ.

However, PSM rose to prominence due to its ability to address the famous LaLonde (1986) critique. Basically, LaLonde (1986) compared the trainee earnings effects of an employment program in which assignment to the training is random to the earnings effects estimated using traditional parametric regression methods with non-randomised control samples. A main result of this analysis was that the application of mainstream econometric methods with non-randomised control samples yields treatment effect estimates that substantially deviate from the treatment effects estimated using the randomised control sample. Given that most of the analyses by economists are based on the application of regression analysis using non-randomised control samples, LaLonde's (1986) results lead to the questioning of the validity of the widely published estimates in the literature and put further emphasis on the use of randomised experiments when logistically feasible (Guo and Fraser, 2010).

In a response to Lalonde's challenge, Dehejia and Wahba (2002, 1999) managed to achieve a breakthrough. The authors mainly showed that the treatment effects estimated on subsamples which include trained workers and members of a non-randomised control group, which have close levels of propensity scores predicting the assignment to the training program, are remarkably close to the treatment effect levels estimated by LaLonde with randomised control groups. Therefore, while the estimators based on propensity scores have no specific efficiency gains asymptotically, it is worth noting that all the samples used by researchers are finite. Hence, by limiting the treatment effect analysis to comparable observations, PSM should often lead to gains in precision (Angrist and Hahn, 2004).

3.4.2. The balancing of the propensity scores and the covariates

With regards to the balancing of propensity scores between the treated and the control groups on the matched sample, a formal approach is offered by the Kolmogrov-Smirnov test. This test allows the researcher to determine if the empirical probability distributions of the propensity scores in both the treated and the non-treated groups, before and after the matching, are not statistically different. The non-parametric aspect of this test gives it an important advantage in assessing the quality of the matching exercise.

In addition to examining the significance of the difference in estimated propensity scores, Rosenbaum and Rubin (1985) suggest using of the *t*-test to examine the difference between the mean values of each of the main covariates between the sample of treated and untreated units before and after the matching. Hence, a successful matching procedure is

supposed to be reflected in insignificant, or weakly significant, differences in the averages of these covariates between the treated and untreated units that end up in the matched sample. Following DiPrete and Gangl (2004) and Guo and Fraser (2010), a further suitable measure for assessing the quality of the matching for every covariate is the Absolute Standardized Mean Difference which, for a continuous covariate x takes the value:

$$d = \left| \frac{\overline{x_{EA}} - \overline{x_{NEA}}}{\sqrt{\frac{S_{EA}^2 + S_{NEA}^2}{2}}} \right|$$

with $\overline{x_{EA}}$and $\overline{x_{NEA}}$ representing the average values of x in the treated and untreated group respectively. S_{EA}^2 and S_{NEA}^2 represent the variances of this covariate in both samples respectively.[35] Based on the results of previous research, a reduction in the level of this bias clearly indicates successful matching (Hujer et al., 2004; Sianesi, 2004).

3.4.3. Estimating ATT

With the matching procedure yielding a sample in which the propensity scores do not significantly differ between the treated and the untreated observations, ATT can be estimated with the following equation (Guo and Fraser, 2010):

$$ATT = \frac{\sum_{i:EA=1}\{CAR_i(EA_i) - CAR_i(NEA_i)\}}{N_1} = \frac{\sum_{i=1}^{N}\left\{\left(EA_i - (1 - EA_i)\frac{K_M(i)}{M}\right)CAR_i\right\}}{N_1} \quad \text{(C.3)}$$

with N representing the total number of deals in the matched sample, N_1 representing the number of earnout financed deals in the matched sample, $CAR_i(EA_i)$ representing the Cumulative Abnormal Returns for deal i when it is financed with an earnout, and $CAR_i(NEA_i)$ representing the outcome for the deal i when it is not financed with an earnout. Hence, $CAR_i(NEA_i)$ represents the counterfactual outcome when not receiving the treatment for a unit that receives the treatment. This counterfactual outcome is represented by the CAR on non-earnout financed deals in the matched sample while allowing each one of these deals to be used more than once as a control unit. Mrepresents the number of control units matched to each treated one. $K_M(i)$ represents the number of times a control unit is used as a match when matching is done with replacement. Hence, to represent the counterfactual outcomes based on this specification, the

[35]For a dichotomous variable y, this measure can be estimated by $d = \left| \frac{P_{yEA} - P_{yNEA}}{\sqrt{\frac{P_{yEA}(1-P_{yEA}) + P_{yNEA}(1-P_{yNEA})}{2}}} \right|$ with P_{yEA} and P_{yNEA}, respectively, representing the portion of the prevalence of the dichotomous variable in the treated and untreated samples.

non-earnout financed deals on the matched samples are appropriately weighted to represent the number of matches chosen per earnout financed deal and the number of times each non-earnout financed deal is chosen as a match.

The estimation of standard errors is of critical importance in testing the hypothesis of the absence of a treatment effect. Caliendo and Kopeinig (2008) emphasise the importance of the estimated variance's inclusion of the variance due to the estimation of propensity scores, the exclusion of observations from the regions of common support, and the potential order by which units are treated. Wooldridge (2010) emphasises the lack of scholarly work that focuses on such issues. Along these lines, Core (2010)mentions that 'standard errors do not appear well developed' (p. 283). However, both Caliendo and Kopeining (2008) and Wooldridge (2010) discuss the use of the bootstrap in the estimation of standard errors.

Abadie and Imbens (2008) show that estimators resulting from bootstrap procedures are not valid even under the simple conditions of a single continuous covariate and an unbiased $N^{1/2}$ normally distributed estimator. The results of the Abadie and Imbens (2008) simulation show that the variance estimator they developed (Abadie and Imbens, 2006) tends to perform well even with small samples. Consequently, in testing the null hypothesis of zero *ATT*, the Abadie andImbens (2006) standard errors are employed in the *t*-tests and reported with the results.

3.4.4. Choice of the covariates

Rosenbaum and Rubin (1984) argue that only the variables that are statistically significant at a pre-determined level should be included in the estimation of propensity scores. Hirano and Imbens (2001), in turn, propose the estimation of individual Logistic regressions by including only one independent variable at a time. Then, only the variables that are individually significant, or that satisfy a pre-determined significance level or threshold, are included in the multivariate estimation of propensity scores. Likewise, Rosenbaum (2002) indicates that a *t*-value higher than |1.5| can be used as a criterion to determine whether a variable is included in the estimation of propensities and thus in the matching process. In turn, Dehejia and Wahba (1999) emphasise the importance of including higher order polynomials and interactions of the candidate variables in the matching, if necessary, and ultimately choosing the variables that are eventually balanced on the matched sample.

Despite the relevance of the statistical guidance provided by earlier studies, Smith and Todd (2005) argue that there is no definitive procedure, or available test, to provide the best propensity score model. In fact, one of the authors' main criticisms of the Dehejia and Whaba (1999, 2002) contribution is that the change in the set of variables used to estimate the

propensity scores influences the size of the matched samples and also the degree of bias relative to LaLonde's (1986) randomised estimates. In turn, Heckman and Navarro-Lozano (2004) show that the best-fitting Logistic models are not necessarily the ones that lead to the lowest bias in the estimation of treatment effects. Along these lines, Smith and Todd (2005) suggest that the inclusion of unnecessary variables might exacerbate the common support problem by making the matched observations less comparable than the case in which matching is not used in the first place. Hence, through the matching procedures that I use in this chapter, in addition to balancing the propensity scores, I aim to balance the variables that significantly predict the use of earnout financing in the Logistic models.

3.5. Results

In this section, I present two non-mutually exclusive specifications of the Logistic models that are used to estimate the propensity scores. In the first specification, I do not include a private-target-specific covariate in the analysis, as in most of the previous research in earnout financing (Barbopoulos and Sudarsanam, 2012; Datar et al., 2001; Kohers and Ang, 2000). In the second specification, I introduce a variable that links the target's pre-acquisition PBT to the acquirer's market value to make the deals on the matched sample more comparable. I compare the resulting *ATT* estimates, their related ramifications on the decision of the acquiring firms, and their sensitivity to a missing covariate between these two specifications.

3.5.1. Specification 1

I employ the Logistic model that is reported in Table 3.4 to estimate the propensity scores. Based on the estimated propensity scores, two matching algorithms are employed. The first algorithm in the Nearest Neighbor (NN) by which each earnout financed deal is matched to the non-earnout financed deal that has the closest propensity score level. The second algorithm is the Caliper Matching (CM) by which the matched sample is limited to earnout and non-earnout financed deals that lie within a specific propensity score distance. This distance is the result of the multiplication of a chosen caliper by the standard deviation of the estimated propensity scores. I allow matching with replacement, by which each non-earnout financed deal can be used more than once as a match, given that the number of earnout financed deals significantly exceeds the number of non-earnout financed ones.

The results reported in Table 3.5 (Panel A) indicate that the *ATT*s of earnout financing on the acquiring firm's CAR, 0.88% and 0.82% with NN and CM respectively, are insignificant.[36] The reported results in both Panels A and B also indicate that the matching algorithm balances the distribution of the propensity scores and the Logistic model's covariates on the resulting

[36] My results also hold with a larger caliper (i.e. 0.1) and a smaller one (i.e. 0.01).

matched sample. In particular, the distributions of the propensity scores are not statistically different between earnout and non-earnout financed deals on the matched samples, as evidenced by the outcomes of the KS test (*p*-values of 0.88 and 0.82 for NM and CM respectively). Furthermore, none of the differences between the Logistic model's covariates in earnout and non-earnout financed deals on the matched sample is significant at the 5% level. Such a balancing of the covariates is also evident from the reduction in Absolute Standardized Mean Difference.

Table 3.5: PSM results without controlling for the effect of target-specific information

Panel A

Matching Algorithm	NN	CM
Caliper	-	0.05
Number of Treated Observations	310	292
Number of Control Observations	85	90
CAR of Treated Observations (%)	3.03***	3.06***
CAR of Control Observations (%)	2.61***	2.09***
KS before Matching (*p*-value)	0.00	0.00
KS after Matching (*p*-value)	0.88	0.82
ATT (%) (Abadie and Imbens (2006)	0.71	0.82
Standard Errors)	(1.12)	(1.02)
Cut-off Γ value (p≈0.05)	1.06	1.05
Cut-off Γ value (p≈0.10)	1.02	1.01

Panel B

	Before Matching				After Matching			
	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value
PROP_SCORE	0.74	0.59	102.08	0.00	0.74	0.74	0.24	0.20
CULT_IND	1.18	1.70	67.41	0.00	1.18	1.19	0.83	0.88
CBA	0.18	0.37	47.62	0.00	0.18	0.24	14.48	0.06
DUMMYRS	0.55	0.40	29.83	0.00	0.55	0.48	13.59	0.07
FREQ	0.25	0.15	23.12	0.00	0.25	0.30	10.67	0.12
ln(AGE)	7.72	8.12	30.83	0.00	7.72	7.82	7.69	0.27
ln(MV)	4.36	4.45	6.54	0.58	4.36	4.44	5.91	0.50
STOCK_PERC	10.53	17.97	42.72	0.01	10.53	9.83	4.06	0.61
LMP x IND	3.33	2.33	39.32	0.00	3.33	3.77	15.84	0.03

Note: Panel A reports the results of the PSM analysis based on a Logistic model in which the dependent variable is the dichotomous variable (EA) which takes the value of 1 if the transaction includes an earnout, and 0 otherwise. The Logistic Model in Table 3.4 is used to estimate the propensity scores. Panel A reports the matching algorithm used (Nearest Neighbor (NN) or Caliper Matching (CM)), the number of control observations matched per treated observation, the caliper used if caliper matching is employed, the number of earnout (Treated) and non-earnout financed deals (Control) in the resulting matched sample, the mean CAR for both the treated and the control group in the matched sample, the *p*-value from the Kolmogorov-Smirnov test with the null hypothesis that the propensity scores estimated from the Logistic model have the same distribution in the treated and control groups before and after the matching respectively. Panel A also reports*ATT* with the standard error (in parentheses) estimated following Abadie and Imbens (2006), the cutoff value of*Γ* at which the initial inference starts to change qualitatively with the corresponding p-value of 5%, and the cutoff value of*Γ* at which the initial inference starts to change qualitatively with the corresponding *p*-value of 10%. Panel B, based on the 1:1 NN matching with replacement in Panel A, reports the means of the propensity scores (PROP_SCORE) and main covariates in the groups of earnout and non-earnout financed deals before and after the matching, the *p*-value from the *t*-test associated with the null hypothesis of no statistical difference between these means before and after matching, and the Absolute Standardized Mean Difference defined as the absolute difference between the respective means of the covariate in the two groups divided by the square root of the mean of the covariate's variances in both groups. Please refer to Appendix 1 for an accurate description of the variables. ***,** and * represent significance at the 1%, 5% and the 10% levels respectively.

Let P_{CEA} and P_{CNEA} represent the probability of deal completion in the presence and the absence of earnout financing, respectively. The ramification of an insignificant *ATT* of earnout financing on the acquirer's CAR in my sample of completed deals can be illustrated as follows.

When valuation disagreements are significant, the contingent aspect of earnout financing presents a mechanism that allows the completion of the deal i.e. $P_{CEA}>P_{CNEA}$. Under such a condition, the acquiring firm can benefit from the use of earnout financing to generate higher expected CAR. In particular, even $CAR_{EA}=CAR_{NEA}$, we have P_{CEA} x $CAR_{EA}>P_{CNEA}$ x CAR_{NEA}. Hence, the use of earnout financing will still be recommended to the acquiring firm.

When valuation disagreements do not represent a challenge to the deal's completion i.e. when the target firm is willing to complete the deal both in the presence and the absence of earnout financing ($P_{CEA}=P_{CNEA}$), the acquiring firm is indifferent between using and not using the earnout. However, it is worth noting that addressing the valuation difficulties during the takeover negotiations is only one function of earnout financing. In particular, given the deal's completion, the earnout is presented as a mechanism that allows the acquiring firm to retain the target firm's skilled human capital in the post-acquisition period to realise high synergies. The insignificant *ATT* of earnout financing in my sample of completed deals indicates that this function of the earnout has no significant wealth effects. Hence, when the acquiring firm is confident that the deal will be completed, and despite the literature's emphasis on the relevance of retaining the target firm's skilled human capital through earnouts (Datar et al., 2001; Kohers and Ang, 2001), earnout financing will be used in only 50% of the deals.

3.5.2. Specification 2

In the estimation of propensity scores, I include a dummy variable that is assigned the value 1 if target firm had recorded losses (PBT<0) in the year preceding the acquisition, and 0 otherwise. For profitable targets, I include the variable LMP which is defined as $\ln\left(\frac{MV}{PBT}\right)$. This variable links the acquiring firm's specific market value with the target's specific pre-acquisition profitability. I also introduce the product $\ln\left(\frac{MV}{PBT}\right)$ x IND to emphasise the relevance of LMP in the sectors in which the use of earnout financing is recommended due to the relevance of human capital. Given that the average profitability of the target firm in my sample is £1.58m and the average acquirer's market value is £298, the natural logarithm is employed in order to reduce the impact of relatively large firms that acquire targets with limited profitability.

The aim of balancing this variable on the matched sample is to make the earnout and non-earnout financed deals more comparable. Possibly, acquiring firms that are relatively large with respect to their target's pre-acquisition profitability are less dependent on such target's post-acquisition performance. Such a characteristic of the deal makes the presence of earnout financing unlikely. However, if significant synergies are expected due to the investment of substantial resources in the target firm during the post-acquisition period, the benefits derived from the retention of the target's human capital make the use of earnout financing more likely.

The results reported in Table 3.6 are in line with the second interpretation. Furthermore, the effect of LMP is strongly significant in the industries in which the role of human capital is highly relevant. More specifically, it is worth noting that the effect of LMP is significant only in such sectors. Furthermore, both the presence of losing targets (LOSS) and the acquiring firm's age (ln(AGE)) have insignificant effects on the odds of the presence of earnout financing in Model 1. After imposing the restriction that the insignificant variables have a joint effect equal to 0, the Wald test yields a *p*-value of 0.49. Hence, I use Model 2 to estimate the propensity scores.

Table 3.6: Predicting the use of earnout financing with target-specific information

Explanatory Variables\Model (.)	(1)	(2)
Intercept	1.620 (1.078)	0.604** (0.251)
STOCKPERC	-0.016*** (0.004)	-0.015*** (0.004)
CBA	-0.497** (0.310)	-0.599** (0.301)
CULT_IND	-0.262** (0.122)	-0.250** (0.121)
DUMMYRS	0.918*** (0.279)	0.874*** (0.231)
FREQ	0.517* (0.304)	0.603** (0.291)
LOSS	0.173 (0.706)	
LMP	0.034 (0.115)	
ln(AGE)	-0.141 (0.098)	
LMP x IND	0.131*** (0.044)	0.150*** (0.404)
McFadden R Squared	0.13	0.13
p-value (LR test)	0.00	0.00

Note: This table presents the results of 2 Logistic models that predict the use of earnout financing. The dependent variable (EA) is a dummy variable that is assigned the value of 1 if earnout financing is used in the deal, and 0 otherwise. As independent covariates, I include the variables discussed in Section 3.2 in addition to LMP, LOSS and LMP x IND. Model 2 includes the significant variables from Model 1. The restriction that the coefficients associated with LOSS, LMP, and ln(AGE) are jointly equal to 0 is not rejected based on a Wald test (p=0.49). Please refer to Appendix 1 for an accurate description of the variables. ***,** and * represent significance at the 1%, 5% and the 10% levels respectively.

The results reported in Table 3.7 (Panel A) yield conclusions that differ from those reported in Table 3.5 (Panel A). In particular, after balancing the propensity scores and most of the covariates used in Model 2, earnout financing is shown to have *ATTs* of 2.48% and 2.39%, based on NM and CM respectively, on the acquiring firm's CAR when earnout financing used. Such a striking difference in the conclusion is mainly due to the change in the composition of the matched sample. For example, based on NN, 32% of the non-earnout financed deals that end up in the matched sample in Table 3.7 do end up in the matched sample in Table 3.5. Furthermore,

the variable LMP x IND that is balanced between the treated and the control groups on the matched sample in Table 3.7 (Panel B) (p=0.18) is not balanced in Table 3.5 (Panel B) (p=0.03).

Table 3.7: PSM results after controlling for the effect of target-specific information

Panel A

Matching Algorithm	NN	CM
Caliper	-	0.05
Number of Treated Observations	310	288
Number of Control Observations	92	92
CAR of Treated Observations (%)	3.03***	2.96***
CAR of Control Observations (%)	1.26*	1.61*
KS before Matching (p-value)	0.00	0.00
KS after Matching (p-value)	0.19	0.20
ATT (%) (Abadie and Imbens (2006)	2.48**	2.39**
Standard Errors)	(1.14)	(1.04)
Cut-off Γ value (p≈0.05)	1.50	1.47
Cut-off Γ value (p≈0.10)	1.53	1.50

Panel B

	Before Matching				After Matching			
	Treatment Group	Control Group	Abs Std Mean Difference	p-value	Treatment Group	Control Group	Abs Std Mean Difference	p-value
PROP_SCORE	0.74	0.60	97.22	0.00	0.74	0.74	0.30	0.22
CULT_IND	1.18	1.70	67.41	0.00	1.18	1.20	2.70	0.61
CBA	0.18	0.37	47.62	0.00	0.18	0.23	12.52	0.07
DUMMYRS	0.55	0.40	29.83	0.00	0.55	0.50	9.92	0.19
FREQ	0.25	0.15	23.12	0.00	0.25	0.31	12.39	0.07
STOCK_PERC	10.53	17.97	42.72	0.01	10.53	11.45	5.23	0.54
LMP x IND	3.33	2.33	39.32	0.00	3.33	3.60	9.83	0.18

Note: Panel A reports the results of the PSM analysis based on a Logistic model in which the dependent variable is the dichotomous variable (EA) which takes the value of 1 if the transaction includes an earnout, and 0 otherwise. The Logistic that is used to estimate the propensity scores is Model 2 (Table 3.7). The table has the same description as Table 3.5. Please refer to Appendix 1 for an accurate description of the variables. ***,** and * represent significance at the 1%, 5% and the 10% levels respectively.

The derived recommendation for the acquiring firm would be that earnout financing should always be used in deals characterised by either valuation difficulties or the need to retain the target's human capital. In particular, because $CAR_{EA}>CAR_{NEA,}$ the acquiring firm would value the use of earnout financing both when $P_{CEA}>P_{CNEA}$ and when $P_{CEA} = P_{CNEA}$. Given that both approaches balance the propensity scores and the covariates included in their respective Logistic models, I adopt the RB analysis in the following section to examine each of the contradictory conclusions' sensitivity to the effect of a missing covariate.

3.5.3. The RB analysis

Rosenbaum (2002) developed a sensitivity analysis that can accompany the use of PSM. In particular, while PSM remains a method that addresses 'selection on observables' (Heckman and Robb, 1985), the Rosenbaum sensitivity analysis answers the question: how strong a missing covariate would have to be, in terms of influencing the odds of assigning a treatment, in order to alter the qualitative conclusions of the study?

In his analysis, Rosenbaum (2002) presents the parameter Γ in the following relation:

$$\frac{1}{\Gamma} \leq \frac{\frac{P_i(EA = 1|W)}{1 - P_i(EA = 1|W)}}{\frac{P_j(EA = 1|W)}{(1 - P_j(EA = 1|W))}} \leq \Gamma \quad \text{(D.1)}$$

Mainly, when $\Gamma = 1$, the assignment of earnout between the two matched units is equivalent to a random assignment. As the value of Γ increases, the assignment of the earnout no longer remains a random procedure. As shown by Rosenbaum (2002), the fraction of odds can be written as:

$$\frac{\frac{P_i(EA = 1|W)}{1 - P_i(EA = 1|W)}}{\frac{P_j(EA = 1|W)}{(1 - P_j(EA = 1|W))}} = \frac{exp(k(W) + \gamma u_i)}{exp(k(W) + \gamma u_j)} = exp\{\gamma(u_i - u_j\} \quad \text{(D.2)}$$

$\gamma \geq 0$ where $k(W)$ represents the impacts of the observed covariates which cancel out. $u_i$andu_j are the unobserved covariates influencing the presence of the treatment for units i and j respectively. γ represents the influence of these covariates on the choice of treatment. Normalizing $u = u_i - u_j$between 0 and 1, Γ can be written as $\Gamma = e^{\gamma}$and a straightforward interpretation is that the matched units may differ in their odds of receiving the treatment by at most Γ(P. Rosenbaum, 2002).

The results of *Specification 1* and *Specification 2* substantially differ with respect to their sensitivity to the effect of a missing covariate. In particular, for two matched deals, a missing covariate in *Specification 1* needs to make the odds of including the earnout in one deal 2% higher than the odds in the matched deal in order to alter the qualitative conclusion of an insignificant *ATT*. In *Specification 2*, however, a missing covariate needs to make the odds of including the earnout in one deal 50% higher than the odds in its matched deal in order to alter the qualitative conclusion of a significant and positive *ATT*.

I follow DiPrete and Gangl (2004) and compare the magnitude of the missing covariate's effect to the impact of the covariates that are used in the Logistic models. For instance, with $\Gamma = 1.02$, a missing covariate dummy variable would have a coefficient in the Logistic model that is equal to ln(1.02)=0.019. Such an effect is considerably small given that the standard deviation of STOCKPERC is 23% in the sample. When the missing dummy variable takes the value of 1, its effect is equivalent to a decrease in the portion of the deal that is financed with stocks from 1.18% to 0, i.e. full cash financing. However, with $\Gamma = 1.5$, the coefficient associated with the missing covariate is equal to ln(1.5)= 0.40. When the missing dummy variable takes the value of 1, its effect is equivalent to a decline in the portion of the deal that is financed with stocks from 25% to 0. Overall, my results are consistent with the notion that earnout financing has a positive and significant wealth effect on the acquiring firms in private target deals, an effect that cannot be captured by PSM in a straightforward manner.

3.6. Conclusion

The earlier results presented by Barbopoulos and Sudarsanam (2012) are somewhat inconclusive with respect to the earnout's wealth effect in the particular case of private target acquisitions. In this chapter, after including target-specific pre-acquisition performance as a key predictor of the earnout's use, my PSM-based results highlight the positive and highly significant wealth effects of this contractual mechanism. More specifically, relative to comparable private target deals, earnout financed transactions yield announcement period CARs that exceed 2%. However, in evaluating the earnout's wealth effect in private target deals, the analysts should give special care to the feasibility of applying the PSM method.

This chapter presents an example of the limitations of PSM by estimating the wealth effect of earnout financing in private target acquisitions on the acquirers' shareholders. When 'selection on unobservables' rather 'selection on observables' is more likely to be the main source of treatment effect estimation bias, PSM can lead to inaccurate inferences as shown by the statistical and economic underestimation of the earnout's wealth effect. My findings, however, should be treated with caution. Rather than presenting a general condemnation of the use of PSM, I advocate a reliance on the RB analysis to determine the magnitude of the conclusions' sensitivity to the effect of a missing covariate after balancing the key variables that influence the treatment's presence.

Appendix 1 - Variables definitions

Variable (Acronym)	Description	Source
Acquirer's Age (AGE)	The number of days between the acquirer's listing in Datastream and the announcement date	Datastream
Acquirer's Market-to-Book Value (ACQMTBV)	The market value of the acquirer at four weeks before the acquisition, divided by its book value of equity from the most recent accounting statement prior to the bid announcement	Datastream
All the deals covered in the sample (ALL)	Refers to the number of deals used in the sample	SDC
Audited Profits Before Taxes (PBT)	The target's Audited Profits Before Taxes for the financial year preceding the acquisition as covered in the acquisition announcement	Investegate + Nexis UK
Audited Profits Before Taxes (PBT)	The target's Audited Profits Before Taxes for the financial year preceding the acquisition as covered in the acquisition announcement	Investegate + Nexis UK
Cash Financed Transactions (CASH)	Dummy=1 if the consideration is 100% financed with cash and 0 otherwise.	SDC
Cross-Border Acquisition (CBA)	Dummy=1 when the transaction includes a UK acquirer and non-UK target and = 0 when the target is a UK firm [= DOM]	SDC
Culture Index (CULT_INDEX)	An index that ranks the countries in which the targets are listed from the most flexible to the least flexible, and from the most transparent to the least transparent, in dealing with accounting and organizational challenges. It takes the following values: 1. The country of the firm acquired belongs to the Anglo-American group. The countries included are: United Kingdom, Canada, the Republic of Ireland, United States, New Zealand, South Africa and Australia. 2. The country of the firm acquired belongs to the Nordic group. The countries included are: Sweden, Denmark, Finland, Norway and the Netherlands. 3. The country of the firm acquired belongs to the Asian-Colonial group. The countries included in this case are: Hong Kong and Singapore. 4. The country of the firm acquired belongs to the Germanic group. The countries included are: Germany, Austria, Israel and Switzerland. 5. The country of the firm belongs to the remaining groups. The underlying assumption in this case is that once high differences in the degree of flexibility are reached, the ordering of the accounting systems becomes less relevant	SDC + The classification provided by Gray (1988) in which he uses cultural and societal values as primary characteristics for grouping families of countries. The ranking of the flexibility of these groups' accounting systems is represented graphically by Radebaugh, Gray and Black (2006).
Cumulative Abnormal Returns (CAR)	The sum of the acquirer's abnormal returns in the 5-day window surrounding the announcement	Datastream
Deal Value (DV)	Reported deal value, in millions of pounds. This value covers the initial payment and the maximum value of the reported deferred payment when an earnout is included	SDC
Diversifying Transaction (DVRD)	Dummy=1 when, in the transaction, the acquirer and the target have different primary 2-digit SIC codes and = 0 otherwise [= FCSD].	SDC
Earnout (EA)	Dummy=1 when the consideration includes an earnout [EA] and 0 otherwise [NEA]	SDC
Frequent Bidder (FREQ)	Dummy=1 when the acquirer is classified as a frequent bidder and 0 otherwise. Following Draper and Paudyal (2006), the acquirers who bid more than the third quartile of bid counts per acquirer in the initial SDC sample of 2797 deals (9 bids) are classified as frequent bidders	SDC
High Relative Size of the Deal (DUMMYRS)	Dummy=1 if the deal value relative to the market value of the acquirer's market value is higher than the third quartile of 17% and 0 otherwise	SDC
FULL	Dummy=1 if the acquirer aims to control 100% of the target's assets and 0 otherwise	SDC
IND	Dummy=1 if the target firm is in the Media and Entertainment, Consumer Products, High Technology, Healthcare and Telecommunications sectors, and 0 otherwise	SDC
LOSS	Dummy=1 if the target firm has a recorded negative PBT in the year preceding the acquisition, and 0 otherwise	InvestEgate + Nexis UK
Market Value of the Acquirer's Equity (MV)	Acquirer's market value of equity at four weeks prior to bid announcement, in millions of pounds. I also employ the natural logarithm of this variable	Datastream
Percentage of the Deal Payment Financed With Stocks (STOCK_PERC)	The percentage of the total transaction value that is financed with the acquiring firm's stocks	SDC
Propensity Score (PROP_SCORE)	The propensity score estimated by a Logistic model that predicts earnout financing. The model's specification for each propensity score model is appropriately defined in each table.	Authors' Estimations
Relative Bargaining Powers (LMP)	The natural logarithm of the quotient of the acquirer's market value divided by the target's PBT	InvestEgate + Nexis UK
Relative Size of the Deal (RS)	Ratio of (DV) to (MV)	Datastream +SDC
Stock Financed Acquisitions (STOCK)	Dummy = 1 when the consideration is 100% financed with stocks and 0 otherwise	SDC
Transactions financed With a Mix of Cash and Stocks Without an Earnout (MIXED)	Dummy = 1 when the deal is financed with a mix of cash and stock excluding earnout and 0 otherwise	SDC

Chapter Four

Takeover Premia in Earnout Financed M&As: Determinants and Wealth Effects

Abstract

I rely on both parametric and non-parametric methods to provide a robust solution to the long-standing issue on how earnout financing in takeovers influences the wealth of the merging firms' shareholders. First, I quantify the effect of the earnout contract's terms on the premia. Second, contrary to previous research, I demonstrate how moral hazard and adverse selection considerations lead the merging firms to set the initial payment in an earnout financed deal at a level that is lower than, or equal to, the full payment in a comparable non-earnout financed deal. Lastly, I show that while acquirers in non-earnout financed deals experience negative short-run abnormal returns from an increase in the takeover premia, this effect is neutralised in earnout financed deals.

4.1. Introduction

Following the previous chapter's robust conclusion that earnout financing tends to have a positive effect on the acquiring firms' returns, several important issues remain to be investigated to enhance our understanding of how earnouts are structured and how their structure influences returns of both merging firms' shareholders. Specifically, it remains to be investigated: (a) how the earnout terms (size and length) influence the premia offered in earnout financed deals, (b) how the transaction value is divided between an initial and a deferred payment, and (c) how the abnormal returns gained by acquirers respond to the premia offered in both earnout and non-earnout financed deals.

Addressing these topics is important for several reasons. First, given the heterogeneous nature of earnouts, the exact impact of the earnout contract's terms on the premium offered in an earnout financed deal provides a useful guide regarding the relationship between the deal's riskiness of success and the extent to which this riskiness is shared between the merging partners. For example, in the presence of earnout financing, how much additional premium should be offered to the target firm's shareholders to incentivise them to accept the deferral of a larger part of the deal's payment, for an even longer period, than the already agreed upon ones? Second, the merging firms would be willing to have access to additional guidance on how to divide the transaction value between the initial payment and the deferred one. For example, should the acquiring firms offer a high initial payment to the target firm's shareholders in order to motivate them to accept the deal? Alternatively, should the acquiring firm ensure that, despite offering a high premium, the initial payment remains low relative to some threshold? Third, the acquiring firm's shareholders would also value a deeper understanding of how the market is processing the information about the relatively high premia that are offered in earnout financed deals. Is the market interpreting the increase in the premia in earnout financed deals as a signal of overpayment, thus leading to lower acquirer abnormal returns? Alternatively, is the market interpreting such an increase in the premia as the result of a detailed contractual arrangement between the merging partners to address valuation disagreements without necessarily leading to target overpayment?

In this chapter, given the extensive use of earnouts in the UK market for corporate control (Barbopoulos and Sudarsanam, 2012), I rely on a UK-based dataset that covers private target M&As in order to establish the link between the terms of earnouts and the difference between the takeover premia offered in earnout and comparable non-earnout financed deals. Specifically, while the use of earnouts represents only 8.7% of private target deals announced by US acquirers (Officer et al., 2009), this contractual arrangement is a popular deal financing method for UK private target M&As, as evidenced by its presence in more than 38% of such deals (Barbopoulos and Sudarsanam, 2012). On the methodological front, I combine both non-

parametric (matching) and parametric analyses to derive results that are robust to changes in the models' specifications and functional forms. Moreover, given the scarcity of publicly available private-target-specific information, and in addition to the use of a hand-collected dataset that covers the target's pre-acquisition performance, I employ the Rosenbaum (2002) bounds sensitivity analysis to measure the impact that a missing covariate should have on the odds of earnout use to alter my conclusions, as in Peel and Makepeace (2012) and Chapter Three. Several important and new results are uncovered.

First, I find that the heterogeneity in the structure of earnouts has a significant effect on the premia offered in earnout financed deals relative to non-earnout financed ones. More specifically, an additional 10% increase in the relative earnout size is associated with, on average, a 6.45% higher premium.[37] Moreover, my results indicate that a 1-month increase in the length of the earnout period is, on average, associated with a 0.6% higher premium. This evidence suggests that the target firms' owners are keen to ensure that the premia they are offered compensate them for (a) sharing the post-merger integration risk with the acquirers, (b) offering their valuable services to facilitate the integration of the both firms during the earnout period, and (c) forgoing alternative valuable business and employment opportunities during this period. These results also indicate that the magnitude of this compensation is not homogenous across all earnout financed deals but is rather strongly dependent on the terms of each earnout contract.

Second, while the previous studies have primarily focused on examining the variation in the relative earnout size (Cain et al., 2011; Kohers and Ang, 2000), I show that, when designing an earnout contract, moral hazard and adverse selection considerations lead to a specific rule of thumb based on which the merging firms divide the deal payment between an initial and a deferred payments. Specifically, despite the offering of a higher premium in an earnout financed deal relative to a comparable non-earnout financed one, moral hazard and adverse selection considerations lead the acquiring firm to insist on setting the initial payment in an earnout financed deal at a level that is lower than, or equal to, the full deal payment in a comparable non-earnout financed deal. This finding contradicts the earlier univariate results derived by Kohers and Ang (2000) which indicate that even if the target firm's shareholders in an earnout financed deal do not receive the deferred payment, they still receive an initial payment that is higher than the full deal payment in a non-earnout financed deal (Kohers and Ang, 2000).

I emphasise the relevance of carefully interpreting the previous results within the univariate context in which they were generated. More specifically, in their important contribution that highlights the determinants and wealth effects of earnout financing, Kohers and Ang (2000) provided a limited discussion of these results and did not employ a multivariate

[37] The relative earnout size is the maximum size of the deferred payment relative to the total deal value.

analysis or a matching-based one. I argue that their conclusion that the targets in earnout financed deals receive higher initial payments than the full payments in comparable non-earnout financed deals is exposed to concerns whether earnout financing, instead of addressing information asymmetry problems, creates its own ones. Specifically, the first problem is moral-hazard-based given that the target firm's managers become less incentivised to co-operate with the acquiring firm during the integration period, as they already receive a higher initial payment than the full payment they would otherwise receive had the earnout not been included in the deal. The second problem is adverse-selection-based. In particular, the target firm's managers are incentivised to exaggerate the magnitude of valuation disagreements by limiting the information they are prepared to share with the acquirer. Such an exaggeration aims to motivate the inclusion of the earnout in the deal's financing process and hence leads the target firm's shareholders to receive an initial payment that exceeds the full payment they would otherwise receive had the earnout not been included in the deal's financing process.

