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Master in Corporate Finance

DELISTING AS A TOOL FOR SHAREHOLDERS' WEALTH  
MANAGEMENT

Master's Thesis by the 2<sup>nd</sup> year student  
Concentration — Corporate Finance  
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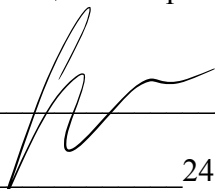
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## **ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ**

Я, Светловская Дарья Викторовна, студентка второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему «DELISTING AS A TOOL FOR SHAREHOLDERS' WEALTH MANAGEMENT», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

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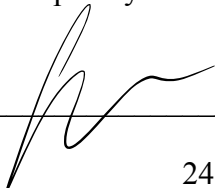
  
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I, Daria Svetlovskaya, second year master student, program «Management», state that my master thesis on the topic «DELISTING AS A TOOL FOR SHAREHOLDERS' WEALTH MANAGEMENT», which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

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## АННОТАЦИЯ

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Описание цели, задач и основных результатов	<p><u>Цель:</u> выделить драйверы, влияющие на решение о делистинге, с целью построения инвестиционной стратегии для потенциальных бенефициаров сделок ухода публичных компаний с биржи</p> <p><u>Задачи:</u></p> <ol style="list-style-type: none"> <li>1) Провести теоретический обзор проблемы исследования с идентификацией природы и принципов феномена делистинга;</li> <li>2) Проанализировать главные причины для добровольного делистинга;</li> <li>3) Провести обзор процедур ухода с биржи;</li> <li>4) Провести эмпирическое исследование относительно оценки влияния независимы переменных на решение о делистинге;</li> <li>5) Предложить рекомендации для менеджеров и индивидуальных инвесторов;</li> <li>6) Сделать общее заключение, суммируя результаты и подтверждая достижение цели.</li> </ol> <p><u>Основные результаты:</u> Рекомендации сформированы в таблицы для распространения между определенными целевыми группами. Данные материалы считаются удобными в использовании и не требуют глубокого профессионального погружения в вопросы феномена делистинга. Предложена инвестиционная стратегия для бенефициаров сделок ухода публичных компаний с биржи.</p>
Ключевые слова	Делистинг, Приватизация, Слияния и Поглощения, Обратный Выкуп Акций, Первичное Публичное Размещение, Лондонская Биржа, Модель Кокса, Модель Выживания, Инвестиционная Стратегия

## ABSTRACT

Master student's name	Daria Svetlovskaia
Master thesis title	Delisting as a Tool for Shareholders' Wealth Management
Faculty	Graduate School of Management
Main field of study	Master in Corporate Finance
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Academic advisor's name	Marat V. Smirnov
Description of the goal, objectives and main results	<p><u>Goal:</u> to identify drivers of delisting process in order to build investment strategy for potential beneficiaries of the going private transactions</p> <p><u>Objectives:</u></p> <ol style="list-style-type: none"> <li>1) To make the theoretical overview of the research problem with identification of nature and principles related to delisting phenomena;</li> <li>2) To analyze the main reasons for voluntary delisting;</li> <li>3) To overview procedures for going private transactions;</li> <li>4) To conduct an empirical study regarding evaluation of variables influenced the decision to delist;</li> <li>5) To provide the recommendations applicable for managers and individuals;</li> <li>6) To make a general conclusion on the research paper summing up all the results and confirming of achievement the stated goal.</li> </ol> <p><u>Main results:</u> The recommendations are formed in tables for distribution among particular target groups and considered to be user-friendly and adopted for different level of diving into voluntary delisting topic. The managerial implications suggest built investment strategy for those who are interested in obtaining benefits from public-to-private transactions.</p>
Keywords	Delisting, Public-to-Private Transactions, GTPs, Mergers and Acquisitions, LBOs, MBOs, MBIs, BOSOs, London Stock Exchange, Investment Strategy, Initial Public Offering, Privatization, Buyout, Going Private, Cox Proportional Hazard Model

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## INTRODUCTION

The well-known statement that a primary goal of a company is maximization of its shareholders wealth. In seeking for such companies which are ready to take care about their owners, investors come to stock exchange and choose a company or a few to buy stocks assuming that this action assure increase in wealth. This mechanism has already been working since 1602 while first stock exchange was founded in Amsterdam, the Netherlands. By now, there are about 200 stock exchanges all over the world and each technologically literate individual has access to global market of securities. Institutional investors and companies are significant players of stock market as well. Regardless, what kind of an investor takes part, one of major aim is still financial benefit.

While experts are disputing about what is real value for shareholders and shifting to “welfare” definition at the root of the issue [Hart, Zingales,2017], the earthy problem is continuing to exist: how to make money on stocks? The answer may vary depending on peculiarities and intrinsic purposes of an investors. Nevertheless, in this research paper it is suggested to look at delisting as a tool of shareholder wealth’s management.

Delisting is the removal of a listed company from a stock exchange [Martinez, 2017]. Basically, going private is the opposite phenomena to IPO (Initial Public Offering). During recent decades, going private has been considered as more common and understandable decisions for participants of financial markets. Leverage Buy-Outs or LBOs as a way to go private became a boom in US market in early 1980s while in Europe first wave occurred in the 1990s. [Djama, Martinez, Serve, 2012]. Delisting can be caused by involuntary and voluntary reasons. One of the most common reason for involuntary delisting is low both financial and operational performance. It is often occasion for the companies, which were forced to leave a stock exchange, to have lower prices of stocks and lower market capitalization comparing with benchmarks [Seguin, Smoller, 1997]. Poor performance leads to sequence of the events: a company underperforms - investors loose interest to this company - lack of funding for current operational activities - bankruptcy or forced leaving of a stock exchange because of lack of resources to maintain requirements for being listed [Angel et al, 2004, Harris t al, 2008]. Among other reason for voluntary delisting is violations of listing requirements [Sanger, Peterson, 1990]. This research paper is focused on voluntary delisting phenomena.

Voluntary delisting is mainly caused by 2 groups of reasons connected with cost-benefit trade off and corporate governance. Being listed is not free of charge activity and it leads to increase of liabilities. Usually, companies expect benefits by being public such as cheaper raising the capital comparing with debt, enhancing of public image and prestige, share of control (in some cases), facilitation of M&A deals and others [Goetzmann, Rouwenhorst, 2005]. Nevertheless,

there are cases when public companies are considered to be undervalued by market and investors, consequently, these companies' stocks cost less than it is expected and benefits of being listed are less than liability load. Thus, such companies decide to go private [Weir et al,2005; Maupin et al, 1984, Opler et al, 1993]. Listing costs are divided into direct and indirect. First group is associated with registration process and underwriting fees, annual payments and costs of trading. Indirect cost includes agency costs and compliance costs: cost of audit and disclosure [Leuz, 2008; Thomsen et al, 2014]. For example, annual fee for being listed on London Stock Exchange (Main Market) is from 5400 UK pounds to 54000 UK pounds depending on market capitalization (VAT 20% must be added as well) [London Stock Exchange, 2018]. Also, in case if a company has no need in funds raised during trading of its stocks, i.e. because of choice of alternative sources, then it comes to conclusion that benefits of being listed are not sufficiently covers corresponding costs [Bharath et al, 2010, Martinez et al, 2011]. Related to corporate governance purposes for voluntary delisting are discussed in the literature as crucial. After IPO a company is led to separation of management from owners (stockholders) which triggers the problem among principal and agent. External shareholders put additional attention to managers' activities. This fact creates some level of pressure for controlled managers and arising of costs for checkup. Moreover, the process of strategical decision making becomes slower since presence of the common approvals. At the same time, under consideration among experts is agency problem in terms of delisting is free cash flow distribution. It implies that managers are tended to invest FCF in projects with negative NPV instead of distribution of funds among shareholders [Mehran, Peristiani, 2009].

Voluntary going private can be completed by different types of transactions which will be overviewed in this research paper:

- 1) Institutional Buy-Out (including Leveraged Buy-out form);
- 2) Management Buy-out;
- 3) Management Buy-in;
- 4) Squeeze-out;
- 5) Deregistration or "going dark";
- 6) Mergers with other company;
- 7) Acquisition by other company (not institutional player).

Recently it was found out that a part of investors is scared of delisting phenomena and consider it like a "horror" of the stock market [Ross, 2009]. However, there are evidences that some market players find delisting as an opportunity to "pocket handsome returns" [Mahesh, Walavalkar, 2012]. This chance arises due to premium paid to investors during voluntary going private process. For instance, while Alfa Laval was making delisting in 2011, its shareholders

received about 44% of return. Thus, the strategy of earning on going private deals seems to be attractive alternative to well-known practices of making money on stock exchange. The main issue here is to understand how to estimate the probability of the fact that a firm will voluntary go private. Therefore, the research goal is to identify drivers of delisting process in order to build investment strategy for potential beneficiaries of the going private transactions. Research questions to be answered for the achievement of stated goal:

- 7) To make the theoretical overview of the research problem with identification of nature and principles related to delisting phenomena;
- 8) To analyze the main reasons for voluntary delisting;
- 9) To overview procedures for going private transactions;
- 10) To conduct an empirical study regarding evaluation of variables influenced the decision to delist;
- 11) To provide the recommendations applicable for managers and individuals;
- 12) To make a general conclusion on the research paper summing up all the results and confirming of achievement the stated goal.

The delisting phenomena is investigated on the example of London Stock Exchange (LSE). LSE by middle of 2017 is considered to be 3<sup>rd</sup> largest stock exchange in the world by market capitalization of listed companies (6,19 trillion USD). Stocks are traded either on Main Market with strict requirement for being listed according to FSA or on Alternative Investments Market (AIM) with less tough requirements and focused on young and innovative companies. Two markets are different in terms of corresponding risks, sizes of companies and their growth opportunities. That is why it is interesting to form a sample from companies listed and delisted from LSE to take into account these aspects too. The hypothesis which are tested in this paper are divided into two groups accordingly to reason for voluntary delisting: cost-benefit trade off and corporate governance. More accurately, the variables might have influence on decision to go private are distributed to first or second group.

To conduct research next sources of information was used: relevant scientific researches, providers of market news such as credited newspapers and journals, professional periodical literature, manuals for technical implementation of econometric models and functions. The data for sample was taken from databases: Thomson Reuters Eikon and Datastream, Bloomberg, ZEPHYR and from official web-site of LSE and companies.

The topic of master thesis is considered to be actual and relevant nowadays. This paper could be useful for investment managers in corporations, hedge funds and private investors. Knowledge about factors affected motivation of traded companies to go private voluntary helps to



create hedge beneficial schemes. Basically, application of this research can be interesting for building of the whole strategy for earning money on delisting. In general, the investigation has high practical significance. Going deeper, it could be helpful tool for creation of new financial instruments (i.e. derivatives) against delisting.

The master thesis has following structure. In the first chapter the in-depth literature overview of delisting phenomena is provided with subsequent formulation of hypotheses. In second chapter the empirical study and results of research are presented. Afterwards, the recommendations are given and summing up of results is concluded.

## **CHAPTER 1. OVERVIEW OF THEORETICAL BACKGROUND**

### 1.1. Definition of delisting phenomena

To begin with, by the definition delisting is removal of a publicly traded company from a stock exchange and has been becoming more and more important for investigation due to its economic effect [Martinez, Serve, Djama, 2015].

Since delisting is the opposite phenomenon to Initial Public Offering (IPO). The theoretical overview is started with the discussion of main reasons for going public. The first form of issuing public shares relates to “publicani” in Roman Republic. It was a legal party and its property was divided into parts. These parts were traded on over-the-counter (OTC) market at the Roman Forum. Prices of shares had high volatility and speculation was appreciated. Nevertheless, the history of “publicanis” found its end with the fall of Roman Republic [Chancellor, 1999].

The first company which did IPO was Dutch India Company or VOC (the abbreviation is from Dutch translation of the name). The firm offered its shares to raise capital and became listed on Amsterdam stock exchange in 1602 [Stringham, 2015].

Being public brings the number of benefits which companies try to get despite the corresponding costs. Among them:

- 1) Access to cheaper capital.

Minimization the cost of capital is one of the primary motivations for companies to go public [Brau, Fawcett, 2006]. In the period between 1980 and 2010 \$669,42 billion was attracted via IPO on the US’s stock exchanges [Ritter, 2011]. Becoming listed provides an access to huge number of potential investors. On the early stages of growth companies can be financed by own capital, business angels, venture funds or loans. Nevertheless, one day for the further development the bigger amounts of money will be required. Attraction of the necessary capital can be expensive through the debt; thus, owners start to seek for alternatives. Among them, IPO which allows to get an access to cheaper money after placing its stocks publicly.

## 2) Enhancing of public image and prestige.

The public status enhance recognition among participants of a market as well as general increase of awareness in society. This fact allows to take better position in negotiation with counterparties, i.e. debt holders, suppliers, customers, even government during implementation of initiatives, etc. [Holden, 1989].

## 3) Facilitation of M&A deals.

Entrepreneurs who are interested in selling their business find very attractive to maximize their profit through enhancing the firm's value via being listed. The acquisition gives opportunity to obtain higher return than from outright sale [Zingales, 1995]. Jian Huang in his research released in 2017 conducted with the sample of "all commitment IPOs from 1985 to 2008" with available in Thomson Financial SDC data found that institutions made large investments in companies which did IPO and consequently became participants of mergers and acquisition deals.

Recently there was another famous evidence of the third benefit from IPO. PayPal went public in order to be acquired by eBay as previously they did not manage to negotiate the price. In order to mitigate this problem, PayPal did IPO and obtained the certified value for its shares by equity market. Afterwards, eBay acquired the service at 20% premium. This case is also called as "dual tracking" [FT, 2006].

## 4) Financial visibility.

First of all, to become public a company needs to go through the strict procedure of listing on a stock exchange. The next steps stay behind the public status: meeting underwriting, registration process, meeting audit requirements, registration statement preparation and other issues [Taylor, 1988]. Thus, it is kind of achievement for a company to become public. After IPO such a firm are required to meet federal and a stock exchange's regulations to remain the public status, including total disclosure. Consequently, complying with formal rules, a company earns its credibility. This fact helps not only within external relationships with stakeholders but also for self-control. A firm can obtain the clear picture of financial situation and the market's perception, which leads to more effective decision-making process.

Delisting is divided into two types: voluntary and involuntary [Macey, 2008]. The involuntary delisting is driven by obligatory designation of the legislative parties. The main reasons to be forced to leave the stock exchange are frauds and any other violation of market rules or financial constraints of a listed company. Involuntary delisting is considered to be unattractive and unwanted scenario for both a company and investors [Beker, Kennedy, 2002].

