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Master in Corporate Finance

Determinants of earnouts in M&A deals in the UK

Master's Thesis by the 2nd year student: Kadykov Nikita Petrovich

Research advisor: Associate professor, Okulov Vitaliy Leonidovich

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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Аннотация

Автор	Кадыков Никита Петрович
Название ВКР	Детерминанты выплат по результатам в сделках слияний и поглощений в Великобритании
Образовательная программа	Менеджмент
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Научный руководитель	Окулов Виталий Леонидович
Описание цели, задач и основных результатов	Целью данной работы является выявление факторов сделки и компании-цели, которые определяют наличие выплат по результатам в сделках слияний и поглощений на рынке Великобритании. В процессе выполнения работы установлено, что выплаты по результатам с большей вероятностью возникнут в следующих ситуациях: когда у компании-цели волатильные денежные потоки, высокая доля денежных средств и нематериальных активов в общей структуре активов, а также когда компания-цель является частной или оперирует в другой отрасли по сравнению с компанией-покупателем. В то же время, было выявлено, что географическая принадлежность компаний не играет роли в данном случае. Также была построена модель исследования с использованием логистической регрессии, которая определяет вероятность включения выплат по результатам при указании вышестоящих характеристик сделки.
Ключевые слова	Выплаты по результатам, слияния и поглощения, детерминанты, волатильность денежных потоков

Abstract

Master Student's Name	Kadykov Nikita Petrovich
Master Thesis Title	Determinants of earnouts in mergers and acquisitions in the UK
Educational Program	Management
Main field of study	Corporate finance
Year	2018
Academic Advisor's Name	Okulov Vitaliy Leonidovich
Description of the goal, tasks and main results	The goal of this thesis is to identify factors of the deal and the target company that determine the inclusion of earnouts in M&A deals in the UK market. During the process of writing this thesis it was found, that earnouts are more likely to occur under the following conditions: when the target company has volatile cash flows, when it has a high share of cash and intangible assets in the structure of total assets, when it is private or operates in an industry other than the acquirer's one. It was also found that geographic positions of the acquirer and the target is irrelevant. Also, the research model with logistic regression was built, which predicts the probability of inclusion of an earnout after putting the deal characteristics in it.
Keywords	Earnout, Mergers and Acquisitions, Determinants, Volatility of cash flows

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Introduction

Mergers and acquisitions are seen as one of the ways for developing the company. Businesses may decide to acquire another company for different motives: to increase the presence in the market, acquire valuable resources, to integrate vertically or horizontally, to diversify the business. Lots of research has been done not only regarding the motives for mergers and acquisitions, but also concerning problems that a company may face when dealing with M&As.

One of the main problems is information asymmetry. Presence of information asymmetry creates an obstacle for completing the deal: a situation when the acquirer and the target have different amount of knowledge about each other makes it more difficult to come to a solution that will satisfy both parties of negotiations. The second problem is the question whether mergers and acquisitions indeed create value. There is no common opinion on this issue. Nevertheless, academic society suggest that they do.

Another group of research on mergers and acquisition is about the choice of method of payment. The majority of studies explore only common methods of payment such as cash, equity or mixed payment. Cash is suitable for transparent companies in situations when the acquirer is confident about future performance of the target, has low debt burden or when the market is undervalued. Stock can be used in opposite cases: when the acquirer has high leverage or when the market is overvalued. Nevertheless, the target may be less willing to receive stock payments since they are less certain than cash.

At the same time, there is lack of research concerning the deals financed in form of earnout. Earnout is a method of payment when it is divided in parts: initial and deferred. The deferred part is paid only in case when the objectives for the target are achieved. This approach should help to cope with the problem of information asymmetry: even if the target company does not disclose some information that could be useful for the acquirer for structuring the deal, it will just not receive the deferred premium in case of poor performance. So, it is a good tool for the acquirer to share risks with the target. For the target company, it is a good signaling mechanism – by accepting earnout agreements, it shows confidence about its future results.

There already exists literature on earnouts and factors which affect the choice of this method of payment. At the same time, it is necessary to mention that these factors were related mostly to the acquirer characteristics, such as expertise and presence in the market; and to the deal characteristics itself (being focused or cross-industry one, or the industry which the target firm operates in). It is clear that factors which affect the choice of earnout are connected with

uncertainty and information asymmetry. This research introduces and explores new determinants which affect this choice and which are related to the target firm characteristics.

Usually management of a business uses financial data for making a decision. It should also be mentioned that every merger or acquisition is unique, and it is necessary to take characteristics of a target company into account. Therefore, financial characteristics of the target were also introduced in this research.

The goal of this research is to identify factors related to the target firm and deal characteristics, which determine the choice of method of payment (earnout or not).

To do so, several objectives were set:

- Review current research on mergers and acquisitions, methods payment, earnout as a method of payment and determinants of earnout
- Basing on the literature review, introduce hypotheses about possible factors that affect the choice of earnout
- Build the research methodology and the model
- Collect the data regarding the M&A deals and target companies
- Make conclusions about the determinants and their impact on the choice of earnout
- Give practical recommendations basing on the results that would be obtained

The time period for analysis is from 01/01/2013 till 01/01/2018, it is after-crisis period till current days, that was not explored. The majority of current research is related to American market. Therefore, it was decided to choose another one, but which is also active in terms of M&A activity. The UK market was a good option.

The first part of this thesis examines existing literature and theories on M&A deals, their development, methods of payment and earnouts as one of them. Then the possible determinants are found basing on this review. The second chapter is devoted to empirical part of the research: the research model is built, data is collected, described and analyzed, results are discussed. In addition to this, managerial application and limitations and suggestions for future researched are presented.

1. Review of existing studies on M&A and earnouts

1.1. Mergers and acquisitions

1.1.1. Development of M&A

Interest in mergers and acquisitions is in the forms of waves. Till current times there were six waves of mergers, each described by its specific features.

First wave began in 1890-s, when after-depression economic environment was favorable for this. This period included mainly horizontal integration deals in mining and manufacturing industries [Gaughan, 2007]. This led to consolidation of the market, where the power was in the hands of several giant companies. The first merger wave ended in 1904 when such mergers were forbidden by anti-trust legislation.

The second merger wave started in the US in the mid-1910-s. During this period, the markets shaped from monopolies to oligopolies due to previous anti-monopoly laws. The second merger wave touched capital intensive industries, such as steel, coal and railroads [Vazirani, 2015]. This era ended in 1929, when the stock market downfall occurred [DePamphilis, 2012].

The third merger wave commenced in 1960-s and was characterized by the popularity of conglomerates, where companies benefited from opening new markets for themselves. Financial engineering also took place during that period. The companies preferred to increase EPS using acquisitions instead of reinvesting. Markets positively viewed conglomerates, better than nowadays [Holmstrom, Kaplan, 2001]. However, the activity declined in the beginning of 1970-s because of the oil crisis that worsened global economy.

The fourth wave, which took place in 1980-s, was full of hostile takeovers and leveraged buyouts. Underperformance of conglomerates and excessive diversification triggered a new wave of M&A deals. Moreover, development of technology led to overcapacity in many industries [Jensen, 1993]. Takeovers and leveraged buyout were suitable instruments for reducing excessive capacity.

The fifth merger wave occurred in 1990-s. The deregulation in some industries and low interest rates made M&A deals attractive again. During this period, hostile takeovers became less popular, and due to high stock valuations, payments in form of equity were frequently used. One more feature of this wave is the size of transactions, which became bigger. The terminator for the fifth merger wave was the internet bubble and economic recession.

The last, sixth merger wave took place at 2003-2007. Many of the deals were completed attracting leverage or private equity funds. Another feature was the cross-border character of

transactions. Structure of the deal was an object to negotiate in a friendly way, and cash was the primary form of payment. The sixth merger wave came to an end in 2008, when a new economic crisis happened.

Table 1. Characteristics of six merger waves.

Time period	Major industries	Key features
1897-1904	Steel mining manufacturing	Markets tend to be monopolistic Horizontal integration
1916-1929	Food steel railroads	Oligopolistic market
1965-1969	Electricity chemicals	Trend of diversification dominance of conglomerates
1981-1989	Oil and gas textiles	Break-up of many conglomerates, hostile takeovers
1993-2000	Banking healthcare	Equity payments deregulation of industries
2003-2007	Banking Media	Cross-border transactions participation of private equity funds

Source: Yaghoubi et al., 2016, Vazirani, 2015

1.1.2. Reasons for M&A

Managerial perspective

Jensen and Ruback [1983] mentioned the role of managers in M&A market: they see it as a competition among different management teams that are competing for scarce corporate resources. When the acquisition takes place, the ability to manage those resources is in hands of the top management of the bidder. Authors therefore claim that competition itself is the driver for M&A deals. There are two main theories that can be tied to managerial perspective. Managers may complete an acquisition to increase the wealth for shareholders, which corresponds with neoclassical theory. On the contrary, they can act in their own interest and by doing so, reduce the wealth of shareholders, which relates to agency costs problem.

