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MASTER'S THESIS

Studying market reactions to Fintech companies -
Acquisitions and initial public offerings in OECD Countries

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ABSTRACT

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Although a plethora of studies focus on different aspects of M&As and IPOs, very few studies concentrate on new technology industries. Such is also the case with the Fintech industry. This thesis studies the reactions to acquisition announcements of Fintech companies, the Fintech IPO short run performance and the Fintech hype period's effect on these corporate events. In the process of studying market reactions to Fintech companies, this thesis also aims to define what kind of companies belong to the Fintech industry.

The transaction data consists of 36 acquisition announcements and 30 initial public offerings in OECD countries during 2013 - 2016. The acquisitions are studied with the event study methodology and the initial public offerings with mean market-adjusted short run performance methodology.

The results indicate that Fintech acquisition announcements create a 1,08 % positive abnormal return one day after the announcement. The Fintech IPO companies shares experience an average 22,64 % market-adjusted return on first trading day. Further, the Fintech hype period does not have a significant impact on market reactions.

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Yritysostoja ja osakeanteja on tutkittu laajasti, mutta vain harvat keskittyvät uusiin teknologiatoimialoihin. Näin on myös Fintech -toimialan kohdalla. Tässä Pro Gradussa tutkitaan Fintech -yrityksiin liittyvien yritysostouutisten markkinareaktioita, Fintech -osakeantien lyhyen aikavälin tuottoa, sekä Fintech -yrityksiin liittyvän kiinnostuksen kohoamisen vaikutusta näihin yritystapahtumiin. Tämä tutkielma pyrkii myös määrittämään, millaiset yritykset voidaan luokitella kuuluvaksi Fintech -toimialaan.

Tutkielmassa käytetty data koostuu 36 yritysostouutisesta ja 30 pörssilistautumisesta OECD maissa vuosina 2013 - 2016. Yritysostoja tutkitaan tapahtumatutkimuksella ja listautumisia keskimääräisellä markkinakorjatulla lyhyen aikavälin tuotolla.

Tutkimustulokset kertovat, että Fintech -yritysostouutiset luovat 1,08 % positiivisen ylituoton yksi päivä uutisen jälkeen. Fintech -yritysten osakkeet kokevat keskimäärin 22,64 % markkinakorjatun tuoton ensimmäisenä vaihtopäivänä. Lisäksi yrityksiin kohdistuva kiinnostuksen kasvu ei näytä vaikuttavan pörssimarkkinareaktioihin.

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Helsinki, 20.5.2017
Heikki Sahi

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1. INTRODUCTION

Financial technology (Fintech) has experienced a recent surge in popularity. The value of investments in Fintech firms has grown by 75% in 2015 to USD 22.3 billion compared to the previous year (Skan et al., 2016). The amount of Fintech firms is increasing rapidly. Although the industry has matured since 2015 and some markets are experiencing a cooling down effect, the overall interest is not about to fade any time soon. The population of Fintech firms is estimated to be beyond 12 000 worldwide (Drummer et al., 2016). Financial technology stands for technologies that are meant to revolutionize the financial services field and as such Fintech companies can be seen as the companies that shape how the financial world will function in the future. The emergence of Fintech has led to numerous incremental and disruptive innovations such as internet banking, mobile payments, crowdfunding, peer-to-peer lending, robo-advisory, online identification, blockchain innovations and so on.

Fintech industry's strongest standing is in the North American market which accounts for more than half of yearly deals (Accenture, 2016). Silicon Valley and New York are the driving hubs of Fintech activity in North America. The Asia-Pacific region has the second largest standing for Fintech with Hong Kong and Singapore being the largest hubs. Europe follows close behind Asia-Pacific in regards to Fintech investment deals made yearly. London and Germany have for quite some time been the largest hubs in Europe but Stockholm and the Nordics have emerged as a third main region for Fintech activity. The Nordics saw year-on-year investments in Fintech companies increase by 106% in 2015 to $13.8 billion (Cbinsights, 2016). The EU legislation offers some interesting possibilities to European Fintech companies as the revised payment service directive (PSD2) is scheduled to be exercised in January 2018. The PSD2 forces banks to open their infrastructure to third party operators which could mean the loss of billions of euros to the banks due to increased competition in the payment services field (Finextra, 2016).

The merger and acquisition (M&A) activity in the financial services market has been high in the past because of consolidation pressures (Berger et. al, 1999). The motives for Fintech acquisitions are, however, fundamentally different as many of the acquisitions are directed towards startups. The usual motive for Fintech acquisitions is to gain access to novel technology faster or at a lower cost than it would take to build them in-house. Seasoned companies have recognized the threat and possibilities of agile Fintech companies for some time now. Many companies invest heavily to Fintech in a bid to stay on top of the revolutionization of financial services. The acquisition of Fintech companies also provides an exit strategy for entrepreneurs and venture capitalists.

Valuation of Fintech companies has been a topic of avid discussion lately. Technology companies and Fintech companies in particular are hard to value because much of their future cash flows are highly speculative. This was painfully realized by many in the beginning of 2016 when the e-commerce giant Powa which was worth more than $2.7 billion collapsed into bankruptcy (CNN, 2016). The collapse quickly showed that the company's value had been seriously inflated. Even successful Fintech companies seem to have difficulty with pricing issues. Square Inc., which is one of the leading payment related Fintech companies was valued at $9 when it went public in November of 2015 but the price rose as high as $13,7 during the first trading, indicating a clear undervaluation during the initial public offering (IPO).

The purpose of this study is to shed light to the market reactions to Fintech companies by examining the underpricing of said companies upon going public and the short-term shocks created by Fintech acquisition announcements on the acquiring company stock prices. As the pricing of Fintech companies has proven truly challenging, it is exceedingly important to study how investors perceive their value. As stated before, both M&As and IPOs have been researched extensively. This thesis strives to extend academic research into the realm of Fintech companies as only few studies have explored the area.

The acquisition announcements of Fintech companies will be studied with the event study methodology, which captures the short run effects of the announcements effectively. The Fintech IPOs will be studied with the mean market-adjusted short run performance methodology, which accurately captures the underpricing effects of IPOs.

1.1. Research questions, objectives and contribution

Initial public offerings have been researched thoroughly and it is commonly known that the average IPO underpricing varies between industries. Furthermore, the impact of acquisition announcements to the acquiring company share prices has been researched to some extent. Although the impact of M&As and pricing of IPOs have both been extensively researched as a phenomenon, the Fintech industry is in such an early stage of its development that research gaps remain. This study aims firstly to give relevant and useful information on the investor reactions to Fintech companies. The acquired Fintech companies represent, in many cases, small startup companies that may have a net worth of a couple of million dollars prior to the acquisition. The listed Fintech companies, however, are often multi-billion dollar mammoths. Examining both the acquisitions and initial public offerings is crucial to gauge investor reactions to Fintech companies. In addition to the lack of scientific research, information on Fintech companies available to investors is also lacking. This leads to anomalies that might not exist in traditional industries where there is an abundance of data and similar comparison companies for company analysis.

The second main objective of this study is to seek ways to effectively identify Fintech companies. The process aims to establish guidelines on how to research market reactions to companies that belong to new and unclassified (technology) industries that have not yet become fully established. Industry classification codes are ambiguous and the criticism they face is mostly brought on by the sluggish adaptation to changes in the industrial field – such as the recognition of completely new industries. Furthermore, the media often groups together companies that are

part of a certain trend even though the grouping might not have an actual standing in industry classifications. The aim of this thesis is to provide information on market reaction research strategies to additional emerging technology industries such as the Health Technology or the Clean Technology segment.

Interest towards Fintech has increased vastly during the last two to three years. The search term “Fintech” has seen a rapid increase in popularity (depicted in figure 1). Whereas financial technology companies have been acknowledged for decades, the term Fintech started to gain noticeable media coverage only in the beginning of 2015, which transposes to the Google searches. With the rapid increase in interest towards Fintech, it is of interest to see whether this has an effect to the capital gains that investors receive in Fintech acquisitions or Fintech IPOs.

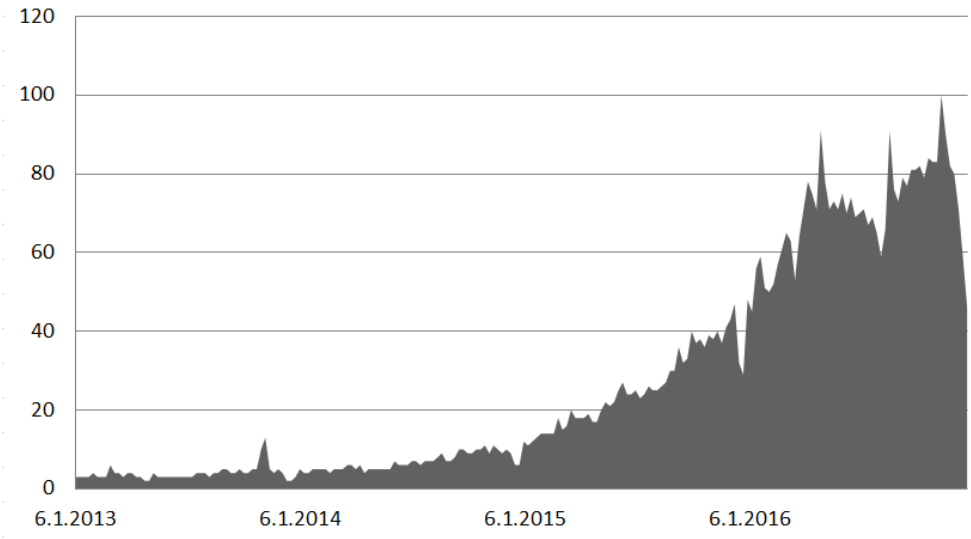

Figure 1. Trend of Google searches for the word “Fintech” between 1.1.2013 – 31.12.2016

The short-term market reaction to acquisitions reflects the stockholders’ anticipation of value-creative or value-destructive development. The reaction should be immediately reflected to the stock price, which leads to the first main research question:

1) *How do the stock markets react to Fintech acquisition announcements?*

The secondary research questions examine the aforementioned increase in interest towards Fintech and Fintech acquisition deal characteristics:

1.1) How do the markets react to domestic acquisition announcements when compared to cross-border announcements?

1.2) What is the impact of increased attention towards the Fintech industry regarding acquisition announcement market reactions?

As stated before, IPO underpricing fluctuates between industries. As the Fintech industry can be described as having “hype” and media attention related to it, it is interesting to see if the Fintech IPO underpricing is more extreme than what is usually witnessed. The second main research question is:

2) How do IPOs of Fintech companies perform in the short run?

The secondary research question connected to this is as follows:

2.1) What is the impact of increased attention towards the Fintech industry regarding IPO underpricing?

Studying these questions provides understanding on the perceptions that stockholders have on Fintech companies.

1.2. Research methodology

This study is conducted as a multimethod research. Two quantitative methods are used to assess the stock market reactions to Fintech companies. Firstly, the event study methodology is utilized to gauge the impact of acquisition announcements of Fintech companies on stock price performance of the acquiring company. The short run IPO performance is studied by calculating the abnormal returns of Fintech company IPOs for the 1, 5, 10, 15 and 20 day from IPO. This is done by utilizing the mean market-adjusted short run performance measurement.

1.3. Theoretical framework

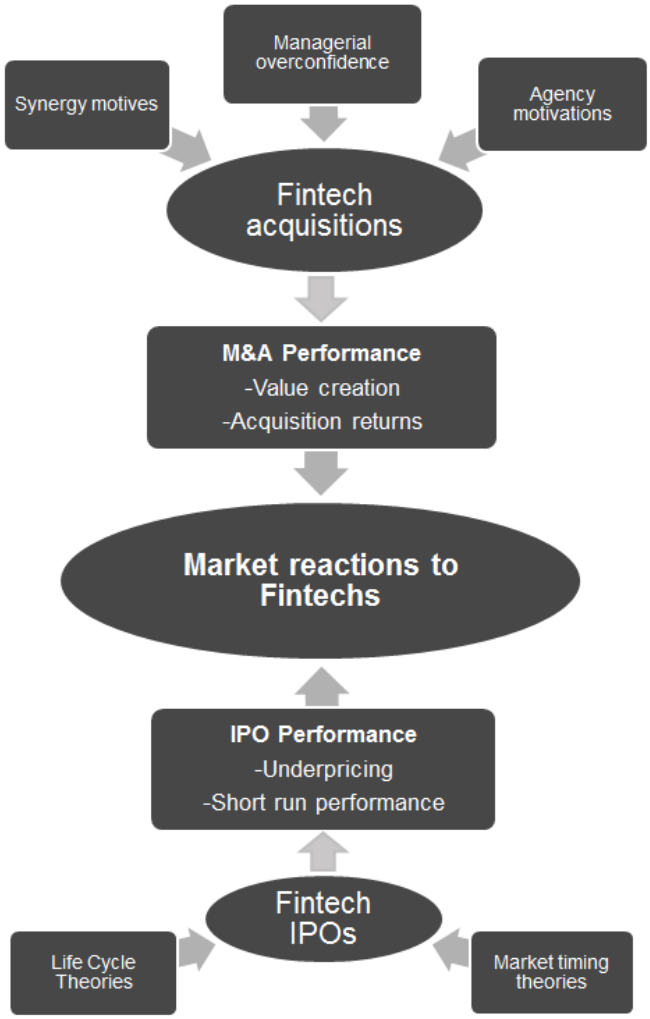

Figure 2. Conceptual framework

The theoretical framework of the thesis emphasizes the two distinct exit strategies of Fintech company owners related to stock markets. The three phenomena fueling Fintech acquisitions are synergy motives, managerial overconfidence and agency motivations (Berkovitch & Narayanan, 1993). The performance of the acquisition is measured by value creation in acquisition announcement. Life cycle theories (See, e.g. Zingales, 1995) and market timing theories (See, e.g. Lucas and McDonald, 1990) fuel the Fintech IPOs. The main IPO performance concept is underpricing, which is measured with short-run performance. This too leads to the

phenomena that the study wishes to quantify, i.e. the market reactions to Fintech companies.