My findings that are based on the multivariate analysis of comparable earnout and non-earnout financed deals suggest that the merging firms, and mostly the acquiring firms, are aware of such concerns. This, in turn, leads the acquirers to insist on adopting the previously mentioned rule of thumb as a condition to proceed with the earnout presence in the deal's financing process. Overall, this rule: (a) incentivises the target firm's managers to co-operate with the acquirer and achieve the main objectives of the merger during the earnout period, and (b) limits the target managers' incentives to exaggerate the extent of valuation disagreements in order to induce the use of the earnout as, otherwise, the initial payment they receive remains considerably lower than, or at most equal to, the full single-payment in a non-earnout financed deal.

Third, while the findings presented by earlier studies confirm that acquirers enjoy higher short-run abnormal returns from earnout financed relative to non-earnout financed deals, I focus on the unexplored issues of: (a) the impact of the premia in earnout financed deals on the short-run abnormal returns gained by acquirers, and (b) the difference between the stock market's assessments of the premia offered in earnout and non-earnout financed deals. An increase in the premia in non-earnout financed deals, which are comparable to earnout financed ones as identified via the Propensity Score Matching (PSM) method, should be interpreted as a signal of overpayment. This interpretation should lead to lower short-run abnormal returns for the acquirers' shareholders (Alexandridis et al., 2013; Mueller and Sirower, 2003). However, if earnout financing allows the acquirer to hedge against the risk of overpayment, the negative relationship between the premium and the acquirer's short-run abnormal returns should be limited to only non-earnout financed deals. My reported results are consistent with this view: the negative relationship between the premium and the acquirer's abnormal returns is fully

neutralised in earnout financed deals, as evidenced by the insignificant effect of the premium on the acquirer's abnormal returns.

Finally, given the limited (public) availability of private-target-specific information, I interpret my results within the context of a sensitivity analysis that quantifies what impact a missing covariate should have on the likelihood of earnout financing presence to alter the derived conclusions. Overall, the robust findings that are generally insensitive to the effect of missing covariates are consistent with the notion that properly designed contractual arrangements contribute towards the creation of wealth effects in M&As, provided that the merging partners are aware of the various trade-offs.

I proceed as follows: Section 4.2 sets the hypotheses; Section 4.3 presents the methodology; Section 4.4 presents the dataset used; Section 4.5 discusses the empirical findings; Section 4.6 provides a sensitivity analysis and finally Section 4.7 concludes.

4.2. Theoretical Framework and Hypotheses

4.2.1. The impact of earnout financing on the premium

Several explanations can be offered to justify the higher premia in earnout financed deals. First, as the target firm often operates as a subsidiary of the acquiring firm during the earnout period (Kohers and Ang, 2000), the target's performance, and hence the likelihood of receiving the deferred payment, are affected by the acquiring firm's overall business conditions. As a result, the target firm demands a higher premium to be compensated for sharing the post-acquisition business risk with the acquirer. Second, the target firm's owners can also be exposed to concerns related to possible disagreements with the acquiring firm regarding the accurate assessment of the target firm's performance, which reduces the likelihood of receiving the deferred payment at the end of the earnout period (Datar et al., 2001). Such concerns, in turn, may lead the target firm's shareholders to demand higher premia in exchange of accepting the presence of the earnout in the financing process of the deal.

Along these lines, Kohers and Ang (2000) show empirically that privately held targets in earnout financed deals are offered higher offer-to-book values than the targets in deals financed with single-payments. While such findings are based on a univariate analysis and are obtained from analysing deals that are not necessarily comparable, they are likely to persist in a matched sample that consists of treated (earnout) and comparable control (non-earnout) deals and on which I control for the effects of various deal characteristics on the premium. Accordingly, H_1 is stated as follows: *The takeover premia in earnout financed deals are, on average, higher than the premia offered in comparable non-earnout financed deals.*

4.2.2. The effects of the earnout contract's terms on the premium

A strong emphasis has been placed in the previous literature on the positive influence of both the riskiness of the target firm's business environment and the knowledge-base of its human capital on the relative earnout size (Cain et al., 2011; Datar et al., 2001). However, the association between the relative size of the earnout payment and the premium has only been theoretically investigated within the context of the game-theoretic option-based model of Lukas at al. (2012). The authors argue that the optimal investment decisions are determined by solving recursively an option pricing problem. The *third* stage of this problem refers to the settlement of the earnout payment, its *second* stage refers to the determination of the optimal level of cooperation by the target, and its *first* stage refers to the timing of the deal and its structure. At the third stage, given that the earnout can be treated as an option that is written on the underlying target firm's cash flows, the value of the option is identified. Based on this value, the target determines its optimal co-operation level. Finally, given this co-operation level, the acquirer determines the size of the earnout payment, the premium, and the timing of the deal.

When the target firm's cash flow riskiness increases, the probability of the target's satisfaction of the earnout's performance requirement also increases. This is analogous to the increase in the probability of exercising a stock option when the stock's riskiness increases. As a consequence, the target's managers/owners incentive to co-operate during the earnout period is reduced and hence the synergies of the M&A are likely to decrease. To avoid this outcome, the earnout payment must increase to incentivise higher synergies. Moreover, the model shows that the initial payment is determined by a Nash Bargaining game in which the parties divide the value of the total payoff. Given that the initial payment is a function of the payoffs that are due to a high earnout payment, the initial payment also increases but such an increase is lower than the increase in the deferred payment. Consequently, there is a positive association between the relative earnout size and the overall premium, as they both reflect the degree of the deal's riskiness. Accordingly, H_{2a} is stated as follows: *An increase in the relative size of the earnout payment is associated with an increase in the premium that is offered in an earnout financed deal.*

The length of the earnout period, in turn, has the potential of being an influential factor in determining the overall level of the takeover premium. As emphasised by Cain et al. (2011), setting a relatively long earnout period is a response to the acquirer's technical ability to accurately measure the target firm's post-acquisition performance. Given that the average length of the earnout period exceeds 18 months in my sample, the target firm's owners not only need to be rewarded for offering their business expertise to the acquirer to facilitate the merging firms' integration but also need to be compensated for forgoing alternative employment and business opportunities during this period. Along similar lines, the comparative

statics resulting from Lukas et al.'s (2012) theoretical model indicate that long earnout periods are associated with high deal payments. As a result, I empirically test the Lukas et al. (2012) predictions by examining the significance of the positive relationship between the earnout period's length and the premium. I develop H_{2b} as follows: *The longer the earnout period the higher the premium offered in an earnout financed deal.*

4.2.3. Moral hazard and adverse selection rule of thumb

Datar et al. (2001) argue that 'although earnouts may alleviate private information problems, these arrangements can also influence the incentives of the party managing the selling firm's assets post-acquisition' (p. 202). Hence, although earnouts are employed to address information asymmetry concerns, they have the potential to create their own ones when they are not properly designed. I argue that the relationship between the initial payment in an earnout financed deal and the full deal payment in a non-earnout financed deal is exposed to critical moral hazard and adverse selection concerns. The only findings I am aware of addressing this relationship are based on the univariate analysis of Kohers and Ang (2000) that shows that the target firms in earnout financed deals receive initial payments that are larger, on average, than the full deal payments in non-earnout financed deals.[38]

The moral hazard concern that arises from this finding is that the target firm's owners in an earnout financed deal are less incentivised to co-operate with the acquirer during the integration period as they already receive a higher initial payment than the full payment in M&As that do not include an earnout. In turn, the adverse selection consideration that arises from these findings is that, as the target firm's managers/owners know that they will be offered a higher initial payment compared to the full deal payment in a non-earnout financed deal, they are likely to exaggerate the extent of valuation disagreements to a level that unnecessarily leads to the involvement of earnout financing.

Contrary to the findings of Kohers and Ang (2000), which are based on: (a) univariate analysis and, (b) possibly a sample of non-comparable deals, moral hazard and adverse selection considerations should primarily incentivise the acquiring firm to insist on setting the initial payment at a level that is lower than, or equal to, the full deal payment in a comparable non-earnout financed deal. Such a contract design is likely to lead to an arrangement under which the target firm's owners are: (a) more incentivised to co-operate with the acquirer during the integration period in order to receive the deferred payment, and (b) less incentivised to exaggerate the magnitude of valuation disagreements to unnecessarily induce the inclusion of the earnout. Otherwise, they would receive a lower initial payment than, or at most an equal

[38]The authors show that the average price-to-book value ratio in earnout financed deals, with the price excluding the deferred payment, exceeds the average price-to-book ratio in non-earnout financed deals (3.7>2.2).

payment to, the full deal payment in a comparable non-earnout financed deal.[39] Accordingly, H_3 is stated as follows: *As a rule of thumb, the initial payment in an earnout financed deal is set to be, on average, at a lower level than, or equal to, the full deal payment in a comparable non-earnout financed deal.*

4.2.4. Earnout financing, the premium, and the acquirer's abnormal returns

The takeover premium has been employed in previous studies as a main determinant of the variation of the abnormal returns gained by acquirers (Hambrick and Hayward, 1997; Alexandridis et al., 2013). Mainly, the market's assessment of an increase in the premium can be explained by either: (a) the synergy hypothesis whereby a high premium is interpreted as a reflection of high synergies to be realised from the merger (Antoniou et al., 2008; Díaz et al., 2009), or (b) the over-investment hypothesis whereby a high premium is interpreted as a signal of managerial discretion and hubris that are leading the acquiring company's board to be engaged in a wasteful acquisition (Mueller and Sirower, 2003; Roll, 1986).[40]

The over-investment hypothesis can also explain the potential presence of high premia in private target deals (Cain et al., 2011; Capron and Shen, 2007; Datar et al., 2001; Kohers and Ang, 2000). Specifically, due to the limited available information about the private target's performance (Ball and Shivakumar, 2005), the acquirer is likely to overpay for the combination of assets and managerial skills as information asymmetry prevents the accurate valuation of these factors' effects on the potential synergies of the deal.

If earnout financing addresses a significant part of the information asymmetry problem, such a likelihood of overpayment should vary significantly between earnout and non-earnout financed deals. Specifically, for comparable deals, one should anticipate the market to negatively interpret the increase in the takeover premia offered in non-earnout financed deals in which earnout financing is likely to be implemented. Such a negative relationship should not persist when earnout financing is used despite the offering of relatively high premia. This neutralisation of the negative effect of the premium on the acquirer's Cumulative Abnormal

[39] It is worth noting that the moral hazard and adverse selection considerations are not mutually exclusive. Specifically, a target firm may operate in an intangible-rich sector, or in an environment that is characterised by high valuation complexity, which: (a) allows the target firm's managers to report an inflated valuation about their firm, or demand a high premium, which gives rise to adverse selection, and (b) makes the retention of the target firm's valuable human capital a critical input for the merger's performance, leading in turn to a higher need to align the target's incentives with those of the acquirer during the integration period, which gives rise to moral hazard considerations.

[40] The literature reports mixed results regarding the effect of the takeover premia on the abnormal returns gained by the acquirers. Hambrick and Hayward (1997) and Mueller and Sirower (2003) find that premia have a negative effect on the acquirers gains. Alexandridis et al. (2013), in turn, find that the premium estimated using the piecewise regressions, based on the target's stock 52-week high, has a statistically and economically significant negative effect on the acquirers gains. Antoniou et al. (2008) find a positive effect of the premia on the acquirers' short-run gains. This effect is not reversed in the long-run. Díaz et al. (2009) document a non-linear relationship between the premia and the acquirers' gains: initial increases of the premia are treated as signals of synergies, leading to higher acquirers gains. Later increases in the premia are treated as signals of over-investment and hence acquirers are penalised by the market.

Returns (CAR) is due to the earnout's function of addressing information asymmetry concerns by linking the satisfaction of a significant portion of the deal's payment to the target firm's future performance. Following this discussion, H_4 is stated as follows: *The negative effect of the premia on the abnormal returns gained by acquirers in non-earnout financed deals is neutralised in comparable earnout financed deals.*

4.3. Methodology

In response to the growing popularity of matching analysis in empirical research, Ho et al. (2007) argue that matching in itself is not an estimation method: once a matched sample (containing the treated and control units) is established, an estimation procedure needs to be adopted to determine the factors influencing the treatment's outcome. Along these lines, the authors recommend that the researchers benefit from 'their decades of experience with parametric models to adjust the matched sample' (p. 213). Particularly, the matching on propensity scores is primarily used to balance the main covariates by simple *t*-tests on the matched sample (Rosenbaum and Rubin 1983). Then, parametric methods can be applied on this matched sample.

The previously discussed two-step approach provides results that are less dependent on the model's: (a) specification, and (b) functional form. Regarding the model's specification, Ho et al. (2007) point out that the two-stage approach is doubly robust: either the matching model or the parametric model needs to be correctly specified, but not necessarily both. Such an approach provides the researcher more flexibility in addressing the research question compared to the strict requirement of correct specification when parametric methods and matching are used separately. Regarding the functional form adopted in the model, King and Zeng (2005) further show that, by dropping observations that have no matches, the researcher not only reduces the degree of model dependence, but also needs to add less emphasis on non-linear relations and interactions among the explanatory variables. In advocating the use of parametric regressions, Ho et al. (2007) do not recommend a change in the computations of the standard errors from the procedures typically used for the particular parametric method adopted.

Consequently, I first employ Propensity Score Matching (PSM) (Dehejia and Wahba, 2002; Peel and Makepeace, 2012) to create a matched sample that includes comparable earnout financed and non-earnout financed deals. Subsequently, I apply parametric estimation methods on the matched sample and proceed with the testing of the hypotheses developed in Section 4.2.

Based on the estimated probabilities from a Logistic model that includes a rich set of dichotomous and continuous covariates, earnout and non-earnout financed deals which have

close estimated propensity scores are matched. Given that the number of earnout financed deals exceeds the number of non-earnout financed (control) deals in my sample, I rely on matching with replacement whereby a control observation can be used more than once, as in Dehejia and Wahba (2002). To benefit from the balancing offered by caliper matching (CM) while maintaining a considerable number of degrees of freedom to estimate the parametric models, I employ the highest possible matching caliper that leads to the balancing of the main covariates while maintaining the highest possible number of control observations. Then, I apply standard parametric analysis on the matched sample while controlling for the effects of the balanced variables, in addition to time and industry effects.[41]

An underlying assumption of the previously mentioned approach is that the main source of bias that the researcher is addressing is the one due to 'selection on observables' (Heckman and Robb, 1985). That is, it is assumed that the set of covariates that are balanced through the matching model and included in the parametric estimations include all the relevant factors. In a research field like private target acquisitions where target-specific information is rarely publicly available, the quantification of the effect of a missing covariate on the resulting conclusions remains critical.

4.4 Data and Sample Features

4.4.1. The dataset

The sample includes acquisitions involving private target firms that are announced between January 1996 and December 2010 (inclusive) and recorded by the Securities Data Corporation (SDC) Thomson ONE database.[42] For a deal to remain in the sample it must satisfy the following criteria: (a) the acquirer is a UK public firm listed in the London Stock Exchange and has a market value of at least £1m four weeks prior to the announcement of the deal; (b) the target firm is privately held and is based in either the domestic or the foreign market; (c) the transaction value should be at least £1m, excluding fees; and (d) the acquirer should aim to control at least 50% of the target firm's assets after the transaction. Furthermore, to avoid the inseparable effects of multiple deals on acquirers' gains, deals that are announced by the same acquirer within 5 days (i.e. the event window analysed) are excluded from the sample.

Following the statement by Officer (2007) that 'acquisition multiple data from SDC is missing or inaccurate, and this data is critical to inferring the acquisition discount for unlisted targets' (p. 579), I search in the acquisition announcements from Nexis UK and the InvestEgate Financial Press to obtain target-related measures that the acquiring firms are prepared to report to their shareholders. I find that, in the reports in which a target-specific performance

[41] The matching and parametric analyses are conducted using the R package MatchIt that is developed by Ho et al. (2006).

[42] The choice of the starting date follows from the observation of Faccio et al. (2006) that the SDC coverage of deals outside the United States becomes more accurate after 1996.

measures are recorded, the acquirers often report the target firm's pre-acquisition Audited Profits Before Taxes (PBT). I identify 445 deals for which the PBT is available. After excluding deals in which the target has negative PBT (as it makes the calculation of the acquisition multiple economically inaccurate), 424 deals remain in the sample (299 earnout financed deals and 125 non-earnout financed deals).[43]

4.4.2. Sample statistics

Table 4.1 (Panel A) records the annual distribution of the sample according to the deal's payment method. In addition, the same table records the annual distributions of the sampled deals in which the acquirer aims to control 100% of the target (FULL) in addition to cross-border acquisitions (CBA). In this sample, which contains most of the observations from Chapter Three, the earnout is the most frequently used financing method (70.5% of the transactions) followed by acquisitions financed in single payments in cash (CASH) (18.9%). This result differs from the statistics of Barbopoulos and Sudarsanam (2012) where the authors report that 38.7% of their sampled UK deals include earnouts and 40.51% include cash payments. Given that the sample is limited to deals covering the target-specific pre-acquisition performance, a potential explanation for this result is that, as earnout financing requires the measurement of the target's performance after the deal's announcement, the acquirers are more often prepared to report target-specific information in earnout financed deals compared to non-earnout financed ones. I operate within this constraint.

[43] This sample represents 15.9% of the original sample of 2,797 observations. Such a percentage level is close to the level of 15.15% reported by Officer et al. (2009) who also deal with the inclusion of unlisted target-specific accounting measures in their sample.

Table 4.1: Annual distribution of private target acquisitions by UK acquirers arranged by deal characteristics and target sector

	Panel A							Panel B											
YEAR	ALL	CASH	STOCK	MIXED	EA	FULL	CBA	IND	HCR	CST	MAT	MED	RTL	CPS	HT	EPW	TLC	FIN	RST
1996	29	9	0	4	16	28	4	10	0	4	4	1	0	1	6	0	2	0	1
1997	38	8	4	2	24	37	14	12	1	3	2	3	1	7	6	0	1	1	1
1998	37	10	0	6	21	37	11	8	0	0	4	2	3	12	7	0	0	1	0
1999	35	7	2	3	23	35	7	5	0	3	6	2	2	5	10	0	0	2	0
2000	35	10	0	2	23	35	12	3	1	1	3	4	1	10	11	0	1	0	0
2001	28	2	0	0	26	28	4	1	0	2	0	3	0	10	9	0	1	2	0
2002	12	1	0	0	11	12	2	2	1	0	0	2	0	3	1	0	1	2	0
2003	11	1	0	1	9	10	2	3	1	0	0	4	0	1	2	0	0	0	0
2004	18	1	0	2	15	18	2	1	0	1	0	6	0	4	3	0	1	1	1
2005	34	3	0	1	30	33	5	7	6	1	0	2	1	8	5	0	1	3	0
2006	32	2	0	3	27	31	6	6	1	0	0	2	1	11	10	0	0	1	0
2007	40	2	1	2	35	40	6	6	1	1	2	4	0	11	9	1	1	4	0
2008	22	8	0	0	14	22	8	2	1	1	1	1	1	8	4	0	0	3	0
2009	18	5	0	6	7	18	7	2	0	0	1	2	2	5	3	0	1	1	1
2010	35	11	1	5	18	30	12	6	1	0	0	4	2	8	8	2	3	1	0
N	424	80	8	37	299	414	102	74	14	17	23	42	14	104	94	3	13	22	4
%	100	18.87	1.89	8.73	70.52	97.64	24.06	17.45	3.30	4.01	5.42	9.91	3.30	24.53	22.17	0.71	3.07	5.19	0.94

Note: Panel A of this table represents the annual distribution of private target M&A bids announced by UK public acquirers between January 1st, 1996 and December 31st, 2010. The distribution of the sample is presented according to the total number of transactions (ALL), method of payment (earnout-financing (EA) or single upfront payments settled in cash (CASH), stock (STOCK) or mixes of both (MIXED)), whether the acquisition is classified by SDC as a full acquisition (FULL), in which case the acquirer controls 100% of the target once the acquisition becomes effective, and whether the acquisition is classified by SDC as a cross-border transaction (CBA) whereby the target is not registered as a UK company. Panel B of this table represents the yearly distribution of private target M&A bids with respect to the target's sector. The sectors, as reported by SDC, are: Industrials (IND), Healthcare (HCR), Consumer Staples (CST), Materials (MAT), Media and Entertainment (MED), Retail (RTL), Consumer Products (CPS), High-Technology (HT), Energy and Power (EPW), Telecommunications (TLC), Financials (FIN) and Real Estate (RST).

Table 4.1 (Panel B) reports the annual distribution of the sampled deals according to the target firm's industrial sector. Private targets from the Consumer Products and Services (CPS) sector are more often involved in acquisitions (24.5%) in the sample. They are followed by private targets in the High-Technology (HT) sector with a share of 22.1%. Consistent with earlier studies, the statistics show that earnout financing is more likely to be present in deals involving private targets from the hi-tech and other service-related sectors in which the value of the firm is dependent on the knowledge, skill, creativity, and efforts of a few personnel (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000). On the contrary, the target sectors with the lowest acquisition activity in the sample are the Energy and Power (EPW) with a share of 0.7% and the Real Estate (RST) one with a share of 0.94%.

The absence of target market value in private target deals makes the estimation of the premia offered in such deals a relatively challenging task. Kohers and Ang (2001) present the offer price-to-book value of equity ratio as the best available premium measure. However, Ball and Shivakumar (2005) emphasise the low quality of financial data reported by private firms. As a result, I rely on the target performance measure that the acquirer -after accessing the target's records- is prepared to report in the acquisition announcement, which is the target's positive Audited Profits Before Taxes (POSPBT). This allows for the calculation of the premium (PREMIUM), which is the outcome of the division of the deal payment, covering the initial payment and the deferred payment if the earnout is used, by the target's pre-acquisition profitability.

Table 4.2 reports the mean and median of PREMIUM in addition to other key variables included in the analysis. Among the sample statistics recorded in Table 4.2, I show that the mean (median) of PREMIUM in earnout financed deals is 39.27 (11.75), which is higher than the corresponding one offered in non-earnout financed ones (25.11 (8.82)). I also show that the acquirers that engage in earnout financed deals are younger and smaller, on average, than the ones engaged in single payment deals. Such results are consistent with findings from previous research indicating that such acquirers are more vulnerable to the consequences of target valuation risk and hence are more likely to rely on deferred payments to maximise the likelihood of the deal's success (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000).

Regarding the terms of earnout contracts, I find that the mean (median) of the size of the earnout payment, as a percentage of the full deal value (REAS), of 36% (32%) is similar to the statistics reported by Barbopoulos and Sudarsanam (2012), 38% (35%). Regarding the length of the earnout contract (LENGTH), I report an average (median) value of 19.8 (19) months. This is lower than the one of 31 (23) month periods reported by Cain et al. (2011). However, it is close to the levels of 21.86 (22) months reported in Barbopoulos and Sudarsanam (2012).

Table 4.2: Summary statistics

	MV(£m)		ACQ_MTBV		DV(£m)		AGE (days)		STOCK_PERC (%)		RS	
	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
ALL	294	71	4	2	13	6	4,833	3,398	12.35	0.0	0.48	0.08
CASH	323	92	3	2	13	4	6,451	5,323	0.00	0.0	0.17	0.05
STOCK	228	48	8	2	46	7	1,685	1,140	100	100.0	11.88	0.11
MIXED	409	51	4	2	9	5	5,968	4,501	33.6	29.3	0.24	0.09
EA	274	70	4	2	12	6	4,343	2,562	10.6	0.0	0.29	0.09
NEA	342	77	4	2	14	4	6,003	4,501	16.3	0.0	0.94	0.05
DOM	227	62	4	2	11	5	4,152	2,284	12.5	0.0	0.54	0.08
CBA	505	146	4	3	30	20	6,982	5,780	11.6	0.0	0.3	0.07
	CULT_IND		POSPBT (£m)		PREMIUM		EASIZE(£m)		REAS		LENGTH (months)	
	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
ALL	1.3	1	1.68	0.5	35.09	10.87	-	-	-	-	-	-
CASH	1.8	1	3.61	0.48	15.58	7.75	-	-	-	-	-	-
STOCK	1.8	1	1.11	0.30	126.05	17.25	-	-	-	-	-	-
MIXED	1.6	1	1.04	0.54	23.87	10.14	-	-	-	-	-	-
EA	1.2	1	1.26	0.50	39.27	11.75	4.8	2.3	0.36	0.32	19.8	19
NEA	1.7	1	2.69	0.49	25.11	8.82	-	-	0.00	0.00	0.00	0.00
DOM	1.0	1	1.02	0.44	37.8	10.96	3.8	1.9	0.38	0.33	10.7	1
CBA	2.4	1	3.78	0.90	26.56	10.17	9.3	4.7	0.29	0.25	15.1	12

Note: This Table represents the mean and median values of a set of continuous covariates in the sample. The covariates are the acquirer's market value (MV), the acquirer's market-to-book value (ACQ_MTBV), the transaction value (DV) and the bidder's age (AGE). The table also includes the means and medians of the portion of the transaction financed with stocks (STOCK_PERC), the size of deal payment relative to the acquirer's market value (RS), the Culture Index (CULT_IND) defined in Appendix 2, the target's positive Profits-before-Taxes (POSPBT), the premium measured by the variable (PREMIUM) defined in Appendix 2, the size of the deferred payment in earnout financed deals (EASIZE), the relative earnout size (REAS) and the length of earnout period (LENGTH). These measures are reported for the sample covering all the transactions (ALL), the transactions fully financed with cash (CASH), the transactions fully financed with stocks (STOCK), the transactions fully financed with a mix of cash and stock with no inclusion of earnouts (MIXED), the transactions financed with earnouts (EA) and the general group of transactions not financed with earnouts (NEA). The table also presents the means and medians of these variables based on the geographic scope of the transaction (domestic transactions (DOM) and cross-borders transactions (CBA). Please refer to Appendix 2 for an accurate description of the variables.

4.5. Results and Discussion

4.5.1. The balancing of the main covariates

To ensure that the effect of selection bias on the comparative analysis of the premia and the abnormal returns between earnout and non-earnout financed M&As is reduced, I employ the PSM method to identify similar single payment deals (in terms of characteristics/covariates) to those that have been financed with an earnout. The propensity score model aims to balance a large set of influential covariates with a caliper of 0.25.

In addition to balancing the overall level of profitability level of the private targets between earnout and non-earnout financed deals on the matched samples, I also balance the portion of the deal payment financed with stock (STOCK_PERC) in order to reflect the possible trade-off between stock and earnout financing,[44] given that they both have contingent payment properties (Chang 1998; Datar, Frankel, and Wolfson 2001; Officer, Poulsen, and Stegemoller 2009).[45] To emphasise the importance of balancing the portions of domestic and cross-border deals in the matched sample, I also include in my estimations a dichotomous variable (CBA) that is assigned the value of 1 if the target is not a UK company and 0 otherwise. Noting that cultural

[44] When the target firm's shareholders receive the acquiring company's stock as part of the deal's payment, the value of this payment increases with increase in the latter firm's stock price following the improvement in performance of the joint company.

[45] I recognise that this measure is based on the deal value which is an outcome variable. Hence, in alternative estimations, instead of STOCK_PERC, I employ a dummy variable that is assigned the value of 1 if stock-financing is present and 0 otherwise. The findings remain qualitatively similar to the ones reported.

and societal values can be a strong factor influencing the post-acquisition integration process especially in cross-border deals, I also employ a Culture Index (CULT_IND) that allows me to balance the influence of cultural heterogeneity between the merging firms on the challenges/difficulties faced during the integration process. This index is based on the graphical presentation presented by Radebaugh et al. (2006) which, in turn, is based on the traditional classification of country groups by cultural and societal values by Gray (1988). High values of CULT_IND indicate that the target firm belongs to a group of countries that put less emphasis on flexibility and more emphasis on uniformity in dealing with the accounting and organisational issues that might arise in a takeover compared to the UK. Along these lines, the use of contractual tools that require precise measurement of the target's performance, like earnout financing, become less feasible. This variable is properly defined in Appendix 2.

I also control for the presence of frequent acquirers (FREQ), which allows me to account for the acquirers' experience in engaging in M&As as well as their experience in assessing synergies and evaluating the success of their deals. I also balance the continuous variables representing the acquirer's market value (MV) and age (AGE). Finally, having balanced the acquirer's sizes, and to ensure that the targets in the matched sample have close sizes relative to their acquirers, I balance the dichotomous variable DUMMYRS which is assigned the value of 1 if the relative size of the deal value to the acquirer's market value exceeds 17%, which is the third quartile in the initial SDC sample, and 0 otherwise. Given that the deal value is an output variable that should not be included as a covariate in the matching (Smith and Todd, 2005), the use of DUMMYRS allows me to balance the portions of relatively large targets in the matched sample between earnout and non-earnout financed deals without necessarily balancing the continuous measure of the deal value.

Table 4.3 records statistics on the balancing of the main covariates between the treated (earnout) and control group (non-earnout) that I use in the analysis. This sample covers the 299 earnout financed deals and 87 comparable non-earnout financed deals. As it is presented by the *p*-values based on the *t*-test with the null hypothesis of 0 difference between the mean values between the treated and the control group, all covariates are balanced between the two groups. These results give a strong indication of an accurate matching. These covariates, in addition to further year and industry effects, are further controlled for in the multivariate analysis on the matched sample.

Table 4.3: Matching results

Panel A

Intercept	ln(MV)	ln(AGE)	FREQ	STOCK	CULT_IND	CBA	DUMMYRS	POSPBT
1.783*	0.247**	-0.229**	0.589*	-0.012**	-0.302**	-0.642*	1.037***	-0.013*
(0.976)	(0.104)	(0.105)	(0.324)	(0.005)	(0.128)	(0.337)	(0.284)	(0.007)

Panel B

	Before Matching			After Matching		
	Treated Group	Control Group	*p*-value	Treated Group	Control Group	*p*-value
PROP_SCORE	0.74	0.60	0.01	0.74	0.75	0.75
STOCK_PERC	10.67	16.35	0.05	10.54	10.19	0.81
CULT_IND	1.18	1.75	0.00	1.17	1.18	0.86
CBA	0.18	0.38	0.00	0.18	0.18	0.90
AGE	4343.80	6003.70	0.00	4396.10	4731.70	0.27
FREQ	0.27	0.16	0.01	0.26	0.22	0.13
MV	274	342	0.48	274	266	0.93
POSPBT	1.26	2.69	0.20	1.26	3.18	0.15
DUMMYRS	0.54	0.04	0.01	0.54	0.57	0.40

Note: This table reports the results of the initial PSM exercise balancing the main covariates in the analysis. After the matching, the treated and control groups contain, respectively, earnout financed (EA) and non-earnout financed (NEA) deals on the matched sample of 386 observations. For each of the covariates, I report the mean in the treated and control group before and after the matching. The Absolute Standardized Mean Difference refers to the absolute value of the ratio of the difference between the mean of the variable in the treated group and the mean of this variable in the control group, divided by the square root of the mean of the covariate's variances in both groups. Please refer to Appendix 2 for an accurate description of the variables.

4.5.2. Multivariate analysis of the premium

The evidence recorded in Table 4.4 gives strong support to the notion that the presence of earnout financing, relative to its absence, leads to higher premia. Consistent with hypothesis H_1, based on the interpretation of dummy variables in semi-logarithmic models that is offered by Kennedy (1981), the acquisition multiple in earnout financed deals is 31.11% higher than its equivalent in non-earnout counterparts.[46] In line with H_{2a}, Model 2 shows that the relative size of the deferred payment (REAS) has a significant positive association with the offered premium: a 10% increase in the relative size of the earnout payment is, on average, associated with 6.45% increase in the offered premium. In turn, as suggested by H_{2b}, the length of the earnout period (LENGTH) has a qualitatively similar effect on the premia. Specifically, a one month increase in the length of the earnout period is associated with a 0.6% increase in the premium.

Despite the previous literature's suggestion that the use of earnout financing is the initial step to establish a long term employer-employee relationship between the acquiring firm and the target's owners/managers (Datar et al., 2001), it appears that the merging firms are keen to separate the takeover related considerations from the employment- and organisational-related ones. Along these lines, my results add strong emphasis on the notion that the target firm's owners prefer that the acquisition contract explicitly recognises their compensation for bearing a significant portion of the post-acquisition integration risk and forgoing valuable alternative business/employment opportunities during the earnout period.

[46] Based on the interpretation offered by Kennedy (1981), if the coefficient associated with a dummy variable in a semi logarithmic equation is c, the percentage impact of this variable on the outcome is $exp(c - var(c)) - 1$.

Table 4.4: Analysis of the determinants of the takeover premium

Model	OLS	OLS
Dependent Variable	ln(PREMIUM)	ln(PREMIUM)
Explanatory Variables\Model (.)	(1)	(2)
Intercept	1.091***	0.898***
	(0.359)	(0.351)
EA	0.283***	
	(0.111)	
ln(POSPBT)	-0.594***	-0.577***
	(0.057)	(0.058)
ln(MV)	0.159***	0.160***
	(0.036)	(0.034)
ln(AGE)	0.008	0.032
	(0.031)	(0.031)
CBA	0.275**	0.287**
	(0.124)	(0.125)
STOCK_PERC	0.007**	0.009***
	(0.003)	(0.003)
CULT_IND	-0.100	-0.099
	(0.065)	(0.062)
FREQ	-0.093	-0.096
	(0.090)	(0.086)
REAS		0.645***
		(0.174)
LENGTH		0.006**
		(0.003)
Year Effects	YES	YES
Industry and Cross-Industry Effects	YES	YES
Adjusted R-Squared	0.41	0.44
N	386	386
P-Value (LR-test)	0.00	0.00

Note: This table represents two models that explain the variation in the premium offered to the target shareholders. The first model puts emphasis on the impact of the presence of earnout financing on the premium while the second model's emphasis is on the impact of the earnout contract's terms on this premium. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. Variables not included in this table were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 2 for an accurate description of the variables.

4.5.3. The structure of the earnout payment

To investigate the difference between the initial payment in earnout financed deals and the full deal payments in comparable non-earnout financed deals, I modify the approach adopted in Section 5.2 by introducing the following dependent variable:

$$\text{INITIALDV} = \begin{cases} \ln\left(\dfrac{\text{INITIALPMT}}{\text{POSPBT}}\right) \text{ in earnout financed deals} \\ \ln\left(\dfrac{\text{DV}}{\text{POSPBT}}\right) \text{ in non} - \text{earnout financed deals} \end{cases}$$

Specifically, employing the INITIALDV as the dependent variable allows for the estimation of the premium based on the assumption that, in earnout financed deals, the deal payment is limited to the initial payment (INITIALPMT). The sign, magnitude and significance of the coefficient associated with the dummy variable referring to the presence of the earnout (EA) in a regression over the matched (treated and control) sample, with INITIALDV being the dependent variable, allow us to examine the difference between the initial payments in earnout financed deals and the full deal payments in comparable non-earnout financed ones, relative to the target's pre-acquisition profitability.

Table 4.5 (Model 1) shows that, after controlling for several covariates over the matched sample, the initial payment in earnout financed deals is found to be significantly smaller than the full deal values in comparable non-earnout financed ones. This effect remains significant, yet at the 10% level, when time and industry effects are included in Model 2. Based on the interpretation of dummy variables in semi-logarithmic models that is offered by Kennedy (1981), the initial payment in an earnout financed deal is, on average, 21.10% lower than the full deal payment in a comparable non-earnout financed deal. Such findings lead to the non-rejection of H_3 and highlight the importance of the hypothesised rule of thumb in dividing the deal payment between an initial payment and a deferred one.

