



Article

# The Consequence of Takeover Methods: Schemes of Arrangement vs. Takeover Offers

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**Abstract:** This paper examined the effect of two selling processes in the UK market: takeover offers and schemes of arrangement. The latter is argued to allow a bidder to acquire a target company more cheaply and easily because schemes provide a lower threshold of the target company's shares before "squeeze-out" procedures may be used. To address potential self-selection bias arising from bidders' ability to choose their acquisition method, the propensity score matching methodology was applied to 803 takeovers of listed-target firms from 1995–2018. The results showed that the scheme of arrangement significantly reduces the target shareholders' gain relative to the takeover offer.

**Keywords:** agency costs; bid premium; propensity score matching; schemes of arrangement; takeover offers; takeover regulations; UK takeover



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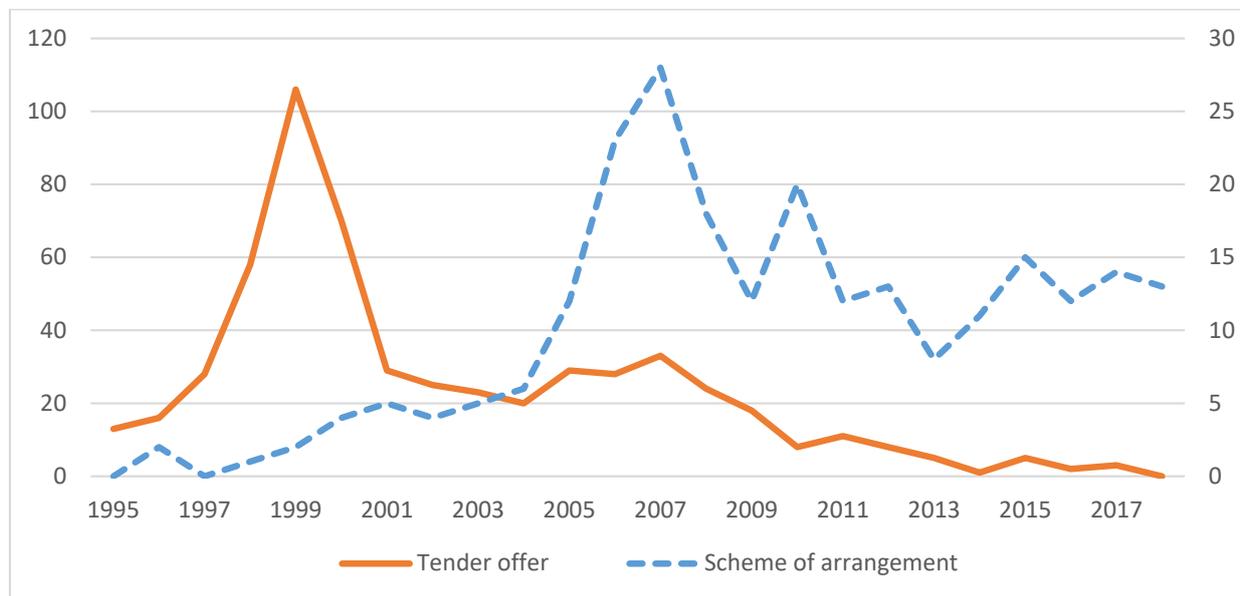
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## 1. Introduction

Corporate takeovers in the UK are commonly conducted through a takeover offer or scheme of arrangement (hereafter scheme). However, in recent years, there has been an increase in the use of schemes as a takeover method (O'Dea et al. 2012) (Figure 1). A takeover offer involves the acquisition of a target firm's shares directly from the market without approval from the target's board or any other buyer, while a scheme is a court-approved agreement between the acquiring company and the target's shareholders. The absence of court involvement makes takeover offers a faster takeover method. However, takeover offers entail a higher threshold for acquiring full control of a target company; schemes require 75% approval from the target's voting shareholders before all target shares can be acquired while, for takeover offers, the bidder's offer is binding only to those shareholders who agree to it, and the bidder must obtain at least 90% of the target's voting shares before it can squeeze out the remaining shareholders.<sup>1</sup> Moreover, the act of directly asking target shareholders to tender their shares may signal the bidder's high willingness to pay and cause shareholders to raise their reservation price (Offenberg and Pirinsky 2015). The empirical evidence has shown that an acquirer pays a higher premium for a target firm when engaging in takeover offers rather than mergers (see Huang and Walkling 1987; Rau 2000; Betton et al. 2009; Offenberg and Pirinsky 2015).

However, takeover offers unduly and perhaps unfairly favour the bidder over the target company; the mere act of a takeover bid gives the bidder company an advantage while the target company is automatically disadvantaged as a passive subject. Historically, an essential feature of UK takeovers is the self-regulatory institution, which allows acquirers to purchase shares directly from the target's shareholders. This ensures that shareholders are protected and that they obtain a reasonable price for the sale of their shares (Kenyon-Slade 2004, p. 496). Therefore, according to the UK takeover regulation 'the Code', the target's board is strictly prohibited from using specific defensive tactics. For example, the board is strictly prohibited from taking defensive actions, such as 'poison

‘poison pills’, against any bids. This ensures that no ‘frustrating action’ could affect an actual or anticipated bid. These regulations make takeover offers a favourite method for bidders and significantly shorten the time required to complete takeover transactions. As a result, takeover offers induce hostile bids in the market (Armour and Skeel 2006).