So, under neoclassical theory assumptions, managers of a firm make an acquisition in order to increase the wealth of shareholders. To achieve this goal, they are looking for opportunities that

create value and synergies. Deals that did not create additional value can be explained by mistaken decisions of management. According to Roll [1986], the reason of mistaken decisions is the overconfidence of managers who think that their estimates of the target company are correct.

Opposite to this, agency costs theory claims that management completes M&A deals because of their interests, not shareholders' ones. One of examples of such interests can be the willingness to minimize the "employment risk" [Amihud, Lev, 1981]. This is actual especially for the period of the third merger wave, when conglomerate mergers took place. After acquiring a company, managers actually have one more option for further career development. Another variant is the willingness of managers to make themselves indispensable, since it will be costly and risky to replace the managers of the acquirer, since they are involved in many processes. Recent literature suggests that the envy of managers can be the reason for an acquisition [Goel, Thakor, 2010]. Top management thinks that top managers of bigger companies has greater compensation, and therefore expand to make their company bigger to pursue their material motives.

Industry perspective

Mergers can be seen as a response to industry changes, such as introduction of new technologies, changes in structure of costs, deregulation. Firms that are not enough flexible become a target for other companies that will utilize the resources more effectively. Mitchell together with Mulherin [1996] showed that industry changes affect the merger activity. It was shown that industry shocks triggered acquisitions in 1980s. Andrade et al [2001] also estimated that deregulation stimulated a number of acquisitions.

When the industry is characterized with firms of relatively the same size, they can commence an acquisition as a defensive step in order not to be acquired by other company [Gorton et al., 2009]. On the contrary, when there is only one big company in industry, companies may acquire each other in order to become an attractive target for that big company.

Macroeconomic perspective and cyclical mergers

There exists a theory that explains the reasons for takeovers at macroeconomic level which was offered by Toxvaerd [2008]. He created a dynamic model of merger activity in which they take place as an equilibrium. He claims that under specific external economic conditions, merger waves occur as a consequence of interaction among a group of bidders who pretend for scarce targets. The moment of takeovers is defined by the tradeoff between the benefits of waiting for better market conditions and risks of losing the competition with rivals. This in turn leads to so called merger waves. Following conclusions can be done from this model. First of all, mergers and acquisitions need to be done in favorable economic situation. Second, M&A deals take place

earlier than they could due to competition. At last, multiple bids take place at later periods of merger waves, because during these periods competition is more severe.

Behavioral perspective

From this perspective, actions of companies are the consequences of the market mispricing. Such a market situation when stocks of a company are overvalued, makes them eager to acquire normally valued or undervalued companies using stocks. Opposite to hubris hypothesis which states that markets are efficient, but managers are not, behavioral theory claims that acquisitions are a type of arbitrage in which managers benefit from market imperfections. This hypothesis is based on findings of Jovanovic and Rousseau [2001], who gave evidence that M&A activity and shares valuation are positively correlated. Thus, managers of the acquiring company benefit from misvaluations in the market. Rhodes and Viswanathan [2004] claim that the willingness of overvalued bidders to use shares in acquisition is not fully explained, because targets often do not want to accept overvalued shares: when the market is overvalued, the target discounts the expected sum of given share bid. Thus, misvaluation affects the form of payment: there will be more stock M&A deals when there is an overvaluation of the market and cash deals when the market is undervalued.

1.1.3. Consequences of M&A

Macroeconomic effects

Existing studies state that wealth effects of M&As are little but positive [Andrade et al., 2001]. Still, it is an open question whether M&A deals indeed create value or only transfer wealth to shareholders. Shleifer and Summers [1988] concluded that if the value gains are just a redistribution of wealth to stockholders, it does not create efficiency improvements. Holmstrom and Kaplan [2001] state that it is difficult to identify the overall effect of the deals on economy due to the presence of many other factors that can also influence the productivity. There are some reasons for concluding that the impact of mergers and acquisition on economy is insignificant:

- Prior studies found negative results in the long term for the acquirers
- The sources which create gains are still not identified

There is also a possibility that mergers change the structure of competition. Lack of antitrust regulations may result in M&A deals that build monopolistic empires. There already has been such a situation during the first merger wave. The main consequence of such deals is the decreasing the level of competition. Stigler [1950] states that the 1st merger wave resulted in monopolization of many industries – many of them were shaped by the companies which had more than half of total market share. But later, with introduction of antitrust legislation, it became

possible to change the trend and switch the market structure to oligopoly. There exist several studies that investigate the impact of mergers on the market share of bidders. Mueller [1985] concluded that the market share of acquirers decreases if compared with companies that did not make mergers and acquisitions. At the same time, despite the decline in sales after the deal, net income of the new company increases [Gugler et al., 2003].

Microeconomic effects

One of the major aspect of effects on microeconomic level is the wealth effect, both announcement and long-term. Talking about announcement wealth effects, it is shown that target companies usually benefit from announcements, while the bidders' gains are insignificant. At the same time, there is no common opinion about long-term performance. Conclusions of the researches depend a lot on metrics that were used for the research. Thus, authors who applied long-term abnormal returns technique found that post-merger performance is neutral or even negative. Opposite to this, authors who applied financial ratios or EVA (economic value added) techniques observed positive results of long-term performance. [Yaghoubi et al., 2015]

Synergies

Achieving synergies is one of the goals that companies pursue when deciding to complete a merger or an acquisition. There are two main types of synergies that can be extracted from an acquisition: operational and financial. Operational ones result in decline of production costs. Financial synergies result in taking advantage of tax shields, reduction of default risk and ability to attract more financing [Jensen, Ruback, 1983]. Operational synergies become possible if the economies of scope and scale are utilized [Wang, Xie, 2009]. One of initial works on financial synergies was written by Lewellen [1971]. The author concluded that M&A deals reduce the likelihood of default and reduce the cost of capital. Leland [2007] developed this idea but argued that that financial synergies may also have negative results. He also offered different results of financial synergies:

- Change in company value (unlevered)
- Change in tax savings
- Change in sum of costs of default

Researchers also found out what kind of synergy shapes new merged company more? Devos et al. [2009] gave evidence for this question: they stated that synergy gains are explained mainly by operational synergies rather than financial.

Leverage

Previous studies show that bidders are less levered than companies not involved in M&A activity; and after the acquisition increase the leverage [Uysal, 2011]. As it was mentioned by Lewellen [1971], M&As mitigate the default risk, and therefore enlarge the debt capacity. This in turn gives an opportunity to increase the leverage and tax savings. The growth of debt capacity can be explained by unused capacities of the bidder and the target firms [Bruner, 1988].

At the same time, in mergers aimed at diversifying the business, imperfect correlation between bidder's and target's cash flows takes place, and coinsurance effect can lower the cost of capital of a new merged firm [Hann et al., 2013]. This coinsurance effect declines the volatility of cash flows and thus reduces costs of both debt and equity. The new rates for debt and equity lead to a new better capital structure. So, this study shows that that M&A deals do not necessary lead to the higher leverage than the acquirer had before. It is true that tax benefits that are caused by higher leverage enhance cash flows, but lesser cost of capital also creates value.

To sum it up, we can say that mergers and acquisitions by increasing debt capacity create opportunities for lowering the cost of capital and utilizing tax benefits from having a higher leverage. Debtholders have income from safer debt, while benefits from taxation are for stockholders. At the same time, there should be a limit because being overleveraged leads to opposite effects.

1.1.4. Theories on choice of method of payment.

Choice of method of payment is one of the key decisions when structuring the deal, because all the points regarding the acquirer, the target company and the character of the deal itself should be taken into account. The question what drives the choice of a particular method of payment was studied by many researchers, and there are several theories which explain this choice [Grigorieva, 2012]:

- Theory of availability of financial resources
- Theory of information asymmetry
- Theory of investment opportunities
- Theory of the relative size of a deal
- Theory of external control
- Theory of structure of ownership

Theory of availability of financial resources

According to this theory, the company-bidder is often limited regarding the possibility of using cash as a method of payment as a consequence of its scarcity. Therefore, for financing mergers and acquisitions with cash, companies frequently raise this cash by attracting new debt. If the leverage is high, a company may prefer to choose shares as a form of financing due to difficulties or unwillingness to further increase the leverage. These preferences of the companies were discussed by Myers [1984], who in research found out that firms prefer the sources of financing in the following order:

1. Internal resources
2. Debt
3. Hybrid securities (for example, convertible bonds)
4. Equity

Actually, when a company has sufficient reserves of cash, it can feel more freely when making a decision whether to choose cash as a form of payment. The size of the acquirer may also play role, because large companies have better access to debt capital markets.

