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**The SPAC-bubble: The initial performance of SPACs  
compared to traditional IPOs**

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**ABSTRACT:**

Recently, the IPO market has been very active in the U.S. Especially the years 2020 and 2021 saw a high volume of new listings. At roughly the same time, Special Purpose Acquisition Companies ("SPACs") gained popularity as an alternative to traditional IPOs. The record number of SPACs was recorded in 2021.

The primary purpose of this study is to analyze the reasons for the recent appearance and popularity of SPACs. One way this is achieved is by examining the initial returns of SPACs, and then comparing those to IPOs. The intended contribution of this study is to compare the SPACs and IPOs and the initial returns. The performance of SPACs has been previously studied in previous research. However, the focus has mainly been on the performance of SPAC after the acquisition.

The purpose of this study is to focus on the initial performance after the listing. The initial performance of SPACs and IPOs is examined using an event study methodology. The data sample consisted of 318 SPACs and 461 IPOs. Alone or compared to IPOs, the findings suggest that SPACs do not generate positive excess returns. However, the finding is made that the distribution of returns for SPACs and IPOs is significantly different. Considering the distribution of SPAC returns and IPO returns are noticeable different samples.

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**KEYWORDS:** IPO, SPAC, initial public offering, special purpose acquisition company, abnormal returns, initial performance

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**TIIVISTELMÄ:**

Listautumismarkkinat ovat viime aikoina olleet erittäin aktiivisia Yhdysvalloissa. Erityisesti vuosina 2020 ja 2021 uusia listauksia on nähty runsaasti. Suunnilleen samaan aikaan Special Purpose Acquisition Companies ("SPAC") nousi suosioon, vaihtoehtona perinteisille listautumisajoille. Ennätysmäärä SPAC:eja nähtiin vuonna 2021.

Tämän tutkimuksen ensisijainen tarkoitus on analysoida SPAC:ien viimeaikaisen suosion syitä. Yksi tapa saavuttaa tämä on tutkia SPAC:ien tuottoja ja vertaamalla niitä perinteisiin listautumisiin. Tämän tutkimuksen tarkoituksena on verrata SPAC:ien ja perinteisten listautumisien tuottoja. SPAC:ien suorituskykyä on tutkittu aiemminkin lukuisissa tutkimuksissa. Painopiste näissä aikaisemmissa tutkimuksissa on kuitenkin ollut lähinnä SPAC:n tuotot yrityskaupan jälkeen.

Tämän tutkimuksen tarkoituksena on keskittyä tuottoihin heti listautumisen jälkeen. SPAC:ien ja perinteisten listautumisien tuottoja tarkastellaan tapahtumatutkimusmetodologialla. Data kostuu 318 SPAC:sta ja 461 IPO:sta. Yksin SPACien tuottoja tai listautumisiin verrattuna, havainnot viittaavat siihen, että SPAC:t eivät tuota positiivista tuottoa. Tästä huolimatta, voidaan tehdä havainto, että SPAC- ja IPO-tuottojen jakautuminen on hyvin erilaista.

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**Avainsanat:** IPO, SPAC, initial public offering, special purpose acquisition company, abnormal returns, initial performance

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## Abbreviations

<b>IPO</b>	Initial public offering
<b>SPAC</b>	Special purpose acquisition company
<b>CAPM</b>	Capital asset pricing model
<b>NASDAQ</b>	National Association of Securities Dealers Automated Quotations
<b>CAR</b>	Cumulative abnormal return

## 1 Introduction

Going public often plays a major part in a company's growth path. Companies need capital to grow and going public is a popular way to raise new funds. The initial public offering or IPO, in short, has been the conventional way for firms to go public. However, during the past twenty years, a new alternative to the IPO has appeared. The most significant alternative has been the special purpose acquisition companies. The special purpose acquisition company or SPAC, in short, is an alternative for a company to get listed in the market. The main idea behind SPAC is that the private company will not conduct the IPO on its own, rather the idea is to use cash shell companies. The private firm will be purchased by a cash shell company that is already publicly listed. Therefore, the private company will archive the status of a publicly traded company. SPACs are cash shell companies, and their main goal is to buy private firms and get them listed. SPAC is an alternative to traditional IPO and the main purpose is to avoid the lengthy and expensive IPO process. (Kolb & Tykvova, 2016).

Even in the relatively small Finnish stock market, there have been two SPACs already. The first Finnish SPAC was the listing of Virala Acquisition Company in June 2021. The second SPAC happened in the same year as the Lifeline SPAC I listed to the Nasdaq Helsinki in October 2021. However, as there is a limitation of data of Finnish SPACs for example, this study focuses on the U.S. stock market.

The year 2020 saw significant growth in the volume of listings that used SPACs in the U.S. stock market. There have been other spikes in the volume of SPACs in the past. However, the rise in volume in 2020 and 2021 was unprecedented. The motivation behind the study is to examine the performance of SPACs and find reasons behind the rise in popularity in recent times. More importantly, the aim is to examine the performance of SPACs and compare it to the traditional IPOs' performance for the first three days after the listing.

Underpricing is a well-known phenomenon related to traditional IPOs and the value of the IPO stock price tends to be higher on the first day of trading than the listing price. The initial returns of IPOs have previously been well-studied. However, the initial returns of SPACs compared to traditional IPOs have not been thoroughly explored in the existing literature. Given the increased interest and participation in the SPACs, it is interesting to understand how the SPACs perform in the short term following their public listing.

### **1.1 Previous related studies**

A previous study by Cumming et al. (2014) examines the motivation and factors related to successfully going public with SPACs. Previous research by Kolb and Tykvova (2016) studies the performance of SPACs compared to traditional IPOs. Their main finding is that the SPACs underperform the market and the IPOs in the long term. A study by Dimitrova (2017) describes the SPAC as a cheaper alternative for a private equity fund, which according to Dimitrova explains the risen popularity of SPACs. Another study by Blomkvist and Vulcanovic (2020) examines the waves of SPACs. They study the change in the volume of SPAC IPOs.

A study by Cumming et al. (2014) examines the success factors of SPAC IPOs. They study the approval probability in companies and which factors affect SPACs going through. They find that active investors reduce the probability of SPAC going through and being successful. Also, they make the finding that the SPAC is more likely to happen during markets in which there is a high volume of SPAC IPOs happening. This is the same observation that has been made from IPO markets which also move in waves.

Kolb and Tykvova (2016) analyze SPACs and IPOs that are conducted after 2003 when the markets saw a new wave of SPACs as a capital vehicle. The authors used data from the 127 different SPAC acquisitions and 1128 IPOs that were performed after 2003. The authors find that SPAC acquisitions happen more when there is weak IPO activity. Moreover, when the markets are volatile the number of SPACs increases. The success

of IPOs is largely dependent on the market environment and the mood of investors. A major advantage is that the SPACs are relatively fast and cheap compared to the IPOs. Also, Kolb and Tykvova compare the long-term performance of IPOs and SPACs by calculating the buy-and-hold abnormal returns of the SPAC firms and the IPO firms. The results from these show that the SPACs underperform the market, IPO firms, and the industry.

A more recent study by Blomkvist and Vulcanovic (2020) studies the SPAC IPO waves. In their study, they focus on the volume of SPAC and how the market conditions affect the volume and the investor's willingness to invest in SPAC issues. Their finding is that the SPAC volume is negatively related to market-wide uncertainty and time-varying risk aversion. Furthermore, their finding is that the SPACs have a higher sensitivity to investors' sentiments than regular IPOs.

## **1.2 Purpose of the study**

As shown before, the previous studies on SPACs have examined the long-term performance of SPACs and the short-term has been left unexamined. Therefore, the purpose of this study is to examine the SPACs and their performance in the short term. The purpose is to compare the SPACs and their performance to the traditional IPOs. Furthermore, the focus will be on the volume of SPACs as the years 2020 and 2021 saw a very high volume of SPAC transactions. The aim is to find explanations for the SPAC bubble in the past five years.

The intended contribution is to offer explanations for the popularity of SPAC IPOs. Also, the intended contribution is to show if there is an optimal time for companies to go public using the SPAC and how the performance compares to going public via traditional IPO. In addition, this study aims to enlighten investors as they might ponder about investing in SPACs or conventional IPOs.

The results of this study can provide valuable insight into the performance of SPACs and traditional IPOs and inform discussions around the suitability of SPACs as a going-public option. The results may also be useful for investors, regulators, and policymakers in making informed decisions around SPAC investments and regulation.

### **1.3 Hypotheses**

The research question will find the causes for risen popularity of SPAC IPOs and compare the performance between SPACs and IPOs. This study aims to investigate the SPAC IPO returns initially and find the reasons for the popularity of SPAC IPOs in the past five years. The aim is to find out how the SPACs perform in the stock market in the first three days of trading. Therefore, the first hypothesis is as follows:

*H<sub>1</sub>: SPACs generate positive abnormal returns in the first 3 days of trading*

The other study aims to find the reason for risen popularity of SPAC IPOs and therefore compare the traditional IPOs returns to the SPAC returns in the short term. The initial return is seen as the first three days of trading in the stock market. Thus, the second hypothesis is as follows:

*H<sub>2</sub>: SPACs generate higher returns than traditional IPOs in the first 3 days of trading*

### **1.4 Structure of the study**

The first chapter introduces the motivation behind the study. The second chapter presents the main financial theories that are well-documented in the world of finance and that are relevant to this study. These theories include the efficiency market hypothesis, agency theory, the capital asset pricing model, and the cyclicity of the financial markets. After the background theories, the focus moves to the main subjects of the thesis. The third chapter introduces the traditional IPOs and the main observations that have been made from IPOs. In the fourth chapter, the focus moves to the other subject of the the-

sis, which is the SPAC IPOs. The fifth chapter discusses the data used and covers the methodology used to examine the main question. The sixth chapter presents the results of the study. The seventh and final chapter concludes the study and discusses its limitations.

