BI Norwegian Business School - campus Oslo

GRA 19502

Master Thesis

Component of continuous assessment: Thesis Master of Science

What are the major drivers behind listing volume fluctuations in Norway and Sweden?

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Start:	02.03.2017 09.00
Finish:	01.09.2017 12.00

Acknowledgement

We would like to express our gratitude towards all the people who has given us guidance and inspiration throughout the process of writing this thesis. A special thanks to our supervisor Janis Berzins, for giving us the guidance needed to accomplish the thesis. We want to express our gratitude towards Oslo Stock Exchange, Nasdaq Stockholm and NGM, for providing useful listing statistics on their websites, as well as additional information through e-mail correspondence. We also want to award Jay R. Ritter and Michelle Lowry for providing additional information through personal communication. Lastly, we want to thank Finans Norge for providing us with raw data on "Forventningsbarometeret" 2017.

Abstract

This thesis investigates potential drivers behind fluctuations in listing volume in Norway and Sweden between 2000 and 2016. The paper replicates findings in previous literature by investigating whether aggregate capital demands, information asymmetry and investor sentiment can explain fluctuations in listing volume. Based on a review of the Norwegian - and Swedish equity markets, the introduction of a secondary stock exchange is included as a potential explanation. Empirical tests include aggregate time-series regressions, using proxies for the above-mentioned factors. All hypotheses are tested both collectively and individually. Regressions are run separately for each country. This enables us to compare results from each country, thereby strengthening the reliability of the results. Results indicate that the level of investor optimism is an important determinant of listing volume in Norway and Sweden, in both statistical – and economic terms. The combined results from both markets, does not offer adequate support for the remaining hypotheses.

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1.0 Introduction

Initial public offerings (IPOs) have received a substantial amount of attention in academic literature. While the IPO pricing mechanisms and returns have a considerable body of literature, the decision to go public and the timing of the listing have not received much attention until the past two decades. In addition to risk-sharing and access to capital, being publicly traded offers benefits such as increased liquidity, visibility and transparency. Growth in publicly listed companies is a key driver of economic development through increased competition and job creation (Norges Bank Investment Management, 2016). The drivers behind listing volume fluctuations are therefore highly relevant for both policymakers and investors.

The vast majority of literature on IPO volume fluctuations have focused on the United States. As pointed out by e.g. Ritter (2003), there are some significant differences between the U.S. and European listing environment. This fact alone begs to question whether theories based on evidence from the U.S can be generalized and employed in other markets. This thesis aims to test multiple well-established theories in two small European markets, namely Norway and Sweden.

The model presented in Lowry (2003) forms the basis of this study. Lowry tests to which extent the capital demands of private firms, adverse selection costs of issuing equity, and the level of investor sentiment can explain fluctuations in IPO issue volume. Her results argue in favor of both the capital demands and investor sentiment hypothesis, while the adverse selection costs explanation receives mixed evidence. We extend the analysis to test whether the introduction of secondary regulated exchanges caused any permanent increase in listing volume.

The established hypotheses cannot be tested directly, thus the model is estimated using a series of proxies thought to have a high correlation with investor sentiment, adverse selection costs and capital demands. Consistent with Lowry, this study employs ordinary least squares in the model estimation. Listing volume is highly persistent over time and shows signs of heteroskedasticity. To ensure the efficiency of the standard errors, first-order autoregressive terms are employed when the Durbin-Watson test statistics suggests autocorrelation in the residuals. Additionally, we use Newey-West standard errors to control for autocorrelation of higher order and heteroskedasticity. The nature of the study requires the use of leads and lags of each individual proxy. To preserve as many degrees of freedom as possible and to mitigate multicollinearity problems, lags and leads are merged into single variables determined using economic reasoning.

Our results show that variations in investor sentiment is an important driver of listing volume fluctuations in both Norway and Sweden. The remaining hypotheses show weak or mixed results, making us unable to confidently conclude that capital demands or adverse selection plays any significant role in influencing listing volume. Unlike previous literature, this study includes listings conducted both with and without an equity offering. The mere presence of listing firms that chose not to issue equity questions the importance of the capital demands hypothesis. Additionally, some firms may choose to use the equity obtained from the listing to adjust their capital structure, rather than to fund new investments. Unfortunately, the latter can only be determined in a study investigating company-specific attributes of each listing firm.

Quite surprisingly, the competing exchange dummies show negative signs, opposite of what the hypothesis predicted, while having statistically significant results with high coefficients in both regressions. The surprising results are likely due to the of the timing of the secondary exchange introduction, rather than the presence of the new exchange.

The mixed results in this study, even when limiting the comparison to Norway and Sweden, highlights the need for more global research on IPO volume. A natural next step is to investigate listing volume on an industry wide level or even company specific level where data is obtainable. This study finds weak support for the capital demands hypothesis, indicating that capital constraints may not be as important as originally anticipated. Investor sentiment fluctuations gain support in both the Norwegian and Swedish regressions, showing that firms are more likely to go public when they believe that they are overvalued.

2.0 Literature review

In the following section, we will investigate the reasons why firms decide to go public, as well as what determines the timing of the listing. The literature on listings is quite limited. The review will therefore focus on IPO literature and literature on seasoned offerings attempting to explain fluctuations in issue volume.

2.1 IPO cyclicality

As first documented by Ibbotson and Jaffe (1975), IPO volume shows substantial fluctuations over time. The IPO market moves in a cyclical manner, shifting between hot and cold issue markets. High IPO first-day returns, followed by IPO volume peaks a few months later, are typically defined as "hot markets" in IPO literature. Lowry, Michaely and Volkova (2017) investigate a 44-year IPO time-series, and find that the cyclical patterns of IPO volume prevail throughout the entire sample series. However, the cycles observed after the dot-com bubble around year 2000 show fewer extreme observations, both in terms of IPO first-day returns and volume peaks. As formulated by Lowry et al., the cyclicality has been muted, with hot markets being "less hot" in the last 17 years.

An additional abnormality in the issuing pattern of the IPO market is the industry clustering of offerings. As documented by e.g. Benveniste, Busaba and Wilhelm (2002), Helwege and Liang (2004) and Jain and Kini (2005), industry clustering occurs in both hot and cold IPO markets. A pioneering firm deciding to go public must provide extensive information about its performance and future prospects, in return receiving feedback from investors. This information is highly visible to competing private firms, which can use this information to adjust their strategy (Benveniste et al. 2002). If the pioneering firm receives negative feedback, the issue is typically withdrawn and the strategy of the firm revised. Pioneering firms are therefore subject to the information disclosure costs without internalizing the benefits, potentially discouraging both the pioneer and the followers from entering the public market altogether. Benveniste et al. argue that the investment banks solve this problem by bundling IPOs within the same industry, thus distributing the information disclosure cost and risk of negative feedback between the pioneer and the followers.

Jain and Kini (2005) analyse the differences between clustered and non-clustered IPOs and find that industry clustering is more likely to occur in high-growth industries with high investor sentiment, industries with many investment opportunities and industries that require high R&D investments. They also note that firms that go public in an industry-clustering period perform more poorly than those who do not. When multiple companies are chasing the same investment opportunities, overinvestments may occur.

2.2 Overcoming financing constraints

Perhaps the most obvious reason for going public, is gaining access to public capital. Literature has attempted to explain if the listing decision is motivated by capital demands and increased investment opportunities, and if the financing decisions are consistent with existing theories of capital structure. Seeking funds from other sources than banks and venture capitalists becomes attractive if a sufficient amount of funding is difficult to obtain due to high leverage, lack of collateral, high monitoring costs or high capital expenditures.

Brau, Ryan, and DeGraw (2006) surveyed CFOs of firms that conducted an IPO between 1996-1998 and 2000-2002. The respondents were asked whether they considered different consequences of the IPO advantageous or disadvantageous. The statements that received the most support were to gain financing for long-term growth (86.8%), to gain financing for immediate growth (82%), and to increase operating liquidity (82.5%). The respondents were not asked why they chose public equity over private equity or debt.

In a study of the U.S. IPO market, Lowry (2003) established several market wide proxies for the capital demands of private firms. She found support in the empirical results, showing both statistical and economic significance for multiple proxies. However, the connection between IPO volume and capital demands does not gain consistent support. Pagano, Panetta and Zingales (1998) used a sample of both private and publicly held companies to test various reasons for the decision to go public. Their variables measuring a firm's financing needs, investments and growth, increased the probability of listing. However, the investment coefficient was not statistically significant and the growth coefficient was significant at the 10% level. Investments actually decreased following the listing, suggesting that companies go public following large investments rather than financing future investment with IPO proceeds. They also found that high leverage increased the probability of a listing, arguing that capital structure adjustments is an important determinant of the listing decision. The mixed evidence for financing constraints as a driver behind the decision to go public indicates that financing constraints is, to the very least, not the sole motivation for the listing decision.

A key benefit of going public is access to a larger and more diverse group of investors than in the private market. However, research shows that private equity funding has become more readily available, thereby bridging the gap between the opportunity cost of public versus private funding. Kwon, Lowry, and Qian (2017) study 103 mutual funds across the 1995 – 2015, and find an interesting development in their investments in privately held companies. The funds held $20 million in VC-backed private firms from 1995 to 1996, $70 – 120 million between 2000 and 2010, and $7 billion in 2015. Their findings support the notion that firms are able to stay private for longer.

2.3 Market timing

The efficiency of capital markets has been challenged since the rise of behavioural finance theory in the 1980's. If firms can be mispriced, managers are incentivised to issue equity when similar firms within the same industry are overvalued. Ritter (1991) discovered that, when compared to companies of similar size and industry, IPOs underperform in the long-run. These findings indicate that IPOs are overvalued at issue and that this overvaluation is eventually corrected. The adjusted returns differ substantially between industries, indicating that investor sentiment can differ between industries at different points in time. Ritter (1991) also finds a negative relation between issue volume and aftermarket performance. This further supports the notion that more companies are likely to go public when comparables are trading at high multiples.

Lowry (2003) found that investor sentiment had both statistical and economic significance in explaining IPO issue volume. Similarly, Pagano et al. (1998) find that firms are more likely to conduct an IPO when the average market-to-book (MB) ratio of firms in their industry is higher. A high MB ratio can reflect both investor optimism and increased investment opportunities within that industry. However, Pagano et al. find that the high MB ratio does not seem to reflect investment opportunities, as firms tend to go public following, rather than prior to, periods of high investment.

2.4 Adverse selection costs

Investors generally know less about the quality of the company going public than the insiders. Asymmetric information allows mispricing in the market, incentivising the initial owners to issue equity or sell their existing shares when the company is overvalued. Knowing this, investors lower their value estimate once a company announces a new equity issue. Firms will therefore have to consider both the direct costs associated with the issue, as well as the adverse selection cost. Korajczyk, Lucas and McDonald's (1992) model how time-varying information asymmetry affects pricing and timing of seasoned equity issues. They find that the presence of time-varying information asymmetry leads to clustering of equity issues. As highlighted by Chemmanur and Fulghieri (1999), high information asymmetry can be a serious obstacle for young private firms with little prior earnings history. Similarly, Myers and Majluf (1984), and Korajczyk et al. show that adverse selection costs can prevent companies from obtaining funding for positive NPV projects. These studies mostly rely on theoretical frameworks. Lowry (2003) does not find empirical support for the notion that firms are more likely to go public when adverse selection costs are lower.

2.5 Fees, compliance costs and loss of confidentiality

Models in IPO literature often investigates how both benefits and costs of going public influence the listing decision. Some of the relevant costs of being public include loss of confidentiality and strict reporting standards, direct fees paid to the stock exchange and advisors, in addition to the risk of hostile takeovers. Maug (2001) presents an equilibrium model, suggesting that firms go public when the insiders' information advantage over competitors and outside investors disappears. Once the benefits of going public outweigh the costs of going public, the firm conducts an IPO.

The U.S. equity market has experienced a prolonged drought in IPO volume following the dot-com bubble at the beginning of the millennium. This decreasing trend suggests a change in the incentives to go public, either due to a decrease in the benefits or an increase in the costs of going public. Multiple researchers and industry professionals have blamed increased compliance costs. The primary focus of research has been the Sarbanes-Oxley Act of 2002 (SOX), arguing that its stricter compliance requirements has increased the cost of being public, especially for small companies. Iliev (2010) found that on net, SOX compliance reduced the market value of small firms. However, neither Gao, Ritter, and Zhu (2013) nor Doidge, Karolyi and Stulz (2013) find that SOX or the 2003 Global Settlement act had any notable effect on IPO volume.

Some support for the compliance costs explanation was found following the Jump Start Our Business Startups Act (JOBS) in 2012. The act passed with an aim to revitalize U.S IPO market. Dambra, Field and Gustafson (2015) found that, after controlling for market conditions, the JOBS act led to an increase of 25% annual IPOs compared to pre-JOBS levels. The effect was most prominent for companies with high proprietary disclosure costs like biotech and pharmaceutical companies.

2.6 Analyst coverage

Decreasing analyst coverage, especially for smaller firms, has been blamed for the decreasing IPO volume. The analyst coverage explanation assumes that company valuations (P/E and M/B ratios) are higher for companies receiving analyst coverage, than for those that do not. Previous event studies have shown positive (negative) share price reactions to unexpected analyst coverage initiations and upgrades (omissions and downgrades). Demiroglu and Ryngaert (2010) documented a +4.84% abnormal return for analyst coverage initiations for firms that had been trading for at least a year without analyst coverage. However, the abnormal returns were not merely driven by the coverage initiations, but were also contingent on positive coverage.

2.7 Economics of scope and speed to market

Gao et al. (2013) found a significant drop in U.S. IPOs after 2000, even compared to levels before the dot.com bubble. The yearly average of firms going public dropped from 311 in 1980-2000 to 108 in 2001-2016. They note that the decrease is mainly driven by a reduction of small company IPOs. Where others have blamed compliance costs and analyst coverage, Ritter et. al. argued that the reduction has been gradual and due to changes in the economics of scope and the need for speed to market. They argue that changes in the competitive environment have made it more attractive for small firms to be acquired than to operate independently.

The study mostly relies on univariate descriptive evidence, testing the hypothesis using a trend variable. The trend variable was economically significant for all regressions, but only statistically significant for small firms. There is a high risk that the trend variable unintentionally captures other exogenous trends that may have contributed to a reduction in IPO volume over time. Therefore, a more precise proxy is needed to strengthen the empirical evidence.

The aim of this study is to investigate market-wide volume fluctuations, restricting us from testing listing motivations on an industry or company level. Data availability poses some additional restrictions, as analyst coverage for small and medium sized firms are unobtainable for the Swedish and Norwegian market. However, the nature of the study allows us to test how financing constraints, adverse selection and market timing relates to listing volume in each market. To determine whether there has been any relevant change in compliance costs, we conduct a thorough investigation of the Norwegian and Swedish equity markets in the following section.

3.0 Norwegian and Swedish Public Equity Markets

AFME Finance of Europe (2015) argues that European equity markets are not used to its full potential. They report a market capitalization (mkt. cap.) to GDP ratio of 1.59 in the U.S., compared to 0.73 in Europe. These measures imply that European equity markets are still untapped. According to Hans Lööf (2004), most continental European countries represent relation based systems (debt- or bank-dominated system), whereas the U.S. and the UK are examples of arm's-length systems (equity or market dominated system). Norwegian and Swedish companies are generally not subject to any statutory rules regulating the capital structure. They have historically kept a relatively high debt to equity ratio (Fan, Titman & Twite, 2012), indicating a preference for debt over equity funding.

3.1 Liquidity

According to Næs, Skjeltorp and Ødegaard (2008) liquidity measures can provide important information about the current state of the economy, potentially serving as a warning mechanism with regards to the financial stability of an economy.

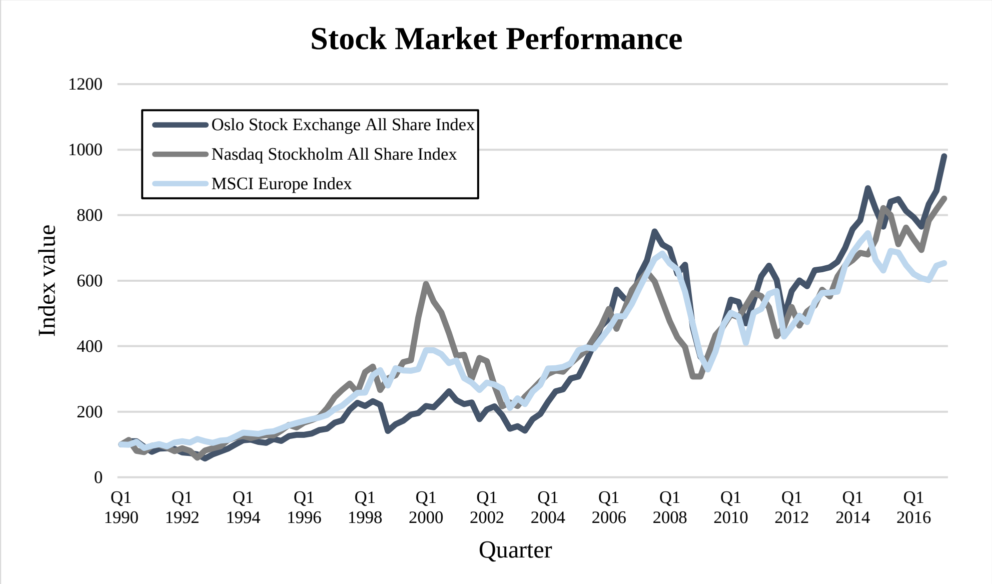
Næs et al. (2008) investigates the historical liquidity development in Norway. They find that the overall liquidity in the Norwegian stock market has improved significantly from 1980 to 2007, especially among the largest firms. However, they also find that the cost of trading has increased during the sample period, even though the evolvement of the trading system would suggest otherwise. Turnover increased from 2% to 136% during the sample period, with the largest increase observed among larger firms. Lastly, they find that the most liquid assets were within the energy and the healthcare sector. According to the monthly statistics supplied by Oslo Stock Exchange, 23.17 million trades were executed in 2016, with a reported turnover of approximately one trillion NOK.

During the last decade, Nasdaq Stockholm has experienced an increase in number of trades, from 13.76 million in 2000 to 69.08 million in 2016. The turnover has been quite stabile during the period, and ranges between 2.7 and 5.5 trillion SEK. In 2016, Nasdaq Nordics reported a turnover of four trillion SEK. Based on the numbers provided by Nasdaq Nordics, Sweden seems to have experienced a decrease in liquidity when measured as a percentage of total market capitalization.

3.2 Stock market performance

FIGURE 1: STOCK MARKET PERFORMANCE IN NORWAY AND SWEDEN

The figure shows the performance of the Oslo Stock Exchange All Share Index and Nasdaq Stockholm All Share Index compared to the performance of the MSCI Europe Index. Since the Nasdaq Stockholm All Share index is not reported prior to 2008, returns prior to this are collected from the OMX Stockholm index.



As shown in Figure 1, Oslo Stock Exchange and Nasdaq Stockholm have closely followed their European peers since 1990. Both the Norwegian and Swedish indices have delivered returns above the European average, amounting to 880 and 750 points throughout the period. Norwegian and Swedish investors achieved average annual returns of 8.8% and 8.3%, compared to 7.2% in Europe as a whole.

3.3 Main Stock Exchanges

In the following section, we will investigate listing requirements and fee structures associated with the main stock exchanges in Norway and Sweden, Oslo Stock Exchange (OSE) and Nasdaq Stockholm (NS) respectively.

3.3.1 Listing requirements

OSE is currently the sole independent stock exchange among the Nordic main stock exchanges. NS has merged the main markets within the Nordics, operating with harmonized listing requirements and continuing obligations, while OSE establishes its own fee structure and listing requirements. This implies that the listing requirements of OSE and NS should deviate, independent of the similarities of the countries.

Shares issued at OSE are required “to be of public interest, and to be object of regular trading”. In addition, shares must be registered with the Norwegian

Central Securities Depository prior to admittance. Companies applying for admittance at the OSE are obliged to meet OSE's *listing rules* and *continuing obligations.* Firms going public are required to have at least 500 shareholders, each holding shares with a value of at least NOK 10,000. Any firm going public needs to prove at least three years of operating activity and a minimum mkt. cap. of NOK 300 million. *Continuing obligations* involves the continuing duty to disclose insider information, corporate actions and transactions, as well as financial reporting requirements.