There were several empirical works on this theory, but their results are quite different. Faccio et al. [2004] concluded that the volume of assets of an acquirer and his leverage are statistically significant factors for the choice of method of payment in M&A transactions; authors also observed that better access to bank financing increase the likelihood of choosing cash as an acquisition currency. At the same time, Martin [1996] in his research stated that debt burden ratio as well as the deal size are not significant when explaining the method of payment.

Theory of information asymmetry

This theory was introduced in the work of Myers and Majluf [Myers, Majluf, 1984]. Its idea is the following: there exists an information asymmetry between the bidder and other participants of the market. Information asymmetry is a situation when various parties have unequal or different information regarding the same object. In this case, management of the bidder company may take advantage of information asymmetry when choosing the method of payment. Thus, if managers think that their shares are undervalued, it motivates them to use cash as an acquisition currency, and vice versa: if shares of the bidder are overvalued, managers would prefer stocks as an acquisition currency. This effect was also discussed by other researches [Dong et al., 2006; Di Giuli, 2008].

It should be mentioned that information asymmetry touches not only the bidder but also the target company. Lack of information about the target company may motivate the acquirer to use shares as a payment currency. In situations when the price paid for the target is too high, market

will respond with decline in the share price. Thus, after the deal both acquirer and the target will face the consequences of this decline. Hansen [1987] developed a theoretical model, which shows that the bidder may use shares as a tool for redistributing the risk of overvaluation the target to target shareholders.

Theory of investment opportunities

From perspective of this theory, when choosing the method of payment, management of the acquirer is guided by the presence other promising investment opportunities for the company. If these opportunities do exist, the company-acquirer will be more likely to choose shares as an acquisition currency. This in turn will allow to save cash and not to increase the debt burden when completing the deal. Therefore, after the deal the company will still have an option to attract financing on the debt markets for other investment projects.

There are several examples of works where this theory was tested and proved: these are the papers of Martin [1996] and Dong with co-authors [Dong et al., 1996]. It is rather complicated to test the hypothesis with empirical data, because explanatory variables in this case are similar to those for checking the theory of asymmetry of information (market-to-book value of equity, Tobin's Q).

Di Giuli [2008] made an attempt to distinguish the effects of information asymmetry and investment opportunities theory in his research. He used capital expenses during the four years after the deal as a proxy for future investment opportunities. It is reasonable because actual capital expenses are highly correlated with expected capital expenses at the moment of completion of M&A deals [Lamont, 2000]. The research of Giuli showed that companies that choose stocks as an acquisition currency invest more during the post-acquisition period if compared to companies that prefer cash.

Theory of the relative size of a deal

This theory suggests that in case when the size of acquired company is significant in comparison with the acquirer, then the chance that shares will be chosen as an acquisition currency is higher. Empirical works support this theory [Grullon, 1997; Zhang, 2001]. These authors found out that the bigger the price for the target company (compared to the bidder), the greater is the possibility of choosing shares or shares with cash as a method of payment.

Nevertheless, there is no common opinion. Martin [1996] in his research has the opposite conclusions. He found that the ratio of the size of the deal to the bidders capitalization 20 days

prior to the official announcement of the deal is not significant for explaining the choice of method of payment in mergers and acquisitions.

Ghosh and Ruland [1998] continued to explore this field of studies and concluded the following: on the one hand, relatively high volume of transaction motivates management of the bidder to use shares in order not to increase the leverage. On the other hand, using stocks for payment leads to diluting the proportion of current shareholders of the bidder company. Both these effects equalize each other, and, therefore, total impact is miserable. Moreover, when the relative size is greater, the greater is the chance of overvaluation of the assets of a target company. Due to this, management of the bidder wants to share risks with the target management and chooses shares as a method of payment. Due to this, it can be said that the relative size of the deal is not the main factor when considering the form of payment, but a catalysator for other factors which determine the method of payment.

Theory of external control

Institutional investors can act as external controllers of management actions; the same role can be regarded to investors who have the control stake of bidder's stocks. It was shown in several studies [Bruner, Asquith, 1990; Bruner, 2004] that in case when stocks are the method of payment, the value gains for of bidder's shareholders are lesser than those in situation when cash is used, which can motivate external controllers to block decisions regarding the choice of shares as acquisition currency in M&A deals. Thus, when institutional investors control a significant stake of shares of the bidder, the likelihood of shares to be the method of payment. This theory was proved by Martin [1996], who showed that there is a statistically significant negative relationship between the stake of equity owned by institutional investors and the likelihood of using stocks as an method of payment, but presence of blocking stockholder does not affect the choice of method of payment

Theory of structure of ownership

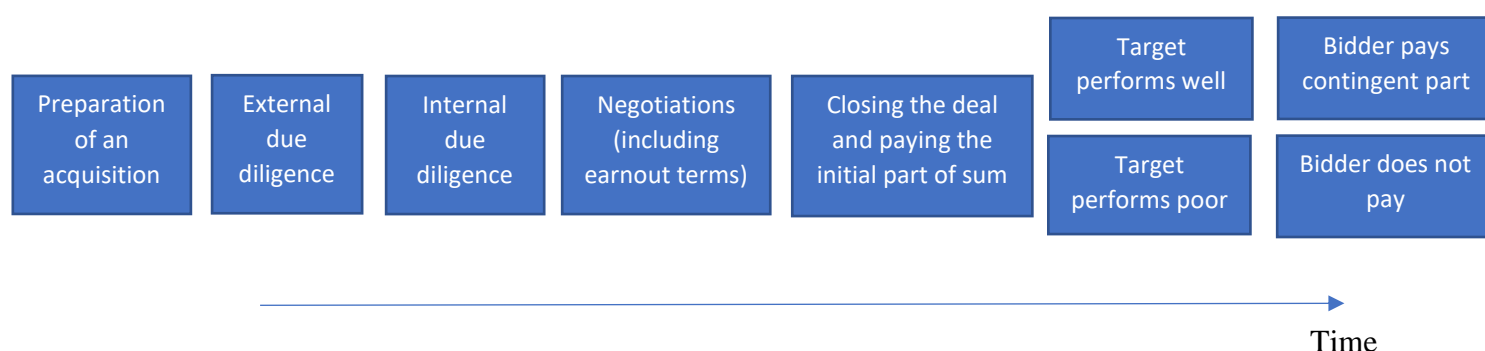
The idea of this theory is to understand how structure of ownership can affect the choice of method of payment in mergers and acquisitions. Financing these deals with shares, as it was mentioned previously, leads to dilution of stake of equity that is under control of existent shareholders of the company. In case when the management of the bidder company owns a stake in equity of their company, cash payment can be preferred due to the willingness of management to retain control over the company. This hypothesis was proved by Stulz [1988], who identified that there is a negative relationship between the likelihood of choosing stocks as an acquisition currency and the amount of equity owned by management.

A study completed by Martin [1996] developed previous findings. He concluded that negative relationship between the stake of equity owned by management and likelihood of stocks being an acquisition currency is nonlinear. This correlation is significant within the range from 5 to 25% shares belonging to management, but it is less significant with other percentage of ownership. This nonlinear character can be explained in the following way: when management owns more stocks, the dilution will be not that negative for them. In case when the share is small than 5%, control is not the primary interest for managers.

1.2. Review on earnouts as a method of payment

1.2.1. Earnout, its rationale and characteristics

The primary goal of an earnout is to minimize the risk of adverse selection for the acquirer. Its idea is pretty clear – the acquirer does not have to pay all the value of the deal at one moment. The whole sum is divided in several parts – the initial one, that is fixed and paid at the moment of closing the deal, and deferred ones. The process of an M&A deal which includes an earnout can be visualized in the following way:



Picture 1. Process of M&A deal with earnout.