This research paper is focused on voluntary type of delisting as the alternative opportunities for obtaining benefits participating on a stock exchange. Procedures for voluntary delisting are

described further in this chapter. Firstly, it is vital to understand history and nature of the phenomenon.

As the American stock market was always foremost, the wave of going private transactions via LBOs (leveraged buyouts) started here in the 1990s. In Europe, delisting wave started in the 2000s in the form of BOSO (buyout offer with squeeze-out) [Ventoruzzo, 2010]. This difference is explained by the size of shareholder base: typically, smaller in United States, while larger in Europe [Faccio, Lang, 2002].

Reasons for going private are vary and depend on a company's peculiarities. Being public is associated with corresponding costs: direct and indirect. First group includes expenses for registration, underwriting fees, annual payments, and cost of trading. Second group is more complicated and involves different outgoings. Firms decide to go private to decrease costs, which form the causes of voluntary delisting.

Delisting in contrast to IPO phenomenon is not that investigated by now. Nevertheless, there the number of researches devoted to public-to-private transactions. Summarizing the concepts and findings, the list of reasons for voluntary delisting figured out by authors can be observed. A few researchers found that companies which are undervalued by market can be tended to go private [Mauphin et al, 1984, Opler et al, 1993, Helpert et al, 1999, Weir et al, 2005, Bharath et al, 2010]. Indeed, if market estimate the potential of a traded company less than it is expected by the management and owners, then being public brings additional liabilities' load instead of advantages of such a status. The deeper discussion about benefits of being public for a firm is discussed in next part of this chapter. Another group of authors pointed out that companies which are smaller are more likely to go private as they cannot maintain cost for public status and benefit from being traded tradeoff [Kieschnick, 1998, Kim et al, 1991, Engel et al, 2007, Becker et al, 2008, Weir et al, 2008]. For smaller firms costs become relatively more comparing with other expenses states than for big companies and harder to allocate. However, the majority of researchers argued that low growth potential affects positively the delisting outcome [Kim et al, 1991, Weir et al, 2005, Wright et al, 2006, Leuz, 2008, Martinez et al, 2011, Pour et al, 2013]. Growth potential in the previous analysis was estimated using Market-to-Book ratio, Tobin's Q and net sales growth rate. MB ratio as well as Tobins' Q mirrors the market perception of a company. The higher is expectation of possible beneficiaries, the less probability of going private. One of the spread research opinions is focused on the evidence that companies with lower sales growth are more inclined to go private [Lehn et al, 1989, Pour et al, 2013]. Among other reasons there are illiquidity of stocks [Achleitner et al, 2013, Mehran et al, 2010, Becker et al, 2008] and higher leverage [Bharath et al, 2010, Leuz et al, 2008, Martinex, 2011]. The more detailed overview will be provided below in this chapter.

Some causes are driven by prevalence of monetary expenses over potential benefits of being public, but some issues can be arisen because of agency problems. Traded companies are operating under certain legislative normative inverted to decision-making processes, the level of disclosure and other factors which affect corporate governance principles. Delisting can decline the effect of agency costs and several experts found the evidence of the fact that internal conflict of interests may lead to decision to go private. Assumptions reflected agency costs were tested as hypotheses about the impact of insider ownership [Maupinet et al, 1984, Marosi et al, 2007], board structure in terms of presence of independent directors and distinct Chief Executive Officer [Leuz et al, 2008, Lee et al, 1992], anti-takeover provision [Becker, Pollet, 2008] and others. The most doubtful is hypothesis about free cash flow distribution in terms of agency costs suggested by Jensen in 1986, proved by number of studies [Opler et al,1993, Leuz et al, 2008, Lehn et al, 1989] and disproved by several researches [Servaes, 1994, Kieschnick, 1998, Halpern et al, 1999, Bharath et al, 2010].

Generalizing, voluntary delisting phenomenon is driven by two groups of factors associated with cost benefit tradeoff and agency costs.

While involuntary delisting has negative impact on shareholders' wealth, voluntary delisting has the strongly positive economic consequence. Usually, investors obtain premium to market price while shares are bought out. The table 1 sums up the results of different investigations.

*Table 1. Voluntary delisting - economic effect on shareholders' wealth*

Researchers	Year	Sample	Effect on shareholders' wealth
De Angelo and Rice	1984	81 transactions (1973 - 1980)	Premium=56,3% (40 days) Cumulative Abnormal Returns= 30,4%
Kaplan	1989	76 transactions - MBOs (1980 - 1986)	Premium=42,3% (60 days) Cumulative Abnormal Returns= 26%
Lehn and Poulsen	1989	263 transactions - LBOs (1980 - 1987)	Premium=36,1% (20 days) Cumulative Abnormal Returns= 20,5%
Lee, Rosenstein, Rangan and Davidson	1992	58 transactions - MBOs (1983 - 1989)	Cumulative Abnormal Returns= 19,18%
Andres,Betzer and Weir	2007	115 transactions - LBOs (1997 - 2005)	Cumulative Abnormal Returns= 24,2%
Renneboog, Simons and Wright	2007	177 transactions - LBOs (1997 - 2003)	Premium=40% Cumulative Abnormal Returns= 29,28%

Sannajust	2010	399 transactions (2000 - 2007) - Europe and US	Premium=25% (Europe), 34% (US) Cumulative Abnormal Returns= 13,57% (Europe), 34,08% (US)
Geranio and Zannotti	2012	106 transactions (2000-2005)	Cumulative Abnormal Returns= 18,7%
Boubaker, Cellier and Rouatbi	2014	323 transactions - BOSOs (2002 - 2011)	Cumulative Abnormal Returns= 10,19%

Based on the information above, it can be concluded that voluntary delisting in fact can be considered as a tool for shareholders' and other possible beneficiaries' wealth management.

## 1.2. Classification of delisting processes: main procedures and principles

Voluntary delisting can be made through completion of different types of public-to-private transactions. Delisting assumes 100% buying out of shares in free float which are available on the stock exchange for open trading. The overview of main procedures is provided in this part.

### 1) Institutional Buy-Out (including Leveraged Buy-out form).

Institutional Buy-Outs (IBOs) are characterized as the type of a deal while institutional investor initiates this event. A venture funds, private equity funds, commercial banks, insurance companies and others can act as an acquirer [Amess, Wright, 2010]. The most common form of IBO in terms of delisting processes is Leveraged Buy-Out (LBO) which is accompanied by borrowing of money with assets acted as collateral for this debt. According to research of Kaplan and Stromberg released in 2009, more than 5000 LBOs were completed in the period from 2005 to 2007 all over the world for the 1,6 billion USD. LBOs deals were considered to be extremely profitable for investors. Nevertheless, the success here depends on management team of acquired company and their ability to shift from corporate thinking to an entrepreneurial style of governance in order to give the new brief to "again-private" company [Schwartz, Weinstein, 1989]. After LBO, a company becomes oriented on long-term benefits rather than on short-term and mostly personal rewards (i.e. managers' bonuses). Leveraged Buy-Outs are statistically the most used type of going private deal in United Kingdom and United States [Djama, Martinez, Serve, 2012]. Classical LBO target company has next peculiarities [Taylor, 1988]:

- It has big amount of tangible assets as the collateral for debt;
- Growth initiatives with lower corresponding costs for development since debt requires cash to pay off;
- Stable market position allowing to meet obligations.

Therefore, going back to topic of this paper, LBOs is the one of the most recognizable ways to go private for a company. Investors which are interested in obtaining gain on delisting process should be aware of LBOs and notice any announcements. It is vital to pay attention on the companies which can meet 3 stated above peculiarities during the filtering for the prediction of delisting. The average premium for shareholders during buy out is about 20% over market price [Eckbo, 2008].

## 2) Management Buy-out (MBO).

An MBO is the kind of a deal while a existing management team purchase a business [Scholes, Westhead, Burrows, 2008]. Not long-time age, Management Buy Out was an instrument to “divest small subsidiaries or to hand-on control in family-run private companies” [Wright, Coyne, 1985]. The enlargement of usage of debt or mezzanine financing reflected in total value of MBOs in last decade of XX century [Thompson, 1991]. MBOs are inwrought with going private transactions. Mostly, this kind of deals is associated with reduction of agency costs of being public and its consequences in additional expenses for monitoring and bonding of executive managers by owners(shareholders) [Jensen, Fama, 1983]. Transfer of ownership fully to managers as the result of an MBO provides opportunity to superpose managerial incentives and beneficial interest related to ownership in profit generation. Managerial Buy Out reduces informational asymmetry between owners and managers which affects positively the overall efficiency due to general reduction of intermediate stops in decision-making and corresponding costs.

Barrie Pearson in its work devoted to successful MBO selected the criteria of suitability of a company to be a target for such type of deals. Among them:

- A company has sufficient part of tangible assets including working capital in comparison with suggested price for buying out;
- A company which makes losses. The management team could be interested in implementation of new initiatives in the private company to put it back on the rails;
- A “Cash cow” company which is mature on the market it operates (“Cash cow” is definition from BCG matrix means that a company obtains big market share in the mature industry). Such a company is stable in terms of positive cash flows and considered to be attractive for privatization due to no necessity to carry listing direct and indirect costs for capitalization.

To sum up, MBO deals as the way to go private should be monitored by the stakeholders of delisting process. The main facts on which the attention should be paid are the existence of

principal-agent controversies, i.e. related media announcements, and stated criteria of a potential target company for buying.

### 3) Management Buy-in (MBI).

Management Buy-Ins are characterized by including the hiring of external managers for acquisition deal in order to support the efficiency of completion and achievement of stated for such transactions goal [Thompson, 1991]. MBI often takes place when the level of existing management team's efficiency is estimated as poor while the product/service of a company seems to be prospective.

### 4) Squeeze-out.

Comparing with popularity of LBOs in UK and US, in Continental Europe "a Buy-out Offer with Squeeze-Out (BOSO)" is the prevailing type [Faccio, Lang, 2002]. This kind of a transaction is determined by the exercising of controlling shareholders' rights to cash out the minorities according to current legislative background: a firm becomes private after closing the capital. Depending on the country, the controlling shareholders can make minorities to sell their parts with guarantee for no losses. For instance, French legislation allows BOSOs while no less than 90% of voting rights are in charge of majorities. The particular characteristic of BOSO that institutional investors are not involved in the deal in contrast with LBO, for instance. Thus, mostly, Buy-out Offer with Squeeze-Out is provoked by insiders, often family.

### 5) Deregistration or "going dark".

Deregistration is the way for traded companies to decrease its publicity by "going dark" and shifting to OTC markets. Therefore, deregistration is not fully equal to going private. Overlooked here type of transaction does not require voting procedure and cash out, however, there might be stocks' repurchase. In fact, tender offer in case of deregistration is not the event required the attention of stakeholders of a deal as companies which go dark mostly are limited in cash to suggest relevant premium [Farris, 2009]. Thus, deregistration is not the most profitable situation for investors who are seeking for gain from transaction. Nevertheless, for current shareholders there are some advantages of going dark. Among them:

- Cost reduction due to excluding expenses for being listed on primary exchange which can affect positively distribution of cash between a company's incentives;
- Maintenance of trading on the Pink Sheets;
- Decrease of disclosure requirements enhance competitive background of a company's activities because of keeping confidential strategic issues;

- Simplification of corporate governance rules, i.e. requirements to Board of Directors.

#### 6) Mergers and acquisitions (with/by other company not institutional player)

M&A deals which includes a public company as a target and an unlisted company from the other side are the considered to be equal to going private transactions as soon as shareholders of the target have an opportunity to exit without losses [EY, 2013]. The decision about M&A transactions are usually correspond to strategic resolution among companies trying to obtain benefits from a synergy, including pros of becoming private.

#### 1.3. Case Study: Cadbury

The theoretical side of the delisting phenomenon is finding its evidence in the case of public-to-private transaction which are made on global stock exchanges, including London Stock Exchange. For better understanding, it suggested to overview the Cadbury takeover by Kraft Foods. The small discussion is supposed to represent market perception of the phenomenon and to look at opinions of different stakeholders of the deal. As part of case study has more applied character, the analysis will be based on evaluation of information from credited journalistic articles published in financial world related mass-media such as Financial Times, Independent, BBC, Telegraph, The Guardian and others.

Cadbury is the famous international confectionery firm founded in UK almost 195 years ago. It was second player in the industry after Mars and now it is subsidiary of Mondelez International (after acquisition by Kraft Food in 2010). The company has long successful history behind, it has the strong and recognizable product brands' portfolio. Stocks of the Cadbury was traded on Main Market of London Stock Exchange from 1984 till 2010 and were included in FTSE 1000 index. In 2009, Kraft Foods announced the intention to acquire Cadbury. It was a bid by the company from United States for British confectionery company, the deal was completed in 2010. Despite the fact that it is story about hostile takeover from the first impression, the insider story of the deal shows interesting facts about series of rational managerial decision of Cadbury turning this transaction in favorable for both its management and investors [BBC, 2014].

To begin with, Cadbury and then merged Cadbury Schweppes was run by John Sunderland, very effective manager, and in 2000 his police was focused on expansion of the product portfolio by buying other firms. In 2002, the president and his prospective assistant Todd Stitzer decided to go into chewing-gum story as fast-growing and high-marginal products. This step was also the attempt to hedge the decrease in profit margins and sales, in general, of core chocolate business. Nevertheless, the penetration into new gum markets did not solve existing problem.

New chairman Roger Carr came in 2008 found that the declining of growth and poorer performance of such a giant as Cadbury was connected with lower level of implementation of



innovative technologies, lower capital expenditures in general and lower marketing expenses comparing to the rivals. The price of stock of Cadbury reacted relatively to the position of the company: slowly dropping. 2006 was the crucial year for Cadbury with public scandal around found Salmonella in a few factories and the company's performance dropped down even more the insider talks were about making the great changes in the company's future: be bought to reorganize business [Independent, 2016]. In the years of management recession in Cadbury, the Trian Fund Management (hedge fund) showed the interest in the company. The fund started to buy shares and took part in the company recovery strategy including decision to split soft drinks and confectionery businesses [The Guardian, 2007]. Nevertheless, at the same time, Trian Fund Management started to buy stocks of American Kraft Foods in sufficient stake and again took part in the company's governance using its control power [FT, 2009]. Apparently, in 2009, against the background of non-improving Cadbury performance, the bid from Kraft Foods was received [Telegraph, 2013]. The experts saw in this situation suspicious coincidence, despite Peltz's rejection of the fact [FT, 2010].