## **2 Financial theoretical background**

There are a few ideas and theories that have been recognized by most people in finance. In short, the majority of academic studies in finance are centered around these theories of that small group of academic theories, most relevant theories and models concerning this topic and thesis are the market efficient market hypothesis, agency theory, capital asset model, and cyclicity in the economy.

### **2.1 Efficient market hypothesis**

The efficient market hypothesis is one of the cornerstones of finance and it explains how the market should in theory work. Roberts was the first to introduce this theory in 1967 and Fama extend this theory further in 1970. The efficient market theory presents the idea that financial market prices reflect fully all the information that is available (Fama, 1970.) The market should get all the new fundamental information immediately and adapt pricing accordingly. According to the efficient market hypothesis the stocks always trade at their true and fair value. This means that there should not be opportunities for investors to benefit from arbitrage. Shares are always traded for the right prices. (Brealey et al. 2011).

The efficient market hypothesis does not apply to everything or even in a meaningful way to any market, and the market offers opportunities to use information as an advantage to make profits. These deviations from the market efficiency theory are called “anomalies” and in IPOs, these anomalies typically appear (for example initial underpricing, which translates into first-day positive excess returns).

### **2.2 Agency theory**

Agency theory explains the problem between different parties in a company and how their priorities differ. A corporation consists of a lot of different parties such as shareholders, managers, employees, and lenders. These entities have different views on

what is good for the company, and it can generate conflicts of interest between these parties. For example, the shareholders' interests should be to maximize their profits by increasing the value of the company, which is not always the top priority for the management. Companies try to combat this problem by giving compensation to the managers which is tied to the firm's stock value. (Brealey et al. 2011).

Although detailed later in this thesis, with respect IPOs and SPACs the principal-agent problem often manifests in that type of agency problem between the owners versus the underwriter or SPAC manager (i.e., underwriter equivalent).

### **2.3 The capital asset pricing model**

The capital asset pricing model or CAPM is one of the cornerstones of academic finance. CAPM was first introduced by Treynor (1961) and later by Sharpe (1964). It is a widely used model to explain the risk and the expected returns of different securities. CAPM is used to calculate the expected returns for securities and determine the price of an asset according to it. CAPM considers the risk-free rate, the beta of the asset, and the market risk premium. CAPM helps investors to evaluate the different securities prices and to determine if the price of the asset is fairly valued compared to the risks. CAPM is calculated with the following formula:

$$r = R_f + \beta x (R_m - R_f) \quad (1)$$

Where  $r$  is the expected return on the investment.  $R_f$  is the risk-free rate of return.  $\beta$  is the systematic risk of the investment and the  $R_m$  is the expected return of the market.

### **2.4 Market cyclicality**

Although not necessarily recognized by academic finance, there are multiple cycles in the stock market and the overall economy. These cycles do influence the financial decisions that are being made by the participants in the market. To generate an answer to

the research question concerning factors affecting IPOs and SPACs it is essential to define what market cycles are. The economic cycle and the cycles that occur in the stock market will be presented.

The economic cycle or the business cycle is often divided into four different parts. These four parts are commonly acknowledged as expansion, crisis, recession, and recovery. These periods can last years at a time. Lowry (2003) argues that the common perception is that IPOs and their volume varies with the business cycle. Lowry finds in his studies that during economic expansion the number of IPOs increases significantly. This is because the demand for capital rises which causes more companies to go public. This is closely related to the fact that during the expansion the optimism along with the different parties increases. (Lowry, 2003).

The cycles in the stock market are also important to acknowledge. The stock market cycles are closely related to the economic cycle. The phases in the stock market are commonly divided roughly into two different phases. The phases are the bull market and the bear market.

The main characteristic of the bull market is the increase in security prices (Brealey et al. 2011). This period also includes the rising optimism of investors and the overall increase in well-being. The outlook for the future is positive and the economic prospects increase. The bull market as a whole means that there are optimal conditions in the stock market for better results. During the bull market, there is strong momentum for higher returns and the period can last months and even years at the time (Gonzalez et al. 2005). The opposite is the bear markets. During a bear market, the prices of securities tend to fall drastically over time. The optimism of investors changes to pessimism and the outlook for the future changes to a more negative view.

The difference in bull and bear market conditions influences the decisions that the companies make concerning IPOs. The number of IPOs often increases in the bull mar-

ket. The bull markets are often the time when companies decide to issue new shares. The volume of new issues clusters in the bull market and decrease in bear market conditions. (Brealey et al. 2011). Also, when the cycles and IPOs are considered, it is important to acknowledge the cyclicity in IPOs. This is a matter that will be addressed in its separate part in the following chapter.

### **3 Initial public offering**

An initial public offering or IPO for short is when a private corporation decides that it wants to go public. This means that the private corporation offers its shares to the public stock market for investors to buy. IPO can consist of the current stocks that the company's early investors own, and the new stocks put on the market. An IPO can bring many benefits to the company, but it also has its flaws. Owners of a private firm who are thinking about listing should consider these and make the decision based on the different factors.

#### **3.1 Common reasons for IPOs**

The main reason for private firms going public is to raise equity capital. Companies need capital to grow and increase their value. This is because the main purpose of a company is to add value for its owners. IPO can play a major part in the growth of a company, but it is not mandatory to succeed. Pagano et al. (1998) find that the largest companies are often private, especially in Europe. IPO is still a major part of many companies and their growth process. Although an IPO is not mandatory it is a choice that many private corporations make to enhance their growth.

Raising capital is not the only reason why private companies go public, there are many other reasons. According to Ritter and Welch (2002), another main reason for companies to go public includes that the company can create a place where the shareholders can turn their wealth into cash. This means that the pre-IPO owners can more easily sell their shares of the company on the market and therefore exit the investment. In other words, liquidity improves, and it enables an exit strategy for investors (Feldman, 2018). This means that the owners can collect their profits from their investment if they do not want to continue with the company and do not trust their future, for example. Increasing publicity can also play a part in a firm's decision-making when a company considers the possibility of going public. Increased publicity is a nonfinancial

reason, but it can have a major impact on a firm's success, and it can also be a reason to go public.

There are also multiple other reasons for companies to go public, and these include better bargaining power with banks and investor recognition (Pagano et al. 1998). When the company is on the public market it can get loans with better conditions from the banks and develop its business even further. Making potential mergers and acquisitions smoother can also be a reason for companies to go public. When the firm is public the valuation of the company gets easier. Feldman (2018) finds that public companies' shares are often valued to be worth twice as much as similar private companies shares. Also, when firm stocks are traded on the public stock market it makes it easier for potential buyers to find the firm. Potential new investors can also find the company a more attractive target, and this may increase the company's value in a possible acquisition.

When a company is public it must be a lot more transparent and clearer about its actions. The company must produce information that will comply with the SEC regulations. Therefore, shareholders know the company and its actions. This will raise the confidence that the shareholders have in the management. Even so, this does not mean that the shareholders should completely trust the company and the information that it produces because there can always be something bad that the company is hiding. (Feldman, 2018).

Some factors increase the likelihood of a company going public and these factors also help the companies to complete a successful IPO. Pagano et al. (1998) find that the high market-to-book ratio of companies in the same industry has a high correlation with new listings on the stock market. The size of the company is also a major determinant. Smaller companies are less likely to go public than larger companies. Also, some private firms may take advantage of the situation of a certain industry or market. Khurshed (2007) finds that private firms can often benefit from other firms when tak-

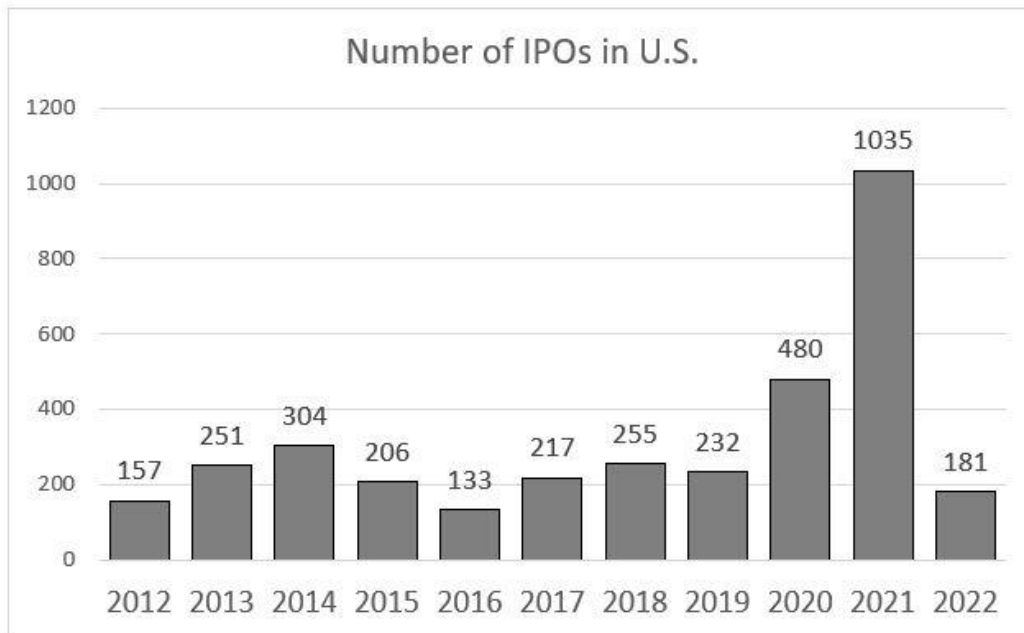
ing the firm public. This applies when the companies in the same industry are overvalued or overall, the market is in a situation where the whole market is overvalued. This means the firm going public can also get good value for its IPO even if it may be overvalued. Private companies can take advantage of the situation where other companies in the same market go public because it helps in the valuation of the IPO. Ritter (1991) calls this phenomenon taking advantage of the “window of opportunity”. This means that the timing of the industry matters and companies could benefit from it.