**Figure 1.** The distribution of takeover methods (scheme of arrangement-takeover offers), UK market, 1995–2018.

The power imbalance between participants involved in the takeover offer process has been publicly debated since Kraft, an American food manufacturer, acquired the UK-listed chocolate maker Cadbury in 2010. Consequently, in September 2011, amendments to the Takeover Code strengthened the positions of target firms and gave them the right to request information about all the financial or economic impacts that could affect the future growth and direction of the firm, particularly any plans that could affect workers (von Bismarck 2021, p. 198). Moreover, recent amendments to the Takeover Codes have given the target boards more power to control the scheme process as well. Previously, the scheme was an ‘offer-related arrangement’ between a bidder and a target firm, allowing the bidder to maintain some control over the scheme process. Now, such implementation agreements are prohibited.<sup>2</sup> These changes are broadly in line with the wide decision-making powers granted by common laws and statutes to directors in all other circumstances. However, in practical terms, such mitigation is indeed illusory. The board of a target company can simply withdraw its recommendation for the offer to avoid implementing the scheme. Nevertheless, ascertaining a board’s true purpose can be factually difficult. However, in such cases, bidders can protect themselves by using long-stop dates,<sup>3</sup> whereby bidders can only withdraw an offer if certain agreements have not been reached (von Bismarck 2021, p. 233). This approach seems to defeat sound commercial decision-making.

The change in control power associated with takeover activities normally creates an interest-based conflict between a target board and the shareholders if such activities negatively affect shareholders’ jobs and perquisites (Jensen 1986). The legal provisions stipulated by takeover law are used to control the transaction process and may mitigate the managerial agency problem. However, a target board has significant control over the implementation of a scheme process. In general, the scheme is similar to merger activities that occur under the US takeover regime for two reasons: (1) the requirement for court approval and (2) the relatively high percentages (considerably higher than 50%) of shareholder approval required. Unlike a takeover offer, a scheme is considered a friendly transaction because a target board is required to implement a scheme process by sending

the scheme proposal and certain other documents containing statutory information. A target board also persuades various classes of shareholders to approve a bid in the court.

A natural question that arises from the fact that schemes are commonly thought of as friendly processes is whether acquirer bidders can acquire a target company cheaply and easily compared with engaging in the takeover offer process. The agency costs hypothesis may be driving the outcomes of the choice between schemes and takeover offers. The loss of a bid premium has been used as evidence to examine the agency costs hypothesis (Officer 2003). Although the takeover offer causes the target board to succumb to hostile bidders, compared with a merger deal, bidders pay higher premiums for the target firm's assets in a takeover offer (Offenberg and Pirinsky 2015). The scheme could open the door for an agency cost problem for two reasons. First, public companies in the UK typically do not have a single shareholder control power, and shareholding is dispersed (Payne 2011). In a friendly process, such as a scheme, target boards inevitably have better opportunities to discuss their private post-acquisition benefits in the merged entity, such as compensation or whether they keep their jobs. Bugeja et al. (2019) discovered a negative correlation between takeover premiums and the likelihood that a target director will be appointed to the board of the acquiring firm. Agency costs also exist when firms' ownership structures are concentrated. Belkhir et al. (2013) argued that the agency issues resulting from the separation between control and cash flow rights in French firms can reduce their financial visibility and stock liquidity and cause them to become private and delist from the stock exchange. However, when the pre-transaction target firm separates the cash flow and control rights of its owner more significantly, the shareholders gain a raw premium of about 36% from the firm becoming private. This implies that these benefits result from a potential reduction in pre-transaction inefficiencies caused by agency conflicts between minority and controlling shareholders in private ownership (Boubaker et al. 2014).

The second reason is that the English court has a neutral stance between schemes and takeover offers which could increase the agency cost problem in a scheme takeover. Bugeja et al. (2016) examined whether the use of schemes induces lower bid premiums in the Australian market and found that schemes cause a reduction in premiums in the range of 16% to 40%. This reduction in bid premiums has led to recent legislative changes in some Australian jurisdictions and New Zealand. Specifically, the court cannot approve a scheme if it has been proposed so that the acquirer can avoid a takeover regulation intended to protect minority shareholders or to obtain the target firms more easily via a scheme that takes advantage of the lower approval threshold.<sup>4</sup> Although the UK government prohibited the cancellation scheme in March 2015 to prevent the acquirer from avoiding stamp duty, the UK government has generally adopted a neutral stance between schemes and takeover offers (Payne 2014, p. 337).<sup>5</sup> Even if the main objective of takeover regulations is to balance the power between participants for both schemes and takeover offers, a target board still has significant ability to control the process in schemes, which might not serve the shareholders of either the target or bidder firms. This conclusion is to suggest that the law and regulations offer only superficial protection to counterparties, which is hardly surprising because the takeover law in the UK supports a *laissez-faire* approach.

To the best of our knowledge, this paper is the first to examine whether the English court should maintain its neutral stance and continue to believe that the choice of scheme method is a matter for target firms to decide. Schemes induce the problem of agency cost to exist. Schemes have been found to have a negative impact on premiums in the Australian takeover market (Bugeja et al. 2016, 2019). However, there is a significant difference between the English and Australian jurisdictions in the way a scheme is implemented during a takeover. For example, the Australian court's approval is not enough to determine definitively whether a scheme bid should be launched. Still, there are further overriding fairness discretionary actions that can approve the scheme (Payne 2014, p.330). This paper offers significant contributions by highlighting issues related to the structure of the scheme in the UK takeover market and producing evidence for regulators that the English court's neutral stance is not justifiable.