1.4. Structure of the thesis

The structure of the thesis has been formed in a way that gives a clear understanding of the two separate research methods utilized while still keeping in mind the primary aims of the study. The thesis comprises of nine main sections. This Introduction chapter is followed by a chapter on the Fintech landscape. The chapter explains the evolution behind Fintech, depicts the categorization of Fintech company types into verticals and finally presents the Fintech verticals. Related literature on mergers & acquisitions is examined followed by a similar chapter on initial public offerings. In the fifth chapter the focus shifts towards research methodology - the event study method and mean market-adjusted short run performance method are explained. After this, a hypotheses chapter explains the formation of the hypotheses utilized in the study. This is followed by a chapter that focuses on the event study on Fintech acquisition announcements. The chapter comprises of sample gathering and data validation process, possible sample and data limitations, sample overview and results. A chapter with similar contents has been constructed on the mean market-adjusted short run performance of Fintech IPOs. This is followed by a final chapter that states the concluding remarks and suggestions for future research.

2. FINTECH LANDSCAPE

To date, no consensus on the definition of the term “Fintech” has been reached in academic literature. Schueffel (2016) aims to establish such definition by examining a total of 200 scholarly articles referencing the term. Applying semantic analysis and building on the commonalities of 13 peer-reviewed definitions Schueffel proposed the following definition: “Fintech is a new financial industry that applies technology to improve financial activities.” While this could be accepted as the definition of the term, distinguishing companies that belong to the industry still proves to be difficult. Fintech is an umbrella term for a variety of technologies, companies and business ventures, which are differentiated by consulting companies and other relevant stakeholders with the help of specific verticals.

2.1. Evolution of Fintech

The launch of the automated teller machine in 1967 began the onset of financial technology. From 1967 through 1987, financial services moved from an analogue to digital industry. The first major event towards the internationalization of the payment services was the establishment of the Society of Worldwide Interbank Financial Telecommunications (SWIFT) in 1973 (Swift, 2017). The organization was established to interconnect domestic payment systems across borders. The establishment of NASDAQ in the US in 1971 was the first step in the future development of the National Market System, enabling the transition from physical trading of securities to fully electronic trading (Nasdaq, 2011).

Financial institutions gradually increased their use of IT in their internal operations throughout the 1980s as computerization proceeded and risk management technology developed to manage internal risks. By the late 1980s, financial services had become a largely digital industry, thrust into rapid development by the emergence of the Internet. In the beginning of 1995, Wells Fargo used the World Wide Web to provide online account checking which began the manifestation of internet

based financial services. By 2005, the first direct banks without physical branches emerged in the UK.

Today Fintech has led to numerous incremental and disruptive innovations such as internet banking, mobile payments, crowdfunding, peer-to-peer lending, robo-advisory, online identification, blockchain innovations and so on. Many of these innovations were introduced by other operators than banks. After the financial crisis of 2008, the focus has shifted from banks introducing new ways of conducting financial services to the question of who has the resources and legitimacy to provide financial services. For example the revised payment service directive (PSD2) will open the payments market to third party vendors and shifts the focus away from banks. Today's Fintech industry is characterized by new competition and diversity, bringing both opportunities and risks that need to be carefully considered. (Arner et al., 2015)

2.2. Fintech verticals

The Fintech verticals have been defined in this thesis by researching the opinions of academic scholars and industry professionals. Defining the verticals is a complex task because many of the academic papers on Fintech concentrate more on the phenomena rather than the actual characteristics of companies, Furthermore consulting companies and other professionals might not provide enough insight to support academic publications. Two of the most commendable definitions were provided by Arner et al. (2015) in their research paper "The Evolution of Fintech" and KPMG (2016) in their yearly Fintech report.

According to the definition by Arner et al. (2015), Fintech industry comprises of six major areas: finance & investment, operations & risk management, payments & infrastructure, data security & monetization, customer interface and regulatory technology. These definitions sum the Fintech field quite well but are still lacking in certain areas**.** Arner et al. group compliance related matters into the financial operations and risk management area, while having another area for regulatory matters

and yet another for Data security and monetization. In reality, compliance and regulatory matters usually go hand in hand. If a bank invests into technology that enables the bank to comply with regulatory demands these actions tend to increase data security and decrease financial fraud. For example complying with Know-Your-Customer regulations and investing into powerful and purposeful KYC-systems decreases money laundering and financial fraud. Another good example is the PSD2 directive, which poses regulatory restraints on customers identification and on the identification procedures (Biometrics being a new and interesting option). Having regulatory compliant identification procedures also decreases cybercrime and financial fraud. These intertwined topics should be considered as their own area rather than spreading them into various verticals. Furthermore, the authors forget a major part of Fintech, insurance technology which should be mentioned when describing Fintech companies.

KPMG (2016) define the verticals as: lending tech, payments/billing tech, personal finance/asset management, money transfer/remittance, blockchain/bitcoin, Institutional/capital markets tech, equity crowdfunding and insurance tech. This list describes the various different Fintech companies well and it will be used in this thesis with certain modifications. Whereas Arner et al. have inserted the compliance, regulatory and security related areas into too many verticals, this listing completely lacks on those areas. The vertical best describing this area can be described as “Fraud prevention and regulatory tech”. Furthermore, dividing lending technology and equity crowdfunding into separate verticals is questionable, as the main idea in both cases is providing alternative platforms to invest and lend or borrow money. As such, the vertical “Alternative lending/investment tech” is used in this thesis. The following chapters will further explain these verticals and give insight to the most interesting aspects of them.

2.2.1. Alternative lending /investment tech

Fintech companies can be categorized into the alternative lending vertical mainly when associated with peer-to-peer lending platforms or underwriter/lending platforms that use machine learning technologies and algorithms to assess creditworthiness (KPMG, 2016).

Peer-to-Peer (P2P) lending platforms are online platforms where borrowers request loans and private lenders bid to fund these (Klafft, 2008). P2P lending is gaining ground among borrowers because of its perceived low interest rates, simplified application process and quick lending decisions. The first iterations of P2P offered mostly small personal loans but as the concept has started to gain momentum companies have begun to offer new products such as mortgage loans which makes these companies direct threats to banks. (PWC, 2015)

The alternative investment field comprises largely of equity crowdfunding companies. Ibrahim (2015) defines the act of crowdfunding as: “using the internet to raise money for a product or cause”. Further, Ibrahim explains that crowdfunding can be equity-based, meaning investors receive stock in a business in exchange for their money, or non-equity based, where people donate funds or receive rewards for their contribution. There are no equity crowdfunding companies present in the IPO sample of this thesis, which is not a surprise as equity crowdfunding offers and alternative source of capital for a company, as opposed to going public or gathering venture capital equity.

2.2.2. Payments/billing tech

Payments and billing tech is a vertical that can be associated with start-up companies revolutionizing the payment technology field as well as seasoned and established payment solution providers. The payments field has long been dominated by very large players, particularly because a fundamental feature of the payment card industry is the existence of strong network externalities, resulting in the domi-

nance of companies such as Visa and Mastercard (Rochet & Tirole, 2002). Today, however, there are a variety of operators in the payments field and the companies range from payment processing to new innovators in the digital payment scene.

Payment technology is often the first thing that comes to a consumers mind when thinking about Fintech and its applications. While it certainly is not the only application, payments and billing tech is a very large vertical and one that is presented heavily in the sample companies of this thesis. Capgemini (2016) mention in their report on top 10 payments trends of 2016 that the mechanisms driving the dynamics of retail payments are: growth in the adoption of digital payments, entry of non-traditional players, technological innovation, and proliferation of immediate payments.

2.2.3. Personal finance/asset management

KPMG (2016) define the personal finance/asset management vertical as: “Technology companies that help individuals manage their personal bills, accounts and/or credit, as well as manage their personal assets and investments.”

Many if not all of our personal finance related tasks have migrated to the web in the 21st century. Hira (2009) states in her study on the needs of financial education that today’s financial services marketplace is complex, specialized and requires consumers to be informed and actively engaged if they are to manage their finances effectively. This has generated a need for platforms that enable consumers to enhance and optimize their personal finance related tasks. Fintech companies provide various platforms that cater to such activities. Especially asset management platforms have become a prominent field as individual customers are in need of but also demand tools to analyze their investments.

2.2.4. Money transfer/remittance

KPMG (2015) define companies categorized to the money transfer/remittance vertical as: “Money transfer companies include primarily peer-to-peer platforms to transfer money between individuals and countries”. Remittance is an act of transferring money by a foreign person to an individual in his or her home country. According to Al-Assaf et al. (2014) money sent by workers to their home countries in the form of remittances is a significant part of international capital flows, especially with regard to labor-exporting countries. The total global remittances totaled 582 billion USD in 2015. Against this background, it is easy to see that money transfer and remittance service providers have a huge market in their hands.

2.2.5. Blockchain/bitcoin

Bitcoin is a cryptocyrrency and a payment system that was first introduced in 2008. Bitcoin relies on digital signatures to prove ownership and public history of transactions to prevent double-spending (Reid & Harrigan, 2013). While Bitcoin has been a major success, the real revolutionizing breakthrough has been the application behind its security and ownership proving, the blockchain. Blockchain has created a plethora of startups trying to invent applications of its distributed ledger technology. The distributed ledger can record transactions between two parties efficiently and in a verifiable and permanent way. As such, it is easy to understand why such technology can have a multitude of usages in the financial world where protecting assets and making binding contracts are at the heart of all operations (Lansiti & Lakhani, 2017).

KPMG (2016) note in their Q3/2016 Fintech report that investments towards blockchain startups have decreased. This is due to the fact that even though blockchain has huge potential, it has not yet realized in terms of revenue and as such investors need further convincing to back such endeavors. Blockchain needs to mature as a technology, which is evident in the samples of this thesis as they include no blockchain companies.

2.2.6. Institutional/capital markets tech

The Institutional and capital markets technology is one of the largest of the verticals in scope. The vertical contains companies that provide tools to financial institutions. Examples of these are financial analysis software, alternative trading systems and financial modeling tools. FT Partners (2015a) discuss innovations in capital markets technology in their report. They state that innovation in capital markets is booming once again after a brief cooling down period that was brought on by the financial crisis of 2008. The innovation is fueled by increasingly cheaper cloud computing, greater bandwidths, multiple new sources of valuable investment data (including social media) and competitive forces fueled by renewed private equity and venture capital interest. FT Partners note that future growth and opportunities lie in communication/messaging improvements and gaining advantages from unstructured data analytics. Unstructured data is variable in nature and comes in many formats, including text, document, image, video and more. Das and Kumar (2013) explain in their framework for unstructured data analytics that it is a relatively untapped source of insight that can reveal important interrelationships that were previously difficult or impossible to determine.

2.2.7. Insurance tech

Financial technologies are used by participant companies in the insurance services market. The use of technology innovations in the insurance field is called insurance tech (Insurtech). Unlike many other areas of financial services, the insurance industry has not been substantially disrupted by new technology and game-changing business models to date, but that is about to change. The most prominent applications that fuel the disruption in this field are related to big data analytics and automation/robotics. Usages include automated claims handling, consumers' right and data protection, peer-to-peer insurance platforms, smart contracts and dynamic pricing by using data streams provided by the IoT (Internet of things). Many innovations related to the IoT also aim to increase consumer involvement in

by providing the customers with ways to affect policy pricing and content by acting favorably and responsibly. (Volosovich, 2017)

2.2.8. Fraud prevention/regulatory tech

Fraud prevention solutions and Regulatory technology (RegTech) are Fintech verticals with tremendous growth potential. Arner et al. (2016) define regulatory technology as: “RegTech – the use of technology, particularly information technology, in the context of regulatory monitoring, reporting and compliance.” Since the global financial crisis of 2008 banks have faced a continued tightening of financial regulation and have to answer to very strict KYC (know-your-customer) and AML (anti-money laundering) rules. Accordingly, banks have been forced to invest heavily into regulatory technologies.

Fraud prevention technology revolves around authentication and signing solutions and fraud screening and detection platforms. Wei et al. (2013) state in their research on effective detection of online banking fraud that fraud detection is a troublesome subject as there is very limited information on means to differentiate fraud from genuine customer behavior. The detection platforms rely heavily on data mining, machine learning and neural networks to catch fraudulent transactions. These transactions might be conducted with e.g. payment cards, account transfers or fake invoices. The authentication and signing solutions refer to ways to verify customers, a popular alternative being biometric solutions that have surfaced in the recent years. (FT Partners, 2015b)

3. MERGERS AND ACQUISITIONS

Damodaran (2002) categorizes acquisitions into a total of four different main forms: merger or consolidation, acquisition of stock, tender offer and acquisition of assets. In a merger a firm is absorbed by another and ceases to exist as a separate business entity. A consolidation is otherwise similar as a merger but a completely new firm is created to facilitate the two merging firms and both previous legal entities are terminated. The second form is the acquisition of stock. In this form one company seeks to purchase the target company's voting stock in exchange for cash, shares of stock, or other securities. This is usually conducted by presenting the target's stockholders a tender offer after discussing the options with the management of the target company. Successful tender offers become mergers. If a firm acquires another by buying all of its assets it is called acquisition of assets. An acquisition can also be performed by a company's own managers. The action is called a buyout and is usually done via a tender offer. The following chapters review the academic literature related to M&A activity, motives and performance.

3.1. M&A Activity

History shows that the amount of M&A activity is cyclical by nature. The M&A activity occurs in "waves" of high and low frequencies and volumes of M&As. The cycles of M&A activity resemble the cycles of other income-producing assets, including most transactions in real estate and securities generally. The frequency and volume of M&As gradually builds up resulting in increasingly unrealistic prices. The rise is abruptly disrupted by a trigger that thrusts the activity to very low volumes. Martynova and Renneboog (2008) counted that the U.S. M&A activity has experienced a total of five waves from 1895 to 2007. Researchers have explained the cyclical nature of M&A activity through industry shocks and market valuations.

3.1.1. Industry shocks

The neoclassical theory behind the cyclical nature of M&A activity posits that merger waves occur as firms in specific industries react to economic shocks. These shocks can be related to deregulation, the emergence of new technologies or substitute products and services. Mitchell and Mulherin (1996) studied the industry-level patterns in takeover and restructuring activity. They found that the inter-industry patterns in the rate of M&As are directly related to the economic shocks borne by the sample industries. In a more recent publication, Harford (2005) found that economic, regulatory and technological shocks drive industry merger waves but whether a certain shock leads to a merger wave depends on the overall capital liquidity on the market. Martynova and Renneboog (2008) came to a similar conclusion stating that all merger waves are preceded by an industry shock and have occurred in a positive economic and political environment, amidst rapid credit expansion and stock market booms.