The number of IPOs has been on the rise in recent years. The Finnish market is a good example of this. The Finnish stock market has seen many new companies going public. In the past five years, there have been 20 more IPOs than in the same period prior. The real bubble happened in the year 2021 when 29 new companies were listed on the Nasdaq Helsinki. This was a record-breaking year for IPOs during one year in Finland (Pörssisäätiö, 2023). In the following figure, the number of IPOs in Finland from 2012 to 2022 is presented.



**Figure 1.** Number of IPOs in Finland between 2013-2022 (Pörssisäätiö, 2023).

The same trend is visual in the U.S. also and the years 2020 and 2021 saw high growth in the volume of new listings. In the following figure, the number of IPOs in the U.S. between 2012 to 2022 is presented.

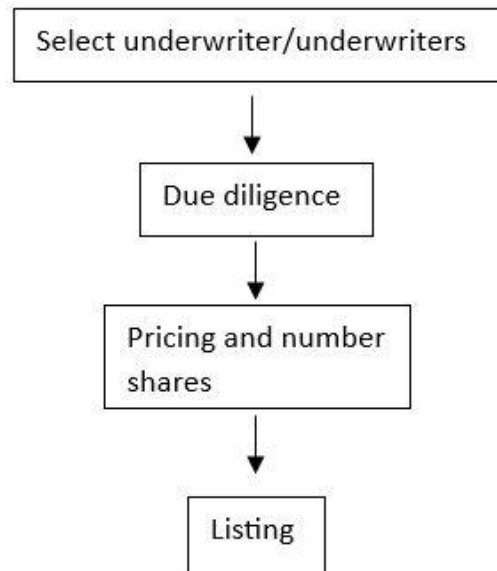


**Figure 2.** Number of IPOs in the U.S. from 2012-2022 (Statista, 2023.)

### 3.2 The process of IPO

When the company has decided it wants to go public it has a lot of steps to complete the process. The firm also has some other more detailed decisions to consider. The company must decide how it wants to execute the IPO. The important thing to decide is whether the company wants to use one underwriter or multiple underwriters. This matter is dependent on the size of the company and if the company is large it might want to use multiple underwriters. The underwriter in question can be an investment bank for example. The firm must also decide does it wants to have different underwriters to manage different parts of the IPO. This might speed up the process and make the IPO process easier. Underwriters come up with the offering price and the number of stocks that are offered to the stock market. Underwriters provide advice for the com-

pany, and they buy the issue and then they sell the new issue to the public market. (Brealey et al. 2011).



**Figure 3.** IPO process (Brealey et al. 2011).

### 3.3 Disadvantages of IPOs

As previously mentioned, IPO brings a lot of advantages to companies. For this reason, an IPO is a common thing in several companies' growth paths. However, there is also another side to IPOs because going public can also bring different difficulties to the company.

First, the process of IPO can be an expensive and time-consuming project for the firm. Going public generates different costs that include the fees paid to the underwriter and registration fees. IPO also generates yearly fixed costs on top of the initial fees. These include auditing, certification, and stock exchange fees for example. Another disadvantage is that when the company is traded publicly it must unveil information to the public that may result in a loss of competitive advantage. The information may be data

about current research and development or information about the firm's future strategies. A publicly traded company also comes to closer scrutiny over its taxes compared to a private company. This reduces the company's opportunities to arrange its taxes in a way that benefits the company financially. (Pagano et al. 1998).

Besides, becoming a publicly traded company can bring fraud, greed, and deceptive practices to the firm. Public companies often are more likely to use deceptive practices. This comes from the pressure that public companies are under. The pressure is generated from the stock market that puts expectations on the company. The pressure pushes the company to do things that are illegal to make the results seem better than they are. (Feldman, 2018).

Increased publicity was mentioned as a positive thing, but it can also be a negative thing for a public company. Public companies are under a lot of scrutiny and it can attract lawsuits according to Feldman (2018). Public companies get a lot of attention and shareholders can seek to sue a company when its stock dives to get compensation. Even so, there are not any legitimate reasons to do so other than to extort the company. In these situations, firms often are forced to settle and avoid bad publicity.

According to Feldman (2018) going public may be harmful to a company because the emphasis shifts to short-term results instead of the long-term performance of the company. Short-term results become important when the company is public because the analyst, shareholders, and potential investors see them in a certain way, and they make valuations based on the results. This is problematic when the company focuses solely on short-term results rather than investing in its R&D, for example. Investors want results fast, and it is not always for the benefit of the company. A public company still wants to please its shareholders so the company must make decisions that make the investors happy. However, decisions must be such that they do not negatively affect the growth of the company. This shows the common problem that often occurs in finance and the problem is agency theory. Keeping in mind these disadvantages and

problems that are tied to going public, the IPO is still a step that many companies take to move forward.

### **3.4 IPO anomalies**

An “anomaly” is a deviation from the expected efficient market hypothesis results. Anomalies in finance occur when the results are not what was predicted using standard textbook economic and financial models. Anomalies contradict the common theories which are trying to explain how the market will react and how stocks are priced. These phenomena show that the theories may not always work in practice. (Brealey et al. 2011). Anomalies in the long term are often related to the overreaction and underreaction to the information that is given to the market (Fama, 1998).

There are common anomalies that appear with IPOs. Three major anomalies that are studied concerning IPOs are initial underpricing, long-run underperformance, and cyclicity in IPO listings.

#### **3.4.1 IPO underpricing**

The phenomenon of underpricing in IPOs is common among researchers. IPOs are typically underpriced, and it affects the stock’s performance in the short term. Thus, the offering price of the IPO is considerably lower than the closing price in the market after the end of the first day of trading in the stock market. IPOs often produce abnormal profits at first. Ibbotson and Jaffe (1975) offer the findings that on average the first-month performance of the new issue is abnormally high. Ibbotson calls these “hot issues” and there is certain predictability attached to them.

Ritter (1991) finds that the underpricing of the IPO produces an average initial return of 16,4 %. Overall, several studies show that on average IPOs are indeed underpriced. In the wake of the 1990s internet boom, the average first-day returns increased to a 65% high from which the returns have since fallen back to in the region of 15%. (Ritter &

Welch, 2002). Ritter finds that out of 13341 IPOs between 1960-2019 in the US, the average first-day return is 16,9% (Ritter, 2019). In the following figure, the results of Ritter's studies are presented.

**Table 1.** US offerings and average first-day returns between 1960-2019 (Ritter, 2019.)

Average first day returns		
Period	Number of IPOs	Average return
1960-69	2 661	21.20 %
1970-79	1 536	7.10 %
1980-89	2 365	6.90 %
1990-99	4 193	21.10 %
2000-19	2 586	20.60 %
<b>Total</b>	<b>13 341</b>	<b>16.90 %</b>

Underpricing offers trading strategies for investors who can benefit from this common theme that occurs with IPOs. Investors can invest in IPOs and sell the shares in the aftermarket for a greater price and make profits. On the other hand, underpricing is not beneficial for the company that is being listed nor is it beneficial for the underwriter of the IPO who offers the shares in the market. Both parties lose money if the IPOs initial price is lower than the price that the shares are traded on the first day. These parties leave money on the table by underpricing.

Still underpricing is common, and it happens widely in most markets in the world. For the average IPO, there is \$9.1 million that is left on the table. This sum is bigger than most companies operating profits for several years. Even considering this the issuers are not getting upset about this because when the IPO is massively underpriced. This is caused by the fact that the market price is higher than it was thought to be. Thus, making the issuers way wealthier than they expected to be (Loughran & Ritter, 2002).

In the following table, the magnitude of underpricing is presented in different countries around the world. The returns in different countries show that the average initial returns differ quite heavily depending on the market, yet they all are positive.

**Table 2.** The first-day average returns in different countries (Loughran et al. 2015).

Country	Time period	Average Initial Return
Argentina	1991-2013	4,20 %
Australia	1976-2011	21,80 %
Austria	1971-2013	6,40 %
Belgium	1984-2006	13,50 %
Brazil	1979-2011	33,10 %
Canada	1971-2013	6,50 %
China	1990-2014	113,50 %
Denmark	1984-2001	7,40 %
Finland	1971-2013	16,90 %
France	1983-2010	10,50 %
Germany	1978-2014	23 %
Hong Kong	1980-2013	15,80 %
India	1990-2014	88 %
Ireland	1991-2013	21,60 %
Italy	1985-2013	15,20 %
Japan	1970-2014	42,80 %
Korea	1980-2014	58,80 %

Multiple reasons have been given to explain why IPOs tend to be underpriced and why it keeps happening over time. Generally, IPO underpricing is explained by the existence of asymmetric information and risk which are heavily connected to IPOs (Ellul & Pagano, 2006). Asymmetric information probably is the most established theory that explains underpricing. Asymmetric information is formed if the different parties do not have the same amount and the same quality of information. This leads to a situation in which the other party knows something that the other side does not. Regarding IPOs, the

different parties include the owners and the investors, and the underwriters. (Ritter & Welch, 2002).