This paper assessed a sample of 803 takeover deals for listed target firms in the UK between January 1995 and 31 December 2018, in which 240 deals were structured as schemes and 563 as takeover offers. The main contribution of this work is that it offers potential answers as to whether selecting a specific takeover method has a causal effect on bid premiums. This paper employed propensity score matching (PSM) to address the selection bias problem. This work has important implications in the corporate law field's debate regarding whether bidders, by implementing a scheme to engage in a takeover, could lower bid premiums. This means that the agency problem drives the choice between schemes or takeover offers. Such results could argue that the English court's neutral stance is not justifiable, and the takeover regulator should revise the Takeover Codes of schemes.

The results showed that schemes significantly reduce bid premiums compared with takeover offers. This means that schemes induce an agency cost problem and show the regulator that the English court's neutral stance must end. One possible explanation could be that schemes are more amenable to large target firms and provide more certainty to the bidder of obtaining 100% of the target's stock shares. Another explanation may lie in the observation that most scheme bids are associated with private acquirers, which may also lower bid premiums. Moreover, target companies are more susceptible to agency costs in a scheme if they initiate a deal since the scheme may lessen the target firm's position power in negotiation.

This paper is organised as follows: Section 2 discusses the different determinants of bid premiums between schemes and takeover bids; Section 3 describes the data, dependent, and explanatory variables; Section 4 sets out the methodology; Section 5 presents the results; and Section 6 concludes the paper.

## 2. Takeover Methods and Bid Premium and Hypotheses Development

The loss of a bid premium has been used as evidence to examine the agency costs hypothesis (Officer 2003). This section discusses the different determinants of bid premiums between schemes and takeover bids. Offenberg and Pirinsky (2015) argued that acquirer firms prefer to use takeover offers in the US market because they are substantially quicker than mergers, primarily if there is more than one bidder for the same target firm and if there are fewer external impediments to implementing the bid. External impediments include the existence or prospect of anti-trust reviews from regulators. However, there is always a trade-off between the cost of using a takeover offer and fast bid execution. If a bidder asks target shareholders to tender their shares directly, this could signal that a target firm has high value to the bidder; therefore, target shareholders could raise their reservation price. Offenberg and Pirinsky (2015) empirically documented that bidders pay higher premiums for the target firm's assets in a takeover offer than in a merger. Moeller et al. (2004) found that takeover offers also create value for the bidder's shareholders. Regarding the bidder's stock price, Eckbo (2009) found that most of the corporate finance empirical literature shows that there is a positive, albeit insignificant, gain for the bidder's shareholders when a takeover offer is used.

However, there have been persistent debates regarding whether an acquirer may overpay for a large target, as the target firm's bargaining power increases with size. Dutta and Saadi (2011) argued that large target firms can negotiate the offer price and extract a higher payment from the acquirer, which becomes even worse for the acquirer if there are other competitors. Bidders may also pay a lower premium for larger target firms. The literature has widely documented a negative relationship between target size and bid premiums (Officer 2003; Barger et al. 2008; Betton et al. 2009; Boone and Mulherin 2011), and this relationship is robust across different measurements of the premium (e.g., using the actual offer price to calculate the premium or the target announcement returns).

The causes of the lower premiums paid for large targets could be related to the degree of certainty about the actual value of the target's assets. For example, acquirers could be more certain about the accurate value of the target because they own a high-value stake in the large target, which could cause the acquirer to offer a low premium. Conversely,

the complexity of integrating asymmetrically sized firms (where the target is larger than the acquirer) could heighten uncertainty regarding the expected synergies. As a result, acquirers are more reluctant to offer a higher premium for the target to mitigate additional potential complexity costs (Alexandridis et al. 2013).

Adopting schemes, which is a friendly takeover agreed upon between bidders and directors, will increase the likelihood that bidders obtain full control of a target. Dispersed ownership is a common feature of UK public firms. Larger firms have more significant numbers of tendered shares, which increases the uncertainty for a bidder to obtain 100% of target ownership if necessary. The scheme is considered an all-or-nothing transaction, which means there is no risk that the minority shareholders will retain influence. Bid premiums may be reduced if a target board and a bidder cooperate through a friendly process such as a scheme.

Moreover, Bargeron et al. (2008) found that private acquirers pay less for their targets than public firms because the latter can gain more from the expected synergies with the target. Private equity bidders are usually outsiders in the target firm industries who cannot manage the targets well themselves. Therefore, they require professionals to handle the assets on their behalf, which could induce the problem of agency cost (Fidrmuc et al. 2012). As a result, takeover offers are usually the preferred method for public bidders (Offenberg and Pirinsky 2015). This preference seems to stem from the fact that the impact of an acquisition failure has more adverse consequences for public than private acquirers (Bargeron et al. 2008). However, schemes have an advantage over takeover offers, whereby public bidders are more confident in controlling the full target's ownership, and this certainty could prevent the adverse consequences of failure. Along similar lines, schemes give private bidders the same confidence in obtaining 100% of target ownership if necessary, and this will lead private bidders to bid for target shares at a low price.

Of course, a bidder with a stake in the target firm (a toehold) gains a competitive advantage over rival bidders who do not possess such control. Betton et al. (2008) observed a negative relationship between stake building in the target before acquisition and bid premiums. As Betton et al. (2008) noted, the higher the toehold the acquirer has before the announcement date, the lower the bid premium the target shareholder gains. However, bidders will not benefit from establishing a toehold in schemes because such a stake will not be counted towards the 75% voting power threshold (Payne 2014, p. 128). Target firms are more vulnerable to agency costs in schemes because such a method gives bidders a high degree of certainty of obtaining complete control of a target firm even if bidders do not build a stake in a target firm, and such a high degree of certainty could lower the bid premium.