3.1.2. Market valuations

The second explanation provided by academics to the clustering of M&A activity is that deviations of market valuations from fundamental values cause merger waves. Rhodes-Kropf and Viswanathan (2004) state that managers tend to use overvalued stock of their company to buy assets of less overvalued firms when market valuations deviate from fundamentals. The market value deviations on both sides of M&A transactions lead to a correlation between stock merger activity and market valuation. Shleifer and Vishny (2003) present a model of M&As based on stock market misvaluations of the combining firms. The model consists of relative valuations of the merging firms and the market's perception of the synergies from the combination. Rhodes-Kropf et al. (2004) provide more empirical evidence for the aforementioned statements and find that low long-run value-to-book firms do indeed buy high long-run value-to-book firms.

3.2. M&A Motives

The three major motives that have been suggested to fuel takeovers are synergy motives, managerial overconfidence and agency motivations (Berkovitch & Narayanan, 1993). Synergy motives are derived from neoclassical theories. They dictate that people act rationally and as such the decision on M&As should be treated as any other investment decision i.e. the acquisition event should be undertaken if its added value exceeds its cost. Agency motivations concentrate on the idea that managers may undertake acquisitions against the interest of shareholders. Managerial overconfidence (also known as the hubris hypothesis) suggests that managers engage in M&A deals due to overconfidence regarding their ability to create value and a resulting overestimation of synergies.

Berkovitch & Narayanan (1993) researched the possible method of distinguishing which of the three aforementioned motives would be in effect when conducting and acquisition. They argue that the correlation between target and total gains should be positive if synergy is the primary motivation, negative if agency and zero if hubris is the motive. They found that synergy was the main motivation in takeovers with positive total gains and agency the primary motive in takeovers with negative gains.

3.2.1. Synergy motives

Chatterjee (1986) identified three broad categories for resources of economic value stemming from acquisitions. Chatterjee classified the resources as cost of capital related (financial synergies), cost of production related (operational synergies) and price related (collusive synergy). In later studies collusive synergies are often categorized as belonging to the operational synergies. Researchers have also presented the existence of strategic synergies in acquisitions.

Damodaran (2005) specifies operational synergies as synergies that allow companies to increase their operating income. The four ways of achieving these are:

economies of scale, greater pricing power, combination of different functional strengths or higher growth in new or existing markets. Further, Damodaran posits that financial synergies arise from more efficient capital structures and a lower cost of capital. The four ways of achieving financial synergies are: cash slack, debt capacity, tax benefits and diversification. Ross et al. (2013) state that strategic benefits of M&As cannot be evaluated the same way as other investment opportunities since they appear more as an option to take advantage of the competitive environment. Strategic synergies are harder to measure than operational or financial synergies but for example real option based models have been generated (Kinnunen, 2010).

3.2.2. Managerial overconfidence

Managerial overconfidence (also known as the hubris hypothesis) was first introduced by Roll (1986). It suggests that CEOs engage in acquisition deals due to overconfidence regarding their ability to create value. The corporate managers believe that they have required a skill set to reduce risks and successfully complete transactions, often underestimating the likelihood of failure. Roll (1986) states that many companies stay active on the M&A markets for years but still acquisition opportunities only occur once in a career for most managers. Doukas and Petmezas (2007) among other posit that managers suffering from managerial overconfidence tend to attribute their initial success from earlier corporate decisions to their own ability and fueled by these decisions conduct value-destructive acquisitions.

While the existence of managerial overconfidence might be easily understandable, it is very difficult to quantify. Researches have tried to use a variety of methods to proxy for overconfidence. For example, Hayward and Hambrick (1997) measured managerial overconfidence by the amount of takeover premium (i.e. high premiums mean overconfident managers). In another study, Malmendier and Tate (2008) used media portrayal in news articles to proxy overconfidence by grouping the articles of all the managers studied to overconfident vs. non-overconfident

ones. Doukas and Petmezas (2007) used high acquisitiveness as a proxy for overconfidence. As it is rare to come across a valid acquisition target repeatedly, doing multiple acquisitions in a short period of time could mean that a manager is engaging in value-destructive acquisitions. Kolasinski and Li (2013) present an insider-trading-based measure of overconfidence. They postulate that a CEO who has purchased his/her company's stock and lost money on the trade has overestimated the value of the firm, which is a telltale sign of managerial overconfidence. This has been noted as an effective way of quantifying overconfidence as it is easily measured from data sources.

3.2.3. Agency motives

As stated by Ross in 1973, agency theory is one of the oldest and most frequently used theories in trying to explain moral hazard problems. Agency motivations in the M&A context deal with the concept that managers may undertake acquisitions against the interest of shareholders. Jensen (1986) states in his theory of free cash flow that managers with access to surplus cash favor engaging in pet projects and unprofitable acquisitions instead of returning cash to shareholders. Furthermore, Harford (1999) showed that cash-rich acquirers are more likely to attempt acquisitions and on average tend to destroy shareholder value. Walkling and Long (1984) studied the agency relationships through a sample of cash tender offers. They found that in the event of a tender offer, the absence of bid resistance could be directly related to the personal wealth changes of the target firm's managers.

The means to battle agency costs have also been studied. Tehranian, Travlos and Waegelein (1987) showed that long-term compensation plans improve the acquirer's performance. Furthermore, Datta, Iskandar-Datta and Raman (2001) find that managers with more stock options make better acquisitions.

3.3. M&A Performance

Prior studies have tried to quantify the M&A performance by using long term share value fluctuations as a measure of performance. Referring to these studies, Michael Porter has stated that '… no self-respecting executive would judge a corporate strategy this way'. Further, Epstein (2004) states that while many believe M&As to be failed strategies, these beliefs are mainly due to shallow and weak analysis of the causes of failure. The two main problems that researches face when doing long-run event studies are difficulties with statistical test procedures and confounding events affecting the overall result (Barber & Lyon, 1997). For instance, justifying an event study on the long-term effect of a corporate takeover is not a feasible action if one does not take into account the many other events affecting the firm's value over to course of the event window. On the other hand, measuring share value fluctuations in the form of event studies has been a long standing and effective way to quantify the short term performance of M&As. The following chapter describes the value creation in M&A process from the acquirer's point of view, determinants of acquisition returns and post-acquisition operating performance.

3.3.1. Value creation in M&A

Most studies have reported that in acquisitions of listed targets the acquiring firms realize negative to zero abnormal returns at the acquisition announcement (See, e.g. Andrade, Mitchell and Stafford, 2001). In contrast to public acquisitions, acquiring firms experience positive abnormal returns in private acquisitions (Chang, 1998). Further, the combined entity (target and acquirer) generally enjoys a positive abnormal return around the announcement date (see, e.g. Mulherin and Boone, 2000). 1998). Fintech company acquisitions are for the most part private and a positive reaction to the acquisition announcement should be expected.

Mixed results have been reported regarding long-term stock performance. Agrawal, Jaffe and Mandelker (1992) find that acquiring firm shareholders suffer

statistically significant negative abnormal returns of about 10% over a five-year period after a merger. In contradiction to this, Franks, Harris and Titman (1991) do not find significant underperformance over a long-term period and conclude that such findings are likely due to benchmark portfolio errors. Rau and Vermaelen (1998) find negative abnormal stock performance over a 3-year period after an acquisition deal but state that the negative returns are mostly concentrated among high valuation acquirers (i.e. low book-to-market ratio), so-called “glamour” firms.

3.3.2. Determinants of acquisition returns

The literature on M&A value creation is dominated by short-run event studies. A wide variety of factors influence the acquisition returns. Most frequently stated factors in current literature are: target firm listing status (Draper and Paudyal, 2006), method of payment (Chemmanur et al., 2009), industry relatedness (Fan & Goyal, 2006), information asymmetry (Officer et al., 2009), cross-border acquisitions (Moeller & Schlingemann, 2005), acquisition technique (Boone and Mulherin, 2008), takeover competition (Alexandridis et al., 2010) and financial advisor reputation (Golubov et al., 2012). The most relevant factors in terms of the framework of this thesis and sample qualities are: target firm listing status, industry relatedness and cross-border acquisitions. As mentioned before, the target firm listing status affects acquisition returns and private acquisitions have been found to generate positive returns whereas public acquisitions lead to zero-to-negative returns (See, e.g. Chang 1998; Fuller et al., 2002). Furthermore, the evidence from private acquisitions is clear and there is a lot of data supporting the capital gains realized upon private acquisition announcements.

Concerning the industry relatedness of bidding firm and target firm, Morck, Shleifer and Vishny (1990) studied a broad sample of M&A deals. They found that diversifying acquisitions perform worse than focused deals where the target and bidder are among the same industry. Fan and Goyal (2006) reported that mergers achieving vertical integration generate higher returns than diversifying deals. DeLong (2001) studied bank mergers and found that the most value creative deals

are those that are focused in terms of both activity and geography. Concerning financial technology companies, the M&A deals are often trying to achieve vertical integration. In the case of cross-border acquisitions, Moeller and Schlingemann (2005) showed that cross-border acquisitions generated lower returns than domestic acquisitions for US acquirers. Conn et al. (2005) reported similar results in case of UK acquirers.

3.3.3. Post-acquisition operating performance

If a corporation has made a value-increasing acquisition the efficiency improvements should gradually show up in reported accounting numbers. This can be estimated by utilizing changes in abnormal operating performance of the merged firm. The most common measures of abnormal operating performance are the operating ROA adjusted for industry median or operating performance of a control firm based on industry classification, size and post-merger operating performance.

The studies conducted on the operating performance of acquiring firms have provided mixed results. Healy, Palepu and Ruback (1992) find an increase in the post-merger cash flow operating performance for a sample of 50 largest US mergers. Further, Heron and Lie (2002) utilized a more comprehensive sample of US deals and also found performance improvements. On the other hand, Ghosh (2001) found no significant performance improvements for US acquirers. Some studies have also been conducted on other parts of the world, Powell and Stark (2005) finding moderate performance improvements for UK deals and Sharma and Ho (2002) finding no significant improvements for Australian deals.

4. INITIAL PUBLIC OFFERINGS

The following chapter explains the most important factors in initial public offerings as well as going through the relevant literature associated with IPO performance and activity. The next section goes through the typical steps involved in an IPO, followed by a section on IPO activity, IPO valuation & performance and finally underpricing and stock hype.

4.1. IPO activity

IPO activity varies widely when examined from a year-by-year perspective. Ritter and Welch (2002) studied IPO activity in the U.S. from 1980 to 2001. Issuing activity was approximately $8 billion per year during the 1980s. This nearly doubled to $20 billion per year during 1990-1995, followed by a period of $35 billion a year from 1995 to 1998. Issuing activity doubled again in 1999 - 2000 to $65 billion a year before falling to $34 billion in 2001. Ibbotson and Jaffe (1975) describe this as IPOs having “hot markets” and “cold markets”.

Companies make the decision to go public for a number of reasons. The most common broad motives are the desire to raise capital for growth and the desire to create liquidity for founders and other shareholders. The motives for going public are straightforward, but this still leaves the question of why going public is a better decision in some situations or times than in others. The two groups of theories that try to answer this are life cycle theories and market-timing theories.

4.1.1. Life Cycle Theories

Life cycle theories try to explain the decision of going public by relating it to different entrepreneurial motives such as achieving higher valuation in the possible future acquisition of the company or acquiring money to facilitate growth. Zingales (1995) studied the decision-making process of firms going public and found it eas-

ier for a potential acquirer to spot a potential takeover target when it is public. Furthermore, the initial owners are able to reduce the level of bargaining with buyers after taking their firm public resulting in higher acquisition valuations. Black and Gilson (1998) argue, however, that venture capitalists often conduct an IPO to divest their investment by giving back the control of a company to the entrepreneurs.

Chemmanur and Fulghieri (1999) introduced a theory on the going-public decision. In their model a company can raise external financing with the help of risk-averse venture capitalists or by selling shares to individual investors through an IPO. An entrepreneur contemplating external financing has private information on their firm's value, but outsiders can reduce the information asymmetry by evaluating the firm at a cost. Equilibrium timing of the going-public decision is determined by the firm's trade-off between minimizing the duplication in information production by outsiders and avoiding the risk-premium demanded by the venture capitalists. The entrepreneur is more likely to exit through and IPO when the company has grown larger and the proceeds of an IPO outweigh the costs of going public.

4.1.2. Market-timing Theories

The market-timing theories concentrate on the concept that firms issue equity in times of high valuations. Bayless and Chaplinsky (1996) describe times when cost of equity is low as "windows of opportunity". Lucas and McDonald (1990) presented a model which predicts that equity is issued most often after an abnormal positive return on stock and equity markets. When faced with a bear market, entrepreneurs are more likely to wait until the markets present a more favorable pricing environment. Choe et al. (1993) studied the decision-making process of companies going public. They found that firms issue equity at times when other promising firms are also issuing equity because of the lower adverse selection costs. These lower costs occur in periods with promising investment opportunities and with less uncertainty about assets in place.

4.2. IPO Valuation and Performance

The pricing of initial public offerings is a concept that has been studied widely. However, there is no clear consensus on what would be the best approach to value a company going public. The fundamental problem behind the pricing issue is that the market is not certain about the quality of the IPO firm, while the issuing firm does not know the market demand for its shares. The IPO underpricing phenomenon indicates that companies leave huge amounts of money on the table upon going public. On the other hand Ritter and Welch (2002) state that it is difficult to say whether the issuing price or the closing price of the first trading day after an IPO reflects the fundamental value of the firm better. The pricing of an IPO contains the future perceptions of the company's performance and there are large differences between the use of valuation methods and their perceived accuracy.