One of the most known models that come from the asymmetric information theory is the Rocks (1986) winners, course model. The model assumes that some investors in the market have better information than other investors. The better-informed investors may have better information than other investors or the issuers about the real value of the stocks. Informed investors only buy good offerings while uninformed investors randomly buy all the shares from different offerings. Uninformed investors only get the worse shares, and they do not get good returns from their acquired shares. Because there are uninformed investors in the market the offerings must be underpriced cause otherwise, these investors could move to different investment options. In other words, underpricing the offered shares keeps the investors interested in taking part in IPOs.

Besides asymmetric information, Ljungqvist (2007) categorizes the different theories that explain underpricing into four categories. The categories are asymmetric information, institutional explanations, ownership, and finally behavioral explanations. Ljungqvist (2007) lists that institutional explanations consist of three different parts. The first explanation concerns the legal side of things. Companies seek legal insurance and try to avoid future lawsuits from unhappy shareholders when the performance of the IPO is not going to be what they hoped. Companies try to achieve this by underpricing the initial offering so that the post-IPO performance does not have to be anything spectacular for the investors to be satisfied. This explanation is not viable in every country because the laws differ from country to country and the risk of being sued is minimal in some countries.

The second institutional explanation is based on price stabilization. In this approach, the main goal is to reduce the price drop of the shares in the after-market and offer support for the price of the shares. The third explanation is about the taxes and tax benefits of underpricing. Management may benefit from underpricing if they own

shares of the company because the taxation is different in income tax and capital taxation. (Ljungqvist, 2007).

The third category relates to the theories concerning ownership and control that revolve around the idea that underpricing the company's management can generate an excessive amount of demand for the IPO. Therefore, avoid the situation where most of the shares offered go to the ownership of a few big entities. This reduces the risk of a hostile takeover, and control remains in the hands of the management. (Brennan & Franks, 1997).

The fourth category that is brought up by Ljungqvist is the behavioral perspective. This theory argues simply that investors, as well as issuers, are irrational, and they have different biases concerning the firm and its real market value. Pre-IPO firms do not have any prior share history which makes the valuation hard. The investors and issuers have different ideas and assumptions from previous IPOs which affect their actions.

### **3.4.2 IPO underperformance**

The underpricing anomaly applies to the time when the IPO is conducted, and it is a short-term phenomenon. The second anomaly concerning IPOs is in the long-term and it explains how the IPOs seem often to be overpriced after the initial listing. Ritter (1991) brought this finding to his studies. According to Ritter IPOs underperform compared to the market in the long run.

Ritter (2019) finds in his recent study that IPOs underperform the market significantly. In his studies, Ritter uses the US stock market and its listings as a sample. Ritter's sample is the IPOs from the US between 1980 and 2018. The IPO returns are generated by buying the initial offering and holding it for three years. These returns are compared to the returns which are obtained in the same period from the market. The results show that investing in IPOs generates significantly fewer returns in three years compared to the market-adjusted returns.

**Table 3.** The long-run market-adjusted returns of IPOs (Ritter, 2019.)

Average 3-year Buy and hold Market-adjusted Return		
Period	Number of IPOs	3-Year Return
1980-1989	2 048	-22,60 %
1990-1994	1 720	-6,60 %
1995-1998	1 894	-34,10 %
1999-2000	856	-31,80 %
2001-2018	1 980	0,20 %

Ritter finds that after the stock has been publicly traded for three years investors lose money if they buy on the first day of trading for the closing market price of the day. In hindsight, the finding is that stocks are overvalued initially, and investors are overoptimistic about the company's future and its stock returns. In his studies, Ritter uses a sample of 1526 IPOs that were conducted between the years 1975 and 1984 in the U.S. The findings were that the IPOs underperformed the matching firms by over 16% during the three years. (Ritter, 1991).

Another study that finds the underperforming phenomenon in IPOs is the study from Loughran and Ritter (1995). Loughran and Ritter find that IPOs are poor investments for investors in the long term compared to investments in other companies. The research was conducted on firms that issued stocks in the market between the years 1970 and 1990. The result is that the average annual return for firms that issue shares is 5% during the five years after the IPO. When investing in firms that have not issued shares recently and firms with the about same market capitalization, the results are significantly different. An equal amount of investment in the same period will result in an average of 12% in annual returns. The difference in returns is large. The difference in returns is roughly 44%, which means that investing in IPOs in the long term is not as profitable as investing in firms that have issued shares recently. Loughran and Ritter conclude that investing in firms issuing stock is risky in the long term. (Loughran & Ritter, 1995).

As a counterargument to Loughran's and Ritter's long-term performance findings, Brav and Gompers (1997) find in their studies that all IPOs overall might not be as bad for investors as Loughran, and Ritter suggests. Brav and Gompers argue that IPO underperformance is not only exclusively an effect that is related to the IPOs. According to Brav and Gompers, the supposed findings of underperformance in IPOs are because small issues that are not backed by venture are showing signs of underperformance. This means that IPOs are not that bad for investors. Investors should only avoid investing in small issues that are performing the worst. (Brav & Gompers, 1997)

Schultz (2003) offers an alternative explanation for the IPO underpricing phenomenon in his study. Schultz finds that the underperformance, in the long run, is tied to pseudo-market timing. This means that more firms are going public when the newly issued stocks get a higher price. Again, this leads to the result that new issues are listed only when there are high valuations in the market for their stock. When the valuations are lower, the firms do not tend to conduct new issues. In market peaks, the new offerings cluster distorts the underperformance effect. (Schultz, 2003).

Overall, the underperformance in the long-term of IPOs compared to benchmarks is noticeable. Multiple studies by Ritter (1991), and Loughran and Ritter (1995) make the same observation. In addition to these studies, Ritter and Welch (2002) make the same findings that support the observation about the long-run underperformance of IPOs. Ritter and Welch study the phenomenon by examining the US stock market between one period between 1980 to 2000. They find that abnormal returns are 23% lower than the benchmark. (Ritter & Welch, 2002). The underperformance of IPOs is also noticed in Finland. Keloharju (1993) makes findings that support the theory. Keloharju uses 80 IPOs in Finland between 1984 and 1989 as evidence. The findings are the same as in the US market. IPO firms underperform in the long run. (Keloharju, 1993).

### 3.4.3 Hot issue markets

The hot issue markets explain why there is a difference in IPO volume at different times. The hot issue market refers to the finding that the IPO markets tend to have cycles in listing volume. The findings are that the IPO market tends to follow this specific cycle between the hot and cold markets. The IPO market is hot when the IPOs tend to cluster at a specific time. Then again when the IPO market is cold there are fewer listings. The hot issues market is a phenomenon that was first brought to light by Ibbotson and Jaffe (1975) in their study and later by Ritter (1984).

Ibbotson and Jaffe (1975) find in their study that the hot issue market is a period in which the first month's average returns are abnormally high for new issues. Another finding is that the high returns in the first month after the listing are predictable during the hot issue markets. This means that in the hot markets there appears to be severe underpricing. Ibbotson and Jaffe also make the finding that in a hot market, investors can benefit from these occurring higher returns and buy the shares when the market is hot. On the other hand, the issuers can also benefit from this information, but the actions should be the opposite. According to Ibbotson and Jaffe, the issuers should take note of this cyclicity and conduct the new issues in the cold markets. This is because the issuers can get higher offering prices for their issues in the cold market rather than in the hot market. The offering price during the cold market should be relatively higher than the efficient price. (Ibbotson & Jaffe, 1975).

Ritter (1984) also makes similar findings in his study. According to Ritter's studies, there have been multiple periods where the average initial returns for new issues are higher than in other periods. Ritter used the six years from 1977 to 1982 as his sample. During these years there were fifteen months when the average returns were 48,4% while in the rest of the years, the returns were only 16,3%. This fifteen-month period is the hot issue markets, and the rest of the years are the cold issue markets. In addition, Ritter made an interesting remark about the hot issues that concern the firms and the industry in which they operate. Ritter finds that the hot issue is especially prominent with

firms and issues that operate with natural resources. In other industries, the phenomenon is not that visible. (Ritter, 1984).

In later work, Lowry, and Schwert (2002) study the patterns and cycles associated with the IPOs. They find that there are indeed strong cycles in listings and that the initial returns are predictable. Lowry and Schwert also find that the cycles are related to two factors. The first factor is that firms that are similar and work in the same industry tend to conduct an IPO at the same time. This causes the IPOs to cluster in specific industries. Firms get information about other firms' IPOs and initial returns which generates more volume in the IPO in the future. Similar companies also get information from the market about the valuation, and they can estimate how would their IPO perform and how it could be valued. (Lowry & Schwert, 2002).

The other factor and explanation for the cyclicity according to Lowry and Schwert is the fact that the IPO takes a relatively long time to complete. When the IPO process is going on the information about the firm becomes available to other firms. This spilled information influences the decisions about pricing and offerings that the other firms are making. The IPO registration period can take months. During that time, information is released, and the firm's IPOs can have overlapping IPO registration periods. These factors together cause the IPOs to cluster and create cycles in listings. Also, Lowry and Schwert argue that companies cannot benefit from the cyclicity by conducting IPOs at a certain time. Filing the IPO in either period of high average initial returns or low average initial returns. Even though there is predictability in the returns in certain periods the market conditions are noted in the pricing. (Lowry & Schwert, 2002).