The cost of transactions is an essential determinant that causes the target company to choose between reducing the competition level between bidders or selling the company using more competitive procedures to extract higher premiums. Aktas et al. (2010) and Offenberg and Pirinsky (2015) used the cost of waiting proxies to investigate whether the level of competition can impact the choice of takeover method and bid premium. The cost of waiting proxies measures unobservable competition before the announcement date, mainly when the target is under pressure to sell. For example, if a target initiates a bid, it signals their willingness to sell, weakening their bargaining power during negotiation. In particular, Masulis and Simsir (2018) documented that there is a significant difference in bid premiums between deals initiated by target firms and those initiated by bidders. Macias et al. (2011) used the variable target-initiated deal as a proxy for higher adverse selection risk and found that if a target initiates a deal, this drives bidders to pay lower premiums. Therefore, the authors argue that acquirers pay lower premiums for target-initiated deals to compensate for adverse selections. However, the effects of adverse selection on a premium are mitigated if target managers have high incentives, such as ownership stakes and equity grants, where there is a positive and significant correlation between the bid premium and the target-initiated deal (Fidrmuc and Xia 2019). Schemes are a friendly process in comparison to takeover bids. Target boards have more opportunities to discuss their

private post-acquisition benefits, such as compensation or whether they keep their jobs. This could weaken the positions of the target firms, mainly if the target firms initiated deals and schemes could harm target shareholders' wealth.

Moreover, [Bargeron et al. \(2008\)](#) used the target debt ratio as a proxy for the target's bargaining power. A target with a high level of debt cannot deter a takeover attempt by using defence tactics, such as restructuring and recapitalisation strategies, which can affect the bid premium. Alternatively, target firms with a high level of debt could gain more because such highly leveraged firms have highly concentrated ownership, which could force the winner to pay more. However, [Aktas et al. \(2010\)](#) showed that a high target debt ratio may signify that the target is under pressure to sell because a high debt level will lead to a more extended sale procedure. Therefore, it could be argued that target firms with a high debt ratio generally prefer to use a fast process, such as takeover offers. Accepting schemes that include a longer selling process because bidders are waiting for the court's approval will increase the pressure on target firms with a high leverage ratio. Consequently, schemes could harm target shareholders' wealth.

Market-to-book value (M/B ratio) is considered one of the main variables determining bid premiums ([Eckbo and Thorburn 2009](#)). M/B ratio is used as a proxy for the probability of firm growth, whereby target firms with a high M/B ratio indicate high growth opportunities ([Harford et al. 2009](#)). Therefore, target firms with low growth opportunities obtain a low bid premium. Moreover, target firms could earn lower bid premiums if their M/B ratios exceeded the industry median for the same ratio ([Eckbo and Thorburn 2009](#)). [Boone and Mulherin \(2008\)](#) used the M/B ratio as a proxy for uncertainty, whereby there was a positive relationship between the M/B ratio and bidders' uncertainty about the value of the target's assets. They argued that target firms with a high M/B ratio could obtain a high premium because bidders overpay for the target's assets. However, [Boone and Mulherin \(2008\)](#) concluded M/B ratio does not support the prediction of overpayment. The probability of target firms being exposed to agency costs will increase if the target firms have a high M/B ratio. Bidders who implement schemes are sure to obtain 100% of the target firm, which gives them an incentive to lower premiums if the target firm has a high M/B ratio.

The level of uncertainty during crises has a significant impact on takeover outcomes. However, there are conflicting findings regarding the effects of crises and the degree of bid premiums offered. For example, the Russian invasion of Ukraine in 2022 harmed the cumulative abnormal returns of global stock market indices ([Boubaker et al. 2022](#)). [Le et al. \(2021\)](#) examined the effects of the COVID-19 pandemic on the dynamics of volatility spillovers in financial markets with a focus on traditional markets, the Fintech index and Bitcoin. The Fintech index and Bitcoin experienced the most volatility spillovers during the COVID-19 pandemic and should therefore not be viewed as safe havens. [Weitzel et al. \(2014\)](#) discovered that bid premiums in takeover activities are lower in nations going through a crisis. In contrast, [Magnanelli et al. \(2022\)](#) found a positive and significant relationship between bid premiums and the COVID-19 pandemic. Schemes have become a more popular takeover method during economic downturns because bidders are becoming more familiar with the judicial process and the courts' effects on takeovers ([Payne 2014](#), p. 84). Moreover, a significant regulatory change to the City Code occurred in December 2011 after the Kraft/Cadbury takeover crisis. The change entails that a scheme is entirely in hands of the target, allowing previous bidders to lose some control over the process. Cooperation between a target board and a bidder through the friendly process of a scheme could lower bid premiums. After this regulatory change, the number of schemes surpassed the number of takeover offers. The UK government banned cancellation schemes in March 2015.<sup>6</sup>

In light of the above discussed arguments about the advantages of using schemes for bidders, we propose the following hypothesis.

**H1.** *The effect of schemes on bid premiums is negative.*

### 3. Data and Variables

#### 3.1. Sample Construction

Using the Thomson One Banker (SDC), Thomson Data Stream, and LexisNexis databases, we constructed a sample of the listed-target firms on the London Stock Exchange between 1 January 1995, and 31 December 2018. The acquirer firms could be either private or public companies or subsidiaries. We omitted bidder firms from outside the UK to guarantee that both the target and acquirer are subject to the UK takeover regulations. It also helps avoid complications that arise from differing foreign tax and legal regimes (Offenberg and Pirinsky 2015). In addition, the sample is limited to deals where the acquirer holds more than 90% of the target's shares after a deal is completed, and the acquirer must have (a toehold) less than 50% of the target's shares before the announcement date. We applied further restrictions on the sample. First, self-tender, recapitalisation, exchange offer, repurchase, privatisation, and creditor's scheme of arrangement transaction were excluded because takeover regulations do not cater to them. Second, the sample did not include deals that switch from takeover offers to schemes, or vice versa, to study the observed effect of each takeover method.

