GRA 19502

Master Thesis

Breaking down Oslo; a new approach to determine micro-clustering

Navn:	Anders Huseby, Audun Vasland

Breaking down Oslo; a new approach to determine micro-clustering

Name of students:
Anders Huseby & Audun Vasland

Study Programme:
MSc in Business, Strategy Major

Date of submission:
13.08.2018

"This thesis is a part of the MSc programme at BI Norwegian Business School. The school takes no responsibility for the methods used, results found and conclusions drawn"

Abstract

This paper examines the clustering and micro-clustering tendencies related to the financial institutions involved in IPO's on the Oslo Stock exchange and Oslo Axcess. In our paper we developed a data-set by collecting information about 184 IPO's between 2002-2017. We developed a new method of defining and determining micro-cluster by using the Haversine distance formula. Our findings and method highlights local influence and competition, in addition to the presences of two Micro-clusters within the municipality of Oslo, with a support-micro cluster surrounding the two MC´s. The MC's are discussed in light of network-theory, with Porter's conditions of a cluster set as a basis.

Acknowledgement

This paper is written with the interest about the issuing on the Oslo Stock Exchange and the location of facilitating banks in Oslo Norway. Our paper was constructed out of the idea where we found the idea of various areas within Oslo to be interesting as whether there would be some areas that may serve as a better location for companies to locate to be better positioned for success.

Table of Content

5

1.0 INTRODUCING THE TOPIC

Initial Public Offerings have expanded gradually over the past few decades. A subtler approach and slight decline was seen and taken post the internet bubble when we entered in to the new millennium. We saw the same events even so after the financial crisis only a decade later (oslobors.no). However, IPO's in Norway have become larger both in stature and the financial aspect. In the market of Initial Public Offerings there has been a growing trend towards the use of a more extensive portfolio of co-managers and multiple underwriters. The issues have become more complex and thus necessitates a larger base of interorganizational relationships that closely relates to the successfulness of the IPO's.

Our aim of the thesis is to develop and understanding of the mechanisms surrounding the IPO-process on the Oslo Stock Exchange. This entails the understanding of the theoretical frameworks that come in to question when operating within this segment of research. Theories that we intend to dive deeper into is the likes of clustering theories and network theories as well as financial theories. Our ambition is to map the expected or potential clustering tendencies that we believe has an impact on the IPO-market in Oslo and Norway but just as well have a more profound role considering the financial actors operating and working with the prospective cluster.

2.0 A PRESENTATION OF IPO

The purpose of this segment is to elaborate on the IPO process and what it entails. We want to clarify how we see and use IPO-theory as a foundation for our thesis, as well as determining the terms used throughout. This segment is based on general theoretical frameworks from international literature from multiple authors like Corwin and Schultz (2005), Krigman et al. (2001) Brau et al., (2003) and Hovakimian & Hutton (2010), and adapted to the Norwegian milieu. IPOs, its theory and actors has not previously been assessed in the cluster theory paradigm, henceforth our presentation of it is vital in understanding the context as a whole.

2.1 Initial Public Offering

An initial public offering is the process of attaining resources, by letting third-party investors effectively be able to buy shares or stakes in your company. An initial public offering is, as in the name, the process where the company for the first time offers their shares and ultimately their company to the public in the process of attaining resources for the henceforth potential future growth. This is most commonly issued by smaller, younger companies that seek to expand, and needs capital for their upcoming ventures. However, IPO's are also conducted by large corporations, like we have seen with Facebook and Snapchat as the two major parties in the recent past. Commonly in IPO's there are underwriting firm(s) assisting in the determining of what type of security to issue as well as the best offering price, the amount of shares issues and then when to bring them to the market (Nasdaq.com; oslobors.no).

Secondary offerings, commonly denoted as a public or a repair offering, is the action of raising new funds through the offering of new shares. However, this is not to be confused with an IPO as a public offering is needed to necessarily be a first time offer, it can be a subsequent action as a succeeding offer of additional shares to the public. While also increasing the number of shares outstanding it also dilutes the existing shares in circulation. This is also letting the current holders of stock able to sell their shares in the company (Espinasse, 2014).

Mergers, Acquisitions and IPO's are three different choices for a company. The distinction that leads each company to conduct one or the other is often based on their capital base. For capital strong companies', acquisitions are the best tool for

rapid expansion. For other who may lack the capital resources, mergers and IPOs can be a solution. Mergers may grant several benefits to the company. In some instances, a merger can be the fuel behind an IPO, as the IPO is used to gain capital for the possibility to expand through mergers and acquisitions with the new inflow of capital ensuing the IPO (Brau et al., 2003; Hovakimian & Hutton, 2010).

2.2 Defining the Actors of the IPO

The IPO-process is an elaborate procedure with often many involved parties, to distinct between the various actors we have hereunder divided these into categories that explain their role in what we call "The Syndicate" later on.