Companies listing at NS must have produced annual reports for the last three years prior to the application, they are also required to present documentation of positive net income prior to the listing. Shares issued by a Swedish public limited company (or equivalently foreign company) at NS are subject to *listing rules* and *continuing obligations* harmonized with the other Nordic Nasdaq stock exchanges. 25% of shares issued must be publicly held. Additionally, companies are required to have a mkt. cap. of at least £1 million, which is considerably lower than the mkt. cap. required by OSE. *Continuing obligations* are similar to those of OSE.

3.3.2 Listing Fees

Listing companies are subject to an application fee and ongoing fees. The application fee is split into two parts; a fixed fee and a variable fee. The variable fee normally depends on the mkt. cap. of the company. Stock exchanges usually have pre-set lower and upper bounds for the variable fee.

Companies going public at OSE are subject to a fixed application fee of NOK 530,400 and a variable application fee of NOK 566 per million mkt. cap. Lower and upper bound for the total application fee is set to NOK 700,200 and NOK 1,096,000 respectively. Issuing firms are also subject to an annual fee of NOK 76.90 per million mkt. cap, with a lower and upper bound of NOK 170,800 and NOK 1,260,000 respectively.

Firms listing on NS are subject to a fixed application fee of SEK 700,000 as well as a variable application fee of SEK 150 per million mkt. cap. The upper bound is set to SEK 1,200,000. In addition, companies are obliged to pay an annual fee of SEK 48 per million mkt. cap, with a lower and upper bound of SEK 205,000 and SEK 3,105,000 respectively.

3.3.3 Changes in listing requirements

Until 2007, Oslo stock exchange had two listing options; the main list and the SMB-list, where firms going public was required to have a mkt. cap of NOK 10 million and NOK 8 million respectively. These listing options were consolidated into one list prior to the establishment of Oslo Axess. By the introduction of Oslo Axess, OSE sharpened their listing rules, and increased the required mkt. cap from NOK 8 million to NOK 300 million. In addition, the requirement of positive profit was discontinued (Oslo Stock Exchange, 2017).

Sweden had a similar structure as OSE, with two listing options; namely the A-list and O-list. In 2006, Companies going public at the A-list was required to have a mkt. cap of at least SEK 300 Million, three years of history, annual reports and documented profitability. In addition, 25 % of shares issued had to be held by the public, spread between a minimum of 2000 shareholders. The O-list did not have any requirements regarding mkt. cap or history of the company, but it did require 10 % of the company shares to be held public, spread between at least 300 shareholders (Gajewski and Gresse, 2006).

3.4 Secondary Stock Exchanges

Oslo Axess (Axess) was established in May 2007, whereas Nordic Growth Market (NGM) became a regulated stock exchange in April 2003. Before these new regulated stock exchanges were established, the main stock exchanges were forced into showing discretion regarding their preset requirements of firms going public. The logic behind was that small and medium sized firms did not have an alternative regulated market place to list on. The emergence of Axess and NGM eased the requirements for firms wanting to go public, which could have a positive impact on listing volume.

Emma Nilsson and Caroline Prior (2003) investigated whether alternative market places have had an impact on the Swedish equity market. They find that firms choose to go public at secondary stock exchanges for several reasons; it better fits their size and business structure (48%), it is cost effective (28%) or they do not qualify to list at the main stock exchange (13%). Another interesting finding is that some firms choose to go public on secondary stock exchanges over the main stock exchange since it is hard for smaller firms to obtain visibility at the main stock exchange.

3.4.1 Listing requirements

Companies applying for admittance at Axess are required to have at least 100 shareholders, each holding shares with a value of at least NOK 10,000. Each share must have a minimum price of NOK 1. Companies applying to issue shares on Axess are required to have mkt. cap of at least NOK 8 million, compared to NOK 300 million at OSE. Companies need to have a history of business operations of at least 1 year prior to listing.

Companies going public on NGM are required to submit a prospectus prior to the admittance of listing, they also need to go through a legal investigation. NGM differentiate from NS by having considerably lower commercial requirements. Firms applying for admittance must have at least 300 shareholders, each holding shares with a value of minimum SEK 5,000. Additionally, at least 10% of shares must be held publicly. NGM does not have requirements with respect to the firms mkt. cap.

3.4.2 Listing Fees

Axess operates with a fee structure similar to OSE. It consists of a fixed fee of NOK 472,200 and a variable fee of NOK 566 per million mkt. cap. The lower and upper bound are set to NOK 476,800 and NOK 1,037,000 respectively. The annual fee are identical to OSE; NOK 76.90 per million mkt. cap.

NGM has considerably lower application fee than NS, the application fee has an upper bound at SEK 350,000. Additionally, companies going public on NGM are subject to a monthly fee of 12,000, which is also considerably lower than the lower bound at Nasdaq.

3.4.3 Changes in listing requirements and listing fees

Listing requirements and fees are amended on an irregular basis. When Axess was established, it replaced the pre-known SMB-list, and adopted the listing requirements set at this list. The listing requirements and fee structure at Axess were amended in September 2007. However, only the changes in the fee structure led to any noticeable changes. Previously, the application fee was a fixed fee which depended on the mkt. cap. of the firm, and ranged from NOK 200.000 to NOK 550.000. Axess has not revised the fee structure since.

NGM do not distribute historical amendments, neither through their website or e-mail correspondence. We were able to track down listing requirements and fees implemented at the establishment of NGM from Nilsson and Prior' master thesis

(2003). They announce that companies going public on NGM was required to have a mkt. cap. of SEK 50 million. The company needed to have at least 300 shareholders, and 30% of shares issued had to be held by the public. Hence, they seem to have operated with stricter listing rules than they currently do. Unfortunately, we do not have information about the timing of the amendment. When established back in 2003, the application fee was SEK 140,000, and had an annual fee of SEK 90,000, hence the total cost of going public has also been reduced within the period.

3.5 Regulations

As discussed in the literature review, previous literature has found a potential link between regulations and IPO volume. In the following section, we discuss regulatory changes that could have affected the attractiveness of a public listing.

3.5.1 Norway

The main regulator of Norwegian capital markets is the *Norwegian Financial Supervisory Authority* (NFSA). Norwegian capital markets are subject to four main regulations; the securities trading act, securities trading regulations, the stock exchange act and stock exchange regulations. Local regulations have changed in a rather slow pace over the years. Hence, it is unreasonable to believe that any of these amendments have had a notable effect on the attractiveness of going public.

Norway is part of the *European Economic Area 1992* (EEA agreement), and are thereby obliged to implement all European Directives regulating the financial markets. European directives are implemented into the Norwegian legislation. The Financial Services Action Plan was launched by the European Union (EU) in 1999 as an attempt to create an integrated financial market in Europe. These initiatives were implemented in Norwegian legislation in 2003/2004, later amended in 2010/2013/2014. These directives will be further discussed under the Financial Services Action Plan section.

3.5.2 Sweden

The main regulator of the Swedish capital markets is the *Swedish Financial Supervisory Authority* (SFSA). The SFSA operates within four areas; Supervision, regulation, licenses and applications. Sweden is a member state of EU, and is thereby obliged to adopt EU directives. Swedish stock exchanges are regulated through the Securities Market Act and the Financial Instrument Trading Act.

Although there have been some minor changes in local regulations, it is unlikely that any of these single regulatory changes have had a significant impact on listing volume.

3.5.3 Financial Services Action Plan

FSAP was launched 11.05.1999 by EU, closely related to the introduction of the Euro currency in the European Monetary Union (1999). It was launched as an attempt to harmonise the financial markets within Europe. Measures were adopted by both the Norwegian and Swedish Legislation in 2003/2004. FSAP consisted of four main initiatives; Market in Financial Instruments Directive (MiFID), the Prospectus Directive, the Market Directive and the Transparency. The most notable directive is the Transparency Directive, which imposed stricter reporting requirements on listed firms. However, the regulatory changes were public knowledge long prior to the implementation of the directives. Thus, it is reasonable to assume that firms considering going public factored in any potential costs once the directive was announced in 1999. There have not been any major revisions to the directives during our sample period.

3.6 Summary

The investigation of all regulated exchanges currently active in each market show that the introduction of a second regulated exchange could have led to some potential benefits for smaller companies considering going public. Lower admittance costs, lower barriers to entry and more visibility could potentially lead to an increase in small company listings. Few quarterly observations do not allow us to split the sample based on company size, but the introduction date of the secondary regulated exchanges will be included as a dummy variable to test whether the new exchange led to any permanent increase in listings for each market.

The only relevant regulatory change that could have made any significant altercations to the attractiveness of a public listing, is the FSAP. However, any potential costs associated with the directive should have been considered when it was first announced rather that at the implementation date. No later revisions of the directive are of a high enough magnitude to alter the attractiveness of a public listing. We cannot rule out that the accumulated effect of smaller revisions of both local and EU regulations could potentially have altered the net benefit of the listing decision. Unfortunately, there is no way of testing this without the risk of noise from other unrelated factors.

4.0 Data and methodology

4.1 Hypothesis

Problem definition: What are the major drivers behind listing volume fluctuations in Norway and Sweden

Previous research on IPO activity and general corporate finance theory has provided us with insight as to what drives changes in the number of listings. However, due to few and conflicting theories in the field, it is difficult to make presumptions about the strength of these relationships. After reviewing previous literature, as well as the Swedish and Norwegian listing environment, we have developed a set of hypotheses tested throughout the thesis. The presented hypotheses are mainly based on Lowry (2003).

4.1.1 Aggregate Capital Demands Hypothesis

Variations in listing volume are driven by changes in the aggregate capital demands of private firms.

The public listing decision is normally accompanied by an initial public equity offering. Thus, the decision to go public should at least be partially driven by a need for capital to finance future investments and increase operational liquidity. Multiple researchers have established a link between financing needs and listing volume (e.g. Lowry, 2003, Brau et al., 2006, Pagano et al., 1998). The hypothesis also finds support in the industry clustering of IPOs (see e.g. Benveniste, Busaba and Wilhelm, 2002, Helwege and Liang, 2004 and Jain and Kini, 2005). Clustering can be a result of increased investment opportunities within a certain industry, thus resulting in a higher demand for capital. Companies will conduct a public equity offering if public capital offers the highest net benefit compared to other sources of funding. Intuitively, higher (lower) aggregate capital demands, translates into higher (lower) listing volume.

4.1.2 Adverse Selection Cost Hypothesis

The number of listings should decrease when adverse selection costs are high.

The presence of adverse selection costs assumes information asymmetry and semi-strong market efficiency. Asymmetric information allows for mispricing in the market. Managers are incentivized to issue equity when their shares are overvalued. Knowing this, investors will lower their value estimate once the firm announces a new equity issue. This devaluation ensures that issued shares will on average, be correctly priced. Any benefit from equity financing must therefore be higher than both the direct costs associated with the issue and the adverse-selection costs. Lowry (2003) suggests that companies are more likely to choose other sources of funding when information asymmetry is high. Consistent with this, Korajczyk, Lucas and Mcdonald's (1980) finds that time-varying information asymmetry contributes to clustering of equity issues. Firms are likely to issue equity when adverse selection costs are low, hence, we should observe a negative relationship between adverse selection costs and the number of listings.

4.1.3 Investor sentiment

More companies go public in periods of high investor sentiment (investor optimism).

Market efficiency has been heavily challenged by various researchers for the last decades. The investor sentiment hypothesis assumes markets to be inefficient. As written in our literature review, several researchers contribute findings consistent with this hypothesis (see e.g. Lowry,2003 and Pagano et al., 1998). Variations in investor sentiment should cause variations in the number of firms conducting a public offering. When investor sentiment is high (low), investors are willing to pay more (less) than the fundamental value of the firms. As a result, value maximising mangers will issue equity when investor sentiment is high.

4.1.4 Secondary stock exchanges

The introduction of a secondary regulated exchange should lead to a permanent increase in listing volume.

Both Norway and Sweden have introduced secondary regulated stock exchanges during the sample period, namely Oslo Axess and NGM Equity. As previously discussed, these secondary exchanges offer lower listing fees and listing requirements than the main stock exchanges. Intuitively, the introduction of a new regulated stock exchange, with lower barriers to entry, should encourage an increase in the cumulative listing volume.

4.1.5 Other potential drivers of listing volume

Throughout section 2 and 3, we have presented multiple other potential drivers of listing volume that we are unable to test for various reasons. Regulatory changes affecting compliance cost or otherwise changing the cost-benefit balance of listing has been an important focus in IPO research the last decade. After reviewing both EU regulations and regulations imposed by the stock exchanges or individual governments, we have not found any changes that should have had any large effect on the attractiveness of going public versus staying private within our sample period. In total, the gradually increasing regulatory burden could have affected listing volume, but without any fixed date, the effect is difficult to model. Including a drift variable could potentially capture the effect of these gradual changes, but it is likely to capture other unrelated effects as well.

Another interesting hypothesis appropriate for a market-wide study is how changes in analyst coverage may have changed the attractiveness of the listing decision. In order to test this hypothesis, the average number of analysts covering mid-sized or small companies could be included as a variable. However, data obtained from Thompson Reuters had too many missing observations, at somewhat random data points, making it difficult to determine if the missing values should be zero or if the data was simply not available.

Gao et al. (2013) argued that the declining IPO volume seen in the U.S. the last two decades is caused by the increasing importance of speed to market and economics of scope. Although this is an interesting hypothesis, the trend variable suggested in their study is not precise enough to rule out other influences in the trend variable. We have not been able to find any appropriate proxies that should have a high correlation with the importance of economics of scope.

4.2 Sample selection

In this paper we study the quarterly listing volume on Norwegian and Swedish stock exchanges from 2000-2016. Earlier samples of listing volume are difficult to obtain, and any relevant descriptive trends would therefore have to be excluded due to the lack of data. Listing statistics is found directly at the homepage of all the included exchanges.

Both countries have two regulated exchanges with differentiating requirements; Oslo Stock Exchange, Nasdaq Stockholm, Oslo Axess and Nordic Growth Market. Multiple companies listed on the secondary exchange transfer to the main stock exchange a few years after listing. To avoid double counting, we exclude these observations from our sample. Including the listings on the secondary exchanges provides us with valuable insight from the actual initial public equity issue since most companies that choose to transfer to the primary exchange at a later point, generally do not conduct a new equity offering. Additionally, since both countries have quite small exchanges compared to e.g. the U.S., the additional observations allow us to capture more of the variability in listings by reducing the number of quarters with zero or very few listings. We construct our sample based on listing changes reported by the individual exchanges and exclude listings that are a result of divestitures, carve-outs and spin-offs from other listed companies. We also omit exchange traded closed-end funds, equity certificates and unsponsored listings. Previous research typically exclude listings with an offer price below $5. To avoid increasing the number of quarters that have zero observed listings; no listings are excluded based on the issue price. The Norwegian sample is reduced from 383 to 279 observations. The Swedish sample is reduced from 320 to 246 observations.

This study relies on market-wide variables, but some company specific information is still extracted for the descriptive analysis. We collect IPO details and company characteristics from Bloomberg Terminal. Any missing data from Bloomberg is supplemented with information from annual reports and IPO prospectuses.

4.2.1 Validity of data

Data is obtained from secondary sources, and are thereby subject to a potential lack of reliability. Data obtained from Oslo Stock Exchange, Nasdaq Stockholm and Nordic Growth Market are considered reliable. We noticed some discrepancies between the issue information provided in Bloomberg and information contained in prospectuses and annual reports. However, these discrepancies were rare and of low magnitude. We originally intended to specify regressions for IPO proceeds as well, but multiple listings before 2007 are missing issue information in Bloomberg. Cross-validation of these companies shows that many of them indeed issued equity with the offering. Information about offerings more than ten years ago are generally difficult to obtain. Even when including the additional information from annual reports, the high risk of understating the issue volume in the years prior to 2007 challenges the validity of the issue data. Since some IPO data is missing, we restrict the use of issue information to the descriptive evidence.

4.3 Estimation method

The objective of the study is to estimate how listing volume fluctuates with multiple explanatory time-series. The aggregate capital demand and investor sentiment hypothesis requires the use of multiple lagged variables, suggesting the vector autoregressive model (VAR) is a god fit. However, some of the independent variables are subject to autocorrelation and strong seasonal effects. Treating each of the leads and lags as separate variables is likely to lead to multicollinearity problems. Additionally, the full sample contains 68 individual observations. Therefore, including 3-4 separate lags for each of the proxy variables and control variables would severely affect the degrees of freedom in the models. Since the timing of the relationship between the dependent and independent variable is important to make any interferences about the hypothesis we seek to test, the appropriate number of lags and leads are determined using economic reasoning. Consistent with Lowry (2003) the models are estimated using least squares.

4.3.1 Ordinary least squares assumptions

The Gauss-Markov theorem suggests that for the estimated coefficients of the linear equation to be the best linear unbiased estimators (BLUE) of the dependent variables, a series of assumptions needs to be satisfied. In the following section, we discuss the individual assumptions and how we address any potential violations of these assumptions. Note that we do not include the normality condition, as it is not required to ensure that the estimators are BLUE.

Assumption 1: Linearity $y = \alpha + \beta x + \varepsilon$

The linearity assumption requires the dependent variable to be a linear combination of the independent variables and the error term. Since we do not intend to estimate any variables with non-linear coefficients, e.g. β^2 this assumption does not pose any additional restrictions on the estimation.

Assumption 2: Full Rank

The second assumption requires the matrix of explanatory variables X to have full rank meaning that if X is a $N \times K$ matrix, the rank of matrix X is K.
Specifically, $Rank(X) = K$.

Practically, this means that the number of explanatory variables in the model cannot be higher than the number of observations included. With a maximum of 10 explanatory variables included and 64-68 observations (regressions including leads reduces the number of observations), this does not pose a problem in the estimations.

Additionally, this assumption implies that there cannot be an exact linear relationship between the included variables. There is no perfect correlation between any of the explanatory variables (exact multicollinearity), but as we will show later, some variables are highly correlated. Less than exact multicollinearity will still allow us to estimate the model. However, as argued by Greene (2012), the presence of multicollinearity may lead to some serious statistical implications. He argues that multicollinearity may lead to the following implications:

1. Small changes in the data may result in wide swings in the parameter estimates.
2. Coefficients can have very high standard errors and low significance levels even though they are jointly significant the regression has a high explanatory power (adjusted R2).
3. Coefficients can show the “wrong sign” or have implausibly large coefficients.

Literature does not offer any perfect remedy for multicollinearity. The multicollinearity can be mitigated by including more data or dropping the variables suspected of causing problems. The latter can lead to bias in the regression of the variables that should have been included. To mitigate the multicollinearity problem, we run multiple regressions both with and without any variables suspected of causing multicollinearity problems. Additionally, the variance inflation factors for each model are investigated and reported to keep track of the multicollinearity problem.

Assumption 3: $E(\varepsilon_i|X) = 0$

Assumption three requires that the explanatory variables are exogenous. Practically, this means that the explanatory variables do not explain any variation in the error term. In time-series regressions, this means that the error term has to be independent of all present, future and past observations of X. Common cases that violate the assumption is omitted variables, measurement error and simultaneity.

An endogeneity problem results in the coefficients being neither consistent nor unbiased. Unfortunately, mitigating the multicollinearity problem is likely to result in endogeneity. Additionally, past research has shown that variables not included in this paper may have some power in explaining listing volume fluctuations (e.g. analyst coverage, economics of scope etc.). The risk of omitting relevant variables, and thus risking endogeneity, is high. However, the estimated models are not intended to be used to forecast future listing volume. The objective of the thesis is to study the causal relationship between listing volume and proxies developed for each hypothesis. When evaluating the empirical results, we are interested in statistical significance and whether the sign of the coefficient is consistent with the hypothesis. Therefore, the exact value of the coefficients is not crucial in evaluating the results.

Assumption 4: $\varepsilon_i \sim iid(0, \sigma^2)$

The fourth assumption requires that the error terms are independent and individually distributed with a mean of zero and a constant, finite variance. First, we need to ensure that the expected value of the error term is equal to zero. We ensure an expected value of zero by including a constant in every estimated regression.

Second, the homoscedasticity assumption implies that the variance of the errors is constant and finite. In the presence of heteroscedasticity, the estimated coefficients will still be unbiased, but they will no longer have the minimum variance in the class of unbiased estimators. The formulae for the coefficient standard errors will no longer hold, as proved by Hill, Griffiths and Judge (1997, cited by Greene, 2012).