Table 4.5: Multivariate analysis of the earnout's structure

Dependent Variable	INITALDV	INITIALDV
Explanatory Variable\Model (.)	(1)	(2)
Intercept	0.974***	1.000***
	(0.248)	(0.286)
EA	-0.227**	-0.212*
	(0.106)	(0.112)
ln(MV)	0.187***	0.193***
	(0.039)	(0.037)
STOCK_PERC	0.011***	0.012***
	(0.003)	(0.003)
ln(POSPBT)	0.455***	0.457***
	(0.067)	(0.067)
CBA	0.371***	0.359***
	(0.125)	(0.128)
CULT_IND	-0.094	-0.091
	(0.059)	(0.066)
Year Effects	NO	YES
Industry and Cross-Industry Effects	NO	YES
N	386	386
Adjusted R-Squared	0.40	0.39
Prob (*F*-statistic)	0.00	0.00

Note: This table reports the results of the cross-sectional analysis explaining the relationship between the initial payments in earnout financed deals and the deal payments in non-earnout financed deals. The dependent variable is INITIALDV. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. Variables not included in this table were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 2 for an accurate description of the variables.

This finding provides a strong indication that the acquiring firms are aware of the adverse selection and moral hazard distortions that arise from systematically committing to making significantly high immediate payments in earnout financed deals. Hence, despite the offer of high premia in earnout financed deals, the careful design of the initial and deferred payments to ensure the target firm's co-operation appears to be an important condition for those firms to proceed with the transaction.

4.5.4. The determinants of abnormal returns gained by the acquirer's shareholders

In examining the determinants of the abnormal returns gained by acquirers, I introduce the presence of earnout financing as an independent variable in Model 1 (Table 4.6). Consistent with previous evidence presented by Barbopoulos and Sudarsanam (2012), my findings highlight the positive market response to the presence of earnout financing. Specifically,

controlling for known determinants[47], earnout financed deals yield, on average, 2.2% higher Cumulative Abnormal Returns (CAR) than non-earnout financed ones.[48]

To determine whether the market reacts differently to the premium level when the earnout is included compared to M&As in which the earnout is not included, I add PREMIUM and the product (EA × PREMIUM) as additional regressors in Model 2. Based on this specification, the coefficient associated with PREMIUM represents the market's sensitivity to the premia in non-earnout financed deals. In turn, the sum of the coefficients associated with PREMIUM and (EA × PREMIUM) represents the market's sensitivity to the premia paid in earnout financed deals. According to H_4 the coefficient associated with PREMIUM should be negative and the coefficient associated with (EA × PREMIUM) should be positive, with an absolute value equal to that of the coefficient of PREMIUM.

The results recorded in Model 2 indicate, as hypothesised in H_4, the two new relations that emerge between the variables PREMIUM and CAR. The first is negative, which is due to the absence of earnout financing. Specifically, as expected in non-earnout financed deals, an increase in the premium is interpreted negatively. However, the second relationship is positive with a magnitude being close in absolute value to the previous relation.[49] The null hypothesis being the restriction that the coefficient associated with (EA × PREMIUM) is equal to the opposite value of the coefficient associated with PREMIUM is not rejected by a Wald test with a *p*-value of 0.77. The sum of both coefficients is not statistically different than 0, which indicates that the market's sensitivity to the premium in earnout financed deals is statistically insignificant. Moreover, the distinction I present between the premium's influence on CAR in earnout and non-earnout financed deals explains the overall positive wealth effect of this financing method as it renders the coefficient of EA insignificant in the specification presented.

Overall, the insensitivity of the acquirer's CAR to the level of the premium in earnout financed deals indicates that the offered premium in an earnout financed deal, despite being relatively higher than the premium in a comparable non-earnout financed deal, carries no implication on whether the target firm is overpaid or not. Rather, this premium is interpreted by the market as the outcome of a detailed bargaining process that aims to ensure the

[47] For industry and year effects, I include dummy variables that refer to each sector covered in the sample and each year, respectively. For cross-industry effects, I include a dummy variable that is assigned the value of 1 if the merging firms have different 2-digit SIC codes and 0 otherwise.

[48] As in Fuller, Netter, and Stegemoller (2002) and Faccio et al. (2006), I estimate the Cumulative Abnormal Returns (CAR) as the sum of the daily differences between the acquiring firm's stocks returns and the returns on a market index (the FT-ALL Share Index in particular) in the 5-day period (-2, 2) surrounding the acquisition's announcement date.

[49] In alternative estimations, I include ln(PREMIUM) instead of PREMIUM as an independent variable. My findings remain qualitatively similar to the ones reported when it comes to signs of the coefficients. However, the effects in these alternative estimations are not significant. Therefore, my findings indicate that the relation between the premia in earnout financed deals and non-earnout financed ones on one hand and the acquirer's CAR on another hand are linear.

completion of the deal by addressing the valuation disagreements between the merging partners.

Table 4.6: Determinants of the market's reaction to the acquisition announcement

Dependent Variable	CAR	CAR
Explanatory Variables\Model (.)	(1)	(2)
Intercept	0.036**	0.044***
	(0.016)	(0.017)
EA	0.022**	0.013
	(0.010)	(0.011)
ln(MV)	-0.003	-0.003
	(0.002)	(0.002)
STOCK_PERC	-0.001	-0.001
	(0.001)	(0.001)
CULT_IND	0.007*	0.007*
	(0.004)	(0.004)
PREMIUM		-0.0004**
		(0.0002)
EA × PREMIUM		0.0004**
		(0.0002)
Year Effects	YES	YES
Industry and Cross-Industry Effects	YES	YES
N	386	386
Adjured R-Squared	0.02	0.04
Prob (*F*-Statistic)	0.00	0.00

Note: This table represents the cross-sectional analysis of the public UK acquirers' CAR in the 5-day period (-2, 2) surrounding the acquisition announcement. Model 1 examines the determinants of CAR without introducing the interaction of the premium (PREMIUM) with the presence of earnouts (EA). Model 2 examines whether the different interpretations by the market of the acquisition premia explains the positive market reaction to the presence of earnouts. The standard errors reported in parentheses are corrected for heteroskedasticity using White's (1980) heteroskedasticity consistent standard errors. Variables not included in this table were included in alternative specifications and were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 2 for an accurate description of the variables.

4.6. Sensitivity Analysis

In the approach adopted in Section 4.5, I used matching analysis with the highest possible caliper to retain the highest number of comparable observations. Then, I applied parametric analysis on the resulting sample. In this Section, I add further emphasis on the validity of the results: (a) by using a smaller caliper to make the deals even more comparable, (b) by estimating the Average Treatment Effect on the Treated (*ATT*), which is the average difference in outcomes between the treated and the control observations on the matched sample, and (c) by applying a sensitivity analysis on the resulting *ATT* to quantify the effect that a missing covariate should have on the treatment's presence (in the Logistic model) in order to alter my conclusions. How strong a missing covariate would have to be, in terms of influencing the odds of assigning a treatment, in order to alter the qualitative conclusions of the study?

In the context of this analysis, this approach can be applied to the results related to the non-rejection of H_1 and H_3 in Section 4.5. In particular, to what extent can we be confident that (a) the increase in premia in earnout financed deals relative to non-earnout financed deals and, (b) the notion that 'the initial payment in an earnout financed deal is lower than, or equal to, the full payment in a comparable non-earnout financed deal' can hold with the introduction of a missing covariate? These examinations are relevant given that a large amount of private-target-

related information is not publicly available to be introduced to the analysis in the form of covariates that influence the use of earnout financing.

Table 4.7: Treatment effect estimates and sensitivity analysis

Outcome	ln(PREMIUM)	INITIALDV
ATT (Abadie and Imbens (2006) Standard Errors)	47.25*** (0.07)	-11.03 (9.92)
Cut-off Γ value (p≈0.05)	2.00	1.50
Cut-off Γ value (p≈0.10)	2.20	1.41

Note: This table represents the outcome of the matching and the Rosenbaum (2002) sensitivity analyses. For both variables, ln(PREMIUM) and INITIALDV, I estimate the Average Treatment Effect on the Treated (ATT) with the Abadie and Imbens (2006) standard errors after a 1:1 matching exercise with caliper 0.1. I also present the cut-off Γ levels at which the treatment effects become significant at the 5% and 10% levels for ln(PREMIUM) and insignificant for INITIALDV. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively.

The results reported in Table 4.7, based on PSM with a caliper of 0.01 and the Logistic model specification as in Table 4.3, present inferences that are in line with conclusions of Section 4.5.[50] These inferences are strongly insensitive to the effect of a missing covariate. In particular, the *ATT* estimate of ln(PREMIUM) is 47.23% and is significant at the 1% level.[51] In turn, the *ATT* estimate of the impact of earnout on INITIALDV is insignificant. Hence, the initial payment in an earnout financed deal is not statistically different than the full deal's payment in a comparable non-earnout financed one. Based on the Γ levels of the Rosenbaum (2002) sensitivity analysis, a missing covariate needs to increase the odds of one of two matched deals, including the earnout relative to the control from the non-earnout group, by a factor of 1.5 to 2 in order to: (a) make the impact of the earnout's presence on the premium statistically insignificant and, (b) make the difference between the initial payment in an earnout financed deal and the full payment in a non-earnout financed one positive and statistically significant.[52]

The Γ levels of 1.5 and 2 that I report are close, for instance, to the level of 1.55 that is reported as evidence of strongly insensitive results in the Peel and Makepeace (2012) study of the premium received by accounting auditors. Furthermore, in the Logistic model, these effects are equivalent to a required reduction in the portion of the deal that is financed by stocks from 57% and 34%, respectively, to 0, i.e. to employ full cash financing in order to alter my qualitative conclusions. These reductions reflect strong economic impacts given that the standard deviation of the portion of the deal financed by stocks is 23%. Following the emphasis of Core (2010) that results in empirical accounting and finance research are not frequently supported by sensitivity analyses, these results give a clear indication that my conclusions are

[50]The key covariates are balanced on the resulting matched sample as in Table 4.3. This matched sample covers 135 earnout financed deal and 64 non-earnout financed ones.

[51]Abadie and Imbens (2008) show that estimators resulting from bootstrap procedures are not valid even under the simple conditions of a single continuous covariate and an unbiased $N^{1/2}$ normally distributed estimator. The results of the Abadie and Imbens (2008) simulation show that the variance estimator they developed (Abadie and Imbens, 2006) tends to perform well even with small samples. Consequently, in testing the null hypothesis of zero *ATT*, theAbadie and Imbens (2006) standard errors are employed in the *t*-tests and reported with the results.

[52] These results are based on the Wilcoxon Rank Sum Test at each Γ level.

relatively insensitive to the effect of a missing covariate on the odds of the earnout's presence in the financing process of the deal.

4.7. Conclusion

Due to the heterogeneity in the structure earnout contracts, and the market participants' need to have clear quantitative estimations of the various trade-offs associated with the design of such contracts, I present the first empirical contribution that investigates the relationship between the terms of the earnout (size and length) and the premia. Specifically, I show that relatively large deferred payments and longer earnout periods are associated with increases in the premia in earnout deals compared to the premia in comparable single-payment deals. This finding indicates that the target firm's owners in an earnout financed deal are compensated for sharing the post-acquisition business risk with the acquiring firm by being offered relatively higher premia. In addition, I present evidence concerning the presence of a specific rule of thumb that governs the relationship between the earnout financed deals and comparable non-earnout financed ones: the initial payments in the former group are set to be, on average, at a lower level than, or equal to, the full deal payments in the latter group. This result indicates that the acquiring firms are aware of the ramifications of making high immediate payments to their targets as such high payments might distort the incentives of the private target's owners (often managers) in co-operating to achieve the takeover's objectives.

Moreover, I investigate the abnormal returns gained by acquirers' shareholders in deals that are financed with earnouts and comparable deals that are financed with single-payments. I find that an increase in the premia in non-earnout financed deals is interpreted as a signal of overpayment. To the contrary, given that earnout contracts are employed to address information asymmetry issues that prevent the completion of the deal, the relatively high premium in an earnout financed deal is not interpreted by the market as a signal of overpayment. This result is expected given that the receipt of a significant portion of this premium is contingent upon the target's satisfaction of pre-determined post-acquisition performance requirements.

Finally, given the limitation of publicly available target-specific information in private target deals, I rely on the Rosenbaum (2002) sensitivity analysis to quantify what the effect that a missing covariate should be on the odds of earnout presence to alter my qualitative conclusions. I find that my results are robust and insensitive to the impact of an omitted unobserved covariate. Hence, my conclusions are likely to be highly consistent. Overall, this chapter adds further emphasis on the usefulness of earnout financing in addressing information asymmetry concerns in M&As and in providing a contextual framework that allows both the acquiring and the target firms to reap additional benefits from the M&A transaction.

Appendix 2 – Variables' Definitions

Variable (Acronym)	Description	Source
Acquirer's Age (AGE)	The number of days between the acquirer's listing in Datastream and the announcement date	Datastream
Acquirer's Market-to-Book Value (ACQMTBV)	The market value of the acquirer at four weeks before the acquisition, divided by its book value of equity from the most recent accounting statement prior to the bid announcement.	Datastream
Audited Profits Before Taxes (PBT)	The target's Audited Profits Before Taxes for the financial year preceding the acquisition as covered in the acquisition announcement	InvestEgate + Nexis UK
Cash Financed Transactions (CASH)	Dummy=1 if the consideration is 100% financed with cash and 0 otherwise	SDC
Cross-Border Acquisition (CBA)	Dummy=1 when the transaction includes a UK acquirer and non-UK target and = 0 when the target is a UK firm [= DOM]	SDC
Culture Index (CULT_INDEX)	An index that ranks the countries in which the targets are listed from the most flexible to the least flexible, and from the most transparent to the least transparent, in dealing with accounting and organisational challenges. It takes the following values: 1. The country of the firm acquired belongs to the Anglo-American group. The countries included are: United Kingdom, Canada, the Republic of Ireland, United States, New Zealand, South Africa and Australia. 2. The country of the firm acquired belongs to the Nordic group. The countries included are: Sweden, Denmark, Finland, Norway and the Netherlands. 3. The country of the firm acquired belongs to the Asian-Colonial group. The countries included in this case are: Hong Kong and Singapore. 4. The country of the firm acquired belongs to the Germanic group. The countries included are: Germany, Austria, Israel and Switzerland. 5. The country of the firm belongs to the remaining groups. The underlying assumption in this case is that once high differences in the degree of flexibility are reached, the ordering of the accounting systems becomes less relevant	SDC + The classification provided by Gray (1988) in which he uses cultural and societal values as primary characteristics for grouping families of countries. The ranking of the flexibility of these groups' accounting systems is represented graphically by Radebaugh et al. (2006).
Cumulative Abnormal Returns (CAR)	The sum of the acquirer's abnormal returns in the 5-day window surrounding the announcement	Datastream
Deal Value (DV)	Reported deal value, in millions of pounds. This value covers the initial payment and the maximum value of the reported deferred payment when an earnout is included	SDC
Earnout (EA)	Dummy=1 when the consideration includes an earnout [EA] and 0 otherwise [NEA]	SDC
Earnout Value (EASIZE)	Value of the reported maximum earnout size, in million pounds.	SDC
Frequent Bidder (FREQ)	Dummy=1 when the acquirer is classified as a frequent bidder and 0 otherwise. Following Draper and Paudyal (2006), the acquirers who bid more than the third quartile of bid counts per acquirer in the SDC sample of 2797 deals (9 bids) are classified as frequent bidders	SDC
High Relative Size of the Deal (DUMMYRS)	Dummy=1 if the deal value relative to the market value of the acquirer's market value is higher than the third quartile of 17%	SDC
Initial Payment in Earnout Financed Deals (INITIALPMT)	The value of the initial upfront payment in earnout financed deals	SDC
Length of the Earnout Period (LENGTH)	The length of the earnout period in months as present in the acquisition announcement. When no earnout is present, this variable takes the value of 0. When an earnout is present and the acquisition announcement refers to the auditing of the target's account without mentioning the length of the earnout period I give this variable a value of 1	Nexis UK + InvestEgate
Market Value of the Acquirer's Equity (MV)	Acquirer's market value of equity at four weeks prior to bid announcement, in millions of pounds. I also employ the natural logarithm of this variable	Datastream
Natural Logarithm of the Deal Value for Non-Earnout Financed Transactions and the Initial Payments in Earnout Financed Transactions, Divided	A continuous variable that is equal to the deal value when an earnout is not included and equal only to the initial payment when the earnout is included, divided by the target's pre-acquisition profitability	SDC

by The target's Profits Before Taxes (INITIALDV)		
Percentage of the Deal Payment Financed With Stocks (STOCK_PERC)	The percentage of the total transaction value financed with stocks	SDC
Positive Profits Before Taxes (POSPBT)	The audited value of the profit-before taxes of the target for the financial year preceding the acquisition. As this measure is used in calculating acquisition multiples, I only include transaction in which this measure has a positive value	Nexis UK + InvestEgate
Premium Offered to the Target (PREMIUM)	The ratio of the deal value to the target's pre-acquisition profitability	SDC + Nexis UK + InvestEgate
Propensity Score (PROP_SCORE)	The propensity scores estimated by the Logistic model in Table 4.3	SDC + Nexis + InvestEgate
Relative Size of the Deal (RS)	Ratio of (DV) to (MV)	Datastream +SDC
Relative Earnout Payment Size (REAS)	The ratio of the maximum size of the deferred payment to overall deal value which covers both the initial payment and the maximum value of the deferred payment	SDC
Stock Financed Acquisitions (STOCK)	Dummy = 1 when the consideration is 100% financed with stocks and 0 otherwise	SDC
Transactions financed with a Mix of Cash and Stocks Without an Earnout (MIXED)	Dummy = 1 when the deal is financed with a mix of cash and stock excluding earnout and 0 otherwise	SDC

Chapter Five

The Valuation Effects of the Scheme of Arrangement in the UK Market for Corporate Control

Abstract

In this chapter, I study why the Scheme of Arrangement (Scheme), as an alternative takeover method to the traditional Contractual Offer (Offer), has recently turned into the most popular takeover method in the UK market for corporate control. The Scheme is more likely to occur in deals involving large targets, deals financed with stock, in the presence of target termination fee agreements, as well as in deals that have been initiated by private equity acquirers. Despite evidence in the legal literature arguing in favour of the limited bargaining power of target shareholders in Scheme deals, my parametric and matching analyses show that the target shareholders receive similar premia in Scheme and Offer deals. My results also show that, before the proper codification of the Scheme by The Panel on Takeovers and Mergers, the sub-optimal use of this takeover method was associated with a significant reduction in the abnormal returns gained by acquirers.

5.1. Introduction

To acquire and eventually control all the shares of a publicly traded (or listed) company in the UK, two takeover methods can be employed. The first method is the Contractual Offer (hereafter 'Offer') via which the acquirer announces directly to the shareholders of the target company her willingness to acquire their shares at a pre-determined price-per-share. The second method is the Scheme of Arrangement (hereafter 'Scheme') via which a process administered by the court is involved, at the end of which, the target company as a single unit accepts or rejects selling her shares to the acquirer at the pre-determined price-per-share that has been initially offered (Boardman, 2012). Approval of the Scheme is the result of a voting process that occurs in separate class meetings. These classes are determined by the court and require the approval of more than 75% of the shareholders in each class (Parliament, 2006). Part 26 of the Companies Act defines the Scheme as 'a compromise or arrangement… between a company and its creditors, or any class of them, or its members or any class of them' (p. 423) (Parliament, 2006). However, the Offer was the standard takeover method for conducting listed target takeovers in the UK, as the Scheme was described as 'inflexible, time-consuming and costly' (p. 2) (Myners, 2008). Franks and Harris (1989) highlight the unpopularity of the Scheme due to the need for extensive dealings with the target board of directors and the involvement of the court. Yet, during the last decade, the increased predictability of the approval of the court, in addition to the guidance and further codification that has been offered by The Panel on Takeovers and Mergers (hereafter 'Panel'), have enhanced the popularity of the Scheme to the extent that it has become the main takeover method in the UK (Boardman, 2012). As a result, while the legal literature has contributed to our understanding of the definitions and regulations associated with both the Scheme and the Offer, the determinants of the choice between the Scheme and the Offer, as well as the effect of each takeover method on the premia offered to the target shareholders and the abnormal returns gained by acquirers, remain to be investigated. This chapter aims to offer insights on the dynamics influencing the choice of the takeover method in listed target acquisitions in the UK and also to shed light on what explains the cross-sectional differences in abnormal returns under each takeover method.

The determinants of the choice of merging firms to implement the Scheme as the takeover method has been discussed in several reports issued by financial and legal consultants (Boardman, 2012; Lombers et al., 2008; Martin, 2007).[53] Among other relevant features, they mainly refer to several firm- and deal-specific factors that contribute to the favourability of the Scheme takeover method, relative to the Offer. For instance, the Scheme guarantees, once it is sanctioned by the court, the immediate acquisition of 100% of the target's shares without the

[53] I rely on such reports in discussing the different aspects of the Scheme due to the limited finance-based scholarly work in this area. However, when appropriate, I refer to the related legal scholarly contributions.

need to negotiate with the target minority shareholders, as it happens in the case of the Offer. This is likely to make the Scheme a favourable takeover method in deals initiated by acquirers that are interested in the immediate control of all the assets of the target for, possibly, financial reasons, i.e. in the case of acquisitions initiated by private equity acquirers that often use debt to finance their deals and the target assets being used as collateral (Lombers et al., 2008). Moreover, while the acquirers using the Scheme, contrary to their counterparts using the Offer, do not pay the stamp duty that amounts to 0.5% of the deal value, the high advisory fees and the length of the court procedure are presented by merger consultants as a cost that possibly outweighs the benefits of tax savings (Ashurst LLP, 2004).[54] Given the overwhelming evidence that public target acquirers experience substantial declines in wealth, or at best break even, following the M&A announcements (Draper and Paudyal, 2006), this 0.5% tax savings can be a critical source of additional returns especially when acquiring relatively large targets (Boardman, 2012). The influence of these factors, among others, on the likelihood of the use of the Scheme rather than the Offer, remains to be empirically investigated.

Along similar lines, earlier studies discuss the consequences of the weak bargaining power of the target shareholders under Scheme, relative to that under the Offer. Specifically, Payne (2011) analyses the Scheme-related regulations and the attitude of the court to highlight the limited ability of the dissenting target shareholders in influencing the takeover outcome under the Scheme. Such a limitation gives the acquirer a strong bargaining position in the takeover process by allowing her to complete the deal at a relatively low premium. Therefore, it remains to be empirically investigated whether the target shareholders under the Scheme manage to ultimately receive as high premia as those received by the target shareholders in comparable Offer deals. In this chapter, in addition to tackling this issue by applying a parametric analysis, I employ the non-parametric Propensity Score Matching (PSM) method to create a matched sample of comparable Scheme and Offer deals in order to accurately evaluate the difference in premia offered between the two groups of deals.

Moreover, given that the Scheme is a relatively complicated legally and regulatory procedure, its use should be limited to those deals in which any associated benefits, in terms of tax deductions or guaranteeing the full acquisition of target's assets, exceed its advisory costs and the costs arising from possible delays in the deal completion. Based on the approach implemented by Barbopoulos and Sudarsanam (2012), in addition to evaluating the overall difference in the abnormal returns gained by acquirers between Scheme and Offer deals, I examine the difference in the acquirers' abnormal returns between the deals in which the use of the Scheme is classified as optimal and the deals in which it is classified as sub-optimal. More

[54] The Telegraph reports that, in 2008 and 2009, the total amount of tax savings enjoyed by acquirers in Scheme deals amounted to £45 million (Wilson, 2010).

specifically, I expect that the sub-optimal use of the Scheme to be associated with significant losses for acquirers' shareholders, relative to the optimal use of this method. Moreover, I apply the same approach across different periods in the sample in order to determine how any observed difference in acquirers' gains has evolved over time, especially given that the use of the Scheme has become less regulatorily demanding in more recent times following the updated clarifications offered by the Panel in Appendix 7 which reduced the heavy reliance on advisors.

My main findings indicate that the likelihood of the Scheme being used as a takeover method in the UK market for corporate control is positively influenced by the fraction of deal's stock financing. As the acquirer is revealing detailed business- and synergy-related information to convince the target's board of directors to accept stock financing, the immediate guarantee of an explicit completion of the deal through the sale of 100% of the target shares sets the Scheme as the favourable takeover method. Along these lines, the tax advantages of the Scheme also contribute to its favourability since the choice of stock financing is likely to be positively influenced by the financial constraints that prevent cash financing (Faccio and Masulis, 2005). I also find that the likelihood of the Scheme being used is influenced by the size of the target firm. Specifically, as acquirers using the Scheme, rather than the Offer, do not pay the stamp duty that amounts to 0.5% of the deal value, the size of the deal presents an important factor that is positively affecting the use of the Scheme takeover method. Likewise, the previously mentioned taxation, ownership, and also the guaranteed deal completion features of the Scheme make it more likely to be used: (a) in acquisitions initiated by private equity acquirers, and (b) when the target's board of directors signs a binding termination fee agreement.[55] I also find that, while these features make the Scheme a more favourable takeover method for domestic diversifying acquirers, foreign diversifying acquirers are less likely to implement it, possibly due to their unfamiliarity with the UK regulatory and legal requirements.

Regarding the premia offered in Scheme and Offer deals, my initial multivariate analysis shows that, on average, the target shareholders in Scheme deals receive almost 7% higher premia than their counterparts in Offer deals. However, when matching analysis is employed, I find that the effect of the takeover method on the offered premia is statistically and economically insignificant. Moreover, based on the Rosenbaum-bounds sensitivity analysis, the conclusions based on the latter analysis are found to be relatively insensitive to the effect of a missing covariate. These findings clearly indicate that the target shareholders, despite their theoretically weak relative bargaining power, manage to receive premia that are, at least, as high as the premia received by their counterparts in comparable Offer deals. Additionally, the voting outcomes of the shareholders' court meeting, in which most of the Schemes receive an

[55] A termination fee agreement requires the party deciding not to proceed with the deal to pay a pre-specified sum to its counterpart.

overwhelming support exceeding 95% of the overall votes, offer further validation to the notion that the Scheme target shareholders are in general satisfied with the premia they are offered.

Lastly, my analysis indicates that the abnormal returns gained by acquirers in Scheme and Offer deals are not significantly different from each other. However, I find significant differences in the acquirers' abnormal returns between the optimal and the sub-optimal use of the Scheme relative to the Offer. Specifically, before the year 2008 (the time at which the Panel issued formal clarifications of the Scheme's procedures and timetable) the sub-optimal use of the Scheme is associated with at least 2.5% decline in the abnormal returns gained by acquirers. This possibly suggests that when the Scheme is not properly codified and/or it is used in circumstances in which such a use is not recommended, as it is classified as sub-optimal by the outcome of the Logistic model, it allows the legal and advisory costs to exceed its tax benefits.

I proceed as follows: Section 5.2 discusses the main procedural differences between the Scheme and the Offer. Section 5.3 presents the theoretical framework and designs the hypotheses. The methods in estimating the takeover premia offered to target shareholders and the abnormal returns gained by acquirers are presented in Section 5.4. Section 5.5 refers to the dataset and discusses the sample's summary statistics. Finally, Section 5.6 discusses the empirical results and Section 5.7 offers a conclusion.

5.2. The Scheme versus the Offer

The discussion of the regulations related to the Scheme and the Offer uncovers several procedural, ownership-specific, as well as tax-related distinctions between the two takeover methods. This section refers to the main aspects of the Scheme and the Offer that I expect to have a significant influence on: (a) the choice of one over the other, and (b) any observed difference in the offered premia to targets and the abnormal returns gained by acquirers' shareholders.

The first difference between the two takeover methods lies in their diverse approaches regarding the participation of the target firm's shareholders, and also the target firm's board of directors, in the deal's process under each method. Specifically, in the case of the Offer, based on Rule 25.2 of the Takeover Code (the 'Code'), the acquirer announces the bid directly to the target firm's shareholders with the target firm's board of directors only expressing its opinion regarding the deal. However, in the case of the Scheme, a friendly target board presents a crucial element that is compulsory to complete the deal. In particular, as the Scheme is an agreement between a company and its investors, it is the target firm's board of directors that often sets a court meeting in which the shareholders vote on the Scheme as required by Section 896 of the Companies Act (Parliament, 2006). Therefore, while an Offer *can* be a friendly deal when it has the approval of the target's board of directors, a Scheme *has* to be a friendly deal as it is a

process that is mainly controlled by the target company through both its management and shareholders.[56] I accommodate this difference in our analysis by focusing on friendly deals that satisfy the Scheme's practical requirement.

The second difference between the two methods is the necessary involvement of the court in the case of the Scheme rather than the Offer. The Companies Act is explicit in making the court's approval a necessity for a Scheme to be binding: Part 26 provides a detailed description of the steps involved in the Scheme process with special emphasis on the role of the court. Specifically, in order to proceed with the Scheme, the target company should start the process by submitting a claim to the court. Then, a first hearing takes place before The Registrar of Companies in which the target company seeks the court's approval to hold a general meeting to vote on the Scheme.[57] Once the necessary documents are posted to the shareholders, at least one court meeting is required to vote on the Scheme (Parliament, 2006). Payne (2011) argues that this process allows the target shareholders to make an undistorted choice after they are fully informed about all the aspects of the deal. After the vote on the Scheme, the court's approval is needed and the Scheme becomes effective only when a copy of the court order is delivered to The Registrar of Companies. The immediate consequence of the court's involvement, placing aside the possibility that a court might not sanction the Scheme, is what makes the Scheme a lengthy process, compared to the Offer (Payne, 2011).

The third difference between the Scheme and the Offer is related to the objectives that can be achieved via each of the two takeover methods. A Scheme necessarily involves the acquisition of 100% of the target shares. In fact, once the Scheme is sanctioned, the acquirer immediately owns and controls all of the issued target shares and has to satisfy the payment of the offered price-per-share to all the target shareholders, as detailed in Rule 31.8 of the Code. However, the Offer can result in a situation in which the acquirer controls the target company while also dealing with the target minority shareholders. As specified by Rule 10 of the Code, an Offer is declared unconditional if the 'offerer has acquired or agreed to acquire (either pursuant to the offer or otherwise) shares carrying over 50 percent of the voting rights'. If an acquirer is aiming to control 100% of the target shares via an Offer, a 90% approval requirement is needed to benefit from the 'squeeze-out' right, as mentioned in Section 979 of the Companies Act, by which she can compulsorily acquire the remaining 10% of the voting rights with the same price offered to the members of the 90% majority (Parliament, 2006). Payne (2011) argues that the requirement that all the shareholders receive the same price, either the original offer or the revised one, for Scheme and Offer deals, limits the acquirer's ability to divide and conquer by

[56] Lombers et al. (2008) claim that a hostile Scheme has not been attempted since 1981 when Trust House Forte made a bid to acquire the Savoy Hotel.

[57] The Registrar of Companies for England, Wales and Scotland is the official responsible for the Companies House which is an executive agency of the Department for Business Innovation and Skills (Department for Business Innovation and Skills, 2014).

offering different prices to different shareholders in the bidding process. I accommodate this difference in my analysis by focusing on transactions in which the acquirer aims to control all the target firm's shares at the completion of the deal.

The fourth difference between the two takeover methods lies in the pre-determined percentages of required approval. While the 75% approval requirement in the case of the Scheme is lower than the 90% that is required under the Offer, whether these percentages apply to the same shareholders is related to the determination of the classes of investors that are required to vote in the case of a Scheme. A basic rule for the constitution of the class comes from the 1892 case of Sovereign Life Assurance Company v Dodd in which the class is supposed to be formed by persons whose rights are not so dissimilar to the point where they cannot consult together (Payne, 2011). As a result, two main groups are excluded from the vote on the Scheme: (a) the creditors of the company, mainly because a change in the company's ownership does not affect the holders of its debt and, (b) the acquiring firm, if she holds shares in the target company, mainly because her interest as a future owner differs substantially from that of the remaining shareholders selling their shares. While the creditors are also excluded from the Offer process because they do not own shares to tender to the acquirer, this does not apply to the acquiring firm when she owns shares in the target. Consequently, the two thresholds are not necessarily comparable unless: (a) the acquirer is aiming to purchase 100% of the target shares, (b) she owns zero percent of its issued share capital, and (c) the holders of all the target shares are classified as one class by the court.

The last difference between the Scheme and the Offer takeover methods lies in the tax treatment associated with each of them. The examination of the tax treatment of the Scheme starts by highlighting the two main methods by which the Scheme can be executed. The first method, known as Cancellation Scheme, involves the cancellation of the target company's shares and using the resulting reserves from capital reduction to issue new shares to the acquirer (Ashurst LLP, 2004). The second method, known as the Transfer Scheme, involves the transfer of the existing target shares to the acquirer (Payne, 2011). The Cancellation Scheme, which is used for takeovers, is characterised by a critical tax advantage compared to the Offer: as Cancellation Scheme does not require a direct transfer of target shares to the acquirer, the 0.5% stamp duty that is paid under the Offer is not paid under Cancellation Schemes (Ashurst LLP, 2004).[58]

5.3. Theoretical Framework and Hypotheses

In addition to controlling for the size of the target firm in order to account for the tax benefits that are associated with large Scheme deals, this section presents the hypotheses that aim to

[58] All the Schemes covered in this chapter's empirical analysis are Cancelation Schemes.

identify the factors influencing the choice of the Scheme over the Offer, as well as the impact of the chosen takeover method on the takeover premia offered to targets and the abnormal returns gained by acquirers. While the effects of several other firm- and deal-specific features are not discussed in detail in this section, their impact in influencing the choice of the takeover method, the takeover premia, as well as the abnormal returns gained by acquirers, is discussed in the remaining sections of the chapter.

5.3.1. The payment method

The Scheme, with the immediate guarantee of owning 100% of the target shares once it is sanctioned, can be very valuable for acquirers willing to finance their deals with stock. Specifically, in stock-financed deals the acquirers are likely to share a significant amount of business- and synergy-related information with the targets during the due-diligence process in order to convince them to accept their stock and, hence, share the post-acquisition business or integration risk with the acquirer (Bates and Lemmon, 2003; Hansen, 1987).[59] As a result, the acquirers might prefer to proceed with the Scheme in order to guarantee the full ownership of the target shares and minimise the possibility of any revelation being exploited by a competing bid. Moreover, based on the results of Faccio and Masulis (2005) that highlight the positive association between the acquirer's debt constraints and stock financing, the tax savings in Scheme deals can also be valuable for acquirers employing stock as the payment method.[60] On the contrary, given that the Scheme is likely to require a considerably longer period to become sanctioned, the target shareholders might prefer cash financing as the payment method over volatile securities. Based on this discussion, the first hypothesis H_1 is formed as follows: *The higher the portion of the deal that is financed with the acquiring firm's stock, the higher the likelihood that the Scheme is used as a takeover method.*

5.3.2. Target termination fees

Previous studies have been devoted to the analysis of the inclusion of target termination fee provisions in corporate takeovers (Bates and Lemmon, 2003; Jeon and Ligon, 2011; Officer, 2003). A target firm may prefer to proceed with the Scheme once she has signed a termination fee agreement, which is specifying particular cash sums that she must pay to the acquirer if she decides not to consummate the deal. By guaranteeing the acquisition of all the target shares

[59] In general, stock financed deals are tax-deferred as the target shareholders continue to have ownership in the combined firm. On the contrary, cash financed deals require target shareholders to exchange ownership for cash, and thus the transaction is necessarily taxable. Therefore, cash financed deals are associated with higher premium relative to stock offers, which compensate target shareholders for the immediate tax payment (Davidson and Cheng, 1997; Franks and Harris, 1989; Huang and Walkling, 1987).

[60] Faccio and Masulis (2005) argue that the financing constraints, e.g. the high level of leverage, limits the acquirer's ability to use cash financing and, as a result, stock financing is more likely.

once the Scheme is sanctioned, the Scheme presents a device that provides an explicit end to the commitment that has been signed by the target firm's board. However, such framework is not available under the Offer. Specifically, in the potential presence of target minority shareholders owning less than 10% of the target shares and an acquirer is proceeding with the 'squeeze-out' provision, the target minority shareholders can request the court's assistance to: (a) object to the acquirer's right to buy their shares at the pre-determined price-per-share that has been initially offered, and (b) not sanction the termination fee agreement (Payne, 2011). Consequently, the second hypothesis H_2 is formed: *The likelihood of using the Scheme increases with the use of a target termination fee agreement in the deal*.