Moreover, we included the deals with payment methods: cash, stock, or a combination of both. Finally, the deal value must be at least £1 million to control the size effect (Alexandridis et al. 2013). The final sample consisted of 240 schemes and 563 takeover offers.

#### 3.2. Variables and Summary Statistics

##### 3.2.1. Dependent Variables

Bid premium is one of the primary observable outcomes of takeovers, and there are different methods of measuring it. We used the SDC database in this section to calculate the actual offer premium (Officer 2003). The actual offer premium is defined as the ratio of the bidder's offer to the target market value of equity before the announcement date (Goeree and Offerman 2003). The bidder's bid is divided into "component" and "price" data. The component data defines the bidder's offer as the aggregate value paid by the bidder for each payment method (i.e., cash or equity), and the "price" data defines the offer price of  $P_{int}$  and  $P_{fin}$ , where the subscripts indicate "initial" and "final" prices per target share, respectively. We calculated the actual bid premium based on the price data of either  $P_{int}$  or  $P_{fin}$ . However, the initial prices are not all available because SDC only provides such information for deals where the terms are amended and in US dollars. Because of this, the final price offered per share indicated in the SDC database (filed HOSTPR in SDC) was used to calculate the premium.

Goeree and Offerman (2003) calculated the bid premium using target stock prices 42 days before the date of announcement as the base. In this section, however, we selected a more extended pre-offer period to decrease the influence of takeover rumour (Eckbo 2009). The selection of the length of pre-offer periods also depends on the specific takeover methods (takeover offers vs. schemes), as they have different time scales for completion. Commonly, takeovers using schemes take longer to complete than takeover offers, and a longer completion time may increase the likelihood of information leaking before the relevant announcement dates.<sup>7</sup> There are two important dates relevant to the publication of the takeover information: the SDC announcement date and the initial (original) public announcement date (filed DAO in SDC).

We then calculated the final actual offer premium as a ratio of the final offer paid by the bidder to the target stock price, adjusted for splits and dividends and measured at one, two, and three months before the SDC announcement or the initial public announcement date, as follows:

$$Premium_i = \left( \frac{P_{fin}}{P_{i,t=\text{either}-A \text{ or } -E}} \right) - 1 \quad (1)$$

where  $t$  is the event date and  $i$  is the target firm, and  $P_{i,t=\text{either}-A \text{ or } -E}$  is the target stock price one/two or three months before the SDC announcement date (indicted by  $-A$ ) or the initial public announcement date, adjusted for splits and price (indicted by  $-E$ ).

### 3.2.2. Explanatory Variables

Table 1 presents the summary statistics for the target firms and the deal characteristics for the two takeover methods of schemes versus takeover offers. A set of variables considered by the literature to be relevant to the variation in bid premiums across schemes and takeover offers is also presented. Most variables, such as the target's size and leverage, were measured 12 months before the announcement date of a bid. Table A1 in Appendix A reports all the definitions and database sources for the variables.

**Table 1.** Summary statistics sorted by the sales process (scheme of arrangement-takeover offer), UK Market, 1995–2018.

	Full Sample		Scheme of Arrangement		Takeover Offer		Difference in Means
	Mean	N	Mean	N	Mean	N	
<b>Panel A: Target characteristics</b>							
Ln (Sales)	11.106	803	11.623	240	10.885	563	0.738 ***
Age (Year)	15.523	803	17.628	240	14.626	563	3.002 ***
M/B	2.201	803	3.026	240	1.849	563	1.177
Target M/B > industry median	0.623	803	1.466	240	0.263	563	1.202
Leverage	20.142	803	19.861	240	20.261	563	−0.4
Book assets (UK£, millions)	1638	803	4777	240	300	563	4.476 **
MV (UK£, millions)	366.887	797	850.935	239	159.562	558	691.373 ***
<b>Panel B: Deal characteristics</b>							
Days to completion	61.505	803	99.95	240	45.117	563	54.832 ***
Target-Initiated (%)	4.981	40	7.916	19	3.73	21	4.186 **
Crisis (%)	16.562	133	24.166	58	13.321	75	10.845 ***
Regulation Shock (%)	13.695	110	35.833	24	4.262	86	31.570 ***
Private bidder (%)	59.775	480	67.5	162	56.483	318	11.016 ***
Toehold (%)	3.338	111	1.425	15	4.153	96	2.727 ***

\*\*, \*\*\* denote significance at the 5%, and 1% level.

Panel A presents the main variables of the target characteristics that could explain the variation in bid premiums across schemes and takeover offers. Target firms that adopt schemes are typically larger, indicating that their shareholders are more vulnerable to agency cost problems in a scheme. The target's size is negatively associated with a bid premium (Bargeron et al. 2008; Boone and Mulherin 2011; Officer 2003). However, Bidders involved in a scheme have a high degree of certainty regarding obtaining full control of a target firm, mainly when the target is large. The scheme process is usually considered a recommended bid, and the target manager may collaborate with bidders to maximise their interests at the shareholders' expense whereby there is no risk that the minority shareholders will retain influence.

There was no significant difference between the two target groups regarding the M/B ratio and leverage levels. Therefore, the M/B ratio and leverage levels cannot determine the differences in bid premiums between schemes and takeover offers.

Panel B provides summary statistics of the deal characteristics. Among the deals initiated by the target firms, it is interesting to observe that the majority were structured through schemes. Masulis and Simsir (2018) and Macias et al. (2011) found that target firms that initiate deals are more likely to obtain low premiums. This could also indicate that target firms that accept a takeover through a scheme are more susceptible to agency costs because schemes give target boards more opportunities to discuss their post-acquisition advantages, which could weaken the positional power of the target firm.