The IID restriction requires the error terms to be independently distributed over time, thus having no autocorrelation. Autocorrelation affects the regression output similarly to heteroscedasticity. The coefficients will still be unbiased, but the estimated standard errors will be misspecified, making the test statistics biased. Time-series tests and previous studies have already established that listing volume is persistent over time. We control for autocorrelation in two ways; first, an AR(1) term is included when the Durbin-Watson test statistic implies first-order autocorrelation. To control for autocorrelations of higher order and to control for heteroscedasticity, we use autocorrelation and heteroscedasticity robust error terms. As suggested by Greene (2012), and employed by Gao et. al (2012) and Lowry (2003), both heteroscedasticity and autocorrelation is controlled for by using Newey – West (1987) standard errors.

4.4 Base model

$$Listings_t = \alpha_0 + \beta_1 CCI_t + \beta_2 Return_{t,t+4} + \beta_3 Sales\ growth_{t,t+4} + \beta_4 St.Dev\ analyst_t + \beta_5 SED + \beta_6 Return_{t-5,t-1} + \beta_7 \frac{M}{B}_t + \beta_8 Q1 + \beta_9 Q3 + \varepsilon_t$$

$Where\ \varepsilon_t = \varepsilon_{t-1} + u_t \quad u_t \sim (0, \sigma^2)$

The base model consist of proxies for each hypothesis, a secondary exchange dummy, stock market variables and dummies for the first and third quarter in each year. The error term follows a first-order autoregressive process.

The CCI and future return represent the investor sentiment proxies, future sales growth represents the capital demands proxy and the standard deviation of analyst EPS forecasts represents the adverse selection proxy. The regression will be run separately for each country. Multiple reduced forms of the base model will be employed to strengthen the results of each hypothesis, as well as mitigating the effect from multicollinearity problems. Each variable and the reason for its inclusion is discussed in detail in the following sections.

4.4.1. Dependent Variable

4.4.1.1 Quarterly listing volume

Historically, IPO volume has shown to be highly persistent over time and shows no clear tendency to revert to any normal volume (Lowry, 2003). Both Norwegian and Swedish listing volume shows a much lower first-order autocorrelation (0.27 and 0.09 respectively) compared to similar studies[1]. However, both the Norwegian and the Swedish listing volume shows autocorrelation of higher order (Appendices 2.2 and 3.2), with almost every second sign being negative. This is likely due to the seasonal tendencies caused by lower business activity during the holiday season and summer months.

To make any valid interference from our test statistics, we need to ensure stationarity of the time series. The test statistic (-2.28) from the Augmented Dickey-Fuller test for the Norwegian market does not allow us to reject the null of non-stationarity. However, both the Kwiatkowski–Phillips–Schmidt–Shin test for stationarity and the Phillips-Perron unit root tests give test statistics consistent

[1] Lowry (2003) show a first-order autocorrelation of 0.87

with stationarity. All test statistics indicate that Swedish listing volume is stationary. See appendices 2.1 and 3.1 for detailed test results.

Similar studies have worked with both stationary (e.g. Gao et al, 2013) - and non-stationary time-series (e.g. Lowry, 2003). The results from the stationarity and unit-root tests do not require us to adjust the dependent variable. However, consistent with Gao et al. (2013), listing volume is deflated with real GDP. The intuition behind this is that listing volume should reflect the size of the economy, and should naturally increase as the economy grows. However, the test results from the unit root tests stationarity tests remain unchanged after deflating listing volume.

Dependent variable: Quarterly listing volume, deflated by the indexed real GDP (1999Q4 =1), the end of the previous quarter.

4.4.2 Independent Variables

The independent variables include proxies for aggregate capital demands, adverse selection and investor sentiment. Additionally, a secondary exchange dummy is included for both markets. To control for seasonality and other exogenous effects, we include dummies for Q1 and Q3. Loughran et al. (1994) show that IPO volume tends to be higher when the stock market is high. Therefore, past returns and the MB ratio are included in some of the regressions. The intended proxies require the use of lead and lagged variables. As discussed in the “Estimation method”, leads and lags that go over multiple quarters are merged into single variables. This ensures that the regressions have a sufficient amount of degrees of freedom, reduces some of the effect of autocorrelation in the independent variables. The inclusion of separate leads and lags may also lead to multicollinearity problems. The estimation method also allows us to use economic reasoning to choose the appropriate timing of the variables.

4.4.2.1 Capital demands proxies

Capital demands of private firms, is not directly observable. Ideally, a measure of private capital demands should capture both the need for increased working capital and capital for investments. We include the proxies future growth in GDP growth, future investment growth and future sales growth, but end up using only future sales growth. As we will get back to later in the thesis, the GDP and investment variables both show a very low correlation with listing volume, while being highly correlated with other variables in our regression. Therefore, they were ultimately excluded from the regression.

Future growth in sales: To generate sales growth, firms are usually required to increase capital expenditures and working capital. Hence, future sales growth should be positively correlated with capital demands. Future sales growth for Norway is obtained from SSB. The database only goes back to Q2 2002. Additional data dating back to Q2 2000 is obtained from EIKON. The Swedish statistics centre (SCB) did not have similar data. Swedish sales growth is obtained from Eikon for the entire sample period. Data from the Eikon database has multiple outliers, likely due to mergers and acquisitions. To reduce the influence from outliers, we use median sales growth rather than the mean. Sales growth is adjusted for inflation.

Cap. Dem. proxy: $Sales\ growth_{t,t+4} = Median\left(\frac{Real\ quarterly\ sales_{i,t+4}}{Real\ quarterly\ sales_{i,t}} - 1\right)$

Future growth in real GDP: Intuitively, capital demands should vary with the business cycle. In an economic expansion, the general activity level and growth potential for firms should improve. Similarly, an economic contraction limits the growth potential. Both Gao et al. (2013) and Lowry (2003) employ real GDP growth as a proxy for capital demands. Real seasonally adjusted quarterly GDP data is obtained from SSB (Statistics Norway) and SCB (Statistics Sweden). The variable is measured over four quarters, starting in the quarter the number of listings is measured.

Capital demands proxy: $Real\ GDP\ growth_{t,t+4} = \frac{Real\ quarterly\ GDP_{t+4}}{Real\ quarterly\ GDP_{t}} - 1$

Future investment growth: Another proxy for capital demands is future investment growth. If the capital demands of private firms increase due to more investment opportunities, this should naturally prevail in an increase in future investments. We obtain real private fixed investment volume from SSB and SCB[2]

Capital demands proxy: $Inv\ growth_{t,t+4} = \frac{Real\ fixed\ quarterly\ investment_{t+4}}{Real\ fixed\ quarterly\ investment_{t}} - 1$

[2] Total investment volume, subtracting investments in residential real estate and investments by the government.

4.4.2.2 Adverse selection proxies

As discussed in the "Literature Review", adverse selection costs increase when information asymmetry is high. Neither information asymmetry nor adverse selection costs are directly observable. Thus, we rely on a proxy to capture the time-varying information asymmetry.

Standard deviation of earnings per share estimates: Firms insiders should be relatively certain about their earnings prior to each earnings announcement, while analysts rely on public information. Information asymmetry should be reflected by the dispersion of analyst earnings forecasts. We rely on the IBES database to provide us with data on analyst coverage. The database has a lot of missing values for earnings and sales estimates. However, earnings per share (EPS) seem to be consistently available. EPS forecasts are not only subject to variance in the earnings assumptions, but also assumptions about share dilution. Although the variation in earnings forecasts alone is preferable, securing sufficient amount of observations is of higher importance for the validity of the variable.

The average standard deviation of EPS announcements is constructed by summing the standard deviations of analyst EPS forecasts for the securities available within a given quarter, divided by the square root of the summed squares of the consensus estimates for the same securities. The consensus estimates are squared to properly account for the companies with negative EPS forecasts.

Adverse selection proxy: $\overline{St.Dev\ analyst_t} = \frac{\sum_{i=m}^{n} St.Dev_{i,t}}{\sqrt{\sum_{i=m}^{n} \overline{EPS\ forecast_{i,t}}^2}}$

Suggested proxies for future research: As indicated above, earnings estimates (e.g. EBITDA, EBIT or Net income) are preferable as proxies for adverse selection costs if a sufficient amount of observations are available. Additionally, Lowry (2003) suggests using abnormal returns associated with earnings announcements. Due to the lack of data available, constructing a sample of abnormal returns associated with earning announcement proved to be too time consuming.

4.4.2.3 Investor sentiment proxies

Neither the Swedish nor the Norwegian market has any direct measures for investor sentiment readily available. To account for investor sentiment's influence on listing volume, we therefore have to rely on proxies. The proxies are determined based on proxies used in previous studies, as well as the accessibility of those variables.

Future market returns: Baker and Wurgler (2000) find that firms issue more equity around stock market peaks, and conclude that firms are more likely to issue equity when the market offers particularly attractive valuations. Stock market peaks are naturally followed by periods of low returns. If investor sentiment influences stock prices and firms are more likely to go public when sentiment is high, future stock returns should be negatively correlated with listing volume.

The future market returns are calculated from the equally weighted index Oslo Stock All Share index and Nasdaq Stockholm index for Norway and Sweden respectively. Returns are measured over four subsequent quarters, starting at the beginning of the observed quarter. The returns are adjusted for inflation.

Investor sentiment proxy: $Return_{t,t+4} = \frac{\frac{Total\ Index\ value_{t+4}}{Total\ index\ value_t}}{1+inflation_{t,t+4}} - 1$

Consumer confidence in the state of the economy: Consumer confidence has long been used as an indicator for future demand for consumer goods, but has also gained popularity as a proxy for investor sentiment in recent years. Qui & Welch (2006) find support for the use of the consumer confidence indexes (CCI) as a measure of investor sentiment. Their study finds that, unlike the discount on closed-end funds, CCI has a high correlation with the U.S. USB/Gallup investor sentiment survey. They find that CCI especially captures movements in the valuations of small firm stocks, even when correcting for the real underlying economy (real consumption and corporate profits). The investor sentiment hypothesis predicts that the CCI index should have a positive correlation with listing volume.

Both the Norwegian “Forventningsbarometeret” (Finans Norge og Kantar TNS, 2017)[3] and the Swedish “Hushållensförtroendeindikator” (SCB, 2017) survey consumers about their expectations of the development of the economy, as well as their private financial situation. Private individual ownership on Oslo stock exchange[4] only represents 3.6% to 7.7% of the owner base in terms of market

[3] Finans Norge were kind enough to provide us with the raw data from the quarterly survey used to construct the index.

[4] Ownership data was not available for Nasdaq Stockholm, but is expected to show similar tendencies.

value. However, it is worth noting that the government ownership varies between 23.1% to 43.1% (Oslo Stock Exchange, 2017), and that private households with a positive outlook on the economy may choose to invest through institutional investors rather than buying individual stock. Similar data was not obtainable for the Swedish market, but we would expect the data to show similar tendencies.

The Norwegian survey asks private individuals if they believe the economy will improve, stay the same or weaken in the next twelve months. The indicator reported in the raw data is measured as the difference between the percentage of pessimistic and optimistic answers. The Swedish survey sums the respondents' current confidence in the economy and how the economy will develop in the next twelve months, subtracting the expectation for unemployment the next twelve months. The Swedish indicator is standardized with a mean of 100 and a standard deviation of 10.

Since the Swedish CCI captures both the current and future outlook of the economy and is adjusted for seasonality, the level of the index at the end of the previous quarter will be used directly. To account for the seasonality in the Norwegian raw data, the average index value of the current and previous three quarters is used. To avoid capturing too much of the past consumer confidence, rather than the current level of confidence, we only use the forward-looking answers excluding answers to "How would you evaluate the current state of the economy".

Investor sentiment proxy: $CCI\ Nor_t = \frac{1}{4}\sum_{i=T-3}^{4} Survey\ pos_t - Survey\ neg_t$

$$CCI\ Swe_t = Macroindex_{t-1}$$

Suggested proxies for future research: Literature suggests multiple proxies for investor sentiment. Similar studies often employ the discount on closed-end funds (see e.g. Ritter, 2003 and Lowry, 2013). None of the financial data sources we could access had collected the net asset value for closed-end funds in Norway or Sweden, meaning that the data would have to be constructed manually from financial reports. Baker and Wurgler (2000) suggest multiple proxies, one of them being IPO first-day returns. Since some quarters in our dataset include zero or few first-day return observations, the variable would have too many missing values to be used as a proxy.

4.4.2.4 Secondary exchange dummies

Both Norway and Sweden have two fully regulated exchanges. The secondary regulated stock exchanges have lower listing requirements, offering a more liquid alternative to unregulated OTC markets for companies that do not qualify for a listing on the main regulated stock exchanges. Lower listing requirements extend the pool of private companies eligible to go public and should therefore result in a permanent increase in listing volume. Due to the few quarterly listings in both countries, we are not able to test specifically if these exchanges have led to an increase volume of small-firm listings, and will therefore test the whole sample.

Oslo Axess dummy: Oslo Axess had its first trading day 02.05.2007. We include a dummy variable equal to zero for any observations prior to Q2 2007, and equal to one otherwise.

NGM dummy: NGM has existed since 1984, but operated as an OTC market until 2003. Nordic growth market had its first trading day as a regulated exchange 22.04.2003. We include a dummy variable equal to zero for any observations prior to Q2 2003, and equal to one otherwise.

4.4.2.5 Seasonality

As pointed out by Lowry (2003), Wall Street investment banks tend to practically shut down during the U.S. holiday season, resulting in low IPO volume in the first quarter of each year. In both Norway and Sweden, this also seem to happen during the summer, resulting in low listing volume in both the first and third quarter (*Table 1*). To account for this seasonality, dummies for both first and third quarter observations are included in all regressions.

Table 1: Total listings by quarter

This table shows the total number of listing conducted during each quarter of the year for Norway and Sweden respectively.

Quarter	Norway	Sweden
Q1	41	32
Q2	112	104
Q3	40	25
Q4	86	85
SUM	279	246

Quarter dummies: Q1 = 1 when observing the first quarter, 0 otherwise
Q3 = 1 when observing the third quarter, 0 otherwise

4.4.2.6 Stock Market conditions

To control for stock market conditions, additional variables are added to some of the regressions. These variables potentially reflect the importance of capital demands and/or investor sentiment as drivers behind fluctuations in listing volume. However, they may also capture some other unknown determinant of listing volume. Two stock market variables are included; quarterly market to book ratio (*M/B*) of both Norwegian and Swedish listed companies, and equally weighted compounded quarterly returns from the Oslo Stock Exchange All Share Index and the Nasdaq Stockholm Index. Both *M/B* and *past returns* are expected to be positively correlated with listing volume. The significance of these variables relies on the coefficients, coefficients obtained should be positive.

$$\frac{M}{B_t} = \frac{1}{n}\sum_{i=1}^{n} \frac{Market\ value\ of\ equity_{i,t}}{Book\ value\ of\ equity_{i,t}}$$

$$Return_{t-5,t-1} = \frac{\frac{Total\ Index\ value_{t-1}}{Total\ index\ value_{t-5}}}{1 + inflation_{t-5,t-1}} - 1$$

4.5 Descriptive statistics

4.5.1 Listings

Listing volume in both Norway and Sweden seem to follow a somewhat similar pattern. From figure 2, we see that the Swedish market has extremely high volumes in 2000, but acts more stable throughout the rest of our sample period. Since the Swedish equity market has a significant portion of both IT and health care stocks, this is not surprising. The Norwegian listing volume showed particularly high volume from 2004 to 2008, likely influenced by the positive oil price shock around the same period. The Swedish market has seen low listing volume since 2008, but shows higher activity after 2014. Not surprisingly, Norwegian listing volume does not show the same increase after 2014, likely impacted by the drop in the oil price at the end of 2014.

FIGURE 2: QUARTERLY LISTING VOLUME IN NORWAY AND SWEDEN

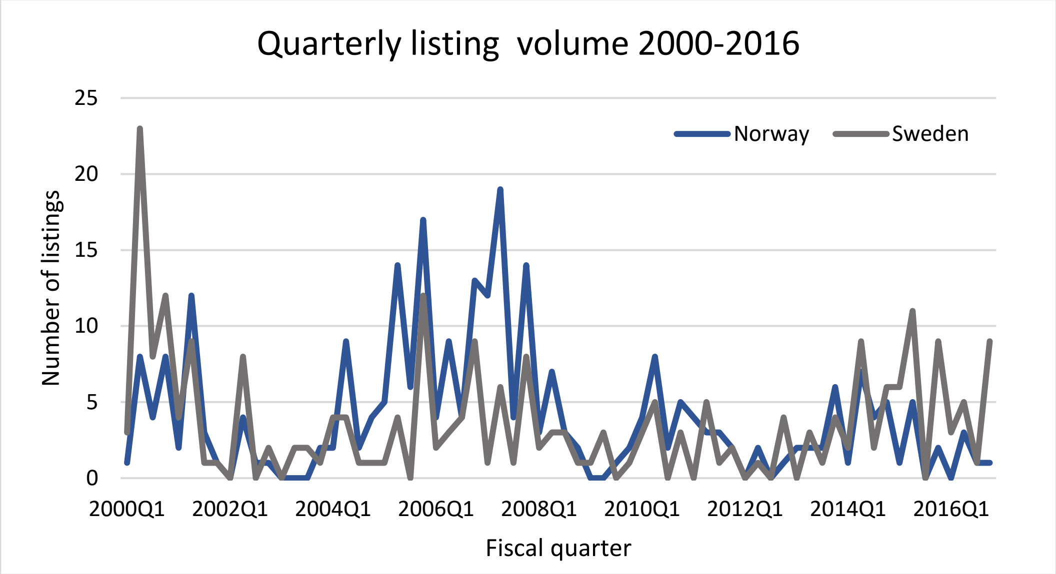


Table 2a. and 2b. describes multiple listing characteristics for the samples used in the respective markets. The total proceeds raised in the Norwegian market amounted to 320 billion NOK, compared to 176 billion SEK in the Swedish market. This is naturally a result of the higher listing volume in Norway, as well as a higher fraction of capital intensive industries in Norway compared to Sweden. However, the Swedish market saw particularly high listing volume during 2000, which is unlikely to be fully captured in the total proceeds due to the lack of data. The firms listed in Sweden are on average both larger and older than in Norway. The high concentration of IT and Health care companies listed in Sweden would suggest a lower average age since these companies typically offer too little collateral to use debt to finance growth. The median ages of the companies in both countries are more comparable (14 and 16 years). The remarkably high difference between the median and mean age in Sweden is mostly driven by a high fraction of companies dated back to the 19th century. In both countries, median age is still higher than in the U.S. Ritter (2017), reports that the median age of listed firms has been 11 years from 2001 to 2016.

While the U.S. IPO market has seen an average first-day return of 14.0% between 2001 and 2016 both Norway and Sweden shows significantly lower returns at 4.5% and 6.0% respectively. This is likely driven by the high fraction of companies with negative first-day returns in both markets. 39% of the Norwegian companies and 23% of the Swedish companies in the sample closed at a price lower than the issue price at the first day of trading.

TABLE 2A: DESCRIPTION OF NORWEGIAN LISTINGS SAMPLE

The table describes annual listing characteristics for the Norwegian listing market. Total proceeds describe the annual capital raised in connection to listings on Oslo Stock Exchange and Oslo Axess. Information about the characteristics of multiple listings prior to 2007 were unobtainable, likely resulting in total proceeds being understated from 2000-2007. The average market value is the average equity value for all companies going public within that year. The companies are valued at the first-day closing price. The average first-day returns show the average price increase from the IPO price to the closing price the first day of trading. Both median age and mean age are reported to control for outliers. All means and medians are based on the sample of listings containing information about each specific characteristic, not on the entire sample.