But deferred payments are paid only in case when the target company performs well. Criteria upon which the acquirer understand whether the target performs well or good are negotiated during the deal structuring. Earnout is a rather flexible instrument which can be adjusted for both the acquirers and the target companies – there are several terms of an earnout that can be tailored for the negotiating parties:

- The proportion of initial and contingent payment
- Measures that identify the performance
- Time period (usually, one to three (five) years)
- Form of payment (stock, cash or mixed)

The proportion of earnout to the total value of the deal varies a lot. Usually, it varies from 30 to 50% of the total value of the deal. This figure depends on the differences in valuation gap between the bidder and target company, and also the uncertainty associated with the deal. Also Kohers and Ang [2000] showed that the deferred part of payment is bigger when the size of the target is bigger if compared to the acquirer and when the total value of the deal increases: in these cases the cost of misvaluation becomes more severe for the acquirer.

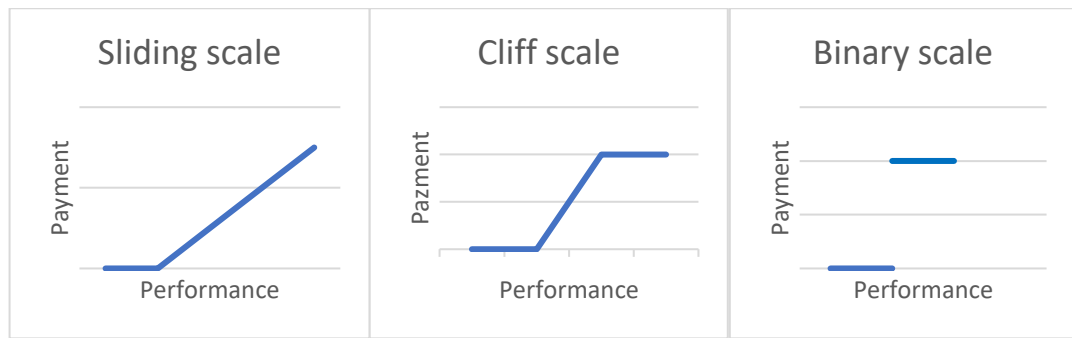
Mentioning the measures, they can be either financial or non-financial ones. Financial measures include such performance figures as revenues, available cash flows, EBIT or EBITDA, profitability indicators, or costs that directly affect the performance of an organization [Quinn, 2013]. Non-financial measures may include achieving the level of desirable market share, approvals (especially relevant for pharmaceutical industry) or non-financial proxies for financial indicators, such as unit sales instead of revenue.

Time period also varies and usually lies in range between one to three or five years. The maturity of an earnout agreement should be sufficient for achieving the goals that were set. Form of payment can also differ: the rest part of payment can be completed with stocks or shares.

Earnouts are also included in the structure of an M&A deal to retain the management of the target company [Kohers, Ang, 2000]. It may be reasonable to retain the management of a target company in case when it is rich with intangible assets, such as human capital or patents. Current management of the target company is likely to have expertise and skills that fit those assets. In addition, they have unique knowledge about the specifics of target's operations. This is why it is reasonable to retain management since it creates opportunities for increasing the value of target company [Barbopoulos, Sudarsanam, 2012]. To do so, the acquirer can relate the deferred payment to the length of contract with current managers, or to negotiate earnout conditions in such a way that an acquisition premium will be in form of a deferred bonus. Moreover, it allows the acquirer to decrease the risk of competition – if the management of the target firm stays, it will not go to competitors or create their own business that will compete with the acquirer.

At the same time, earnout is an interesting tool for the target company, too. The readiness of the target company to include earnout in the structure of the deal can serve as a signaling mechanism. By doing so, the target company makes the bidder understand that it is a high-quality seller and it is sure in ability to achieve the results that were set.

The payments within earnout agreements can also differ by their nature: they can be in the form of sliding scale, cliffs or of binary type.



Picture 2. Different approaches to earnout payments

Binary triggers are widespread and quite easy to control. Its idea is the following: earnout payment is activated if set goal was achieved. To be a binary one, this goal should be explained by yes/no result. This type of trigger is suitable for non-financial performance measures, such as launching a new product, creating a new technology or getting an approval. This approach is straightforward and easy to understand but has some disadvantages. Binary approach suggests “all or nothing” reward, and in cases when the target’s management understands that it has little chances to achieve the goal, it finally loses the motivation and do not put further effort.

To cope with this problem, negotiating parties may choose payments on a sliding scale. It is opposite to the binary approach and can be applied only to measurable metrics. In this case the reward for the target company will be proportional to its performance. At the same time, there is no clear objectives to achieve, just relationship between the performance and reward. Example of such reward can be percentage of sales or other financial metric.

Cliff trigger combines the features of binary and sliding scale approaches. If the objective is not achieved, the target company does not get the contingent reward. Then, starting from a particular result, it can get a payment, which varies within a certain range. Also there exist the maximum results, after which the payment does not increase.

1.2.2. Earnout vs cash vs stock

When negotiating the price of the M&A deal, the firm-target and the firm-buyer often have different valuation figures. This happens due to existence of information asymmetry, which creates valuation risk. Due to the lack of information, the bidder is demanding for a discount to compensate the lack of information. This problem was discussed in the works of Travlos and Chang [Travlos, 1987; Chang, 1998]. This valuation risk may lead to a situation in which the bidder pays too much for the target company. This, in turn, may make value gains for the bidder company shareholders lower.

If the deal is processed in the form of stock exchange, the shareholders of the target firm then become the shareholders of a new merged company and thus share the risk of valuation with the shareholders of the bidder firm after the acquisition [Hansen, 1987]. Therefore, if the company-buyer wants to alleviate the valuation risks from information asymmetries it will be more likely to prefer to do a stock exchange instead of cash offer. At the same time, the shareholders of the target company may think that the willingness of the bidder to pay with stocks can be explained with the fact of overvaluation of the bidder's shares, and therefore will not be willing to accept this offer [Shleifer, Vishny, 2003]. Taking this into account, there is a big possibility that the firm-target will demand an additional premium to accept this bid.

Cash is more certain in this case, because its value does not vary depending on later performance of acquired company. Therefore, cash offer helps to avoid the "lemon problem" (a situation when fair value is less than it seems to be) for the acquired company. Fishman [1989] claimed that if the bidder offers a high sum in cash, it is a signal that the bidder is sure in good performance under its control. Thus, acquirers who are not enough sure would not pay in cash but offer a stock exchange.

Barbopoulos in his article describes an earnout as an alternative to cash or stock payments in M&A [Barbopoulos, Sudarsanam, 2012]. Earnout is a form of payment in financing of mergers and acquisitions, which is described by two stages – initial (first) and the second, which is dependent on the performance of the target firm. The latter payment is dependent on the results shown by the target and the fact whether it has met the goals that were set [Reuer et al, 2004]. The performance targets, as well as the portion of contingent reward and duration of the payment period are the points to be included into the merger agreement. Earnout allows to evaluate the target company not only once at the moment of acquisition, but for a longer period of time, which, in turn, allows to perform more precise valuation.

Kohers and Ang [2000], as well as Cain et al. [2011] in their research papers showed that earnouts are used in a big number of M&A transactions. The level of information asymmetry indicates the usefulness of including earnout. This problem is especially acute when the target firm is operating in dynamically developing industry or when the firm is at early stages of development. Therefore, it will be more difficult to predict financial cash flows [Officer et al., 2009].

One more reason for using earnouts is the desire to reduce the cost of valuation uncertainty and moral hazards, according to Cain et al. [2011]. The authors made several conclusions:

- The size of an earnout has positive relation to the uncertainty of the value of a target firm

- The period of an earnout is longer when uncertainty of valuation lasts longer
- The performance measure choice is predetermined by its possibility to be verified

There is no common opinion about post-acquisition performance and gains in ordinary M&A deals. For instance, there is an opinion that bidders face losses of wealth [Loughran, Vijh, 1997] in the long term after the acquisition, whereas Higson and Elliott [1998] claim that companies-buyers break-even after the acquisition. At the same time, Powell and Stark [2005] give evidence that companies improve their performance in the post-acquisition period. Such a difference in observations of wealth effects creates questions regarding the factors that facilitate post-acquisition gains.

At the same time, there exist several studies which found the value that can be added by earnouts. It was found that average AR (abnormal return) for the bidders who included earnouts in the deals, equals to 1,36% at the announcement day [Kohers, Ang, 2000]. It shows that market positively reacts to the decision to add earnout because it reduces risks for the acquirer. This positive reaction is relevant not only for the announcement day, but for longer timeframes. For instance, 31 days CAR for the acquisitions of private companies using earnout is equal to 5,39%, opposite to 1,45% when the deal is completed in cash and 1,13% in stock. Barbopoulos [2012] obtained similar results in his research – it was shown that on overall value gains for the acquirers who include earnout are higher than for those who do not do so. At the same time, the gains for acquirers who use earnouts are higher when there is more uncertainty regarding the target company or the deal itself.