In another study by Helwege and Liang (2004), the findings are shown that the hot market or cold market does not occur only in a single industry one at a time. Instead, the cycles often happen in multiple industries at the same time. Helwege and Liang make the same findings as the other studies that the hot issue markets are concentrated in a few industries. The cycles also are not only tied to the new technical innova-

tions in the industries and that is not the only factor. This is because the cycles in the IPO markets happen more often than innovations. The primary explanation for the hot market according to Helwege and Liang is the optimism that the investors have for a specific industry or company. Their other finding is that the IPOs in the hot markets have a better outlook for future growth than the cold market IPOs. (Helwege & Liang, 2004).

### **3.5 Market cycle impact on IPO Performance**

Ritter and Welch (2002) argue that the main factor in deciding to go public is the market conditions. The various market conditions in this study are evaluated in the shape of different cycles in the market. The effect of cycles is explored using the previously mentioned types of cycles. These cycles include the economic cycle, the stock market cycle, and the cycles in the IPO markets. The impact is studied initially by looking into the short-term performance as well as the long-term performance. The short-term performance in this case is the initial returns that are obtained from participating in the offering. In contrast, long-term performance signifies the average returns that are obtained from investing in the IPO and holding it for three years and beyond.

#### **3.5.1 Initial returns**

First under investigation is the timing of the IPO and what are its effects on the IPOs performance in the short term. Generally, the average returns of IPOs tend to be significantly positive. This is because of the common phenomenon of underpricing which was discussed earlier in this study. The finding is that the higher average initial returns from IPOs are often related to underpricing. Moreover, the underpricing accelerates with the increased IPO volume in the market. According to Lowry and Schwert (2002), the volume of IPOs and average initial returns are highly correlated.

The economic cycle has a significant impact on the volume of new offerings. The increase in offerings is noticeable during the economic expansion (Yung et al. 2008). Yung

et al. (2008) find in their study that the number of firms getting listed rises significantly in the economic expansion. The growth of offerings is positively correlated with underpricing, and this leads to higher initial returns. Lowry (2003) also makes similar findings in his study. The economic cycle is one of the main factors that cause the IPO volume to change.

Economic expansion is the most optimal time for firms to go public because the demand for capital is higher. Also, during the expansion stage in the economy, there is high optimism about future growth opportunities which translates to higher stock prices. According to Lowry, this results in high abnormal returns initially. (Lowry, 2003). Economic expansion is a productive period also according to Draho (2004). The view is that the expansion increases the demand for capital which then again increases the profits. Draho also argues that the expansion phase will bring higher-quality issuers to the IPO market (Draho, 2004).

The increase in optimism is a common theme during periods when the short-term returns are higher. The stock market cycles have a similar impact on the initial returns as the economic cycle. Lucas and McDonald (1990) find out in their study that the bullish market is a preferable market condition for IPOs. Similar findings are shown in studies including studies by Ljungqvist et al. (2006), Brau and Fawcett (2006), and Bouis (2009). Bouis finds in his study that firms are more likely to conduct IPO when the stock market index is high, and the period is bullish. According to Bouis market conditions have a major impact on the optimal timing of the IPO. In a bullish market, the market valuations are higher, which means better returns in the short term. (Bouis, 2009).

Both the economic expansion phase and bullish market conditions on their own drastically impact the number of IPOs. These conditions are also both significant factors that result in the issue markets being hot. The fact that in the hot issue markets the IPO volume increases have already been noticed. However, there is also a difference in returns when comparing the hot issue markets to the cold issue markets. The hot issue

markets are proven to be preferable times for higher returns. This is presented in multiple studies starting with the studies by Ibbotson and Jaffe (1975), and Ritter (1984). During the hot issue markets period, the initial returns are abnormally high. The volume of new offerings rises, and it is also less costly for firms to go public in this period (Alti, 2005).

Other studies get similar results including the study by Pastor and Veronesi (2005) who study the waves in IPOs. According to Pastor and Veronesi, the difference in expected returns is the exact reason that the cyclicity occurs. Firms want to conduct the IPOs in conditions where there are high market returns (Pastor & Veronesi, 2005). Also, Lowry et al. (2010) find in their study that the initial returns vary significantly and that the returns are noticeably larger in the hot issue markets. Furthermore, they remark that the re-turns have specifically high volatility in the IPOs which are conducted by a firm that is difficult to value. These firms often create their industry. Young technology firms are a common example of this. The information asymmetry is high for these kinds of firms which makes the valuation more difficult. Asymmetry in information and pricing errors increases the higher initial returns. (Lowry et al. 2010).

### **3.5.2 Long-term performance**

The findings of the long-run performance of IPOs are partly opposite to the initial returns. In the long term, IPOs show signs of underperformance, which were discussed earlier. Finding out what is the impact of market cycles on long-term performance is a more difficult task. When the firm's shares are traded for a longer period, multiple other factors come along.

However, there is a view that high underpricing and high initial returns are followed by bad performance in the long run. The finding was first brought to light by Ritter (1991). According to Ritter, the long-term returns are lower for offerings that are carried out in times when there is high optimism among investors. Moreover, Ritter states that young companies that conduct their IPO during hot issues markets when there is a high vol-

ume of listings perform even worse. During the heavy volume of listing the investors are over-optimistic about growth opportunities. Holding the IPO investments for longer periods results in losing money. (Ritter, 1991).

Similar findings are made in studies by Lowry (2003) and Schultz (2003). The IPOs issued during the high volume of issues have generally poor long-term performance. According to these studies, poor long-term performance is tied to the IPO volume. Considering the long-term performance, the hot issues market is not an optimal time for firms to issue IPOs. As discussed earlier the volume of IPO is on the rise when investor optimism is high. In terms of different cycles, these periods include economic expansion, bullish stock markets, and hot issue markets.

Opposite to the view of the poor long-term performance of IPOs issued during the hot market is the study by Yung et al. (2008). According to their study, the hot market seems to be the most profitable time to issue an IPO in the long run. The finding from their test is that the long-run abnormal returns are significantly higher for firms that have issued their IPOs during the hot markets.

Contrary to the mentioned studies and their findings there is also another different view. Studies from Gompers and Lerner (2003) for example show that the long-term underperformance of IPOs is insignificant. Their finding is that the abnormal returns disappear, and over time the returns are as much as the returns got from the market in the same period.

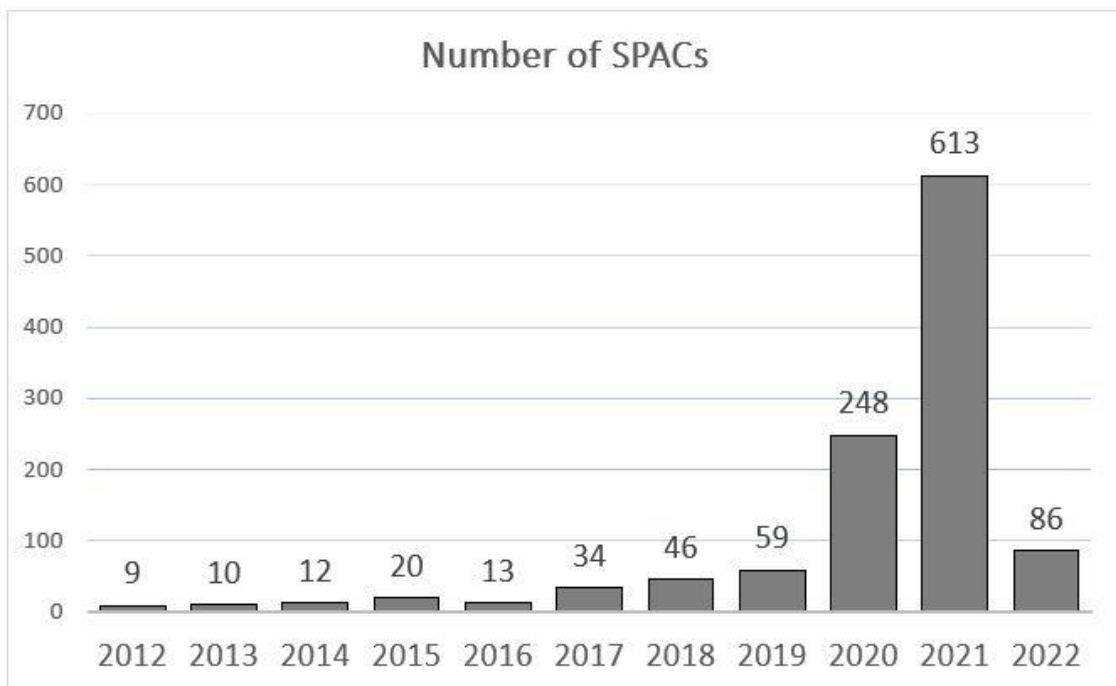
In the study, Gompers and Lerner find that the timing of the issue does not have significance. Whether the IPO is issued during the cold market or the hot market, the offering has a similar performance in the long run. (Gompers & Lerner, 2003). Furthermore, a study by Helwege and Liang (2004) makes similar findings. Their findings also are that the timing of the issues does not determine long-term performance. The hot IPOs do

not perform worse than the cold IPOs in the long run. The long-run returns are similar either way (Helwege & Liang, 2004).

## 4 Special purpose acquisition company

Special Acquisition Companies or SPACs in short are a type of investment vehicle that has gained significant popularity in recent years. A SPAC is essentially a shell company that is created with the only purpose of raising capital through an IPO to use the funds to acquire one or more existing companies. The rise of SPACs reflects a growing demand for alternative ways to go public that offer greater flexibility, speed, and certainty for companies and investors. (Kolb & Tykvova, 2016).

SPACs have become an increasingly popular alternative to the IPO in recent years, with a record number of SPAC IPOs taking place in 2021. In the following figure the number of SPACs in the U.S. between 2012 and 2022.