Nevertheless, the initial bid for \$16,3 billion was rejected despite the internal understanding of Cadbury that it is opportunity to go out from the public status for proceedings management decisions in more efficient way and share the expertise. The offered amount of money was considered to be too little for such an old company with the strong brand portfolio. Moreover, the big concern of the management team and employees was regarding losing of heritage by being bought by US company. That is why, lots of stakeholders saw in the proposal of this deal the attempt of hostile acquisition.

In short time, Kraft Foods offered new bid for \$17 billion and buying out with cash and shares (40% - 300 pence to 60% - 0,2589 shares of Kraft Foods per 1 Cadbury's share and conversion rate 1,66 US dollar for 1 UK pound). This bid was quickly rejected as well. The negotiations were continuing for 4 months and the deal was finally agreed with \$19,55 billion offer and buying out with bigger proportion of cash - 60% [Reuters, 2010]. The premium for the shareholders of Cadbury was not extremely high comparing with other examples of voluntary delisting, it was a bit more than 5% (840 pence, where 500 pence in cash and 0,1874 Kraft Foods' stock, and 10 pence dividend against closing price of Cadbury's stock in 807,4 pence). However, comparing with first bid in 755 pence, 840 pence provided 11,26% premium [Telegraph, 2009]. The last Cadbury's stock price before the deal's completion was heated by the news and enhanced attention to the company. Thus, it seems to be more logical to compare with initial offer of Kraft Foods to argue about premium and added value for shareholders wealth. Moreover, in respect that there were premises to slowing down the Cadbury's leading position based on financial performance and market overview, then there was covert opportunity to Cadbury's shareholders

both to hedge the risk and take a chance to gain benefits from synergy with obtaining some of Kraft Foods stocks along with pure cash.

Stitzer remained the chief executive of Cadbury business in Kraft Foods' portfolio. The acquisition was evaluated by investors as well-done deal as the management team was acknowledged as "less skilled at running the business day to day: they were good at the former and not at the latter" [FT, 2012]. With retention of the Cadbury' management, the target company obtained access to Kraft distribution facilities and new opportunities for adding value based on synergy effect. Notwithstanding of the acquisition type of the deal, this case can be discussed in terms of quasi-voluntary delisting:

- 1) Wise decision to sell company and delist from stock exchange with increase of shareholders' wealth, especially, on the background of declining performance of Cadbury;
- 2) Management team of Cadbury stayed in place and Cadbury business remained detached being part of Kraft Foods' portfolio;
- 3) According to journalists' researches, the partial or full acquisition was concerned by the Cadbury's management team as the way to improve the financial performance. Taking into account the fact of suspicious role of Trian Fund Management and following Kraft Foods' bid for Cadbury, it can be assumed that it might be premediated "win-win" strategic position;
- 4) Triggers for the Cadbury's going out from the stock market as an independent company can be discussed applying the previous theoretical investigation: low sales growth rates, conservative investing policy, moderate growth opportunities;
- 5) Buying out allows not only to make a relief but also to relocate costs associated with being listed as independent company both direct and indirect.

#### 1.4. Hypothesis formulation

To meet the main goal of this research paper to select drivers of delisting process in order to build investment strategy for shareholders, the empirical study will be conducted. Previously it was stated that reasons for voluntary delisting can be divided into two groups: cost-benefit tradeoff and agency problems. Consequently, hypotheses will be related to these groups.

**Hypothesis 1. There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.**

According to published earlier researches, firms which were voluntary delisted from a stock exchange had been showing low growth potential comparing with firms stayed traded. As fundamentally ROE is incorporated in the numerator of the MB ratio, the choice of the variable is justified in terms of growth opportunity. Higher MB ratio shows bigger return on equity for investors, so, the firm with lower MB ratio tend to go private more likely in order to hide from

public the low growth potential which will lead to decrease in attractiveness of this firm for investors [Bharath, Dittmar, 2013]. Market-to-Book ratio reflects the perception of a company by a market. If focus not on speculators only but long-term investors, the last type seeks for opportunities to enhance their wealth due to sustainable growth of a bought asset. Therefore, in case when a firm seems to be low growth potential, then it becomes less attractive as an investment chance, which leads to decrease of incoming capital via trading. At the end, it reverts to prevailing of costs over benefits from being listed.

Another indicator of growth potential discussed in relevant literature is net sales growth. There is the evidence of significant influence of net sales growth rate on value for shareholders [Ataunal et al, 2016]. Chemmanur and his colleagues found in their research paper that public firms have U-form pattern of changes in sales growth during their life cycle [Chemmanur, He, Nandy, 2010]. The peak is reached at the time around IPO event and driven by high capital inflow and intrinsic motivation of companies' leaders: productivity enhancement. An outstanding performance leads to laying up of the attractiveness for potential investors and increase of gains from public status, consequently. That is why with decreasing of growth rate investors becomes less interested in a company with leads to drop of potential benefit of being listed. The growth rate of net sales is historic indicator which explains the facts while Market-to-Book ratio evaluate the perspectives of a company. Thus, it seems to be consistent to take into account both metrics as feedback and feedforward.

**Hypothesis 2. There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.**

The higher liquidity of a stock, the lower cost of capital for traded company. Liquidity have positive influence on stock price which leads to increase of benefits to be listed [Amihud, Mendelson, 2000]. That is why firms with higher volume of transaction aim to go or stay public. It is important to understand that here the definition of "liquidity" is narrowed to number of transactions with a company's shares. The turnover of these shares reflects interest of investors to the particular firm. The authors of high-credited researches regarding voluntary delisting phenomena stated that this factor is vital [Mehran, Peristiani, 2010, Bharath, Dittmar, 2010]. According to previous investigations, the failure of the attempt to attract investors' attention to the company, which is expressed through trading volume of its shares, leads to going private since the beneficial part of being listed does not exceed corresponding costs.

**Hypothesis 3. There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.**

Suggested and tested by Jensen in 1986 FCF hypothesis states that there is the evidence that a company's managers spend Free Cash Flows on projects with negative NPV rather than

distributes among shareholders. Such decisions might be connected to a reward system i.e. bonuses or other factors related to corporate governance. This fact leads to agency problem and shareholders become more interested in taking over the control. Nevertheless, the FCF hypothesis seems to be controversial if other scientific papers are discussed. Some authors found that companies with higher free cash flows are more tended to go private [Maupin et al, 1984]. Others claimed that FCF was not confirmed by their researches not for US, not for European market [Geranio et al, 2010, Weir et al, 2005, Dittmar et al, 2010]. Thus, the influence of FCF is attractive for current research and finding of evidence from London Stock Exchange in different from other authors time period. Following the most reliable and deep research [Jensen, 1986], it is assumed that higher FCF ratio affects positively on the decision to go private.

**Hypothesis 4. There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.**

The impact of leverage on decision to go private is considered to be controversial. On the one hand, being highly leveraged a company is interested to go or remain public because of limited access to funding [Kim, Weisbach, 2008]. While other researches proved that big leverage may signalize that such a company are seeking for “safety” boat, i.e private equity fund, to handle debt load [Bhathar, Dittmar, 2009]. In addition, high leverage may affect investment initiatives due to cornice of obligations to holders of debt while they are prioritized [Mayers, 1977, Becker et al, 2008]. This fact leads to slowing down of development focusing on resolution issues regarding existing liabilities and decrease in attractiveness to investors. Thus, cost-benefit tradeoff is imbalanced as well.

**Hypothesis 5. There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.**

Agency problem is strongly tight to the issue of insider ownership of a company. An insider can be either a person or an entity of a firm which should have one or both characteristics [Mehran, Peristiani, 2009]:

- “1. Any holder representing 5% or more of the total shares outstanding;
2. Any officer or board director of the company, including their related or affiliated individuals, families, entities and trusts.”

Going private allows to meet more efficiently insider’s interests. Acquiring of stocks in free floating by insiders provides the opportunity to cross the interest of shareholders and managers and their view on value maximization and decrease the effort for decision making [Renneboog, 2007, Croci et al, 2011]. Last means that alignment of managerial vision and vision of owners results in quicker and fully coordinated decision. Meanwhile, analysts of Morgan Stanley claims that increase of a company’s investor base affect positively on the its stocks’ liquidity and

following raise of the price. Investor base is increased by the number of small individual investors [Amibud, Mendelson, 2000]. Thus, by obtaining higher price of its stocks, a company ramps up market capitalization and gets the access to cheaper cost of capital, which are considered to be ones of the primary goals of being public. Then benefits from being traded prevail over costs related to public status. Considering all the views above, the firms with higher insider ownership are more likely go private.

**Hypothesis 6. There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.**

In case if a firm do not see a crucial need in access to capital, it can be messages by low capital expenditures relating to net sales [Modigliani et al, 1963, Scott, 1976, Pour et al, 2013]. Indeed, based on the analysis of benefits from being private, it is seen that if access to capital is not that important and necessary anymore while other pros are irrelevant, then there is no sense to bear costs to be listed on stock exchange and meet agency problems in distribution of resources. The metric “CAPEX/Net Sales” was suggested in different previous studies as the indicator for productivity improvement showing the effect from capital expenditures on market competition reflected by revenue [Datta et al, 2013, Custodio, 2014]. Indeed, firms invest in modernization and replacement incentives in order to catch the flow of competition and generate more or, at least, remain the level. Considering stated above ideas, it can be pointed out that less CAPEX/Net Sales ratio, less probable that a firm is in the race for the market position and higher sales using aggressive policy regarding capital expenditures. Coming back to the purposes to be public, one of them is access to a cheap capital for extensive investments in assets. Therefore, lower discussible ratio refers to lower importance of the possibility to arise less expensive resources. In its turn, it might be concluded that a company is able to manage sales level with other approaches and cost benefit tradeoff is disbalanced while agency problems are always around public status.

**Hypothesis 7. There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.**

Since one of the main reasons for voluntary delisting is the trade-off between costs and benefits, then the effect of real listing costs in absolute means in the relation to net income as the indicator for potential benefit in real money from being listed is considered to be interesting for further investigation. According to Bharath and Dittmar and their research in 2010, the observation of cost-benefit trade-off is fair relating with time being public: from IPO to control point. Therefore, the AGE variable is included inside the tested model of survival (AGE = number of days from IPO to determined date or delisting date).

**Hypothesis 8. There is negative relation between the size of a company and the decision to voluntarily delist from stock exchange.**

“Size effect” was well-researched by Dang and Li in 2015 with the conclusion that Ln(Total Assets) is one of the proven measures for determination of a firm’s size. The variable size acts like an appraisal tool for ability of a company to be public. It includes the fact that bigger firms have higher expenses to be transparent (disclose financial performance) while these costs become relatively less than for small companies and easier to allocate.

For better organization of logic for hypotheses formulation the figure 1 is provided where is green cells indicate positive relationship and red cell vice versa.

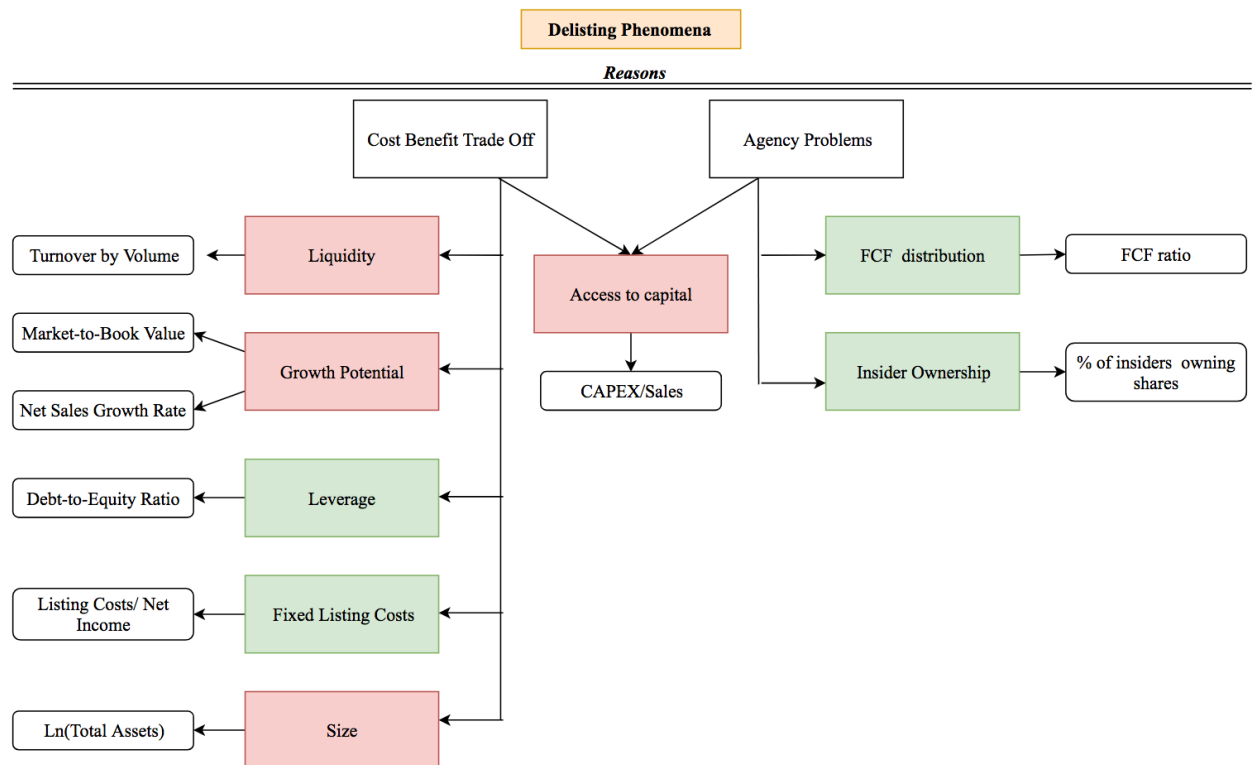


Figure 1. Summary of hypotheses formulated

## CHAPTER 2. EMPIRICAL STUDY

### 2.1. Research design

The decision to go private is binary choice model: a company goes private or stays publicly traded on a stock exchange. The dependent variable is the event of delisting, which is estimated with econometrics models.