1.2.3. International and inter-industrial aspects

The problem of information asymmetry is especially actual for international mergers and acquisitions. The bidder is often unfamiliar with the specifics of the country and culture of the target company [Zaheer, 1995]. This problem is especially acute in cases when the bidder has no or limited experience in working internationally [Johanson, Vahlne, 1977]. Another obstacle for international M&A deals is the difference in legal procedures and accounting standards, which leads to increase of transaction costs [Datta, Puia, 1995]. Such complications can make companies just avoiding doing international M&A transactions or to enter new markets through opening joint ventures [Hennart, Reddy, 1997]. In this case earnout is a contractual solution for this problem, because after implementing an earnout a part of mis-valuation risk is shared with the target firm. If the target company is well performing and is sure in its future results, it will be likely to accept to include an earnout in the deal, and by doing so, send a signal to the bidder [Spence, 1974]. It is rather important to succeed in international M&A deals because potentially they can benefit a lot.

For example, Harris and Ravenscraft [1991] indicate that markets react to cross-border acquisitions even more positively than to domestic ones.

Such a situation is typical not only for domestic/cross-border acquisitions, but for core/noncore M&A deals. For example, in horizontal mergers two companies will likely have similarities in business operations and organizational structure [Gordon, 1991]. On the contrary, when the bidder is interested in a company with noncore activity, he has limited knowledge about the true value of disposable resources. This in turn increases the chances of adverse selection.

1.2.4. Asset perspective

The benefits of using an earnout depend not only on the relations between the bidder and the target, but also on the nature of the resources that will be acquired. For instance, the bidder may want to acquire a company in unfamiliar market, but the industry is relied on the resources that can be easily valued. In this case the possibility of an adverse selection is not that high due to underlying resources. Researches claim, that the more standardized the resource, the more accurate the valuation is [Kogut, Zander, 1992]. Opposite to this, such industries as IT create more difficulties for valuing the company due to its reliability on intangible assets. Because of this, big share of the value will be related not to the assets themselves but to the opportunity of growth they create. In addition, as the degree to which the knowledge is tacit increases, the more difficult it is to assess the possibility to transfer it to the bidder [Coff, 1999].

1.2.5. Benefits and problems

Talking about the advantages that earnout contracts give, the main of them are to “agree to disagree” and “agree to stay” at the same time [Kohers, Ang, 2000]. It is normal that the bidder and target company have different estimations of the value of the target company. Therefore, a single payment cannot satisfy the bidder, because he is less informed. Thus, it is difficult to come to a win-win solution. In this case, such a payment that is divided into parts that are paid in different periods of time and when the latter is dependent on the performance of the target company can solve this problem. So, the initial payment shows the extent to which both parties agree, and the deferred part indicates the extent to which the bidder and target disagree. In this case, the bidder reduces the risk of overpayment because in case of bad performance he just will not pay the deferred part of payment. By agreeing to stay authors mean that managers of the target company may become an integral part of creating the value, they have deep knowledge about all details of their business, which cannot be easily replaced [Coff, 1997]. Therefore, there is a reason to retain the management of the target firm. It becomes possible with implementation of earnouts – it makes managers interested in staying within the company and achieving the results to get their bonuses.

Nevertheless, earnouts have several disadvantages which prevent companies from including them into a deal [Boyce, Hewitt, 1998]. It is rather difficult to negotiate all the points of an earnout, such as the length of earnout period, metrics which assess the results of the target company, accounting methods to be used. Moreover, the format of an earnout itself and its relatively short duration may stimulate the target managers to do actions that increase the possibility of getting the deferred payment at the cost of long-term prosperity of the company. For example, they can reduce investments in research and development, maintenance expenses, which result in short-term improvement of financials but make a company less competitive in the long term. One more problem is the need to calculate the performance of the target company at stand-alone basis, which assumes low integration of the companies, which is not true when bidders are searching for immediate synergy effects when combining two firms [Capron, 1999].

1.2.6. For private companies

Information asymmetry represents different levels of valuation risk for public and privately held companies-targets. Existing literature claims that it is possible to find sufficient information about public companies with the use of their annual financial reports and analysts forecasts [Draper and Paudyal, 2006]. It is more complicated to find similar information about non-public companies. Thus, the influence of earnouts on value creation for acquirer can differ a lot for public and non-public companies. This statement was supported in several studies which showed that acquirers of privately-held firms enjoy more significant gains than acquirers of public companies [Fuller et al., 2002].

Including an earnout in the structure of an M&A deal may be also relevant for young companies. They are more likely to face valuation problems, whereas established companies are less problematic in these terms. A new company does not have lots of available historical data, and current information that is available is not always reliable due to organizational routines and lack of accountability [Hannan, Freeman, 1989]. The information about new ventures is often asymmetric because these companies have the motivation not to share a lot of information they dispose, because it can be used by competitors and put them into advantageous positions [Casson, 1995]. In addition to this, companies at early stages of development lack support from companies which can endorse them [Podolny, 1993]. Basing on this literature, we can say that as a new company grows up and becomes a mature organization, it improves its operations, organizational procedures, creates historical data, and this, in turn, reduces the extent of disagreement in valuation. Therefore, it is possible to say that earnout is more attractive when buying a new venture instead of mature organization due to information asymmetry which is more severe for new ventures rather than for mature organizations.

There are different ways to cope with information asymmetry, such as target selection (choosing such a company which is nearby or has publicly available information (public companies)) or signaling. Another solution is to agree on shared ownership instead of full acquisition to mitigate the risk of adverse selection. Shared ownership is characterized by low level of sunk and contracting costs, and measurement issues. Nevertheless, minority equity partnerships have other possible costs due to lack of control over the target and limited presence in the board of directors; opposite to minority equity partnerships, earnouts do not have these problems.

1.2.7. Hypotheses development

Hypothesis 1: the likelihood of earnout to be chosen as an acquisition currency is higher when target company has higher intangible assets to total assets ratio.

Intangible assets, such as intellectual capital are more difficult to manage than tangible assets. Therefore, they are an additional source of uncertainty that can lead to incorrect valuation of the target company and make more difficult to forecast its future performance. In addition to this, it is a challenge to fairly measure and reflect them in financial reporting.

Previous studies investigated only industries, such as healthcare, telecom and IT, as factors which determine the choice of earnout when structuring the deal [Barbopoulos, Sudarsanam, 2012; Kohers, Ang, 2000]. These industries can be characterized by high proportion of intangible assets in the structure of total assets. Nevertheless, just types of industries were tested, but not the specifics of assets of target companies. Therefore, it was decided to check not these types of industries as determinants, but their main feature, such as high amount of intangible assets, which is a new knowledge presented by this thesis.

Hypothesis 2: the likelihood of earnout to be chosen as an acquisition currency is higher when the target company has higher cash ratio.

Target companies rich with cash are quite often attractive for the bidders, since this cash can be used for paying out existing debt, for instance. Regarding earnouts, cash reserves may attract the bidder in such a way that cash that the target has can be used for paying the deferred part of payment. Actually, the acquirer does not have to spend its own savings or attract any additional financing. This idea was introduced by Waryjas et al. [2011] and proven in research of Luchinina [2014] (on a worldwide sample of the deals).

Hypothesis 3: the likelihood of earnout to be chosen as an acquisition currency is higher when the target company generates more volatile cash flows.

This assumption was not introduced in previous studies regarding the UK market. There is only one research that tested this hypothesis [Luchinina, 2014], but it was not tied to any particular market. Other researches checked various deal-related factors, such as industry of the target company. These industries tend to be rapidly changing, and companies which operate in these industries can perform unstable. Unstable performance means that the target company may either outperform or underperform expected levels. Therefore, earnout may be an interesting solution for both the acquirer and the target: the acquirer protects himself from underperformance of the acquired company. At the same time, the target company may have an opportunity to receive an additional payment in case of good performance. Therefore, it was chosen to check the volatility of cash flows of the target company as a determinant for the choice of earnout as an acquisition currency. It is expected that the higher is the volatility of cash flows, the higher is the likelihood of earnout to be included in the structure of an M&A deal.

Hypothesis 4: the likelihood of earnout to be chosen as an acquisition currency is higher when the acquirer and the target are from different industries.

In this case information asymmetry takes place, which in turn can result in adverse selection of the target. The acquirer may have insufficient knowledge to adequately assess the potential benefits of the deal or to evaluate the target incorrectly. Earnout should mitigate these risks by tying future payment to performance of the target. This idea was discussed by Kohers and Ang [2000] and Datar et al. [2001].