4.2.1. Valuation methods

Kim and Ritter (1999) divide the IPO valuation methods to three categories: Comparable firm approaches, discounted cash flow approaches and asset-based approaches. The comparable firm approaches compare the performance multiples of a peer group to the assessed company multiples. This method is advantageous when highly comparable firms are available but is rendered ineffective if such firms are hard to find or the peer group itself is over- or undervalued. Popular multiples used are price-to-earnings, price-to-book and price-to-sales. Kim and Ritter state that even though multiples are commonly used in IPO valuations they have modest predictive capability without further modifications. This is largely due to the nature of the comparable firms in the industry. Many of the firms going public are young, high growth and have large variation of multiples. Furthermore the comparable firm approaches are not particularly effective when valuing Fintech companies as the companies often possess unique or at least uncommon business concepts. Despite the aforementioned shortcomings, the comparable firm approach has also had successful implementations. For example, How et al. (2007) man-

aged to successfully implement the approach to the Australian stock market, despite it being a less populated market.

The discounted cash flow approaches have the firmest theoretical background but their shortcomings lie in the difficulty of estimating future cash flows and finding a suitable discount rate. Berkman et al. (2000) studied the accuracy of the discounted cash flow method with a sample of 45 firms newly listed on the New Zealand Stock Exchange. They found that the median pricing error for the valuations was around 20 percent. Asset-based approach is best suited for situations where a company has a large amount of liquid assets that with a well-determined market price. This valuation method is rarely used for IPO valuation and even less in the case of tech IPOs. This is due to the fact that the IPO market price highly reflects the future growth opportunities of the company and as such the asset-based valuation approach might have little relevance to the actual price of the company stock on the market.

It is commonly recommended by both academics and practitioners that the valuations of firms going public should be based on both accounting information and comparable firms multiples. Roosenboom (2007) investigated how French underwriters value the stocks of companies they bring public. The study states that the underwriters frequently combine two or more valuation methods to arrive to their fair value estimate. The underwriters base their decision of preferable methods on firm characteristics, aggregate stock market returns and aggregate stock market volatility in the period before the IPO. Deloof et al. (2009) studied the different IPO valuation methods and their accuracy by conducting a survey on the IPO valuation habits of investment bankers in Belgium. The study suggests that the most widely used method amongst the investment bankers is the discounted cash flow approach. This contradicts previous literature which primarily focuses on company multiples.

4.2.2. IPO underpricing

Perhaps the most discussed phenomenon related to IPO performance is their underpricing. IPO underpricing has been researched thoroughly by academics. Among the first of them was Logue (1973), who stated that companies leave substantial amounts of money on the table when going public. The money left on the table is the difference between the closing price on the first day of trading and the offer price, multiplied by the number of shares sold. This is the first-day profit received by investors who were allocated shares at the offer price and so represents a wealth transfer from the issuing firm to these investors. Ritter and Welch (2002) observed the average first day return for IPOs to be 18.8% between the years 1980 and 2001 in the US. Further, they found that approximately 70 percent of the IPOs ended the first day of trading at a closing price greater than the offer price and about 16 percent have a first-day return of exactly zero.

The most common explanation for IPO underpricing is asymmetric information. There are various theories on asymmetric information that seek to explain the underpricing, perhaps the most notable ones being: the winner's curse model, the entrepreneurial losses model, the information momentum model and the signaling theory.

Rock (1986) introduced the winners curse model. The model assumes that there are two types of investors: well-informed and uninformed. The well-informed investors would only bid on IPOs that were underpriced and so the uninformed investors would tend to get relatively more of the overpriced shares and less of the underpriced ones. IPO companies use underpricing to compensate for the losses of uninformed investors as it prevents them from withdrawing from the markets. Upon explaining the underpricing phenomena, this theory also answers a question that may arise upon inspecting IPOs: "Why not invest in every available IPO if the mean return for first day is so high?" An uninformed investor would end up with more of the "bad apples" and would experience negative returns in this scenario.

The information momentum model was developed by Aggarwal et al. in 2002. The model states that first day underpricing of IPOs generates an information momentum by attracting attention to the stock and shifting its demand curve outwards. This allows managers to sell their shares after the lockup expiration date at higher prices than they would have obtained if the IPO was not underpriced.

Habib & Ljungqvist (1999) introduced the entrepreneurial losses model which aims to quantify the level of underpricing beneficial for the issuer. The benefits of reducing underpricing depend on the issuer's participation in the offering via the secondary shares the issuer sells as well as the magnitude of the dilution suffered on retained shares which increases when the number of newly issued shares rises. Decreasing underpricing is, however, costly as it requires costly marketing and underwriter fees. Hence, there is in fact positive underpricing in equilibrium, as issuers trade off the costs and benefits of lower underpricing.

The signaling theory was introduced by Allen & Faulhaber (1989). They argued that firms signal their worthiness through underpricing. Successful firms can underprice their IPOs because they can regain the money left on table by performing well in the future but floundering firms cannot do this making underpricing costly to them. Underpricing is used by companies to reduce the information asymmetry by signaling their worthiness. Although this theory has gathered much popularity, it has failed to find strong support in academic literature.

Kennedy et al. (2006) studed six different information asymmetry related models to find out the most relevant and accurate theories to explain IPO underpricing while keeping in mind that no single theory can solely explain the phenomena. They concluded that the most accurate model was the entrepreneurial losses model followed by the information momentum model.

4.3. Underpricing and stock hype

Ritter (1984) first coined the phrase “hot issue market” to reflect a market state that provides excessive expectations for future growth for firms. In such markets “hype” surrounds the market for new issues generated by media and the equity market’s sentiment towards public offerings of firms.

Ducharme et al. (2001) studied the relation of hype to the amount of IPO underpricing by using a sample of US-based internet companies. They found that the extent of underpricing was systematically related to greater levels of news exposure for the IPO candidate in a seven-day period prior to the IPO. Loughran and Ritter (2002) found that the higher the expected demand for stock prior to listing, the more likely it was that issuers would accept a lower offer price because of the expected high appreciation in the share price after the listing of the stock.

Ho et al. (2001) studied the level of underpricing of technology IPOs in the Australian stock market in 1999 to 2000. They found that the underpricing of the sample firms upon listing was 49.7%. The results of the study indicate that the extent of underpricing is systematically related to variables measuring the hype surrounding the listing of an IPO. The authors also found evidence indicating underpricing was higher during the hot listing market for technology IPO candidates prior to the technology market correction in april 2000.

5. RESEARCH METHODOLOGY

5.1. Event study

The event study method can be used to study the impact of an exogenous factor to the price of a company in the stock market. It is assumed that the impact can be seen in the prices instantly. Therefore the economic impact of the event can be measured as the short term change in the market price (MacKinley, 1997). The method focuses on studying the returns of the stock of a company at around the event and at the time of the event. Event studies usually focus on the impact of certain types of events such as stock splits, mergers and acquisitions or earnings announcements. Event studies mostly focus on short-term effects and have an important role in providing evidence to understand the impact of corporate policy decisions (Eckbo, 2007).

The process starts by subtracting the normal return from the actual stock return. The normal return is not impacted by the event, but is the consequence of the changes in the broader market. It is also known as the expected return. After the normal return is subtracted, the residual which is also known as the abnormal return, indicates the impact of the event (MacKinley, 1997). For example, the normal return for security *i* at time *t* is K_{it} and the residual is e_{it} . The actual return R_{it} is their sum:

$$R_{it} = K_{it} + e_{it} \tag{1}$$

Therefore the abnormal return which is the impact of the new information can be estimated by the following formula:

$$e_{it} = R_{it} - K_{it} \tag{2}$$

The expected returns are estimated based on the historical returns of the stock prices that are used in the study. The estimation period starts 260 days prior to the

event date, the Fintech acquisition announcement in this study, and ends ten days before the event date. This is when the event window opens. It spans ten days preceding the event and the following ten days. The event window is analyzed for the abnormal returns.

Before measuring the impact of the event, which is the unexpected return, the researcher has to specify how the anticipated return will be measured. There are multiple methods available for the estimation of the normal returns of the stocks. In this study we use the market model. Based on this method the return "*R*" for security "*i*" at time "*t*" is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{3}$$

Where R_{mt} is the market return and ε_{it} is the residual. The parameters of the model are Alpha and Beta. The parameters are estimated using the OLS method (MacKinley 1997). The abnormal return is the part of the return that exceeds or falls under the expected return. The abnormal return can be estimated using the following formula:

$$AR_{it} = R_{it} - \hat{\alpha}_t - \hat{\beta} R_{mt} \tag{4}$$

Where R_{it} is the actual return subtracted by the expected return. Beta reflects the return of the stock in relation to the market return. Alpha and beta are estimated from the returns prior to the event (the estimation period).

After the abnormal returns for each day of the event window have been estimated for each stock in the study, the average abnormal returns are calculated. This is done for each day of the event window. The formula for the average abnormal returns is:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{n} AR_{i,t} \tag{5}$$

When the average abnormal return for each day of the event window is known, their statistical significance can be tested. This is done with the t-test. If the test statistic significantly deviates from zero the results are statistically significant. The test statistic *t* for a single days abnormal return is:

$$t_{AAR_t} = \sqrt{N}\frac{AAR_t}{\sqrt{\sigma^2(AAR_t)}} \sim t(N) \tag{6}$$

Where,

$$\sigma^2(AAR_t) = \frac{1}{N-1}\sum_{i=1}^{N}(AR_{i,t} - AAR_t)^2 \tag{7}$$

The cumulative abnormal returns during the event window will also be tested since the event can affect the stock returns around the event date, and not just on the exact date of the announcement. The cumulative abnormal returns for stock *i* from day *t* through day *T* can be estimated using the following formula:

$$CAR_i = \sum_{i=t}^{T} AR_{i,t} \tag{8}$$

Similarly to the cumulative abnormal returns, the average cumulative abnormal returns will also be aggregated:

$$CAAR_i = \sum_{i=t}^{T} CAR_i \tag{9}$$

The statistical significance of the cumulative abnormal returns will also be tested using the t-test:

$$t_{CAAR_t} = \sqrt{N}\frac{CAAR_t}{\sqrt{\sigma^2(CAAR)}} \sim t(N) \tag{10}$$

5.2. Mean market-adjusted short run performance

The short run performance of Fintech IPOs is examined with the standard methodology used in calculating the performance of new issues, the mean market-adjusted short run performance. The measures are calculated for the 1st, 5th, 10th and 20th trading day from IPO. The data collection dates are spread to avoid the effect of sporadic market irregularities that could distort the results. A similar approach has been taken in recent publications by Heerden & Alagidede (2012) who studied South African IPOs by calculating the short run performance of IPOs in the Johannesburg Stock Exchange. Sadagat et al. (2011) also used a similar approach earlier to study Pakistani IPOs. The mean market-adjusted short run return calculation starts with calculating the stock return at the close of the trading day as follows:

$$\frac{R_{x,d} = P_{x,d} - P_{x,0}}{P_{x,0}} \tag{11}$$

$R_{x,d}$ is the return on stock *'x'* at the close of the trading day (*d* = 1, 5, 10, 15 & 20). $P_{x,d}$ is the price of stock *'x'* at the end of the *d* th trading day and $P_{x,0}$ is the offer price of stock *'x'*. The average raw return is calculated as follows:

$$\overline{R}_{x,d} = \frac{1}{N}\sum_{i=1}^{n} R_{x,d} \tag{12}$$

$\overline{R}_{x,d}$ is the sum of returns of the IPOs divided by the number of IPOs in the sample. The return of the market index during the same time period is calculated as:

$$R_{m,d} = \frac{l_{m,d} - l_{m,0}}{l_{m,0}} \tag{13}$$

Where $R_{m,d}$ is the market return at the close of the trading day (*d* = 1, 5, 10, 15 & 20). $l_{m,d}$ is the market index value at the end of the trading day and $l_{m,0}$ is the market index value on the offer day of the stock '*x*'. The market-adjusted short run performance (MASRP) for stock 'x' after day '*d*' is calculated as follows:

$$MASRP_{x,d} = 100\ x\ \left\{\frac{(1+\ R_{x,d})}{(1+R_{m,d})} - 1\right\} \tag{14}$$

The market adjusted model measures the initial trading returns in excess market return form. The sample mean market-adjusted short run performance for the *d* th trading day is calculated as follows:

$$\overline{MASRP_{x,d}} = \frac{1}{n}\sum_{i=1}^{n} MASRP_{x,d} \tag{15}$$

This is the sum of the market adjusted short run performance of the sample IPOs divided by the number of sample IPOs. The final results are compared to the historical average underpricing for the same time period to see if the underpricing of Fintech IPOs exceeds the average underpricing. The following t-statistic is calculated to test the statistical significance of the results:

$$t = \frac{\overline{MASRP_{x,d}}}{s/\sqrt{n}} \tag{16}$$

Where ‘s’ is the standard deviation of $MASRP_{x,d}$ for ‘n’ number of firms. Further, the following t-statistic is calculated to compare two groups from the same sample:

$$t = \frac{MASRP_1 - MASRP_2}{s\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} \tag{17}$$

Where ‘s’ is the standard deviation for the two groups. The t-statistic is utilized to assess whether the expected values of the two groups differentiate from each other significantly.

6. HYPOTHESES

The following hypotheses have been constructed based on the presented theoretical background and findings from earlier studies on M&As and IPOs. The goal in M&As is value creation and the maximization of shareholder wealth. Previous studies on private acquisition stock price effects have found positive abnormal returns upon acquisition announcement (See, e.g. Chang, 1998; Fuller et al., 2002). The first hypothesis is derived from the assumption that, as Fintech acquisitions are mostly private, there is a positive stock price shock evident:

H1: There is a positive short-term market reaction to the Fintech acquisition announcements

Previous studies have found that cross-border acquisitions create lower returns than domestic acquisitions. This effect has been reported on US and UK based stocks and a large share of the Fintech acquisitions included in the sample took placein these countries (See, e.g. Moeller and Schlingemann, 2005; Conn et al., 2005). Further, bank mergers have been found to be more value creative when they are focused geographically. The second hypothesis is derived from these studies:

H2: Domestic acquisition announcements create stronger positive price shocks than cross-border acquisitions

M&A studies highlight the impact of M&A waves on activity and possible short-term returns but do not indicate that hype around certain industries would create abnormal short-term returns. Therefore, it is assumed that the M&A announcement returns follow the merger & acquisition waves and the public hype around Fintech is not reflected in the short-term market reactions:

H3: The Fintech hype is not reflected in the short-term market reactions to the acquisition announcements

Studies have found that IPOs in general experience underpricing. Further, it has been noted that certain industries experience more severe underpricing than others. The fourth hypothesis is as follows:

H4: Fintech companies experience significant underpricing upon IPO

Previous studies have found that the hype created by media affects the capital gains experienced by shareholders upon IPO. Hence, it is assumed that the hype around Fintech IPOs is reflected in the IPO underpricing:

H5: The Fintech hype affects the severity of IPO underpricing upon the first trading day

These five hypotheses are used to answer the underlying research questions.