**Figure 4.** The number of SPAC IPOs in the U.S. from 2012-2022 (Statista, 2023.)

#### 4.1 Reasons behind SPACs

There are several advantages to using a SPAC as an alternative for IPO. For investors, SPACs offer the opportunity to invest in a company before it goes public, potentially providing early access to growth opportunities. For the target company, going public through a SPAC can be a quicker and easier process than a traditional IPO, as it avoids some of the regulatory hurdles and time-consuming filing requirements associated with a typical IPO. SPAC IPO process often takes 3-6 months and traditional IPOs take 12-18 months (Kolb & Tykvova, 2016).

Kolb and Tykvova (2016) list multiple reasons for companies using SPAC instead of IPO to get listed. The first of these reasons is that the SPAC is a better option for smaller companies to access new capital. It is easier for some companies to get listed through acquisition rather than conducting a traditional IPO on their own. According to Kolb and Tykvova, SPACs are especially popular for private companies when there is weak IPO activity in the markets and the markets are volatile.

Dimitrova (2017) makes the same remark in her study and according to her, SPACs are more popular during times when there is uncertainty in the markets. Furthermore, according to her, the SPACs offer an opportunity for a public form of private equity. This statement is compressed into a sentence when Dimitrova describes SPACs as a “poor man’s private equity funds”. ‘The SPACs offer a flexible way of fund-raising. In addition, SPACs have more transparency between investors and the managers of the acquisition compared to private equity funds (Dimitrova, 2017). However, Lewellen (2008) states in his study that there are differences between SPACs and private equity funds. These differences include first that the SPACs normally acquire one company whereas private equity firms acquire multiple firms in their fund. Also, SPAC investors get to vote for the proposed acquisition, and the private equity fund investors don’t get the opportunity. (Lewellen, 2008).

In the study by Gahng et al. (2021), they mention the main benefits of SPACs being the following. The first benefit is that private companies gain an additional option for raising capital and an option for getting listed on the stock market. On the investor side, the benefit is that retail investors gain an opportunity to invest in growth companies. This is because normally the opportunity for investing in younger growth companies would be possible only via venture capital, which is not normally available to retail investors. (Gahng et al. 2021).

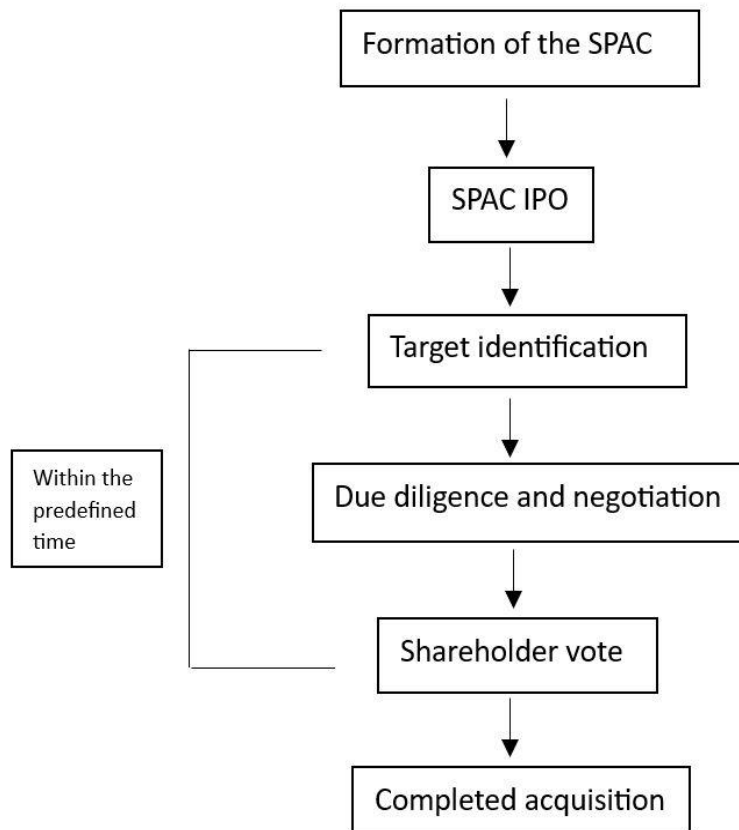
## **4.2 SPAC process**

In short, the process of creating a SPAC is typically as follows: a sponsor or group of sponsors creates the SPAC and the SPAC raises funds with an IPO. These funds raised are held in a trust account until the SPAC identifies an appropriate acquisition target company. When the target company is identified and a deal is achieved, the SPAC uses the funds raised in the IPO to acquire the target company, effectively taking it public through a reverse merger. (Kolb & Tykvova, 2016)

The first step is the formation of the SPAC. A SPAC is created by a group of investors, to raise funds with an IPO to acquire an existing private company. The second step is registration and IPO. The SPAC registers with the SEC and files a registration statement. This process involves providing details about the SPACs structure, management team, investment objectives, and potential target industries. The SPAC then issues shares to the public, usually at \$10 per share, and begins trading on a stock exchange.

The next phase is related to target identification. The SPAC has a limited period, typically two years, to identify a suitable target for acquisition. The target company must meet certain criteria, such as having a minimum valuation and revenue threshold. Once a target company is identified, the SPAC conducts a thorough due diligence process to assess the viability of the potential merger or acquisition. Negotiations between the SPAC and the target company also take place to determine the terms of the deal. Then follows the shareholder vote. If a deal is agreed upon, the SPAC submits a statement to

its shareholders for a proxy vote on the proposed acquisition. The shareholders can either approve or reject the deal. If the deal is approved, the SPAC completes the acquisition, and the target company becomes a publicly traded company through the SPAC's existing public listing. In the following figure, the typical SPAC process is presented step by step.



**Figure 5.** The SPAC process (Kolb & Tykvova, 2016)

### 4.3 Disadvantages of SPACs

There are also potential risks and downsides to SPACs. As often there are certain risks related to different investment instruments. For investors, there are no guarantees that the SPAC will be successful in finding a suitable acquisition target, and the funds invested may be tied up for an extended period. Therefore, the funds can't be generating

returns in some other way during this period. Additionally, there is often a lack of transparency and regulatory oversight with SPACs, which can increase the risk of fraud. Kolb and Tykova (2016) state in their study that the SPACs has also disadvantages for private companies as the owners of the SPAC have to accept the acquisition and the shareholders might fear for their money. Thus, it might according to the authors cause uncertainty about the SPAC acquisition. This differs from conventional IPOs, where the firms must convince the investors in the stock market in a different way.

Even though the SPAC IPO might be a quicker and easier process for private firms to go public than the traditional IPO, it is much more expensive according to a study by Gahng et al. (2021). According to the authors, the additional expenses are a by-product of the quickness of SPAC compared to the traditional IPO.

The major criticism related to SPACs is the lack of regulation which could generate multiple problems and issues. SPACs are not subject to the same level of regulation as traditional IPOs. For example, SPACs are not required to meet the same disclosure requirements to the same governance standards as traditional IPOs. The lack of regulation has led to concerns about the risks for investors and the market. Newman and Trautman (2021) discuss these risks in their study. According to the authors, the risks include the conflicts of interest for involved parties, compensations, and the funds of retail investors being drawn in a baseless hype. In addition, to the significant amount of capital that has been put into SPACs.

## 5 Data and methodology

In this chapter, the focus on the data and the use of data is described. In addition to the data description, this chapter presents the methodology used for the study.

The data is gathered with the help of Jaakko Tyynelä, who acts as a researcher at the University of Vaasa. The data of this study consists of the IPOs and SPACs conducted in the U.S. stock market as there are limited SPACs and their data from other markets. The data is from IPO and SPAC offerings for five years from the year 2018 to the year 2022. This is because the SPACs became more popular recently and there were hardly any SPACs before the year 2018. More specifically, the data consists of listings on the NASDAQ stock market. The reason for picking only the NASDAQ for data instead of the NYSE for example is that the NASDAQ is the most active stock exchange in the U.S. In addition, the purpose was to limit the data and examine the new listing on one stock exchange.

### 5.1 SPAC data

The first step in collecting the SPAC data was to compile a list of SPAC offerings. This was achieved by using the list of SPACs on Stock Market MBA on their website. Stock Market MBA offers research and data from the U.S. stock market. On their website, they have a list of all the SPACs that are traded in the U.S. stock market. The list was compared to the IPO data that was collected on Refintiv. The whole IPO data was filtered with the listings on the NASDAQ stock exchange that had “Blank Check (SPAC) Involvement” between 2018-2022. This is because SPACs are often described as being shell companies or a “blank check companies” before the merger with an existing company. Both lists were compared, and the definitive list of SPACs during this period was achieved.

The initial sample contained a total of 503 SPACs. This final data sample decreased considerably after the stock market data was collected. This is because of multiple reasons.

Firstly, the main reason that many listings have been left out is because of missing stock market data. Secondly, many SPACs were delisted during the sample period or were merged, or turned out that they weren't SPACs in the first place. The final sample consists of 318 SPACs from the original 503 identified SPACs. In the following table, the final data sample is presented.

**Table 4.** SPAC data sample

Number of SPACs between 2018-2022	Completed	Final sample
Observations	503	318

One of the potential limitations of the final data sample is that after the screening, the final data does not include the SPACs that have been delisted or for other reasons are not active in the stock market. This generates a survivor's bias and will likely affect the results as the data only consists of the SPACs that have been successful. Nonetheless, the decision was made to only examine the SPACs that are still active in the stock market.

The other possible limitation is that SPACs are clustered mainly in the years 2020-2022. There aren't SPACs before this period and five years is quite a short period to examine the performance of the listings. However, this shouldn't be a major problem as the initial returns of SPACs are being examined in this study. Furthermore, the IPOs that are compared to the SPACs are clustered roughly in the same period.