Across the sample of takeover cases, a significantly higher proportion of scheme deals (24%) occurred during the financial crisis compared with only 13% of takeover offer deals. Because bidders are more familiar with the judicial process and the courts' effects on

schemes during economic downturns, target enterprises are more likely to experience the agency cost problem during financial crises.

Moreover, private acquirers are associated with a higher percentage of scheme deals, indicating why bid premiums for scheme deals are lower than those for takeover offers (Bargeron et al. 2008). Unsurprisingly, bidders engaged in takeover offers usually own a more significant stake of a target firm than bidders engaged in schemes, which could lower the premiums associated with takeover offers (Betton et al. 2008).

#### 4. Methodology

The choice of takeover method is not random. As such, the difference in the mean of the bid premium across schemes and takeover offers is likely to be biased as there will be differences in the characteristics of deals (Kai and Prabhala 2007). Propensity score matching (PSM) (Rosenbaum and Rubin 1983) is used to address this selection bias problem.

Let  $D_i$  be a treatment dummy which takes the value of 1 if deal  $i$  is structured through a scheme of arrangement, and 0 if through a takeover offer.  $Premium_{1i}$  and  $Premium_{0i}$  represent the potential premium of deal  $i$  if it is structured using a scheme and takeover offer respectively. We wish to estimate the average treatment effect (ATE) and average treatment effect for the treated (ATET) of choosing schemes as the takeover method.

$$\tau_{ATE} = E(Premium_{1i}) - E(Premium_{0i}) \quad (2)$$

$$\tau_{ATET} = E(Premium_{1i}|D_i = 1) - E(Premium_{0i}|D_i = 1) \quad (3)$$

Because only one outcome can be observed for each deal, it is necessary to find a group of deals that were conducted using a takeover offer that can provide a valid estimate of the bid premium for scheme deals had they been conducted using a takeover offer (i.e.,  $Premium_{0i}$ ). For the ATE, it is also necessary to identify a group of deals that were structured using a scheme that can provide an accurate estimate of the bid premium for takeover deals, in the event that they were structured using a scheme (i.e.,  $Premium_{1i}$ ).

To estimate (2) and (3), propensity score matching entails estimating a logit model in which the dependent variable is the binary variable denoting treatment status, and the independent variables are all covariates that determine both the takeover mechanism and the bid premium. These are firm size, leverage, and M/B ratios, whether a bidder is a private firm, whether a bidder holds a stake in a target firm six months before the announcement date (toehold), the period of the financial crisis, and the period of the change of takeover regulation, whether a target initiated the deal. The functional form of the logit model was determined using the approach outlined in Imbens and Rubin (2015). The estimated coefficients were then used to calculate propensity scores, which were used to create a matched sample of treated and untreated deals. Under the conditional independence assumption, which requires that all variables that determine both method of takeover and bid premium are observed, the difference in the mean of the bid premium across deals conducted via a takeover process and deals conducted using a scheme in the matched sample represents an unbiased estimate of the treatment effect.

#### 5. Results

Table A2 in Appendix A presents the results from estimation of the logit model for choice of takeover method using the specification reached after applying the method of Imbens and Rubin (2015). Table 2 reports the estimated ATE and ATET using bid premiums calculated at one, two, and three months prior to the initial and SDC announcement dates and one, two, and three takeover deals to construct the matched sample. In the first column, the bid premium was calculated using a start date one month before the initial announcement date. The estimated ATE was negative and statistically significant regardless of the number of neighbours used to construct the matched sample. In the case of the ATET, the point estimate was negative but only statistically significant when two or three neighbours were used to construct the control group. The estimated effect ranged from  $-8.153\%$  to  $-11.392\%$ .

**Table 2.** Estimated treatment effects from propensity score matching based on logistic model in Table A2 using different numbers of ‘neighbours’.

Number of Matches		Before the Initial Announcement Date			Before the SDC Announcement Date			Untreated Observations
		One-Month	Two-Month	Three-Month	One-Month	Two-Month	Three-Month	
1	ATE	−10.377 *** (3.977)	−10.373 *** (3.975)	−10.269 ** (4.220)	−5.543 (3.766)	−7.556 ** (3.722)	−8.879 ** (4.052)	563
	ATET	−11.056 (7.399)	−12.787 * (7.605)	−12.989 * (6.948)	−9.477 (6.649)	−10.689 * (6.296)	−11.892 * (6.283)	120
2	ATE	−11.392 *** (3.216)	−11.106 *** (2.829)	−9.287 *** (3.403)	−6.402 ** (3.069)	−8.668 *** (2.949)	−7.950 ** (3.368)	563
	ATET	−8.153 ** (3.982)	−8.812 (6.722)	−8.541 *** (3.216)	−6.160 (4.002)	−7.689 ** (3.013)	−7.947 ** (3.884)	190
3	ATE	−10.630 *** (3.019)	−10.205 *** (2.592)	−9.015 *** (3.279)	−5.395 * (2.882)	−7.410 *** (2.769)	−7.533 ** (3.220)	563
	ATET	−9.392 *** (2.478)	−8.527 (5.676)	−8.497 (5.763)	−6.829 ** (2.758)	−7.011 *** (0.527)	−7.439 *** (2.422)	242

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% levels (standard errors are in parentheses).