Hypothesis 5: the likelihood of earnout to be chosen as an acquisition currency is higher when the acquirer and the target are from different countries.

This hypothesis is similar to the previous one. Instead of industries we test countries where the bidder and the target operate as a factor which affects the choice of method of payment. Different geographical position also creates uncertainty regarding the deal: it can be business specifics as well as cultural aspects. This hypothesis was previously tested by Datar et al. [2001], but the results did not support that hypothesis. Therefore, it was decided to test it once again in this thesis.

Hypothesis 6: the likelihood of earnout to be chosen as an acquisition currency is higher when the target company is private.

When the target company is private, it is a source of information asymmetry between the target and the acquirer. Since the target is not listed, there is no historical market information about the company which could be considered during the process of due diligence. Private companies

may be less transparent than public ones, and it is more difficult to get into business processes of such an organization. This in turn again increases uncertainty about future performance of the company [Datar et al., 2001; Barbopoulos, Sudarsanam, 2012].

2. Analysis of earnout determinants.

2.1. Research method.

Previous research papers devoted to finding determinants of earnouts in mergers and acquisitions have logistic regression as a tool for identifying these factors. It should be a logistic regression, but not a linear one, because the choice of earnout as an acquisition currency can be expressed only in a binary manner (0 if it is non-earnout or 1 if it is an earnout). Thus, the model is the following:

$$Prob(i) = F(\beta_0 + \beta_1 private(i) + \beta_2 crossborder(i) + \beta_3 crossindustry(i) + \beta_4 cash(i) + \beta_5 intangible(i) + \beta_6 volatility(i) + \varepsilon(i))$$

, where Prob(i) is the probability of earnout to be included in the deal, and F is a logistic function.

2.2. Variables

As this thesis is aimed at finding the factors which determine the choice of earnout as a method of payment, the dependent variable will be the presence of earnout in the structure of a deal. Since there are only “yes/no” options for this decision, it is a binary variable, where it equals 1 when earnout is included in the deal and 0 otherwise.

The dependent variable mentioned above is dependent on several regressors. The first is the volatility of cash flows. EBITDA has been chosen as a proxy for cash flows, because it is more similar to free cash flow and it is more difficult to manipulate than net income or EBIT. To calculate volatility, standard deviation formula was used. To have an ability to work with the numbers of both bigger and smaller companies it was decided to calculate relative rather than absolute figures. First, average EBITDA for three years prior to the acquisition was calculated. Then, relative change from EBITDA of each of these years to the average was calculated as $(EBITDA_t - EBITDA_{average})/EBITDA_{average}$. Then standard deviation of these three figures was calculated. The formula of standard deviation is the following:

$$Volatility = \sqrt{\frac{\sum_{t=1}^{t-3} (change\ EBITDA_t - change\ EBITDA_{av})^2}{n}}$$

where $n=3$ because information for three previous years was taken

The next variable should show the extent to which the target company is rich with cash resources. For this purpose, cash ratio was calculated: cash and cash equivalents are divided by the total assets of the target:

$$\text{Cash ratio} = \frac{\text{cash and cash equivalents}}{\text{total assets}}$$

The next variable is also related to financial conditions of the target company. Previous researches tested particular industries which had high presence of intangible assets in common. In this thesis it was decided to test not industries but financial features of the target. So, the variable “intangible” was introduced. It is calculated with the following formula:

$$\text{Intangible} = \frac{\text{intangible assets}}{\text{total assets}}$$

To identify whether the target company is private or a public one, the variable “private” was introduced. It is a dummy variable which equals 1 when the target company was listed at the moment of an acquisition and 0 otherwise.

Next two variables refer not to the features of the target company but to the features of the deal itself.

To find out whether the bidder and the target are from the same industry or not, variable “cross-industry” was introduced. For defining the industry which companies operate in, SIC (Standard Industrial classification) was used. From this code, the first two digits were taken as a identificatory of an industry. The same approach for identifying industries was used in previous researches [Kohers, Ang, 2000], Barbopoulos [2012]. It is a binary variable which equals 1 when the bidder and the acquirer are not from the same country and 0 otherwise.

The variable “cross-border” identifies whether the deal is an international one. It equals 1 if the bidder and the target companies are not from the same country and 0 otherwise.

The brief summary on the variables is provided below:

Table 2. Summary on the variables.

Variable	Description	Type
Earnout	Method of payment: 1 if earnout was included into structure of the deal, 0 otherwise	Binary

Private	1 if the target company is not listed, 0 otherwise	Binary
Cross-border	1 if the acquirer and the target are not from the same country, 0 otherwise	Binary
Cross-industry	1 if the acquirer and the target are not from the same industry, 0 otherwise	Binary
Cash ratio	Cash ratio of the target company calculated as the ratio of cash to total assets	Numerical
Intangibles ratio	The share of intangible assets of the target company	Numerical
Volatility	The volatility of cash flows generated by the target firm 3 years prior to acquisition	Numerical

Source: author's analysis

2.3. Data collection

To complete the quantitative analysis, the following data was needed:

- Country of the acquirer
- Country of the target
- Industry of the acquirer
- Industry of the target
- Information whether target company is listed or not
- Financial statements of target companies (to calculate cash/ total assets, intangible assets/total assets ratios and EBITDA)
- Method of payment that was used (to distinguish earnout and non-earnout deals)

The searching strategy was the following:

- Geographic region: United Kingdom (UK) - acquirer
- Time period: 01/01/2013 – 01/01/2018
- Deal status: completed-confirmed
- Deal value: 1 million EUR minimum
- Stake acquired: 50% equity minimum

- Type of the deal: merger, acquisition

For searching for the details of transactions that were mentioned above, Zephyr database was used. For searching for the financial figures of the target company, Amadeus database was used.

2.4. Data description

After applying all the conditions mentioned above in Zephyr database, 1986 deals were available. Nevertheless, it was not possible to work with all these observations, since financial data about target companies was limited. This limitation narrowed the sample to 326 observations. Three of them were later excluded because of being outliers in terms of volatility.

Descriptive statistics on variables are provided below:

Table 3. Descriptive statistics of numerical variables.

Variable	Mean	Stdev	Min	Max
Cash ratio	.162693	.1872088	3.32e-06	.9109896
Intangible	.0948352	.1735714	-.0030817	.9466752
Volatility	.4582963	.6262174	.0126965	5.98343

Source: author's calculations

Dummy variables divide deals by different types. Summary on them is also provided:

Table 4. Summary on dummy variables.

Characteristic	№ of observations	% of total observations
Target is private	264	81,7%
Target is public	59	18,3%
The deal is cross-industrial	151	46,7%
The deal is focused	172	53,3%
The deal is cross-border	59	18,3%
The deal is domestic	264	81,7%

Source: author's calculations

As for dependent variable, earnout, it is presented by 91 observations in the sample, or 28,2% of total. Thus, the rest 71,8% includes deals without earnout contract, for example, deals paid with cash, stock or mix of cash and stock.

2.5. Regression analysis

Before running the regression analysis, it is necessary to check variables for multicollinearity. It is necessary to run correlation analysis to identify whether there are highly correlated regressors or not. Logistic regression requires regressors to be of no or little multicollinearity between them [Frank, Harrell, 2001]. In case when independent variables are highly correlated, this may lead to unstable parameters in the regression. To avoid this, correlation analysis was completed. The results are provided in the table below:

Table 5. Correlation matrix.

	Private	Cross-border	Cross-industry	Cash	Intangible	Volatility
Private	1.0000					
Cross-border	0.0161	1.0000				
Cross-industry	0.2021	-0.0093	1.0000			
Cash	0.0658	-0.0050	-0.0225	1.0000		
Intangible	-0.3722	-0.0053	-0.0031	-0.1606	1.0000	
Volatility	0.1238	-0.0027	-0.0009	0.0557	-0.0210	1.0000

Source: author's calculations

The results of correlation analysis show that there are no regressors that are highly correlated. This in turn means that all the variables can be added together into the model at the same time.

After completing the correlation analysis and checking variables for multicollinearity, it is possible to run the logistic regression itself. The results are as follows:

Number of obs = 323

LR chi2 (6) = 58.38

Prob > chi2 = 0.0000

Pseudo R2 = 0.1536

Table 6. Logistic regression analysis.