## 5.2 IPO data

The collecting of IPO was more straightforward as the data from new listings on the market is easier to figure out. The IPO data that was collected on Refintiv. However, the initial raw IPO data needed a lot of screening. The thorough and manual screening process included removing all the SPAC IPOs so that there was no overlapping in the data compared to the SPAC data. In addition, the delisted, merged, and otherwise incorrect

stocks from the sample data. The final sample was reduced even more from the original IPO list which consisted of 507 IPOs. The final sample data consists of 461 IPOs. In the following tables, the final data sample is presented.

**Table 5.** IPO data sample

Number of IPOs between 2018-2022	Completed	Final sample
Observations	507	461

In the following table, the distributions of IPOs in the data sample are presented. From the table is possible to see that the IPOs in the data are clustered in two years.

**Table 6.** The distribution of IPOs per year in the data sample

Year	Number of IPOs in a year
2018	74
2019	71
2020	110
2021	203
2022	46
Total	504

The same limitations of the data, that appear in the SPAC data, also apply to IPO data. This is because the delisted and merged stocks for example are excluded from the final sample. This also causes survivor bias and impacts the returns positively, as unsuccessful IPOs are left unexamined. The other limitation concerning the SPACs is limitations also present in the years between 2018 and 2022. Most of the IPOs in the data are clustered in the five years between 2020 and 2021. However, it still offers a decent sample period with listings happening at different times.

### **5.3 Benchmark data**

To conduct analysis and compare the performance of IPOs and SPACs it is necessary to pick and choose a benchmark index. Therefore, the benchmark market data used in this study is from the Russell 2000 index. The reason for this index to be selected as the benchmark is that the Russell 2000 index is a popular index that reflects the movements in the market with a wide variety of companies.

The Russell 2000 index is an index that includes the stocks of 2 000 different companies. These companies are considered to be small-cap companies. This is another reason for the decision to pick the Russell 2000 as a benchmark. Because SPACs and IPOs include different sizes of companies. A lot of small-cap companies are included in comparison to the S&P 500 index. The commonly used S&P 500 index includes the 500 large-cap companies in the stock market. The Russell 2000 index's historical data from 2018-2022 is collected from Yahoo Finance.

### **5.4 Methodology**

In this subchapter, the focus is on the methodology that is being used to examine the research question. The chosen methodology is presented and the reasons for using the specific methods are discussed.

#### **5.4.1 Event study**

In this study, an event study is used to examine the impact of the SPACs and IPOs and to calculate returns. Event studies are a widely used method in finance and economics research to analyze the impact of a specific event on the stock prices of a company or an industry. The idea behind event studies is to measure the abnormal returns of the stock price of a company or an industry following the announcement of an event, such as a merger or acquisition, or a macroeconomic shock. (MacKinlay, 1997).

The event study methodology is not, however, without its flaws. MacKinlay (1997) presents the issues related to event studies in his study. The first possible problem is choosing the sampling interval. Daily and monthly are the most used intervals in stock return data. MacKinlay states that the shortest possible interval is the most accurate and that using an interval shorter than the day can have major gains and change the results significantly. However, using shorter intervals than daily brings complications and makes data collecting harder. Another issue related to event studies is the uncertainty of the event date. It might be difficult to determine the exact date of the event as the day might be the previous date for example and this affects the results. Another bias is that regarding the closing price as a daily price can cause a bias. This is because the closing price is the last transaction's price, and the last transactions do not happen at the same time every day.

Fama (1970) describes empirical tests in three different categories. These different categories according to Fama are “weak form”, “semi-strong form”, and “strong form” tests. Event studies are generally thought to be semi-strong forms of efficiency tests. However, Fama discusses a problem related to testing market efficiency. This flaw is the joint hypothesis problem. This means that when market efficiency is tested using a model the model is also tested. The model might have its issues and it might not offer accurate results.

Despite the previously mentioned issues event studies are widely used and according to MacKinlay a tool that offers value to economics and finance. The use of an event study methodology in this study provides several benefits for analyzing the initial performance of SPACs compared to traditional IPOs. Event study methodology provides a standardized framework for analyzing the performance of SPACs and traditional IPOs during their initial period of trading. This allows for a consistent and comparable analysis of the two alternatives.

The event study methodology typically involves several steps, including defining the event, selecting a sample of stocks or industries to study, estimating the expected returns based on a benchmark, and calculating the abnormal returns using statistical techniques. (MacKinlay, 1997).

The first step is to select the event. In this study, the event will be listed in the market and so is the first trading day in the stock market. Usually, the event window is set to be some days before the event itself. However, in this case where the event is the listing, naturally, there is not any prior stock data before the listing. For this reason, the event window  $[0,2]$  is set to be the first three days of trading after the listing to the market to capture initial returns from the SPACs and IPOs.

#### **5.4.2 Market-adjusted model**

The market model is a widely used model which can be used to calculate the returns for any given security. However, according to the study by MacKinlay (1997), it is better to use the market-adjusted model instead of the market model, when the data is limited, and it is not possible to get pre-event data. The market-adjusted model is a restricted version of the market model. This is because the coefficients of the model are prespecified and it isn't required to obtain parameter estimates.

MacKinlay adds that the recommendation is to use the market-adjusted model only when it is necessary because it has restrictions, and the it can cause biases in the results. Nevertheless, the decision was made to use the market-adjusted model as it is not possible to obtain the pre-event market data and the market-adjusted model fits best when examining the initial returns of a new offering. For example, Ritter (1991) used the market-adjusted model in his study, where he calculated the underpricing of IPOs.

Another study by Campbell et al. (1998) also states that a marked-adjusted model is a good option when there is limited data available. In this study, the authors make the

same stamen as was made in the study by MacKinlay (1997). The remark is that the restricted model should be used after careful consideration and in the cases in which the use is necessary. This is because the market-adjusted model might create biases in the results. Still, the authors also state that the marked-adjusted model is often used when examining the underpricing of IPOs. Which makes the use of the market-adjusted model logical.

The market-adjusted model is a restricted model from the market model. Therefore, it is necessary to present the market model first. The market model assumes that the returns follow a single factor. The returns are calculated as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

Where  $R_{it}$  is the return of stock  $i$  in the period  $t$ .  $R_{mt}$  is the market return (benchmark) in period  $t$ .  $\varepsilon_{it}$  is the zero mean disturbance term and the  $\alpha_i$  and  $\beta_i$  are the parameters of the market model. From this formula, the abnormal returns (ARs) are calculated as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (3)$$

As discussed previously in this study the use of the market model is not possible as there is not any pre-event data available. Therefore, as recommended by MacKinlay (1997) the restricted version of the market model is used in the form of the market-adjusted model. Where the parameter estimates are left out. The  $\alpha_i$  is considered to be zero and  $\beta_i$  is considered to be one. In the market-adjusted model the abnormal returns are calculated as follows:

$$AR_{it} = R_{it} - R_{mt} \quad (4)$$

After calculating the abnormal returns for each stock at a specific time, the next step is to calculate the cumulative abnormal returns (CARs) for each stock by adding the returns from each day with the following formula:

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \quad (5)$$

From calculating the CARs for each stock, the natural following step is to determine the cumulative average abnormal returns (CAARs) for every stock in the event period. CAAR represents the average returns of the data. Where  $n$  represent the number of observations during the event period that are taken to account. CAARs are calculated as follows:

$$CAAR = \frac{1}{n} \sum_{i=1}^n CAR(t_1, t_2) \quad (6)$$

The final step is to test the statistical significance of the results. Often it is important to test the significance of the results using both parametric and nonparametric tests. This will be achieved by conducting a parametric test in the form of a t-test. In addition to the parametric test, the hypothesis is tested using a nonparametric test.

The nonparametric test will be done with a sign test. Testing the null hypothesis with the t-test will be conducted on the CARs of both the IPOs and SPACs. The CAARs of both IPOs and SPACs will be tested using the nonparametric sign test. T-test is one of the most used ways to test the statistical significance level of the obtained results. The benefits of the sign test are discussed in their study by Campbell et al. (1998). The authors mention that a nonparametric approach is free of specific assumptions concern-

ing the returns and their distribution. The sign test is used as an alternative and the t-test is for examining the results.

## 6 Results

In this chapter, the results from the calculations themselves are presented. In addition, to the results, the chapter will contain a discussion about the key findings and point out the possible limitations of the analysis. The analysis aims to calculate and examine the first three-day performance after the listing of the SPACs and IPOs in the NASDAQ during the 2018-2022 period. Furthermore, the aim is to compare the abnormal returns of both SPACs and IPOs.

The abnormal returns are calculated using the market-adjusted model methodology that was described in the previous chapter. The cumulative abnormal returns are calculated for both SPACs and IPOs for the event window. The event window is three days starting from the first day of being traded in the stock market. The CARs are presented for both sub-data samples. As well as the descriptive values, values of the parametric t-test, and the results of the nonparametric sign test.

### 6.1 SPAC returns

The SPAC abnormal returns are calculated from the data sample of 318 SPACs that occurred during the five years between 2018 and 2022. The SPAC CARs are calculated during the  $[0,2]$  event window. The CARs are calculated using the market-adjusted market model.

Table 7 shows the descriptive statistics of the SPAC CARs. Table 7 presents the mean, median, maximum, minimum, standard deviation, skewness, and kurtosis for SPAC CARs. In addition, the table shows the value of the Jarque-Bera test, the p-value of the t-test, and the p-value of the sign test.