As shown in the second column, the ATE and ATET were estimated using a bid premium measured over two months. The estimated ATE was negative and statistically significant irrespective of the number of neighbours used and implied a reduction in the bid premium due to use of a scheme of more than 10%. The estimate of the ATET was of a similar magnitude but was not statistically significant at the 5% level. Calculating the bid premium over a period of three months did not substantially change the results, although the negative effect using two nearest matches was then significant. Implementing a scheme significantly reduces the bid premium using two and three months before the SDC announcement date (columns 4–6).

Robustness test was divided into two steps: evaluate the matching strategy and sensitivity analysis to the hidden bias. Table 3 reports the covariate balance in the full and matched samples after applying the nearest neighbour 1-to-2 matching strategy.<sup>8</sup> Table 3 shows that most of the variables have a standardised difference that is close to zero and a variance ratio that is close to one, indicating that they are well balanced. While matching will reduce bias resulting from differences in observed characteristics across the treated and untreated groups, it does not address bias resulting from unobservable characteristics. Table 4 presents results from the  $Q_{MH}$  test, proposed by Becker and Caliendo (2007), which shows how large the effect of the unobservable or “hidden bias” needs to be to reverse the results found by PSM. Table 4 shows that under  $\Gamma = 1$ , there is no hidden bias. The scheme has a significant negative impact on the bid premium if bid premiums are calculated one, two, or three months before the initial announcement date.

**Table 3.** Comparison of covariate imbalance after estimating ATE and ATET by applying the nearest neighbour matching strategy (1–2) that matches a target firm that accept a scheme to two nearest neighbour target firms that accept a takeover offer.

Variable	ATE				ATET			
	Standardised Differences		Variance Ratio		Standardised Differences		Variance Ratio	
	Raw	Matched	Raw	Matched	Raw	Matched	Raw	Matched
Ln (Sales)	0.38	0.046	2.155	0.921	0.38	0.198	2.155	0.752
Leverage	−0.019	−0.052	1.191	0.993	−0.019	−0.066	1.191	1.001
M/B	0.115	0.023	0.827	0.276	0.115	0.072	0.827	0.806
Private Acquirer	0.228	0.052	0.894	0.973	0.228	−0.104	0.894	1.095
Toehold	−0.341	0.036	0.415	1.076	−0.341	−0.025	0.415	0.915
Crisis	0.28	−0.069	1.59	0.887	0.28	−0.158	1.59	0.853
Regulation Shock	0.856	0.06	5.647	1.147	0.856	0.16	5.647	1.132
Target-Initiated	0.179	−0.017	2.034	0.93	0.179	−0.015	2.034	0.954
Private Acquirer × Regulation Shock	0.591	0.01	4.632	1.029	0.591	0.049	4.632	1.067
Ln (Sales) × Leverage	0.089	−0.043	1.601	1.008	0.089	−0.056	1.601	0.91
Private Acquirer × Crisis	0.215	−0.09	1.61	0.814	0.215	−0.17	1.61	0.777
Ln (Sales) <sup>2</sup>	0.446	0.039	2.33	0.944	0.446	0.172	2.33	0.806
Observations	803	353			803	353		
Treatment observations	240	163			240	163		
Control observations	563	190			563	190		

**Table 4.** Result of sensitivity analysis to hidden bias.

Matching Strategy	Average Treatment Effect	$\Gamma$	Before the Initial Announcement Date						Before SDC Announcement Date					
			One-Month		Two-Month		Three-Month		One-Month		Two-Month		Three-Month	
			Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
1-to-2	ATE	1	0.0002	0.0002	0.0005	0.0005	0.020	0.020	0.251	0.251	0.048	0.048	0.126	0.126
		1.25	<0.0001	0.213	<0.0001	0.301	<0.0001	0.753	<0.0001	0.980	<0.0001	0.858	<0.0001	0.944
		1.5	<0.0001	0.922	<0.0001	0.955	<0.0001	0.998	<0.0001	0.999	<0.0001	0.999	<0.0001	0.999
		1.75	<0.0001	0.999	<0.0001	0.999	<0.0001	0.999	<0.0001	1	<0.0001	1	<0.0001	1
		2	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1
		2.25	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1
		2.5	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1
		2.75	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1
		3	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1	<0.0001	1
	ATET	1	0.003	0.003	0.006	0.006	0.026	0.026	0.005	0.005	0.006	0.006	0.028	0.028
		1.25	0.118	<0.0001	0.161	<0.0001	0.328	0.0002	0.148	<0.0001	0.165	<0.0001	0.337	0.0003
		1.25	0.506	<0.0001	0.586	<0.0001	0.778	<0.0001	0.564	<0.0001	0.591	<0.0001	0.786	<0.0001
		1.75	0.849	<0.0001	0.892	<0.0001	0.963	<0.0001	0.880	<0.0001	0.894	<0.0001	0.965	<0.0001
		2	0.972	<0.0001	0.983	<0.0001	0.996	<0.0001	0.980	<0.0001	0.983	<0.0001	0.996	<0.0001
		2.25	0.996	<0.0001	0.998	<0.0001	0.999	<0.0001	0.997	<0.0001	0.998	<0.0001	0.999	<0.0001
2.5	0.999	<0.0001	0.999	<0.0001	0.999	<0.0001	0.999	<0.0001	0.999	<0.0001	0.999	<0.0001		
2.75	0.999	<0.0001	0.999	<0.0001	1	<0.0001	0.999	<0.0001	0.999	<0.0001	1	<0.0001		
3	0.999	<0.0001	1	<0.0001	1	<0.0001	0.999	<0.0001	1	<0.0001	1	<0.0001		

Source:  $Q_{MH}$  test,  $\Gamma = 1 \approx$  No hidden bias.