Norwegian listing characteristics

2000 - 2016

Year	Listings	Total Proceeds*	Average market value	Average first-day return	Age Median (Mean)
2000	21	8,970	6,798	3.64 %	4 (13)
2001	18	10,534	12,429	9.68 %	12 (24)
2002	6	2,165	3,045	2.31 %	12 (20)
2003	2	457	705	-2.26 %	7 (7)
2004	17	9,064	1,720	3.02 %	9 (25)
2005	42	27,002	1,783	6.58 %	6 (12)
2006	30	19,006	3,374	4.84 %	6 (13)
2007	49	18,516	1,960	5.35 %	6 (13)
2008	15	330	1,660	-5.09 %	4 (9)
2009	3	814	1,703	-2.98 %	3 (22)
2010	19	178,091	3,519	-4.37 %	12 (22)
2011	12	8,831	1,480	2.52 %	2 (10)
2012	3	2,337	1,643	-3.21 %	64 (54)
2013	12	9,422	2,161	18.18 %	13 (18)
2014	17	15,372	3,181	1.45 %	7 (8)
2015	8	8,188	2,353	-2.14 %	23 (31)
2016	5	1,232	3,960	16.50 %	9 (10)
Average	16.4	18,843	3,318	4.53 %	12 (18)
Sum	279	320,332	-	-	-

TABLE 2B: DESCRIPTION OF SWEDISH LISTINGS SAMPLE

The table describes annual listing characteristics for the Swedish listing market. Total proceeds describe the annual capital raised in connection to listings on Nasdaq Stockholm and Nordic Growth Market. Information about the characteristics of multiple listings prior to 2007 were unobtainable, likely resulting in total proceeds being understated from 2000-2007. The average market value is the average equity value for all companies going public within that year. The companies are valued at the first-day closing price. The average first-day returns show the average price increase from the IPO price to the closing price the first day of trading. Both median age and mean age are reported to control for outliers. All means and medians are based on the sample of listings containing information about each specific characteristic, not on the entire sample of listings.

Swedish listing characteristics

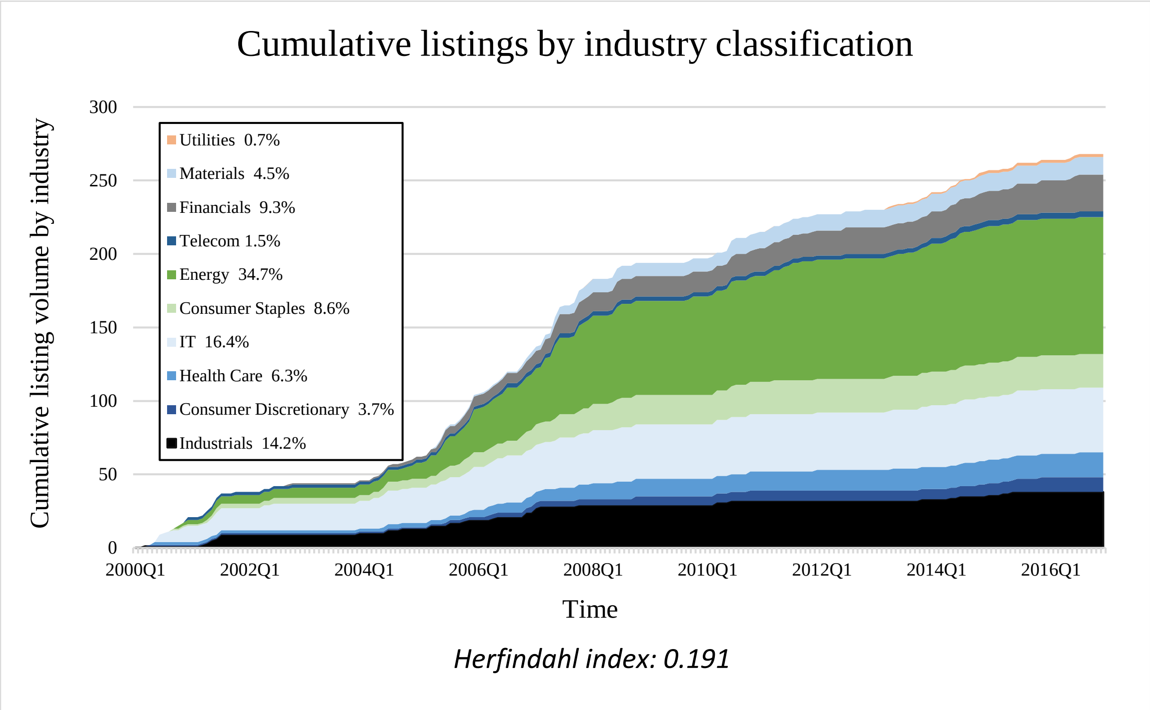
2000 - 2016

Year	Listings	Total Proceeds*	Average market value	Average first-day return	Age Median (Mean)
2000	46	21,543	23,294	30.62 %	9 (19)
2001	15	3,293	2,314	-1.41 %	14 (28)
2002	10	9,423	4,359	1.08 %	17 (35)
2003	5	-	1,114	N/A	9 (20)
2004	10	5,404	3,284	9.22 %	7 (12)
2005	17	11,149	4,538	-0.60 %	8 (14)
2006	18	15,632	3,566	4.57 %	16 (36)
2007	16	8,074	1,995	3.65 %	15 (24)
2008	9	124	25,294	-11.08 %	8 (14)
2009	5	-	1,113	N/A	9 (45)
2010	11	2,659	955	6.73 %	8 (12)
2011	8	1,830	2,319	-0.50 %	21 (37)
2012	5	-	2,056	N/A	16 (17)
2013	8	4,243	2,289	5.72 %	13 (33)
2014	19	26,440	4,093	8.81 %	28 (41)
2015	26	46,063	4,616	11.88 %	22 (36)
2016	18	19,782	3,588	14.99 %	17 (34)
Average	14	10,333	7,975	5.98 %	14 (27)
Sum	246	175,657	-	-	-

As anticipated, Norwegian listings (Figure 3a.) show higher industry concentration with a Herfindahl index (HI) of 0.191. Industrial and energy companies have dominated the Oslo Stock Exchange, representing 48.9% of total listings. Information technology (IT) companies also constitute a rather large fraction of the total listing volume, specifically 16.4% in the sample period. While most of the energy companies listed during the 2005 to 2008 period, the flow of IT companies has been quite steady throughout the sample period.

FIGURE 3A: CUMULATIVE NORWEGIAN LISTING VOLUME BY GICS INDUSTRY CLASS

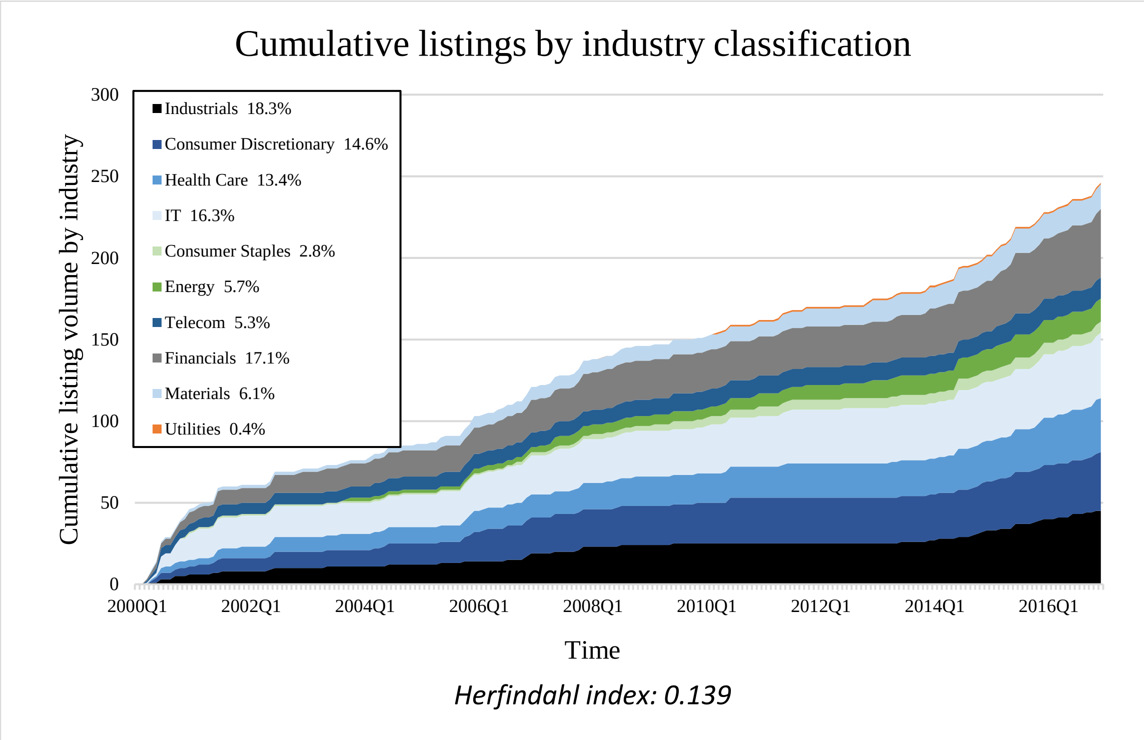
The graph shows the cumulative listing volume in the Norwegian market from 2000 to 2016, sorted by their GICS industry classification. The "Financials" category also includes real estate companies. The table describes the colour code for each industry and their percentage of the total listing volume throughout the sample. The Herfindahl index is used to measure the industry concentration in listing volume



The Swedish market (Figure 3b.) shows lower industry concentration (HI: 0.139) and the number of listings is more evenly distributed among industries. Swedish listing volume has a slightly higher fraction of high tech firms (e.g. IT, biotech and telecom). The percentage of IT stocks is similar across both markets. However, Nasdaq Stockholm has a higher concentration of health care and telecom companies. We also see a high fraction of consumer discretionary companies, mostly driven by a high number of retail companies. Both countries have a significant portion of real estate and financial companies, even after removing closed-end funds.

Figure 3b: Cumulative Swedish listing volume by GICS industry class

The graph shows the cumulative listing volume in the Swedish market from 2000 to 2016, sorted by their GICS industry classification. The "Financials" category also includes real estate companies. The table describes the colour code for each industry and their percentage of the total listing volume throughout the sample. The Herfindahl index is used to measure industry concentration.



4.5.2 Independent variables

Table 3a. and 3b. describe the proxy variables for Norway and Sweden respectively. The differences in the proxies reflect what we already know about the qualities of the individual stock markets. Norwegian listed companies are highly concentrated within oil and gas exploration and services. More comparable companies, should be reflected in lower uncertainty about EPS in Norway than in Sweden. The oil price has been remarkably high throughout our sample period, which we would expect to be reflected in high sales growth. This is not reflected in the mean. Since the Swedish data was collected directly from Thompson Reuters without controlling of mergers and acquisitions, sales growth has some major outliers. Median sales growth, rather than the mean is therefore used in the estimations. The market-to-book ratio in Sweden is higher than in the Norwegian sample. This is likely to be driven by, at least partially, that the Swedish equity market has a lower fraction of firms within industries that require large investments in tangible assets (e.g. energy, industrials and materials). Consistent with the stock market returns discussed in section three, Oslo Stock exchange has outperformed Nasdaq Stockholm in the sample period.

TABLE 3A. DESCRIPTIVE STATISTICS FOR NORWEGIAN PROXY VARIABLES

The table provides descriptive statistics for the quarterly time-varying proxies. Analyst dispersion is the average standard deviation of analyst EPS forecasts across Norwegian companies available in the I/B/E/S database. Quarterly sales growth is the quarterly change in sales for Norwegian listed companies obtained from SSB (from 2002Q2) and Eikon Thompson Reuters (from 2000Q2 to 2002Q1). Quarterly EW returns are compounded quarterly returns for the equally weighted Oslo Stock Exchange All Share index. CCI is the percentage point difference between positive and negative answers to the question "How do you expect the Norwegian economy to be in 12 months?" obtained from TNS Gallup and Finans Norge's Forbrukerbarometeret. M/B is the quarterly market to book ratio of Norwegian listed companies available in Datastream. Sales growth and EW returns are inflation adjusted.

	Norway 2000Q1 - 2016Q4				
	Analyst dispersion	Quarterly sales growth	Quarterly EW returns	CCI	M/B
Mean	0.46	0.01	0.04	2.39	2.38
Median	0.43	0.01	0.05	7.90	2.23
Maximum	1.30	0.14	0.28	36.80	3.94
Minimum	0.03	-0.19	-0.22	-52.20	1.07
Std. Dev.	0.23	0.06	0.10	19.08	0.71
Observations	68	67	68	68	68

TABLE 3B. DESCRIPTIVE STATISTICS FOR SWEDISH PROXY VARIABLES

The table provides descriptive statistics for the quarterly time-varying proxies. Analyst dispersion is the average standard deviation of analyst EPS forecasts across Swedish companies available in the I/B/E/S database. Quarterly sales growth is the quarterly change in sales for Swedish listed companies obtained from Eikon Thompson Reuters. Quarterly EW returns are compounded quarterly returns for the equally weighted Nasdaq Stockholm index. CCI is the "Makroindeks" obtained from the SCB's consumer confidence index. It measures Swedish consumers faith in the current and future (12 months) state of the economy and is standardized with a mean of 100 and a standard deviation of 10. M/B is the quarterly market to book ratio of Swedish listed companies available in Datastream. Sales growth and EW returns are inflation adjusted.

	Sweden 2000Q1 - 2016Q4				
	Analyst dispersion	Quarterly sales growth	Quarterly EW returns	CCI	M/B
Mean	0.67	0.02	0.01	99.20	3.31
Median	0.62	0.00	0.04	97.10	3.41
Maximum	1.41	0.21	0.21	121.60	5.66
Minimum	0.09	-0.12	-0.23	77.60	1.60
Std. Dev.	0.20	0.08	0.11	10.13	0.89
Observations	68	67	68	68	68

- Unadjusted listing volume. Listing volume deflated with real GDP the previous quarter will be used throughout the rest of the analysis.

From table 4a. and 4b. it is evident that there is considerable risk of multicollinearity problems. The stock market condition variables; *M/B* and *past* *returns*, contains high correlation with most of the other variables, especially the capital demands proxies and the investor sentiment proxies. Intuitively, this makes sense. Past returns and a high M/B can both represent increased investment opportunities and should therefore be related to the capital demands proxies. They can also be caused by increased optimism among investors, thereby having a high correlation with the investor sentiment proxies. Changes in the stock market variables could also be caused by unrelated factors such as changes in the market risk premium. The stock market variables are included in some of the regressions, but the reliability of the coefficients is evaluated in combination with variance ratio tests.

Both intuition and previous research suggests that capital demands should have an impact on listing volume. However, our original proxies, GDP growth and growth in investments, show a low correlation with listing volume while being highly correlated with other variables. In an attempt to find a better proxy for the capital demands of private firms, sales growth for public firms are used. The variable *Sales growth* has a higher correlation with Norwegian listings than the Swedish listings. However, it is worth noting that the proxies used here are seasonally adjusted in some form, while listing volume has only been deflated.

TABLE 4A. DESCRIPTIVE STATISTICS FOR UNADJUSTED LISTING VOLUME AND TIME-VARYING PROXY VARIABLES NORWAY

The table provides the correlation matrix for deflated listing volume and the proxies for capital demands, investor sentiment, information asymmetry and stock market variables (dummies for Axess, Q1 and Q3 are excluded).

Correlation matrix: Norway

	Listings	CCI	Future return	Sales growth	GDP growth	Inv. growth	Analyst dispersion	Past returns
Listings	1.000							
CCI	0.480	1.000						
Future return	-0.214	-0.274	1.000					
Sales growth	0.302	0.557	0.236	1.000				
GDP growth	0.052	0.075	0.486	0.355	1.000			
Inv. growth	0.171	0.331	0.409	0.505	0.443	1.000		
Analyst dispersion	-0.216	-0.316	0.237	0.125	0.169	0.075	1.000	
Past returns	0.477	0.510	0.046	0.648	0.288	0.535	0.011	1.000
M/B	0.515	0.519	-0.283	0.124	-0.066	0.336	-0.342	0.357

TABLE 4B. DESCRIPTIVE STATISTICS FOR UNADJUSTED LISTING VOLUME AND TIME-VARYING PROXY VARIABLES SWEDEN

The table provides the correlation matrix for deflated listing volume and the proxies for capital demands, investor sentiment, information asymmetry and stock market variables (dummies for NGM, Q1 and Q3 are excluded).

Correlation matrix: Sweden

	Listings	CCI	Future return	Sales growth	GDP growth	Inv. growth	Analyst dispersion	Past returns
Listings	1.000							
CCI	0.356	1.000						
Future return	-0.367	-0.504	1.000					
Sales growth	-0.027	0.215	0.395	1.000				
GDP growth	-0.035	0.130	0.381	0.560	1.000			
Inv. growth	-0.052	0.405	0.216	0.676	0.619	1.000		
Analyst dispersion	0.075	-0.028	-0.001	-0.213	0.118	-0.169	1.000	
Past returns	0.227	0.560	-0.046	0.636	0.462	0.655	-0.139	1.000
M/B	0.298	0.326	-0.367	-0.056	-0.145	0.048	-0.356	0.344

5.0 Empirical results

Multiple regressions are used to test each individual hypothesis. The sample for each country are treated individually. Table 5a. and 5b. show the regression outputs for Norway and Sweden respectively.

5.1 Empirical results: Norway

TABLE 5A. REGRESSION OUTPUTS FOR NORWEGIAN LISTING VOLUME

The following table shows the estimated parameters with GDP-deflated listing volume as the dependent variable.

	(1) All proxies	(2) No Axess or controls	(3) Investor sentiment	(4) Capital demands	(5) Information asymmetry
Constant	2.537	6.031***	5.192***	5.195***	1.148
	(1.580)	(1.176)	(0.583)	(0.879)	(1.331)
CCI	-0.004	0.0923**	0.119***		
	(0.032)	(0.041)	(0.026)		
Future return	-2.757*	-1.902	-1.111		
	(1.468)	(1.396)	(1.468)		
Future Sales	2.034	4.869		9.839***	
	(5.168)	(3.636)		(2.234)	
Analyst dispersion	-1.795	-1.716			-2.515**
	(1.471)	(1.592)			(1.085)
Q1 dummy	-3.328***	-2.983***	-2.964***	-3.033***	-3.172***
	(0.938)	(1.076)	(0.907)	(1.102)	(0.846)
Q3 dummy	-3.302***	-3.676***	-3.580***	-3.576***	-3.153***
	(0.924)	(1.065)	(0.906)	(1.184)	(0.919)
Secondary market dummy	-1.814***				
	(0.619)				
M/B	1.915**				1.868***
	(0.744)				(0.668)
Past return	3.617**				5.153***
	(1.660)				(1.239)
AR(1)	0.061	0.364***	0.405***	0.464***	0.179
	(0.158)	(0.133)	(0.121)	(0.123)	(0.148)
R2 without AR(1)	0.533852	0.368675	0.349006	0.230176	0.498112
R2 with AR(1)	0.517344	0.424494	0.445918	0.370786	0.506909
VIF >5	3	0	1	0	0
Obs.	63	63	67	63	67

The first column of table 5a. show all proxies regressed on the Norwegian listing volume. The only proxies showing statistical significance, is the future return proxy for investor sentiment, and the secondary market dummy representing the introduction and presence of a second fully regulated exchange. Both the magnitude and sign of the future returns coefficient shows economic significance.

Quite puzzling, the Oslo Axess dummy is significant at the 1% level, but shows a coefficient opposite of what our hypothesis predicted. Intuitively, this is likely due to the timing of the introduction of the second exchange. Oslo Axess was introduced in 2007, a period when both the index and the oil price were at high levels. The financial crisis of 2008/2009 and simultaneous drop in oil price is likely to have affected listing volume in the years that followed. There is no empirical evidence that the introduction of Oslo Axess led to any permanent increase in listing volume.

The hypothesis that seem to gain the most support is the investor sentiment hypothesis. The consumer confidence shows both statistical and economic significance in the second and third regression. Future return is only statistically significant at the 10% level in the first regression, but is of economic significance in all the regressions of which it is included.

The capital demands proxy, future sales growth, is only statistically significant in the fourth regression, but shows economic significance in all regressions where it is included. However, the other variables attempted as proxies (GDP growth and investment growth) showed a low correlation with listing volume, coefficients opposite of what was predicted and no statistical significance in any of the regression where they were included. This provided mixed support for the capital demands proxy. Sales growth typically leads to a need for more working capital, as well as increased capital expenditures. Including growth in capital expenditure as an additional proxy may provide additional information in future research. The strong statistical significance in the in fourth regression suggests that there may be a relation between capital demands and listing volume, but the conflicting results from the other attempted variables makes us unable to confidently conclude that there is a positive and significant relation between capital demands and listing volume.

The information asymmetry proxy, the average standard deviation of analyst EPS forecasts, is both of statistical and economic significance in the isolated regression (regression 5). Analyst dispersion is also economically significant, and have a sign consistent with the hypothesis in all regressions. The stock market variables are included as controls since these variables should not overlap with information asymmetry.

The stock market variables included in regression (1) are statistically significant at the 5% level. They are also of economic significance, with positive coefficients. Although this could show some support for both the investor sentiment and capital demands hypothesis, it is impossible to determine whether the positive effects steams from investor sentiment, capital demands or other unrelated reasons.