7. IMPACT OF ACQUISITION ANNOUNCEMENTS

The following chapter will go through the process of sample selection, concentrating on the peculiarities that go into defining a sample for an unclassified industry. After addressing the limitations of the data and the sample selection, an overview of the sample is presented which includes descriptive statistics. This is followed by the final chapter containing the results obtained from the event study on Fintech acquisition announcements.

7.1. Sample gathering and data validation process

The gathered events for the event study consist of acquisition announcements of Fintech companies between the years 2013 and 2016. The events used in the study have been gathered through researching relevant news outlets, company web pages and doing event queries in the Bloomberg Terminal financial market data platform. The news pages used in the initial screening for suitable samples include but are not limited to pages listed in table 1.

The time period was chosen so as to include both the surge in Fintech media attention in 2015 (See figure 1, page 11) and also a sufficient amount of prior data. The vendor companies of the announcements are listed in stock exchanges based in one of the OECD countries (See appendix 2 for list of OECD countries). The geographical limits of the study were narrowed to the OECD countries was because the acquisition news and public offering statements had to be partly manually searched. Including geographical areas that do not operate in the terms of the western world would have made the search process more prone to information biases and mistakes.

Table 1. Acquisition news pages

Company	Main offerings	Website
Banking tech	Source of news and analysis of the global fintech sector	bankingtech.com
Business Wire	Disseminates full-text press releases	businesswire.com
Finextra	Financial technology, retail and wholesale banking news	finextra.com
FinSMEs	Information on venture capital/private equity deals	finsmes.com
MarketWatch	Provides business news, analysis, and stock market data	marketwatch.com
Power Retail	Australia's news resource for e-commerce retailers	powerretail.com.au
Reuters	International news agency	reuters.com
StreetInsider	Publishes breaking stock market news	streetinsider.com
Tech City News	News, videos, analysis and events on the UK's tech sector	techcitynews.com
Tech.eu	European technology news, data, research and analysis	tech.eu
TechCrunch	Publishes technology industry news	techcrunch.com
TechVibes	Publisher of Canadian technology industry news	techvibes.com
Bizjournals	Business and industry news from the United States	bizjournals.com
The Next Web	International technology news, business & culture	thenextweb.com
VentureBeat	Source for news & perspective on tech innovation.	venturebeat.com

After constructing the preliminary sample it needed to be cross-referenced to the Fintech verticals introduced in the second chapter of this thesis. For the event to be included in the final sample, the target company of the acquisition event had to be recognizable as a Fintech company in the media but it also needed to belong to the verticals determined by the author.

The event histories of the acquiring companies were extracted from the Bloomberg terminal to find possible confounding events that would distort the event study. If an M&A announcement was made by a company that had other major events happen during the event window, the M&A announcement was removed from the sample. A single event per acquiring company was allowed in the sample to avoid distortions. If a company had made more than one Fintech acquisition during the time period, only the first event was included in the sample. Finally, for a vendor company stock data to be included in the data set obtained from the sample, there

had to be 240 days of stock price data available prior to the acquisition event and 20 days of data after the event.

The preliminary sample included a total of 273 acquisition announcements. After the first stage screening of identifying Fintech companies, the number of announcements was reduced to 96. Screening for confounding events and companies with multiple acquisitions led to 45 remaining announcements. Finally, companies with insufficient stock price data were removed, leaving a final number of 36 events in the sample.

Defining a Fintech company is a non-trivial exercise because the Fintech phenomenon spans on different industry classification codes and there is no official taxonomy on Fintech companies. Table 2 provides a list of Fintech M&A target company industry classifications in the Bloomberg Terminal. As can be seen, the categories of the industries vary vastly. A major part of the companies that are included in said industries have nothing to do with Fintech. This makes the screening for suitable events more arduous in comparison to traditional industries.

Table 2. Fintech Acquisition target industry in Bloomberg Terminal

1.	Advertising Servies	11.	Data Processing/Mgmt
2.	Applications Software	12.	E-Commerce/Products
3.	Cellular Telecom	13.	Enterprise Software/Serv
4.	Commercial serv-Finance	14.	Finance-Credit Card
5.	Commercial Services	15.	Finance-Invest Bnkr/Brkr
6.	Computer Graphics	16.	Finance-Other Services
7.	Computer Services	17.	Identification Sys/Dev
8.	Computer Software	18.	Internet Applic Sftwr
9.	Computers-Integrated Sys	19.	Internet Connectiv Svcs
10.	Computers-Other	20.	Transactional Software

A fundamental issue in finding suitable Fintech companies was that media, scholars and industry professionals disagree on the definition and inclusion criteria of Fintech. For example some instances see Health Technology companies as au-

tomatically being part of the Fintech sector whereas this thesis does not promote such a view. For a Health Tech company to be included in the sample, the main driver of the company had to be an innovation in the financial part of health services.

Some factors should be stated considering the reproducibility of this thesis and using this thesis as a framework for other studies. As discussed earlier, the method used in this thesis adds additional layers of work into the data gathering and validation process. In studies conducted on traditional industries, the data can be gathered with appropriate industry classifications without the additional manual work that was required to identify appropriate companies. Figure 3 describes the data gathering and validation process and highlights the steps which are needed to conduct an event study into an emerging new (technology) industry.

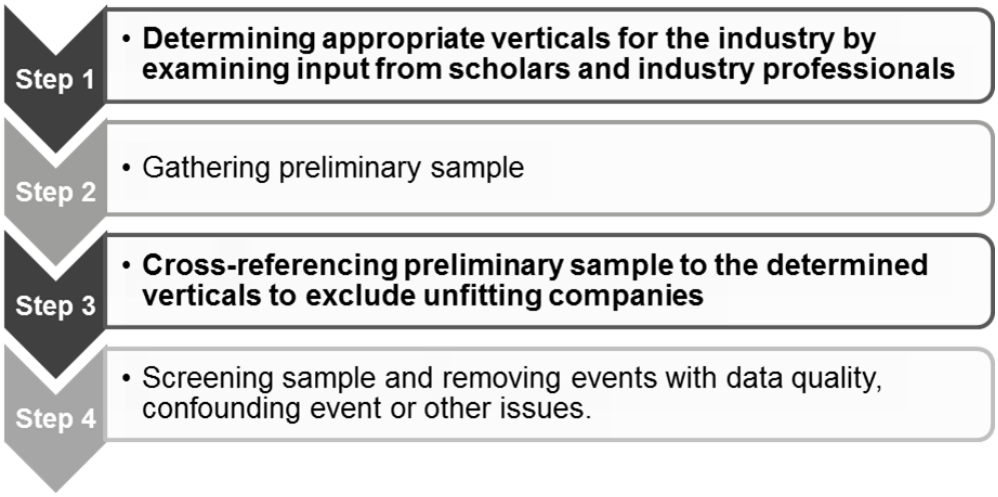

Figure 3. Sample gathering and validation process

7.2. Sample and data limitations

Event studies attempt to isolate the impact of an event on a firm's financial performance. Thus, it is important to control for other factors that can potentially influence a firm's financial return. Industry-specific factors are a problem if a relatively large number of firms in the sample belong to the same or a related industry. One might suspect that the problem could occur in this study. Further inspection of the

sample reveals, however, that the sample consists of acquiring companies that belong to a variety of different industries ranging from banks and telecommunications companies to e-commerce giants. Furthermore, Brown and Warner (1980) state that controlling for market return is adequate if the event window is not very long (for example 41 trading days is considered a very long event window). Controlling for industry-specific factors was therefore not obligatory.

The central limit theorem suggests that if a distribution has a large sample size (n>30) the distribution is assumed to be normally distributed. Even though the sample size in the even study is 36 events, which exceeds the aforementioned guideline of more than 30 events, it still proved small when studying phenomena that required dividing the sample into segments. Another limitation to the sample is that Fintech acquisitions are usually acquisitions of privately held companies. In these cases information on total acquisition price and other info might be withheld from the public. This means that acquisition price was not used as a proxy in the future event study.

7.3. Sample overview

The sample consists of Fintech company acquisition announcements that were released during the time period of 2013-2016. The final sample consists of 36 events. The majority of the acquisitions were domestic is seen in Figure 4. Most of the domestic transactions were conducted in the US as 19 of the total sample transactions were intra-US. The aforementioned division was later used to study which acquisition type creates a larger impact in the context of Fintech acquisition announcements.

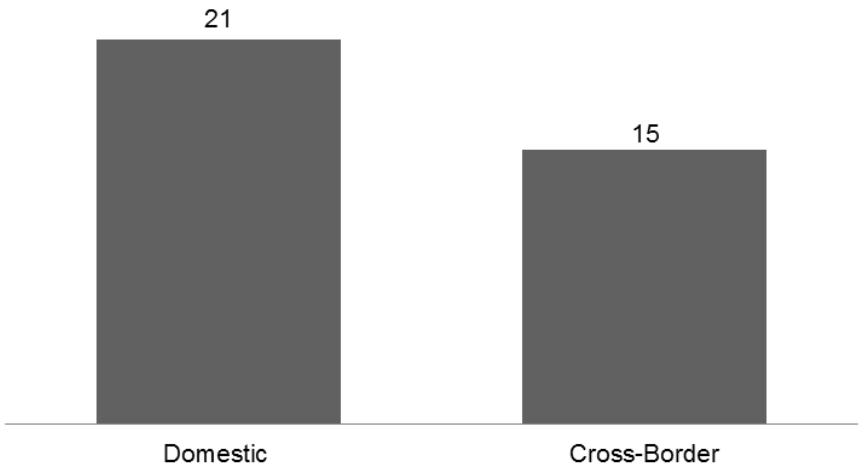

Figure 4. Acquisition type

The yearly distribution for the acquisition events is quite even as can be seen in Figure 5. The acquisitions were divided into years 2013-2014 and 2014-2015 to study whether the increase in Fintech popularity affected the acquisition announcement stock price impact.

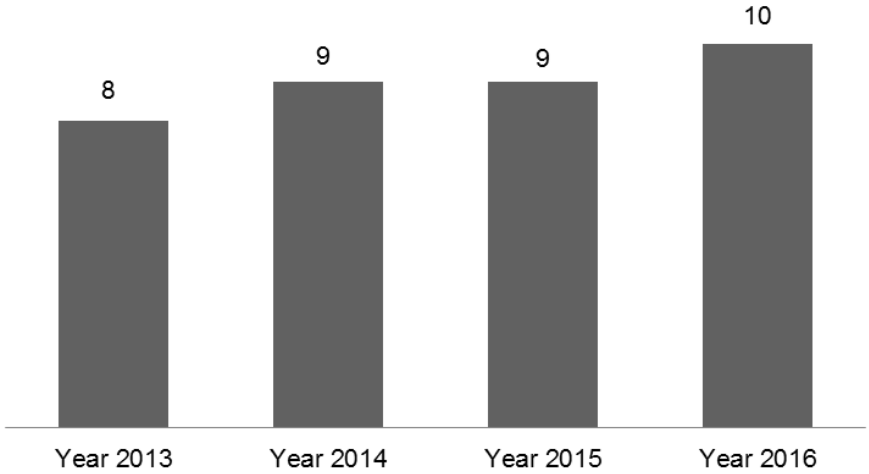

Figure 5. Acquisition year

Fintech acquisitions are for the most part private acquisitions and because of this the payment methods and payment amounts are often not disclosed. Figure 6 highlights this fact as almost half of the deals in the sample have undisclosed payments details.

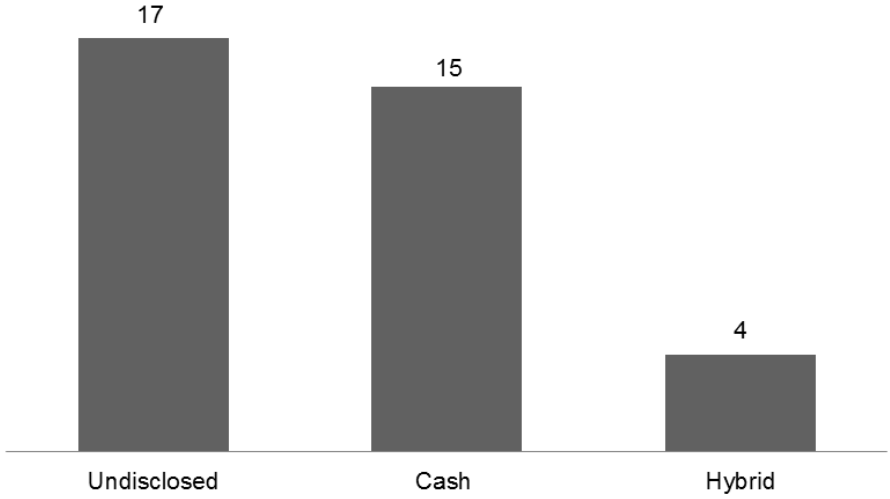

Figure 6. Method of payment

The sample companies lean very heavily into just a few of the Fintech verticals. Most of the target companies in the sample belong to the payments/billing tech vertical (17 companies). Another prominent vertical is Institutional/capital markets tech with 13 companies. Fraud prevention and regulatory tech comprises of 5 companies, personal finance/asset management 2 and insurance tech 1.