## 6. Conclusions

This paper found that target firms sold through schemes significantly lose premiums than those sold through takeover offers. Therefore, an agency cost problem exists in a scheme takeover. One possible explanation for the low premium levels in schemes could be that schemes are a favourable method for acquiring a large firm. Schemes are considered all-or-nothing transactions, which means there is no risk that minority shareholders will retain influence. Larger companies tend to offer more shares, which makes it more difficult for a bidder to acquire 100% of the target ownership if necessary. Cooperation between a target board and a bidder through the friendly process of a scheme could lower bid premiums.

Furthermore, most scheme deals are associated with private acquirers, which may lower the bid premiums. Moreover, target companies are more vulnerable to agency costs in a scheme deal if they agree to a takeover after its initial commencement, since the scheme may reduce the positional power of the target firm during negotiations. Therefore, the English court should end its neutral stance. Large UK-based firms could be quickly and cheaply obtained by foreign hands that implement takeover bids through schemes, which could threaten the economy's stability. Future research could investigate the impact of the characteristics of internal teams and the characteristic of advisors on takeovers and the choice between schemes or takeover offers.

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## Appendix A

**Table A1.** Variable definitions and sources.

The Variables	Definitions	Sources
<b>Panel A: Target characteristics</b>		
<i>Ln (Sales)</i>	The natural logarithm of target firm total sales twelve months before the date of announcement.	DataStream
<i>Age (Year)</i>	The age of the firm, which is measured in year since DataStream holds information about target firms to the date of announcement.	DataStream
<i>Market to book</i>	The market value of assets divided by the book value of assets one month before the date of announcement.	DataStream
<i>Target M/B &gt; industry mean</i>	Calculated by subtracting the yearly mean of target's market to book from the mean of the target firms in the same two-digit SIC code.	DataStream
<i>Leverage</i>	The ratio of the book value of total debt to total assets as measured twelve months before the date of announcement.	DataStream
<i>Book assets (UK£, millions)</i>	Target's total assets in millions of pounds twelve months before the date of announcement	DataStream
<i>MV (UK£, millions)</i>	The market value of equity (stock price multiplied by the number of shares outstanding in millions of pounds) twelve months before the date of announcement immediately prior to the announcement date.	DataStream

Table A1. Cont.

The Variables	Definitions	Sources
<b>Panel B: Deal characteristics</b>		
<i>Target-Initiated</i>	A dummy variable that takes the value of one if a target (bidder) firm initiated the deal, and zero otherwise.	Thomson One Banker
<i>Crisis</i>	A dummy variable that takes the value of one when a transaction occurs between the period of 1 January 2007, and 31 December 2009, and zero otherwise.	Thomson One Banker
<i>Regulation Shock</i>	A dummy variable that takes the value of one when a transaction occurs between the period of 1 January 2012, and 31 December 2018, and zero otherwise.	Thomson One Banker
<i>Private bidder</i>	A dummy variable that takes the value of one if a bidder firm is unlisted in London Exchange Market, and zero otherwise.	Thomson One Banker
<i>Toehold</i>	The percentage of the target firm's equity held by a bidder six months before the date of announcement.	Thomson One Banker

Table A2. Variable means and parameter estimates used to estimate propensity scores.

Variable Name	Logit Estimates
<b>Target Characteristics</b>	
<i>Ln (Sales)</i>	−1.777 *** (0.000)
<i>Leverage</i>	−0.082 ** (0.013)
<i>M/B</i>	−0.000 (0.990)
<b>Deal Characteristics</b>	
<i>Private Acquirer</i>	0.924 *** (0.000)
<i>Toehold</i>	−1.415 *** (0.000)
<i>Crisis</i>	1.962 *** (0.000)
<i>Regulation Shock</i>	5.263 *** (0.000)
<i>Target-Initiated</i>	0.668 * (0.085)
<b>Interactions and Squares</b>	
<i>Private Acquirer × Regulation Shock</i>	−2.982 *** (0.006)
<i>Ln (Sales) × Leverage</i>	0.007 ** (0.010)
<i>Private Acquirer × Crisis</i>	−0.991 ** (0.047)
<i>Ln (Sales)<sup>2</sup></i>	0.084 *** (0.000)
Constant	6.879 *** (0.001)
Observations	803
Pseudo R-squared	0.280

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% levels.

## Notes

- 1 [UK] Companies Act 2006, s.979.
- 2 [UK]Takeover code, Rule 21.2(a)
- 3 [UK]Takeover code, Appendix 7, s3(b)
- 4 Australian Corporations Act 2001, s.411(17).
- 5 Stamp duty is paid on transfers of shares at 0.5% of the target consideration shares-The Companies Act 2006 (Amendment of Part 17) Regulations 2015, amended s.641 substituting s.641(2A).
- 6 Typically, there are two ways to implement a scheme: cancellation or transfer. Under a cancellation scheme, the target company's shares are cancelled and new ones are issued to the bidder, while in a transfer scheme, the existing target shares are transferred to the bidder ([UK] Companies Act 2006, pt.17–28, s.641(1), s.895–901).
- 7 Schemes usually take longer in compression to the takeover offers to be organised. In this paper, we will choose to calculate bid premiums by selecting target firms' stock prices before the initial public announcement date as the base to decrease the effects of information leakage on the stock prices. As will be seen later, a takeover offer is faster from announcement to completion than a scheme, by an average of 45 (Around two months) days, and the latter needs around 100 (on average three months) days to be completed. Moreover, the scheme needs a long time to prepare the legal document, meet the shareholders in different classes, book the court, etc. Considering all possible pre-offer times of target stock price before the initial public announcement date or the SDC announcement date.
- 8 The main reason to avoid presenting too many tables for each matching strategy and the results are available upon request.

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