**Table 7.** Descriptive statistics for SPAC CARs

SPAC CARs	[0,2]
Mean	0.19 %
Median	0.27 %
Maximum	7.98 %
Minimum	-8.88 %
Std. Dev.	2.70 %
Skewness	-0.057643
Kurtosis	2.969299
Jarque-Bera	0,162500
T-stat	1,175991
Sign test	0,3337
Observations	318

As is presented in the table, the SPACs yield positive CARs, and the mean is 0,19%. Another thing that can be seen from the table is that the maximum and minimum are much closer together compared to the minimum and maximum of IPOs CARs presented in Table 8. However, the results are not statistically significant at the significant level of 1% or 5% as the p-value of the t-test is 1,175991. In addition, it can be stated from the table that the results are not statistically significant with conducting the nonparametric sign test. The p-value of the sign test is 0,3337. Therefore, the statement can be made that the results are not significant with the used significance test.

The first hypothesis of this study is that the SPACs generate positive abnormal returns during the first three days of being traded in the stock market. The calculations suggest that the SPACs indeed generate positive abnormal returns in the first three days in the stock market. However, as the results of the calculations are not significant the null hypothesis is accepted, and the first hypothesis is rejected. Based on these calculations the finding can be made that the SPACs don't generate positive abnormal returns in the first three days of being traded in the stock market.

## 6.2 IPO returns

The IPO abnormal returns are calculated from the data sample of 461 IPOs that occurred during the five-year event period. The IPO CARs are calculated during the [0,2] event window. Table 8 shows the descriptive statistics of the IPO returns. The table presents the mean, median, maximum, minimum, standard deviation, skewness, and kurtosis for SPAC CARs. In addition, the table shows the value of the Jarque-Bera test, the p-value of the t-test, and the p-value of the sign test.

**Table 8.** Descriptive statistics for IPO CARs

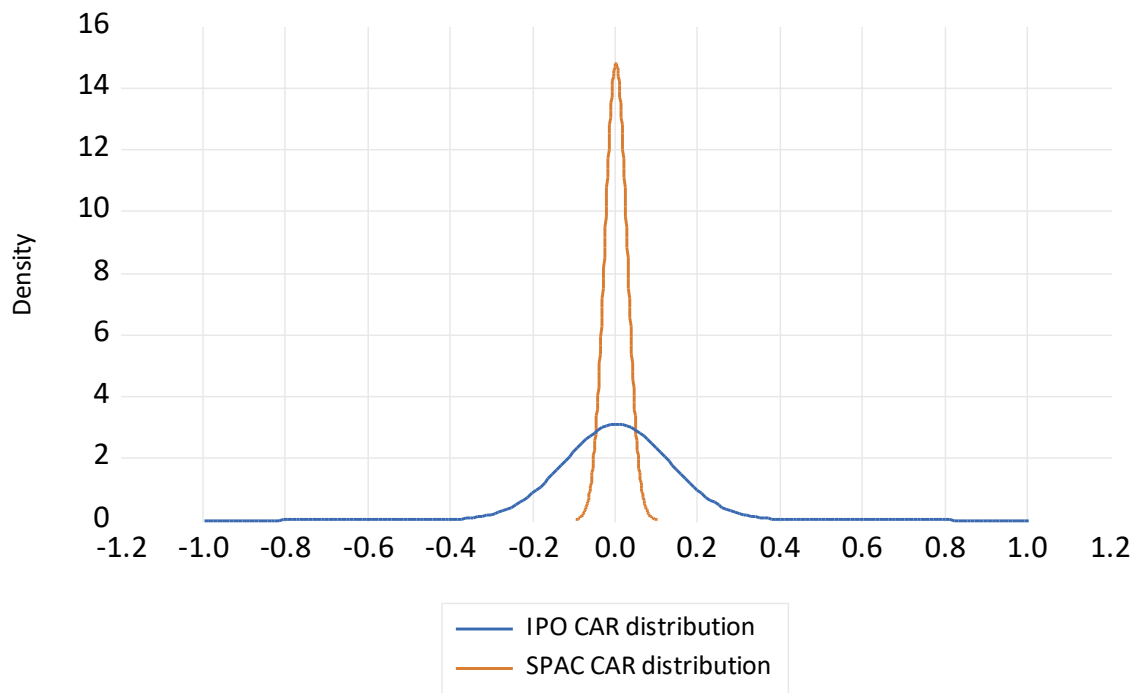
IPO CARs	[0,2]
Mean	0.39 %
Median	0.01 %
Maximum	91.70 %
Minimum	-45.12 %
Std. Dev.	12.82 %
Skewness	1.854343
Kurtosis	15.78453
Jarque-Bera	3403,689
T-stat	0,665630
Sign test	0,9629
Observations	461

The IPOs produce abnormal returns of 0.39% during the first three days of trading. However, the same can be said about the IPO CARs as that was said about SPAC CARs, the results are not statistically significant at the significant level of 1% or 5% as the p-value of the t-test is 0,665630. Also, as was discovered with the SPAC CARS, it can be stated from the table that the results are not statistically significant with conducting the nonparametric sign test. The p-value of the sign test is 0,9629. Therefore, the statement can be made that the results of the calculations are not significant using the t-test and sign test.

The second hypothesis of the study is that the SPACs generate higher returns than traditional IPOs in the first 3 days of trading. By only looking at the CARs for both SPACs and IPOs the finding can be made that the SPACs generate lower CARs than the traditional IPOs during the event window. This would be in line with previous findings in a study by Kolb and Tykvova (2016) for example, who make the finding that the IPOs show higher CARs than the SPACs. However, as was the case with the SPACs returns, the IPO CARs results are not statistically significant. Thus, the second hypothesis is also rejected. With these calculations, it is not possible to make a statement that SPACs generate higher returns than traditional IPOs during the three days of being in the stock market with certainty.

However, by looking at values for both samples, the finding can be made that the data samples are drastically different. This observation can be made for example by looking at the skewness and kurtosis of both SPAC and IPO CARs in Table 7 and Table 8. The SPAC CARs have a noticeable low skewness and IPO CARs have a high skewness. In addition, SPAC CARs are close to being normally distributed with a kurtosis of 2,969299. Furthermore, the value of the Jarque-Bera test for SPAC CARs is 0,162500 which indicates that the SPAC CARs are very close to being normally distributed. In comparison, the IPO CARs have a kurtosis of 15,78453 and a value of the Jarque-Bera test of 3403,689. These values for IPO CARs indicate that the IPO CARs differ massively from a normal distribution. Therefore, the IPO CARs sample contains extreme values, and the returns differ significantly.

With these results, the finding can be made that the SPAC CARs distribution is close to being normal, as the IPO CARs differ from it. Thus, the return data differs massively between the two samples. In the following figure, the difference in distributions is presented.

**Figure 6.** Distribution of SPAC and IPO CARs

## 7 Conclusions

The IPO market has been very active in the past five years and the years 2020 and 2021 saw a high number of new IPOs. Furthermore, during these five years, SPACs have gained popularity among investors as an investment opportunity and as a way to go public for private companies. SPACs have become a popular alternative to the traditional IPO. As was the case with traditional IPOs, the years 2020 and 2021 saw significant growth in the number of SPAC IPOs. The record number of SPACs was in 2021.

Even though SPACs are a relatively new phenomenon, the performance of SPACs has been previously studied. However, the focus of these previous studies has been on the acquisition of a target company and how it impacts the returns, rather than the returns of the initial listing itself. Generally, the performance of SPACs has been examined after the acquisition and the initial performance of the SPACs haven left unexamined.

The purpose of this study was to find out the reason for the popularity of SPACs in recent times. This was carried out by examining the initial returns of the SPACs. In addition, the other main purpose was to compare the initial returns of SPACs to the initial returns of traditional IPOs. The motivation for this was to compare the two alternatives as an investment vehicle and as a way for a private company to get listed on the stock market. The intended contribution of this study is to add to the existing research and review the initial performance of SPACs. In achieving this the purpose is to present investors and private companies with an alternative to a traditional IPO and how the performance compares.

The performance of SPACs and IPOs was examined using the event study methodology. The marked-adjusted market model was implemented to calculate the abnormal returns on the event window which was the first three days of being traded in the stock market. The statistical significance of the results was then tested using a t-test and sign test. The data used to examine the performance of SPACs and IPOs listed in the

NASDAQ stock exchange was from 2018-2022. The data sample consisted of 318 SPACs and 461 IPOs.

The first hypothesis of this study is that the SPACs generate positive abnormal returns in the first 3 days of trading. The findings from the event study suggest that it is not possible to define that the SPACs generate positive returns as the evidence is not strong enough. The first hypothesis is rejected. The second hypothesis of the study is related to comparing the returns of SPACs and IPOs. The hypothesis is that SPACs generate higher returns than traditional IPOs in the first 3 days of trading. The finding from the analysis purpose that the evidence is not strong enough to determine the abnormal returns of SPACs or IPOs. Therefore, is not possible to compare the returns as the results are statistically insignificant for both SPAC CARs and IPO CARs. Considering these findings, the second hypothesis is also rejected.

Even though this study could not find a difference in returns in a statistically significant way, another meaningful finding is made. It seems that the distribution of SPAC and IPO returns are noticeably different in the first three trading days. However, it cannot be conclusively stated why this is the case and which factors affected it.

For further research, it would be interesting and beneficial to use different methodologies to examine the returns of SPACs and IPOs. This way it could be possible to find out if there are abnormal returns in SPACs and how the returns compare to the returns of traditional IPOs. Also, a different event window could offer significantly different results. Furthermore, it would be interesting to use different data samples. The data sample could be modified by only focusing on a specific industry for example.

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