5.3.3. Financial aspects of the transaction

Earlier evidence suggests that the Scheme is likely to be a favourable method in highly leveraged deals (Ashurst LLP, 2004). Specifically, the requirement of the lending party (i.e. bank) that the target firm's assets become fully controlled by the acquirer at a specific date, as such assets are likely to be used as collateral in deals financed by debt, makes the Scheme, due to its immediate ownership aspect, more likely to be implemented relative to the Offer. Martin (2007) states that the uncertainty of ultimate control of the target's assets makes 'lending banks very nervous' (p. 1). The full ownership aspect of the Scheme, in addition to its associated tax benefits, also makes it attractive for non-strategic acquirers that prefer to control the target for a limited period and sell it for profit. As these characteristics mostly fit the description of deals announced by private equity acquirers (Fidrmuc et al., 2012), hypothesis H_3 is formed as follows: *The Scheme is more likely to be used when the deal is a private equity transaction*.

5.3.4. Acquirer and target relatedness

The Scheme can also be a favourable takeover method for a specific type of acquirers: those that are aiming to acquire targets operating in a different economic environment than the one in which they operate. The acquisitions of targets in different sectors than those of the acquirers, i.e. diversifying deals, and the acquisitions that are initiated by non-UK acquirers, represent possible candidates for such deals. Under both categories, the acquirers relying on the Scheme takeover method are likely to highly value the immediate and guaranteed ownership of all the target shares. In addition, the tax savings resulting from the use of the Scheme can partially or fully offset the potentially high costs, and other advisory fees, that are covered by acquirers when assessing the foreign/diversified target firm's business environment. Therefore, the following testable hypotheses are formed: H_{4a}: *The Scheme is more likely to be used in diversifying acquisitions*; and H_{4b}: *The Scheme is more likely to be used in the acquisitions of UK targets by non-UK acquirers*.

5.3.5. The riskiness of the target's returns

The concerns presented by Franks and Harris (1989) and Myners (2008) with respect to the complexity of the Scheme, make it a less favourable takeover method in deals involving targets that are subject to high valuation uncertainty. In such deals the acquirer is likely to be subject to the ramifications of the changes in the target's market valuation, in addition to the emergence of competing bids. Moreover, a potential increase in the target's market valuation following the initial bid can make the target shareholders, who initially expressed their willingness to accept the bid, reluctant to vote on the acceptance of the Scheme. This can also lead to objections from the Panel that is aiming to protect the target's shareholders, as the value of the initial bid no longer reflects the value of the target firm. Therefore, the variation in the target's abnormal returns is more likely to make the Scheme an un-attractive takeover method. Following this discussion, the hypothesis H_5 is formed as follows: *The higher the variation in the target's abnormal returns, the lower the likelihood of using the Scheme*.

5.3.6. The target's returns

Payne (2011) argues that, when it comes to ensuring that the target shareholders make undistorted choices, the Scheme and the Offer are on an equal footing. However, with respect to target minority shareholders, Payne (2011) indicates that they are less protected under the Scheme, relative to the Offer. In particular, the author highlights two reasons that support this relative reduction in protection. *First*, she highlights the importance of the criteria used in determining the class of shareholders voting in each meeting. After welcoming the recent guidance offered by the court in making such criteria more explicit, Payne warns of the ramifications of the current practice of dividing shareholders into classes based on the rights carried by their shares.[61] Specifically, while such classification is straightforward, it leads to fewer classes being formed than the classification based on the hard-to-be-determined criterion of shareholders' actual interests. As a result, with the reduced shareholder approval requirements in the Scheme, such an approach leads to a higher likelihood of the Scheme being approved compared to the Offer.[62] *Second*, Payne (2011) raises specific concerns related to whether enough protection is devoted to the target minority shareholders in the last stages of the Scheme process. Specifically, she expresses her concerns regarding the 'reasonable man test' by which, before sanctioning the Scheme, the court simply examines whether the decision made by the shareholders is equivalent to the decision of an agent seeking her own interest.

[61] For instance, the owners of ordinary shares will be included in one class while the owners of various types of preference shares are included in other classes.

[62] For instance, if only one class is formed, the target minority shareholders under the Scheme deal end up in the same position as the minority shareholders subject to the squeeze-out provision, yet with a benchmark of 75% instead of 90%.

Accordingly, once the required majority approves the Scheme, and if the court is already satisfied with the way in which classes were determined, the likelihood of following the desire of minority shareholders and refusing to sanction the Scheme is extremely low.

The legal argument presented by Payne (2011) is highly critical as it shows that the 'rules of the game' make target shareholders under the Offer better off than their Scheme counterparts. Specifically, assuming the presence of target minority of shareholders holding similar percentages of the target firm's shares under Scheme and Offer deals in response to a given offered premium, the minority group in the Scheme deals is less capable of blocking the completion of the transactions and, hence, less capable of forcing the acquirers to increase the premia.

However, following the classic emphasis of Pound (1910) on the distinction between 'law in books' and 'law in action' (p. 12), the bargaining though the Scheme and the Offer can be treated as embedded games included in a larger game (Baird et al., 1994). That is, the target firm's shareholders may choose to proceed with the Offer provided that they are aware that the rules of the Scheme requiring the court's involvement and places them in a weak bargaining position, compared to the rules of the Offer. Alternatively, such shareholders can demand an additional premium as a condition to proceed with a Scheme.[63]

Examining the voting outcomes of the court-meetings related to the Scheme in Nexis UK, I find that the Schemes received overwhelming support from target shareholders: out of the 113 outcomes court-meetings from which we managed to retrieve detailed information, 93 (82.30%) of the Schemes passed with the approval of more than 95% of the target shareholders, 19 (16.81%) passed with approval levels between 80% and 95% and only one passed with an approval of 78%. None of the Schemes covered in the analysis were rejected. Hence, it appears that Scheme target shareholders are satisfied with the premia they are offered.[64] Following this discussion, hypothesis H_6 is formed as follows: *The Scheme target shareholders receive premia that are at least as high as the premia received by the Offer target shareholders*.

5.3.7. The abnormal returns gained by acquirers

In addition to studying the overall difference in the acquirer's abnormal returns between Scheme and Offer deals, I offer special emphasis on the distinction between the optimal and sub-optimal use of the Scheme. More specifically, despite its advantages in terms of tax savings

[63] The findings reported by Franks and Harris (1989) over a relatively old sample of UK listed target acquisitions that have been announced between 1955 and 1985, after measuring the abnormal returns as deviations from a market model, show that in the month when the acquisition is made, Offer target shareholders receive total abnormal returns of 24% compared to the 14.8% abnormal returns received by the Scheme target shareholders. For the five-month period surrounding the acquisition, the returns are 30.1% and 20.0% for Offer and Scheme target shareholders, respectively.

[64] The voting outcomes are available upon request from the author.

and guaranteeing the acquisition of all the target shares, the Scheme remains a complicated and regulatorily demanding takeover method that should be implemented *only* when its benefits exceeds its economic costs. Otherwise, the requirement to hire a significant number of advisors and the possible complications due to the reliance on the court procedure can delay the integration process of the merged companies and raise concerns about unexpected costs. Such concerns can be reflected in a reduction in the acquirer's abnormal returns when the Scheme is used under circumstances in which it is not recommended.

I limit the analysis to the subsample of UK listed acquirers whose stock performance can be compared to the FT-All Share Index and hence calculate the abnormal returns gained by acquirers. I then apply the methodological framework discussed in Barbopoulos and Sudarsanam (2012) to identify the deals in which the Scheme is used optimally and sub-optimally, as follows: when the Scheme is used and the likelihood of its use, over the Offer, as estimated via a Logistic model that involves several deal and merging firms' features, exceeds a threshold level that is the apriori probability of the Scheme use, then the use of the Scheme is labelled as optimal. Likewise, when the Scheme is used and the estimated likelihood of its use, over the Offer, is below the threshold level that is the apriori probability of Scheme use, then it is labelled as sub-optimal. Following this discussion, hypothesis H_7 is formed as follows: *The sub-optimal use of the Scheme yields lower abnormal returns to acquirers than its optimal use.*

Recognising that the use of the Scheme has increased gradually throughout the period covered in the sample, which is more so after the Panel introduced its formal reforms in 2008 through what is known as Appendix 7 that was added to the takeover Code, I test H_7 on two subsamples. The first covers the period preceding the formal introduction of Appendix 7 in January 2008 while the second covers the period following the introduction of Appendix 7. This follows from the emphasis that the procedural clarifications provided in this appendix potentially reduced the reliance on expensive advisors and made the use of the Scheme more likely (Lombers et al., 2008).

5.4. Estimating the Takeover Premia and the Abnormal Returns Gained by Acquirers

I estimate the premium (PREM) offered to target shareholders in both Scheme and the Offer deals by dividing the deal value by the target firm's market value of equity 43 days prior to the announcement of the deal, and subtract 1 from the result, as in Officer (2003).[65] While Officer (2003) excludes from his analysis deals with premia that lie outside the 0 to 2 range, the exclusion of deals with negative premia from the analysis reduces the sample significantly,

[65] Alexandridis, Fuller, Terhaar, and Travlos (2013) calculate the premium by using the market value of the target 30 days prior to the acquisition's announcement day. I follow the same method and reach the same qualitative conclusions in alternative estimations.

especially in the period following the recent financial crisis.[66] As a result, while my findings remain qualitatively similar with and without the exclusion suggested by Officer (2003), the final analysis is conducted by including deals that also experience negative premia. I also introduce an alternative estimate of premia, the PREMADJ, which accounts for the variation in the premia across different sectors. In particular, this estimate represents the difference between the premium offered and the average premium level in the target's sector.

Moreover, the announcement period abnormal returns gained by acquirers is captured by the acquiring firms' Cumulative Abnormal Returns (CAR) over different windows surrounding the acquisition announcement's day. The abnormal returns are estimated using the adjusted market model, as in Fuller et al. (2002), in which the differences between the daily acquirer stock returns and the returns on a market index (FT-ALL share index) are calculated for each day within the announcement period window.

5.5. Data and Summary Statistics

5.5.1. The dataset

The sample covers acquisitions announced between January 1st 2002 and December 31st 2011. They involve both UK and non-UK listed or privately owned (at the ultimate parent level) acquirers and UK listed targets. The sample's starting date is chosen due to the limited use of the Scheme before the year 2002. A deal to be retained in the sample needs to meet the following sample-selection criteria: (a) the deal value should exceed £1m, (b) the transaction's payment method should be available from the Securities Data Corporation (SDC) Thomson One database, (c) the deal needs to be friendly to satisfy the Scheme's practical requirement, and (d) the takeover premia should be available and lower than 2, as in Officer (2003). To guarantee that all acquirers involved in the sampled deals share the same objective, the analysis is limited to only deals in which the acquirer aims to control 100% of the target shares. Once the above sample criteria are satisfied, 552 completed deals remain in the sample.[67] All the variables in the analysis are retrieved from SDC except the age of the target firm, and both the target and the acquiring firms' market-to-book value and price-to-earnings ratios, which are retrieved from Datastream.[68]

[66] 48 out of the 111 deals that are associated with negative premium are announced between August 2007 and December 2009, representing 17.69% of the deals announced during that period.

[67] The inability to identify withdrawn deals that satisfy my sample criteria prevents the analysis of the possible role of the takeover method in influencing the odds of the deal's completion. The deficiency of SDC in providing accurate incidences of withdrawn deals has been also discussed by Netter et al. (2011).

[68] As in Boone and Mulherin (2007), I find that SDC understates the presence of the acquirer and target termination fees. While SDC reports 151 (23) incidences of target (acquirer) termination fees, I examined the acquisition announcement accessed via the InvestEgate financial press website and found this number to be 287 (34).

5.5.2. Summary statistics

Table 5.1 records the annual distribution of the sampled deals according to the geographic scope of the deal, the industry relatedness of the merging firms, as well as the listing status of the acquirer. While only 10.64% of the deals were conducted via the Scheme takeover method in 2002, the percentage of Scheme deals, relative to the total number of deals in the sample, has grown in popularity throughout the decade by reaching a high of 63.64% in 2010. Overall, the use of the Scheme as a takeover method has increased across all the deal- and firm-related features. For example, in 2011, 75% of the deals announced by UK acquirers were Scheme deals. As for the acquisitions announced by foreign (CBACQ), diversifying (DVRD), as well as privately held acquirers (PRIVACQ), the majority of deals announced in 2011 were Scheme ones. Overall, out of the 552 deals involved in the sample, 38.88% are Scheme ones and the remaining deals (61.12%) are Offer ones. As a result, deals conducted under the Scheme takeover method present an important segment of the UK market for corporate control and hence the study of the impact of the Scheme on the wealth effects of the shareholders of the merging firms proposes an interesting problem that calls for investigation.

Table 5.2 records the descriptive statistics of the premium estimates employed in this chapter. Overall, using the standard estimate of the premium (PREM), I find that the target shareholders receive significantly higher premia from Scheme deals rather than Offer ones. The premia are ranging, on average, from about 34.65% for the overall sample to 37.60% and 32.93% for the Scheme and Offer deals, respectively. I also find that Scheme target shareholders receive significantly higher premia from domestic acquirers (DOMACQ), diversifying acquirers (DVRD), and from deals announced during the period following the introduction of Appendix 7 (APPND).

Moreover, the results recorded in Table 5.3 further show that the number of days required for the deal to become effective (DAYSEFFECTVE) is not different between the deals conducted under the Scheme and Offer takeover methods. While this contradicts the statement of Payne (2011) that the Scheme deals need considerably more time to become effective, relative to Offer deals, it is worth noticing that this conclusion is based on a univariate analysis and needs to be validated in a multivariate context.[69] Moreover, stressing the complexity of Scheme deals, I find that they involve significantly more advisors (legal and financial) (TOTALADV), relative to the Offer ones. These results further show that such a difference in terms of the number of advisors between the two groups of deals persists even when the analysis is restricted to financial advisors (FINADV) and legal advisors (LEGALADV), separately. Lastly, the statistics record that Scheme deals are associated with larger targets (TARGMV),

[69] Indeed, in a regression analysis in which DAYSEFFECTIVE is the dependent variable and in which the deal-, acquirer- and target-related factors are controlled for, Scheme deals are found to need significantly more time to become effective compared to Offer deals.

higher percentage of stock financing (STOCK_PERC), as well as with more mature target firms (TARGAGE), relative to Offer deals. The age-related finding indicates that the Scheme is more likely to be used in acquiring targets with a relatively longer history of objectively verifiable information.

Table 5.1: Annual distribution of the characteristics of the sample

	ALL			DOMACQ			CBACQ			FCSD			DVRD			PRIVACQ			PUBACQ		
YEAR	SCHEME	OFFER	%	SCHEME	OFFER	%	SCHEME	OFFER	%	SCHEME	OFFER	%	SCHEME	OFFER	%	SCHEME	OFFER	%	SCHEME	OFFER	%
2002	5	42	10.64	5	31	13.89	0	11	0.00	2	21	8.70	3	21	12.50	2	25	7.41	3	17	15.00
2003	10	40	20.00	8	34	19.05	2	6	25.00	3	20	13.04	7	20	25.93	5	21	19.23	5	19	20.83
2004	7	29	19.44	5	20	20.00	2	9	18.18	2	7	22.22	5	22	18.52	5	22	18.52	2	7	22.22
2005	18	45	28.57	11	36	23.40	7	9	43.75	8	18	30.77	10	27	27.03	10	30	25.00	8	15	34.78
2006	25	41	37.88	23	30	43.40	2	11	15.38	6	14	30.00	19	27	41.30	15	29	34.09	10	12	45.45
2007	43	50	46.24	31	39	44.29	12	11	52.17	14	15	48.28	29	35	45.31	28	28	50.00	15	22	40.54
2008	24	35	40.68	17	25	40.48	7	10	41.18	12	12	50.00	12	23	34.29	18	21	46.15	6	14	30.00
2009	19	29	39.58	12	21	36.36	7	8	46.67	9	14	39.13	10	15	40.00	14	15	48.28	5	14	26.32
2010	35	20	63.64	22	10	68.75	13	10	56.52	11	7	61.11	24	13	64.86	25	11	69.44	10	9	52.63
2011	17	18	48.57	12	4	75.00	5	4	55.56	5	8	38.46	12	10	54.55	10	10	50.00	7	8	46.67
Total	203	349	36.77	146	250	36.86	57	89	39.04	72	136	34.61	131	213	58.83	132	212	38.37	71	137	34.13

Note: The table represents the annual distribution of the deals in the sample with respect to different groups of transactions. For the total number of transactions (ALL), transactions classified based on the acquirer's domicile (domestic acquirer (DOMACQ) and cross-border acquirer (CBACQ)), industry relatedness based on the 2-digit SIC codes (focused (FCSD) and diversifying (DVRD)) and the listing status of the acquirer at the ultimate parent level (a listed acquirer (PUBACQ) or a private one (PRIVACQ)). I present the number of Scheme deals, Offer deals, as well as the percentage (%) relative to the total number of deals.

Table 5.2: Univariate analysis of the takeover premia

		PREM			PREMADJ			PREM	PREMADJ
		ALL	SCHEME	OFFER	ALL	SCHEME	OFFER	SCHEME vs. OFFER	SCHEME vs. OFFER
ALL	Mean	34.65***	37.60***	32.93***	0.00	3.51	-2.04	4.67	5.55
	Median	31.63***	34.87***	30.63***	-3.89	0.41	-5.69**	4.24	6.10
	N	552	203	349					
DOMACQ	Mean	32.68***	37.43***	30.01***	-1.33	3.67	-4.15	7.42*	7.82*
	Median	30.01***	33.65***	28.45***	-6.46**	-1.10	-7.63***	5.10*	6.53*
	N	406	146	260					
CBACQ	Mean	40.13***	38.01***	41.49***	3.72	3.11	4.11***	-3.48	-1.00
	Median	36.85***	37.05****	36.49***	4.04	6.52***	3.70	0.56	2.82
	N	146	57	89					
FCSD	Mean	35.63***	36.80***	35.00***	0.42	0.97	0.13	1.80	0.84
	Median	32.29***	29.60***	32.49***	-4.17	-1.03	-4.89	-2.89	3.86
	N	208	72	136					
DVRD	Mean	34.06***	38.03***	31.61***	-0.25	4.92	-3.44***	6.42	8.36*
	Median	31.48***	34.93	30.28442	-3.50	0.67	-6.38	4.64	7.05*
	N	344	131	213					
BEFOREAPPND	Mean	31.36***	29.59***	32.14***	-2.47	-3.59	-1.98***	-2.55	1.61
	Median	28.64***	28.05***	28.96***	-5.73***	-2.56***	-6.28	-0.91	3.72
	N	356	109	247					
APPND	Mean	40.63***	46.88***	34.87***	4.507	11.76**	-2.19***	12.01*	13.95**
	Median	38.90***	46.40***	32.49***	4.433	13.80***	-3.55	13.91*	17.35**
	N	196	94	102					
PRIVACQ	Mean	24.57***	29.17***	22.18***	-8.13**	-2.15	-11.24***	6.99	9.09
	Median	21.22***	25.42***	19.07***	-12.76***	-7.39	-16.08***	6.35	8.69
	N	208	71	137					
PUBACQ	Mean	40.74***	42.13***	39.88***	4.92**	6.57*	3.89	2.25	2.68
	Median	35.99***	36.63***	35.39***	-0.15	3.89	-2.03	1.24	5.92
	N	344	132	212					

Note: The table documents the premium offered to UK listed target shareholders in different groups of transactions. For the total number of transactions (ALL), transactions classified based on the acquirer's domicile (domestic acquirer (DOMACQ) and cross-border acquirer (CBACQ)), industry relatedness based on the 2-digit SIC codes (focused (FCSD) and diversifying (DVRD)), timing of the deal (before the introduction of Appendix 7 to the Takeover Code (BEFOREAPPND) and after the introduction of this Appendix (APPND)) and the listing status of the acquirer at the ultimate parent level (a listed acquirer (PUBACQ) or a private one (PRIVACQ)), two measures of the premium, PREM and PREMADJ are reposted as discussed in Section 5.4. For each group, the mean and median premia in addition to the number of observations N are presented. The table also presents the difference between the premia in deals conducted via the Scheme and the premia in those conducted via the Offer. Next to the means, the significance based on the t-test under the null hypothesis that the premium is equal to 0 is reported. Next to the medians, the significance of the Wilcoxon Rank Sum test under the null hypothesis that the median is equal to 0 is reported. Next to the differences in means, the significance of the t-test with the null hypothesis that the difference in means is equal to 0 is reported. Next to the differences in medians, the significance based on the Wilcoxon Rank Sum test with the null hypothesis that the two populations whose sample median differences are presented have the same continuous distribution is presented. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

Table 5.3: Continuous covariates and the takeover method

Variable	*N*	No. of SCHEME deals	No. of OFFER deals	Mean of Variable in SCHEME deals	Mean of Variable in Offer deals	SCHEME vs. OFFER
ACQMTBV	156	59	97	2.31	2.409	-0.09
ACQMV	156	59	97	8577.66	5137.37	3440.29
ACQPE	156	59	97	16.73	55.01	-38.28
DAYSEFFECTIVE	552	203	349	104.77	96.75	8.02
FINADV	546	203	343	3.00	2.38	0.62***
LEGALADV	546	203	343	3.43	2.02	1.41***
PERCHELD	552	203	349	2.58	5.07	-2.48***
STDV	552	203	349	0.025	0.029	-0.004*
STOCK_PERC	552	203	349	24.21	16.81	7.40**
TARGAGE	552	203	349	5372.88	4449.2	923.63**
TARGMTBV	343	132	211	2.88	2.85	0.029
TARGMV	552	203	349	826.28	182.04	644.24***
TARGPE	343	132	211	24.92	59.12	-34.19
TOTALADV	546	203	343	6.13	4.40	1.72***

Note: The table represents for each continuous covariate employed in the analysis: the size of the sample N in which the covariate is available, the number of Scheme and Offer deals in the sample analysed, the mean value of this covariate in the group of Scheme deals, its mean value in the group of Offer deals, the difference between these two mean values and its significance based on the null hypothesis that it is equal to 0. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

5.6. Results and Discussion

5.6.1. The use of the Scheme

Table 5.4 records the Logistic model estimations that aim to identify the factors influencing the choice between the Scheme and the Offer takeover method in the UK market for corporate control. As expected, the size of the target firm has a positive and significant effect on the use of the Scheme (Models 1 to 6). Specifically, the higher tax savings in the presence of a large target in a Scheme deal (0.5% of the deal value) are likely to exceed the advisory costs. Similarly, the percentage of stock financing in the deal's financing process is found to be associated with higher use of the Scheme, which supports H_1. This indicates that the tax benefits of the Scheme are expected to be relevant to acquirers that use stock financing due to possible cash constraints (Faccio and Masulis, 2005). Moreover, as such acquirers (in stock financed deals) reveal critical information about their business activities to ultimately convince the target shareholders to accept their stock, the guaranteed ownership of 100% of the target shares via the Scheme limits the extent to which such information can be exploited by the target minority shareholders, or even by competing acquirers. Overall, both the size of the target firm and the proportion of the deal's financing by stock appear to be highly correlated with the use of the Scheme as the takeover method in the UK market for corporate control.

Table 5.4: Predicting the use of the Scheme

Dependent Variable	SCHEME = 1 Offer = 0	SCHEME = 1 Offer = 0	SCHEME = 1 Offer = 0	SCHEME = 1 Offer = 0	SCHEME = 1 Offer = 0	SCHEME = 1 Offer = 0
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-4.320***	-4.943***	-3.163***	-2.701**	-5.381***	-2.706***
	(1.028)	(1.288)	(1.229)	(1.110)	(1.223)	(0.969)
ACQMTBV						0.099
						(0.140)
ACQPE						-0.033
						(0.025)
ACQTERM		0.099	0.006	-0.138		
		(0.434)	(0.521)	(0.543)		
APPND	1.291***	1.303***	1.159***		0.879**	2.017***
	(0.225)	(0.239)	(0.256)		(0.359)	(0.609)
CBACQ	-0.152	0.510		-0.434		0.773
	(0.245)	(0.379)		(0.471)		(0.598)
DVRD	0.359	0.703***		0.550*	0.534*	
	(0.232)	(0.277)		(0.333)	(0.315)	
ln(TARGAGE)	0.027	0.029	-0.031	-0.171		
	(0.113)	(0.117)	(0.120)	(0.131)		
ln(TARGMV)	0.535***	0.528***	0.593***	0.813***	0.685***	0.917***
	(0.066)	(0.074)	(0.079)	(0.107)	(0.116)	(0.206)
MOE			-1.747***	-2.046***	-1.689***	-1.904***
			(0.239)	(0.324)	(0.309)	(0.545)
PERCHELD	-0.010	-0.011	-0.009	-0.010	0.004	
	(0.011)	(0.011)	(0.010)	(0.010)	(0.015)	
PRIVACQ	-0.050	-0.111	0.195		-0.179	
	(0.280)	(0.286)	(0.256)		(0.400)	
PRIVEQ	0.490*	0.515*			0.459	
	(0.287)	(0.288)			(0.368)	
STDV	-1.626	0.920	-2.856	-1.630		
	(5.711)	(5.647)	(6.285)	(10.201)		
STOCK_PERC	0.011***	0.011***	0.010***	0.011***	0.013***	0.016***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)
TARGMTBV					-0.044***	
					(0.017)	
TARGPE					-0.001	
					(0.001)	
TARGTERM	0.618***	0.662***	0.697***	0.734***	0.939***	0.123
	(0.218)	(0.230)	(0.237)	(0.239)	(0.310)	(0.456)
CBACQ x DVRD		-0.965**		-0.618		
		(0.502)		(0.515)		
CBACQ x APPND				0.937*		
				(0.511)		
DVRD x APPND				-0.012		
				(0.466)		
ln(TARGAGE) x APPND				0.341***		
				(0.106)		
ln(TARGMV) x APPND				-0.502***		
				(0.154)		
MOE x APPND				0.787*		
				(0.463)		
STDV x APPND				-3.232		
				(11.406)		
ln(ACQMV)						-0.326**
						(0.158)
INDUSTRY EFFECT	NO	YES	YES	NO	YES	NO
N	552	552	552	552	343	156
McFadden R-squared	0.20	0.21	0.28	0.29	0.307	0.40
Prob(LR-test)	0.00	0.00	0.00	0.00	0.00	0.00

Note: The table presents the output of 6 Logistic regressions, which aim to highlight the factors influencing the use of the Scheme (SCHEME). The Maximum Likelihood coefficients are presented with the standard errors in parentheses. The McFadden R-squared is reported to highlight the models' goodness of fit. The p-values from the Likelihood Ratio (LR) test with the restriction that all the model coefficients are jointly equal to 0 are reported. Variables not included in the table were included in alternative specifications and were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively.

The results further convey that the presence of target termination fees (TARGTERM) is associated with an increased use of Scheme, which supports H_2.[70] That is, by guaranteeing an explicit completion of the deal via the acquisition of 100% of the target shares, the target's board that grants termination fee provisions prefer to complete the deal under the Scheme rather the Offer takeover method. However, this does not apply to the case of acquirer termination fees (ACQTERM). Noting the Panel's priority of addressing the concerns of the target shareholders, it is the target's board, rather than the acquirer's one, that ultimately values the guaranteed completion of the deal when a binding termination fee agreement is signed. Otherwise, the requirement to deal with minority shareholders through the 'squeeze-out' provision under the Offer, with the presence of a binding commitment by the target's board, can raise concerns by both the Panel and the court.

The findings in Models 1 and 2 (Table 5.4) provide evidence of a marginal effect of private equity acquirers (PRIVEQ) on the use of the Scheme, which supports H_3. However, this effect is sensitive to particular target characteristics as it becomes insignificant once the target's market-to-book value (TARGMTBV) and price-to-earnings ratio (TARGPE) are included in Model 5. Specifically, while TARGPE has no significant effect on the likelihood of the Scheme presence as a takeover method in the UK, this takeover method is more likely to be used in acquisitions of low, rather than high, market-to-book value targets, as verified by the negative effect of TARGMTBV. One possible explanation of this can be offered by Morck et al. (1990). The authors contend that deals involving high market-book-value targets are often initiated by acquirer's managers that are primarily willing to enlarge the firms they manage and ultimately increase their personal short-term privileges at the expense of their shareholders. Hence, the finding that low-growth targets are more likely to be acquired via the Scheme indicates that this takeover method, which is carefully scrutinised and investigated by both the court and the Panel, is used by acquirers focusing on the long-term prospects of the merger rather than short-term artificial growth.

The results in Model 1 (Table 5.4) also suggest that the Scheme is not a favourable takeover method in deals announced by foreign acquirers (CBACQ) and diversifying (DVRD) ones, which leads to the rejection of H_{4a} and H_{4b}. Model 2 further predicts a negative relationship of the presence of the Scheme in foreign diversifying deals (DVRD × CBACQ), yet a positive and significant relationship between domestic diversifying deals and the Scheme use.[71] That is, while domestic diversifying acquirers are more likely to employ the Scheme, foreign diversifying acquirers are less likely to prefer this takeover method, possibly due to their

[70] In alternative estimations, simultaneous equation systems with various exclusion restrictions indicate that the presence of target termination fees agreements and the use of the Scheme are jointly determined. The results from these estimations are available upon request from the authors.

[71] The restriction that the coefficients associated with DVRD and (DVRD × CBA) have the same absolute value but opposite signs is not rejected based on the LR-test with a *p*-value of 0.67.

unfamiliarity with the UK-specific regulations.[72] However, foreign deals (CBACQ) appear to be strongly associated with the use of Scheme takeover method after the introduction of the Appendix 7 (APPND) from the Panel in 2008. That is, the Panel's reforms have clarified specific procedures that used to prevent the reliance on the Scheme by foreign acquirers before the year 2008. Moreover, the findings that are recorded in Models 1 to 4 lead to the rejection of H_5 as the coefficient associated with STDV and the use of the Scheme is found to be statistically insignificant. This indicates that the valuation uncertainty of the target is not by itself a factor influencing, positively or negatively, the choice the Scheme takeover method.

The time effect representing the introduction of the Panel's reforms (APPND) is found to have a strong and positive effect on the use of the Scheme. Moreover, controlling for the product of APPND and other relevant factors sheds more light on the influence of the Panel's reforms on the favourability of the Scheme under specific conditions. Interestingly, in Model 4, the effect of ln(TARGMV) on the likelihood of using the Scheme has weakened after the introduction of Appendix 7. Hence, as the distinctions between the Scheme and the Offer became more clarified, the Scheme became more likely to be used in the acquisitions involving smaller targets, relative to earlier times (before the introduction of Appendix 7). A likely interpretation of this finding would be that the clarifications offered by Appendix 7 allowed the acquirers aiming to benefit from the tax savings of the Scheme, but were initially reluctant to implement it, to rely on the Scheme takeover method. Furthermore, while the target's age was an irrelevant factor in the absence of the Panel's reforms, its effect on the choice of the Scheme as the takeover method appears positive and highly significant with the introduction of the reforms. Such a finding suggests that, while acquirers are involved in deals with smaller targets by relying on the Scheme, they are still reluctant to apply this potentially complicated method in acquiring targets with short financial history (Henderson, 1999). For example, the acquiring company might have concerns that, in the absence of a verifiable performance history of the target firm, the court might refuse to proceed with the Scheme under the pretext that the offer does not reflect the target value. Moreover, while the Panel's reforms increased the effect of mergers of equals (MOE) on the likelihood of using the Scheme, this effect remains negative, which suggests that similar in size merging partners, in terms of bargaining power (Wulf, 2004), are unlikely to choose the Scheme that is potentially a lengthy and a complicated method.[73]

Lastly, Model 6 is estimated on the sample of deals announced by listed acquirers for which the acquirer's market value (ACQMV), market-to-book value (ACQMTBV) and price-earnings ratio (ACQPE) are available to be accounted in the analysis. Among other

[72] In alternative estimations, I divide the group of foreign acquirers into two groups: (a) the first group includes acquirers from the United States, Australia, New Zealand, South Africa, Malaysia, Singapore and Hong Kong which are countries in which the Scheme is an aspect of the takeover scene (Damian and Rich, 2013), (b) the second group includes acquirers from the remaining countries. I find insignificant differences in the results.
[73] Summing both the coefficients associated with MOE and (MOE × APPND) yields an overall coefficient of -1.26.

characteristics, ln(ACQMV) has a negative and significant effect on the likelihood of the Scheme use. Hence, smaller acquiring firms, for which the tax benefits of the Scheme are likely to be highly relevant, seem to prefer the use of the Scheme takeover method despite the possible complications and delays that might arise when such a method is used.[74]

5.6.2. Effect on the premium

5.6.2.1. Regression analysis

Evidence recorded in the first two Models of Table 5.5 shows that Scheme target shareholders receive, on average, 7.30% to 7.50% higher takeover premia relative to Offer ones. Combined with the voting results that are presented in Section 5.3 of this chapter, such results, although marginally significant, indicate that Scheme target shareholders overcome their 'law in books' (Pound, 2010) limited bargaining power and eventually tip the balance in their favour.

Emphasising the importance of relying on the analysis of comparable observations, the last two Models present the estimations in the variation of the premium based on samples of deals announced before and after the introduction of Appendix 7 (356 and 196 deals respectively). Accordingly, the results recorded in Models 3 and 4 show that the effect of SCHEME on the offered premia becomes statistically insignificant. Yet, in the period following the introduction of Appendix 7, the Scheme's effect, 6.90% higher premium, remains relatively close to the levels of 7.30% and 7.50%. In turn, the results reported in Table 5.6 show that, on average, the target shareholders in Scheme deals earn significant gains varying between 4.70% and 7.50% higher three-day CAR (CARTHREE) before and after the introduction of Appendix 7.

The results reported in Tables 5.5 and 5.6 also highlight some important determinants of the takeover premia and the abnormal returns gained by target shareholders. For instance, in Table 5.5 (Models 1, 2 and 3), foreign acquirers offer significantly higher premia than domestic ones. A possible explanation of this finding is that, with the assistance of the Panel, the UK target shareholders are able to exploit their home advantage, relative to foreign acquirers, and thus receive higher premia. Moreover, as larger acquisitions are hard to finance, the reduced completion for large targets leads to lower premia (Alexandridis et al., 2013), as it is indicated by the negative and significant relation between ln(TARGMV) and the premia. In turn, the negative effect of toehold (PERCHELD) on the premia is in line with the previous literature (Betton and Eckbo, 2000; Eckbo and Langohr, 1989). In particular, the increase in the toehold not only reduces the number of shares that need to be acquired, but also reflects an improved bargaining position for the acquiring firm due to its familiarity as a shareholder with the target's business activity. However, an interesting observation in Table 5.6 (Models 2, 3 and 5) is that the effect of PERCHELD on CARTHREE becomes positive and significant once PREM is

[74] Noticeably, smaller acquirers are more sensitive to negative NPV projects and also to high advisory costs.

controlled. This indicates that, by holding the effect of the premium constant, the familiarity of the acquiring firm with the target's business activity through its ownership is reflected in higher synergies which, in turn, lead to higher target CAR.