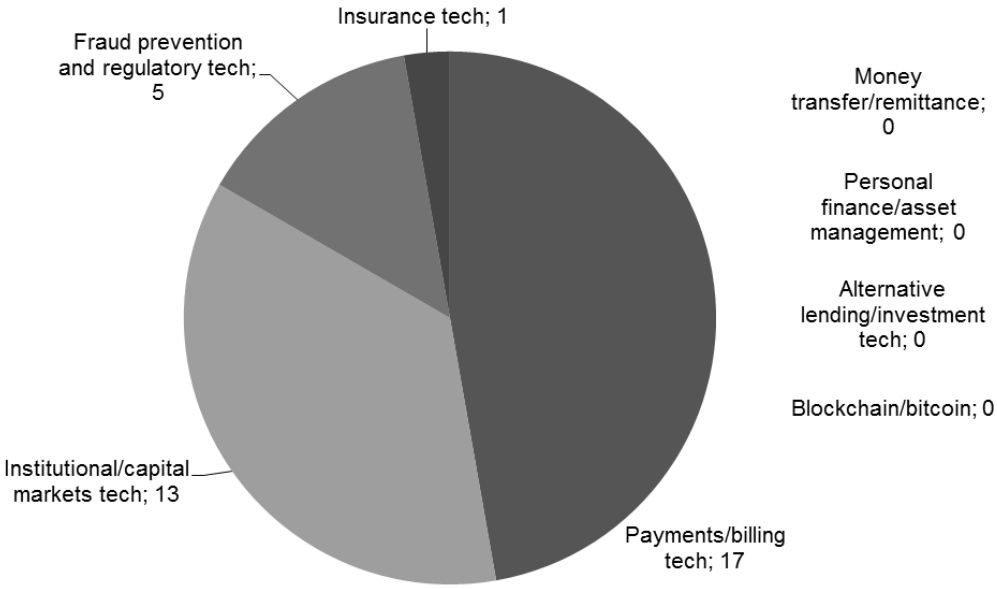

Figure 7. Fintech verticals (M&A)

7.4. Results

The impact of the acquisition announcements were examined by applying the event study methodology to gauge the possible shock in share pricing. The calculations were conducted in Microsoft Excel. The event study was first conducted on the whole sample, which consists of 36 announcements. After studying the whole sample, different deal characteristics and their impact on stock pricing were studied.

Many previous studies have found that M&A announcements create negative abnormal returns for the acquirer but this has mainly been seen in cases of public acquisitions. Private acquisitions have been found to create positive abnormal returns. Fintech acquisitions are mostly private and the results are similar to the aforementioned findings. The acquisition announcements create a positive abnormal return. At one day after the event, a statistically significant abnormal return of 1,08 % was calculated. At day ten, an abnormal return of 0,74 % was calculated. This might, for a big part, be explained by the 21,47% abnormal return generated by Yelp US.

Table 3. Event study results (AR) – Whole Sample

Stock price reaction (AR) - Whole sample					
	AR (0)	AR (1)	AR (2)	AR (5)	AR (10)
Average	-0,21 %	1,08 %**	-0,10 %	-0,08 %	0,74%*
Variance	0,043 %	0,096 %	0,041 %	0,011 %	0,136 %
Min	-7,26 %	-5,55 %	-9,36 %	-2,03 %	-2,85 %
Max	7,61 %	9,20 %	3,43 %	3,99 %	21,47 %
Probability test					
N	36	36	36	36	36
J1 statistic / t-ratio	-0,479	2,497	-0,222	-0,189	1,709
p-ratio	0,635	0,017	0,826	0,851	0,096

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

The cumulative abnormal returns experienced after the announcement events are mostly not statistically significant. The only significant returns were found on (-1,1) time interval with 1,13 % cumulative abnormal return and (0,1) interval with 0,78 % return.

Table 4. Event study results (CAR) – Whole Sample

Stock price reaction (CAR) - Whole sample						
	CAR (0,0)	CAR (0,1)	CAR (0,2)	CAR (0,5)	CAR (0,10)	CAR (-1,1)
Average	-0,16 %	0,78%*	0,59 %	0,67 %	0,92 %	1,13 %**
Variance	0,002 %	0,004 %	0,006 %	0,011 %	0,020 %	0,002 %
Min	-7,26 %	-10,32 %	-11,51 %	-11,88 %	-15,20 %	-10,50 %
Max	7,61 %	12,90 %	7,62 %	10,45 %	25,41 %	14,89 %
Probability test						
N	36	36	36	36	36	36
J1 statistic / t-ratio	-0,37	1,29	0,79	0,63	0,64	2,61
p-ratio	0,354	0,099	0,216	0,264	0,261	0,005

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

Figure 8 shows the AAR and CAAR returns graphically and highlights the clear abnormal returns experienced after the acquisition announcements.

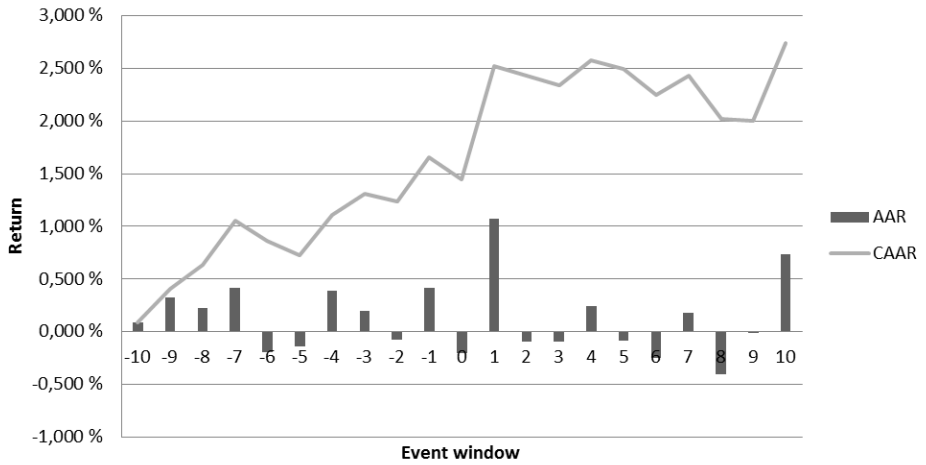

Figure 8. AAR & CAAR returns

Based on the aforementioned findings it can be concluded that Hypothesis 1 ("*There is a positive short-term market reaction to the acquisition announcements")* holds. The short-term reaction happens one day after the announcement and fades away instantly.

The deal characteristics were examined by dividing the events into domestic acquisitions and cross-border acquisitions. The domestic acquisitions generated clear positive abnormal returns. The average abnormal returns was 1,30% on the day after the announcement (Table 5). The cumulative abnormal returns were also statistically significant with a 0,96% return on interval (0,1) and 1,26% return on (0,2) interval. The outlier company Yelp US was eliminated from the sample at this point.

Table 5. Event study results – Domestic & Cross-border transactions

Stock price reaction (AR) & (CAR) - Domestic transactions

	AR (0)	AR (1)	AR (2)	CAR (0,1)	CAR (0,2)	CAR (0,5)
Average	-0,34 %	1,30 %***	0,30 %	0,96 %**	1,26%***	1,18 %*
Variance	0,018 %	0,093 %	0,016 %	0,002 %	0,003 %	0,006 %
N	20	20	20	20	20	20
J1 statistic / t-ratio	-1,11	4,25	0,97	2,22	2,37	1,57
p-ratio	0,280	0,000	0,344	0,013	0,009	0,058

Stock price reaction (AR) & (CAR) - Cross-border transactions

	AR (0)	AR (1)	AR (2)	CAR (0,1)	CAR (0,2)	CAR (0,5)
Average	0,02 %	0,45 %	-0,42 %	0,47 %	0,05 %	0,21 %
Variance	0,078 %	0,087 %	0,068 %	0,017 %	0,025 %	0,050 %
N	15	15	15	15	15	15
J1 statistic / t-ratio	0,03	0,49	-0,46	0,37	0,03	0,09
p-ratio	0,979	0,630	0,649	0,357	0,487	0,463

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

The cross-border acquisition results differ markedly from the domestic acquisitions. There are no statistically significant average abnormal returns or cumulative abnormal returns. Figure 9 shows the returns for domestic and cross-border transactions during the event window.

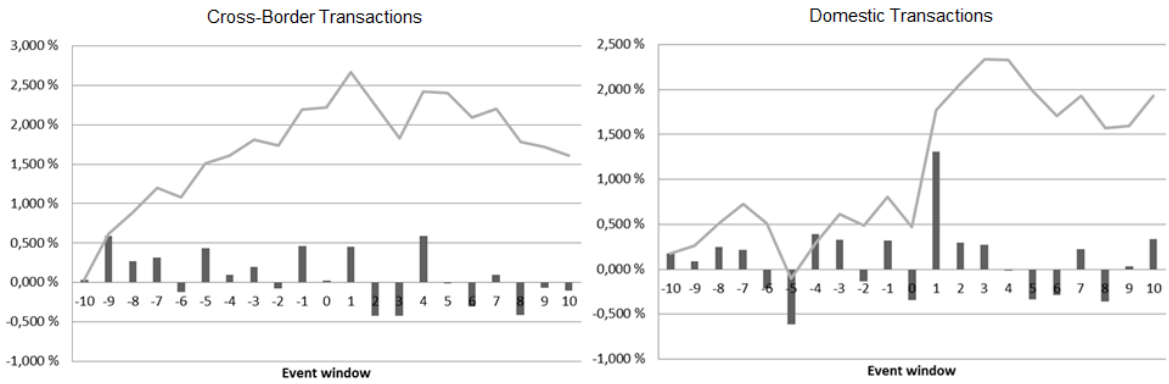

Figure 9. Cross-Border and Domestic transactions

Based on the aforementioned findings, it can be concluded that Hypothesis 2 ("*The domestic acquisition announcements create stronger positive price shocks than cross-border acquisitions")* holds as there is a clear positive effect experienced upon domestic acquisition announcements.

To study the possible impact of hype around Fintech the sample was divided to two time intervals, 2013-2014 and 2015-2016. The results in Table 6 show that the average abnormal returns do not differ greatly between the two samples.

Table 6. Event study results – 2013-2014 and 2015-2016

Stock price reaction (AR) & (CAR) - 2013-2014

	AR (0)	AR (1)	AR (2)	CAR (0,1)	CAR (0,2)	CAR (0,5)
Average	-0,27 %	1,01%***	-0,10 %	0,75%**	0,65 %	0,05 %
Variance	0,008 %	0,085 %	0,005 %	0,002 %	0,003 %	0,006 %
N	16	16	16	16	16	16
J1 statistic / t-ratio	-0,858	3,266	-0,325	1,703	1,203	0,07
p-ratio	0,404	0,005	0,749	0,044	0,115	0,473

Stock price reaction (AR) & (CAR) - 2015-2016

	AR (0)	AR (1)	AR (2)	CAR (0,1)	CAR (0,2)	CAR (0,5)
Average	-0,12 %	0,88 %	0,06 %	0,76 %	0,82 %	1,36 %
Variance	0,074 %	0,098 %	0,068 %	0,011 %	0,017 %	0,033 %
N	19	19	19	19	19	19
J1 statistic / t-ratio	-0,154	1,173	0,085	0,720	0,637	0,747
p-ratio	0,879	0,255	0,933	0,236	0,262	0,228

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

The strongest reaction that happens day after the announcement is 1,01% on 2013-2014 and 0,88% on 2015-2016. The results are not statistically significant for the 2015-2016 time interval. An interesting point is, however, that the cumulative abnormal returns are the highest out of all the samples in the announcements made on 2015-2016. This observation can be clearly seen in Figure 10.

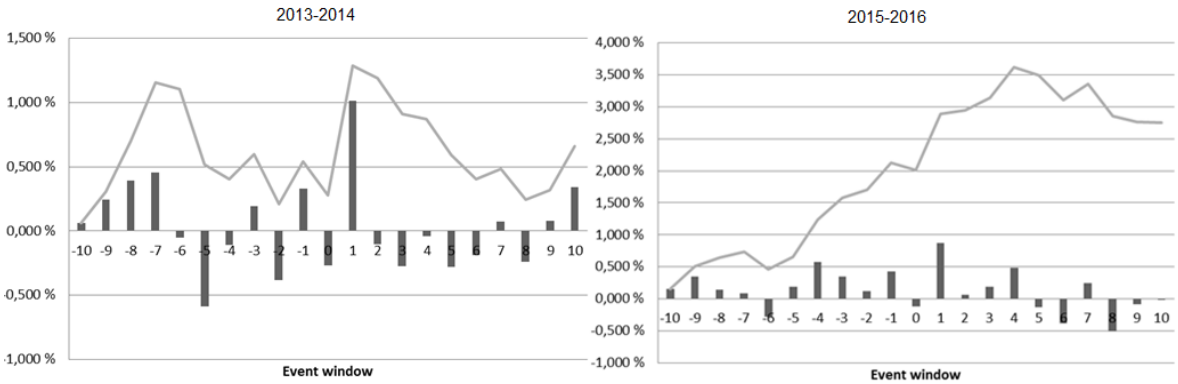

Figure 10. Transactions on 2013-2014 and 2015-2016

Dividing the sample to domestic and cross-border acquisitions as well as dividing the sample to different time intervals reveals some interesting aspects but the small amount of observations hinders the statistical significance of the results. Based on these findings, it can be concluded that hypothesis 2 ("*The Fintech hype is not reflected in the short-term market reactions to the acquisition announcements*") holds as the results are inconclusive and it cannot be confirmed that the hype period would affect the acquisition announcement returns.

8. SHORT RUN IPO PERFORMANCE

8.1. Sample selection

The sample consists of Fintech companies that have conducted an IPO between the years 2013 and 2016. For the Initial public offering to be included in the sample the company had to be listed to an OECD country based stock exchange.

The first step in gathering a preliminary sample of Fintech IPOs was to look for the most comprehensive lists of Fintech companies available in the western countries. Some examples are provided in table 7. The companies were then checked for their IPO date to find Fintech IPOs that occurred in the time frame.

Table 7. Sources of Fintech companies

Source of Fintech company intel	Example
Indeces	Solactive Fintech Index (SOLFINT)
Equity traded funds	GLOBAL X FINTECH THEMATIC ETF (FINX US Equity)
Market analysis and other publications from investment banking firms	Financial Technology Partners U.S. Fintech IPO analysis

The preliminary sample of Fintech IPOs was handled in the same way as in the case of acquisition announcements (see Figure 3). The companies that did not belong to one of the Fintech verticals introduced in the second chapter of this thesis were excluded. After this companies with data limitations or other issues were excluded. There had to be 20 days of stock price data available after the Initial Public Offering of the Fintech company. The sample IPOs can be found in Appendix 3.