If consider classical linear probability model (LPM) (1) with OLS, then it should be adopted to the expected options of dependent variable  $y$ : 1 - delisting, 0 - staying traded.

$$y = \beta_1 + \beta_2 x_2 + \dots + \beta_k x_k + u = x\beta + u \quad (1)$$

Then to include conditional probability, the formula is reorganized to meet the requirement:

$$\Pr(y = 1|x) = E(y|x; \beta),$$

$$\Pr(y = 1|x) = x\beta,$$

At the same time:

$$\Pr(y = 0|x) = 1 - x\beta.$$

Nevertheless, there are list of disadvantages in LPM's application [Soderbom, 2009]:

1. The mix of some independent variables can result in predictions which might be less than 0 or bigger than 1. Despite the definition of interval from 0 to 1, some can turn out outside, which devoid such predictions of meaning. Also, it is not completely right to state that a probability relates linearly to continual covariates for all viable values, since continuously enhancing regressor might drive probability above 1 or below 0.

2. Since dependent variable has value either 1 or 0, then residuals can have two options:

$1 - \beta x$  and  $-\beta x$ . Thus,

$$\begin{aligned} \text{Var}(u|x) &= \Pr(y = 1|x)[1 - x\beta]^2 + \Pr(y = 0|x)[-x\beta]^2 = x\beta[1 - x\beta]^2 + (1 - x\beta)[-x\beta]^2 \\ &= x\beta[1 - x\beta], \end{aligned}$$

Where OLS estimator remains unbiased, however, t-values might be not right as residuals are heteroskedastic by default. Moreover, as there are only 1 and 0 for residuals, they are not supposed to be distributed normally.

Considering the information above, LPM can be bared in mind as the very beginning stage in the case of binary analysis. Nevertheless, there are some problems which are easier solved with LPM rather than more complex models, i.e. logit and probit [Miguel, Satyanath, Sergenti, 2004].

As this research is focused on the complex task, the LPM seems to be not appropriate for usage. In econometrics, the most famous models for binary response are logit and probit, which mitigate problems are faced to Linear Probability Model.

First application of logit regression to the financial issue was in 1977 regarding triggers for a commercial bank failure [Martin, 1997]. A few years later, Ohlson used logit "multivariate conditional probability model to business failure prediction" [Ohlson, 1980]. Probit model was

integrated in financial studies first in 1984 by professor Zmijewski for prediction of economic distress of companies.

Logistic regression (logit) as well as probit do not use linear dependency. Logit do not consider normal distribution while probit takes into consideration that covariates are normally distributed, and this model has “fatter tails”, which means the existence of bigger amount of observations in the end of the function [Kliestik, Kocisova, Misankova, 2015]. If there is no “extreme” observations in a sample, then there is little difference between these two models.

Mathematical form of logistic models begins from the equation:  $\Pr(y = 1|x) = G(x\beta)$ , where  $0 < G(x\beta) < 1$  and  $G$  is cumulative density function (CDF).  $G$  is not linear function and OLS is not applicable. CDF growing in  $x\beta$  as follow:

$$\Pr(y = 1|x) \rightarrow 1 \text{ as } x\beta \rightarrow \infty$$

$$\Pr(y = 1|x) \rightarrow 0 \text{ as } x\beta \rightarrow -\infty.$$

As delisting as an event is not flat regarding time, therefore, usage of logit and probit models leads to not realistic limitations about identity of hazard rate (the going private solution) over time. This shortcoming can be got over with including a duration dependent parameter in the model of binary choice. One of the resolution is application of the Cox Duration (or Proportional Hazard) Model which is survival model - derivative from logit/probit approaches [Jones, Branton, 2005].

Cox Proportional Hazard Model created in 1972 is used for investigation of the factors influenced on the final decision about going private (to delist). This model is included in groups of survival models which obtain next characteristics (in case of delisting the survival event is staying public):

- 1) «The dependent variable or response is the waiting time until the occurrence of a well-defined event;
- 2) Observations are censored, in the sense that for some units the event of interest has not occurred at the time the data are analyzed;
- 3) There are predictors or explanatory variables whose effect on the waiting time we wish to assess or control» [Rodriguez, 2007]

In case of delisting the survival, event is staying public.

Cox model helps to predict how much time after IPO a company takes to go private. The variables in model relates as follow (2):

$$h(\tau|x_{t-1,i},\beta) = h_0(\tau)e^{(x_{t-1,i}\beta)} \quad (2)$$

where  $\tau$  – age of the firm in year t (in model in this paper it is in days);



$h(\tau|x_{t-1,i,\beta})$  –probability (conditional) that a company goes private in a stated year (considering that this did not go private in the previous years);

$x_{t-1,i,\beta}$  - vector of all covariates;

$i*\beta$  – parameters which model estimates;

$h_0(\tau)$  – baseline hazard, equals to the conditional probability that a company goes private while all covariates are equal to 0(zero). The hazard can vary over time.

$$Hazard\ Ratio = \frac{h(x_{t-1,i,\beta})}{h(x_{t-1,j,\beta})} (3)$$

Transforming Hazard Ratio (3) above to word equation tight to state in this research problem:

*Hazard Ratio*

$$= \frac{\text{number of companies went private in the year } t}{\text{number of companies listed in a stock exchange at the beginning of year } t}$$

Survival models and hazard function are considered in the section of duration models. Many duration models are estimated by maximum likelihood [Davidson, MacKinnon, 2004].

## 2.2. Sample and Data Collection

### 2.2.1. Company Data Selection

The considering period is from 2009 to 2017 (the most recent reports). The year 2009 was chosen as the first year after Global Economic Crisis in 2009 and as the first period of recovering after this event which was accompanied with list of bankruptcies and general decrease in companies' performance. The London Stock Exchange was chosen for conduction of the analysis. The figure 2 provide statistics about IPO by values for period from 2005 to 2017. Hong Kong Stock Exchange (HKEX), London Stock Exchange (LSE), New York Stock Exchange (NYSE), NASDAQ, Shanghai Stock Exchange (SSE), Tokyo Stock Exchange (TSE) are largest stock exchanges in the world by IPO value. London Stock Exchange among them, is the top on European part of the world as well keeping the status of the world's most international stock exchange by IPO deviation. London's IPOs have become even more international, with nine of the top ten IPOs by size coming from outside. That underlines the recognized status of LSE as the worlds most matured financial center. From the figure 2 it is seen that NYSE and TSE have bigger value of IPOs offhand. Despite the performance of NYSE, LSE was preferred due to higher level of informational disclosure which makes the research to be reliable. TSE, in its turn, has limited access for foreign companies while Asian companies are very specific and requires special advanced corresponding knowledge while information about listed on Tokyo Stock Exchange is limited.

## TOTAL VALUE OF IPOs

By market of issue; 2018 data as of Feb. 28

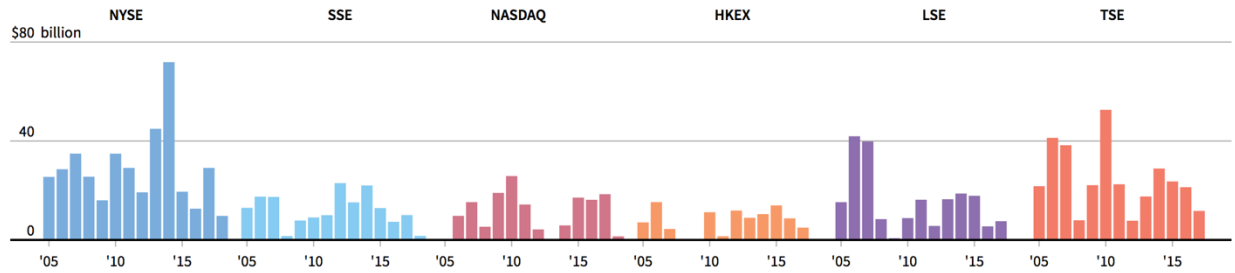


Figure 2. Information about values of IPOs from 2005 to 2017 (Source: Thompson Reuters)

This research is focused on London Stock Exchange both Main Market and AIM, and companies listed there and delisted from there. Companies traded on both markets are grouped into sectors. The distribution is shown on the figures 3 and 4.

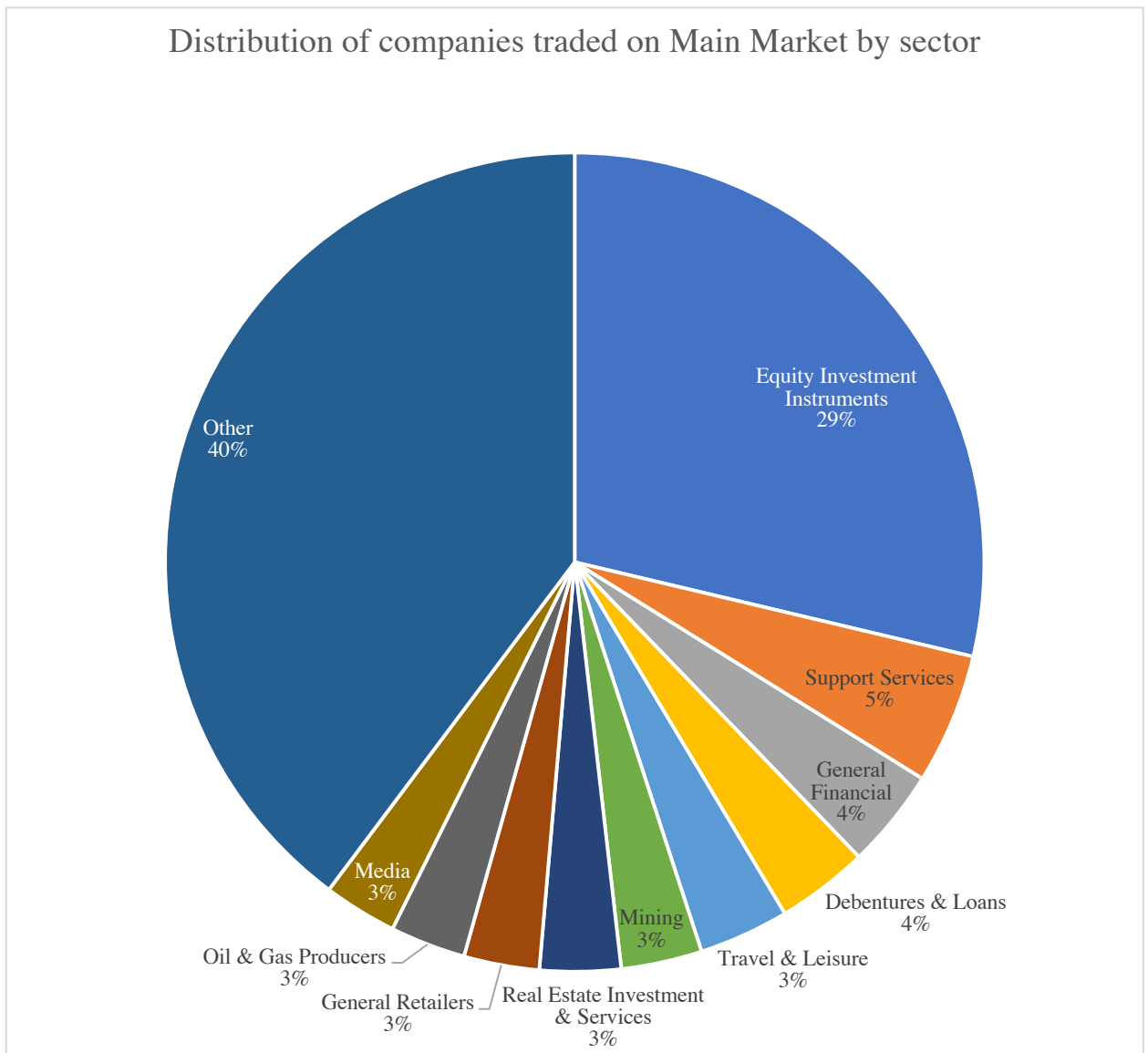
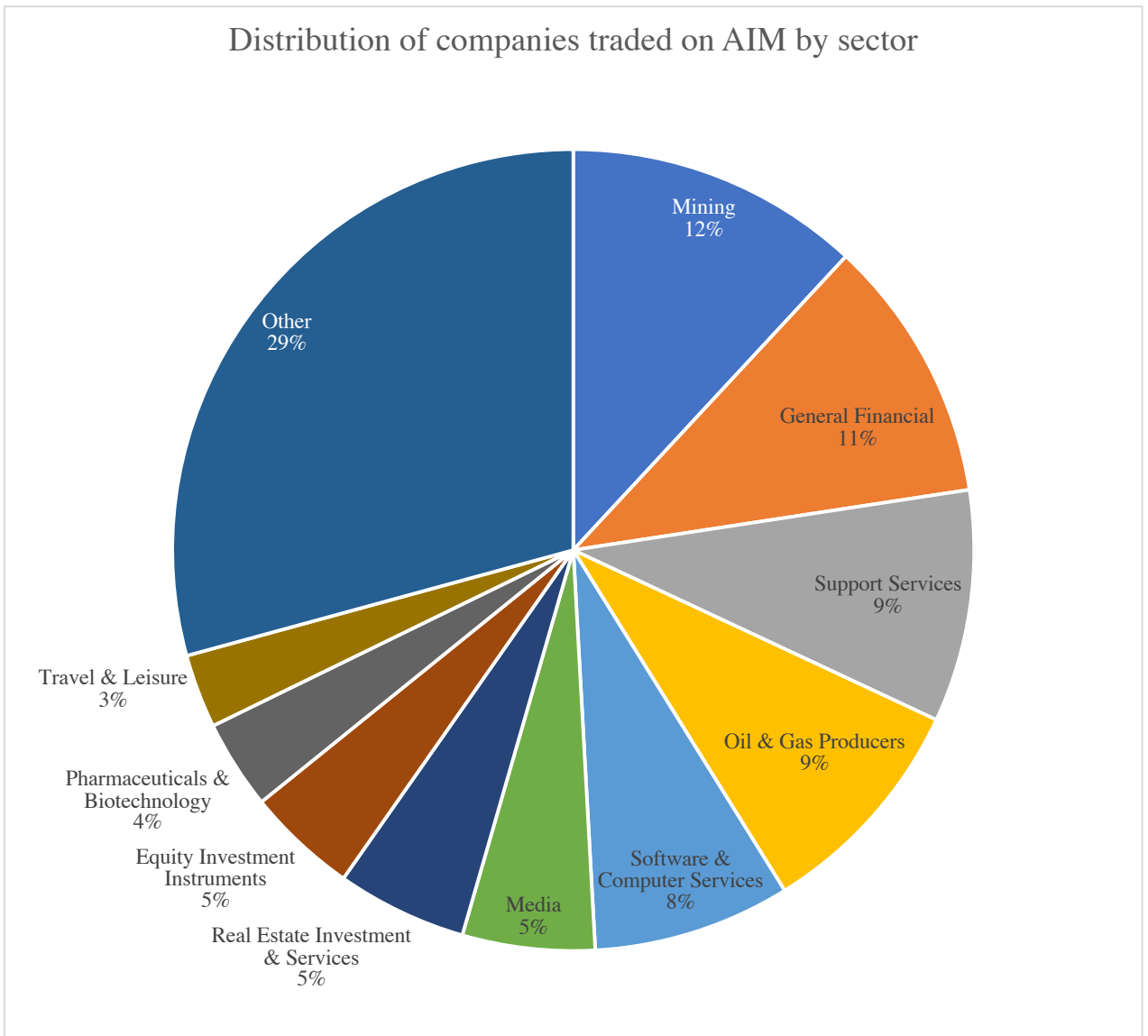


Figure 3. Distribution of companies traded on Main Market by sector



*Figure 4. Distribution of companies traded on AIM by sector*

In the table 2, the information about changes in companies traded on LSE are presented where 2009 is starting point and 2017 is ending point with last related report for 2016. The figure 5 visualizes information provided in table 2. Here is necessary to pay attention on fact that as well as some companies do delisting, new players appear due to IPO.