5.2 Empirical results: Sweden

TABLE 5B. REGRESSION OUTPUTS FOR SWEDISH LISTING VOLUME

The following table shows the estimated parameters with GDP-deflated listing volume as the dependent variable.

	(1) All proxies	(2) No NGM or controls	(3) Investor sentiment	(4) Capital demands	(5) Information asymmetry
Constant	1.640	-0.778	-6.712	4.049***	-2.480
	(5.094)	(4.606)	(6.188)	(0.566)	(1.925)
CCI	-0.010	0.043	0.114*		
	(0.045)	(0.047)	(0.068)		
Future return	-0.838	-2.832*	-1.683*		
	(1.878)	(1.688)	(0.876)		
Future Sales	3.034	0.662		-0.559	
	(3.914)	(3.817)		(2.922)	
Analyst dispersion	2.199	1.008			3.959**
	(1.496)	(1.419)			(1.891)
Q1	-1.927	-2.518***	-2.847***	-2.315***	-3.343***
	(1.789)	(0.666)	(0.831)	(0.683)	(0.915)
Q3	-1.337***	-2.880***	-3.414***	-2.957***	-3.299***
	(0.385)	(0.655)	(0.788)	(0.712)	(0.891)
Secondary market dummy	-3.187***				
	(1.082)				
M/B	-2.850***				1.305***
	(0.591)				(0.364)
Past return	-2.760***				2.396
	(0.609)				(1.755)
AR(1)	0.018	0.202**	0.219**	0.328***	0.239**
	(0.083)	(0.076)	(0.088)	(0.087)	(0.098)
R2 without AR(1)	0.512976	0.317477	0.306114	0.155788	0.308363
R2 with AR(1)	0.408553	0.342758	0.330574	0.35188	0.335519
VIF >5	4	4	0	0	0
Obs.	63	63	67	63	67

The empirical evidence for Swedish listing volume (Table 5b.) shows some of the same tendencies seen in the Norwegian market. The coefficient for the NGM dummy variable is negative and statistically significant at the 1% level. A reasonable explanation for this could be that NGM became a regulated exchange just a few years after the incredibly high listing volume seen in 2000 and 2001.

Regardless of this, the empirical results do not indicate an increase in listing volume following the introduction of a secondary regulated stock exchange.

Consistent with the findings in the Norwegian market, the empirical evidence offers some support for the investor sentiment proxies. Both the consumer confidence index and future returns are statistically significant at the 10% level in the third regression. Additionally, future returns are significant in the full regression without controls or the NGM dummy. The signs of the coefficients are consistent with the hypothesis in all regressions, except for CCI in the full regression. However, the p-value for the coefficient in the first regression is 0.829 (Appendix 3.3).

The aggregate capital demands proxy, future sales growth, is not statistically significant in any of the regressions, and shows only economic significance in the initial regression including all proxies and control variables. Combined with the somewhat conflicting support from the analysis of the Norwegian market, the regression offers no strong evidence that aggregate capital demand is a primary motivation behind the listing decision. Although this may seem surprising, Pagano et al. (1998) found similar results when analysing the Italian market using company specific information. The Norwegian stock market is dominated by companies that require larger investments in tangible assets, while the Swedish stock market has a more diversified industry composition. This may help explain why the aggregate capital demands proxy has more support in the regressions on Norwegian listing volume.

Quite surprisingly, the information asymmetry proxy, *analyst dispersion*, consistently show coefficients with positive signs (opposite of what was predicted) and is statistically significant at the 1% level in the fifth regression. We do not find any intuitive explanation for this, other than potential measurement errors in the data. EPS forecasts was the only data consistently available for both Swedish and Norwegian firms in the IBES database. Using earnings per share rather than earnings exposes the variable to the risk of including forecast deviations that are a result of e.g. share dilutions. The conflicting evidence does not allow us to confidently conclude that information asymmetry motivates the listing decision.

The stock market variables included in the first regressions are statistically significant at a 1 % level. However, the estimated coefficients are negative. The regression has four variance inflation factors above 5 (See appendix 3.3), suggesting high multicollinearity. As discussed earlier, multicollinearity problems can result in coefficients showing the wrong sign.

The first-order autoregressive terms for both Norway and Sweden are significantly lower than reported by both Lowry (2003) and Gao et al. (2013). Lowry reports AR(1) terms ranging from 0.79 – 0.85, while Gao et al. reports AR(1) terms between 0.32 – 0.53. The highest AR(1) term found in the Norwegian and Swedish regressions are 0.46 and 0.33 respectively. IPO volume simply seems to be less persistent in the Scandinavian countries the in the U.S. Some of the effect may be due to the large sample size used in the mentioned studies, or our inclusion of listings in general rather than only focusing on IPOs.

6.0 Conclusion

This thesis puts multiple theories about the drivers of listing volume to the test. We attempt to explain Norwegian and Swedish listing volume fluctuations from 2000-2016 using multiple time-varying proxies and dummy variables. By testing well-established IPO theories in two different markets, we strengthen the validity of our conclusions and highlight the differences between the American, Swedish and Norwegian listing environment.

All models are estimated using OLS. To ensure the robustness of our results, multiple tests are conducted to ensure stationarity, avoid multicollinearity and control for autocorrelation and heteroskedasticity. The base model is evaluated in comparison with multiple reduced forms of the model to reduce the effect from multicollinearity between the variables. This induces the risk of endogeneity problems, specifically the risk of omitting relevant variables in the reduced form. However, the results from the combined analysis of both countries and multiple regressions allow us to confidently conclude that investor sentiment is an important driver of listing volume fluctuations. Both markets consistently show economic and statistical significance of at least one of the investor sentiment proxies in each regression. Our results indicate that market timing, specifically listing when investor optimism is high, is an important motivation for companies considering a public listing.

The combined results from both markets, does not offer adequate support for the remaining hypothesises. Future sales growth is both of economic and statistical significance when looking at the Norwegian market isolated, but Swedish listing volume shows no significant link between future sales growth and the listing decision. Since future sales growth shows a negative coefficient in the capital demands regression for Sweden, further evidence is required to conclude that companies going public are motivated by a need for capital. The weak support for the aggregate capital demands hypothesis compared to similar studies in the U.S., can be caused by the fact that the study does not only focus on companies conducting an IPO, but also includes companies that go public without raising additional funds. The mere presence of companies that go public without raising new equity, typically from OTC to a regulated exchange, indicates that benefits not included in this study may play a role in explaining listing volume.

Similarly, the information asymmetry hypothesis receives mixed evidence. The information asymmetry proxy, analyst dispersion, shows statistical and economic significance when evaluated in isolation. However, the coefficient is positive in the regression for the Swedish market, indicating that higher adverse selection costs lead to an increase in listing volume. This puzzling result does not yield support for adverse selection cost hypothesis.

A considerable amount of IPO literature is based on theories of capital structure. The study, specifically the support for the investor sentiment hypothesis and the lacking evidence consistent with the capital demands hypothesis, suggests that the focus of future literature should not only be the attractiveness of public capital versus other sources of funding. The focus should rather be the trade-off between the costs and benefits of being a public versus private corporation.

7.0 Contribution to literature and suggestions for future research

This study highlights that there is still a lot unexplained in determining what drives listing volume fluctuations. By focusing on two economies that have not received much attention in IPO literature, we challenge well-established theories, while building stronger support for the investor sentiment explanation. In addition to focusing on two markets that have received little attention in IPO literature, we extend the analysis to include listings in general, instead of focusing on IPOs alone. Providing further evidence for the investor sentiment hypothesis also challenges the assumption of market efficiency, a key assumption in several financial models.

The different empirical evidence in the Norwegian and Swedish regressions may be influenced by differences in industry concentration. A natural next step is therefore to investigate how industry dynamics and company specific characteristics influences listing volume. The quarterly listing volume for each country is too low to study industry dynamics on a market-wide basis, but a study similar to Pagano et al. (1998) is feasible and likely to provide valuable insight. They investigate the listing decision based on the pool of private companies eligible for a public listing. A similar study would allow the researcher to observe how industry dynamics influence listing volume.

Bibliography

Acemoglu, D., & Scott, A. (1994). Consumer Confidence and Rational Expectations: Are Agents' Beliefs Consistent with the Theory? *The Economic Journal*, *104*(422), pp. 1-19. doi:10.2307/2234671.

AFME Finance for Europe (2015). Why equity markets matter, the heart of Europe's economy, December 2015. *Author.* Retrieved from https://www.afme.eu/.

Oslo Børs (2017). Avgifter gjeldende for utstedere på Oslo Børs og Oslo Axess. *Oslo Børs.* Retrieved from https://www.oslobors.no/.

Baker, M. and Wurgler, J. (2000). The Equity Share in New Issues and Aggregate Stock Returns. *The Journal of Finance, 55*(5), pp. 2219–2257. doi:10.1111/0022-1082.00285

Benveniste, L. M., Busaba, W. Y. (2002). Information Externalities and the Role of Underwriters in Primary Equity Markets. *Journal of Financial Intermediation, 11* (1), pp. 61-86. Doi: 10.1006/jfin.2000.0310.

Boström, E., Svensson, N. & Mannheimer Swartling Advokatbyrå (n.d). Equity Capital Markets in Sweden: Regulatory overview. *Thomson Reuters Practical Law.* Retrieved from https://uk.practicallaw.thomsonreuters.com/.

Bram, J. & Ludvigson, S. C. (1998). Does Consumer Confidence Forecast Household Expenditure? A Sentiment Index Horse Race. *Economic Policy Review, 4*(2), pp. 59-78. Retrieved from: https://ssrn.com/.

Brau, J. C., Ryan, P. A. and DeGraw, I. (2006). Initial Public Offerings: CFO Perceptions. *Financial Review, 41*(4), pp. 483–511. doi:10.1111/j.1540-6288.2006.00154.x.

Brooks, C. (2008). *Introductory Econometrics for Finance Second Edition*. New York, NY: Cambridge university press.

Börsregler REGLER FÖR BOLAG VARS AKTIER ÄR UPPTAGNA TILL HANDEL PÅ NGM EQUITY GÄLLANDE FRÅN OCH MED DEN 3 JULI 2016. *NGM.* Retrieved from http://www.ngm.se/.

Carroll, C., Fuhrer, J., & Wilcox, D. (1994). Does Consumer Sentiment Forecast Household Spending? If So, Why? *The American Economic Review, 84*(5), 1397-1408. Retrieved from http://www.jstor.org/.

Chemmanur, T. J. & Fulghieri, P. (1999). *A Theory of the Going-Public Decision. The Review of Financial Studies*, 12(2), pp. 249-279. doi: 10.1093/rfs/12.2.249

Continuing obligations of stock exchange listed companies (2017). *Oslo Børs.* Retrieved from https://www.oslobors.no/.

Dalhäll, A. (2017). Nordic Capital Markets Insights. *EY.* Retrieved from http://www.ey.com/.

Dambra, M., Field, L. C. & Gustafson, M. T. (2015). The JOBS Act and IPO volume: Evidence that disclosure costs affect the IPO decision. *Journal of Financial Economics, 116*(1), pp. 121-143. doi:10.1016/j.jfineco.2014.11.012.

Demiroglu, C. and Ryngaert, M. (2010). The First Analyst Coverage of Neglected Stocks. *Financial Management, 39*(2), pp. 555–584. doi:10.1111/j.1755-053X.2010.01084.x.

Directives and regulations. *Oslo Børs.* Retrieved from https://www.oslobors.no/.

Doidge, C., Karolyi, G. A. & Stulz, R. M. (2013). The U.S. left behind? Financial globalization and the rise of IPOs outside the U.S.. *Journal of Financial Economics, 110*(3), pp. 546-573. doi:10.1016/j.jfineco.2013.08.008.

Eikrem, P. (2007). Oslo Axess - ny markedsplass i sterk medvind. *MAGMA Econas tidskrift for Økonomi og Ledelse.* Retrieved from https://www.magma.no/.

European Commission (n.d.). FSAP Evaluation. *European Commission.* Retrieved from http://ec.europa.eu/.

François Haas (2007). The Markets in Financial Instruments Directive: Banking on Market and Supervisory Efficiency. *International Monetary fund. 07* (250), pp 1-19. Retrieved from https://www.imf.org/.

Fan, J., Titman, S., & Twite, G. (2012). An International Comparison of Capital Structure and Debt Maturity Choices. *Journal of Financial and*

Quantitative Analysis, *47* (1), pp. 23-56. Doi:10.1017/S0022109011000597.

Gajewski, J-F. & Gresse, C. (2006). A Survey of the European IPO Market. *CEPS ECMI Research Reports, 2. Retrieved from* http://aei.pitt.edu/.

Gao, X., Ritter, J., & Zhu, Z. (2013). Where Have All the IPOs Gone*? Journal of Financial and Quantitative Analysis, 48*(6), pp. 1663-1692. doi:10.1017/S0022109014000015

Grue, C. and Wikborg Rein & Co (n.d). Capital Markets: Norway. *Thomson Reuters Practical Law*. Retrieved from https://uk.practicallaw.thomsonreuters.com/.

Hans Lööf (2004). Dynamic optimal capital structure and technical change. *Structural Change and Economic Dynamics*. *15*(4), pp 449-451. Retrieved from http://www.sciencedirect.com/.

Helwege, J., & Liang, N. (2004). Initial Public Offerings in Hot and Cold Markets. *Journal of Financial and Quantitative Analysis, 39*(3), 541-569. doi:10.1017/S0022109000004026.

Ibbotson, R. G. & Jaffe, J. F. (1975), "HOT ISSUE" MARKETS. The Journal of Finance, 30: 1027–1042. doi:10.1111/j.1540-6261.1975.tb01019.x.

ILIEV, P. (2010). The Effect of SOX Section 404: Costs, Earnings Quality, and Stock Prices. *The Journal of Finance*, *65*(3), pp. 1163–1196. doi:10.1111/j.1540-6261.2010.01564.x.

Jain, B. A. and Kini, O. (2006). Industry clustering of initial public offerings. *Managerial and Decision Economics, 27*(1), pp. 1–20. doi:00310.1002/mde.1245

Korajczyk, R.A., Lucas, D. J. & McDonald, R. L. (1992). Equity Issues With Time-Varying Asymmetric Information. *Journal of Financial and Quantitative Analysis*, *27*(3), pp. 397-418. doi:10.3386/w3170.

Kwon, S., Lowry, M. & Qian, Y. (2017). Mutual Fund Investments in Private Firms. doi:10.2139/ssrn.2941203

Legal Affairs Oslo Børs (2000-2016). Circulars. *Oslo Børs*. Retrieved from https://www.oslobors.no/.

Lowry, M. (2003). Why does IPO volume fluctuate so much? *Journal of Financial Economics, 67*(1), pp 3-40. doi:10.1016/S0304-405X(02)00230-1.

Lowry, M., Michaely, R. & Volkova, E. (2017). Initial Public Offering: A Synthesis of the Literature and Directions for Future Research. Retrieved from https://papers.ssrn.com/.

Ludvigson, S. C. (2004). Consumer Confidence and Consumer Spending. *Journal of Economic Perspectives*, *18*(2), pp. 29-50. doi:10.1257/0895330041371222.

Maug, E. (2001). Ownership Structure and the Life-Cycle of the Firm: A Theory of the Decision to Go Public. *European Finance Review, 5*(3), pp. 167-200. doi: 10.1023/A:1013804026442

Myers, C. & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), pp. 187-221. doi:10.1016/0304-405X(84)90023-0.

Nasdaq (2017). Main Market (Prices in SEK exclusive of VAT) EQUITY ISSUERS ON NASDAQ STOCKHOLM. *Author.* Retrieved from http://business.nasdaq.com/.

Nasdaq (2016). Rule book for issuers Nasdaq Stockholm. *Author.* Retrieved from http://business.nasdaq.com/.

Nilsson, E. & Prior, C. (2003). Alternativa Marknadsplatser – har de spelat ut sin roll. *Lund University Library.* Retrieved from https://lup.lub.lu.se/.

Norges bank investment management (2016). The Listings Ecosystem: Aligning Incentives. *Author.* Retrieved from https://www.nbim.no/contentassets/8644909957dd46489e9d5711a2e6a3b8/nbim_assetmanagerperspective_1-16.pdf.

Næs, R., Skjeltorp, J. A. & Ødegaard, B. (2008). Liquidity at the Oslo Stock Exchange. *Norges bank.* Retrieved from http://finance.bi.no/~bernt/.

Oslo Børs (2017). Listing Rules for equities on Oslo Børs (2017). *Author.* Retrieved from https://www.oslobors.no/.

Oslo Børs (2017). Listing rules for equities on Oslo Axess. *Author.* Retrieved from https://www.oslobors.no/.

Pagano, M., Panetta, F. and Zingales, L. (1998), Why Do Companies Go Public? *An Empirical Analysis. The Journal of Finance, 53*(1), pp. 27–64. doi:10.1111/0022-1082.25448

Ritter, J. R. (1991). The Long-Run Performance of initial Public Offerings. *The Journal of Finance, 46*(1), pp. 3-27. doi:10.1111/j.1540-6261.1991.tb03743.x.

Ritter, J. R. (2003). Differences between European and American IPO Markets. *European Financial Management,* 9(4), pp. 421-434. doi: 10.1111/1468-036X.00230

Stadig lettere å slippe til på Oslo Børs (2005, October 16). *Dagensperspektiv.* Retrieved from http://www.dagensperspektiv.no/.

Stock Exchange Act, 74 Lovdata.no §§ 1 – 51 (2007)

Securities Trading Act, 75 Lovdata.no §§ 1-19

Thomson Reuters Practical Law (Maintained). Prospectus Directive. *Author.* Retrieved from https://uk.practicallaw.thomsonreuters.com/.

The European parliament and Council (2004). DIRECTIVE 2004/109/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of 15. December 2004 on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market and amending Directive 2001/34/EC. *Official journal of the European Union,* 390, pp. 38-57.

The European Parliament and Council (2004). DIRECTIVE 2004/39/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 april 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and DIRECTIVE 2000/12/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL and repealing Council Directive 93/22/EEC. *Official journal of the European Union,* 145, pp. 1-44.

The European Parliament and Council (2003). DIRECTIVE 2003/6/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 january

2003 on insider dealing and market manipulation (market abuse). *Official Journal of the European Union, 96, pp. 16-25.*

The European Parliament and Council (2003). DIRECTIVE 2003/71/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 November 2003 on the prospectus to be published when securities are offered to the public or admitted to trading and amending Directive 2001/34/EC. *Official journal of the European Union, 345, pp. 64-89.*

Timothy Edmonds (2016). Market Abuse Directive/Regulation. *House of Commons Library. SN03271, pp. 1-10.* Retrieved from http://researchbriefings.files.parliament.uk/.

Transparency directive. *European Securities and Market Authority. Retrieved from* https://www.esma.europa.eu/.