Table 5.5: Multivariate analysis of the takeover premia

Dependent Variable	PREM	PRMADJ	PREM	PREM
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)
Intercept	0.531***	0.157**	0.285**	0.526***
	(0.069)	(0.069)	(0.126)	(0.111)
ACQTERM	0.003	-0.001	-0.054	0.109
	(0.065)	(0.062)	(0.052)	(0.134)
CBACQ	0.139***	0.106***	0.156***	0.071
	(0.041)	(0.040)	(0.048)	(0.078)
DVRD	-0.001	-0.003	-0.088*	0.143
	(0.040)	(0.040)	(0.055)	(0.062)
ln(TARGMV)	-0.038***	-0.029***	-0.033***	-0.029*
	(0.009)	(0.009)	(0.012)	(0.015)
MOE	0.049	0.035	0.019	0.053
	(0.043)	(0.043)	(0.058)	(0.070)
PERCHELD	-0.015***	-0.013***	-0.015***	-0.014***
	(0.001)	(0.001)	(0.001)	(0.002)
PRIVACQ	-0.170***	-0.142***	-0.065	-0.284***
	(0.046)	(0.046)	(0.056)	(0.088)
PRIVEQ	0.060	0.056	0.036	0.096
	(0.048)	(0.048)	(0.052)	(0.095)
SCHEME	0.075*	0.073*	0.023	0.069
	(0.044)	(0.044)	(0.055)	(0.072)
STOCK_PERC	-0.002***	-0.002***	-0.0009	-0.002**
	(0.000)	(0.0006)	(0.0008)	(0.001)
TARGTERM	0.047	0.0362	0.058	0.032
	(0.036)	(0.036)	(0.042)	(0.070)
INDUSTRY EFFECT	NO	-	YES	YES
Adjusted R-squared	0.18	0.15	0.18	0.21
Prob(*F*-test)	0.00	0.00	0.00	0.00
N	552	552	356	196

Note: The table presents the outcome of 4 regressions explaining the variation in the premium paid to the target shareholders. The two measures of the premium, PREM and PREMADJ, are defined in Section 5.5. The Adjusted R-squared is reported to highlight the models' goodness of fit. The p-values from the F-test with the restriction that all the model coefficients are jointly equal to 0 are reported. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. Variables not included in the table were included in alternative specifications and were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively.

Table 5.6: Multivariate analysis of the abnormal returns gained by target shareholders

Dependent Variable	CARTHREE	CARTHREE	CARTHREE	CARTHREE
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)
Intercept	0.160***	0.131***	0.178	0.031
	(0.046)	(0.044)	(0.160)	(0.138)
ACQTERM	-0.015	-0.009	0.020	-0.002
	(0.036)	(0.034)	(0.084)	(0.075)
CBACQ	0.046*	0.030***	0.011	0.007
	(0.024)	(0.025)	(0.050)	(0.040)
DVRD	-0.066***	-0.057***	0.040	-0.005
	(0.021)	(0.021)	(0.054)	(0.045)
ln(TARGMV)	-0.008	-0.005	-0.031**	-0.025**
	(0.006)	(0.006)	(0.013)	(0.011)
MOE	0.023	0.021	0.016	-0.013
	(0.019)	(0.019)	(0.046)	(0.039)
PERCHELD	0.001	0.003***	-0.002	0.003*
	(0.001)	(0.001)	(0.002)	(0.0016)
PRIVACQ	-0.029	-0.022	-0.043	0.075
	(0.025)	(0.025)	(0.061)	(0.054)
PRIVEQ	-0.020	-0.024	-0.056	-0.097*
	(0.026)	(0.026)	(0.062)	(0.055)
SCHEME	0.047*	0.044*	0.075*	0.025
	(0.025)	(0.024)	(0.046)	(0.039)
STOCK_PERC	-0.001***	-0.001***	-0.002***	-0.0003
	(0.0002)	(0.0002)	(0.0006)	(0.0006)
TARGTERM	0.043**	0.037*	0.003	-0.004
	(0.021)	(0.021)	(0.048)	(0.042)
PREM		0.102***		0.394***
		(0.029)		(0.056)
INDUSTRY EFFECT	YES	YES	YES	YES
Adjusted R-squared	0.18	0.18	0.03	0.34
Prob(*F*-test)	0.00	0.00	0.15	0.00
N	356	356	196	196

Note: The table presents the outcome of 4 regressions explaining the variation in the target's CAR around the acquisition announcement. The measure of CAR, i.e. CARTHREE, represents estimation over the three (-1, 1) day window. The Adjusted R-squared is reported to highlight the models' goodness of fit. The p-values from the F-test with the restriction that all the model coefficients are jointly equal to 0 are reported. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. Variables not included in the table were included in alternative specifications and were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively.

5.6.2.2. Matching analysis results

Following the estimation of the propensity scores from the Logistic models, as in Dehejia and Wahba (2002), I use caliper matching with replacement to create matched samples. On these samples (including treated -Scheme- and control -Offer- deals), the difference in the propensity scores, and also the differences between the main covariates, between the groups of Scheme and Offer deals should not be statistically significant to allow for the analysis of comparable deals.

On the matched samples, I estimate the Average Treatment Effect on the Treated (ATT) based on the following equation:

$$ATT = \frac{\sum_{i:SCHEME=1}\{PREMIUM_i(SCHEME) - \widehat{PREMIUM_i}(OFFER)\}}{N_1} = \frac{\sum_{i=1}^{N}\left\{\left(SCHME_i - (1 - SCHEME_i)\frac{K_M(i)}{M}\right)PREMIUM_i\right\}}{N_1}$$

with N representing the number of observations in the matched sample, N_1 representing the number of Scheme (Treated) deals, $PREMIUM_i(SCHEME)$ representing the measure of the observed premium (PREM or PREMADJ) for deal i when the Scheme is used and $\widehat{PREMIUM_i}(OFFER)$ representing this outcome when the Offer is used. Hence,

$\widehat{PREMIUM_i}(OFFER)$ represents the counterfactual outcome for a treated unit i when it does not receive the treatment, i.e. it is not executed via the Scheme takeover method. $SCHEME_i$ is a dichotomous (dummy) variable assigned the value of 1 when the Scheme is used as the takeover method, and 0 otherwise. M represents the number of control units matched to each treated one. $K_M(i)$ represents the number of times unit i is used as a match when matching is performed with replacement.

Given that PSM relies on the strong assumption that the assignment of the Scheme in the matched sample is random on the matched sample, I also employ the Rosenbaum (2002) sensitivity analysis to assess the extent to which a missing variable affects the choice of the takeover method. In particular, I incrementally increase the impact of a missing covariate on the likelihood of assigning the Scheme for each matched pair. On the resulting upper and lower bounds, I present the Hodges and Lehmann (1963) point estimates and apply the Wilcoxon signed rank test to test the hypothesis of no treatment effect.

The outcomes of the matching exercises are presented in Table 5.7. The variables that are strongly significant (at 5% level) are automatically included in the Logistic model and the inclusion of the remaining covariates is dependent on whether the matching exercise balances the mean of each covariate between the treated and control groups in the matched sample. The results reported in Panel B based on matching exercises with replacement, in addition to the outcomes of Kolmogorov-Simonov (KS) tests reported in Panel A, show that the propensity scores and most of the main covariates become balanced in the matched samples.

The estimated *ATT* in both matching exercises (-3.42% and -0.91%) are statistically insignificant. Such levels are smaller in magnitude than the differences in premium exceeding 7% in the initial regression analysis. Furthermore, results of the Rosenbaum (2002) sensitivity analysis indicate that a missing covariate needs to increase the relative odds of one of two matched deals being conducted via a Scheme by 87% and 61% (Γ levels of 1.87 and 1.61) to alter the initial qualitative conclusion of insignificant treatment effect and replace it with a significant treatment effect at the 5% level.[75] Such effects of missing covariates are relatively high compared to the results of previous research (e.g. the 50% effect reported by Peel and Makepeace (2012).[76] These results confirm the earlier emphasis on the relevance of analysing comparable deals to draw accurate conclusions as to the reliance on the initial regression analysis results leading to a qualitatively different conclusion from the one resulting from

[75] The treatment effect can be either positive or negative as shown by the values of the HL estimates at the upper and lower bounds established by each Γ.

[76] My findings remain qualitatively similar to the ones reported in terms of the significance of treatment effects and the relative sensitivity to the influence of missing covariates when matching is conducted on: (a) the sample of deals announced by listed acquirers in which I balance the size, price-earnings ratio and market-to-book value of the acquirers in the matched samples, and (b) the sample of deals classified as mergers of equals. In the latter sample, the size of the private acquirer is represented by the size of the target company.

matching analysis. The economic interpretation of these findings, following DiPrete and Gangl (2004), can be presented as follows. For Γ=1.8, the change in the natural logarithm of the odds of the Scheme being used is ln(1.8)=0.58. In Model 3 (Table 5.5), and the model used to estimate propensity scores, this effect is equivalent to, for example, a 58% increase in the percentage of the deal financed with stock.[77]

Table 5.7: Results of the matching analysis

Panel A

Matching Algorithm	CM	CM
Control Observations per Treated Observation	1:1	2:1
Caliper	0.01	0.05
Number of Scheme Observations	62	130
Number of Offer Observations	50	101
KS before Matching (p-value)	0.00	0.00
KS after Matching (p-value)	0.99	0.99
PREMADJ of Scheme Observations (%)	4.72	4.90
PREMADJ of Offer Observations (%)	4.79	3.21
ATT (%) (Abadie and Imbens (2006) Standard Errors)	-3.42 (3.41)	-0.91 (3.67)
HL Estimate (%) at Γ=1	5.14	4.47
Cut-off Γ value (p≈0.05)	1.87	1.61
HL Estimate at the Upper Bound (%) (p≈0.05)	20.74	15.48
HL Estimate at the Lower Bound (%) (p≈0.05)	-10.91	-6.70
Cut-off Γ value (p≈0.10)	1.71	1.52
HL Estimate at the Upper Bound (%) (p≈0.10)	18.31	14.24
HL Estimate at the Lower Bound (%) (p≈0.10)	-8.42	-5.39

Panel B

	Before Matching				After Matching			
	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value
PROP_SCORE	0.59	0.26	130.52	0.00	0.39	0.39	0.02	0.73
APPND	0.40	0.28	24.01	0.02	0.37	0.43	13.52	0.47
TARGTERM	0.65	0.51	28.88	0.00	0.62	0.54	17.38	0.31
CBACQ	0.24	0.23	2.03	0.84	0.20	0.26	12.77	0.51
STOCK_PERC	20.59	13.64	18.86	0.06	17.22	17.60	1.11	0.94
ln(TARGMV)	5.34	3.89	77.99	0.00	4.50	4.47	1.62	0.90
TARGPE	23.50	57.93	110.33	0.05	27.53	33.03	12.19	0.59
TARGMTBV	2.75	2.84	1.85	0.88	2.48	2.80	10.53	0.51
PERCHELD	2.32	4.54	29.12	0.02	2.46	3.42	12.81	0.54
PRIVACQ	0.38	0.38	1.57	0.88	0.33	0.38	9.57	0.57
PRIVEQ	0.34	0.24	20.55	0.04	0.27	0.26	1.49	0.93
ln(TARGAGE)	8.34	8.12	23.45	0.02	8.24	8.49	28.46	0.08
MOE	0.44	0.77	66.44	0.00	0.67	0.63	8.55	0.62

Note: Panel A reports the results of the PSM analysis based on a Logistic model in which the dependent variable is the dichotomous variable (SCHEME) which takes the value of 1 if the deal is a Scheme deal and 0 otherwise. The results of the two matching exercises are based on a Logistic model in which the independent variables are ln(TARGMV), APPND, TARGPE, ln(TARGAGE), MOE, TARGMTBV, PRIVACQ, CBACQ, STOCK_PERC, TARGTERM, PERCHELD and PRIVEQ. The matching algorithm used is Caliper Matching (CM). The Panel also reports the number of control observations matched per treated observation, the caliper used, the number of Scheme and Offer deals in the resulting matched sample, the mean (PREMADJ) for both the treated and the control group in the matched sample, the p-value from the Kolmogorov-Smirnov test with the null hypothesis that the propensity scores estimated from the Logistic model have the same distribution in the treated and control groups before and after the matching, ATT with the standard error (in parentheses) estimated following Abadie and Imbens (2006), the Hodges-Lehman point estimate at Γ = 1, the cutoff value of Γ at which the initial inference starts to change qualitatively with the corresponding p-value of 5%with the value of the Hodges-Lehman point estimates at the upper and lower bounds established by Γ, the cutoff value of Γ at which the initial inference starts to change qualitatively with the corresponding p-value of 10% and the value of the Hodges-Lehman point estimates at the upper and lower bounds established by Γ. Panel B, based on the first matching exercise presented in Panel A, reports the means of the propensity scores and each main covariate in the groups of Scheme (Treated) and Offer (Control) groups before and after the matching, the p-value from the t-test associated with the null hypothesis of no statistical difference between these means before and after matching, and the Absolute Standardized Mean Difference defined as the absolute difference between the means of the covariate in the two groups divided by the square root of the mean of the covariate's variances in both groups. ***,**, and * represent significance at the 1%, 5% and the 10% levels respectively.

[77] The matching results related to CAR are highly dependent on the choice of the event window. For instance, for a three-day (*t*-1, *t*+1) CAR, the level of Γ at which the initial inferences change is equal to 1.2. However, for an eleven-day (*t*-5, *t*+5) CAR, the level of Γ is equal to 1.6.

Overall, these results are consistent with the notion that, for comparable deals that are likely to be conducted by either the Scheme or the Offer, the choice of the takeover method has no significant impact on the target shareholders gains.

5.6.3. The abnormal returns gained by acquirers

The results reported in Table 5.8 (Model 1) show that the announcement period abnormal returns gained by acquirers do not differ between Scheme and Offer deals. This highlights that, on average, and despite the concerns raised by Payne (2011) about the limited bargaining power of the target shareholders relative to that of the acquirers, there is no evidence that the acquirers shareholders benefit from the use of the Scheme rather than the Offer.

Table 5.8: Abnormal returns gained by the acquirers

Dependent Variable	ACARFIVE	ACARFIVE
Explanatory Variables\Model (.)	(1)	(2)
Intercept	0.022**	0.022**
	(0.010)	(0.011)
SCHEME	-0.006	-0.028*
	(0.012)	(0.015)
SCHEME × OPTIMAL		0.052**
		(0.024)
SCHEME × APPND		0.028*
		(0.015)
SCHEME × APPND × OPTIMAL		-0.064**
		(0.027)
STOCK_PERC	-0.001	-0.002*
	(0.001)	(0.001)
STDV	-0.593**	-0.523*
	(0.297)	(0.318)
ACQMV	-0.001	-0.004
	(0.001)	(0.003)
TARGMV	-0.002	-0.003
	(0.002)	(0.002)
Adjusted R-squared	0.04	0.04
Prob (F-test)	0.07	0.07
N	141	141

Note: The table presents the outcome of 2 regressions explaining the variation in the target's CAR around the acquisition announcement. The measure of CAR, i.e. ACARFIVE, represents estimation over the five (-2, 2) day window. The Adjusted R-squared is reported to highlight the models' goodness of fit. The p-values from the F-test with the restriction that all the model coefficients are jointly equal to 0 are reported. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. Variables not included in the table were included in alternative specifications and were not found to have significant effects. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively.

My next task is to identify the deals in which the Scheme is used optimally and examine whether such optimality leads to higher abnormal returns to acquirers shareholders, as hypothesised by H_7. Accordingly, in the 141 deals announced by UK listed acquirers, I use the 30.5% (43/141 = 30.49%), which is the apriori probability of an included observation belonging to the treated group, as the threshold or cut-off point to which the probabilities estimated from the Logistic model (Panel A; Table 5.9) are compared. Along these lines, a Scheme deal is classified as optimal if the probability estimated from the Logistic model exceeds 30.5% cut-off point and the Scheme is actually used. Alternatively, a Scheme deal is classified as sub-optimal if the probability estimated from the Logistic model is below 30.5% cut-off point and a Scheme is

actually used. The results are presented in a matrix form where the columns indicate the expected number of acquisitions using Scheme and Offer whereas the rows indicate the number of acquisitions that actually used the Scheme and the Offer. Sensitivity is a measure of classification accuracy, i.e. the model predicted group is the same as the actual group of a sampled acquisition. This sensitivity is 77% for the Scheme group, meaning that the model 'optimally' classifies 77% of sampled Scheme deals. Similarly 78% of Offer deals are 'optimally' classified. The overall sensitivity of the model is 77%. Misclassification rate is referred to as 'false positive', i.e. Offer deals being classified as Scheme (=40%) and as 'false negative', i.e. Scheme deals being classified as Offers (=12%).

Table 5.9: Logistic model and classification matrix

Panel A: Logistic Model

	Intercept	APPND	STOCK_PERC	ln(TARGMV)	TARGTERM	STDV	ACQMV	McFadden R-squared	*N*
Coeffic.	-4.3396	2.0454	0.0146	0.7657	-0.1344	-27.3835	-0.0002	0.31	141
s.e.	0.9110	0.5667	0.0057	0.1808	0.4719	13.2731	0.0001		

Note: This Panel compares the actual use of the Scheme and the Offer compared to the predictions from a Logistic. When the Scheme is used as a takeover method (SCHEME=1) and the probability of such a use estimated by the Logistic model exceeds 30.4%, the use of the Scheme is classified as optimal. The same applies to the case of the Offer (SCHEME=0). The Logistic model used includes the following explanatory variables: an intercept, APPND, STOCK_PERC, ln(TARGMV), TARGTERM, STDV, and ACQMV.

Panel B: Classification Matrix

		Expected / Classified Group			
		Scheme	Offer	All	Sensitivity %
Actual group	Scheme	33	10	43	77% (=33/43)
	Offer	22	76	98	78% (=76/98)
	All	55	86	141	77% [=(33+76)/141)
	Misclassification	40% (=22/55)	12% (=10/86)		

Note: The Panel presents the predictions of the logistic regression for Scheme use (logistic regression estimates in Panel A). The results are presented in a matrix form where the columns indicate the expected number of acquisitions using Scheme and Offer whereas the rows indicate the number of acquisitions that actually used Scheme and Offer. The matrix is based on the *a priori* probability of a sample observation belonging to the Scheme group. This is the same as the sample proportion of Scheme, i.e. 30.5% representing the percentage of Scheme deals in the sample. Sensitivity is a measure of classification accuracy, i.e. the model predicted group is the same as the actual group of a sampled acquisition. It is 77% for the Scheme group, meaning that the model 'correctly' classifies 77.6% of sampled Scheme deals. Similarly 78% of Offer deals are 'correctly' classified. The overall sensitivity of the model is 77%. Misclassification rate is referred to as 'false positive', i.e. Offer deals being classified as Scheme (=40%) and as 'false negative', i.e. Scheme deals being classified as Offers (=12%).

I employ the dichotomous variable (OPTIMAL) that is assigned the value of 1 if the Scheme is optimally used and 0 otherwise in Table 5.8, Model 2. Under this specification Iexamine the difference in the acquirer's 5-day CAR (ACARFIVE) between the optimal and sub-optimal use of the Scheme in the period preceding the introduction of Appendix 7 and the period following to the introduction of APPDN. Moreover, in the specification of Model 2 of Table 5.8, we have: (a) the coefficient associated with (SCHEME) refers to the added effect of the sub-optimal use of the Scheme on the acquirers CAR over the use of the Offer before the introduction of Appendix 7; (b) the sum of the coefficients associated with (SCHEME) and (SCHEME × OPTIMAL) refers to the effect of the optimal use of the Scheme on the acquirers abnormal returns before the introduction of Appendix 7; (c) the sum of the coefficients associated with (SCHEME) and (SCHEME × APPND) refers to the effect of the sub-optimal use of

the Scheme on the acquirers CAR after the introduction of Appendix 7; and (d) the sum of the coefficients associated with (SCHEME), (SCHEME × APPND), (SCHEME × OPTIMAL) and (SCHEME × OPTIMAL × APPND) refers to the effect of the optimal use of the Scheme on the acquirers CAR after the introduction of Appendix 7.[78]

The reported results yield a strong support for H_7 in the period preceding the introduction of Appendix 7. That is, the UK listed acquirers that used the Scheme under circumstances in which this use is not recommended (based on several merging firms and deal specific characteristics) experienced a 2.80% lower announcement period CAR while their counterparts that optimally used the Scheme did not incur such a loss. Interestingly, in the period following the introduction of Appendix 7, the losses arising from the sub-optimal use of the Scheme became statistically and economically insignificant. In particular, I apply the Wald test to determine whether the acquirer CAR associated with the optimal use of the Scheme and the sub-optimal use of this method yields equal acquirer announcement period CAR after the introduction of Appendix 7, i.e. (c)=(d). The restriction is not rejected with a *p*-value of 0.46. Therefore, following the detailed clarifications that the Panel presented with respect to the procedures and timetables associated with the Scheme, and with the likelihood of using the Scheme increasing significantly after these reforms, the sub-optimal use of this takeover method became inconsequential in terms of the losses incurred by acquiring firms. Overall, these results confirm the notion that the takeover method used is not trivial and that the proper codification and standardisation of the procedures associated with each takeover method are required to assist the acquiring firms' shareholders avoid substantial losses.

5.7. Conclusion

I investigate the growing reliance on the Scheme of Arrangement (Scheme), as a takeover method in the UK market for corporate control. Based on a rigorous methodological analysis of a hand-collected dataset representing several firm- and deal-specific features, as well as the voting outcomes of the court-meetings related to the Scheme that have been collected from Nexis UK, my analysis identifies the main determinants that influence the use the Scheme as a takeover method in the UK, relative to the traditional Contractual Offer (Offer). Moreover, my analysis concentrates on the influence of the takeover method on the premia offered to target shareholders, as well as the abnormal returns gained by acquirers during the announcement period. The latter is conducted by employing both parametric and non-parametric methods. Specifically, in addition to standard univariate and multiple regression analyses, I provide

[78] In this model specification the SCHEME coefficient refers to the added effect of the sub-optimal use of the Scheme over the Offer, this is due to the introduction of the intercept term and the product (SCHEME × OPTIMAL) in the model. Alternative specifications in which the intercept term is omitted and dummy variables are introduced representing: (a) the use of the Offer, and (b) the sub-optimal use of the Scheme before and after the introduction of Appendix 7, yield quantitatively similar conclusions to the ones reported in Table 5.8 (Model 2).

robust estimates on the influence of the takeover method on the premia offered to target shareholders based on the non-parametric Propensity Score Matching (PSM) method that is augmented with the Rosenbaum-bounds (RB) method. Lastly, in addition to standard multiple regression analyses on the abnormal returns gained by acquirers, I implement the method identifying the optimal versus sub-optimal use of the Scheme and, hence, examine the impact of such optimality on acquirers' gains.

My main findings suggest that the Scheme's use is more likely to occur in deals involving large targets that are financed with stock, especially when the target firm's board of directors has signed termination fee agreements and when the acquirer is a private equity company. I also find that while the use of the Scheme before the introduction of the Appendix 7 by the Panel of Takeovers and Mergers in the UK is limited to only domestic acquirers, after the introduction of the Appendix 7, the use of the Scheme is more likely to be used by foreign acquirers.

Moreover, regarding the premia offered to the target shareholders and despite the concerns raised in the legal literature about the limited protection that is offered to target shareholders in a Scheme deal, my findings indicate that the target shareholders under the Scheme are offered premia that are as high as those offered to the target shareholders under the Offer. More specifically, my results based on the initial parametric analysis show that target shareholders under the Scheme receive 7% higher premia compared to the premia received by target shareholders under the Offer. However, when the analysis is limited to comparable deals, following the analysis based on the non-parametric PSM, the effect of the takeover method (Scheme and Offer) on the premia becomes statistically and economically insignificant. Lastly, I demonstrate how the sub-optimal use of the Scheme during the period preceding the formal codification of this takeover method was associated with a significant reduction of the announcement period abnormal returns gained by the acquirers. While the initial parametric analysis shows that acquirers in Scheme deals do not experience different abnormal returns than the acquirers' returns in Offer deals, these acquirers' shareholders experienced significant losses when the Scheme was used sub-optimally, especially before the introduction of Appendix 7 by The Panel on Takeover and Mergers.

Overall, my results offer a strong emphasis on the relevance of adopting the appropriate takeover method when conducting takeovers in the UK market for corporate control. These results also emphasise the role that regulatory bodies have in properly codifying the use of the takeover methods. In particular, while the takeover method is usually considered as a process that precedes the completion of the deal, the market participants' sub-optimal reliance on a possibly poorly defined takeover method might lead to substantial losses. Additionally, in a well-functioning takeover market, the shareholders must be aware of the regulatory and tax-related advantages of each of the available takeover methods in order to proceed with the

method that strengthens their bargaining position. Given that the Scheme is gaining popularity in the United States, Australia, New Zealand, South Africa, Malaysia, Singapore and Hong Kong, the empirical framework applied in this chapter can be extended to evaluate the determinants of the use of the Scheme as a takeover method and also investigate its effects on various deal outcomes worldwide.

Appendix 3- Variables' Definitions

Variable (Acronym)	Description	Source
ACARFIVE	The acquirer's announcement period five-day (-1, 1) Cumulative Abnormal Returns	Datastream
ACQMTBV	The acquiring firm's market-to-book value 43 days before the deal's announcement	Datastream
ACQMV	The acquiring firm's market valuation 43 days before the deal's announcement	SDC
ACQPE	The acquiring firm's price-earnings value 43 days before the deal's announcement	Datastream
ACQTERM	Dummy=1 if the deal includes an acquirer termination fee agreement, 0 otherwise	SDC & InvestEgate
ALL	Refers to the total number of observations in the sample	SDC
APPND	Dummy=1 if the deal is announced after the introduction of Appendix 7 in January 2008, 0 otherwise	SDC
BEFOEAPPND	Dummy=1 if the deal is announced before the introduction of Appendix 7 in January 2008, 0 otherwise	SDC
CARTHREE	The target's announcement period three-day (-1, 1) Cumulative Abnormal Returns	Datastream
CBACQ	Dummy=1 if the acquirer is a not UK firm, 0 otherwise	SDC
DAYSEFFECTIVE	Number of days until the deal is declared effective	SDC
DOMACQ	Dummy=1 if the acquirer is a UK firm, 0 otherwise	SDC
DVRD	Dummy=1 if the acquirer and the target have different 2-digit SIC code, 0 otherwise	SDC
FCSD	Dummy=1 if the acquirer and the target have the same 2-digit SIC code, 0 otherwise	SDC
FINADV	Number of financial advisors involved in the deal	SDC
LEGALADV	Number of legal advisors involved in the deal	SDC
MOE	Dummy=1 if the deal is classified as a merger of equal, 0 otherwise	SDC
OFFER	Dummy=1 if the Offer is used as a takeover method, 0 otherwise	SDC
OPTIMAL	Dummy=1 if the use of the Scheme is judged to be optimal, 0 otherwise	Table 5.9
PERCHELD	The percentage of target shares owned by the acquiring firm before the announcement	SDC
PREM	The ratio of the deal value to the acquirer's market valuation 43 days before the announcement minus one	SDC
PREMADJ	The difference between PREM and its average in the target's macro-industry during the period covered in the sample	SDC
PRIVACQ	Dummy=1 if the acquirer is a listed firm, 0 otherwise	SDC
PRIVEQ	Dummy=1 if the deal is classified as a private equity transaction, 0 otherwise	SDC
PROP_SCORE	The propensity score estimated by a Logistic model	Table 5.7
PUBACQ	Dummy=1 if the acquirer is a privately listed firm, 0 otherwise	SDC
SCHEME	Dummy=1 if the Scheme is used as a takeover method, 0 otherwise	SDC
STDV	The standard deviation of the target firm's returns from 240 to 43 days before the announcement date	Datastream
STOCK_PERC	The percentage of the deal value that is financed with stock	SDC
TARGAGE	Number of days separating the announcement days from the date at which the target firms was listed in Datastream	Datastream
TARGMTBV	The target firm's market-to-book value 43 days before the deal's announcement	Datastream
TARGMV	The target firm's market valuation 43 days before the deal's announcement	SDC
TARGPE	The target firm's price-earnings value 43 days before the deal's announcement	Datastream
TARGTERM	Dummy=1 if the deal includes a target termination fee agreement, 0 otherwise	SDC & InvestEgate
TOTALADV	The total number of advisors, financial and legal, involved in the deal	SDC

Note: The variables used in the chapter and their data sources are summarised. SDC is Thomson-Reuters' SDC database; the voting outcomes discussed in Section 5.3 are based on company announcements retrieved from Nexis UK; the adjusted termination fee-related variables are retrieved from the announcements in the InvestEgate financial press website; acquirer- and target-related financial variables are retrieved from Datastream.

Chapter Six

Target Termination Fee Provisions:

Their Determinants and the Merits of Banning Them in the UK

Abstract

I present the first empirical contribution that examines the determinants of the presence of target termination fee provisions and the effect of such provisions on the premia in UK public target deals. In the presence of various forms of shareholder commitments in the UK market, my empirical evidence suggests that termination fee provisions are granted by the target boards when the target shareholders agree in principle to complete the deal but remain reluctant to grant binding commitments. Given that my sample covers the deals announced before the ban imposed by the Panel on Takeovers and Mergers on the inclusion of termination fees, I find that neither public nor private acquirers systematically exploited the inclusion of these provisions to the detriment of their targets' shareholders. Consequently, I recommend that the Panel end its ban.

6.1. Introduction

An established array of studies investigates the determinants of the decision to include a Target Termination Fee Provision (hereafter 'TTFP') in the acquisition deal and the effect of the presence and the size of the termination fee payment on particular deal outcomes (Bates and Lemmon, 2003; Chapple et al., 2007; Coates and Subramanian, 2000; Coates, 2009; Jeon and Ligon, 2011; Officer, 2003). This provision requires the target that decides not to proceed with the deal to pay a pre-specified sum to the acquirer (Bates and Lemmon, 2003). The relevant literature mostly revolves around investigating whether the granting of such a provision by the target's board is: (a) an efficient contractual device that incentivises potential acquirers to initiate bids and leads them to offer relatively high premia, or (b) a symptom of a principal-agent problem in the target company reflected by the directors' attempt to protect a sweetheart deal that offers them particular private benefits to the detriment of their shareholders (Bates and Lemmon, 2003; Jeon and Ligon, 2011; Officer, 2003).

On September 19th 2011, the ban that the Panel on Takeovers and Mergers in the UK imposed on the inclusion of TTFPs became effective. The rationale behind this ban was not related to concerns about agency problems in the target companies: the Panel is praised for her role in addressing the concerns of the target shareholders with respect to the performance and loyalty of their boards (Armour and Skeel, 2007).[79] Rather, this decision was motivated by many market participants' complaints that, with the inclusion of a TTFP becoming a market standard, 'the balance of negotiating power has shifted away from the boards of offeree companies in favour of offerors, to the extent that the board of an offeree company may consider itself unable to resist the package'(p. 80) (The Panel on Takeovers and Mergers, 2010). Yet, TTFPs in the UK market, despite their popularity in the last decade and being subject to a ban by the Panel, have received limited coverage in the empirical finance literature. The only study I am familiar with is presented by Coates (2009). The author compares and contrasts several outcomes of the deals with a TTFP between the US and UK markets. However, no comparisons of deal outcomes between transactions including a TTFP and transactions not including this provision are executed. This chapter aims to fill this gap.

Accordingly, in this chapter, I present two main contributions which aim to enhance our understanding of the determinants of the decision to include a TTFP and the effect of this provision on the takeover premium in the UK market. First, given that the target shareholders in the UK can also make various types of commitments to the acquirers, I present the first contribution which examines how the different conditions under which these commitments cease to be binding have varying effects on the target boards' decision to grant TTFPs. Second, I

[79]Armour et al. (2009) find that the likelihood of a UK director being sued by her shareholders under the UK Company Law is extremely small.

investigate whether the target shareholders receive low premia when a TTFP is granted and, consequently, whether the Panel's concern with respect to the reduction in the target's bargaining power is empirically justified. In pursuing these enquiries, I attempt to overcome the significant data constraints that characterise the termination fees-related research. In particular, I employ a dataset that documents not only the accurate incidences of TTFP presence, but also the alternative forms of commitments made by the UK target shareholders.

The previous literature examines the determinants of the percentage of target shares subject to shareholders' commitments to accept the offer (Wright et al., 2007). The literature also studies the association between the presence of target shareholders' commitments and: (a) the presence of a TTFP (Boone and Mulherin, 2007), and (b) the size of the termination fee payment relative to the deal payment (Jeon and Ligon 2011). This literature treats the various shareholder commitments as a homogenous group. In practice, however, these commitments can vary with respect to the degree by which they bind the target shareholders that offer them. Hence, the different conditions under which the shareholders' commitments can cease to be binding and, in particular, the varying influence of the percentage of target shares subject to these different conditions on the inclusion of a TTFP, remain unexplored. Given that a TTFP binds the entire company rather than a particular group of shareholders, I hypothesise that the target boards grant TTFPs to encourage bidders to proceed with the deals when the target shareholders are reluctant to offer fully binding commitments to accept the deal. Furthermore, given that a loyal target board will not grant a TTFP unless the target shareholders show some sign of approval, I hypothesise that the likelihood of TTFP presence increases with the portion of the target shares subject to weakly binding commitments, i.e. those commitments to accept the offer that cease to be binding under particular conditions.

In turn, if the standardised inclusion of a TTFP reduces the target boards' options in the due diligence process, as indicated by the Panel, such a reduction in bargaining power is supposed to be reflected in losses of takeover premia. Therefore, parametric and matching analyses are applied in order to accurately evaluate the effect of the inclusion of a TTFP on the premia relative to deals not including such a provision.

While the targets in my analysis are publicly traded companies, the acquirers are both public and private. In investigating the effect of TTFPs on the premia, to make the conclusions more reliable by analysing comparable deals, this chapter builds on the extensive literature highlighting the differences in resources, managerial motives and sensitivity to the deal's failure across different types of acquirers (Bargeron et al., 2008; Coates and Subramanian, 2000; Jensen, 1989, 1986). Therefore, in addition to examining the overall difference in premia between the deals including a TTFP and the deals not including this provision, I examine this

difference within each of the groups of deals announced by public operating, private operating and private equity firms, respectively.

Along these lines, I hypothesise that, when TTFPs are granted, the target shareholders receive premia that are at least as high as the premia in comparable deals announced by the same group of acquirers and which do not include such provisions. To further emphasise that none of the market participants systematically exploit the inclusion of TTFPs, I also hypothesise that the deals announced by public operating, private operating, and private equity acquirers do not systematically differ in their likelihood of including a TTFP. Alternative evidence that acquirers from a particular group systematically manage to include a TTFP, and that the acquirers belonging to this group pay significantly low premia in deals with a TTFP, will give support to the Panel's argument. Following this discussion, the contributions of this chapter are as follows:

First, after demonstrating how the frequently used SDC database understates the extent of the presence of TTFPs (as in André, Khalil, and Magnan (2007), Boone and Mulherin (2007) and Jeon and Ligon (2011)), the evidence that I present suggests that the influence of the overall percentage of target shares subject to commitments on the presence a TTFP is insignificant. However, emphasising the relevance of the different conditions at which the shareholders' commitments cease to be binding, I find that a TTFP is more likely to be present when the percentage of shares subject to binding commitments is relatively low. Furthermore, the likelihood of including a TTFP increases with the percentage of target shares subject to commitments that cease to be binding under particular conditions and non-binding promises. Such findings can potentially be interpreted as evidence that target managers, by granting a TTFP that binds the entire company when their shareholders are reluctant to make their shares subject to binding commitments, possibly distort the acquisition process for their personal benefit. However, such concerns remain negligible because: (a) the target shareholders are still expressing interest in the acquisitions by making other types of commitments to the acquirer, and (b) the Panel's Consultation Paper discussing the reasons behind the ban does not report any shareholder concerns related to the loyalty of target managers (The Panel on Takeovers and Mergers, 2010).

Second, I present new and robust evidence suggesting that, in the UK market, the inclusion of a TTFP is not detrimental to the target shareholders with respect to the premia they are offered. In fact, for the premia offered in the acquisitions announced by private operating acquirers, a TTFP has an Average Treatment Effect on the Treated (*ATT*) exceeding 27% in premium. As the relative size of the termination fee payment is capped (and rather standardized) at 1% of the deal value (The Panel on Takeovers and Mergers, 2011), I do not present my findings as evidence that these relatively large increases in premia are fully *caused*

by the target board's granting of a TTFP.[80] Rather, I argue that the inclusion of this provision provides some form of compensation for high-paying private operating acquirers that incur high costs in assessing the synergies of their deals. My conclusions complement the previous literature by indicating that the granting of a TTFP facilitates the completion of transactions at higher premia relative to transactions with comparable deal and target characteristics (Bates and Lemmon, 2003; Officer, 2003). Moreover, as expected, I do not find significant differences in the likelihood of including TTFPs among the deals announced by public operating, private operating and private equity acquirers. The lack of systematic use of TTFP by particular groups of acquirers represents a further indicator that TTFPs do not offer any of these groups specific bargaining advantages relative to the target shareholders.