Table 2. Information about changes in companies traded on LSE

Year	Number of companies listed on LSE	Number of companies delisted (voluntary and involuntary) by beginning of year
2009	2788	
2010	2669	359
2011	2593	282
2012	2479	280
2013	2448	246
2014	2446	251
2015	2365	284
2016	2268	954
2017	2039	263

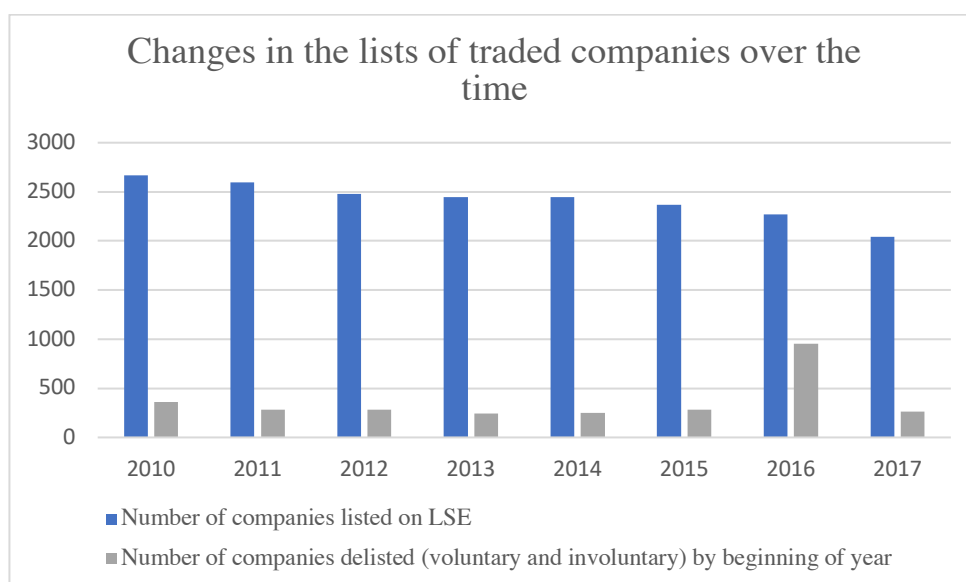


Figure 5. Changes in the lists of traded companies over the time

The list of trading companies for each year was taken from the official web site of London Stock Exchange (LSE). The sample of delisted companies was taken from Zephyr database. The in-put filters were next:

- 1) Deal type: Institutional buy-out, MBI / MBO, Share buyback, Acquisition;

The criteria are chosen on the base of theoretical overview of the possible ways to voluntary go private and available in the database. All the deals imply 100% buyback of shares in free float.

- 2) Current deal status: Completed;
- 3) Country primary addresses: United Kingdom (UK-based for Target);
- 4) Time period: on and after 01/01/2009 and up to and including 31/12/2017 (completed-confirmed).

As the result the sample contained 2768 results. After association with the list of companies traded on LSE in any year from 2009 to 2017, there is 209 observations for voluntary delisted companies from chosen stock exchange with full presented data for analysis.

The two samples companies which went or did not were merged into one for further analysis using survival model. As the result the total number of unique observation was 5472 with fully available information regarding independent variables.

### 2.2.2. Sample Data Collection

Each row of observations' sample includes dependent variable, dummy variable and independent variables. The table 3 provides information about variables in sample:

*Table 3. Description of variables*

<b>Variable</b>	<b>Code</b>	<b>Type of variable</b>	<b>Description</b>	<b>Data type</b>
Fact of Voluntary Delisting	G_private	dependent	1 - if voluntary delisted 0 - if not	binary
Market of LSE	Market	dummy	1 - if Main Market 0 - if AIM	binary
Age	Age/Age_months/ Age_years	independent	Duration from IPO date to control date or date of a delisting deal's completion	numeric
Turnover by Volume	Liquidity	independent	Number of Transaction (in thousands)	numeric
FCF ratio	FCF_ratio	independent	Free Cash Flow/Net Sales	numeric
Debt-to-Equity	DE	independent	Total Interest-Bearing Debt/Total Book Value of Equity	numeric
Insider Ownership	INSIDER_OWNERSHIP	independent	% of insiders owned shares of a company	numeric
Market-to-Book Value	MV_BV	independent	Market Capitalization/Book Value of a Company	numeric
CAPEX-to-Sales	CAPEX_Sales	independent	CAPEX/Net Sales	numeric
Listing Costs-to-Net Income	ListC_NI	independent	Fixed Listing Costs/Net Income Available to Common	numeric
Size	LnTA	independent	Natural Logarithm of Total Assets	numeric

Descriptive statistics for variables of the sample is provided in table 4.

Table 4. Descriptive statistics

	<i>Market</i>	<i>Liquidity</i>	<i>FCF_ratio</i>	<i>GrSales</i>	<i>DE</i>	<i>INSIDER_OWNERSHIP</i>
Mean	0,50	421236,75	-326,59	149,71	47,28	31,64
Standart Error	0,01	28685,82	161,01	62,42	7,91	0,35
Median	0,00	35484,45	8,52	5,46	23,97	27,65
Mode	0,00	2144,10	3,29	2,13	0,00	0,02
Standart Deviation	0,50	2121974,92	11910,71	4617,25	585,08	26,06
Sample Variance	0,25	4502777564460,85	141864894,27	21319036,60	342316,56	679,33
Kurtosis	-2,00	257,56	2218,34	3331,25	405,80	-0,74
Skewness	0,00	14,33	-37,73	54,56	-10,47	0,54
Range	1,00	50946768,60	988711,90	299200,52	27821,66	99,86
Minimum	0,00	1,40	-676157,61	-99,93	-18028,00	0,00
Maximum	1,00	50946770,00	312554,29	299100,59	9793,66	99,86
Sum	2735,00	2305007486,20	-1787074,34	819189,06	258725,99	173107,50
Count				5472		
	<i>MV_BV</i>	<i>CAPEX_Sales</i>	<i>ListC_NI</i>	<i>LnTA (SIZE)</i>	<i>Age</i>	<i>G_Private</i>
Mean	2,73	6,04	0,75	12,41	5829,83	0,04
Standart Error	0,37	3,20	0,62	0,03	80,71	0,00
Median	1,65	0,02	0,02	12,03	3647,50	0,00
Mode	-0,28	0,00	0,16	11,63	2777,00	0,00
Standart Deviation	27,41	236,42	45,60	2,50	5970,68	0,19
Sample Variance	751,57	55895,77	2079,03	6,23	35648996,89	0,04
Kurtosis	585,95	1882,55	5422,30	0,57	3,65	21,12
Skewness	-2,66	43,13	73,48	0,64	1,98	4,81
Range	1780,89	11407,09	3456,91	16,14	41760,00	1,00
Minimum	-921,91	-2,59	-91,56	5,47	0,00	0,00
Maximum	858,98	11404,50	3365,35	21,61	41760,00	1,00
Sum	14947,76	33039,48	4122,01	67923,11	31900810,00	210,00
Count				5472		

The independent variables were tested for correlation with Pearson Correlation Coefficient. The results are provided in table 5. As it is seen there is no one evidence of strong correlation between covariates. However, CAPEX\_Sales and FCF\_ratio has moderate downhill relationship (-0,55 as well as LnTA and Insider\_Ownership (-0,48). In first case, the reason for correlation is the fact that companies with large FCF are not likely to distribute it on Capital Expenditures. while second relationship could be spurious as the nature of variables does not assume similar behavior or at least this phenomenon has not been mentioned yet in relevant literature. Weak uphill linear relationships are observed for Liquidity and Size variable (0,36), for Market-to-Book Value and Debt-to-Equity Ratio (0,39), and, lastly, for Size variable and Age (0,38). Indeed, the bigger the company, the more likely that it has higher visibility and attractiveness for investors, consequently, number of transactions is increasing. At the same time, correlation between size and age is rather understandable too: the older the company, the higher probability that it has bigger amount of total assets as it has been operating for longer time. The positive linear relationship between Market-to-Book Value and Debt-to-Equity Ratio can be explained by the assumption that a company borrows more for meeting growth opportunities which leads to development of that firm and enhancing its position on stock market [Majumdar, 2013].

Table 5. Pearson correlation matrix

	Liquidity	FCF_ratio	GrSales	DE	INSIDER_OWNERSHIP	MV_BV	CAPEX_Sales	ListC_NI	LnTA	AGE
Liquidity	1.00	0.00	0.00	0.05	-0.14	0.00	0.00	0.01	0.36	0.13
FCF_ratio	0.00	1.00	0.00	0.00	0.01	0.00	-0.55	0.00	0.01	0.02
GrSales	0.00	0.00	1.00	0.00	0.00	0.03	0.00	0.00	-0.02	-0.02
DE	0.05	0.00	0.00	1.00	-0.02	0.39	0.00	0.01	0.07	0.03
INSIDER_OWNERSHIP	-0.14	0.01	0.00	-0.02	1.00	-0.03	-0.01	-0.01	-0.48	-0.28
MV_BV	0.00	0.00	0.03	0.39	-0.03	1.00	0.00	0.00	0.00	0.02
CAPEX_Sales	0.00	-0.55	0.00	0.00	-0.01	0.00	1.00	0.00	0.00	-0.01
ListC_NI	0.01	0.00	0.00	0.01	-0.01	0.00	0.00	1.00	0.01	0.00
LnTA	0.36	0.01	-0.02	0.07	-0.48	0.00	0.00	0.01	1.00	0.38
AGE	0.13	0.02	-0.02	0.03	-0.28	0.02	-0.01	0.00	0.38	1.00

### 2.3. Empirical results and discussions

#### 2.3.1. Analysis of output

For implementation of Cox Proportional Hazard model for obtained data, the R programming software was applied. R has the SURVIVAL package which includes (coxph) function. The survival input parameters are age and “public-to-private” deal. Thus, surv(time,event) takes into account time as the age of a company in the sample from the IPO date to control date or date of a “public-to-private” deal’s completion. At the same time, voluntary going private is dummy variable for event: 1 if the event occurred and a company made delisting, 0 in opposite case. Independent variables are included in the model linearly. The output of the applied Cox Proportional Hazard Model is shown in table 6.

Table 6. Cox Proportional Hazard Model output

<b>Cox Proportional Harard Model</b>					
<i>Call: coxph(formula = Surv(Age, G_private) ~ market + liquidity + FCF_ratio + GrSales + DE + insider_ownership + mv_bv + capex_sales + ListC_NI + LnTA, data = dt)</i>					
n= 5472, number of events= 209					
	coef	exp(coef)	se(coef)	z	Pr(> z )
Market	-1.881e+00	1.524e-01	2.287e-01	-8.227	< 2e-16 ***
Liquidity	-1.280e-07	1.086e+00	8.269e-08	-1.547	0.03917 *
FCF_ratio	2.983e-05	1.000e+00	7.290e-05	0.409	0.68235
GrSales	-9.811e-07	1.000e+00	2.313e-05	-0.042	0.96617
DE	2.580e-04	1.064e+00	9.992e-05	2.582	0.00983 **
INSIDER_OWNERSHIP	6.762e-03	1.007e+00	2.989e-03	2.262	0.02369 *
MV_BV	-2.140e-03	9.979e-01	2.269e-03	-0.943	0.34547
CAPEX_Sales	-1.213e-03	9.988e-01	2.677e-03	-0.453	0.65053
ListC_NI	-2.274e-03	9.977e-01	2.358e-02	-0.096	0.92316
LnTA (SIZE)	-8.823e-02	1.092e+00	4.425e-02	-1.994	0.04615 *
<i>Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1</i>					
Concordance= 0.693 (se = 0.022)					
Rsquare= 0.023					
Likelihood ratio test= 129.9 on 10 df, p=<2e-16					
Wald test = 109.6 on 10 df, p=<2e-16					
Score (logrank) test = 134.6 on 10 df, p=<2e-16					

The likelihood ratio test, Wald test and score (logrank) test above the summary table are examining the null hypothesis about the whole model insignificance ( $\beta_s = 0$ ). The chosen model is considered to be significant according to 3 tests provided: p-values < 0,05 so the null hypothesis is not accepted. Since the sample is enormous, there is no suspicions why p-values in both three cases are extremely small. Basically, 2e-16 is the smallest possible number R can demonstrate. R<sup>2</sup> in case of Cox Proportional Hazard Model has not explanatory power and experts do not recommend to focus on this measure in survival models [Gillespie, 2006].

At the same time, not all covariates are examined as significant. The independent variable Liquidity, DE (Debt/Equity), INSIDER\_OWNERSHIP and LnTA (SIZE) are statistically significant at least level of 0,01.

It is seen that dummy variable “Market” which has information either a company on Main Market or AIM is highly significant. It means that it matters on which market the company is more tended to voluntary go private was listed. Therefore, companies listed on AIM resulted in higher probability to go private. Indeed, AIM consists mainly from innovative, growing companies with smaller size. They are riskier comparing with giants on Main Market and attractive for limited part of investors with high risk-taking level. Moreover, the strategy of sustainable development is not well-examined, therefore, such companies can overestimate their ability to be public (the problems and costs related to be listed) and concomitant benefits.

Covariate “Liquidity” demonstrates that companies with lower turnover by volume of transactions were more interested in voluntary delisting. The more liquid a stock, the more attractive this company for investors as they are guaranteed by quick exchange procedure. That is why, a few aims of being public might be met if the turnover by volume is high: a company becomes more visible and provides the opportunity for easier attraction of capital.