8.2. Sample overview

The sample consisted of a total of 30 Fintech IPOs. The vertical with the highest number of IPOs was payments/billing tech comprising more than 50% of all observations (Figure 11.). No companies categorized to the blockchain/bitcoin or insurance tech verticals conducted an IPO during the time period of the study.

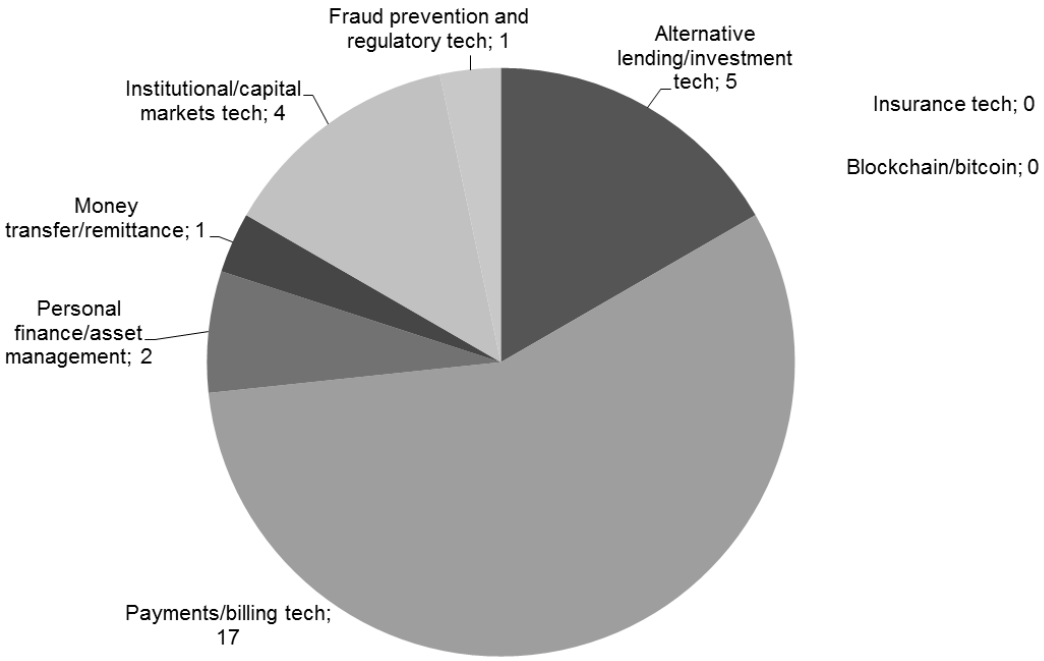

Figure 11. Fintech verticals (IPO)

The yearly amount of Fintech IPOs in the sample can be seen from figure 12. It should be noted that this might not represent the total amount of Fintech IPOs conducted in the chosen time period because the amount depends on what companies one sees fit to include under the Fintech umbrella term.

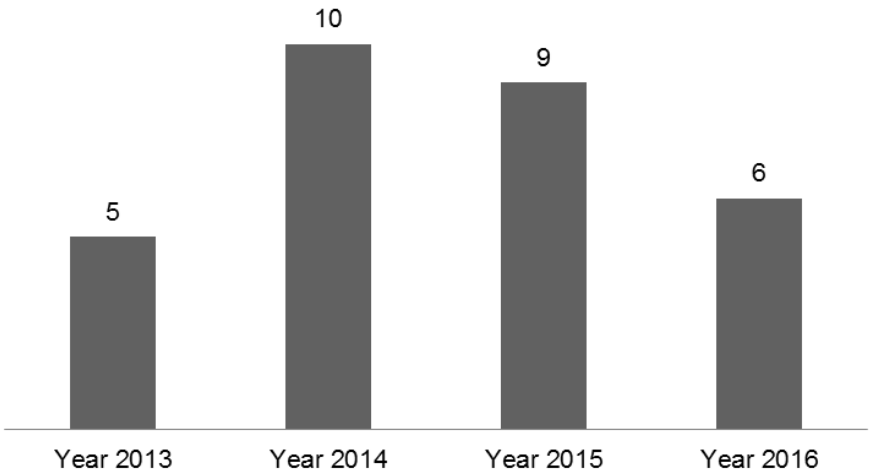

Figure 12. IPO year

Table 8 shows the descriptive statistics for the sample IPOs. The companies had an average market capitalization of $1524,65 Million when calculated with the first trading days closing price.

Table 8. Descriptive statistics (IPOs)

Descriptive statistics - Whole sample

	Offer Amount (M. $)	Market Capitalization (M. $)	Money left on table (M. $)
Mean	521,83	1803,71	63,94
Standard deviation	756,76	1982,83	106,11
Minimum	6,00	13,53	-79,28
Maximum	2825,55	8460,84	486,41
N	30	30	30

The companies left $63,94 million on average on table upon going public. As can be seen in Table 8, the standard deviation on money left on table is high. This is understandable as the company size varies and the amount left on table tends to increase in course with the market capitalization. The larger the market capitalization, the bigger the dollar denominated impact of a percentage change in stock

price. The maximum of money left on table was in the IPO of LendingClub Corp. LendingClub also had the largest Market Capitalization after the 1st day of trading ($8460,84 M.) and with more than 50 percent change in market price, the money left on table rose to $486 Million.

8.3. Results

The short run IPO performance was examined by applying the mean market-adjusted short run performance (MASRP) methodology to gauge the possible underpricing effects. The calculations were conducted with Microsoft Excel. The calculations were first conducted on the whole sample, which consisted of 30 IPOs. The sample was then divided into time periods for further inspection.

As can be seen from table 9 below, the returns for the trading days were greatest on the 1st day of trading and somewhat smaller after this. The market adjusted return for the 1st trading day was 22,64 % indicating clear underpricing upon IPO.

Table 9. Short run performance results – Whole sample

Market adjusted return (%) - Whole sample					
	1st	5th	10th	15th	20th
Average	22,64 %***	20,39 %***	19,11 %***	20,19 %***	19,08 %***
Variance	6,63 %	6,34 %	6,07 %	6,15 %	7,12 %
Min	-11,88 %	-22,18 %	-36,51 %	-9,81 %	-17,94 %
Max	87,40 %	87,22 %	71,84 %	82,22 %	109,57 %
Probability test					
N	30	30	30	30	30
t-statistic	5,00	4,43	4,25	4,46	3,92
p-ratio	0,000	0,000	0,000	0,000	0,000

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

The average 1st day return for IPOs listed on CRSP (CRSP includes AMEX, NYSE and NASDAQ stocks) between 2013-2016 was 17,48 % (Ritter, 2017). The raw return for Fintech IPOs was 5,16 % higher than the mean raw return for all of the

IPOs listed in CRSP. The p-value for all of the trading days is <.001 and the null hypothesis can be rejected. Hypothesis 4 ("*Fintech companies experience significant underpricing upon IPO"*) holds. It can also be concluded that the short run performance of Fintech IPOs is significantly higher than the average short run IPO performance of CRSP stocks.

As mentioned before, the interest and usage of the word Fintech started to gain momentum in the year 2015. To gauge whether Fintech hype has had an impact on IPO underpricing, two time periods have been generated. Table 10 shows the market adjusted returns for the periods 2013-2014 and 2015-2016.

Table 10. Short run performance results – 2013-2014 and 2015-2016

Market adjusted return (%) - 2013-2014 and 2015-2016					
2013-2014	1st	5th	10th	15th	20th
Average	25,78 %	22,74 %	22,52 %	19,57 %	14,22 %
Variance	6,67 %	7,64 %	6,33 %	5,97 %	4,59 %
Min	-0,58 %	-2,37 %	-3,20 %	-7,65 %	-10,79 %
Max	87,40 %	87,22 %	71,83 %	63,61 %	52,00 %
2015-2016	1st	5th	10th	15th	20th
Average	19,51 %	18,04 %	15,70 %	20,81 %	23,94 %
Variance	6,85 %	5,39 %	6,00 %	6,76 %	9,65 %
Min	-11,88 %	-22,18 %	-36,51 %	-9,81 %	-17,94 %
Max	84,80 %	64,06 %	59,79 %	82,22 %	109,57 %
Probability test					
N	15+15	15+15	15+15	15+15	15+15
t-statistic	0,660	0,504	0,752	-0,135	-0,997
p-ratio	0,515	0,618	0,458	0,894	0,327

* = Statistically significant at 90% confidence level
** = Statistically significant at 95% confidence level
*** = Statistically significant at 99% confidence level

In 2013-2014 the 1st day return was 25,78 % but the returns decreased during the forthcoming days and were only 14,22 % at the closing of the 20th trading day. The returns for the 2015-2016 period were quite different: the 1st day return was 19,5 % which is considerably lower than on 2013-2014. The returns declined on 5th and 10th trading day but increased to 20,81% on the 15th trading day and finally

23,94% on the 20th trading day. These trends can be seen in Figure 13. The expected returns between the two samples do not differentiate statistically significantly.

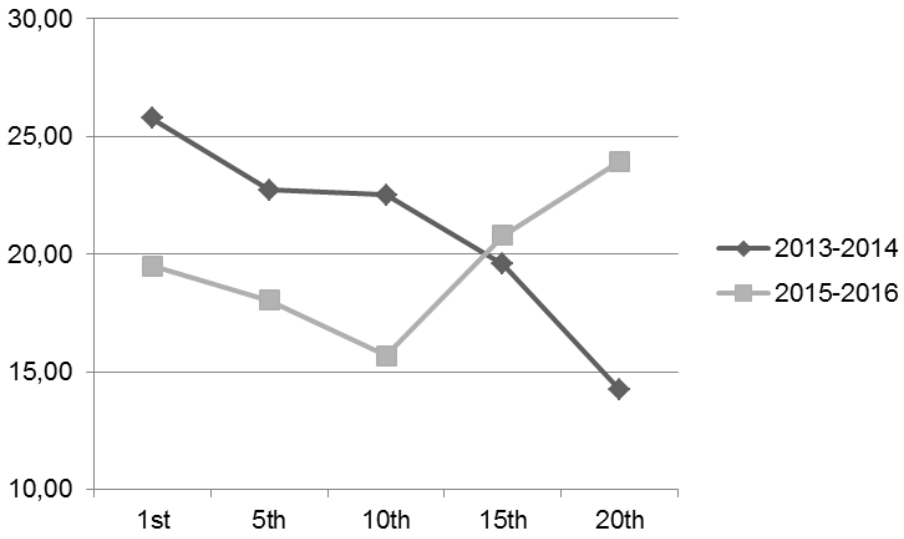

Figure 13. Short run performance - 2013-2014 and 2015-2016

The results show that the hype around Fintech did not increase the 1st day IPO returns. The 20th day returns, however tell another story with an almost 10% difference in the returns of the two time periods. The mean first day returns in CRSP listed IPOs for 2013-2014 was 18,3 % and 16,8% for 2015-2016. As mentioned before, the differences between the two samples are not statistically significant. Based on this information, hypothesis 5 ("*The Fintech hype affects the severity of IPO underpricing upon the first trading day")* cannot be accepted.

9. CONCLUSIONS

The purpose of this study was to combine two quantitative methods to assess the stock market reactions to Fintech companies in terms of shareholder value. Further, this thesis sought to illustrate how to define and identify Fintech companies. The identification of Fintech companies was done by utilizing Fintech verticals. The Fintech acquisition announcements were studied with the event study methodology. The initial public offerings of Fintech companies were studied by utilizing the mean market-adjusted short run performance methodology. A total of five research questions were formed for this study. They were answered with five hypotheses grounded on previous related literature.

The first three of the research questions were related to the Fintech acquisitions, the first one of them being: "*How do the stock markets react to Fintech acquisition announcements?"* The associated hypothesis was H1: "*There is a positive short-term market reaction to the Fintech acquisition announcements*". This hypothesis was formed to support earlier findings of private acquisition announcements generate positive abnormal returns (See e.g. Fuller et al., 2002). The hypothesis holds and a 1,08 percent positive abnormal return was reported one day after the acquisition announcement. This result confirms previous findings and extends the findings to the Fintech industry.

The subquestion 1.1 related to the first research question was: ""*How do the markets react to domestic acquisition announcements when compared to cross-border announcements?".* The supporting hypothesis was H2: "*The domestic acquisition announcements create stronger positive price shocks than cross-border acquisitions*". Previous studies on deal characteristics have found that cross-border acquisitions create lower returns than domestic (see, e.g. Conn et al., 2005). H2 was also accepted as the domestic transactions reported clearly higher statistically significant abnormal returns (1,30 % one day after announcement and high cumulative abnormal returns on days 0 to 5). Once more, this result confirmed previous findings.

The subquestion 1.2. related to the first research question was: "*What is the impact of increased attention towards the Fintech industry in regards to acquisition announcement market reactions?"* The hypothesis related to this was H3: "*The Fintech hype is not reflected in the short-term market reactions to the acquisition announcements".* It was assumed that the M&A announcement returns follow the M&A waves rather than hype around certain industries. The hypothesis was accepted and confirms previous findings.

The second main research question was related to the Fintech IPOs: "*How do IPOs of Fintech companies perform in the short run?".* The hypothesis related to this was H4: "*Fintech companies experience significant underpricing upon IPO*". This hypothesis was accepted as the Fintech companies shares experienced an average 22,64 percent market adjusted return on the first trading day, which was significantly higher than the return on all companies listed on CRSP.

The subquestion related to the second main research question was: "*What is the impact of increased attention towards the Fintech industry in regards to IPO underpricing?".* The hypothesis related to this question was: *"The Fintech hype affects the severity of IPO underpricing upon the first trading day".* The results provided somewhat contradictory findings as the Fintech media hype in 2015-2016 was not an increasing factor to the acquisition announcement shocks. The results are most likely due to the fact that the Fintech IPO companies are in many cases seasoned companies with multi-million dollar net worth. On the other hand the Fintech hype is centered on smaller startups that disrupt the financial services field. With the consideration to these issues, it is reasonable to assume that the Fintech hype does not extend to most of the Fintech companies undergoing an IPO.