I also address the potential influence of unobservable covariates on the derived conclusions by relying on the Rosenbaum (2002) bounds analysis. The treatment effect estimates based on the matching analyses for transactions announced by each of the three groups of acquirers are less sensitive to such a missing covariate. Specifically, for the comparable deals within each of these groups, a missing covariate needs to increase the odds of one of two matched deals including a TTFP, relative to the other, by a factor ranging from 1.47 to 1.70 in order to alter the qualitative conclusions. Such levels are very close to the levels reported in earlier financial research as evidence that inferences resulting from the matching exercises are relatively insensitive to the effect of a missing covariate (Bartram et al., 2011; Peel and Makepeace, 2012).

Overall, this chapter offers a specific regulatory recommendation that the Panel reconsiders its decision to ban TTFPs. I recognise that the conclusions are primarily related to the termination provision's relationship with the premium rather than its relationship with the likelihood of deal completion or the emergence of competing bidders, as SDC does not report uncompleted deals or deals with a competing bidder that satisfy the restrictions I impose on the sample. I also recognise that the Panel's decision to ban TTFPs might also be driven by concerns not strictly related to the premium as the target shareholders' long-term interest might not be in an acquisition in the first place. However, the premium-related conclusions should be interpreted in the context of other theoretical and empirical conclusions showing that low or moderate termination fee payments, like the ones capped at the maximum 1% level in the UK, neither hurt the target shareholders with respect to the premia they receive nor influence the allocative efficiency in the market for corporate control (Ayres, 1990; Calcagno and Falconieri, 2014; Coates, 2009; Jeon and Ligon, 2011).

[80] Coates (2009), using a sample of UK public target deals announced between 1999 and 2008, finds that the relative size of termination fee payments clusters around the 1% cap. Furthermore, as the acquisition announcements indicate that the relative size of termination fees is 1% of the deal value in all the deals including a TTFP in the sample, I limit my analysis to the presence of TTFP rather than the relative sizes of the termination fee payments.

Following this discussion, this chapter proceeds as follows. Section 6.2 reviews the relevant literature. In Section 6.3, I provide a detailed discussion of the reasons behind the Panel's decision in addition to the early assessment of the consequences of this decision by both the Panel and particular merger consultants. The empirical hypotheses are discussed in Section 6.4. Section 6.5 describes the Dataset. Section 6.6 discusses the empirical results and Section 6.7 concludes.

6.2. Related Literature

6.2.1. The presence of a TTFP

The empirical literature on termination fees highlights several deal- and firm-related factors influencing the merging partner's decisions to include a TTFP. Given that the TTFP is granted by the target boards, which makes it present in friendly deals by definition, this literature either highlights a significantly strong reduction in the likelihood of a TTFP being present in a deal classified as hostile (Bates and Lemmon, 2003; Chapple et al., 2007; Officer, 2003) or limits the empirical analysis to friendly transactions (Coates and Subramanian, 2000). Furthermore, as the inclusion of a TTFP is likely to be a part of a reciprocal agreement between the merging partners, a positive relation is documented between its presence and the presence of an Acquirer Termination Fee Provision (Bates and Lemmon, 2003; Officer, 2003).

Among the target's characteristics, its size has been presented as a major factor positively influencing the presence of a TTFP. While large deals are hard to finance which makes them less likely to attract competing offers and therefore limits the requirement to include a TTFP (Alexandridis et al., 2010), such deals are usually complex to assess and are conducted by relying on experienced and highly compensated lawyers familiar with the use of the TTFP as a deal protection measure (Bates and Lemmon, 2003). This, consequently, makes such deals more likely to include these provisions (Bates and Lemmon, 2003; Chapple et al., 2007; Coates and Subramanian, 2000; Officer, 2003).

The financing of the deal using the acquirer's securities, in turn, is also presented as a positive contributor to the presence of a TTFP. Coates and Subramanian (2000) present an explanation for this positive effect. Specifically, as straightforward cash payments induce the target shareholders to tender their shares more quickly than the complex stock financing, there is less of a need to protect the deal from the emergence of a competing bidder in cash-financed deals relative to stock-financed ones. Furthermore, a complementary explanation is presented by Bates and Lemmon (2003) who consider stock financing as a proxy for the risk of information expropriation faced by the bidder: a bidder deciding to finance the transaction with stocks, in order to convince the target's board to accept this financing method, reveals private

information about the expected synergies of the deal and wants to prevent competing bidders from free riding and benefiting from the shared information.

The documented effect of the bidder's toehold on the TTFP's presence remains mixed and highly dependent on the accuracy of the datasets. On the one hand, Officer (2003) presents evidence of a negative effect of bidder toeholds on the likelihood of TTFP presence. Qualitatively similar results are presented by Bates and Lemmon (2003) who report that the deals including a TTFP have average toeholds of 0.59% while deals not including this provision have average toeholds of 6.42%. Such findings are presented as evidence that toeholds and TTFPs are equivalent as both of them compensate the bidder financially in case a competing higher paying offer emerges.[81] On the other hand, Boone and Mulherin (2007) show that these results are based on inaccurate data reported by SDC and that the results based on the more accurate data retrieved from the offer documents indicate an insignificant relation between toeholds and TTFPs.

Finally, the previous literature presents interesting patterns related to the likelihood of TTFP presence in particular industries. Coates and Subramanian (2000) find that TTFPs are frequently used in high-tech and healthcare deals and attribute this finding to the valuation difficulties which characterise these sectors.[82] Bates and Lemmon (2003) report a qualitatively similar result in addition to emphasising the strong reliance on these provisions in utilities industries acquisitions which require extended time for regulatory approval.[83] Officer (2003), however, finds that the rate of TTFP presence is constant across industries with the exception of a significantly reduced presence of TTFPs in the financial industry. Such findings are in line with the argument of Coates and Subramanian (2000) stating that firms in this industry have regulatory capital rules preventing the granting of such financial commitments.[84]

6.2.2. Effect of the TTFP on the premium

The takeover premium has been presented as a main yardstick for determining whether the granting of a TTFP is a symptom of an agency problem in the target company or an efficient contractual device. Both Officer (2003) and Bates and Lemmon (2003) test similar hypotheses explaining the TTFP's relationship with the premium. As the initial bidders invest substantial

[81] When a higher paying competing bid emerges, the acquiring company, despite losing the bid, can earn significant returns by selling her shares to the rival bidder.

[82] While the acquisition of targets in a different industry than the acquirer's is presented as example of a case in which the acquirer might have concerns related to the emergence of a higher-paying competing bidder more familiar with the target's business activities, Officer (2003) and Bates and Lemmon (2003) find that the likelihood of TTFP presence is not influenced by the industry relatedness of the merging parties.

[83] Stressing the relevance of valuation difficulties and growth opportunities as determinants of the inclusion of a TTFP, Officer (2003) and Bates and Lemmon (2003) account for the target's market-to-book in their Logistic models. While Officer (2003) documents and insignificant effect of this variable on the likelihood of TTFP presence, Bates and Lemmon (2003) document a positive significant one.

[84] As an example of such restrictions in the US, Coates and Subramanian (2000) note the restriction by the Federal Reserve Board rules on cash commitments by financial firms exceeding more than 10% of their net worth.

resources in assessing the synergies of their acquisitions and share private information with their targets' boards regarding these synergies, the contractual efficiency hypothesis indicates that TTFPs compensate these bidders for the costs they incur and the likelihood of competing bidders emerging and free riding on the information shared. Under such an arrangement, a TTFP's effect on the premium should be positive or, at least, neutral. However, a disloyal target board can make this commitment to a low-paying bidder in exchange for managerial or financial privileges in the acquiring company during the post-acquisition period.

The results of the survey presented in Table 6.1 give overwhelming support to the contractual efficiency hypothesis. In particular, the effect of a TTFP on both the premium and the market's assessment of the deal is positive and significant or, at worst, insignificant when firm and deal characteristics are controlled for in a multivariate setting. Interestingly, both Bates and Lemmon (2003) and Jeon and Ligon (2011) present evidence of the negative effect of excessively high termination fee payments, 10% and 5% of the deal value respectively, on the premia. However, these excessively high payments exceed the 1% limit imposed in the UK.

Among the studies presented in Table 6.1, the results presented by Chapple, Christensen, and Clarkson (2007), based on an analysis of acquisitions in the Australian market, go against the conclusions of the other studies. Specifically, the authors' conclusions convey a negative relationship between the inclusion of a TTFP and the premium. Such findings are especially relevant for UK analysis as they are based on transactions taking place in a market with a similar 1% cap on the relative size of termination fee payments. The authors, however, do not find that the granting of TTFPs reduces competition in the Australian market. Consequently, they contrast their conclusions with those of US and Canadian studies and present them as evidence that capping the size of the termination fee payments limits the ability of such provisions to positively influence the target's wealth. That is, potentially high-paying acquirers are reluctant to announce their bids given that the commitments granted by the target's board are not enough to compensate them for the research costs they will incur in assessing the merits of the deal.

An alternative perspective on the relationship between the TTFP and the premium is offered by Coates and Subramanian (2000). The authors employ the premium as an independent variable in their models which aim to predict the presence of a TTFP. These models document an insignificant effect. The rationale behind this approach follows from the assumption that a high premium protects the deal from competing bidders and reduces the need to include a TTFP. Nonetheless, the results of the attempts to estimate the endogenous relation between the TTFP and the premium remain mixed: while Officer (2003), using various exclusion restrictions, documents that the TTFP presence causes an increase in the premium, the evidence presented by both Bates and Lemmon (2003) does not support the notion that

Table 6.1: Summary of the empirical studies that examine the relation between TTFPs, the takeover premia and the market's reaction

Study	Data	Variables Investigated	Measure of Premium and/or market reaction	Conclusions
Officer (2003)	Acquisitions of US public targets announced between 1988 and 2000	• The presence of a TTFP	• The total value of the bid deflated by the target's market value of equity 43 days before each acquisition, minus one. • 7-day (-3, 3) CAR	• Premia are 7% higher in deals with a TTFP. This effect becomes insignificant as deal and target characteristics are accounted for • CAR are 3% higher in deals with a TTFP. This effect becomes insignificant when the premium and target characteristics are accounted for
Bates and Lemmon (2003)	Acquisitions of US public targets announced between 1989 and 1998	• The Presence of a TTFP • The presence of jumbo fees exceeding 10% of the deal value	• The total value of the bid deflated by the target's market value of equity 42 days before the acquisitions, minus one. • 3-day (-1, 1) CAR	• Premia are 3.7% to 6.3% higher in deals with a TTFP. However, when the relative size of the termination fee payment exceeds 10%, the premium is reduced by 16.3% • 3% higher CAR in deals with a TTFP. This effect becomes insignificant as deal and target characteristics are accounted for
André, Khalil, and Magnan (2007)	Acquisitions of Canadian public targets including a TTFP and announced between 1997 and 2004	• The relative size of termination fee payments	• 3-day (-1,1) and 41-day (-20, 20) CAR	• Weak evidence based on univariate results that termination fee payments above the median relative size are associated with higher CAR
Chapple, Christensen, and Clarkson (2007)	Acquisitions of Australian public companies announced between 2002 and 2006	• The presence of a TTFP • The relative size of termination fee payments	• The total value of the bid deflated by the target's market value of equity 30 days before the acquisitions, minus one. • 7-day (-3, 3) CAR	• 7.5% reduction in the premium and 3.5% reduction in CAR in deals with a TTFP. The results are contrasted with the US based results and presented as evidence that the 1% cap imposed on the relative size of the termination fee payment is preventing these provisions from positively impacting the target shareholders' wealth in Australia • The results become less significant (at the 10% level) when endogeneity bias is addressed
Jeon and Ligon (2011)	Acquisitions of US public targets announced between 2001 and 2007	• The relative size of termination fee payments	• 3-day (-1, 1) and 5-day (-2, 2) CAR	• Insignificant effect of the continuous measure of relative size of the termination fee payment on CAR. • The dummy variable indicating that this relative size exceeds 5% has a weakly negative effect on CAR. However, such deals are documented to have a higher completion rate (7%) than other deals. • The negative effect of this dummy variable is stronger for middle sized targets

Note. This table summarises the results of four empirical studies examining the relation between TTFPs and/or the relative size of termination fee payments on one hand and the different measures of the takeover premium and announcement period returns on another. For each contribution, the sample employed, the variables investigated, the measures of the premium and/or market reaction and the main empirical results are presented

causality runs in either direction between the premium and the presence of a TTFP. André, Khalil, and Magnan (2007) find a qualitatively similar result with respect to the causality between the relative size of termination fee payment and the premium. Finally, the previously mentioned negative effect of TTFP on the premium documented by Chapple, Christensen, and Clarkson (2007) becomes less significant when endogeneity bias is addressed by applying a simultaneous equation system with various exclusion restrictions.

6.2.3. Deal completion

Officer (2003) and Bates and Lemmon (2003) report that the presence of a TTFP is a significant and positive contributor to the likelihood of deal completion. Officer (2003) presents his results as evidence that TTFPs represent efficient contractual devices protecting the investments the bidders make in researching the synergies of the deal. In particular, a bidder granted such a provision will share more detailed private information with the target shareholders which, in turn, increases the likelihood of them accepting the offer. Bates and Lemmon (2003), in turn, present their findings as evidence that TTFPs are either used by target managers to lock deals with a friendly bidder or as an efficient method of reducing the cost of information exchange between the merging parties. The authors' previously presented premium-related findings are consistent with the second explanation.

The effect of the size of the termination fee payment on deal completion also received attention in the relevant literature. Coates and Subramanian (2000) show that the higher the relative size of this payment compared to the deal value, the higher the likelihood of deal completion. Jeon and Ligon (2011) report a qualitatively similar result for their full sample but find this effect to be insignificant when the analysis is limited to the sample of deals including a TTFP. The authors complement Officer (2003) and Bates and Lemmon (2003) by examining whether the presence of a TTFP facilitates the completion of deals with high premia while also taking into account the size of the termination fee payment. Interestingly, they provide evidence of a non-linear effect of the payment on deal completion as moderate fees significantly increase the likelihood of deal completion while high fees significantly reduce this likelihood.[85]

Moreover, Coates (2009) offers the only contribution covering datasets from the UK as he examines the relation between the relative size of the termination fee payment to the deal value and the likelihood of deal completion. In particular, given the inaccuracy of SDC's coverage

[85] A possible explanation for these findings, not presented by Jeon and Ligon (2011), is that the high termination fee payments in such high-premium deals are demanded by bidders aiming to protect the deal to benefit from significantly high synergies arising from acquiring the target. Such an aspect of the deal signals to the target shareholders the possibility of finding a higher-paying bidder despite making a substantial termination fee payment to the initial one.

of the presence of a TTFP, the author limits his analysis to deals including such a provision.[86] The author argues that, due to the relatively small cap of 1% imposed in the UK, the deals in this country are documented to be completed 60% as often as their US equivalents.

6.2.4. Competing bidders and allocative efficiency

In addition to the empirical finance literature, the legal literature which discusses the merits of banning lockups in the US courts provides relevant insights that can be applied to the case of TTFPs.[87] The application of the Ayres (1990) model for lockups on TTFPs demonstrates that these provisions can foreclose a higher-paying competing bidder when the size of the termination fee payment, as a percentage of the deal value, exceeds the increase in the competing bidder's valuation relative to the current bid. Based on this result, excessively high termination fee payments should be banned. The application of the Fraidin and Hanson (1994) approach, however, indicates that TTFPs do not affect allocative efficiency as the authors appeal to the Coase theorem to support their argument. In particular, in the presence of particularly high termination fee payment from which the initial bidder gains more from losing the bid than completing the deal, and as long as transaction costs are low, the initial bidder compensates the higher valuing competing potential acquirer by forgoing part of the gain from the termination fee payment in order to motivate the latter bidder to announce her bid.

However, Coates and Subramanian (2000) argue the buy-side distortions from the acquirer's side can influence allocative efficiency.[88] For instance, they find that, due to the agency problems characterising public acquirers relative to private ones, they are less likely to accept the termination fee payment and prefer to complete the deal even if their true valuation of the target is below that of the competing bidder. Also, the authors present their finding that deals with a TTFP are more likely to be completed than deals with stock lockups in the presence of a competing bidder as further evidence of the effect of buy-side distortions on allocative efficiency. That is, the acquirer proceeds with the deal despite the fact that the increase in the competing bid's value increases the value of stock lockups relative to the fixed termination fee payment.

Officer (2003), in turn, finds a 3% reduction in the probability of the emergence of a competing bid when a TTFP is granted. However, such a relatively small effect is mainly driven by correlated deal characteristics. Bates and Lemmon (2003) report qualitatively similar findings and estimate the target's returns in the period of multiple bids. The author's findings highlight the trade-off between the reduction in the likelihood of competing bids and a resulting

[86] The author limits the analysis to deals exceeding 1 billion dollars in size, with 1989 as the base year, to make the comparison more valid as US deals are usually larger than UK ones.
[87] Contrary to the fixed pre-specified cash sums in TTFPs, lockups grant the bidder a call option on a pre-determined number of target shares at a specific strike price.
[88] I discuss these distortions in detail in Section 6.2.5.

increase in the returns accrued to the target shareholders. To stress that capped termination fee payments do not deter competing bidders, Coates (2009) shows that UK deals with a TTFP are more likely to be subject to post-bid competition compared to their US equivalents in which termination fee payments have no legal cap.[89] Post-bid competition, however, captures only a part of the competitive process surrounding the acquisitions. For instance, Aktas, de Bodt, and Roll (2010) focus on potential competition, rather than on the documented presence of competing bids, as a significant contributor to the premium.[90] Boone and Mulherin (2007), in turn, present an alternative measure of competition by examining whether the targets were contacted by multiple bidders (auction) or a single one (negotiations) before the acquisition announcement. They find that auctions are more likely to include a TTFP than negotiations. Consequently, their findings are consistent with the notion that TTFPs encourage potential acquirers to announce their bids without deterring competitors.

6.2.5. The acquirer's agency characteristics and the premium

Coates and Subramanian (2000), Roll (1986), Jensen (1986) and Bargeron et al. (2008) focus on the agency characteristics on the acquirer's side as potential determinants of her bidding strategy. In particular, Roll (1986) emphasises the role of managerial hubris in causing acquisitions as the companies' managers might exaggerate their abilities to realize gains from takeover deals. A by-product of the hubris hypothesis is that the managers of public firms attempt to develop a reputation for toughness in acquisition bids by not withdrawing their attempt to acquire their targets even if they had to pay additional premia (Coates and Subramanian 2000).[91] Furthermore, especially in the presence of free cash flows (Jensen and Meckling, 1976), managers are incentivised to grow their companies beyond their optimal levels in order to benefit from large compensations (Murphy, 1985). Such problems are more likely to be influential in public companies characterised by a separation between management and ownership (Coates and Subramanian 2000).

Public companies have other agency characteristics that lead them to be less reluctant to withdraw their bids even if they have to pay higher premia. Coates and Subramanian (2000) argue that, for large public companies characterised by a hierarchical structure with multiple layers, switching strategies by deciding to withdraw from a specific merger project is costly to

[89] Stressing that relatively low and capped termination fee payment limits the bidder's compensation for investigating the merits of the deal, Coates (2009) reports that the bidding activity, measured as the percentage of M&A bids relative to the total number of companies, is smaller in the UK compared to the US.

[90] Aktas, de Bodt, and Roll (2010) use the increase in the overall corporate control activities in the target's industry, the growing buyout fund activity and indicators of overall economic expansions to represent this potential competition.

[91] Coates and Subramanian (2000) also present the psychological phenomenon of endowment as a representative of buy-side distortion. Specifically, the acquirer's managers tend to be more averse to the loss of a deal once they familiarise themselves with the notion that the target's assets will become part of their companies.

implement. In particular, even in the absence of managerial hubris, deciding not to proceed with a merger deal requires that the company reassesses the entire business strategy in addition to abandoning future projects dependent on the acquisition of the target's assets.

Likewise, the literature related to acquisitions by firms engaged in private equity transactions emphasises the high-powered incentives of these firms' managers (Jensen, 1989; Kaplan and Strömberg, 2009). A private equity transaction is one in which the acquirer finances the transaction using 'a relatively small portion of equity and a relatively large portion of debt financing' (p. 1) (Kaplan and Strömberg, 2009). This strong reliance on debt financing by private equity acquirers is presented by Jensen (1989) as a main cause for the reduction of conflicts of interest between stakeholders and the managers of these firms and, consequently, as a source of bargaining strength in any takeover negotiations. Specifically, the requirement to service the private equity firm's debt limits the managers' incentives to retain cash reserves and consequently limits the amount of free cash flows to be spent on wasteful acquisitions. Hence, the private equity firm's managers are incentivised to be selective in choosing their targets and the levels of premia they are prepared to offer for such targets. Along similar lines, contrary to the case of multi-layer companies described by Coates and Subramanian (2000), Jensen (1989) also argues that private equity firms are more decentralised than publicly held corporations. Such an aspect also allows these firms to have an increased flexibility in the bargaining process. Given these distinctions between the various types of acquirers with respect to their attitude towards the withdrawal from the deal, in the hypotheses presented in this chapter, I examine whether these acquirers differ in the likelihood of including a TTFP in their deals and whether the presence of a TTFP influences the premia they pay.

6.3. The Panel's Ban on TTFPs

The Panel's decision to ban TTFPs was part of a series of decisions following the controversial hostile bid initiated by Kraft to acquire Cadbury. This bid was initiated in the end of August 2009 and was completed in January 19th, 2010 after an initial rejection by Cadbury's board (Moeller, 2012). The notion that a British landmark company was being acquired by a foreign competitor, with the potential job losses associated with Kraft's future plans regarding Cadbury's business activities and the role of the recently bailed out Royal Bank of Scotland in financing the deal, caused extensive media coverage stressing Cadbury's relevance to the British economy (Morris, 2014). This led to many calls to the Panel to ensure that 'the outcome of a takeover bid is determined primarily by the long term shareholders of the offeree company, who will have a greater commitment to, and a better understanding of, the company, its management and its employees than those shareholders who are driven by short term trading strategies' (p. 13) (The Panel on Takeovers and Mergers, 2010). Due to the relatively long

period of speculation with respect to Kraft's intentions, among the most relevant changes to the Code was the tightening of the 'put up or shut up' period. Specifically, the Panel required a specified bidder to declare formally her intention to acquire or not acquire the target within 28 days of the target's declaration of the presence of a potential offer (Morris, 2014).

In a further attempt to strengthen the bargaining position of the target companies, the Panel banned the inclusion of TTFPs. Under such an arrangement, when TTFPs are not granted to the initial bidders, the target boards will have a wider range of options in the bargaining process including the possibility of withdrawing from the deals with no substantial costs. To further allow the targets to improve their tactical bargaining position, the Panel permitted the granting of TTFPs, following the Panel's approval, to White Knight bidders, which are friendly acquirers that emerge when the target company is facing a hostile bid.

In the seven-month period following the Panel's ban, Clifford Chance LLP published a report assessing the UK takeover scene following the ban. Among the 56 acquisitions surveyed, only one dispensation from the prohibition on TTFPs was granted in the merger between Shell and Cove Energy. In addition, no TTFPs were found to be granted to White Knight bidders (Clifford Chance LLP, 2012).

The Panel, in turn, published a Consultation Paper in November 2012 aiming to evaluate the impact of its reforms on the takeover scene. Among the interesting aspects of this chapter is the Panel's concern with respect to the merging parties' attempt to add provisions aiming to *de facto* play the role of a TTFP to the 'Co-operation Agreements' following Rule 21.2(b) of the Code (The Panel on Takeovers and Mergers, 2012). Under such provisions, the target company commits not to produce the required acquisition documents within a pre-specified period and not to publish these documents without the acquirer's approval. Further, some provisions imposed restrictions on the target board's ability to 'communicate with shareholders and others in relation to the offer' (p. 12) (The Panel on Takeovers and Mergers, 2012). Additionally, the commitments made following the ban by the target directors who are also shareholders included: (a) provisions related to the non-solicitation of competing offers, and (b) commitments to notify the acquirer of competing offers and the recommendation of the announced offer to the other shareholders. Nevertheless, the Panel remained confident that the changes introduced in September 2011 increased the protection offered to the target company shareholders (The Panel on Takeovers and Mergers, 2012).

To the best of my knowledge, no scholarly empirical contribution has addressed the empirical merits of this decision. However, the only theoretical scholarly contribution addressing the merits of the Panel's decision is presented by Calcagno and Falconieri (2014). The theoretical bargaining model presented by the authors, to which the analysis of the role of termination fees is an extension, includes an unsolicited bidder with the outside option to

initiate a tender offer and a target board with the outside option to call for an auction. In this model, moderately low termination fee payments like the ones banned by the Panel are found to have a useful function of compensating the initial bidder for losing the takeover bid without reducing the target's bargaining power.

6.4. Hypotheses

6.4.1. Relationship with alternative commitments

Previous literature indicates that TTFPs do not represent the only deal protection device from the target's side. Coates and Subramanian (2000), for instance, exclude the deals with targets having a controlling shareholder from their sample as 'it is legal and advisable (and hence common) for an acquirer to obtain a binding agreement from the controlling shareholder to vote for (or tender into) the deal' (p. 7). As both TTFPs and shareholder commitments represent outcomes of the acquirer's negotiations with target's board and shareholders before the formal announcement of the bid, the literature records mixed findings consistent with these forms of commitments being either complements or equivalents. Jeon and Ligon (2011) find that deals including shareholder commitments also include a TTFP. In turn, Boone and Mulherin (2007) find that the fraction of the target's shares subject to commitments or owned by long-term affiliated bidders negatively influences the likelihood of including a TTFP. However, none of these studies account for the effect of the different conditions at which the shareholders' commitments cease to be binding on the TTFP's presence. In this section, a specific hypothesis is presented to examine this relationship.

The 'Irrevocable Undertakings' made to the bidder by the target shareholders have been a main feature of the takeover scene (Wright et al., 2007). These commitments are either binding or weakly binding agreements with existing shareholders to accept the acquirer's bid at the price offered.[92] The 'Letters of Intent', in turn, simply represent non-binding promises from the shareholders' side to accept the offer (The Panel on Takeovers and Mergers, 2011). Covering these forms of assurance in the dataset allows us to present the first contribution examining the relationship between the commitments the target shareholders make to accept the offer and the conditions at which these commitments expire on one hand and the presence of TTFPs on another.

The trade-off between the percentage of the target shares subject to binding commitments and the presence of TTFPs has been highlighted in the press following the Panel's decision. For instance, a report by the FoxWilliams Business Law firm indicates that after the ban, due to the inability to include a TTFP, the acquirers may request binding 'Irrevocable Undertakings' from a greater number of target shareholders (FoxWilliams, 2012). Along these

[92] The weakly binding commitments, unlike the binding ones, expire under specific pre-determined conditions.

lines, it is important to note that, while the commitments granted by a particular shareholder do not bind the remaining shareholders, the TTFP binds the entity company as a single decision-making unit.[93] Hence, when target shareholders with relatively high ownership stakes grant binding commitments, there is less of a need for the target's board to grant a TTFP that binds the entire company. Consequently, I hypothesise that there is a negative relationship between the percentage of target shares subject to binding commitments and the presence of a TTFP. Following this discussion, I test the following hypothesis H_{1a}: *The lower the percentage of target shares subject to binding commitments, the more likely the presence of a TTFP.*

Given the reduction in the portion of the target shares subject to binding commitments, a loyal target board should be hesitant to grant a TTFP unless the target shareholders express some sign of approval of the bid. By granting weakly binding commitments that cease to be binding in the presence of a competing bid that exceeds the current one by a specific percentage, or by simply offering non-binding promises to the acquiring firm, the target shareholders indicate that they approve the bid, at least in principle. Under such a condition, a loyal target board that highly values the overall wealth gains due to the acquisition would become more incentivized to grant a TTFP when requested by the acquiring firm. Along these lines, I test H_{1b}: *The higher the percentage of target shares subject to weakly binding and non-binding commitments, the more likely the presence of a TTFP.*

6.4.2. The merits of the Panel's decision

In addition to examining the overall difference between the premia in deals including a TTFP and the premia in deals not including such a provision, I present two hypotheses asserting that the granting of TTFPs does not hurt the target shareholders.

Mainly, the three types of acquirers -public operating, private operating and private equity firms- might have different capabilities to realise synergies from these deals. For instance, operating companies that are familiar with the target's business activities can be better equipped to integrate the target and exploit its resources to realise high synergies. Furthermore, public acquirers are relatively large and have access to substantial financing opportunities from the securities market. Such an aspect can make these acquirers more capable of realizing synergies, and possibly offer higher takeover premia, than privately listed acquirers.

If the inclusion of a TTFP allows the initiation and completion of takeover deals rather than reducing the bargaining power of the target shareholders, the premia in deals including

[93] As noted by Coates (2009), the granting of a TTFP by the target companies' boards does not usually require the approval of the shareholders.

these provisions should, at least, be as high as the premia in comparable deals announced by the same group of acquirers and not including these provisions. Hence, relative to comparable deals in which the acquirers are not compensated for any costs they incur if the deal is not consummated, deals with a TTFP are not supposed to have lower premia. Based on this discussion, I test H_2 as follows: *In each of the groups of deals announced by public operating, private operating and private equity acquirers, the premia in the deals including a TTFP are, at least, as high as the premia in comparable deals which do not include this provision.*

H_2 addresses the effect of TTFPs on the premia in deals announced by the same group of acquirers without examining whether the popular use of such provisions is associated with a particular type of acquirer approaching the target. For instance, private acquirers (operating and non-operating) that can walk away from the deal at a relatively lower cost than public acquirers can further improve their bargaining position with respect to the target's board by exploiting the standardised inclusion of a TTFP (Bargeron et al., 2008). Under such an arrangement, the target's board is not only facing a bidder than can easily walk away from the deal but also has to compensate this bidder if this board decides not to consummate the deal.[94] Therefore, complementing H_2, to stress that none of the groups of acquirers systematically exploit the standardised inclusion of a TTFP, I test H_3: *The likelihood of including a TTFP does not significantly differ among the deals announced by public operating, private operating and public equity acquirers.*

It is imperative to note that the rejection of H_3 by itself does not indicate that the target shareholders are disadvantaged by the inclusion of TTFP. Possibly, a particular group of acquirers, due the debt constraint characterising its deals (private equity) or the agency problems characterising its decision-making process (public firms), might systematically demand the inclusion a TTFP as a deal protection measure. However, the rejection of H_3 combined with the rejection of H_2 for any particular group of acquirers is a likely indicator of the exploitation of a market standard at the expense of the target shareholders.

6.5. Data

6.5.1. Initial dataset

The sample covers acquisitions announced between January 1st, 2002 and September 1st, 2011. The starting date is chosen mainly because the coverage of the acquisition announcements and the shareholder commitments in the InvestEgate website starts at 2002. The end date is chosen because no deals with a TTFP between this date and the Panel's ban were announced. The

[94] Unless she agrees on completing the deal with a relatively low premium.

acquisitions covered involve both UK and non-UK listed or privately owned (at the ultimate parent level) acquirers and UK listed targets. A deal to be retained in the sample needs to meet the following sample-selection criteria: (a) the deal value should exceed £1m, (b) the transaction's payment method should be available from the Securities Data Corporation (SDC) Thomson One database, (c) the deal needs to be friendly to satisfy the termination fees' practical requirement of a friendly target board, and (d) the takeover premia should be available and lower than 2, as in Officer (2003). To guarantee that all acquirers involved in the sampled deals share the same objective, the analysis is limited to only deals in which the acquirer aims to control 100% of the target shares. The acquirers are classified either as public operating, private operating or private equity acquirers. The latter group includes both privately listed firms and private equity divisions of public companies.[95] Following Fidrmuc et al. (2012), deals flagged by SDC as 'leveraged buyouts', 'acquirer is a financial sponsor' and 'acquirer is an investor group' are classified as private equity deals after screening the deal description. The public operating and private operating acquirers' deals, in turn, are transactions without the previously mentioned SDC flags and which have the ultimate parent classified as public and private, respectively. As a result, 541 deals end up in the sample. All the variables in the analysis are retrieved from SDC except the age of the target firm, and both target and acquiring firms' market-to-book value and price-to-earnings ratios, which are retrieved from Datastream. Moreover, the documents that cover the target shareholder commitments are retrieved from the InvetEgate Financial Press website.

A main source of deficiency in this dataset is that it does include uncompleted deals, deals with competing acquirers or deals announced by White Knight bidders. Recognising that such an aspect of the dataset prevents the examination of the role of TTFPs in influencing the likelihood of deal completion and the presence of a competing bid, I present my results within the context of the results discussed in Section 6.2.[96]

6.5.2. Understatement of the presence of TTFPs

A consensus has emerged in recent literature that SDC underreports the presence of TTFPs. For instance, Boone and Mulherin (2007) report that 25% of the deals in their sample recorded by SDC as not including a TTFP do actually include such a provision. In addition, André, Khalil, and Magnan (2007) find in their Canadian acquisitions sample that 70% of the deals recorded by

[95] The findings remain qualitatively similar if I analyse separately the acquisitions by privately listed private equity firms and the acquisitions by the divisions of public companies specialising in private equity activities.

[96] The absence of deals with competing bids due to the restrictions imposed on the dataset does not necessarily reflect the lack of competition in the market for corporate control. Such a result is not surprising. For instance, Betton, Eckbo, and Thorburn (2008) impose a weaker restriction that the acquirer wants to control more than 50% of the target shares following the transaction. The authors also allow the inclusion of hostile bids. They find that more than 90% of the bids in their US sample are single-bid transactions.

SDC as not including such a provision did in fact include one. Along the same lines, Jeon and Ligon (2011) report that more than 10% of the deals in their US sample which were reported by SDC as not including a TTFP did actually include one.

After screening the acquisition announcements in the UK sample, similar patterns are detected for not only the target-related but also the acquirer-related termination fee provisions. In the sample of 541 acquisitions covered in this study, while SDC reports that 151 deals (27.91%) include a TTFP, the number of deals which did include such a provision is 287 (53.04%). Hence, 34.87% of the deals recorded as not including a TTFP actually included one. Likewise, while SDC reports that 23 deals (4.25%) include an Acquirer Termination Fee Provision, I find that 34 deals (6.28%) include such an agreement.[97]

6.5.3. Univariate analysis of the premium

I estimate the premium (PREM) offered to target shareholders by dividing the deal value by the target firm's market value of equity 43 days prior to the announcement of the deal, and subtracting 1 from the result, as in Officer (2003).[98] While Officer (2003) excludes from his analysis deals with premia that lie outside the 0 to 2 range, the exclusion of deals with negative premia from the analysis reduces the sample significantly, especially in the period following the recent financial crisis.[99] As a result, while the findings remain qualitatively similar with, and without, the exclusion suggested by Officer (2003), the final analysis is conducted by including deals that also experience negative premia. I further introduce an alternative estimate of premium, PREMADJ, which accounts for the variation in the premia across different sectors. In particular, this estimate represents the difference between the premium offered and the average premium level in the target's sector.

Table 6.2 presents the means and medians of the two measures of premium, PREM and PREMADJ, for the entire sample while it further explores the premium within different subsamples based on deal characteristics. These premium measures are represented for the deals in each sample in addition to the groups of deals including, and not including, a TTFP. The mean (median) level of premium, PREM, in my sample is 35% (31.66%) with the premia in all the subsamples being positive and highly significant (at the 1% level). As expected, based on the sector-adjusted measure, PREMADJ, the means (medians) of the premia are considerably lower than the non-industry adjusted ones. In addition, these premia become statistically insignificant on the average level for the entire sample (ALL), and for each of the subsets: domestic

[97] This dataset is available from the authors upon request.