The variable relates to Debt-to-Equity ratio is significant on 0,001 level. Higher leverage has positive impact on decision to go private. Companies with high debt load with higher probability can require re-structuring of capital. As an option it can be acquisition of such companies by institutional investors.

Another significant insider ownership variable shows that there is positive relation between the percentage of share owned by insiders to probability of going private. Actually, to mitigate agency problems occurred with obtaining of public status, firms are more likely to voluntary delist from stock exchange.

Lastly, the covariate of size represented as Ln(Total Assets) being significant demonstrates that bigger companies are more tended to keep public status as for them cost benefit tradeoff is fair and permissible.



The exponential coefficient in second column shows multiplicative effect on the hazard, basically, hazard rate. The interpretation to each holding over variables constant, the additional unit of measurement increases the daily hazard of delisting by a factor of  $e^{b_2} = \exp(\text{coef})_i$ .

It is reasonable to interpret exponential coefficient only for significant variables. For market variable the coefficient is -1.881e+00 hazard rate equals to 1.524e-01 which means that listing on AIM market increase the probability of being voluntary delisted by 15,24%. For liquidity the coefficient is equal to -1.280e-07 while hazard ratio is 1.001e+00 which means that for a 1 unit (thousand) increase in turnover the probability e of voluntary delisting decreases by 0,1%. Variable reflected Debt-to-Equity ratio has coefficient which is equal to 2.580e-04 while hazard rate is 1.064e+00. That states that increase for a 1 unit in leverage indicator leads to increase of probability of voluntary delisting by 6,4%. Insider ownership variable has coefficient 6.762e-03 and hazard rate 1.007e+00. It can be concluded that increase for a 1 unit in insider ownership leads to increase of probability to go private for 0,7%. Lastly, the significant size variable has coefficient equals to -8.823e-02 while hazard rate is 1.092e+00. Thus, with increase for 1 unit in size measured via logarithm of Total Assets, the probability of voluntary delisting decreases by 9,2%.

Analyzing results of applying Cox Proportional Hazard Model to selected data, next conclusion about hypotheses testing can be made (table 7).

*Table 7. Conclusion about hypotheses testing*

Hypothesis 1. There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 2. There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 3. There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 4. There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 5. There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 6. There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 7. There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 8. There is negative relation between the size of a company and its decision to go private.	Accepted

After fitting the data to Cox Proportional Hazard model, it is interesting to estimate distribution of survival time over the stated period, the month was chosen as control. The figure 6 represent with 95% level of confidence provides this information.

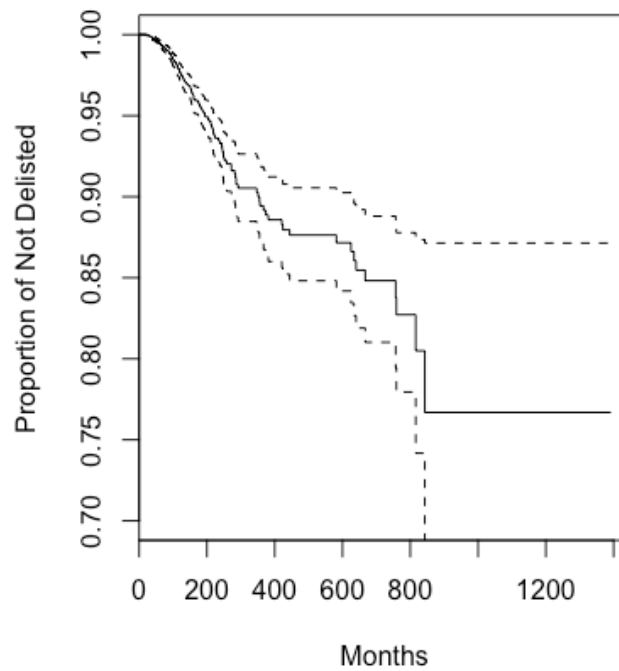


Figure 6. Distribution of survival time over the stated period

### 2.3.2. Model Diagnostics

Cox Proportional Hazard model is linear and requires examining the fitness of such a regression model for sufficient description of data. The diagnostic was provided with application of methods of residuals [Therneau, 1999]

Schoenfeld residuals test helps to examine proportional hazard. This test is implemented to significant coefficients. The output is provided in table 8.

Table 8. Schoenfeld residuals test

<b>Schoenfeld residuals</b>					
call: coxph(formula = Surv(Age, G_private) ~ market + liquidity + DE + insider_ownership + LnTA, data = dt)					
n= 5472, number of events= 209					
	coef	exp(coef)	se(coef)	z	Pr(> z )
Market	-1.883e+00	1.521e-01	2.284e-01	-8.246	< 2e-16 ***
Liquidity	-1.283e-07	1.086e+00	8.309e-08	-1.544	0.02917 *
DE	2.419e-04	1.064e+00	1.006e-04	2.404	0.0162 *
INSIDER_OWNERSHIP	6.878e-03	1.007e+00	2.982e-03	2.306	0.0211 *
LnTA (SIZE)	-8.953e-02	1.094e+00	4.417e-0	2.027	0.0427 *
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Likelihood ratio test= 128.7 on 5 df, p=<2e-16					
	rho	chisq	p		
Market	-0.03982	0.44893	0.503		
Liquidity	0.08776	1.01865	0.313		
DE	0.00444	0.00438	0.947		
INSIDER_OWNERSHIP	0.05230	0.68064	0.409		
LnTA (SIZE)	-0.10746	2.25979	0.133		
GLOBAL	NA	9.11644	0.195		

The proportional-hazard test estimates each variable as well as whole model (GLOBAL). The null hypothesis is no presence of non-proportional hazards for variables and model as a whole. Since p-values are more than 0,05 in each case, then the null hypothesis is accepted. As it is seen, there is strong argument that there are no non-proportional hazards for any significant variable. The global test with 3<sup>o</sup> of freedom shows the evidence of the non-proportional hazards' absence. Observation of influences is checked via visualization of dfbeta values which measure the impact of an observation on a separate regression coefficient. The output of the test is provided on the figure 6.

The graph shows the existence of influential observations. Nevertheless, the size and specific of sample allows to proceed with obtained results as the proportion is insufficient [Cook, 1977]. There are ways to overcome the influential outliers by log or sqrt transformations. Despite this fact, it was concluded by the author of this research paper that using these tools do not have adequate effect on the whole model and particular variables. Moreover, the model becomes worse in its significance and in general more contradictory to previous investigation of other authors. This conclusion was made based on manual permutation and checking of variables in different forms.

To sum up, survival model of Cox implemented on obtained data is considered to be appropriate and fitting.

#### 2.4. Analysis of subsamples

The analysis of base model using the full sample of chosen listed on LSE companies showed that the type of market (Main or Alternative Investments) do matter in estimation of the probability to voluntary delist from the stock exchange. That is why two subsamples were checked for the relationships between dependent variable and independent ones using the same methodology but without including of the dummy.

##### Main Market

The Cox Proportional Hazard Model was applied to subsample consisted of companies traded on the Main Market of London Stock Exchange. As it was previously stated, the more mature and sustainable firms are listed there. The output of the estimation is provided in table 9.

Table 9. The output of Cox Proportional Hazard Model (Main Market)

<b>Cox Proportional Harard Model</b>					
<i>Call:</i> <code>coxph(formula = Surv(Age, G_private) ~ liquidity + FCF_ratio + GrSales + DE + insider_ownership + mv_bv + capex_sales + ListC_NI + LnTA, data = dt)</code>					
n= 2735, number of events= 86					
	<b>coef</b>	<b>exp(coef)</b>	<b>se(coef)</b>	<b>z</b>	<b>Pr(&gt; z )</b>
Liquidity	-6.709e-08	1.002e+00	8.008e-08	-0.838	0.04021 *
FCF_ratio	1.753e-03	1.002e+00	4.582e-03	0.383	0.70200
GrSales	8.159e-04	1.001e+00	1.239e-03	0.658	0.51028
DE	4.391e-04	1.013e+00	1.776e-04	2.473	0.01341 *
INSIDER_O	1.179e-02	1.012e+00	4.672e-03	2.524	0.01159 *
MV_BV	-2.872e-02	9.717e-01	1.056e-02	-2.720	0.00653 **
CAPEX_Sal	1.046e-01	1.110e+00	1.886e-01	0.555	0.57912
ListC_NI	-8.981e-04	9.991e-01	7.213e-03	-0.125	0.90090
LnTA (SIZE)	-1.798e-02	9.822e-01	6.297e-02	-0.285	0.37527
<i>Signif. codes:</i> 0 '****' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Concordance= 0.612 (se = 0.034 )					
Rsquare= 0.007					
Likelihood ratio test= 18.89 on 9 df, p=0.03					
Wald test = 22.45 on 9 df, p=0.008					
Score (logrank) test = 18.23 on 9 df, p=0.03					

All three tests checking significance show that the model is significant: the null hypothesis about insignificance is not accepted because p-values<0,05. Nevertheless, as in the previous time, not all of independent variables. Here it is seen that Liquidity, Debt-to-Equity, Insider ownership and Market-to-Book ratio are statistically significant and can be interpreted. Comparing with the base model, the variable which reflects the influence of the size of a company is not significant anymore, while growth potential via MB ratio becomes interesting for analysis.

The Size covariate is not significant anymore. This fact can be explained by the specific of companies listed on Main Market. On the official web-site of LSE, it is stated that “The Main Market is London’s flagship market for larger, more established companies, and is home to some of the world’s largest and most well-known companies.” [LSE, 2018]. Thus, such companies are big by default and the variance in the size among them do not affect the decision to voluntary delist.

If in case of variables related to liquidity and insider ownership, the interpretation has common character with base model, then Market-to-Book ratio has its specifics. This covariate responses the growth potential and the perception of a company by a market. At the same time, the sustainability of companies from Main Market makes them be considered as suitable for IBO, MBO and MBI according to criteria for target firms taking part in such types of going private

deals. With the matureness of a business, another struggle is coming: despite the stable cash flows and market position, it becomes harder to expand more. It means that if growth potential can be lower for such companies, then there is higher probability to go private as there is no need to carry listing cost while the processes for obtaining of positive cash flows are already set.

Exponential coefficient of significant variables can be interpreted as follow:

- Liquidity: for each unit (in thousands) decrease in turnover the probability of voluntary delisting increases by 0,2%;
- Debt-to-Equity Ratio: for each unit increase in leverage indicator the probability of going private increases by 1,3%;
- Insider Ownership: for each unit increase in insider ownership the probability of voluntary delisting increases by 1,2%;
- Market-to-Book ratio: for each unit increase in MB ratio the probability of voluntary delisting decrease by 2,83%.

The summary of analysis of hypotheses is provided in table 10.

*Table 10. Conclusion about hypotheses testing (Main Market)*

Hypothesis 1. There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.	Accepted (in part of MB ratio)
Hypothesis 2. There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 3. There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 4. There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 5. There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 6. There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 7. There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 8. There is negative relation between the size of a company and its decision to go private.	Not significant variable

The table 11 shows the output of model diagnostics for examination of proportional hazard. As the subsample is considered then test for influential observations can be skipped.

Table 11. The model's diagnostics output

<b>Schoenfeld residuals</b>					
call: <i>coxph(formula = Surv(Age, G_private) ~ liquidity + DE + insider_ownership + LnTA, data = dt)</i>					
n= 2735, number of events= 86					
	<b>coef</b>	<b>exp(coef)</b>	<b>se(coef)</b>	<b>z</b>	<b>Pr(&gt; z )</b>
Liquidity	-8.450e-08	1.000e+00	7.591e-08	-1.113	0.00438 **
DE	4.819e-04	1.000e+00	1.530e-04	3.149	0.00164 **
INSIDER_O	1.240e-02	1.012e+00	4.240e-03	2.923	0.00346 **
MV_BV	-3.081e-02	9.697e-01	9.697e-03	-3.177	0.00149 **
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Likelihood ratio test= 18.17 on 4 df, p=0.001					
	<b>rho</b>	<b>chisq</b>	<b>p</b>		
Liquidity	0.075814	2.39e-01	0.625		
DE	0.000553	2.02e-05	0.996		
INSIDER_O	0.042526	1.72e-01	0.678		
MV_BV	-0.032722	4.69e-02	0.829		
GLOBAL	NA	4.85e-01	0.975		

The proportional-hazard test demonstrates that no presence of non-proportional hazards for variables and model as the whole.

The figure 7 shows that the survival time for companies traded on Main Market are quite longer than in the base model, which also relates to the specifics of the subsample.

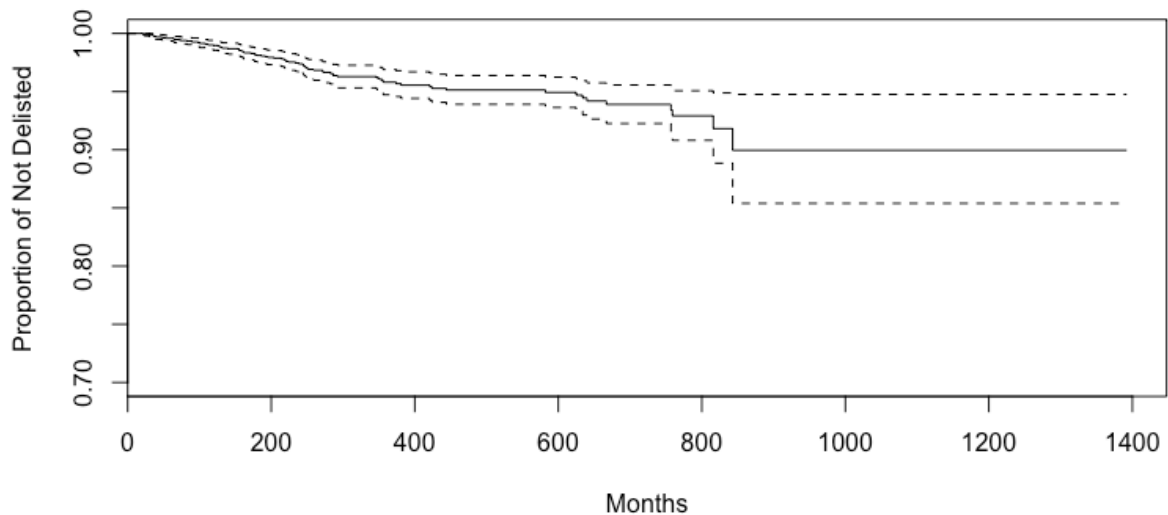


Figure 7. Distribution of survival time over the stated period

## AIM

The subsample consisted of the companies traded on AIM was analyzed. The Cox Proportional Hazard model was applied as well. The output of the estimation is provided in table 12.