Earnout	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
Private	3.493	1.044	3.34	0.001	1.445	5.54
Crossborder	.279	.338	0.83	0.409	-.384	.944
Crossindustry	.445	.273	1.63	0.103	-.09	.98
Cash	2.536	.688	3.69	0.000	1.188	3.885
Intangible	1.623	.906	1.79	0.073	-.153	3.4
Volatility	.422	.198	2.13	0.034	.032	.812
_cons	-5.225	1.071	-4.88	0.000	-7.326	-3.125

Source: author's calculations

Obtained results need to be interpreted. In the upper right corner, the likelihood ratio test (LR chi2) is provided. Digit “6” indicates the number of degrees of freedom, and it is equal to the number of regressors included into the model. LR chi2 is used the same purposes as F-statistic in ordinary least squares model – its aim is to test the hypothesis whether all coefficients that are included in the model are equal to zero.

P-value is used to make a decision whether to accept or reject a hypothesis. In the model of this research measure p-value for chi2 measure is equal to 0.0000, which means that there is very low probability that all the coefficients present in the model are equal to 0 at the same time. It allows us to conclude that the model overall is significant.

The same principle is applied to the coefficients alone. The common rule for testing null hypotheses is the following: if p-value is less than a particular level of significance, than the null hypothesis is rejected, which in turns means that coefficient is not equal to zero and is statistically significant.

The regression coefficient for variable “private” has p-value of 0,001. It means that it is statistically significant at 10%, 5% and 1% levels of confidence. The sign of this coefficient is positive which means that the possibility of earnout being included in an M&A deal increases when the target company is private.

The coefficient of variable “Crossborder” has p-value of 0,409. This value indicates that the null hypothesis should be accepted. This coefficient is not significant neither at 1%, 5% nor at 10% levels. Therefore, the second hypothesis that the likelihood of an earnout to be included in the deal is not dependent on the fact whether the acquirer and the target company are from different countries.

The coefficient of variable “Crossindustry” has p-value equal to 0,103. Formally, it should be said that this coefficient is insignificant according to the rules, but in fact it is very close to be statistically significant at 10% level of confidence. This just means that the probability of the variable “Crossindustry” to be insignificant is 10,3%, which is not that much. The sign is positive, which indicates that the chance of earnout to be included in the deal is higher if the acquirer and the target company are from different industries. Formally, this result is not consistent with the hypothesis that was stated.

The parameter for “Cash” variable is equal to 0,0000 and significant at all three levels of confidence (1%, 5% and 10%). It means that the more cash the target company has, the higher is the probability of choosing earnout as a method of payment. This result supports the hypothesis that was developed in this thesis.

The regression coefficient for “Intangible” variable equals to 0.073. This coefficient is significant at 10% level of significance. These results support the hypothesis regarding this variable and they indicate that the more is the share of intangible assets in total assets of the target company, the higher is the probability of earnout to be chosen as an acquisition currency.

The last coefficient “Volatility” has p-value of 0,034. Thus, it is significant at 10% and 5% levels. Positive sign in addition to significance of the factor show that the more volatile cash flows the target company has, the higher is the probability that earnout will be added in the terms of an M&A deal. This result supports the hypothesis about the volatility of cash flows.

After defining all the coefficients of variables that were included in the model, it becomes possible to forecast the probability of including an earnout in a particular deal. To make it possible, logistic cumulative distribution function was used, which is the following:

$$\text{Prob (Earnout}_i = 1 | \text{Private}_i, \text{Crossborder}_i, \text{Crossindustry}_i, \text{Cash}_i, \text{Intangible}_i, \text{Volatility}_i) = \frac{1}{1 + e^{-(-5.225 + 3.493\text{Private}_i + 0.279\text{Crossborder}_i + 0.445\text{Crossindustry}_i + 2.536\text{Cash}_i + 1.623\text{Intangible}_i + 0.422\text{Volatility}_i)}}$$

To better understand how the variables influence the choice of method of payment, it was decided to complete the analysis of marginal effect of these variables. The results of marginal effects are the following:

Table 7. Analysis of marginal effects.

Variable	dy/dx
Private	0,3142
Crossborder	0,0481
Crossindustry	0,0733
Cash	0,4145
Intangible	0,2653
Volatility	0,069

Source: author's calculations

These figures show how the likelihood of including earnout will change with changes of independent variables. The results obtained above can be explained in the following way:

- If the target firm is private, the probability of using the earnout in the structure of the deal increases by 31,4%
- If the target and the acquirer are from different countries, then the probability increases by 4,8%
- If the target and the acquirer are from different industries, the likelihood of including earnout increases by 7,33%
- If cash ratio of the target company increases by 1%, the chance that earnout will be chosen as an acquisition currency increases by 0,41%
- If the share of intangible assets in total assets of the target firm increases by 1%, the probability of including earnout will increase by 0,26%
- If the volatility of cash flows of the target firm increases by 1%, the probability of choosing earnout increases by 0,07%

2.6. Discussion

Four out of six hypotheses were proved with regression analysis of the model that was developed in this research. The assumption that if the target company is private then the likelihood of including earnout is higher was confirmed. It is consistent with the results of prior studies. Private targets are less transparent, and it is more difficult for the acquirer to get into the details of its operations and business approaches. It creates the risk of overvaluation, and to mitigate this risks, the acquirers prefer to use earnout as a payment currency.

The risk of misvaluation is acute for cross-industrial mergers and acquisitions. It is hardly possible for the acquirer to know about the industry of the target as much as the target knows. To mitigate the consequences of situation where the target knows more and can take advantage of this, earnout can be included in the structure of an M&A deal. Formally, the hypothesis about significance of the cross-industrial character of the deal was not confirmed (p-value is equal to 0,103 which is a bit more than 10% confidence level) but it is clear that cross-industrial character of the deal shapes the choice of method of payment.

At the same time, the hypothesis about cross-border acquisitions was not confirmed. It is true that these deals have sources of uncertainty, but, probably earnout is not the instrument which can solve the problem. We can assume, that presence of earnout itself can create currency risk because of lag between payments which can be rather long and different currencies which are used in countries of the bidder and the target. This finding is consistent with previous results of other researchers.

The hypothesis about cash ratio was confirmed. Presence of cash on the balance of the target does not create risk which has to be eliminated, but it is attractive for the acquirer, since the contingent part of earnout could be paid from those very cash reserves which the target has. At the same time huge cash reserves may mean that it used ineffectively and there is potential for better performance if used appropriately.

It was also proved that the higher is the share of intangible assets on the target's balance sheet, the more is the probability of earnout to be included. Previous studies checked different industries as the factors that affect the decision. All these industries were characterized with importance of intangible assets. That is why it was decided to test the hypothesis about intangible assets, which was proven. Intangible assets are less certain than tangible, but has a potential of creating benefits for the company. The uncertainty about whether the target could get use of these assets is eliminated with earnout.

The last hypothesis about volatility of cash flows of the target company was also proved. Every acquirer is interested in financial benefits from the target. Cash flows that it generates is one of the main interests for the acquirer. And the more volatile cash flows are, less attractive it is for the acquirer. To get rid of this problem, earnout can be included.

2.7. Managerial application

This thesis gave evidence on factors which affect the choice of earnout as a method of payment. The function of the model that was built during the research process is able to predict the likelihood of choice of earnout. Nevertheless, the number which indicates the value of function

itself may be insufficient for making a management decision. That is why, it was decided to calculate the sensitivity and specificity of the model for different values of the function of this model. To do so, predicted probability was calculated for every deal that was included in the sample. To be able to do so, all data about a particular deal (cash ratio, intangibles ratio, volatility of EBITDA, values of “cross-border”, “cross-industry” and “private” dummy variable) was inserted into logistic cumulative distribution function.