[98] Alexandridis, Fuller, Terhaar, and Travlos (2013) calculate the premium by using the market value of the target 30 days prior to the acquisition's announcement day. I follow the same method and reach the same qualitative conclusions in alternative estimations.

[99] 48 out of the 111 deals that are associated with negative premium are announced between August 2007 and December 2009, representing 17.69% of the deals announced during that period.

acquisitions (DOMACQ), acquisitions by foreign acquirers (CBACQ), industry-focused (FCSD), industry-diversifying (DVRD) and private equity deals (PRIVEQ).

I note the interesting observation that, for the group of deals including a TTFP, PREMADJ is not significantly negative either within the full sample (ALL) or any of the subsamples. However, the deals not including a TTFP include significant negative premia on the full sample (ALL) as well as the subsample of diversifying acquisitions (DVRD) at the 10% level, deals with domestic acquirers (DOMACQ) at the 5% level and the deals announced by private acquirers (PRIVACQ) at the 1% level.

The results related to the size, sign and significance of the difference between the premia in deals including a TTFP and the premia in deals not including this provision give strong support to the notion that the inclusion of such provisions does not negatively influence the target shareholders' wealth. In particular, deals including a TTFP have significantly higher sector-adjusted premia than deals not including this provision at both the mean and median levels, except those acquisitions by public acquirers in which the significant difference is limited to the median. Furthermore, the difference in the sector-adjusted premium (PREMADJ) is insignificant in deals announced by private equity acquirers and cross-border transactions. The differences in premia are close to or exceed 10% which is substantially higher than the 1% cap for TTFP. Such a result provides an early indication that the granting of a TTFP, while possibly having some effect on the increase in the premia, facilitates the completion of deals with acquirers that are already willing to pay high premia.

Another interesting observation that is recorded in Table 6.2 is related to the difference in premium (PREM) at the median level between deals with a TTFP and deals without a TTFP announced by private equity acquirers. The negative and highly significant difference (-0.92%) with a level close to the 1% cap raises concerns that the standardised inclusion of a TTFP comes at the expense of the premium received by the target shareholders in private equity deals. However, despite increasing in magnitude, this difference becomes less significant when the comparison is based on the sector-adjusted premium (PREMADJ). Overall, despite providing strong initial evidence that the inclusion of a TTFP is not detrimental to the target shareholders, the results of the univariate analysis need to be complemented by the results of multivariate and matching analyses comparing deals with close characteristics in order to provide an accurate assessment of the role of TTFPs.

Table 6.2: Univariate analysis of the premia

		PREM			PREMADJ			PREM	PREMADJ
		ALL	TARGTERM	NOTARGTERM	ALL	TARGTERM	NOTARGTERM	TARGTERM vs. NOTARGTERM	TARGTERM vs. NOTARGTERM
ALL	Mean	35.00***	41.30***	27.88***	0.41	5.98***	-5.88*	13.42***	11.87***
	Median	31.66***	36.18***	26.15***	-3.84	1.97	-9.54***	10.02***	11.52***
	N	541	287	254					
DOMACQ	Mean	32.78***	39.44***	24.81***	-1.18	4.67*	-8.21**	14.63***	12.88***
	Median	30.01***	33.36***	24.72***	-6.46*	-0.83	-13.07***	8.64***	12.24***
	N	400	218	182					
CBACQ	Mean	41.29***	47.19***	35.64***	4.95	10.14**	-0.01	11.54	10.16
	Median	37.05***	45.87***	32.15***	4.39	8.67*	-0.82***	13.71**	9.49
	N	141	69	72					
FCSD	Mean	36.33***	43.01***	29.18***	1.16	6.81*	-4.89	13.82**	11.70*
	Median	32.38***	37.53***	26.06***	-3.90	3.81	-8.09	11.46***	11.90**
	N	203	105	98					
DVRD	Mean	34.20***	40.32***	27.06***	-0.03	5.51**	-6.51*	13.25***	12.02***
	Median	31.48***	34.88***	26.68***	-3.12	1.77	-10.85**	8.19***	12.62***
	N	338	182	156					
PRIVACQ	Mean	24.99***	34.30***	14.72***	-7.56*	1.21	-17.27***	19.58***	18.48***
	Median	21.86***	28.29***	11.14***	-12.76**	-7.35	-20.08***	17.14***	12.73***
	N	202	106	96					
PUBACQ	Mean	40.97***	45.41***	35.88***	5.16*	8.78***	1.02	9.53**	7.75
	Median	35.97***	37.80***	32.49***	0.29	4.82**	-4.68	5.30**	9.50**
	N	339	181	158					
PRIVEQ	Mean	32.19***	33.55***	30.29***	-0.77	0.61	-2.72	3.26	3.33
	Median	27.85***	27.85***	28.77***	-5.19	-6.78	-1.13	-0.92***	-5.65
	N	139	81	58					

Note: This table documents the premium paid to UK public target shareholders in different groups of transactions. Two measures of the premium, PREM and PREMADJ, are reported for the total number of transactions (ALL), transactions classified based on the acquirer's domicile (domestic acquirers (DOMACQ) and cross-border acquirers (CBACQ)), industry relatedness based on the two-digit SIC code (focused (FCSD) and diversifying (DVRD)), the listing status of the acquirer at the ultimate parent level (a public acquirer (PUBACQ) or a private one (PRIVACQ)), and acquisitions classified as private equity deals (PRIVEQ). For each group, the mean and median premia in addition to the total number of deals, deals including TTFP and deals not including such provisions are presented. The table also presents the difference between the premia in deals including TTFP and the premia in deals not including a TTFP. The significance based on the t-test with the null hypothesis that the premium is equal to 0 is reported next to the means. The significance of the Wilcoxon Rank Sum test with the null hypothesis that the median is equal to 0 is reported next to the medians. Next to the differences in means, the significance of the t-test with the null hypothesis that the difference in means is equal to 0 is reported. Next to the differences in medians, the significance based on the Wilcoxon Rank Sum test with the null hypothesis that the two populations whose sample median differences are presented have the same continuous distribution is presented. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

6.5.4. Data on shareholders' commitments

As a result of screening the acquisition announcements collected from the InvestEgate Financial Press website, I have managed to retrieve 164 deals (30.31% of the full sample) that include full details about the commitments made by the target shareholders and the specific conditions at which these commitments cease to be binding. Out of the 164 deals, 107 include a TTFP while 57 deals do not include such provisions. An interesting aspect of this dataset is that it covers all 34 deals which include an Acquirer Termination Fee Provision. Such a finding indicates that these provisions are granted by the acquirer as part of the negotiation in which she aims to receive commitments to accept the offer from the target shareholders.

6.5.5. Descriptive statistics

Table 6.3 contains descriptive statistics for the main continuous variables employed in the analysis. Stressing that toeholds and TTFPs represent equivalent measures for compensating the acquirer in the event of the potential loss of the deal (Bates and Lemmon, 2003; Officer, 2003), the percentage of target shares owned by the acquirer (PERCHELD) is significantly lower in deals with a TTFP compared to deals without a TTFP (1.3% vs. 6.98%). Furthermore, while the targets in deals with TTFP exceed the targets in deals without a TTFP in market value by £104.43m, neither this difference nor the differences in the targets' market-to-book values (TARGMTBV), age (TARGAGE), and price-equity ratios (TARGPE) between the two groups of deals are statically different. Also, contrary to the conclusions of Officer (2003) and Bates and Lemmon (2003), the deals without TTFP are found to have a higher percentage of their total considerations financed by the acquirer's securities (STOCK_PERC) than deals with a TTFP (23.61% vs. 15.83%). An interpretation of this result is discussed by Coates and Subramanian (2000) who suggest that the acquirers not using common equity as a financing method are eager to complete the deal and, consequently, are more likely to request the inclusion of a TTFP.

Shifting the focus to the commitments granted by the target shareholders, Table 6.3 depicts some interesting patterns. In particular, while there is no significant difference in the overall percentage of target shares subject to commitments (BIND + WEAK_BIND + NON_BIND) between deals with TTFP and deals without such provisions, the former group has a significantly lower percentage of the target shares subject to binding commitments (BIND) than the latter (15.65 vs. 27.81). However, deals with a TTFP include a significantly higher percentage of target shares subject to weakly binding (WEAK_BIND) than deals without such a provision (16.63 vs. 10.47) a level of non-binding (NON_BIND) commitments that is not statistically different than these deals. While such findings give initial support for H_{1a} and the first part of H_{1b}, they need to be validated in a multivariate context.

Table 6.3: The continuous covariates and the presence of a TTFP

Variable	*N*	No. of Deals with a TTFP	No. of deals without a TTFP	Mean of variable in deals with a TTFP	Mean of variable in deals without a TTFP	Differentials
PERCHELD	541	287	254	1.30	6.98	-5.67***
STOCK_PERC	541	287	254	15.83	23.61	-7.78**
TARGMV	541	287	254	474.95	370.52	104.43
TARGAGE	541	284	254	4551	5078	527
TARGMTBV	347	198	149	3.30	2.31	0.98
TARGPE	347	198	149	37.35	54.91	-17.55
BIND	164	107	57	15.65	27.81	-12.16***
WEAK_BIND	164	107	57	16.63	10.47	6.16**
NON_BIND	164	107	57	3.48	3.21	0.26

Note: This table represents for each continuous covariate employed in the analysis: the size *N* of the sample in which it is available, the number of deals with and without a TTFP in this sample, the mean value of this covariate in the group of deals including a TTFP, its mean value in the group of deals not including a TTFP, the difference between these two mean values and its significance based on the null hypothesis that this difference is equal to 0 using the *t*-test. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

6.6. Results and Discussion

6.6.1. Logistic models

Table 6.4 presents the determinants of the likelihood of TTFP's inclusion based on Logistic models with the dependent variable TARGTERM being assigned the value of 1 in the presence of a TTFP and 0 otherwise. Model 1 presents the determinants of this presence on the full sample (541 observations) employed in the analysis while the estimations in Model 2 are based on the sample for which the target's market-to-book value (TARGMTBV) and price-earnings ratio (TARGPE) are available in Datastream. Consistent with the results of the descriptive statistics, the likelihood of a TTFP inclusion decreases with the increase in the percentage of the consideration financed by stock (STOCK_PERC) and the percentage of target firm's shares which are already owned by the acquirer (PERCHELD). However, none of the target's characteristics (the natural logarithm of the target's market value ln(TARGMV), the market-to-book value (TARGMTBV) or price-earnings ratio (TARGPE)) are found to have a significant impact on influencing the likelihood of the presence of a TTFP.

Table 6.4: Predicting the presence of a TTFP and the variation in the target's shares subject to commitments

Dependent Variable	TARGTERM=1 NOTARGTERM=0	TARGTERM=1 NOTARGTERM=0	TARGTERM=1 NOTARGTERM=0	TARGTERM=1 NOTARGTERM=0	TARGTERM=1 NOTARGTERM=0	TARGTERM=1 NOTARGTERM=0
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.163	0.554	2.120	0.902	-0.433	0.096
	(0.560)	(0.399)	(0.162)	(0.612)	(0.668)	(0.556)
STOCK_PERC	-0.009***	-0.010***	-0.009	-0.007	-0.005	-0.007
	(0.002)	(0.003)	(0.006)	(0.006)	(0.005)	(0.005)
ln(TARGMV)	0.073	-0.031	0.152	0.069	0.197	0.131
	(0.056)	(0.075)	(0.137)	(0.126)	(0.133)	(0.119)
PERCHELD	-0.060***	-0.066***	-0.079***	-0.076***	-0.056***	-0.065***
	(0.014)	(0.015)	(0.027)	(0.024)	(0.022)	(0.022)
PRIVACQ	0.120	0.315	0.437	0.160	0.173	0.101
	(0.256)	(0.327)	(0.523)	(0.500)	(0.534)	(0.509)
PRIVEQ	0.055	-0.030	0.082	0.041	-0.052	-0.022
	(0.267)	(0.344)	(0.576)	(0.569)	(0.573)	(0.566)
CBACQ	-0.216	-0.499*	0.505	0.264	0.390	0.411
	(0.216)	(0.279)	(0.507)	(0.475)	(0.463)	(0.451)
DVRD	-0.077	-0.160	-0.384	-0.231	-0.173	-0.138
	(0.206)	(0.267)	(0.394)	(0.392)	(0.383)	(0.386)
SCHEME	0.605***	0.621**	1.294***	1.035**	1.062***	1.077***
	(0.216)	(0.270)	(0.493)	(0.45)	(0.447)	(0.452)
ACQTERM	1.490***	1.586**				
	(0.520)	(0.641)				
TARGMTBV		0.019				
		(0.023)				
TARGPE		-0.0002				
		(0.0005)				
BIND+WEAK_BIND+NON_BIND			-0.011			
			(0.009)			
BIND				-0.021***		
				(0.007)		
WEAK_BIND					0.019*	
					(0.011)	
NON_BIND						0.005
						(0.024)
INDUSTRY and YEAR EFFECTS	YES	NO	YES	NO	NO	NO
N	541	347	164	164	164	164
McFadden R-squared	0.12	0.11	0.17	0.11	0.14	0.10
Prob (LR statistic)	0.00	0.00	0.01	0.00	0.00	0.00

Note: This table presents the output of 6 Logistic regressions highlighting the factors influencing the inclusion of a TTFP (TARGTERM) in the deals. The McFadden R-squared is reported to highlight the goodness of fit of the Logistic regressions. Standard errors are reported within parentheses. The *p*-values from the LR test with the restriction that all the Logistic model coefficients are jointly equal to 0 are reported. Variables not included in the table were included in alternative specifications and were not found to have significant effects. Also, the variables representing yearly time effects are found to have insignificant effects. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

Moreover, consistent with previous research, the presence of an Acquirer Termination Fee Provision (ACQTERM) is a positive contributor to the presence of a TTFP indicating that both provisions are part of reciprocal agreements. The use of the Scheme of Arrangement (SCHEME), in turn, increases the likelihood of a TTFP presence as this court-administered method to conduct the deal requires the cooperation of the target's board and might necessitate extended time to be completed, leaving the door open for competing offers. In Chapter Five, the presence of a TTFP was presented as a key predictor of the Scheme's use. In this chapter, I expand this argument by emphasising the reciprocal aspect of the relationship between these two arrangements. In particular, as both the Scheme and the TTFP are used by acquirers that aim to guarantee the deal's completion, an acquirer that uses the scheme is also likely to demand the inclusion of a TTFP. Likewise, once an acquirer manages to receive a TTFP, she is likely to proceed with the Scheme further ensure the acquisition's completion. Appendix 5 gives further support to the complementary aspect of the relationship between these two

arrangements. In particular, with the choice of various exclusion restrictions, the positive and significant effect of the Scheme on the choice of the TTFP and the positive effect of the TTFP presence in making the use of the Scheme more likely persists.

Furthermore, despite the asymmetric information which unusually characterises diversifying (DVRD) deals and acquisitions by foreign acquirers (CBACQ) (Kohers and Ang, 2000) which might increase the likelihood of TTFP's use as a deal protection measure, I find weak evidence in Model 2 that the presence of a foreign acquirer reduces the likelihood of a TTFP being used while the effect of diversifying acquisitions is insignificant in all the specifications reported.

With the inclusion of intercepts in the models, the insignificance of the coefficients associated with the dummy variables referring, respectively, to the presence of a private acquirer (PRIVACQ) and the presence of a private equity acquirer (PRIVEQ) lead to the non-rejection of H_3. Specifically, the likelihood of a TTFP being included does not systematically differ among private and public acquirers whether operating or private equity firms are involved.

While the total percentage of target shares subject to commitments (BIND + WEAK_BIND + NON_BIND) does not influence the likelihood of a TTFP being used in Model 3 (Table 6.4), the results in Model 4 are in line with H_{1a}. In turn, the results in Model 5 indicate that the increase in the portion of the target shares subject to weakly binding commitments is associated with an increase in the likelihood of TTFP presence, which lends support to the first part of H_{1b}. However, Model 6 indicates that non-binding promises do not influence the likelihood of TTFP presence, as evidenced by the insignificant impact of NON_BIND, which is not in line with the second part of H_{1b}. Hence, in absence of binding commitments, the target boards remain hesitant to grant TTFPs unless the holders of a relatively high number of target shares signal that they accept the bid, at least in principle, by making commitments that bind them to some extent. Thus, rather than highlighting overall tradeoff or complementary relationships between the overall portion of the target shares subject to commitments and TTFPs by treating the shareholder commitments as a homogenous group, my results lend support to the notion that the heterogeneity in the types of commitments granted by the target shareholders is a critical factor that influences the target board's decision to grant a TTFP.

6.6.2. Initial parametric analysis

I examine the influence of the presence of a TTFP on the premium and the shareholders' announcement period returns in Table 6.5. PREM and PREMADJ are employed as dependent variables in Models 1, 2 and 3. In turn, the three-day (-1, 1) Cumulative Abnormal Returns (CARTHREE) earned by the target shareholders, estimated as the sum of the differences

between the target's daily stock returns and the FT-ALL Share index returns over the three day window surrounding the announcement, is employed as the dependent variable in Models 4, 5 and 6. The coefficient associated with the presence of a TTFP (TARGTERM) in all the specified models is insignificant. Such results indicate that the use of a TTFP, while not necessarily benefiting the target shareholders, does not reduce the overall gains they realise from takeover deals. In addition, the estimated effect of TARGTERM on CARTHREE in Model 4 (2.25%) is reduced to (1.34%) in Model 5 once I control for the effect of the sector-adjusted premium (PREMADJ) on the market reaction.[100]

Table 6.5: Multivariate analysis of the variation in the premia and the market's reaction

Dependent Variable	PREM	PREMADJ	PREMADJ	CARTHREE	CARTHREE	CARTHREE
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.532***	0.158***	0.230***	0.178***	0.151***	0.209***
	(0.061)	(0.061)	(0.081)	(0.053)	(0.049)	(0.054)
TARGTERM	0.045	0.032	-0.029	0.022	0.013	0.034
	(0.037)	(0.037)	(0.040)	(0.021)	(0.019)	(0.024)
STOCK_PERC	-0.002***	-0.002***	-0.001	-0.001***	-0.001***	-0.001***
	(0.0006)	(0.0006)	(0.0008)	(0.0002)	(0.0002)	(0.0003)
ln(TARGMV)	-0.033***	-0.026***	-0.032***	-0.018***	-0.010*	-0.016**
	(0.009)	(0.009)	(0.012)	(0.006)	(0.006)	(0.008)
ACQTERM	0.0009	-0.003	-0.012	0.004	0.004	-0.039
	(0.064)	(0.062)	(0.074)	(0.037)	(0.032)	(0.042)
PERCHELD	-0.015***	-0.013***	-0.015***	-0.0003	0.003***	0.0003
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
PRIVACQ	-0.165***	-0.136***	-0.084	-0.032	0.001	-0.029
	(0.047)	(0.047)	(0.055)	(0.028)	(0.027)	(0.033)
PRIVEQ	0.051	0.049	0.025	-0.040	-0.051*	-0.028
	(0.049)	(0.049)	(0.053)	(0.027)	(0.026)	(0.031)
CBACQ	0.135***	0.105***	0.087*	0.038	0.011	0.038
	(0.042)	(0.041)	(0.052)	(0.025)	(0.023)	(0.030)
DVRD	-0.004	-0.006	-0.003	-0.026	-0.025	-0.0006
	(0.040)	(0.040)	(0.048)	(0.023)	(0.022)	(0.026)
SCHEME	0.040	0.047	0.026	0.053**	0.043**	0.044
	(0.038)	(0.039)	(0.044)	(0.024)	(0.022)	(0.027)
POST_2008	0.085**	0.067*	0.090**	0.063***	0.045**	0.092***
	(0.039)	(0.038)	(0.043)	(0.024)	(0.021)	(0.029)
TARGMTBV			5.78E-05			-0.0006
			(0.0017)			(0.001)
TARGPE			0.000135**			6.00E-05
			(6.70E-05)			(5.11E-05)
INDUSTRY EFFECTS	NO	-	-	NO	YES	YES
N	541	541	347	541	541	347
Adjusted R-squared	0.19	0.15	0.16	0.11	0.24	0.11
Prob (*F*-test)	0.00	0.00	0.00	0.00	0.00	0.00

Note: This table presents the output of 3 regressions highlighting the factors influencing the variation in the premium received by the target shareholders. The premium measures employed are PREM and PREMADJ. The table also presents the output of 3 regressions examining the variation in the target company's three-day (-1,1) CAR (CARTHREE). The adjusted R-squared is reported to highlight the models' goodness of fit. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. The *p*-values from the *F*-test with the restriction that all the model coefficients are jointly equal to 0 are reported. Variables not included in the table were included in alternative specifications and were not found to have significant effects.***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

[100] In Table 6.4, I also control for industry effects and the time effect representing acquisitions announced during or after the year 2008 (POST_2008). Among the various time effects examined in alternative specifications, this time effect is the only significant one.

6.6.3. Propensity Score Matching

To test H_2, I rely on Propensity Score Matching (PSM) to create matched samples of comparable deals within the overall sample as well as the group of deals announced by private equity acquirers (PRIVEQ), the group of deals announced by private (PRIVACQ) operating (NOPRIVEQ) acquirers, and the group of deals announced by public (PUBACQ) operating (NOPRIVEQ) acquirers.

The control observations in these samples are deals not including a TTFP but which would be likely to include this provision, as represented by the propensity scores estimated by Logistic models. I estimate on these matched samples the Average Treatment Effect on the Treated (*ATT*) (Guo and Fraser, 2010) using the sector-adjusted premium (PREMADJ) as the outcome variable:[101]

$$ATT = \frac{\sum_{i:TARGTERM=1}\{PREMADJ_i(TARGTERM_i) - PREMADJ_i(NOTARGTERM_i)\}}{N_1}$$

$$= \frac{\sum_{i=1}^{N}\left\{\left(TARGTERM_i - (1 - TARGTERM_i)\frac{K_M(i)}{M}\right)PREMADJ_i\right\}}{N_1}$$

with N representing the number of deals in the matched sample, N_1 representing the number of deals including a TTFP in this matched sample, $PREMADJ_i(TARGTERM_i)$representing the observed sector-adjusted premium for target i when such provisions are included and $PREMADJ_i(NOTARGTERM_i)$ representing the outcome in the absence of this provision. Hence, $PREMADJ_i(NOTARGTERM_i)$ represents the counterfactual outcome for a treated unit $i$that receives the treatment. This counterfactual outcome is represented by the premium in deals with no TTFP in the matched sample while allowing each one of these deals to be used more than once as a control unit. M represents the number of control units matched to each treated one and is limited to 1 in this study. $K_M(i)$ represents the number of times unit i is used as a match, given that matching is done with replacement. For each group of deals, the models used to estimate the propensity scores are the ones that balance not only these scores on the matched samples but also the main covariates employed in the analysis.

Table 6.6 (Panel A) presents the results of the four matching exercises conducted based on the 1:1 Nearest Neighbour (NN) matching algorithm and Caliper Matching (CM). Among the different possible specifications for each of the Logistic models employed in these exercises, I choose the specifications that include the covariates that significantly influence the presence of a TTFP. As for the remaining main covariates, their presence in the Logistic model is dependent on whether they end up being balanced between the treated and control groups on the resulting matched sample. As matching is pursued with replacement, the *ATT* estimates in which

[101] The matching analysis results with PREM as the outcome variable are qualitatively similar but, emphasising the relevance of sector-related characteristics, the results are more sensitive to the effect of a missing covariate.

particular control observations, closer to the treated one in terms of propensity scores, are given larger weights than others indicate an insignificant treatment effect.

Table 6.6: Results of the matching analysis

Panel A

Sample	ALL	PRIVEQ	NOPRIVEQ AND PRIVACQ	NOPRIVEQ AND PUBACQ
Matching Algorithm	NN	CM	NN	NN
Caliper	-	0.05	-	0.01
Control Observations per Treated Observation	1:1	1:1	1:1	1:1
Number of deals with TTFP	287	68	38	109
Number of deals without TTFP	124	31	20	68
PREMADJ of Deals with TTFP (%)	5.98*	1.77	3.306	9.65***
PREMADJ of Deals without TTFP (%)	-0.82	-3.04	-19.61**	5.91
KS before Matching (*p*-value)	0.00	0.00	0.00	0.00
KS after Matching (*p*-value)	0.99	0.99	0.99	0.99
ATT (%) (Abadie and Imbens (2006)	3.08	2.75	27.74**	-0.02
Standard Errors))	(4.83)	(8.51)	(12.55)	(3.77)
HL Estimate (%) at Γ=1	0.00	-3.12	28.17	2.84
Cut-off Γ value (p≈0.05)	1.21	1.73	1.62	1.47
HL Estimate at the Upper Bound (%) (p≈0.05)	4.66	9.88	46.17	9.14
HL Estimate at the Lower Bound (%) (p≈0.05)	-4.43	-15.91	15.67	-7.15
Cut-off Γ value (p≈0.10)	1.16	1.58	1.82	1.35
HL Estimate at the Upper Bound (%) (p≈0.10)	3.69	7.78	50.87	7.24
HL Estimate at the Lower Bound (%) (p≈0.10)	-3.43	-13.01	13.07	-5.42

Panel B

	Before Matching				After Matching			
	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value	Treatment Group	Control Group	Abs StdMean Difference	*p*-value
PROP_SCORE	0.59	0.45	94.63	0.00	0.59	0.59	-0.01	0.99
ln(TARGMV)	4.34	3.78	30.91	0.00	4.34	4.40	3.29	0.68
PERCHELD	1.30	6.97	99.91	0.00	1.30	1.698	6.87	0.17
POST_2008	0.34	0.33	2.88	0.73	0.34	0.34	0.42	0.95
DVRD	0.63	0.61	4.13	0.63	0.63	0.62	1.14	0.88
CBACQ	0.24	0.28	10.00	0.25	0.24	0.22	4.68	0.55
PRIVEQ	0.28	0.22	11.95	0.15	0.28	0.24	8.37	0.22
STOCK_PERC	15.83	23.62	22.95	0.02	15.83	12.36	10.25	0.10
PRIVACQ	0.37	0.37	1.78	0.83	0.37	0.39	4.62	0.54
ACQTERM	0.09	0.02	24.87	0.00	0.09	0.07	8.20	0.00
SCHEME	0.44	0.27	32.75	0.00	0.44	0.48	8.40	0.08

Panel C

	Before Matching				After Matching			
	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value	Treatment Group	Control Group	Abs Std Mean Difference	*p*-value
PROP_SCORE	0.64	0.49	129.2	0.00	0.66	0.66	0.57	0.26
ln(TARGMV)	4.61	3.92	42.15	0.03	4.68	4.64	2.72	0.79
PERCHELD	1.44	7.40	103.32	0.00	0.84	0.39	10.49	0.42
POST_2008	0.25	0.32	15.49	0.38	0.23	0.18	12.04	0.35
CBACQ	0.13	0.17	10.62	0.56	0.13	0.13	0.00	0.99
STOCK_PERC	0.62	7.43	120.11	0.04	0.00	1.12	0.00	0.31
ACQTERM	0.01	0.00	11.11	0.32	0.01	0.00	12.12	0.36
SCHEME	0.51	0.32	37.97	0.02	0.54	0.36	36.63	0.03

Note: Panel A reports the results of the PSM analysis based on Logistic models in which the dependent variable is the dichotomous variable TARGTERM taking the value of 1 if a target termination fee is included in the deal and 0 otherwise. The four reported matching exercises are applied respectively on the full sample used in this study, the sample of deals classified as private equity transactions, the sample of deals classified as non-private equity transactions and announced by private acquirers, and the sample of deals classified as non-private equity transactions and announced by public acquirers. The results of the first matching exercise are based on a Logistic model in which the independent variables are PERCHELD, SCHEME, DVRD, STOCK_PERC, ACQTERM, PRIVACQ, PRIVEQ, CBA and ln(TARGMV). The results of the second matching exercises are based on a Logistic model in which the independent variables are PERCHELD, POST_2008, STOCK_PERC, and ln(TARGMV). The results of the third matching exercise are based on a Logistic model in which the independent variables are PERCHELD, CBACQ and ln(TARGMV). The results of the fourth matching exercise are based on a Logistic model with the independent covariates PERCHELD, STOCK_PERC, POST_2008, CBACQ and ln(TARGMV). The Panel also reports the number of control observations matched per treated observation, the number of deals including and not including TTFP in the resulting matched sample, the mean of PREMADJ for both the treated and the control group in the matched sample in addition to the *p*-value from the Kolmogorov-Smirnov test with the null hypothesis that the propensity scores (PORP_SCORE) estimated from the Logistic model have the same distribution in the treated and control groups before and after the matching. The panel also reported *ATT* with the standard error (in parentheses) estimated following Abadie and Imbens (2006), the HL estimate at $\Gamma = 1$, the cutoff value of Γ at which the initial inference starts to change qualitatively with the corresponding *p*-value of 5% as well as the value of the HL estimates at the upper and lower bounds established by Γ, the cutoff value of Γ at which the initial inference starts to change qualitatively with the corresponding *p*-value of 10% and the value of the HL estimates at the upper and lower bounds established by Γ. Panels B and C, based on the first and second matching exercises respectively, report the means of the propensity scores and each main covariate in the groups of deals including and not including target termination fees before and after the matching, the *p*-value from the *t*-test associated with the null hypothesis of no statistical difference between these means before and after matching, and the Absolute Standardized Mean Difference defined as the absolute difference between the means of the covariate in each of the two groups divided by the square root of the mean of the variable's variances in both groups.***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

For deals announced by private equity acquirers as well as the deals announced by public operating acquirers, the insignificant *ATT* indicates that those acquirers do not benefit from the inclusion of a TTFP and therefore do not pay relatively low premia when this provision is granted. While the size of the termination fee payment relative to the deal value is capped (and standardized) at 1%, the high and significant *ATT* (27%) of the TTFP for deals by private operating acquirers is significantly high. Hence, I do not interpret my findings as evidence that the granting of relatively small target termination fee provisions necessarily fully causes an increase in the premium exceeding 27%. Rather, I argue that the targets in deals announced by private operating firms and including a TTFP are approached by acquirers that investigated the different aspects of the acquisitions and are willing to complete the deals by paying relatively high premia given the receipt of a form of deal protection like the TTFP.[102]

A potential explanation of the limitation of the TTFP's positive impact on the premia to the case of deals announced by private operating acquirers can be that, while public acquirers already pay significantly high premia in their deals, private acquirers do not often pay high premia due to the limitation of their resources. Furthermore, private operating acquirers might not have the access to the debt financing facilities as the case of private equity acquirers. Hence, private operating acquirers are more likely to proceed with their high-premium deals when they receive a deal protection measure like a TTFP.

Table 6.6 (Panels B and C) presents examples of the success of the matching exercises, the first and the second respectively, in balancing the main covariates in the analysis. In particular, the results of the Kolmogorov Smirnov (KS test) indicate that the distributions of propensity scores are not statistically different between the treated and control groups post-matching. The results of the *t*-tests and the reduction in the Absolute Standardized Mean Bias also confirm the balancing of the main covariates. However, whether the resulting conclusion is valid, given the presence of unobserved covariates influencing the likelihood of TTFP presence is a main concern.

The results reported in Table 6.6 (Panel A) also include outcomes of the Rosenbaum (2002) bounds analysis. For the overall sample (ALL), the results of this sensitivity analysis indicate that the resulting conclusion is sensitive to the effect of a missing covariate. In particular, a missing covariate needs to increase the relative odds of including a TTFP by 16% in order to have either a positive or negative *ATT* that is significant at the 10% level with corresponding HL estimates of (3.69%) and (-3.43%) at the upper and lower bound respectively. However, the conclusions of the remaining three matching exercises are far less

[102] On each matched sample, I run a regression in which the dependent variable is CARTHREE and the dependent variables are TARGTERM and PREMADJ. As expected, the effect of TARGTERM on CARTHREE remains insignificant in the presence of PREMADJ. Alternatively, under the assumption that premium is a determinant of TTFP presence, I estimate propensity score models while including PREMADJ as an independent covariate. Also as expected, the *ATT*s of the inclusion of a TTFP on CARTHREE in these exercises are insignificant.

sensitive to the effect of a missing covariate which highlights the relevance of comparing deals announced by the same acquirer. Specifically, a missing covariate needs to increase the relative odds of target termination fee presence by a factor ranging from 1.47 (for public operating companies) to 1.70 (private operating companies) to alter the qualitative conclusions at the 5% level. Such levels, for instance, are close to the 1.5 level presented by Peel and Makepeace (2012) as evidence of relatively insensitive conclusions in the analysis of the premia charged by accounting auditors.[103] They also exceed the level of 1.25 reported by Hujer, Caliendo, and Thomsen (2004) in their analysis of German job market schemes.

An economic interpretation of these findings within the context of this investigation is as follows: with $\Gamma=1.60$, for instance, a missing covariate needs to have the same effect on the odds of including TTFP as the effect of a decrease in the percentage of the deal value financed by stock by 47%. This effect is also equivalent to that of a decrease in the percentage of target shares already owned by the acquirer by 7% (in Table 6.4, Model 2) in altering the initial qualitative conclusion.[104] The fact that these variations are relatively high given the respective averages (standard deviations) of STOCK_PERC and PERCHELD (these are 19.49% (37.44%) and 3.97% (10.53%) respectively) further indicates that my conclusions are relatively insensitive to the effect of a missing covariate.[105]

Overall, these results show that the usually low-paying private acquirers are willing to pay significantly high premia when a TTFP is present. Hence, the inclusion of the TTFP, while not detrimental to the shareholders of targets acquired by public and private equity companies, actually has a beneficial effect for the shareholders of targets acquired by private firms. Hence, the results of both the parametric and non-parametric analyses suggest that, as reflected by the levels of premia eventually received by the target shareholders, the inclusion of TTFPs in acquisition deals does not reduce the bargaining power of these shareholders, as the Panel suggested. Consequently, I recommend that the Panel end its ban.

6.7. Conclusion

This is the first contribution examining the impact of the varying degrees by which the target shareholders' commitments to accept an acquisition are binding on the target board's decision to grant a TTFP in the UK market for corporate control. In particular, I document that this decision is not influenced by the overall percentage of target shares subject to commitments but

[103] For the matching exercises presented in the previous footnote, a missing covariate needs to increase the relative odds of TTFP presence in one of two matched deals by a factor exceeding the level of 1.7.
[104] Such an analysis follows from the increase of the natural logarithm of the likelihood a TTFP being present by ln(1.6)=0.47. See DiPrete and Gangl (2004) for a description of Rosenbaum (2002) sensitivity analysis interpretation.
[105] I also apply the matching analysis to the sample of deals covering the shareholder's commitments. The Logistic model used follows the same specification as Model 6 (Table 6.5). The results based on NN matching yield an insignificant *ATT* of 5.82%. However, the r level at which the treatment effect becomes significant at the 10% level is 1.02.

rather by the percentages of shares subject to binding commitments and weakly binding commitments. As a TTFP binds the entire company rather than particular groups of shareholders, my findings are consistent with the notion that the target's board grants such a provision when the shareholders are committed to accepting the offer but remain reluctant to grant binding promises. Accordingly, further analysis is required to examine the composition of the shareholders' commitments in the period following the ban to determine whether, as a substitute for TTFPs, the proportion of binding commitments has increased relative to the proportion of weakly binding commitments.

Additionally, in examining the empirical merits of the Panel's decision to ban the inclusion of a TTFP, this contribution provides strong evidence suggesting that the presence of such a provision does not harm the target shareholders. Specifically, after classifying the acquirers in the sample into public operating, private operating and public equity acquirers, my evidence suggests that the effect of the TTFP on the premium is not negative in the groups of comparable deals announced by each of these acquirers. In fact, this effect is positive and significant in the group of acquisitions announced by private operating firms. Furthermore, I combine my premium-related results with the finding that the likelihood of including a TTFP does not significantly differ among these three groups of acquirers to stress that none of these groups exploits the standard inclusion of this provision.