Ødegaard, B. A. (2017). Empirics of the Oslo Stock Exchange. Basic, descriptive, results 1980-2016. *University of Stavanger.* Retrieved from

Appendices

1.0 Summary of estimation output

1.1 Norway

Variable	Significance	(1)*	(2)*	(3)	(4)	(5)	(6)	(7)	(8)
	Economic	YES	YES	YES	YES	YES	YES	YES	YES
c	Statistical	NO	NO	1 %	NO	1 %	NO	1 %	NO
	Sign	-	-	-	-	-	-	-	-
	Economic	NO	NO	YES	YES	YES			
CCI	Statistical	NO	NO	5 %	5 %	1 %			
	Sign	NO (-)	YES (+)	YES (+)	YES (+)	YES (+)			
Future return	Economic	YES	YES	YES	NO	YES			
	Statistical	10 %	NO	NO	NO	NO			
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)			
Future Sales	Economic	YES	YES	YES			NO	YES	
	Statistical	NO	NO	NO			NO	1 %	
	Sign	YES (+)	YES (+)	YES (+)			YES (+)	YES (+)	
Analyst dispersion	Economic	YES	YES	YES					YES
	Statistical	NO	NO	NO					5 %
	Sign	YES (-)	YES (+)	YES (+)					YES (-)
Secondary market dummy	Economic	YES							
	Statistical	1 %							
	Sign	NO (-)							
	Economic	YES	YES	YES	YES	YES	YES	YES	YES
Q1	Statistical	1 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)
	Economic	YES	YES	YES	YES	YES	YES	YES	YES
Q3	Statistical	1 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)
	Economic	YES	YES		YES		YES		YES
M/B	Statistical	5 %	5 %		5 %		1 %		1 %
	Sign	YES (+)	YES (+)		YES (+)		YES (+)		YES
Past return	Economic	NO	NO		NO		YES		YES
	Statistical	5 %	1 %		1 %		1 %		1 %
	Sign	YES (+)	NO (-)		YES (+)		YES (+)		YES (-)
	Economic	YES	YES	YES	YES	YES	YES	YES	YES
AR(1)	Statistical	NO	NO	1 %	NO	1 %	NO	1 %	NO
	Sign	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)
R2	NO AR(1)	0.533852	0.499587	0.368675	0.496769	0.358199	0.491256	0.230176	0.498112

1.2 Sweden

Variable	Significance	(1)*	(2)*	(3)	(4)	(5)	(6)	(7)	(8)
c	Economic	YES	YES	YES	YES	YES	YES	YES	YES
	Statistical	NO	NO	NO	NO	NO	NO	1 %	NO
	Sign	-	-	-	-	-	-	-	-
CCI	Economic	YES	YES	YES	YES	YES			
	Statistical	NO	NO	NO	NO	10 %			
	Sign	NO (-)	YES (+)	YES (+)	YES (+)	YES (+)			
Future return	Economic	YES	YES	YES	NO	YES			
	Statistical	NO	NO	10 %	NO	10 %			
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)			
Future Sales	Economic	NO	NO	NO			YES	NO	
	Statistical	NO	NO	NO			NO	NO	
	Sign	YES (+)	YES (+)	YES (+)			NO (-)	NO (-)	
Analyst dispersion	Economic	YES	YES	YES					YES
	Statistical	NO	NO	NO					5 %
	Sign	NO (+)	NO (+)	NO (+)					NO (+)
Secondary market dummy	Economic	YES							
	Statistical	1 %							
	Sign	NO (-)							
Q1	Economic	YES	YES	YES	YES	YES	YES	YES	YES
	Statistical	1 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)
Q3	Economic	YES	YES	YES	YES	YES	YES	YES	YES
	Statistical	1 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %
	Sign	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)	YES (-)
M/B	Economic	YES	YES		YES		YES		YES
	Statistical	1 %	1 %		1 %		1 %		1 %
	Sign	YES (+)	YES (+)		YES (+)		YES (+)		YES
Past return	Economic	NO	NO		NO		YES		YES
	Statistical	1 %	NO		NO		NO		NO
	Sign	YES (+)	NO (-)		YES (+)		YES (+)		YES (-)
AR(1)	Economic	NO	YES	YES	YES	YES	YES	YES	YES
	Statistical	NO	NO	1 %	5 %	5 %	5 %	1 %	5 %
	Sign	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)	YES (+)
R2	NO AR(1)	0.51298	0.34272	0.3175	0.305	0.3061	0.25116	0.155788	0.308363

2.0 Eviews output Norway

2.1 Stationarity and unit root tests

Consistent with Gao et. al (2013), listing volume is deflated using real GDP. Two out of three tests (PP and KPSS vs ADF) indicate that the time-series is stationary. The GDP adjustment do not alter the results.

2.1.1 Unit root tests, unadjusted listing volume

Augmented Dickey Fuller test, unadjusted listing volume

Null Hypothesis: LISTINGS_UNSCALED has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.275338	0.1829
Test critical values:	1% level	-3.533204	
	5% level	-2.906210	
	10% level	-2.590628	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LISTINGS_UNSCALED)

Method: Least Squares

Date: 06/08/17 Time: 18:40

Sample (adjusted): 7 72

Included observations: 66 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS_UNSCALED(-1)	-0.273965	0.120406	-2.275338	0.0263
D(LISTINGS_UNSCALED(-1))	-0.600686	0.099507	-6.036620	0.0000
C	1.043761	0.651955	1.600972	0.1144

R-squared	0.593192	Mean dependent var	-0.106061
Adjusted R-squared	0.580278	S.D. dependent var	5.165354
S.E. of regression	3.346426	Akaike info criterion	5.298052
Sum squared resid	705.5095	Schwarz criterion	5.397581
Log likelihood	-171.8357	Hannan-Quinn criter.	5.337381
F-statistic	45.93214	Durbin-Watson stat	1.762413
Prob(F-statistic)	0.000000		

Kwiatkowski-Phillips-Schmidt-Shin stationarity test, unadjusted listing volume

Null Hypothesis: LISTINGS is stationary

Exogenous: Constant

Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.223394
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	18.20999
HAC corrected variance (Bartlett kernel)	48.80585

KPSS Test Equation

Dependent Variable: LISTINGS

Method: Least Squares

Date: 07/05/17 Time: 18:21

Sample (adjusted): 1 68

Included observations: 68 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.102941	0.521336	7.870056	0.0000

R-squared	0.000000	Mean dependent var	4.102941
Adjusted R-squared	0.000000	S.D. dependent var	4.299044
S.E. of regression	4.299044	Akaike info criterion	5.769259
Sum squared resid	1238.279	Schwarz criterion	5.801899
Log likelihood	-195.1548	Hannan-Quinn criter.	5.782192
Durbin-Watson stat	1.440709		

Phillips-Perron unit root test, unadjusted listing volume

Null Hypothesis: LISTINGS has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.378915	0.0000
Test critical values:	1% level	-3.531592	
	5% level	-2.905519	
	10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	16.96019
HAC corrected variance (Bartlett kernel)	22.13096

Phillips-Perron Test Equation

Dependent Variable: D(LISTINGS)

Method: Least Squares

Date: 07/05/17 Time: 18:22

Sample (adjusted): 2 68

Included observations: 67 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS(-1)	-0.726084	0.119291	-6.086672	0.0000
C	3.012708	0.711280	4.235614	0.0001

R-squared	0.363042	Mean dependent var	0.000000
Adjusted R-squared	0.353243	S.D. dependent var	5.199068
S.E. of regression	4.181153	Akaike info criterion	5.728447
Sum squared resid	1136.333	Schwarz criterion	5.794259
Log likelihood	-189.9030	Hannan-Quinn criter.	5.754489
F-statistic	37.04757	Durbin-Watson stat	2.279085
Prob(F-statistic)	0.000000		

2.1.2 Unit root tests, deflated listing volume

ADF unit root test, deflated listing volume

Null Hypothesis: LISTINGS_ADJ has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.246602	0.1923
Test critical values:	1% level	-3.533204	
	5% level	-2.906210	
	10% level	-2.590628	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LISTINGS_ADJ)

Method: Least Squares

Date: 07/05/17 Time: 18:19

Sample (adjusted): 3 68

Included observations: 66 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS_ADJ(-1)	-0.268642	0.119577	-2.246602	0.0282
D(LISTINGS_ADJ(-1))	-0.612108	0.098009	-6.245448	0.0000
C	0.913620	0.589356	1.550202	0.1261

R-squared	0.607567	Mean dependent var	-0.108783
Adjusted R-squared	0.595109	S.D. dependent var	4.765576
S.E. of regression	3.032386	Akaike info criterion	5.100966
Sum squared resid	579.3080	Schwarz criterion	5.200496
Log likelihood	-165.3319	Hannan-Quinn criter.	5.140295
F-statistic	48.76851	Durbin-Watson stat	1.760281
Prob(F-statistic)	0.000000		

KPSS stationarity test, deflated listing volume

Null Hypothesis: LISTINGS_ADJ is stationary

Exogenous: Constant

Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.268843
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	15.31654
HAC corrected variance (Bartlett kernel)	40.84081

KPSS Test Equation

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 07/05/17 Time: 18:18

Sample (adjusted): 1 68

Included observations: 68 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.727377	0.478127	7.795795	0.0000

R-squared	0.000000	Mean dependent var	3.727377
Adjusted R-squared	0.000000	S.D. dependent var	3.942733
S.E. of regression	3.942733	Akaike info criterion	5.596222
Sum squared resid	1041.524	Schwarz criterion	5.628862
Log likelihood	-189.2715	Hannan-Quinn criter.	5.609155
Durbin-Watson stat	1.465203		

PP unit root test, deflated listing volume

Null Hypothesis: LISTINGS_ADJ has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.471455	0.0000
Test critical values:	1% level	-3.531592	
	5% level	-2.905519	
	10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	14.37560
HAC corrected variance (Bartlett kernel)	19.06662

Phillips-Perron Test Equation

Dependent Variable: D(LISTINGS_ADJ)

Method: Least Squares

Date: 07/05/17 Time: 18:17

Sample (adjusted): 2 68

Included observations: 67 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS_ADJ(-1)	-0.738181	0.119770	-6.163311	0.0000
C	2.780844	0.652013	4.265015	0.0001

R-squared	0.368849	Mean dependent var	-0.002610
Adjusted R-squared	0.359139	S.D. dependent var	4.808522
S.E. of regression	3.849405	Akaike info criterion	5.563111
Sum squared resid	963.1650	Schwarz criterion	5.628922
Log likelihood	-184.3642	Hannan-Quinn criter.	5.589153
F-statistic	37.98641	Durbin-Watson stat	2.261425
Prob(F-statistic)	0.000000		

2.2 Autocorrelation

Date: 07/07/17 Time: 13:14

Sample: 1 69

Included observations: 68

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |** |	. |** |	1	0.272	0.272	5.2512	0.022
. |***** |	. |**** |	2	0.624	0.594	33.338	0.000
. |*. |	.*| . |	3	0.118	-0.188	34.350	0.000
. |*** |	. |*. |	4	0.418	0.103	47.346	0.000
. | . |	.*| . |	5	-0.004	-0.115	47.348	0.000
. |** |	. |*. |	6	0.295	0.076	54.040	0.000
.*| . |	.*| . |	7	-0.114	-0.143	55.058	0.000
. |*. |	.*| . |	8	0.125	-0.083	56.300	0.000
**| . |	.*| . |	9	-0.242	-0.127	61.015	0.000
. | . |	. | . |	10	0.011	-0.016	61.025	0.000
.*| . |	. |** |	11	-0.146	0.224	62.817	0.000
. |*. |	. |*. |	12	0.093	0.101	63.550	0.000
.*| . |	**| . |	13	-0.200	-0.241	67.028	0.000
. | . |	.*| . |	14	-0.027	-0.177	67.090	0.000
**| . |	. | . |	15	-0.243	-0.009	72.378	0.000
. | . |	. | . |	16	-0.048	0.058	72.586	0.000
**| . |	. | . |	17	-0.230	-0.062	77.510	0.000
. | . |	. | . |	18	0.018	0.061	77.542	0.000
**| . |	.*| . |	19	-0.244	-0.143	83.311	0.000
. | . |	. | . |	20	-0.021	0.019	83.355	0.000
**| . |	. | . |	21	-0.261	0.039	90.259	0.000
. | . |	. | . |	22	-0.012	-0.038	90.273	0.000
.*| . |	. | . |	23	-0.145	-0.003	92.490	0.000
. |*. |	. |*. |	24	0.116	0.095	93.934	0.000
.*| . |	. | . |	25	-0.130	-0.039	95.802	0.000
. |*. |	. |*. |	26	0.161	0.099	98.742	0.000
.*| . |	. | . |	27	-0.102	-0.030	99.947	0.000
. |*. |	.*| . |	28	0.114	-0.161	101.51	0.000

2.3 Estimation results

This section includes all estimated equations, both with and without the AR(1) terms. Additionally, we include the variance inflation factors for all estimated equations.

Full regression with AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:13
Sample (adjusted): 3 65
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.537421	1.580005	1.605957	0.1143
CCI	-0.004114	0.032097	-0.128181	0.8985
FUT_RET	-2.757116	1.467503	-1.878781	0.0659
FUTURE_SALES_G	2.034075	5.168408	0.393559	0.6955
ST_DEV_ANALYST	-1.795352	1.470610	-1.220822	0.2277
DUMMY_Q1	-3.328351	0.937511	-3.550201	0.0008
DUMMY_Q3	-3.301681	0.924317	-3.572024	0.0008
AXESS_DUMMY	-1.813731	0.618525	-2.932350	0.0050
MB	1.914733	0.744340	2.572391	0.0130
PAST_RET	3.617119	1.659667	2.179425	0.0339
RESID_FULL(-1)	0.061208	0.157632	0.388299	0.6994

R-squared	0.595192	Mean dependent var	3.815876
Adjusted R-squared	0.517344	S.D. dependent var	4.009322
S.E. of regression	2.785413	Akaike info criterion	5.043985
Sum squared resid	403.4434	Schwarz criterion	5.418183
Log likelihood	-147.8855	Hannan-Quinn criter.	5.191159
F-statistic	7.645595	Durbin-Watson stat	2.039012
Prob(F-statistic)	0.000000	Wald F-statistic	9.284175
Prob(Wald F-statistic)	0.000000		

Full regression without AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/16/17 Time: 21:02

Sample (adjusted): 2 65

Included observations: 64 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.435100	1.492345	1.631727	0.1086
CCI	-0.006605	0.027987	-0.236019	0.8143
FUT_RET	-2.779545	1.419378	-1.958284	0.0554
FUTURE_SALES_G	2.435422	4.536210	0.536885	0.5936
ST_DEV_ANALYST	-1.822701	1.463148	-1.245739	0.2182
DUMMY_Q1	-3.357109	0.810834	-4.140315	0.0001
DUMMY_Q3	-3.244166	0.865257	-3.749367	0.0004
AXESS_DUMMY	-1.787534	0.618963	-2.887949	0.0056
MB	1.962524	0.760639	2.580098	0.0126
PAST_RET	3.440359	1.630749	2.109680	0.0395

R-squared	0.600444	Mean dependent var	3.881328
Adjusted R-squared	0.533852	S.D. dependent var	4.011693
S.E. of regression	2.738986	Akaike info criterion	4.995654
Sum squared resid	405.1104	Schwarz criterion	5.332979
Log likelihood	-149.8609	Hannan-Quinn criter.	5.128543
F-statistic	9.016677	Durbin-Watson stat	1.889307
Prob(F-statistic)	0.000000	Wald F-statistic	10.63757
Prob(Wald F-statistic)	0.000000		

Variance inflation factors for full regression with AR(1)

Variance Inflation Factors
Date: 06/16/17 Time: 21:15
Sample: 1 69
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.496417	60.38242	NA
CCI	0.001030	6.935190	6.001190
FUT_RET	2.153564	2.856481	2.363133
FUTURE_SALES_G	26.71244	6.752152	6.242248
ST_DEV_ANALYST	2.162693	10.50309	1.805239
DUMMY_Q1	0.878926	4.285224	4.122162
DUMMY_Q3	0.854361	14.17498	6.727546
AXESS_DUMMY	0.382573	4.018586	1.359971
MB	0.554042	77.11843	4.221951
PAST_RET	2.754495	6.563598	3.666642
RESID_FULL(-1)	0.024848	2.957017	2.950739

Full regression without Axess dummy and AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:15
Sample (adjusted): 2 65
Included observations: 64 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.764390	1.743151	1.012184	0.3159
CCI	0.009279	0.027478	0.337676	0.7369
FUT_RET	-1.944969	1.227168	-1.584925	0.1187
FUTURE_SALES_G	3.490352	4.319929	0.807965	0.4226
ST_DEV_ANALYST	-1.949087	1.472464	-1.323691	0.1911
DUMMY_Q1	-3.332043	0.770262	-4.325855	0.0001
DUMMY_Q3	-3.235705	0.853866	-3.789475	0.0004
MB	1.709001	0.828073	2.063829	0.0438
PAST_RET	3.928919	1.521990	2.581435	0.0125

R-squared	0.563131	Mean dependent var	3.881328
Adjusted R-squared	0.499587	S.D. dependent var	4.011693
S.E. of regression	2.837867	Akaike info criterion	5.053683
Sum squared resid	442.9419	Schwarz criterion	5.357276
Log likelihood	-152.7178	Hannan-Quinn criter.	5.173283
F-statistic	8.861999	Durbin-Watson stat	1.684544
Prob(F-statistic)	0.000000	Wald F-statistic	14.47120
Prob(Wald F-statistic)	0.000000		

Full regression without Axess dummy, with AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/16/17 Time: 21:16

Sample (adjusted): 3 65

Included observations: 63 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.680111	1.715145	0.979574	0.3317
CCI	0.019424	0.030239	0.642366	0.5234
FUT_RET	-1.684825	1.174618	-1.434361	0.1573
FUTURE_SALES_G	1.922979	4.576437	0.420191	0.6760
ST_DEV_ANALYST	-1.666345	1.422256	-1.171621	0.2466
DUMMY_Q1	-3.189410	0.957808	-3.329905	0.0016
DUMMY_Q3	-3.338605	0.986500	-3.384293	0.0013
MB	1.646425	0.747825	2.201620	0.0321
PAST_RET	4.303944	1.458582	2.950773	0.0047
RESID_FULL_NOAXESS(-1)	0.176675	0.165800	1.065593	0.2914

R-squared	0.567914	Mean dependent var	3.815876
Adjusted R-squared	0.494541	S.D. dependent var	4.009322
S.E. of regression	2.850454	Akaike info criterion	5.077451
Sum squared resid	430.6296	Schwarz criterion	5.417631
Log likelihood	-149.9397	Hannan-Quinn criter.	5.211245
F-statistic	7.740080	Durbin-Watson stat	2.133590
Prob(F-statistic)	0.000000	Wald F-statistic	15.52357
Prob(Wald F-statistic)	0.000000		

Variance inflation factors for full regression with AR(1), without Axess dummy

Variance Inflation Factors

Date: 06/16/17 Time: 21:21

Sample: 1 69

Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.941722	80.12180	NA
CCI	0.000914	6.917942	6.910623
FUT_RET	1.379726	2.644982	2.164871
FUTURE_SALES_G	20.94378	5.112038	4.956882
ST_DEV_ANALYST	2.022812	15.28894	2.271271
DUMMY_Q1	0.917396	5.480731	4.508270
DUMMY_Q3	0.973182	11.22025	5.674944
MB	0.559241	80.83453	5.031302
PAST_RET	2.127461	7.994924	5.302839
RESID_FULL_NOAXESS (-1)	0.027490	3.589728	3.580569

Full regression without stock market variables, Axess dummy and AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/16/17 Time: 21:22

Sample (adjusted): 2 65

Included observations: 64 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.495360	1.242688	5.226862	0.0000
CCI	0.076440	0.049418	1.546811	0.1274
FUT_RET	-2.400695	1.733917	-1.384550	0.1716
FUTURE_SALES_G	6.564861	3.938031	1.667042	0.1010
ST_DEV_ANALYST	-2.594487	1.837946	-1.411623	0.1635
DUMMY_Q1	-3.275604	0.767968	-4.265288	0.0001
DUMMY_Q3	-3.374348	0.798175	-4.227578	0.0001

R-squared	0.428802	Mean dependent var	3.881328
Adjusted R-squared	0.368675	S.D. dependent var	4.011693
S.E. of regression	3.187528	Akaike info criterion	5.259287
Sum squared resid	579.1392	Schwarz criterion	5.495415
Log likelihood	-161.2972	Hannan-Quinn criter.	5.352309
F-statistic	7.131700	Durbin-Watson stat	1.317621
Prob(F-statistic)	0.000011	Wald F-statistic	6.296888
Prob(Wald F-statistic)	0.000040		

Full regression without stock market variables, Axess dummy, with AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/16/17 Time: 21:23

Sample (adjusted): 3 65

Included observations: 63 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.030585	1.175859	5.128661	0.0000
CCI	0.092765	0.040547	2.287839	0.0260
FUT_RET	-1.901907	1.396406	-1.362001	0.1787
FUTURE_SALES_G	4.869122	3.636240	1.339054	0.1861
ST_DEV_ANALYST	-1.715683	1.592454	-1.077383	0.2860
DUMMY_Q1	-2.983369	1.076279	-2.771929	0.0076
DUMMY_Q3	-3.675510	1.064669	-3.452254	0.0011
RESID_FULL_NOAXESSCONT(-1)	0.364495	0.133021	2.740135	0.0083

R-squared	0.489470	Mean dependent var	3.815876
Adjusted R-squared	0.424494	S.D. dependent var	4.009322
S.E. of regression	3.041557	Akaike info criterion	5.180783
Sum squared resid	508.8089	Schwarz criterion	5.452927
Log likelihood	-155.1947	Hannan-Quinn criter.	5.287819
F-statistic	7.533027	Durbin-Watson stat	2.285245
Prob(F-statistic)	0.000002	Wald F-statistic	7.461908
Prob(Wald F-statistic)	0.000003		

Variance inflation factors for full regression with AR(1), without market variables and Axess dummy.