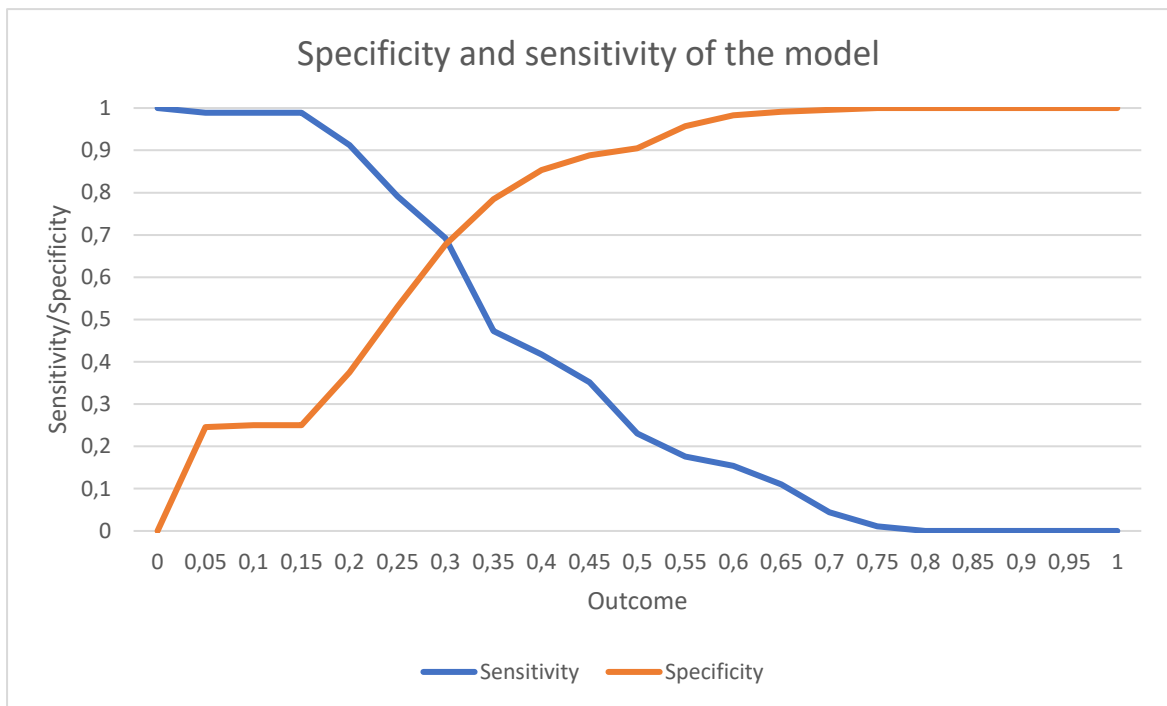
Then, different scenarios were assumed: when the predicted outcome is greater than X, where X is the value of logistic cumulative distribution function, then it is assumed that the deal will include earnout (in other words, for each value of distribution function every deal will have the value 1 or 0). It has the following view:

Prediction	0	0,05	0,1	0,15	0,2
0,008428156	1	0	0	0	0
0,177155	1	1	1	1	0
0,013657527	1	0	0	0	0
0,009769583	1	0	0	0	0
0,013517963	1	0	0	0	0
0,016309942	1	0	0	0	0
0,031011462	1	0	0	0	0
0,280629075	1	1	1	1	1
0,013577315	1	0	0	0	0
0,33081592	1	1	1	1	1
0,013802689	1	0	0	0	0

Picture 3. Predictions of the model and outcomes under different assumptions (fragment)

The same procedure was done for values of the function from 0 to 1 with step of 0,05. After this step was finished, sensitivity and specificity of the model was calculated. Sensitivity of the model shows the degree to which the model correctly presents positive results (regarding this thesis, the percentage of real-life earnout deals in total number of deals which were identified by the model as earnout). Specificity of the model shows how accurately the model presents negative results (the percentage of actual non-earnout deals in total number of deals which were identified

by the model as non-earnout). After we calculated sensitivity and specificity of the model for values of the function from 0 to 1, then it is possible to build the following graph:



Picture 4. Sensitivity and specificity of the model

When the value of the function is 0,3 the model has the highest combination of sensitivity and specificity. At the same time, it is not possible to say that it is the best choice for every manager, since they may have different preferences. It depends on their attitude to sensitivity and specificity. For instance, a conservative manager often prefers traditional methods of payment such as cash or stock payments, and it is likely that specificity of the model would be quite important for him – he would agree to choose an earnout as a method of payment when it is of high likelihood to be so. At the same time, other manager who has different vision or has some doubts about paying all the value of the deal at one moment, can have other preferences. Possibly, he would pay more attention to specificity of the model in order not to ignore the opportunity to include earnout in the structure of the deal.

Summing it up, the model can be used by managers of companies when deciding on the method of payment that could be used in an M&A deal. For instance, the company may have no or little expertise of acquisitions, and this model is able to show which method of payment an average abstract company in the market will choose. It was shown by previous researchers that earnouts outperform ordinary method of payment when the deal is associated with uncertainty. As a result, this tool can help to make a better decision which could lead to better post-acquisition returns for the acquirer.

2.8. Limitations of the research and field for further research

This study as well as any other research has its limitations. Limitations of this paper are caused primarily by the field of research that was chosen for study – earnouts. As it became evident during the research process, earnouts are often included when the deal is related to the private target company. This fact limited the sample of the research, because it was sometimes impossible to find financial data about private companies.

The next difficulty while doing the research was the availability of financial data in the databases. For instance, sometimes there was a balance sheet for a particular company but no statement of profit and loss for it. In this case, such examples were excluded from the sample.

The next limitation of the research is the time period that was analyzed for the target companies (three years prior to the acquisition). Volatility of cash flows was calculated only for three years prior to the acquisition, which was again dictated by the availability of financial data. Probably, measures could be more accurate if longer timeframe was taken.

It is necessary to mention that the list of determinants that were analyzed is not exhaustive. There exist other factors which may affect the choice of the method of payment and they can be related either to the target company or to the acquirer.

It also should be mentioned that the results obtained in this research are applicable for the UK market primarily. Markets that belong to other geographic regions have their own features that can differ from those that were discussed during this research. It would be interesting to investigate the situation on developing markets, such as BRICS countries. M&A activity in these countries is lower than in the UK, but it shows positive dynamics. Business environment is different there, and it is possible that the results related to these countries will differ from findings of this thesis.

Conclusion

Mergers and acquisitions are one of options to develop the company. There may be different motives for acquiring the company, they can be related or not, but the decision which method of payment to use arises for every deal. Most of previous research studied the choice between cash and stock payments. At the same time, earnout can be seen an alternative to two previous options and it needs to be studied deeper.

As it was mentioned, information asymmetry is one of the main obstacles which makes the process of negotiating the deal more difficult. The bidder does not want to overpay for the target, and the target may be not willing to accept the bid in stock because it may be overvalued. Earnout could solve this problem due to its main feature – it considers the post-merger performance of

acquired company. If the target company operates poorly, the bidder does not have to pay contingent part of payment. In case when the target company achieves the objectives that were set, then it receives deferred part of payment.

The field of research related to factors which determine the choice of earnout is quite new – all the research papers are written in 2000-s or later. Therefore, there was some space for further analysis: most of factors that were already identified relate to either industry characteristics or acquirer, but not the target. That is why it was decided to introduce new determinants related to the target company characteristics in this research. Since earnout is aimed at eliminating the uncertainty associated with the deal, the determinants that were checked, represent this uncertainty. They are the cross-industrial and cross-border character of the deal, private status of the target firm, cash flows volatility and ratio of intangible assets to total assets. In addition to this, cash ratio was also included because it was assumed in previous works but have not been checked yet.

After all the data was collected and quantitative analysis was completed, four out of six hypotheses were accepted and it was identified that:

- If the target company is a private one, the likelihood of including earnout increases
- If the target company has volatile cash flows, the likelihood of including earnout increases
- The higher is cash ratio of the target company, the higher is the probability of including earnout
- The higher is the proportion of intangible assets to total assets, the higher is the probability of including earnout

At the same time, hypotheses claiming that cross-border and cross-industrial character of the deal increase the likelihood of earnout were not supported. One of the was rejected just because of formal standard (hypothesis about cross-industrial factor had p-value of 0,103 and was almost significant at 10% confidence level) and still needs to be considered.

The model which was built during the research can be used by managers for making decisions on method of payment. After putting all necessary data in the model, it gives predicted probability of earnout to be included in the structure of the deal. Having the preferences about sensitivity and specificity and knowing the expected probability, managers will know how they could act regarding the choice of method of payment under conditions that they have. In other words, the main benefit of this thesis and its model is that it shows a manager, how other companies in the market would act under given conditions. Thus, a manager actually would have an

opportunity to make a choice basing on expertise of other companies that have already executed mergers and acquisitions.

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Appendices.

Appendix 1. Marginal effects derivation in Stata

```
. mfx
Marginal effects after logit
      y = Pr(Earnout) (predict)
      = .20571282
```

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]	X
Private*	.3142743	.03506	8.97	0.000	.245568	.382981	.817337	
Crossbr*	.0481312	.06121	0.79	0.432	-.071842	.168104	.182663	
Crossi~y*	.0733449	.04566	1.61	0.108	-.016146	.162836	.467492	
Cash	.414515	.1197	3.46	0.001	.179916	.649114	.162693	
Intang~e	.2653157	.14918	1.78	0.075	-.027071	.557702	.094835	
Volati~y	.0690982	.03352	2.06	0.039	.003408	.134788	.458296	

(*) dy/dx is for discrete change of dummy variable from 0 to 1