Overall, my empirical findings, combined with the previous literature's theoretical and empirical conclusions that highlight the harmless aspects of moderate and small termination fee payments, lead to a specific regulatory recommendation that the Panel reconsider its ban. Moreover, on the methodological front, my results highlight the relevance of estimating treatment effects on samples of comparable observations in order to draw accurate regulatory conclusions

Appendix 4 – Variables' Definitions

Variable (Acronym)	Description	Source
ACQTERM	Dummy=1 if the deal includes an acquirer termination fee agreement, 0 otherwise	SDC & InvestEgate
CARTHREE	The target's announcement period three-day (-1, 1) Cumulative Abnormal Returns	Datastream
CBACQ	Dummy=1 if the acquirer is a not UK firm, 0 otherwise	SDC
DOMACQ	Dummy=1 if the acquirer is a UK firm, 0 otherwise	SDC
DVRD	Dummy=1 if the acquirer and the target have different 2-digit SIC code, 0 otherwise	SDC
FCSD	Dummy=1 if the acquirer and the target have the same 2-digit SIC code, 0 otherwise	SDC
MOE	Dummy=1 if the deal is classified as a merger of equal, 0 otherwise	SDC
PERCHELD	The percentage of target shares owned by the acquiring firm before the announcement	SDC
POST_2008	Dummy=1 if the deal is announced in or after the year 2008, 0 otherwise	SDC
PREM	The ratio of the deal value to the acquirer's market valuation 43 days before the announcement minus one	SDC
PREMADJ	The difference between PREM and its average in the target's macro-industry during the period covered in the sample	SDC
PRIVACQ	Dummy=1 if the acquirer is a listed firm, 0 otherwise	SDC
PRIVEQ	Dummy=1 if the deal is classified as a private equity transaction, 0 otherwise	SDC
PROP_SCORE	The propensity score estimated by a Logistic model	See the description of Table 6.6
PUBACQ	Dummy=1 if the acquirer is a privately listed firm, 0 otherwise	SDC
SCHEME	Dummy=1 if the Scheme of Arrangement is used as a takeover method, 0 otherwise	SDC
STOCK_PERC	The percentage of the deal value that is financed with stock	SDC
TARGAGE	The number of days separating the announcement days from the date at which the target firms was listed in Datastream	Datastream
TARGMTBV	The target firm's market-to-book value 43 days before the deal's announcement	Datastream
TARGMV	The target firm's market valuation 43 days before the deal's announcement	SDC
TARGPE	The target firm's price-earnings value 43 days before the deal's announcement	Datastream
TARGTERM	Dummy=1 if the deal includes a target termination fee agreement, 0 otherwise [NOTARGTERM]	SDC & InvestEgate
BIND	The percentage of the target shares that are subject to fully binding commitments to accept the takeover bid	InvestEgate
WEAK_BIND	The percentage of the target shares that are subject to weakly binding commitments to accept the takeover bid i.e. commitments that expire under particular conditions	InvestEgate
NON_BIND	The percentage of the target shares that are subject to non-binding promises to accept the takeover bid	InvestEgate

Note: The variables used and their data sources are summarized in this table. SDC is Thomson-Reuters' SDC database; the adjusted termination fee-related variables are retrieved from the announcements in the InvestEgate financial press website; acquirer- and target-related financial variables are retrieved from Datastream.

Appendix 5 – The Simultaneous Relationship between the Scheme and the TTFP

In Chapter Five, the presence of a TTFP was a treated as an exogenous variable in predicting the use of the Scheme of Arrangement. Yet, in Chapter Six, the presence of a Scheme of Arrangement was treated as an exogenous variable in predicting the use of a TTFP. This appendix puts more emphasis on the endogenous relationship between the Scheme and TTFP. In particular, the results presented in the following table show that both variables are simultaneously determined, and therefore influence each other's presence through a simultaneous equations system. Following Maddala (1983), two Probit models, rather than Logistic ones, are estimated using pre-determined firm- and deal-related characteristics. Then, various restrictions are examined due to the absence of an apriori justification for a specific exclusion restriction.

Table 6.7: The simultaneous relationship between SCHEME and TARGTERM

Dependent Variable	TARGTERM=1 NOTARGTERM=0	SCHEME=1 NOSCHEME=0	TARGTERM=1 NOTARGTERM=0	SCHEME=1 NOSCHEME=0	TARGTERM=1 NOTARGTERM=0	SCHEME=1 NOSCHEME=0
Explanatory Variables\Model (.)	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.020	-0.1797***	-0.154	-0.859***	0.140	-1.653***
	(0.171)	(0.198)	(0.154)	(0.142)	(0.126)	(0.168)
STOCK_PERC	-0.004***	0.005***		0.004***	-0.005***	
	(0.001)	(0.001)		(0.001)	(0.001)	
ln(TARGMV)	0.065**	0.277***	0.042			0.265***
	(0.030)	(0.034)	(0.032)			0.032)
PERCHELD	-0.037***	-0.006	-0.035***	-0.007	-0.038***	
	(0.006)	(0.006)	(0.006)	(0.005)	(0.007)	
PRIVACQ	0.046	-0.060		-0.209	0.067	-0.179
	(0.149)	(0.159)		(0.151)	(0,131)	(0.147)
PRIVEQ	0.081	0.288*		0.445***		0.279*
	(0.157)	(0.165)		(0.156)		(0.160)
CBACQ	-0.123	-0.011	-0.127	0.199	-0.106	
	(0.134)	(0.138)	(0.132)	(0.130)	(0.132)	
DVRD	-0.008	0.220*	0.094	0.202*	-0.034	
	(0.125)	(0.133)	(0.117)	(0.127)	(0.125)	
ACQTERM	0.881***	0.186	0.717***		0.884***	
	(0.265)	(0.248)	(0.263)		(0.263)	
EST_SCHEME			0.314**		0.300**	
			(0.126)		(0,149)	
EST_TARGTERM				0.445***		0.333***
				(0.156)		(0.118)
N	541	541	541	541	541	541
McFadden R-squared	0.09	0.14	0.09	0.04	0.10	0.13
Prob (LR-test)	0.00	0.00	0.00	0.00	0.00	0.00

Note: This table presents the output of the simultaneous equations system that relates SCHEME and TARGTERM. The first two models represent the reduced-form equations and the remaining four models present the system with arbitrarily chosen restrictions. EST_SCHEME and EST_TARGTERM represent the fitted probabilities of the Scheme and TTFP presence, respectively, as estimated via the reduced-form equations. The McFadden R-squared is reported to highlight the goodness of fit of the Logistic regressions. Standard errors are reported within parentheses. The *p*-values from the LR test with the restriction that all the Logistic model coefficients are jointly equal to 0 are reported. Variables not included in the table were included in alternative specifications and were not found to have significant effects.. ***,**, and * represent significance at the 1%, 5% and 10% levels respectively.

The results which are presented in Table 6.7 are in line with the qualitative conclusions of the Logistic models reported in Chapters Five and Six. In particular, both the presence of the Scheme and the TTFP are jointly determined and simultaneously linked in a positive relationship. The stability of EST_SCHEME and EST_TARGETERM's coefficients' values with the two imposed restrictions, and the high significance of these coefficients, give further support to the reciprocal relationship between these two arrangements.

It is worth noting that the key results in Chapters Five and Six are not influenced by this simultaneous relationship. In particular, the main result of an insignificant *ATT* of the Scheme on the premium received by the target shareholders does not change if TARGTERM is excluded from the matching analysis. Likewise, excluding SCHEME from the models that predict the presence of TTFP does not alter the key result that the TTFP has an insignificant effect on the premium received by the target shareholders.

Concluding Remarks

The primary objective in this thesis was to improve the understanding of the determinants and wealth effects of earnout financing, the Scheme of Arrangement and termination fees in the UK takeover market. In the process, PSM was applied while emphasising its limitations and interpreting its results within the context of an appropriate sensitivity analysis. When appropriate, mainstream parametric analysis was also applied to the matched samples resulting from PSM. Each of the chapters in the thesis included a concluding section that discussed and analysed its empirical results. Therefore, the sole aim of this concluding chapter is to briefly describe these conclusions and their relevance to a future research agenda.

With respect to earnout financing, my findings indicate that earnout contracts, by addressing the relevant information asymmetry concerns, help the acquiring firms create additional wealth from private target M&A. However, what Chapter Three shows is that applied economists and merger consultants should be extremely careful when it comes to choosing the appropriate method to estimate the impact of particular contractual arrangements on shareholder wealth. Despite the growing popularity and non-parametric aspect of PSM, when the dataset employed is deficient, this method can yield inaccurate inferences. As this chapter indicates, PSM underestimates the statistical and the economic significance of the earnout's wealth effect when target-specific factors are omitted from the analysis. Along these lines, employing the relevant sensitivity analysis with PSM in order to quantify the effect that a missing covariate should have on the results reported, and consequently determining if 'selection on unobservables' is the main source of estimation bias, are relevant steps that offer critical guidance in evaluating wealth effects.

As an indicator of the earnout's ability to address the market's concerns about the acquirer's overpayment to the target, my findings indicate that increases in the premia are negatively interpreted by the market in non-earnout financed deals via a reduction in the acquirers' abnormal returns. This negative effect is neutralised in earnout financed deals. Furthermore, as discussed in Chapter Four, the target firms can receive relatively high premia following the satisfaction of the earnout's performance requirements. In particular, I quantify the relationship between the earnout contract's terms and the offered premium in the earnout financed deal. Along these lines, my results are consistent with the notion that larger relative earnout sizes and longer earnout periods are associated with an increase in the premium that the target's shareholders require in order to complete the deal. However, contrary to the previous conclusions of Kohers and

Ang (2000), despite offering relatively high premia to their targets, the UK acquiring firms are aware of the moral hazard/adverse selection ramifications of making relatively high immediate initial payments. As a result, these firms follow a rule of thumb whereby they make in earnout financed deals initial payments that are lower than, or equal to, the deal payments in comparable non-earnout financed transactions.

Chapter Five provides the first investigation of the frequent reliance on the Scheme of Arrangement in UK public target acquisitions. In addition to examining the influence of various firm- and deal-related factors on the probability of using the Scheme, I also estimate the wealth effects of this takeover method on both the acquiring and the target firms. I document that the tax benefits and guaranteed ownership aspects of the Scheme make its use more likely in complex deals that involve large targets, deals financed by securities, deals that include significant amounts of debt financing and transactions that include termination fee commitments made by the target company. With respect to the premia received by the target shareholders, despite the concerns raised by Payne (2011) about the limited protection offered to target shareholders under the Scheme, my robust parametric and matching-based results indicate that Scheme target shareholders receive premia that are at least as high as those received by the Offer target shareholders.

Regarding the Scheme's effect on the acquiring firm's shareholders, I demonstrate how the suboptimal use of the Scheme as a takeover method during the period that preceded its formal codification lead to a significant reduction in the acquirer's announcement period abnormal returns. Consequently, I put a strong emphasis on the relevance of adopting the appropriate takeover methods when conducting takeovers. I also emphasise the role of regulatory bodies in properly codifying the use of such methods as, otherwise, the regulatory and legal complications that the merging firms will face could significantly reduce the gains from the mergers.

Chapter Six provides the first detailed analysis of determinants and wealth effects of termination fees in the UK market for corporate control. The evidence presented in this chapter suggests that termination fees are granted by the target's board to facilitate the deal's completion when the target's shareholders are reluctant to grant binding commitments, and instead make weakly binding commitments to accept the takeover bid. Moreover, my conclusions with respect to the premia are critical of the recent ban that the Panel imposed on termination fees. Particularly, while the Panel's ban was presented as a protective measure to prevent the exploitation of the target firms' shareholders, I do not find any evidence suggesting a systematic use of these fees to

the detriment of the target shareholders. Consequently, my main recommendation based on the empirical analysis is that the Panel end its ban on termination fees.

Clearly, substantial scope for further research remains. Earnout financing is not the only mechanism applied to address information asymmetry problems in M&A. As Caselli et al. (2006) note, collars and contingent value rights have gained popularity in recent years.[106] Hence, the approach that I adopted in studying earnouts, whereby PSM is combined with the RB analysis while also applying parametric analysis to the matched sample, can be useful in studying the characteristics and wealth effects of the remaining risk management techniques.

In turn, the analysis of the Scheme of Arrangement in the UK can be applied to samples that cover deals in the various countries in which the use of the Scheme is gaining momentum. Such an analysis can lead to a cross-country comparison of the determinants and wealth effects of the Scheme. This analysis also allows the evaluation of the role of regulatory bodies and merger consultants in influencing the use and codification of this method. Moreover, given that more than three years have passed since the ban on target termination fees, the way this ban influenced the overall M&A activity and the choice of the particular type of 'Irrevocable Undertakings' granted by the shareholders could be investigated by comparing these outcomes between the pre- and post-ban periods. In particular, it would be interesting to examine whether the inability to receive target termination fees has made potential bidders reluctant to initiate offers, or if the binding 'Irrevocable Undertakings' became more prevalent as substitutes for target termination fees. As this analysis requires the estimation of several outcomes following the Panel's ban in a time series context, the variant of PSM developed for time series analysis by Angrist and Kuersteiner (2011) is worth considering as a methodology in this investigation.

[106] In stock-for-stock public target deals, a collar gives each party the right to walk away from the deal if the stock price of the other party falls below a pre-specified level. In turn, a contingent value right is a put option issued by the acquiring firm. Via this option, the acquiring firm commits, in case its stock price falls below a pre-specified level, to pay a pre-specified sum to the target firm in cash (Caselli et al., 2006).

References

Abadie, A., Imbens, G.W., 2011. Bias-Corrected Matching Estimators for Average Treatment Effects. J. Bus. Econ. Stat. 29, 1–11. doi:10.1198/jbes.2009.07333

Abadie, A., Imbens, G.W., 2008. On the failure of the bootstrap for matching estimators. Econometrica 76, 1537–1557. doi:10.3982/ECTA6474

Abadie, A., Imbens, G.W., 2006. Large sample properties of matching estimators for average treatment effects. Econometrica 74, 235–267. doi:10.1111/j.1468-0262.2006.00655.x

Agrawal, A., Cooper, T., Lian, Q., Wang, Q., 2013. Common advisers in mergers and acquisitions: determinants and consequences. J. Law Econ. 56, 691–740.

Akerlof, G.A., 1970. The market for "lemons": quality uncertainty and the market mechanism. Q. J. Econ. 84, 488. doi:10.2307/1879431

Aktas, N., de Bodt, E., Roll, R., 2010. Negotiations under the threat of an auction. J. Financ. Econ. 98, 241–255. doi:10.1016/j.jfineco.2010.06.002

Alexandridis, G., Fuller, K.P., Terhaar, L., Travlos, N.G., 2013. Deal size, acquisition premia and shareholder gains. J. Corp. Financ. 20, 1–13. doi:10.1016/j.jcorpfin.2012.10.006

Alexandridis, G., Petmezas, D., Travlos, N.G., 2010. Gains from mergers and acquisitions around the world: new evidence. Financ. Manag. 39, 1671–1695. doi:10.1111/j.1755-053X.2010.01126.x

André, P., Khalil, S., Magnan, M., 2007. Termination fees in mergers and acquisitions: protecting investors or managers? J. Bus. Financ. Account. 34, 541–566. doi:10.1111/j.1468-5957.2007.02032.x

Angrist, J., Hahn, I., 2004. When to control for covariates? panel asymptotics for estimates of treatment effects. Rev. Econ. Stat. 86, 58–72.

Angrist, J.D., Kuersteiner, G.M., 2011. Causal effects of monetary shocks: semiparametric conditional independence tests with a multinomial propensity score. Rev. Econ. Stat. 93, 725–747.

Angrist, J.D., Pischke, J.S., 2008. Mostly harmless econometrics: an empiricist's companion. Princeton University Press.

Antoniou, A., Arbour, P., Zhao, H., 2008. How much is too much: are merger premiums too high? Eur. Financ. Manag. 14, 268–287. doi:10.1111/j.1468-036X.2007.00404.x

Armour, J., Black, B., Cheffins, B., Nolan, R., 2009. Private enforcement of corporate law: an empirical comparison of the United Kingdom and the United States. J. Empir. Leg. Stud. 6, 687–722. doi:10.1111/j.1740-1461.2009.01157.x

Armour, J., Skeel, D., 2007. Who writes the rules for hostile takeovers, and why? the peculiar divergence of US and UK takeover regulation. Georgetown Law J. 95, 1722–1793.

Ashurst LLP, 2004. Step change in the use of schemes of arrangement in takeovers.

Ayres, I., 1990. Analyzing stock lock-ups: do target treasury sales foreclose or facilitate takeover auctions? Columbia Law Rev. 682–718.

Baird, D., Gertner, R., Picker, R., 1994. Game theory and the law. Harvard University Press.

Ball, R., Shivakumar, L., 2005. Earnings quality in UK private firms: comparative loss recognition timeliness. J. Account. Econ. 39, 83–128.

Barbopoulos, L., Sudarsanam, S., 2012. Determinants of earnout as acquisition payment currency and bidder's value gains. J. Bank. Financ. 36, 678–694. doi:10.1016/j.jbankfin.2011.10.007

Bargeron, L.L., Schlingemann, F.P., Stulz, R.M., Zutter, C.J., 2008. Why do private acquirers pay so little compared to public acquirers? J. Financ. Econ. 89, 375–390. doi:10.1016/j.jfineco.2007.11.005

Bartram, S.M., Brown, G.W., Conrad, J., 2011. The effects of derivatives on firm risk and value. J. Financ. Quant. Anal. 46, 967–999. doi:10.1017/S0022109011000275

Bates, T.W., Lemmon, M.L., 2003. Breaking up is hard to do? an analysis of termination fee provisions and merger outcomes. J. Financ. Econ. 69, 469–504. doi:10.1016/S0304-405X(03)00120-X

Becchetti, L., Trovato, G., 2002. The determinants of growth for small and medium sized firms. The role of the availability of external finance. Small Bus. Econ. 19, 291–306. doi:10.1023/A:1019678429111

Behr, A., Heid, F., 2011. The success of bank mergers revisited. An assessment based on a matching strategy. J. Empir. Financ. 18, 117–135. doi:10.1016/j.jempfin.2010.08.006

Betton, S., Eckbo, B.E., 2000. Toeholds, bid jumps, and expected payoffs in takeovers. Rev. Financ. Stud. 13, 841–882. doi:10.1093/rfs/13.4.841

Betton, S.B., Eckbo, B.E., Thorburn, K.S., 2008. Merger negotiations and the toehold puzzle. J. Financ. Econ. 91, 158–178. doi:10.1016/j.jfineco.2008.02.004

Boardman, N., 2012. Public takeover offers versus schemes of arrangement. Who's Who Legal.

Boone, A.L., Mulherin, J.H., 2007. Do termination provisions truncate the takeover bidding process? Rev. Financ. Stud. 20, 461–489. doi:10.1093/rfs/hhl009

Brickley, J.A., Misra, S., Van Horn, R.L., 2006. Contract duration: evidence from franchising. J. Law, Econ. Organ. 49, 173–196.

Brown, S.J., Warner, J.B., 1980. Measuring security price performance. J. Financ. Econ. 8, 205–258. doi:10.1016/0304-405X(80)90002-1

Cadman, B., Carrizosa, R., Faurel, L., 2014. Economic determinants and information environment effects of earnouts: new insights from SFAS 141(R). J. Account. Res. 52, 37–74. doi:10.1111/1475-679X.12036

Cain, M.D., Denis, D.J., Denis, D.K., 2011. Earnouts: a study of financial contracting in acquisition agreements. J. Account. Econ. 51, 151–170. doi:10.1016/j.jacceco.2010.05.001

Calcagno, R., Falconieri, S., 2014. Competition and dynamics of takeover contests. J. Corp. Financ. 26, 36–56. doi:10.1016/j.jcorpfin.2014.02.003

Caliendo, M., Kopeinig, S., 2008. Some practical guidance for the implementation of propensity score matching. J. Econ. Surv. 22, 31–72. doi:10.1111/j.1467-6419.2007.00527.x

Capron, L., Shen, J.-C., 2007. Acquisitions of private vs. public firms: private information, target selection, and acquirer returns. Strateg. Manag. J. 28, 891–911. doi:10.1002/smj.612

Carbo-Valverde, S., Kane, E.., Rodriguez-Fernandez, F., 2012. Regulatory arbitrage in cross-border banking mergers within the EU. J. Money, Credit Bank. 44, 1609–1629. doi:10.1111/j.1538-4616.2012.00546.x

Caselli, S., Gatti, S., Visconti, M., 2006. Managing M&A risk with collars, earn-outs, and CVRs. J. Appl. Corp. Financ. 18, 91–104. doi:10.1111/j.1745-6622.2006.00115.x

Casu, B., Clare, A., Sarkisyan, A., Thomas, S., 2013. Securitization and bank performance. J. Money, Credit Bank. 45, 1617–1658. doi:10.1111/jmcb.12064

Chang, S., 1998. Takeovers of Privately Held Targets, Methods of Payment, and Bidder Returns. J. Finance 53, 773–784. doi:10.1111/0022-1082.315138

Chapple, L., Christensen, B., Clarkson, P.M., 2007. Termination fees in a “bright line” jurisdiction. Account. Financ. 47, 643–665. doi:10.1111/j.1467-629X.2007.00228.x

Clifford Chance LLP, 2012. Impact of UK takeover code reform.

Coates, J.C., 2009. M&A break fees: U.S. litigation versus UK regulation. Harvard Public Law Work. Pap.

Coates, J.C., Subramanian, G., 2000. A buy-side model of M&A lockups: theory and evidence. Stanford Law Rev. 53, 307–396.

Coff, R.W., 2002. Getting to’yes' when acquiring firms in human capital intensive industries: medium of exchange, diversification strategy, and impasse. J. Manage. 28, 115–137.

Core, J., 2010. Discussion of chief executive officer equity incentives and accounting irregularities. J. Account. Res. 48, 273–287. doi:10.1111/j.1475-679X.2010.00367.x

Damian, T., Rich, A., 2013. Schemes, takeovers and himalayan peaks: the use of schemes of arrangement to effect change of control transactions, Third Edit. ed. Ross Parsons Centre of Commercial, Corporate and Taxation Law, in conjunction with Freehills.

Datar, S., Frankel, R., Wolfson, M., 2001. Earnouts: the effects of adverse selection and agency costs on acquisition techniques. J. Law, Econ. Organ. 17, 201–238. doi:10.1093/jleo/17.1.201

Davidson, W.N., Cheng, L.T.W., 1997. Target firm returns: does the form of payment affect abnormal returns? J. Bus. Financ. Acconting 24, 465–479. doi:10.1111/1468-5957.00115

Dehejia, R.H., Wahba, S., 2002. Propensity score matching methods for nonexperimental causal studies. Rev. Econ. Stat. 84, 151–161. doi:10.1162/003465302317331982

Dehejia, R.H., Wahba, S., 1999. Causal effects in nonexperimental studies: reevaluating the evaluation of training programs. J. Am. Stat. Assoc. 94, 1053–1062. doi:10.1080/01621459.1999.10473858

Department for Business Innovation and Skills, 2014. Companies House [WWW Document]. URL http://www.companieshouse.gov.uk/

Díaz, K.B.D., Azofra, S.S., Gutiérrez, C.L., 2009. Are M&A premiums too high? analysis of a quadratic relationship between premiums and returns. Q. J. Financ. Account. 48, 5–21.

DiPrete, T.A., Gangl, M., 2004. Assessing bias in the estimation of causal effects: Rosenbaum bounds on matching estimators and instrumental variables estimation with imperfect instruments. Sociol. Methodol. 34, 271–310. doi:10.1111/j.0081-1750.2004.00154.x

Draper, P., Paudyal, K., 2006. Acquisitions: private versus public. Eur. Financ. Manag. 12, 57–80. doi:10.1111/j.1354-7798.2006.00310.x

Eckbo, B.E., Langohr, H., 1989. Information disclosure, method of payment, and takeover premiums. J. Financ. Econ. 24, 363–403. doi:10.1016/0304-405X(89)90052-4

Ekkayokkaya, M., Holmes, P., Paudyal, K., 2009. Limited information and the sustainability of unlisted-target acquirers' returns. J. Bus. Financ. Account. 36, 1201–1227.

Faccio, M., Masulis, R., 2005. The choice of payment method in european mergers and acquisitions. J. Finance 60, 1345–1388. doi:10.1111/j.1540-6261.2005.00764.x

Faccio, M., McConnell, J.J., Stolin, D., 2006. Returns to acquirers of listed and unlisted targets. J. Financ. Quant. Anal. 41, 197–220.

Fama, E.F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. J. Financ. Econ. 33, 3–56. doi:10.1016/0304-405X(93)90023-5

Fidrmuc, J.P., Roosenboom, P., Paap, R., Teunissen, T., 2012. One size does not fit all: selling firms to private equity versus strategic acquirers. J. Corp. Financ. 18, 828–848. doi:10.1016/j.jcorpfin.2012.06.006

Flannery, M., 1986. Asymmetric information and risky debt maturity choice. J. Finance 41, 19–37. doi:10.1111/j.1540-6261.1986.tb04489.x

FoxWilliams, 2012. The revised takeover code increases transparency but are you aware of how the changes could impact UK plc?

Fraidin, S., Hanson, J.D., 1994. Toward unlocking lockups. Yale Law J. 1739–1834.

Franks, J.R., Harris, R.S., 1989. Shareholder wealth effects of corporate takeovers: the UK experience 1955–1985. J. Financ. Econ. 23, 225–249.

Fuller, K., Netter, J., Stegemoller, M., 2002. What do returns to acquiring firms tell us? evidence from firms that make many acquisitions. J. Finance 57, 1763–1793. doi:10.1111/1540-6261.00477

Graebner, M.E., Eisenhardt, K.M., 2004. The seller's side of the story: acquisition as courtship and governance as syndicate in entrepreneurial firms. Adm. Sci. Q. 49, 366–403.

Gray, S.J., 1988. Towards a theory of cultural influence on the development of accounting systems internationally. Abacus 24, 1–15. doi:10.1111/j.1467-6281.1988.tb00200.x

Guo, S., Fraser, M.W., 2010. Propensity score analysis: statistical methods and applications. SAGE Publications.

Hambrick, M., Hayward, D., 1997. Explaining the premiums paid for large acquisitions: evidence of CEO hubris. Adm. Sci. Q. 42, 103–127.

Hansen, R.G., 1987. A theory for the choice of exchange medium in mergers and acquisitions. J. Bus. 60, 75–95.

Heckman, J.J., 2010. Building bridges between structural and program evaluation approaches to evaluating policy. J. Econ. Lit. 48, 356–398. doi:10.1257/jel.48.2.356

Heckman, J.J., Navarro-Lozano, S., 2004. Using matching, instrumental variables, and control functions to estimate economic choice models. Rev. Econ. Stat. 86, 30–57. doi:10.1162/003465304323023660

Heckman, J.J., Robb, R., 1985. Alternative methods for evaluating the impact of interventions: an overview. J. Econom. 30, 239–267.

Hirano, K., Imbens, G.W., 2001. Estimation of causal effects using propensity score weighting: an application to data on right heart catheterization. Heal. Serv. Outcomes Res. Methodol. 2, 259–278. doi:10.1023/A:1020371312283

Ho, D., Imai, K., King, G., Stuart, E., 2006. Matchit: nonparametric preprocessing for parametric casual inference.

Ho, D.E., Imai, K., King, G., Stuart, E.A., 2007. Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. Polit. Anal. 15, 199–236. doi:10.1093/pan/mpl013

Hodges, J.L., Lehmann, E.L., 1963. Estimates of location based on rank tests. Ann. Math. Stat. 598–611.

Holland, P.W., 1986. Statistics and causal inference. J. Am. Stat. Assoc. 81, 945–960. doi:10.1080/01621459.1986.10478354

Huang, Y., Walkling, R.A., 1987. Target abnormal returns associated with acquisition announcements: Payment, acquisition form, and managerial resistance. J. Financ. Econ. 19, 329–349. doi:10.1016/0304-405X(87)90008-0

Hujer, R., Caliendo, M., Thomsen, S.L., 2004. New evidence on the effects of job creation schemes in Germany—a matching approach with threefold heterogeneity. Res. Econ. 58, 257–302. doi:10.1016/j.rie.2004.07.001

Jensen, M.C., 1989. Eclipse of the public corporation. Harv. Bus. Rev. 67, 61–74.

Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. Am. Econ. Rev. 323–329.

Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. J. Financ. Econ. 3, 305–360. doi:10.1016/0304-405X(76)90026-X

Jeon, J.Q., Ligon, J.A., 2011. How much is reasonable? The size of termination fees in mergers and acquisitions. J. Corp. Financ. 17, 959–981. doi:10.1016/j.jcorpfin.2011.04.013

Kaplan, S.N., Strömberg, P., 2009. Leveraged buyouts and private equity. J. Econ. Perspect. 23, 121–146. doi:10.1257/jep.23.1.121

Kennedy, P., 1981. Estimation with correctly interpreted dummy variables in semilogarithmic equations. Am. Econ. Rev. 71, 801.

King, G., Zeng, L., 2005. The dangers of extreme counterfactuals. Polit. Anal. 14, 131–159. doi:10.1093/pan/mpj004

Kohers, N., Ang, J., 2001. The take-over market for privately held companies: the US experience. Cambridge J. Econ. 25, 723–748. doi:10.1093/cje/25.6.723

Kohers, N., Ang, J., 2000. Earnouts in mergers: agreeing to disagree and agreeing to stay. J. Bus. 73, 445–476.

LaLonde, R.J., 1986. Evaluating the econometric evaluations of training programs with experimental data. Am. Econ. Rev. 76, 604–620.

Lombers, M., Bardell, M., Smith, H., 2008. The Scheme: a most convenient and modern arrangement. PLC Mag. 44.

Lukas, E., Reuer, J.J., Welling, A., 2012. Earnouts in mergers and acquisitions: a game-theoretic option pricing approach. Eur. J. Oper. Res. 223, 256–263. doi:10.1016/j.ejor.2012.05.017

Maddala, G., 1983. Limited-dependent and qualitative variables in econometrics. Cambridge University Press, Cambridge.

Mantecon, T., 2009. Mitigating risks in cross-border acquisitions. J. Bank. Financ. 33, 640–651. doi:10.1016/j.jbankfin.2008.12.001

Martin, C., 2007. The rise and rise of schemes of arrangement. The Lawyer.

Moeller, S., 2012. Case study: Kraft's takeover of Cadbury. Financ. Times.

Morck, R., Shleifer, A., Vishny, R., 1990. Do managerial objectives drive bad acquisitions? J. Finance 45, 31–48.

Morris, P., 2014. The Cadbury deal: How it changed takeovers. BBC News.

Mueller, D.C., Sirower, M.L., 2003. The causes of mergers: tests based on the gains to acquiring firms' shareholders and the size of premia. Manag. Decis. Econ. 24, 373–391. doi:10.1002/mde.1103

Murphy, K.J., 1985. Corporate performance and managerial remuneration. J. Account. Econ. 7, 11–42. doi:10.1016/0165-4101(85)90026-6

Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. J. Financ. Econ. 13, 187–221. doi:10.1016/0304-405X(84)90023-0

Myners, P., 2008. Scheme of Arrangement: the current structure of choice for acquisitions of UK-listed companies. Smart Cap.

Netter, J., Stegemoller, M., Wintoki, M.B., 2011. Implications of data screens on merger and acquisition analysis: a large sample study of mergers and acquisitions from 1992 to 2009. Rev. Financ. Stud. 24, 2316–2357.

Officer, M.S., 2007. The price of corporate liquidity: acquisition discounts for unlisted targets. J. Financ. Econ. 83, 571–598. doi:10.1016/j.jfineco.2006.01.004

Officer, M.S., 2003. Termination fees in mergers and acquisitions. J. Financ. Econ. 69, 431–467. doi:10.1016/S0304-405X(03)00119-3

Officer, M.S., Poulsen, A.B., Stegemoller, M., 2009. Target-firm information asymmetry and acquirer returns. Rev. Financ. 13, 467–493. doi:10.1093/rof/rfn017

Parliament, U., 2006. Companies Act,www.legislation. gov. uk/ukpga/2006

Payne, J., 2011. Schemes of Arrangement, takeovers and minority shareholder protection. J. Corp. Law Stud. 11, 67–97.

Peel, M.J., Makepeace, G.H., 2012. Differential audit quality, propensity score matching and rosenbaum bounds for confounding variables. J. Bus. Financ. Account. 39, 606–648. doi:10.1111/j.1468-5957.2012.02287.x

Pound, R., 1910. Law in books and law in action. Am. L. Rev. 44.

Quandt, R.E., 1972. A new approach to estimating switching regressions. J. Am. Stat. Assoc. 67, 306–310. doi:10.1080/01621459.1972.10482378

Quandt, R.E., 1958. The estimation of the parameters of a linear regression system obeying two separate regimes. J. Am. Stat. Assoc. 53, 873–880.

Radebaugh, L., Gray, S., Black, E., 2006. International accounting and multinational enterprises. Wiley Blackwell, New York, NY.

Ragozzino, R., Reuer, J.J., 2009. Contingent earnouts in acquisitions of privately held targets. J. Manage. 35, 857–879. doi:10.1177/0149206308328503

Reuer, J.J., Shenkar, O., Ragozzino, R., 2004. Mitigating risk in international mergers and acquisitions: the role of contingent payouts. J. Int. Bus. Stud. 35, 19–32. doi:10.1057/palgrave.jibs.8400053

Roll, R., 1986. The hubris hypothesis of corporate takeovers. J. Bus. 59, 197–216.

Rosenbaum, P., 2002. Observational studies. Springer Series in Statistics.

Rosenbaum, P., Rubin, D., 1985. Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. Am. Stat. 39, 33–38.

Rosenbaum, P., Rubin, D., 1984. Reducing bias in observational studies using subclassification on the propensity score. J. Am. Stat. Assoc. 79, 516–524. doi:10.1080/01621459.1984.10478078

Rosenbaum, P., Rubin, D., 1983. The central role of the propensity score in observational studies for causal effects. Biometrika 70, 41–55.

Rosenbaum, P., 2002. Observational studies, Springer Series in Statistics. Springer New York, New York, NY. doi:10.1007/978-1-4757-3692-2

Rubin, D.B., 1977. Assignment to treatment group on the basis of a covariate. J. Educ. Behav. Stat. 2, 1–26. doi:10.3102/10769986002001001

Saunders, A., Steffen, S., 2011. The costs of being private: evidence from the loan market. Rev. Financ. Stud. 24, 4091–4122. doi:10.1093/rfs/hhr083

Sianesi, B., 2004. An evaluation of the Swedish system of active labor market programs in the 1990s. Rev. Econ. Stat. 86, 133–155.

Smith, J., Todd, P., 2005. Does matching overcome LaLonde's critique of nonexperimental estimators? J. Econom. 125, 305–353. doi:10.1016/j.jeconom.2004.04.011

The Panel on Takeovers and Mergers, 2012. Review of the 2011 amendments to the Takeover Code 2012/8.

The Panel on Takeovers and Mergers, 2011. City Code on takeovers and mergers, Tenth Edit. ed. The Panel on Takeovers and Mergers, London.

The Panel on Takeovers and Mergers, 2010. Consultation paper issued by the Code committee of the Panel 2010/2.

Travlos, N.G., 1987. Corporate takeover bids, methods of payment, and bidding firms' stock returns. J. Finance 42, 943–963. doi:10.1111/j.1540-6261.1987.tb03921.x

White, H., 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 3, 216–227.

Wilson, H., 2010. Companies avoid £90m stamp duty. Telegr.

Wooldridge, J.M., 2010. Econometric analysis of cross section and panel data. MIT Press.

Wright, M., Weir, C., Burrows, A., 2007. Irrevocable commitments, going private and private equity. Eur. Financ. Manag. 13, 757–775. doi:10.1111/j.1468-036X.2007.00382.x

Wulf, J., 2004. Do CEOs in mergers trade power for premium? evidence from "mergers of equals." J. Law, Econ. Organ. 20, 60–101. doi:10.1093/jleo/ewh024