Variance Inflation Factors
Date: 06/16/17 Time: 21:27
Sample: 1 69
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.382645	47.94180	NA
CCI	0.001644	3.782964	2.814987
FUT_RET	1.949949	4.546468	1.631593
FUTURE_SALES_G	13.22224	2.673216	2.500730
ST_DEV_ANALYST	2.535909	13.74978	1.407998
DUMMY_Q1	1.158377	15.10247	4.987981
DUMMY_Q3	1.133521	9.579134	4.371544
RESID_FULL_NOAXESS CONT(-1)	0.017695	4.637833	2.509878

Regression with investor sentiment proxies and stock market variables, without AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/17/17 Time: 16:31
Sample (adjusted): 1 66
Included observations: 66 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.443517	1.438116	0.308401	0.7589
CCI	0.035845	0.030734	1.166321	0.2482
FUT_RET	-1.432150	1.438532	-0.995563	0.3235
MB	1.843167	0.564819	3.263285	0.0018
PAST_RET	3.940895	1.481179	2.660647	0.0100
DUMMY_Q1	-3.363123	0.835397	-4.025778	0.0002
DUMMY_Q3	-3.195379	0.854151	-3.741000	0.0004

R-squared	0.549414	Mean dependent var	3.815682
Adjusted R-squared	0.503592	S.D. dependent var	3.969162
S.E. of regression	2.796521	Akaike info criterion	4.994633
Sum squared resid	461.4112	Schwarz criterion	5.226869
Log likelihood	-157.8229	Hannan-Quinn criter.	5.086401
F-statistic	11.99012	Durbin-Watson stat	1.615028
Prob(F-statistic)	0.000000		

Regression with investor sentiment proxies, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/17/17 Time: 16:32

Sample (adjusted): 2 66

Included observations: 65 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.758029	1.446780	0.523942	0.6024
CCI	0.038348	0.030499	1.257353	0.2138
FUT_RET	-1.518847	1.430409	-1.061827	0.2928
MB	1.678776	0.573782	2.925808	0.0049
PAST_RET	4.410222	1.508502	2.923577	0.0050
DUMMY_Q1	-3.103642	0.846765	-3.665293	0.0005
DUMMY_Q3	-3.291181	0.848156	-3.880398	0.0003
RESID_IS_FULL_NEW(-1)	0.196172	0.130510	1.503120	0.1383

R-squared	0.569803	Mean dependent var	3.859000
Adjusted R-squared	0.516971	S.D. dependent var	3.984297
S.E. of regression	2.769097	Akaike info criterion	4.989737
Sum squared resid	437.0702	Schwarz criterion	5.257354
Log likelihood	-154.1665	Hannan-Quinn criter.	5.095329
F-statistic	10.78533	Durbin-Watson stat	2.134315
Prob(F-statistic)	0.000000		

Variance inflation factors for regression with investor sentiment proxies, stock market variables and AR(1)

Variance Inflation Factors

Date: 06/17/17 Time: 16:32

Sample: 1 69

Included observations: 65

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.093171	17.74360	NA
CCI	0.000930	1.761642	1.640668
FUT_RET	2.046071	1.602857	1.181968
MB	0.329226	17.40675	1.442900
PAST_RET	2.275578	1.971428	1.419417
DUMMY_Q1	0.717011	1.496131	1.127853
DUMMY_Q3	0.719368	1.501048	1.131559
RESID_IS_FULL_NEW(-1)	0.017033	1.024910	1.024910

Regression with investor sentiment proxies, without stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/17/17 Time: 16:33
Sample (adjusted): 1 66
Included observations: 66 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.262723	0.629340	8.362285	0.0000
CCI	0.117033	0.028441	4.114967	0.0001
FUT_RET	-1.510137	1.579467	-0.956105	0.3428
DUMMY_Q1	-3.375488	0.956284	-3.529797	0.0008
DUMMY_Q3	-3.400841	0.976616	-3.482270	0.0009

R-squared	0.389067	Mean dependent var	3.815682
Adjusted R-squared	0.349006	S.D. dependent var	3.969162
S.E. of regression	3.202487	Akaike info criterion	5.238467
Sum squared resid	625.6112	Schwarz criterion	5.404349
Log likelihood	-167.8694	Hannan-Quinn criter.	5.304015
F-statistic	9.711822	Durbin-Watson stat	1.199646
Prob(F-statistic)	0.000004		

Regression with investor sentiment proxies and AR(1), without stock market variables

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/17/17 Time: 16:34
Sample (adjusted): 2 66
Included observations: 65 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.191753	0.583192	8.902307	0.0000
CCI	0.119410	0.026487	4.508180	0.0000
FUT_RET	-1.110883	1.467758	-0.756857	0.4521
DUMMY_Q1	-2.964119	0.906684	-3.269188	0.0018
DUMMY_Q3	-3.579512	0.905937	-3.951173	0.0002
RESID_IS_NEW_NOCONT(-1)	0.404584	0.120616	3.354315	0.0014

R-squared	0.489205	Mean dependent var	3.859000
Adjusted R-squared	0.445918	S.D. dependent var	3.984297
S.E. of regression	2.965780	Akaike info criterion	5.099923
Sum squared resid	518.9552	Schwarz criterion	5.300635
Log likelihood	-159.7475	Hannan-Quinn criter.	5.179117
F-statistic	11.30125	Durbin-Watson stat	2.326259
Prob(F-statistic)	0.000000		

Variance inflation factors for regression with investor sentiment proxies and AR(1), without stock market variables.

Variance Inflation Factors
Date: 06/17/17 Time: 16:46
Sample: 1 69
Included observations: 65

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.340113	2.513381	NA
CCI	0.000702	1.158325	1.078781
FUT_RET	2.154315	1.471234	1.084908
DUMMY_Q1	0.822076	1.495388	1.127292
DUMMY_Q3	0.820721	1.492924	1.125435
RESID_IS_NEW_NOCON T(-1)	0.014548	1.022874	1.022691

Regression with capital demands proxy and stock market variables, without AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:37
Sample (adjusted): 2 65
Included observations: 64 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.605382	1.338937	-0.452136	0.6529
FUTURE_SALES_G	2.301786	3.462975	0.664685	0.5089
DUMMY_Q1	-3.296444	0.744665	-4.426745	0.0000
DUMMY_Q3	-3.181332	0.857802	-3.708700	0.0005
MB	2.235532	0.816185	2.739003	0.0082
PAST_RET	3.929172	1.521708	2.582080	0.0124

R-squared	0.531632	Mean dependent var	3.881328
Adjusted R-squared	0.491256	S.D. dependent var	4.011693
S.E. of regression	2.861392	Akaike info criterion	5.029554
Sum squared resid	474.8789	Schwarz criterion	5.231949
Log likelihood	-154.9457	Hannan-Quinn criter.	5.109287
F-statistic	13.16687	Durbin-Watson stat	1.587077
Prob(F-statistic)	0.000000	Wald F-statistic	18.27239
Prob(Wald F-statistic)	0.000000		

Regression with capital demands proxy, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:38
Sample (adjusted): 3 65
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.644573	1.142802	-0.564029	0.5750
FUTURE_SALES_G	1.182449	3.101277	0.381278	0.7044
DUMMY_Q1	-3.147732	0.910948	-3.455446	0.0011
DUMMY_Q3	-3.230923	1.013243	-3.188696	0.0023
MB	2.212555	0.694114	3.187596	0.0023
PAST_RET	4.431779	1.408684	3.146042	0.0026
RESID_CP(-1)	0.216677	0.160714	1.348213	0.1830

R-squared	0.546040	Mean dependent var	3.815876
Adjusted R-squared	0.497401	S.D. dependent var	4.009322
S.E. of regression	2.842377	Akaike info criterion	5.031597
Sum squared resid	452.4298	Schwarz criterion	5.269723
Log likelihood	-151.4953	Hannan-Quinn criter.	5.125253
F-statistic	11.22647	Durbin-Watson stat	2.187282
Prob(F-statistic)	0.000000	Wald F-statistic	19.96046
Prob(Wald F-statistic)	0.000000		

Variance inflation factors for regression with capital demand proxy, stock market variables and AR(1)

Variance Inflation Factors
Date: 06/16/17 Time: 21:40
Sample: 1 69
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.305996	21.38094	NA
FUTURE_SALES_G	9.617921	2.234157	2.038650
DUMMY_Q1	0.829827	4.478196	3.707923
DUMMY_Q3	1.026661	9.179808	5.881455
MB	0.481794	44.83562	4.368352
PAST_RET	1.984390	5.200800	3.598789
RESID_CP(-1)	0.025829	1.697332	1.686365

Regression with capital demands proxy, without stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ

Method: Least Squares

Date: 06/16/17 Time: 21:41

Sample (adjusted): 2 65

Included observations: 64 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.247100	0.962331	5.452491	0.0000
FUTURE_SALES_G	9.146565	3.182376	2.874131	0.0056
DUMMY_Q1	-3.333980	0.754120	-4.421021	0.0000
DUMMY_Q3	-3.334452	0.843984	-3.950846	0.0002

R-squared	0.266834	Mean dependent var	3.881328
Adjusted R-squared	0.230176	S.D. dependent var	4.011693
S.E. of regression	3.519844	Akaike info criterion	5.415172
Sum squared resid	743.3582	Schwarz criterion	5.550102
Log likelihood	-169.2855	Hannan-Quinn criter.	5.468328
F-statistic	7.278962	Durbin-Watson stat	1.088740
Prob(F-statistic)	0.000305	Wald F-statistic	7.503565
Prob(Wald F-statistic)	0.000241		

Regression with capital demands proxy and AR(1), without stock market variables

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:42
Sample (adjusted): 3 65
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.194666	0.878530	5.912905	0.0000
FUTURE_SALES_G	9.838586	2.233957	4.404108	0.0000
DUMMY_Q1	-3.032981	1.102001	-2.752249	0.0079
DUMMY_Q3	-3.575667	1.184839	-3.017850	0.0038
RESID_CP_NOCONT(-1)	0.463756	0.122861	3.774632	0.0004

R-squared	0.411380	Mean dependent var	3.815876
Adjusted R-squared	0.370786	S.D. dependent var	4.009322
S.E. of regression	3.180315	Akaike info criterion	5.227876
Sum squared resid	586.6355	Schwarz criterion	5.397966
Log likelihood	-159.6781	Hannan-Quinn criter.	5.294773
F-statistic	10.13390	Durbin-Watson stat	2.411893
Prob(F-statistic)	0.000003	Wald F-statistic	11.63341
Prob(Wald F-statistic)	0.000001		

Variance inflation factors for regression with capital demands proxy and AR(1), without stock market variables

Variance Inflation Factors
Date: 06/16/17 Time: 21:43
Sample: 1 69
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.771816	20.46282	NA
FUTURE_SALES_G	4.990562	1.151337	1.150673
DUMMY_Q1	1.214406	11.64069	4.048264
DUMMY_Q3	1.403844	7.878820	4.181519
RESID_CP_NOCONT(-1)	0.015095	2.765412	1.926608

Regression with information asymmetry proxies and stock market variables, without AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:44
Sample (adjusted): 1 68
Included observations: 68 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.966053	1.440521	0.670628	0.5049
ST_DEV_ANALYST	-2.516537	1.182157	-2.128768	0.0373
DUMMY_Q1	-3.421593	0.723273	-4.730710	0.0000
DUMMY_Q3	-3.028214	0.802452	-3.773699	0.0004
MB	1.978255	0.753826	2.624286	0.0109
PAST_RET	4.698883	1.281408	3.666968	0.0005

R-squared	0.535566	Mean dependent var	3.727377
Adjusted R-squared	0.498112	S.D. dependent var	3.942733
S.E. of regression	2.793191	Akaike info criterion	4.976344
Sum squared resid	483.7188	Schwarz criterion	5.172183
Log likelihood	-163.1957	Hannan-Quinn criter.	5.053941
F-statistic	14.29919	Durbin-Watson stat	1.639268
Prob(F-statistic)	0.000000	Wald F-statistic	16.14947
Prob(Wald F-statistic)	0.000000		

Regression with information asymmetry proxies, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:45
Sample (adjusted): 2 68
Included observations: 67 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.148153	1.331004	0.862622	0.3918
ST_DEV_ANALYST	-2.515336	1.084934	-2.318424	0.0239
DUMMY_Q1	-3.171871	0.846180	-3.748457	0.0004
DUMMY_Q3	-3.153443	0.919402	-3.429883	0.0011
MB	1.868128	0.667853	2.797216	0.0069
PAST_RET	5.153187	1.238683	4.160216	0.0001
RESID_AD(-1)	0.178782	0.148172	1.206584	0.2323

R-squared	0.551736	Mean dependent var	3.768084
Adjusted R-squared	0.506909	S.D. dependent var	3.958066
S.E. of regression	2.779370	Akaike info criterion	4.980933
Sum squared resid	463.4939	Schwarz criterion	5.211274
Log likelihood	-159.8613	Hannan-Quinn criter.	5.072080
F-statistic	12.30827	Durbin-Watson stat	2.096498
Prob(F-statistic)	0.000000	Wald F-statistic	17.81674
Prob(Wald F-statistic)	0.000000		

Variance inflation factors with information asymmetry proxies, stock market variables and AR(1)

Variance Inflation Factors
Date: 06/16/17 Time: 21:46
Sample: 1 69
Included observations: 67

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.771571	33.12664	NA
ST_DEV_ANALYST	1.177081	5.972127	1.209482
DUMMY_Q1	0.716021	4.074718	3.627139
DUMMY_Q3	0.845301	9.631092	5.279508
MB	0.446027	47.54026	4.043015
PAST_RET	1.534334	3.746822	2.389109
RESID_AD(-1)	0.021955	1.813566	1.806584

Regression with information asymmetry proxies, without stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:47
Sample (adjusted): 1 68
Included observations: 68 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.543591	1.750586	4.309179	0.0001
ST_DEV_ANALYST	-4.667591	2.214341	-2.107891	0.0390
DUMMY_Q1	-3.546215	0.795235	-4.459331	0.0000
DUMMY_Q3	-3.185243	0.801204	-3.975572	0.0002

R-squared	0.240701	Mean dependent var	3.727377
Adjusted R-squared	0.205109	S.D. dependent var	3.942733
S.E. of regression	3.515208	Akaike info criterion	5.409097
Sum squared resid	790.8282	Schwarz criterion	5.539656
Log likelihood	-179.9093	Hannan-Quinn criter.	5.460829
F-statistic	6.762767	Durbin-Watson stat	1.142981
Prob(F-statistic)	0.000494	Wald F-statistic	6.877314
Prob(Wald F-statistic)	0.000436		

Regression with information asymmetry proxies and AR(1), without stock market variables

Dependent Variable: LISTINGS_ADJ
Method: Least Squares
Date: 06/16/17 Time: 21:48
Sample (adjusted): 3 66
Included observations: 64 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.460347	1.431161	4.514060	0.0000
ST_DEV_ANALYST	-2.290781	1.610316	-1.422565	0.1601
DUMMY_Q1	-3.137882	1.051377	-2.984545	0.0041
DUMMY_Q3	-3.386373	1.098619	-3.082391	0.0031
RESID_CP_NOCONT(-1)	0.390064	0.122165	3.192933	0.0023

R-squared	0.321391	Mean dependent var	3.794222
Adjusted R-squared	0.275383	S.D. dependent var	3.981145
S.E. of regression	3.388927	Akaike info criterion	5.353808
Sum squared resid	677.6046	Schwarz criterion	5.522471
Log likelihood	-166.3219	Hannan-Quinn criter.	5.420253
F-statistic	6.985631	Durbin-Watson stat	1.898153
Prob(F-statistic)	0.000113	Wald F-statistic	5.863540
Prob(Wald F-statistic)	0.000484		

Variance inflation factors for regression with information asymmetry proxies and AR(1), without stock market variables

Variance Inflation Factors
Date: 06/16/17 Time: 21:48
Sample: 1 69
Included observations: 64

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.048222	27.82836	NA
ST_DEV_ANALYST	2.593119	7.467632	1.325913
DUMMY_Q1	1.105394	5.437755	3.531036
DUMMY_Q3	1.206963	9.207957	4.130732
RESID_CP_NOCONT(-1)	0.014924	1.909539	1.740675

3.0 Eviews output Sweden

3.1 Unit root and stationarity tests

3.1.1 Unit root tests, unadjusted listing volume

Augmented dickey fuller test, unadjusted listing volume

Null Hypothesis: LISTINGS has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.079631	0.0020
Test critical values:	1% level	-3.536587	
	5% level	-2.907660	
	10% level	-2.591396	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LISTINGS)

Method: Least Squares

Date: 06/12/17 Time: 10:43

Sample (adjusted): 5 68

Included observations: 64 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS(-1)	-0.652266	0.159884	-4.079631	0.0001
D(LISTINGS(-1))	-0.482097	0.138735	-3.474948	0.0010
D(LISTINGS(-2))	-0.266662	0.136046	-1.960087	0.0547
D(LISTINGS(-3))	-0.272850	0.096201	-2.836261	0.0062
C	1.894305	0.622803	3.041579	0.0035

R-squared	0.715132	Mean dependent var	-0.046875
Adjusted R-squared	0.695819	S.D. dependent var	4.788974
S.E. of regression	2.641243	Akaike info criterion	4.855280
Sum squared resid	411.5936	Schwarz criterion	5.023943
Log likelihood	-150.3690	Hannan-Quinn criter.	4.921725
F-statistic	37.02844	Durbin-Watson stat	1.769313
Prob(F-statistic)	0.000000		

Kwiatkowski-Phillips-Schmidt-Shin stationarity test, unadjusted listing volume

Null Hypothesis: LISTINGS is stationary

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.210239
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	15.70675
HAC corrected variance (Bartlett kernel)	21.93064

KPSS Test Equation

Dependent Variable: LISTINGS

Method: Least Squares

Date: 06/12/17 Time: 10:43

Sample (adjusted): 1 68

Included observations: 68 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.617647	0.484179	7.471718	0.0000

R-squared	0.000000	Mean dependent var	3.617647
Adjusted R-squared	0.000000	S.D. dependent var	3.992640
S.E. of regression	3.992640	Akaike info criterion	5.621379
Sum squared resid	1068.059	Schwarz criterion	5.654019
Log likelihood	-190.1269	Hannan-Quinn criter.	5.634312
Durbin-Watson stat	1.953076		

Phillips-Perron unit root test, unadjusted listing volume

Null Hypothesis: LISTINGS has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.052738	0.0000
Test critical values:	1% level	-3.531592	
	5% level	-2.905519	
	10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	15.93383
HAC corrected variance (Bartlett kernel)	22.22081

Phillips-Perron Test Equation

Dependent Variable: D(LISTINGS)

Method: Least Squares

Date: 06/12/17 Time: 10:42

Sample (adjusted): 2 68

Included observations: 67 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LISTINGS(-1)	-0.989955	0.125749	-7.872466	0.0000
C	3.591335	0.665579	5.395806	0.0000

R-squared	0.488091	Mean dependent var	0.089552
Adjusted R-squared	0.480216	S.D. dependent var	5.621203
S.E. of regression	4.052666	Akaike info criterion	5.666023
Sum squared resid	1067.567	Schwarz criterion	5.731835
Log likelihood	-187.8118	Hannan-Quinn criter.	5.692065
F-statistic	61.97573	Durbin-Watson stat	1.606298
Prob(F-statistic)	0.000000		