Table 12. The output of Cox Proportional Hazard Model (AIM)

<b>Cox Proportional Harard Model</b>					
<i>Call:</i> <code>coxph(formula = Surv(Age, G_private) ~ market + liquidity + FCF_ratio + GrSales + DE + insider_ownership + mv_bv + capex_sales + ListC_NI + LnTA, data = dt)</code>					
n= 2737, number of events= 124					
	<b>coef</b>	<b>exp(coef)</b>	<b>se(coef)</b>	<b>z</b>	<b>Pr(&gt; z )</b>
Liquidity	-2.694e-09	1.000e+00	1.366e-07	-0.020	0.284266
FCF_ratio	-6.576e-06	1.000e+00	1.560e-05	-0.422	0.673344
GrSales	-1.268e-0	1.000e+00	2.406e-05	-0.053	0.957955
DE	2.736e-04	1.064e+00	1.227e-04	2.230	0.025726 *
INSIDER_O	2.875e-03	1.003e+00	3.797e-03	0.757	0.048945 *
MV_BV	-3.406e-04	9.997e-01	4.343e-03	-0.078	0.937487
CAPEX_Sal	-8.622e-04	9.991e-01	6.059e-03	-0.142	0.886842
ListC_NI	-5.940e-03	9.941e-01	4.420e-02	-0.134	0.893096
LnTA (SIZE)	-2.257e-0	1.092e+00	6.452e-02	-3.498	0.000469 ***
<i>Signif. codes:</i> 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Concordance= 0.598 (se = 0.03 )					
Rsquare= 0.006					
Likelihood ratio test= 16.17 on 9 df, p=0.06					
Wald test = 17.83 on 9 df, p=0.04					
Score (logrank) test = 16.65 on 9 df, p=0.05					

As it is seen, the significance of the whole model according to Likelihood ratio test became less, however, in terms of this research and taking into consideration results of other two tests, the null hypothesis about insignificance of the model is not accepted on the 0,10. The range of the statistically significant independent variables is inside the base model, however, the liquidity does not matter anymore. According to the definition from official web site of LSE, “AIM is the London Stock Exchange’s international market for smaller growing companies. A wide range of businesses including early stage, venture capital backed as well as more established companies join AIM seeking access to growth capital.” [LSE, 2018]. This means that such companies are not attributed with high investors’ awareness and not tended to have high turnover. At the same time, significant covariates can be interpreted a bit in the other way from the base model. The main difference is the level of underlying risks. If it comes to leverage position, the positive relationship between debt-to-equity ratio and decision to go private correlates with the risk of not meeting of liabilities by the growth companies. The firms listed on the AIM market seek for a capital and their debt

position can be high as well due to necessity in resources for development. At the same time, these companies are not that mature as ones from Main Market, so they may have less expertise in management of debt load. It leads to arising risk of bankruptcy, for example. In order not to be forced delisted, these firms prefer to go private. Variables which is responsible for insider ownership and size of a firm in case of AIM companies also can have similar explanation of influence as in the base model. Nevertheless, looking at table 13, it is seen that average percentage of insider ownership for companies traded on AIM is more than twice higher than for firms from Main Market. This means that owners of young companies being at the stage of growth keep higher level of control over their business. It is logical that such companies with primary goal in arising the capital to develop are more interested in keeping the reins. Moreover, it can be vital as firms from AIM are often use innovative business models which might be complicated for an external participant's understanding, which would lead to great agency problems.

Table 13. Descriptive Statistics for Comparable Variable

	<b><i>INSIDER_OWNERSHIP (MM)</i></b>	<b><i>INSIDER_OWNERSHIP (AIM)</i></b>
Mean	19,80	43,46
Standart Error	0,42	0,47
Median	11,37	43,01
Mode	0,25	38,20
Standart Deviation	21,90	24,48
Sample Variance	479,76	599,05
Kurtosis	0,49	-0,79
Skewness	1,17	0,18
Range	99,61	99,84
Minimum	0,00	0,02
Maximum	99,61	99,86
Sum	54151,52	118955,98
Count	2735	2737

Also, it is interesting to see how the significance of the size covariate has increased comparing with base model. It can be explicated by the specifics of the market.

Exponential coefficient of significant variables can be interpreted as follow:

- Debt-to-Equity Ratio: for each unit increase in leverage indicator the probability of going private increases by 6,4%;
- Insider Ownership: for each unit increase in insider ownership the probability of voluntary delisting increases by 0,3%;
- Size as Ln(Total Assets): for each unit increase in MB ratio the probability of voluntary delisting decrease by 9,2%.

The summary of analysis of hypotheses is provided in table 14.



Table 14. Conclusion about hypotheses testing (AIM)

Hypothesis 1. There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 2. There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 3. There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 4. There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 5. There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.	Accepted
Hypothesis 6. There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 7. There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.	Not significant variable
Hypothesis 8. There is negative relation between the size of a company and its decision to go private.	Accepted

The table 15 shows the output of model diagnostics for examination of proportional hazard. As the subsample is considered then test for influential observations can be skipped.

Table 15. The model's diagnostics output

<b>Schoenfeld residuals</b>					
<i>call: coxph(formula = Surv(Age, G_private) ~ market + liquidity + DE + insider_ownership + LnTA, data = dt)</i>					
n= 2737, number of events= 124					
	<b>coef</b>	<b>exp(coef)</b>	<b>se(coef)</b>	<b>z</b>	<b>Pr(&gt; z )</b>
Liquidity	-1.996e-09	1.000e+00	1.360e-07	-0.015	0.08830 .
DE	2.717e-04	1.000e+00	1.208e-04	2.249	0.02449 *
INSIDER_O	2.834e-03	1.003e+00	3.792e-03	0.747	0.04488 *
LnTA (SIZE	-2.240e-01	1.251e+00	6.445e-02	-3.476	0.00051 ***
<i>Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1</i>					
Likelihood ratio test= 15.75 on 4 df, p=0.003					
	<b>rho</b>	<b>chisq</b>	<b>p</b>		
Liquidity	0.09792	0.64701	0.421		
DE	0.00769	0.00712	0.933		
INSIDER_O	0.01126	0.01721	0.896		
LnTA (SIZE	0.04369	0.25410	0.614		
GLOBAL	NA	0.97562	0.913		

The proportional-hazard test demonstrates that no presence of non-proportional hazards for variables and model as the whole.

The figure 8 shows that the survival time for companies traded on AIM are much shorter than in base model or comparing to Main Market, which also relates to the specifics of the subsample: smaller growing companies are less stable and have lower potential to stay public for a long time due to overestimation of cost-benefit tradeoff as well as underestimation of corresponded agency problems

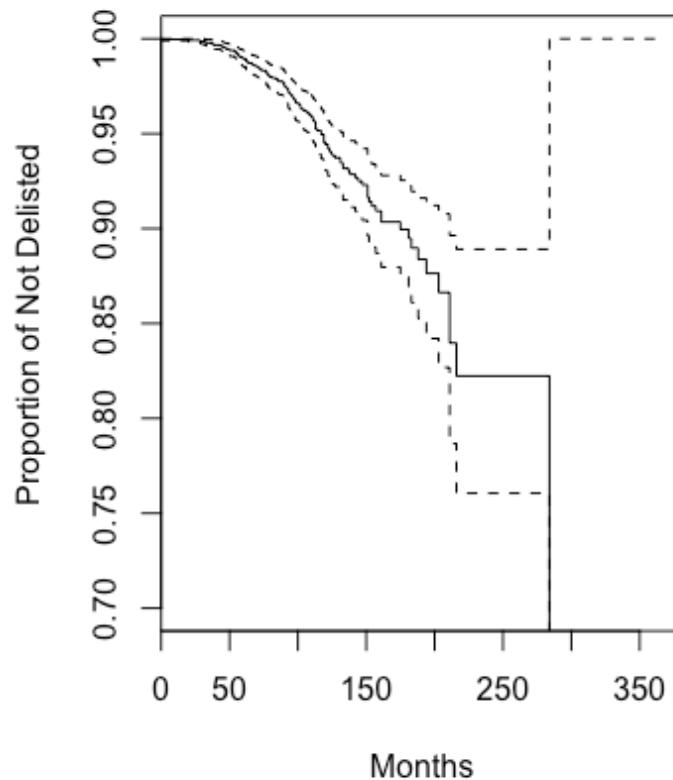


Figure 8. Distribution of survival time over the stated period

## 2.5. Summary of analysis (base model and subsamples)

After theoretical overview of the delisting phenomenon with focus on voluntary type, the analysis of collected data with application of Cox Proportional Hazard Model as most appropriate for such kind of binary choice was conducted. Eight hypotheses were formulated and checked on the whole sample and then subsamples. Subsamples were organized depending on the type of LSE Market: Main Market or AIM. The decision about checking subsamples was made after conclusion that dummy variable does matter. The summary table 16 represents hypotheses testing results.

Table 16. Summary of hypotheses testing results

	<b>Base Model</b>	<b>Main Market</b>	<b>AIM</b>
Hypothesis 1. There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.	Not significant variable	Accepted (in part of MB ratio)	Not significant variable
Hypothesis 2. There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.	Accepted	Accepted	Not significant variable
Hypothesis 3. There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.	Not significant variable	Not significant variable	Not significant variable
Hypothesis 4. There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.	Accepted	Accepted	Accepted
Hypothesis 5. There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.	Accepted	Accepted	Accepted
Hypothesis 6. There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.	Not significant variable	Not significant variable	Not significant variable
Hypothesis 7. There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.	Not significant variable	Not significant variable	Not significant variable
Hypothesis 8. There is negative relation between the size of a company and its decision to go private.	Accepted	Not significant variable	Accepted

The summary of analysis is provided in table 17.

Table 17. Summary of conducted analysis

<b>Base Model</b>	
Accepted Hypotheses	Inference
<ul style="list-style-type: none"> <li>- There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange;</li> <li>- There is positive relation between higher leverage and the decision to voluntary delist from stock exchange;</li> <li>- There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange;</li> <li>- There is negative relation between the size of a company and its decision to go private.</li> </ul>	<p>The analysis of the full sample consisted of companies from both LSE markets showed that there several factors among the chosen scope, which can affect a firm's decision to go private. Among them, liquidity estimated as turnover of shares on the stock exchange, financial leverage, the percentage of insiders in ownership structure and the size of a company. These four indicators can be first signals for beneficiaries of going out transactions.</p>
<b>Subsamples</b>	
Main Market	AIM
Accepted Hypotheses	
<ul style="list-style-type: none"> <li>- There is negative relationship between growth potential and the decision to voluntary delist from stock exchange (in part of MB ratio);</li> <li>- There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange;</li> <li>- There is positive relation between higher leverage and the decision to voluntary delist from stock exchange;</li> <li>- There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.</li> </ul>	<ul style="list-style-type: none"> <li>- There is positive relation between higher leverage and the decision to voluntary delist from stock exchange;</li> <li>- There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange;</li> <li>- There is negative relation between the size of a company and its decision to go private.</li> </ul>
Inference	
<p>The estimated model applied to subsample of companies from Main Market showed that the base model results can be applicable for particular market, however, with the limitation. The size is not trigger for paying attention on a company as on a potential delisted due to specifics of Main Marker. At the same time, the growth potential becomes more important for checking.</p>	<p>The estimated model applied to subsample of companies from AIM showed that the base model results can be applied partly. The intensity of share's turnover is not the trigger for smaller growth companies. Meanwhile, the interpretation of leverage in terms of companies traded on AIM has changed in the way of risk exposure.</p>

## 2.6. Managerial implication

The conducted research has implication for different stakeholders. Among them:

- 1) Managers of institutional players;
- 2) Managers of companies who are responsible for investing activities;
- 3) Individual investors;
- 4) Owners of listed companies on London Stock Exchange.

For 3 first groups this research paper and the suggested investment strategy may be used as a tool for wealth management.

Investment strategies are provided in table 18:

*Table 18. Implication for groups 1-3: managers of institutional players, managers of companies who are responsible for investing activities and individual investors*

Market	Triggers for delisting to focus on
<p style="text-align: center;"><b>London Stock Exchange</b></p>	<ul style="list-style-type: none"> <li>• Presence of a company on AIM increase the probability of going private by 15,24% while other factors are constant. Thus, for playing against market within general, it is reasonable to choose AIM;</li> <li>• The focus on liquidity performance and size parameters are important for monitoring. Any dropping fluctuation in turnover by volume and total assets can increase the probability that a company will voluntary delist from stock exchange;</li> <li>• In case if a company's leverage has the tendency to increase, then it is a signal to pay attention to such a company as the probability of its going private is increasing.;</li> <li>• If in a company's ownership structure the significant part is hold by insiders, then such a company is more likely to go private comparing with other where stocks in free float are distributed mostly among external investors.</li> </ul>
<p style="text-align: center;"><b>Main Market</b></p>	<ul style="list-style-type: none"> <li>• Choosing Main Market to monitor companies there, there is no sense to pay attention on the size of a company since the market is characterized by presence of large and mature firms;</li> <li>• Fluctuations in growth potential estimated as Market-to-Book value can signal about the probability to go private. Companies with lower growth potential are more likely to go private since stable position and constant positive cash flows allow to reduce costs corresponded to listing on the stock exchange;</li> <li>• The pattern of attitude to liquidity, leverage and insider ownership remains the same as in the case of LSE in general.</li> </ul>

<b>AIM</b>	<ul style="list-style-type: none"> <li>• Choosing AIM to monitor companies there, the horizon of overview is changed: the information about turnover of shares becomes irrelevant;</li> <li>• The pattern of attitude to leverage and size remains the same as in the case of LSE in general;</li> <li>• In case if a company traded on AIM has high leverage (Debt-to-Equity ratio), then it is reasonable to monitor such a firm as it can higher probability to go private. Nevertheless, it is important to notice that having large debt load for a small growing company can be risky because of lack of experience in liabilities' management. Therefore, a firm from AIM with high leverage is also tended to be involuntary delisted, which is not favorable situation for potential beneficiaries.</li> </ul>
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For last group of possible users of this research paper the implementation relates to corporate governance and argumentative decision making to go private based on proved hypotheses tested in the work. Again, these decisions depend on the market or/and sector where the company is traded. The implication for owners of listed companies on London Stock Exchange is provided in table 19:

*Table 19. Implication for owners of listed companies on London Stock Exchange*

<b>Market</b>	<b>Reason to consider going private</b>
<b>London Stock Exchange</b>	<ul style="list-style-type: none"> <li>• If the size of a company is not that big and the situation does not improve over time, then it could be not beneficial to stay listed and bear the costs related to public status. The cost-benefit tradeoff can be imbalanced;</li> <li>• If the liquidity of a company's stocks is dropping down, then it is signal either of considering going private or enhance efforts for increase of turnover. Without this action, each thousands of decrease in volume will decrease the level of cost-benefit tradeoff for 0,1%;</li> <li>• If the big portion of a company's stocks is already owned by insiders, it can be reasonable to discuss possibility to go private in case of the presence of agency problems on the background;</li> <li>• In case of the debt ratio's increase, it is wise to overview the option to voluntary delist from stock exchange for restructuring of the liabilities' load. For instance, go private via buying out by private equity fund.</li> </ul>

<p style="text-align: center;"><b>Main Market</b></p>	<ul style="list-style-type: none"> <li>• If it is noticed that Market-to-Book ratio has the tendency to decrease, then it might be considered as the reason to think in the way of going private. The reason is that low growth potential or even just a perception of the market about it make doubts about the significance and necessity to be listed. Being a large and sustainable company, it can be more favorable to voluntary delist in order to decrease associated costs while cash flows are positively stable.</li> </ul>
<p style="text-align: center;"><b>AIM</b></p>	<ul style="list-style-type: none"> <li>• In case of a high leverage, it can be reasonable to pay big attention on debt management for understanding the risks associated with liabilities. If there is board line situation and there is no confidence, it is vital to think about going private voluntary before this process will be forced.</li> </ul>

## 2.6. Research limitations

The conducted research has a number of limitations:

- 1) The sample was significantly cut because of non-availability of data for all variables for all companies in primary sample. The final number of observation is 5472 for period from 2009 to 2017 including Main Market and AIM.
- 2) Fixed Listing Costs were computed as the sum of auditor fees and annual fee of LSE depending on the market (Main Market or AIM). This approach is considered to be simplified and does not take into account other associated fixed costs for more complex analysis of this factor. The reason is availability of data in open sources.
- 3) The research is conducted for London Stock Exchange only, thus, application of results on other markets is not proven.

## CONCLUSION

This research paper is devoted to voluntary delisting phenomenon. The goal of the study was to identify drivers of delisting process in order to build investment strategy for potential beneficiaries of the going private transactions. The research was conducted on the example of London Stock Exchange. At the result, the recommendations for 4 groups of stakeholders as potential beneficiaries were suggested on the base of conducted analysis. Since to obtain measurement gain from going private transactions, the beneficiary should be shareholder, then the topic of this master thesis matches the main aim.

First of all, the theoretical base was overviewed for better understanding of the nature and main principles of voluntary delisting phenomenon. It was started with the stating the fact that going private transactions are considered to be opposite to IPOs. Therefore, the analysis started from the analysis of reasons of companies to become public. Afterwards, the corresponding with being listed direct and indirect costs were discussed based on the literature review and credited previous studies. The overviewed reasons formed the comprehension of factors which affect a company's decision to go private. All the factors were divided into two groups associated with cost-benefit tradeoff and agency costs.

For becoming private company after being traded on a stock exchange, a company should complete the procedures which will lead to change of the status. In the first chapter was considered different types of public-to-private transactions among which the most wide-spread: LBOs, MBOs/MBIs and M&A deals.

Since this research paper seeks to propose managerial implication, the case study of the Cadbury's buying out by Kraft Foods with following retention of the target company's management team and its independence inside US public company. The acquisition increased the wealth of shareholders. At the same time, on the example, there were touched the factors which found their effect on the decision of the Cadbury with 184 years heritage to be taken-over by foreign player. This case showed the transaction peculiarities and gave the understanding of premium formation via real world situation.

After paying attention on main components of voluntary delisting, several hypotheses were formulated with again reviewing of theoretical background of the research problem. Next hypotheses were suggested for testing:

Hypothesis 1. (cost-benefit trade off group) There is negative relationship between growth potential and the decision to voluntary delist from stock exchange.

Hypothesis 2. (cost-benefit trade off group) There is negative relationship between liquidity by volume and the decision to voluntary delist from stock exchange.



Hypothesis 3. (agency costs group) There is positive relationship between free cash flow ratio and the decision to voluntary delist from stock exchange.

Hypothesis 4. (cost-benefit trade off group) There is positive relation between higher leverage and the decision to voluntary delist from stock exchange.

Hypothesis 5. (agency costs group) There is positive relation between percentage of insider owners and the decision to voluntary delist from stock exchange.

Hypothesis 6. (cost-benefit trade off group/agency costs group) There is negative relationship between importance of access to capital and the decision to voluntary delist from stock exchange.

Hypothesis 7. (cost-benefit trade off group) There is positive relation between costs to be listed on stock exchange to net income as the performance indicator ratio and the decision to voluntary delist from stock exchange.

Hypothesis 8. (cost-benefit trade off group) There is negative relation between the size of a company and the decision to voluntary delist from stock exchange.

The results of empirical study which was conducted with the sample of companies from LSE both Main Market and AIM in period from 2009 to 2017 showed significant results. The base model and models for subsamples with tightness to markets were tested for their significance and independent variables included. The resume is provided in table 20 where significant factors affected delisting decision with their signs are represented.

*Table 20. Comparison of the models' significant covariates*

<b>Base Model</b>	<b>Main Market</b>	<b>AIM</b>
Liquidity (-)	Liquidity (-)	Debt-to-Equity Ratio (+)
Debt-to-Equity Ratio (+)	Debt-to-Equity Ratio (+)	Insider Ownership (+)
Insider Ownership (+)	Insider Ownership (+)	Size (-)
Size (-)	Market-to-Book Ratio (-)	
Dummy: Market		

After analysis of the output with application of theoretical base, the managerial implications were suggested and provided in corresponding part of this research paper. The recommendations are presented in tables for distribution among particular target groups and considered to be user-friendly and adopted for different level of diving into voluntary delisting topic. The managerial implications suggest built investment strategy for those who are interested in obtaining benefits from delisting transactions, for instance, due to received premium during buying out process.

Nevertheless, this research has number of limitations regarding data access, analysis conducted only for LSE and, finally, about peculiarities of computations of the listing costs.

Moreover, there is field for further research using the suggested concepts. For example, introduction of other variables in the model. Due to characteristics of the Cox Proportional Hazard Model chosen for the study, it is not required to adopt the specific mix of variables, but it is possible to enter new one and exclude some based on the assumptions of next researchers.

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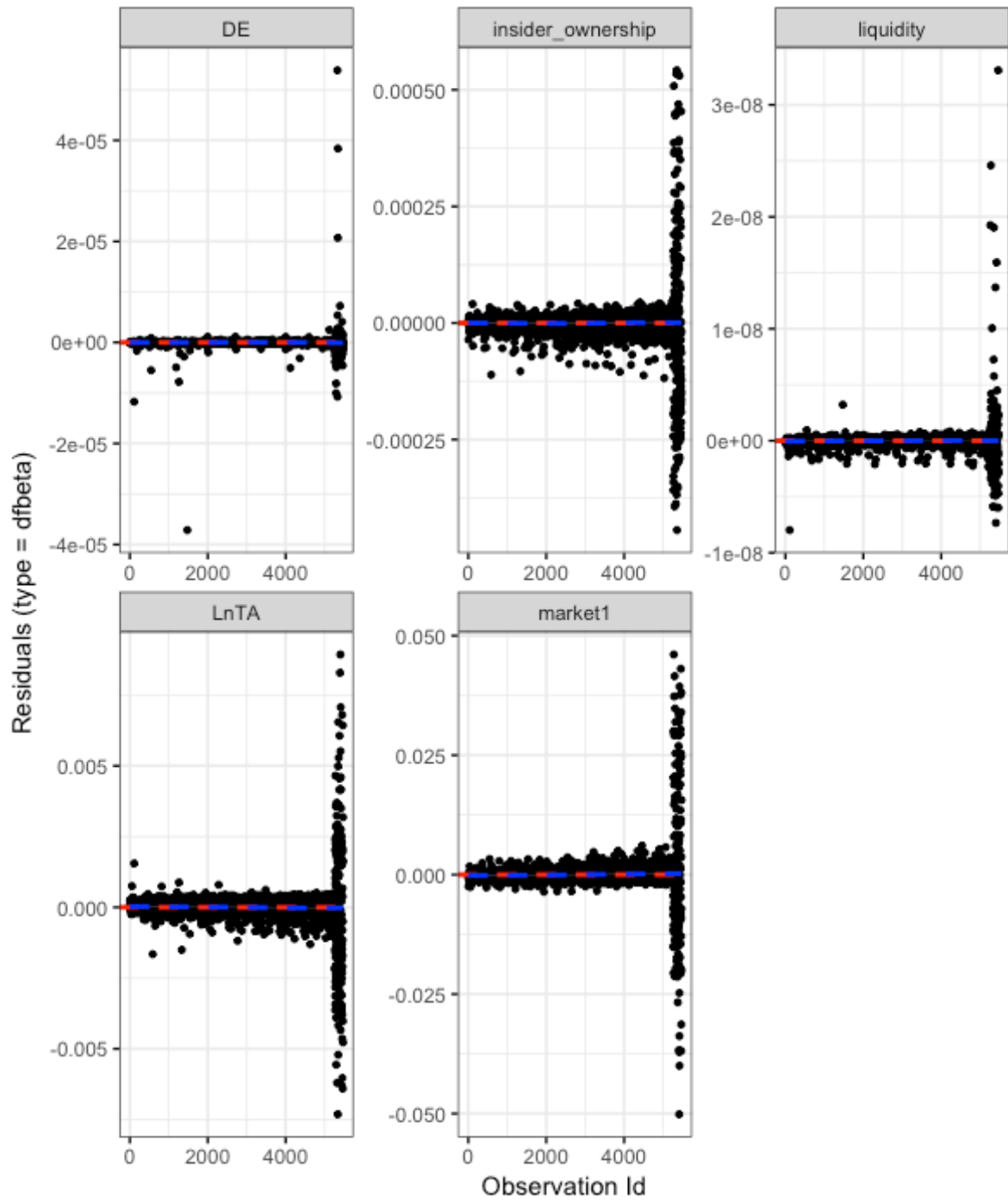
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# APPENDIX

## Appendix 1. Testing influential observations



```

library(survival)
library(dplyr)
library(corr2D)
library(corrplot)
library(PerformanceAnalytics)
library(unfoldr)
library(survminer)
library(ggplot2)
setwd("/Users/user/Desktop/Delisting")
dt <- read.csv2("No_Omitted2.csv", header = T, as.is = T)
head(dt)
summary(dt)
cor(dt[,-1], method = "pearson")
names(dt) <- c("company", "market", "liquidity", "FCF_ratio", "GrSales", "DE",
"insider_ownership", "mv_bv",
"capex_sales", "ListC_NI", "LnTA", "Age", "G_private")
dt$market <- factor(dt$market)
dt$mv_bv <- as.numeric(sub(",", ".", dt$mv_bv, fixed = TRUE))
dt <- na.omit(dt)
table(dt$G_private)
dt$g_private_2 <- NA
dt$g_private_2[dt$G_private == 1] <- 0
dt$g_private_2[dt$G_private == 0] <- 1
model <- coxph(Surv(Age, G_private) ~
market + liquidity + FCF_ratio + GrSales + DE + insider_ownership + mv_bv +
capex_sales + ListC_NI + LnTA,
data = dt)
for_cor <- dt[,names(dt) %in% c("liquidity", "FCF_ratio", "GrSales", "DE",
"insider_ownership", "mv_bv",
"capex_sales", "ListC_NI", "LnTA", "Age")]
cor_matrix <- cor(for_cor, method = "pearson")
summary(model)
dt$age_month <- round(dt$Age / 30, 0)
model2 <- coxph(Surv(age_month, G_private) ~
market + liquidity + FCF_ratio + GrSales + DE + insider_ownership + mv_bv +
capex_sales + ListC_NI + LnTA,
data = dt)
plot(survfit(model2), ylim=c(0.7,1), xlab="Months",
ylab = "Proportion of Not Delisted")
residuals(model, "scaledsch")
modelres1 <- coxph(Surv(Age,G_private)~formula = formula
market + liquidity + DE + insider_ownership + LnTA,data = dt)
modelres2 <- coxph(Surv(age_month,G_private)~
market + liquidity + DE + insider_ownership + LnTA,data = dt)
dt$age_years <- round(dt$Age / 365, 0)

```

```

modelres3 <- coxph(Surv(age_years,G_private)~
                  market + liquidity + DE + insider_ownership + LnTA,data = dt)
summary(modelres1)
cox.zph(modelres1)
dfbeta <- residuals(modelres1, type="dfbeta")
par(mfrow=c(2,2))
for (j in 1:5) {plot(dfbeta[, j], ylab=names(coef(modelres1))[j])
  abline (h=0,lty=2)}
#"Age", "LnTA", "liquidity", "DE", "insider_ownership"
par(mfrow=c(2,2))
res <- residuals(modelres1, type = "martingale")
X <- as.matrix(dt[, c("insider_ownership")])
par(mfrow=c(2,2))
for (j in 1:2) {plot(X[, j], res, xlab=c("insider_ownership")[j], ylab="residuals")
  abline(h=0, lty=1)
  lines(lowess(X[, j], res, iter=0))}
b <- coef(modelres1) [c(6)]
test.ph <- cox.zph(modelres3)
test.ph
ggcoxzph(test.ph)
ggcoxdiagnostics(modelres1, type = "dfbeta", linear.predictions = TRUE, ggtheme =
theme_bw())
ggcoxdiagnostics(modelres1, type = "martingale", linear.predictions = FALSE, ggtheme =
theme_bw())
ggcoxdiagnostics(modelres1, type = "deviance", linear.predictions = FALSE, ggtheme =
theme_bw())
ggcoxfunctional(Surv(Age,G_private)~
                liquidity + log(liquidity) + sqrt(liquidity),data = dt)
coxph(Surv(age_years,G_private) ~ LnTA + pspline(liquidity), dt)
ggcoxfunctional(Surv(age_years,G_private)~
                liquidity + log(liquidity) + I(sqrt(liquidity)),data = dt,
                point.col = "white", point.alpha = 0.5, ggtheme = theme_dark())

```