The biggest limitation of this study was the overall amount of transactions for both of the methodologies. The small sample size decreased the statistical power of the sub-group analysis, rendering it useless to divide the samples to more than two sub-groups. Furthermore, the lack of deal information made it impossible to conduct certain event studies, for example, deal size and other specific characteris-

tics. The time frame for the study and the lack of transaction data prevented long-term performance analysis.

Future research on Fintech companies is needed. An intrinsic addition to this study would be the inclusion of an accounting study or another variant of a long-term study on the performance of Fintech companies. This study and its framework for recognizing companies belonging to new industries can be utilized in additional studies. As the Fintech industry evolves and gradually grows in size, further studies could be conducted into single sections of the Fintech phenomenon. Such studies could quantify, for instance, the market reactions to regulatory technology or insurance technology companies. The process could also be used as a framework for studying market reactions to other technology based industries where singling out companies by using traditional means such as industry classification codes is not possible.

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APPENDICES

Appendix 1. Sample Transactions (M&As)

Acquirer name (ticker) [country]	Acquirer industry	Target Name [country]	Target industry	Target Fintech Vertical	Announced Date	Completion Date	Announced value (M.) (Currency) [Payment type]
American Express Co (AXP US) [U.S.]	Finance-Credit Card	InAuth Inc [U.S.]	Applications Software	Fraud prevention and regulatory tech	6.12.2016	6.12.2016	Undisclosed [Cash]
Verisk Analytics Inc (VRSK US) [U.S.]	Consulting Services	Analyze Re [Canada]	Applications Software	Insurance Tech	24.10.2016	24.10.2016	Undisclosed
NEX Group PLC (NXG LN) [U.K.]	Finance-Invest Bnkr/Brkr	Abide Financial Ltd [U.K.]	Finance-Other Services	Fraud prevention and regulatory tech	13.10.2016	13.10.2016	Undisclosed
Thomson Reuters Corp (TRI CN) [U.S.]	Multimedia	Redi Holdings LLC [U.S.]	Transactional Software	Institutional/ capital markets tech	22.9.2016	17.1.2017	Undisclosed
E*TRADE Financial Corp ETFC US [U.S.]	Finance-Invest Bnkr/Brkr	Aperture Group LLC [U.S.]	Finance-Invest Bnkr/Brkr	Institutional/ capital markets tech	25.7.2016	12.9.2016	725 (USD) [Cash]
EML Payments Ltd (EML AU) [Australia]	Commercial Serv-Finance	Store Financial Services LLC [U.S.]	Computers-Integrated Sys	Payments/ billing tech	2.5.2016	3.6.2016	35,71 (USD) [Cash and Stock]
Banco Bilbao Vizcaya Argentari (BBVA SM) [Spain]	Commer Banks Non-US	Holvi Payment Services Ltd [U.K.]	Finance-Other Services	Payments/ billing tech	7.3.2016	7.3.2016	Undisclosed
Rambus Inc (RMBS US) [U.S.]	Electronic Compo-Semicon	Smart Card Software Ltd [U.K.]	Finance-Credit Card	Payments/ billing tech	25.1.2016	25.1.2016	64,7 (GBP) [Cash]
Fiserv Inc (FISV US) [U.S.]	Data Processing/Mgmt	Community Financial Services [U.S.]	Transactional Software	Institutional/ capital markets tech	20.1.2016	3.3.2016	200 (USD) [Cash]
Brady PLC (BRY LN) [U.K.]	Computer Software	Energycredit Software Services [India]	Applications Software	Institutional/ capital markets tech	4.1.2016	4.1.2016	Undisclosed
ACI Worldwide Inc (ACIW US) [U.S.]	Transactional Software	PAY.ON AG [Germany]	Computers-Other	Payments/ billing tech	4.11.2015	4.11.2015	180 (EUR) [Cash and Stock]

Acquirer name (ticker) [country]	Acquirer industry	Target Name [country]	Target industry	Target Fintech Vertical	Announced Date	Completion Date	Announced value (M.) (Currency) [Payment type]
Wirecard AG (WDI GR) [Germany]	Commercial Services	GI Payment services [India]	Finance-Credit Card	Payments/ billing tech	27.10.2015	27.10.2015	230 (EUR) [Cash]
IHS Markit Ltd (INFO US) [U.S.]	Multimedia	CoreOne Technologies LLC [U.S.]	Data Processing/Mgmt	Fraud prevention and regulatory tech	12.8.2015	1.10.2015	200 (USD) [Undisclosed]
Blackbaud Inc (BLKB US) [U.S.]	Computer Software	Smart Tuition Inc [U.S.]	Applications Software	Payments/ billing tech	10.8.2015	5.10.2015	190 (USD) [Cash]
Jack Henry & Associates Inc (JKHY US) [U.S.]	Computers-Integrated Sys	Bayside Business Solutions Inc [U.S.]	Applications Software	Institutional/ capital markets tech	1.7.2015	1.7.2015	Undisclosed
Net Element Inc (NETE US) [U.S.]	E-Commerce/Products	Com Web Sarl [France]	E-Commerce/Products	Payments/ billing tech	25.3.2015	25.3.2015	Undisclosed
Visa Inc (V US) U.S.	Finance-Credit Card	TrialPay Inc [U.S.]	Advertising Services	Payments/ billing tech	27.2.2015	30.6.2015	Undisclosed
Envestnet Inc (ENV US) [U.S.]	Computer Software	Upside Financial LLC [U.S.]	Finance-Invest Bnkr/Brkr	Institutional/ capital markets tech	26.2.2015	26.2.2015	Undisclosed
FactSet Research Systems Inc (FDS US) [U.S.]	Multimedia	Code Red Inc [U.S.]	Applications Software	Institutional/ capital markets tech	9.2.2015	9.2.2015	Undisclosed
Moody's Corp (MCO US) [U.S.]	Commercial Serv-Finance	Lewtan Technologies Inc [U.K.]	Applications Software	Institutional/ capital markets tech	27.10.2014	27.10.2014	Undisclosed
SAP SE (SAP GR) [Germany]	Enterprise Software/Serv	Concur Technologies Inc [U.S.]	Enterprise Software/Serv	Payments/ billing tech	18.9.2014	5.12.2014	7241,19 (USD) [Cash]
FleetCor Technologies Inc (FLT US) [U.S.]	Commercial Serv-Finance	Comdata Inc [U.S.]	Transactional Software	Payments/ billing tech	12.8.2014	17.11.2014	3362,48 (USD) [Stock & Debt]
Telefonaktiebolaget LM Ericsson (ERICB SS) Sweden	Wireless Equipment	MetraTech Corp. [U.S.]	Internet Connectiv Svcs	Payments/ billing tech	29.7.2014	1.10.2014	7,5 (USD) [Cash]
WEX Inc (WEX US) [U.S.]	Commercial Serv-Finance	Evolution1 Inc [U.S.]	Data Processing/Mgmt	Payments/ billing tech	16.6.2014	16.7.2014	532,5 (USD) [Cash]

Acquirer name (ticker) [country]	Acquirer industry	Target Name [country]	Target industry	Target Fintech Vertical	Announced Date	Completion Date	Announced value (M.) (Currency) [Payment type]
Morningstar Inc (MORN US) [U.S.]	Commercial Serv-Finance	ByAllAccounts Inc [U.S.]	Data Processing/Mgmt	Institutional/ capital markets tech	1.4.2014	1.4.2014	28 (USD) [Cash]
Global Payments Inc (GPN US) [U.S.]	Commercial Serv-Finance	Payment Processing Inc [U.S.]	Commercial Serv-Finance	Payments/ billing tech	24.1.2014	5.3.2014	420 (USD) [Cash]
Equifax Inc (EFX US) [U.S.]	Commercial Serv-Finance	TDX Group Ltd [U.K.]	Enterprise Software/Serv	Institutional/ capital markets tech	16.1.2014	15.1.2014	200 (GBP) [Cash]
Wolters Kluwer NV (WKL NA) [Netherlands]	Publishing-Periodicals	Financial Tools Inc [U.S.]	Applications Software	Institutional/ capital markets tech	3.1.2014	3.1.2014	Undisclosed
Mastercard Inc (MA US) [U.S.]	Commercial Serv-Finance	Provus Bilisim Hizmetleri AS [Turkey]	Computer Services	Payments/ billing tech	10.10.2013	6.1.2014	Undisclosed
Experian PLC (EXPN LN) [U.K.]	Commercial Serv-Finance	41st Parameter Inc/The [U.S.]	Applications Software	Fraud prevention and regulatory tech	1.10.2013	1.10.2013	324 (USD) [Cash]
MoneyGram International Inc (MGI US) [U.S.]	Commercial Serv-Finance	Money Transfer Kiosk Business [U.S.]	Finance-Other Services	Payments/ billing tech	31.7.2013	1.10.2013	Undisclosed [Cash]
Yelp Inc YELP US [U.S.]	Internet Content-Info/News	SeatMe Inc [U.S.]	Applications Software	Payments/ billing tech	18.7.2013	24.7.2013	11,44 (USD) [Cash and Stock]
Broadridge Financial Solutions BR US [U.S.]	Data Processing/Mgmt	Bonaire Software Solutions LLC [U.S.]	Enterprise Software/Serv	Institutional/ capital markets tech	26.6.2013	17.7.2013	Undisclosed
Fair Isaac Corp FICO US [U.S.]	Data Processing/Mgmt	Infoglide Software Corp [U.S.]	Computer Graphics	Fraud prevention and regulatory tech	1.4.2013	1.4.2013	Undisclosed
London Stock Exchange Group PL LSE LN [U.K.]	Finance-Other Services	GATElab Ltd [U.K.]	Computer Software	Institutional/ capital markets tech	11.2.2013	11.2.2013	Undisclosed
Fidelity National Information FIS US [U.S.]	Data Processing/Mgmt	mFoundry Inc [U.S.]	Applications Software	Payments/ billing tech	31.1.2013	14.3.2013	120 (USD) [Cash]

Appendix 2. List of OECD countries

Australia	France	Latvia	Slovenia
Austria	Germany	Luxembourg	Spain
Belgium	Greece	Mexico	Sweden
Canada	Hungary	Netherlands	Switzerland
Chile	Iceland	New Zealand	Turkey
Chech Republic	Ireland	Norway	United Kingdom
Denmark	Israel	Poland	United States
Estonia	Japan	Portugal	
Finland	Korea	Slovak Republic	

Appendix 3. Sample Transactions (IPOs)

Company	Date of IPO	Country of operation	Offer amount (M. $)	Market capitalization (M. $)	Vertical
Blackline NASDAQ: BL	27.10.2016	United States	146,20	1169,15	Institutional / Capital Markets tech
Coupa NASDAQ: COUP	6.10.2016	United States	133,20	1596,32	Payments/Billing tech
Nets A/S CPH: NETS.CO	23.9.2016	Denmark	2 378,25	4388,58	Payments/Billing tech
Kyckr Ltd ASX: KYK	7.9.2016	Ireland	6,00	13,53	Fraud Prevention/Regulatory tech
Cotiviti Holdings, Inc. NYSE: COTV	25.5.2016	United States	237,50	1535,31	Payments/Billing tech
Bats Global Markets NASDAQ: BATS	14.4.2016	United States	252,70	2201,10	Institutional / Capital Markets tech
Square, Inc. NYSE: SQ	19.11.2015	United States	243,00	352,89	Payments/Billing tech
First Data Corp NYSE: FDC	14.10.2015	United States	2 560,00	2520,00	Payments/Billing tech
Worldpay LSE: WPG	13.10.2015	United Kingdom	2 825,55	6031,40	Payments/Billing tech
CPI card Group, Inc. NASDAQ: PMTS	8.10.2015	United States	150,00	687,31	Payments/Billing tech
AppFolio, Inc. NASDAQ: APPF	26.6.2015	United States	74,40	87,30	Payments/Billing tech
Transunion NYSE: TRU	25.6.2015	United States	664,77	4515,81	Alternative lending / Investment tech
Shopify, Inc. NASDAQ: SHOP	21.5.2015	United States	130,90	197,74	Payments/Billing tech
Black Knight Financial Services NYSE: BKFS	19.5.2015	United States	441,00	1770,35	Alternative lending / Investment tech

Company	Date of IPO	Country of operation	Offer amount (M. $)	Market capitalization (M. $)	Vertical
Ferratum Oyj FRA:FRU	6.2.2015	Finland	125,38	430,10	Alternative lending / Investment tech
On Deck Capital, Inc. NYSE: ONDK	16.12.2014	United States	200,00	1851,17	Alternative lending / Investment tech
LendingClub Corp NYSE: LC	11.12.2014	United States	865,50	8460,84	Alternative lending / Investment tech
Yodlee NASDAQ: YDLE	3.10.2014	United States	75,00	380,62	Personal Finance / Asset Management
HealthEquity, Inc. NASDAQ: HQY	31.7.2014	United States	127,40	872,89	Personal Finance / Asset Management
IHS Markit Ltd NASDAQ: INFO	19.6.2014	United Kingdom	1 283,34	4775,78	Institutional / Capital Markets tech
Worldline S.A. FP: WLN	16.6.2014	France	781,41	2160,98	Payments/Billing tech
Paycom Software, Inc. NYSE: PAYC	15.4.2014	United States	99,68	779,95	Payments/Billing tech
Q2 Holdings, Inc. NYSE: QTWO	20.3.2014	United States	100,89	481,49	Institutional / Capital Markets tech
Paylocity Holding Corp NASDAQ: PCTY	19.3.2014	United States	119,77	1176,08	Payments/Billing tech
Quotient Technology, Inc. NYSE: COUP	7.3.2014	United States	168,00	2195,09	Payments/Billing tech
OzForex Group Ltd ASX: OFX	11.10.2013	Australia	416,00	577,71	Payments/Billing tech
Qiwi Plc NASDAQ: QIWI	3.5.2013	Russia	212,50	213,50	Payments/Billing tech
Blackhawk network holdings NASDAQ: HAWK	21.4.2013	United States	230,00	260,10	Payments/Billing tech
Evertec, Inc. NASDAQ: EVTC	12.4.2013	United States	505,26	1616,73	Payments/Billing tech
Xoom Corp NASDAQ: XOOM	15.2.2013	United States	101,20	811,57	Money transfer/remittance