3.2 Autocorrelation listings

Date: 06/12/17 Time: 11:08

Sample: 1 69

Included observations: 68

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |*. |	. |*. |	1	0.085	0.085	0.5152	0.473
. |*** |	. |*** |	2	0.400	0.396	12.063	0.002
. | . |	.*| . |	3	-0.020	-0.088	12.090	0.007
. |** |	. |*. |	4	0.319	0.202	19.638	0.001
.*| . |	**| . |	5	-0.166	-0.211	21.725	0.001
. |*. |	. | . |	6	0.117	-0.034	22.778	0.001
.*| . |	. | . |	7	-0.118	0.025	23.857	0.001
. |*. |	. |*. |	8	0.161	0.089	25.922	0.001
.*| . |	.*| . |	9	-0.191	-0.112	28.851	0.001
. | . |	.*| . |	10	0.027	-0.084	28.910	0.001
.*| . |	. | . |	11	-0.155	-0.028	30.921	0.001
. | . |	. | . |	12	0.002	-0.051	30.921	0.002
.*| . |	. | . |	13	-0.134	0.050	32.477	0.002
. |*. |	. |*. |	14	0.074	0.084	32.963	0.003
.*| . |	.*| . |	15	-0.118	-0.092	34.216	0.003
. | . |	. | . |	16	0.022	-0.054	34.260	0.005
.*| . |	.*| . |	17	-0.167	-0.101	36.853	0.004
. |*. |	. |*. |	18	0.078	0.086	37.439	0.005
.*| . |	.*| . |	19	-0.181	-0.073	40.616	0.003
. |*. |	. |*. |	20	0.134	0.139	42.407	0.002
.*| . |	.*| . |	21	-0.150	-0.098	44.684	0.002
. |** |	. |*. |	22	0.245	0.139	50.874	0.000
.*| . |	. | . |	23	-0.105	-0.008	52.042	0.000
. |*. |	.*| . |	24	0.094	-0.144	52.989	0.001
.*| . |	. |*. |	25	-0.067	0.118	53.490	0.001
. |*. |	. | . |	26	0.160	0.001	56.392	0.001
.*| . |	. | . |	27	-0.096	-0.006	57.455	0.001
. |*. |	. | . |	28	0.126	0.017	59.334	0.000

3.3 Eviews estimation output

Full regression without AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:07
Sample (adjusted): 2000Q2 2016Q1
Included observations: 64 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.710951	5.557953	0.667683	0.5072
CCI	-0.024905	0.046099	-0.540254	0.5912
FUT_RET	-0.432254	2.512899	-0.172014	0.8641
FUTURE_SALES	4.187656	5.164000	0.810932	0.4210
STDEV_ANA	2.109817	1.358885	1.552609	0.1264
PST_RET	4.268396	2.516558	1.696125	0.0956
M_B	1.814769	0.660672	2.746855	0.0082
NGM_D	-5.528810	2.271283	-2.434223	0.0183
Q1_D	-3.222336	0.678018	-4.752582	0.0000
Q3_D	-3.117651	0.715469	-4.357491	0.0001

R-squared	0.582551	Mean dependent var	2.985083
Adjusted R-squared	0.512976	S.D. dependent var	3.653296
S.E. of regression	2.549530	Akaike info criterion	4.852296
Sum squared resid	351.0055	Schwarz criterion	5.189621
Log likelihood	-145.2735	Hannan-Quinn criter.	4.985185
F-statistic	8.373006	Durbin-Watson stat	1.677465
Prob(F-statistic)	0.000000	Wald F-statistic	5.546940
Prob(Wald F-statistic)	0.000022		

Full regression with AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:08
Sample (adjusted): 2000Q3 2016Q1
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.639940	5.094417	0.321909	0.7488
CCI	-0.009706	0.044594	-0.217655	0.8285
FUT_RET	-0.838441	1.877732	-0.446518	0.6571
FUTURE_SALES	3.033949	3.914233	0.775107	0.4418
STDEV_ANA	2.198881	1.496099	1.469743	0.1477
PST_RET	1.926701	1.789184	1.076860	0.2865
M_B	1.336612	0.384526	3.475997	0.0010
NGM_D	-3.187495	1.082187	-2.945420	0.0048
Q1_D	-2.850252	0.591067	-4.822217	0.0000
Q3_D	-2.759958	0.609076	-4.531384	0.0000
RESID_FULL(-1)	0.017508	0.083340	0.210081	0.8344

R-squared	0.503948	Mean dependent var	2.677779
Adjusted R-squared	0.408553	S.D. dependent var	2.724054
S.E. of regression	2.094950	Akaike info criterion	4.474252
Sum squared resid	228.2184	Schwarz criterion	4.848450
Log likelihood	-129.9389	Hannan-Quinn criter.	4.621426
F-statistic	5.282763	Durbin-Watson stat	2.049231
Prob(F-statistic)	0.000025	Wald F-statistic	7.533861
Prob(Wald F-statistic)	0.000000		

Full regression without stock market variables, NGM dummy and AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:13
Sample (adjusted): 2000Q2 2016Q1
Included observations: 64 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.022486	7.292362	-0.551603	0.5834
CCI	0.067874	0.075676	0.896900	0.3735
FUT_RET	-4.394231	2.665725	-1.648419	0.1048
FUTURE_SALES	4.361100	5.431636	0.802907	0.4254
STDEV_ANA	2.828638	2.151272	1.314868	0.1938
Q1_D	-3.242901	0.854406	-3.795501	0.0004
Q3_D	-3.280975	0.767881	-4.272766	0.0001

R-squared	0.382480	Mean dependent var	2.985083
Adjusted R-squared	0.317477	S.D. dependent var	3.653296
S.E. of regression	3.018168	Akaike info criterion	5.150095
Sum squared resid	519.2321	Schwarz criterion	5.386223
Log likelihood	-157.8030	Hannan-Quinn criter.	5.243118
F-statistic	5.884108	Durbin-Watson stat	1.257762
Prob(F-statistic)	0.000079	Wald F-statistic	5.238133
Prob(Wald F-statistic)	0.000236		

Full regression with AR(1), without NGM dummy and stock market variables

Dependent Variable: LISTINGS_ADJ_

Method: Least Squares

Date: 06/15/17 Time: 15:15

Sample (adjusted): 2000Q3 2016Q1

Included observations: 63 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.777609	4.606170	-0.168819	0.8666
CCI	0.043364	0.046798	0.926618	0.3582
FUT_RET	-2.831617	1.687583	-1.677912	0.0990
FUTURE_SALES	0.662267	3.816609	0.173522	0.8629
STDEV_ANA	1.007852	1.419254	0.710128	0.4806
Q1_D	-2.517826	0.666007	-3.780479	0.0004
Q3_D	-2.880499	0.654656	-4.400018	0.0001
RESID_NOCONT(-1)	0.201926	0.075738	2.666129	0.0101

R-squared	0.416962	Mean dependent var	2.677779
Adjusted R-squared	0.342758	S.D. dependent var	2.724054
S.E. of regression	2.208404	Akaike info criterion	4.540584
Sum squared resid	268.2376	Schwarz criterion	4.812728
Log likelihood	-135.0284	Hannan-Quinn criter.	4.647619
F-statistic	5.619079	Durbin-Watson stat	2.123917
Prob(F-statistic)	0.000064	Wald F-statistic	5.828803
Prob(Wald F-statistic)	0.000044		

Variance inflation factors for full regression with AR(1), without NGM dummy and stock market variables

Variance Inflation Factors

Date: 06/15/17 Time: 15:16

Sample: 2000Q1 2016Q4

Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	21.21680	679.9034	NA
CCI	0.002190	646.2152	4.680914
FUT_RET	2.847937	5.827778	3.419312
FUTURE_SALES	14.56650	5.241864	3.338546
STDEV_ANA	2.014283	32.26431	1.622869
Q1_D	0.443566	4.062070	2.630312
Q3_D	0.428575	5.267990	2.467932
RESID_NOCONT(-1)	0.005736	1.500091	1.412581

Regression with investor sentiment proxies and stock market variables, without AR(1)

Dependent Variable: LISTINGS_ADJ_

Method: Least Squares

Date: 06/15/17 Time: 15:18

Sample: 2000Q1 2016Q4

Included observations: 68

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.298264	7.824175	-0.804975	0.4240
CCI	0.089245	0.085838	1.039694	0.3026
FUT_RET	-1.246838	1.054176	-1.182761	0.2415
Q1_D	-3.075809	0.863594	-3.561637	0.0007
Q3_D	-3.250224	0.617552	-5.263078	0.0000
M_B	0.610164	0.267436	2.281530	0.0260
PST_RET	0.167509	1.738285	0.096364	0.9235

R-squared	0.367202	Mean dependent var	3.005671
Adjusted R-squared	0.304959	S.D. dependent var	3.575372
S.E. of regression	2.980756	Akaike info criterion	5.119479
Sum squared resid	541.9792	Schwarz criterion	5.347958
Log likelihood	-167.0623	Hannan-Quinn criter.	5.210010
F-statistic	5.899540	Durbin-Watson stat	1.567265
Prob(F-statistic)	0.000067	Wald F-statistic	6.096039
Prob(Wald F-statistic)	0.000048		

Regression with investor sentiment proxies, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:18
Sample (adjusted): 2000Q2 2016Q4
Included observations: 67 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.498195	6.471545	-1.004118	0.3194
CCI	0.089066	0.070619	1.261227	0.2122
FUT_RET	-1.271015	0.976512	-1.301587	0.1981
Q1_D	-2.851888	0.823732	-3.462155	0.0010
Q3_D	-3.363937	0.797941	-4.215773	0.0001
M_B	0.666107	0.245765	2.710341	0.0088
PST_RET	0.721102	1.638892	0.439994	0.6615
RESID_IS(-1)	0.227450	0.101972	2.230510	0.0295

R-squared	0.402068	Mean dependent var	3.005755
Adjusted R-squared	0.331127	S.D. dependent var	3.602357
S.E. of regression	2.946176	Akaike info criterion	5.110544
Sum squared resid	512.1171	Schwarz criterion	5.373791
Log likelihood	-163.2032	Hannan-Quinn criter.	5.214711
F-statistic	5.667630	Durbin-Watson stat	1.558010
Prob(F-statistic)	0.000049	Wald F-statistic	4.609844
Prob(Wald F-statistic)	0.000365		

Variance inflation factors for regression with investor sentiment proxies and stock market variables, without AR(1)

Variance Inflation Factors
Date: 06/12/17 Time: 12:09
Sample: 1 69
Included observations: 64

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	38.51347	925.7995	NA
CCI	0.004519	986.8846	2.798616
FUT_RET	3.400600	3.637881	1.984627
Q1_D	0.715643	3.721980	2.913565
Q3_D	0.709198	5.555816	2.963481
M_B	0.066502	17.53890	1.285677
PST_RET	3.178303	2.841198	2.559921
RESID_IS(-1)	0.010652	1.789913	1.604713

Regression with investor sentiment proxies, without stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:19
Sample: 2000Q1 2016Q4
Included observations: 68
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.703606	6.484862	-0.879526	0.3825
CCI	0.103832	0.071147	1.459408	0.1494
FUT_RET	-1.733852	0.997631	-1.737969	0.0871
Q1_D	-3.057991	0.855965	-3.572565	0.0007
Q3_D	-3.302172	0.627243	-5.264581	0.0000

R-squared	0.347540	Mean dependent var	3.005671
Adjusted R-squared	0.306114	S.D. dependent var	3.575372
S.E. of regression	2.978279	Akaike info criterion	5.091254
Sum squared resid	558.8192	Schwarz criterion	5.254453
Log likelihood	-168.1026	Hannan-Quinn criter.	5.155919
F-statistic	8.389410	Durbin-Watson stat	1.572442
Prob(F-statistic)	0.000017	Wald F-statistic	8.186195
Prob(Wald F-statistic)	0.000022		

Regression with investor sentiment proxies and AR(1), without stock market variables

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:22
Sample (adjusted): 2000Q2 2016Q4
Included observations: 67 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.712014	6.187859	-1.084707	0.2823
CCI	0.114028	0.068054	1.675557	0.0989
FUT_RET	-1.683218	0.876018	-1.921441	0.0594
Q1_D	-2.847049	0.830721	-3.427203	0.0011
Q3_D	-3.414283	0.787701	-4.334490	0.0001
RESID_IS_NOCONT(-1)	0.219220	0.088332	2.481782	0.0158

R-squared	0.381288	Mean dependent var	3.005755
Adjusted R-squared	0.330574	S.D. dependent var	3.602357
S.E. of regression	2.947392	Akaike info criterion	5.085004
Sum squared resid	529.9144	Schwarz criterion	5.282440
Log likelihood	-164.3476	Hannan-Quinn criter.	5.163130
F-statistic	7.518392	Durbin-Watson stat	1.548754
Prob(F-statistic)	0.000015	Wald F-statistic	5.073291
Prob(Wald F-statistic)	0.000594		

Variance inflation factors for regression with investor sentiment proxies and AR(1), without stock market variables

Variance Inflation Factors
Date: 06/15/17 Time: 15:23
Sample: 2000Q1 2016Q4
Included observations: 67

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	38.28960	867.5616	NA
CCI	0.004631	965.0219	2.617146
FUT_RET	0.767408	1.243065	1.088111
Q1_D	0.690097	3.497176	2.641430
Q3_D	0.620473	5.575592	2.949462
RESID_IS_NOCONT(-1)	0.007802	1.781986	1.665434

Regression with capital demands proxy and stock market returns, without AR(1)

Dependent Variable: LISTINGS_ADJ_

Method: Least Squares

Date: 06/15/17 Time: 15:28

Sample (adjusted): 2000Q2 2016Q1

Included observations: 64 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.432935	1.683182	1.445438	0.1537
FUTURE_SALES	-9.037929	8.589773	-1.052173	0.2971
M_B	0.718516	0.280987	2.557111	0.0132
PST_RET	3.886420	3.560121	1.091654	0.2795
Q1_D	-3.032359	0.737589	-4.111179	0.0001
Q3_D	-3.180071	0.674625	-4.713834	0.0000

R-squared	0.310591	Mean dependent var	2.985083
Adjusted R-squared	0.251160	S.D. dependent var	3.653296
S.E. of regression	3.161400	Akaike info criterion	5.228967
Sum squared resid	579.6781	Schwarz criterion	5.431362
Log likelihood	-161.3269	Hannan-Quinn criter.	5.308701
F-statistic	5.226017	Durbin-Watson stat	0.989484
Prob(F-statistic)	0.000500	Wald F-statistic	8.951239
Prob(Wald F-statistic)	0.000002		

Regression with capital demands proxy, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:29
Sample (adjusted): 2000Q3 2016Q1
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.744163	1.092497	1.596492	0.1160
FUTURE_SALES	-4.673101	3.907669	-1.195880	0.2368
M_B	0.743533	0.214305	3.469503	0.0010
PST_RET	1.775599	1.135407	1.563844	0.1235
Q1_D	-2.377563	0.662887	-3.586677	0.0007
Q3_D	-2.859299	0.693608	-4.122355	0.0001
RESID_CD(-1)	0.287741	0.116912	2.461179	0.0170

R-squared	0.422154	Mean dependent var	2.677779
Adjusted R-squared	0.360242	S.D. dependent var	2.724054
S.E. of regression	2.178831	Akaike info criterion	4.499893
Sum squared resid	265.8490	Schwarz criterion	4.738019
Log likelihood	-134.7466	Hannan-Quinn criter.	4.593549
F-statistic	6.818616	Durbin-Watson stat	2.379505
Prob(F-statistic)	0.000018	Wald F-statistic	15.52323
Prob(Wald F-statistic)	0.000000		

Variance inflation factors for regression with capital demand proxy, stock market variables and AR(1)

Variance Inflation Factors
Date: 06/15/17 Time: 15:29
Sample: 2000Q1 2016Q4
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.193550	69.85540	NA
FUTURE_SALES	15.26988	11.68839	3.090032
M_B	0.045927	26.14838	3.387343
PST_RET	1.289149	3.010199	2.973431
Q1_D	0.439420	7.094633	2.107843
Q3_D	0.481092	3.952672	2.375570
RESID_CD(-1)	0.013668	1.430074	1.429473

Regression with capital demands proxy, without stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ_

Method: Least Squares

Date: 06/15/17 Time: 15:33

Sample (adjusted): 2000Q2 2016Q1

Included observations: 64 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.633994	0.951207	4.871697	0.0000
FUTURE_SALES	-0.928150	4.906129	-0.189182	0.8506
Q1_D	-3.115895	0.840111	-3.708910	0.0005
Q3_D	-3.287158	0.679331	-4.838817	0.0000

R-squared	0.195989	Mean dependent var	2.985083
Adjusted R-squared	0.155788	S.D. dependent var	3.653296
S.E. of regression	3.356685	Akaike info criterion	5.320246
Sum squared resid	676.0401	Schwarz criterion	5.455177
Log likelihood	-166.2479	Hannan-Quinn criter.	5.373402
F-statistic	4.875269	Durbin-Watson stat	0.893916
Prob(F-statistic)	0.004234	Wald F-statistic	7.806736
Prob(Wald F-statistic)	0.000175		

Regression with capital demands proxy and AR(1), without stock market variables

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:34
Sample (adjusted): 2000Q3 2016Q1
Included observations: 63 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.048977	0.565799	7.156216	0.0000
FUTURE_SALES	-0.558914	2.922450	-0.191248	0.8490
Q1_D	-2.315551	0.682830	-3.391109	0.0013
Q3_D	-2.956737	0.711885	-4.153389	0.0001
RESID_CD_NOCONT(-1)	0.327532	0.086954	3.766719	0.0004

R-squared	0.393694	Mean dependent var	2.677779
Adjusted R-squared	0.351880	S.D. dependent var	2.724054
S.E. of regression	2.193024	Akaike info criterion	4.484478
Sum squared resid	278.9425	Schwarz criterion	4.654568
Log likelihood	-136.2611	Hannan-Quinn criter.	4.551375
F-statistic	9.415334	Durbin-Watson stat	2.409542
Prob(F-statistic)	0.000006	Wald F-statistic	6.222466
Prob(Wald F-statistic)	0.000309		

Variance inflation factors for regression with capital demands proxy and AR(1), without stock market variables

Variance Inflation Factors
Date: 06/15/17 Time: 15:35
Sample: 2000Q1 2016Q4
Included observations: 63

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.320128	11.05168	NA
FUTURE_SALES	8.540715	2.691233	1.265118
Q1_D	0.466257	4.694715	2.179821
Q3_D	0.506781	4.759829	2.455698
RESID_CD_NOCONT(-1)	0.007561	1.191753	1.189806

Regression with information asymmetry proxy and stock market variables, without AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:30
Sample: 2000Q1 2016Q4
Included observations: 68
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.892064	2.697144	-1.072269	0.2878
STDEV_ANA	4.683380	2.889546	1.620801	0.1101
M_B	1.287286	0.410219	3.138046	0.0026
PST_RET	2.365730	2.097389	1.127940	0.2637
Q1_D	-3.411513	0.848145	-4.022323	0.0002
Q3_D	-3.213041	0.713877	-4.500832	0.0000

R-squared	0.359978	Mean dependent var	3.005671
Adjusted R-squared	0.308363	S.D. dependent var	3.575372
S.E. of regression	2.973447	Akaike info criterion	5.101418
Sum squared resid	548.1661	Schwarz criterion	5.297257
Log likelihood	-167.4482	Hannan-Quinn criter.	5.179016
F-statistic	6.974338	Durbin-Watson stat	1.553133
Prob(F-statistic)	0.000032	Wald F-statistic	9.107526
Prob(Wald F-statistic)	0.000002		

Regression with information asymmetry proxy, stock market variables and AR(1)

Dependent Variable: LISTINGS_ADJ_
Method: Least Squares
Date: 06/15/17 Time: 15:30
Sample (adjusted): 2000Q2 2016Q4
Included observations: 67 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.479891	1.925026	-1.288238	0.2026
STDEV_ANA	3.958951	1.891205	2.093349	0.0406
M_B	1.305353	0.363526	3.590807	0.0007
PST_RET	2.396260	1.755105	1.365309	0.1773
Q1_D	-3.343048	0.914925	-3.653902	0.0005
Q3_D	-3.299146	0.890646	-3.704216	0.0005
RESID_ANA(-1)	0.238661	0.098032	2.434530	0.0179

R-squared	0.395927	Mean dependent var	3.005755
Adjusted R-squared	0.335519	S.D. dependent var	3.602357
S.E. of regression	2.936486	Akaike info criterion	5.090911
Sum squared resid	517.3770	Schwarz criterion	5.321252
Log likelihood	-163.5455	Hannan-Quinn criter.	5.182058
F-statistic	6.554279	Durbin-Watson stat	1.778463
Prob(F-statistic)	0.000023	Wald F-statistic	4.895652
Prob(Wald F-statistic)	0.000393		

Variance inflation factors for regression with information asymmetry proxy, stock market variables and AR(1)

Variance Inflation Factors
Date: 06/15/17 Time: 15:31
Sample: 2000Q1 2016Q4
Included observations: 67

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	3.705726	130.4619	NA
STDEV_ANA	3.576654	58.09087	2.828403
M_B	0.132151	44.85703	3.701617
PST_RET	3.080393	1.847938	1.541322
Q1_D	0.837088	10.10056	3.547906
Q3_D	0.793251	7.538783	4.125698
RESID_ANA(-1)	0.009610	3.032587	2.870413