2.2.1 The Issuer

The Issuer is the notation for the company conducting the IPO and selling their shares. They are at the centre of the following process that is the IPO. Furthermore, their purpose is taking charge of selecting the Bookrunner, and manager of the syndicate, as well as complete the list of other needed syndicate members, underwriters. This is often in accordance with the assistance of and guidance of the a priori chosen Bookrunner.

2.2.2 Bookrunner

The Bookrunner, or the book-manager, is the primary underwriter of the IPO as well as in charge of the books. The most common denotation is either Book-manager, lead-underwriter or Bookrunner whereas we aim to use Bookrunner as the primary notation. The Bookrunner is responsible for the IPO, and usually tends to the role of manager of the IPO-syndicate. The Bookrunner takes charge of organizing and managing the syndicate and all that the IPO process entails. There may be multiple Bookrunners in an IPO. They may add analytical skills to the syndicate or market research, amongst others, but the primary role is that of managing the syndicate (Krigman et al., 2001; Hu & Ritter, 2007).

2.2.3 Co-lead manager

Just below the Bookrunner, is the co-lead manager(s), also referred to as Co-manager. There may be one or multiple financial actors that take the role as co-

lead managers below the Bookrunners position. The co-managers role is often jointly shared with other parties operating in the syndicate together. Their roles are to conduct analysis of the markets of which they operate in or markets the IPO-bound firm intends to target. Moreover, they add information and assistance on other levels as where the primary Bookrunner directs the focus. In contrast to the Bookrunner, the co-manager is denoted as the subordinate of the Bookrunner, as the Bookrunner is in charge of the project.

2.2.4 Underwriter

The underwriter(s) is at the bottom of the syndicate and is often the last actor(s) to join in the preparations towards the IPO. Underwriters tend to take the role of risk experts in the syndicate. They are hired to assess the risks and add information to the other parties involved. Additionally, they may also be used for the selling off shares in the final process.

2.2.5 Combining the actors; Creating the Syndicate

A rather modern phenomenon is the use of a so-called underwriter-syndicate. Corwin & Schultz (2005) label these co-managers, inclusive the underwriters as a consortium or more precisely as a syndicate. The Syndicate is often referred to as a group of individual actors collaborating or combining their expertise to achieve or promote a common goal. Several authors including the likes of Torstila (2001) and Jeon & Lee (2015) have shed light upon the heated internal battles taking place within these IPO-syndicates as a liability for the companies conducting the IPO's. However, this is not considered a part of our paper as our focus will be less focused on the making and sustaining of the syndicate including how and where the financial actors within it are. Nevertheless, the importance and presence of the syndicate is worth taking into account when the area of focus is clusters and networks.

The role that the underwriter(s) takes on, is that of the financial actor or institution that underwrites the insurance risk concerning the offering for the company offering. An underwriter-syndicate is the group of financial institutions, banks or broker-firms who collaborate in the offering process. They take charge of the trading of the companies offering of equity and/or debt securities to investors. A typical distribution of the syndicate is comprised by the roles described above. At

9

the very top is the Bookrunner, administering the offering, who is, with the rest, compensated by the underwriting spread. Which in essence indicates the difference in the price paid to the Issuer and the price received from the brokerage-deals and investors (Roosenboom, 2012).

3.0 SYNDICATE AND THE UNDERWRITERS

Corwin and Schultz (2005) emphasises the difficulties for the underwriter to determine the price of a share for the IPO bound Issuer, stated through the phrase "part art and part science" articulated by one underwriter used in their study. Mostly due to the fact that firms conducting their initial public offering have yet to be valuated based no preceding trading history. The challenge is to figure out the interest in the Issuers offering in the market. However, when syndicates are compiled by a larger portfolio of actors, the possibilities of understanding the demand in the market for the Issuers may seem slightly easier. When using multiple underwriters and co-managers the common understanding is that they have a varied customer base. Consequently, this leads to a more informed understanding of the IPO demand and a clearer and more refined understanding of the market based off of the underwriters' market knowledge. It may become clear that underwriters not always offer information adding to the prior IPO process but rather have input on the pricing of shares based of their customer knowledge.

Furthermore, the underwriters are mainly used for the purpose of selling a given number of shares. The number of shares are allocated prior to the IPO initiation. Conversely, these shares distributed to the various actors may not in the end align with the actual amount sold by the underwriter. This is mainly due to the reason that the Bookrunner is usually credited with the sales post transaction as well as given the highest number of shares. In our research we distribute the gross proceeds equally between the bookrunners.

In addition to their responsibilities of selling shares, the underwriters add another stamp of approval if used for additional certification for the quality of the Issuer. By certifying the Issuer, the possibility of underpricing diminishes. This is in addition levelling the asymmetric information flow and uncertainty surrounding the valuation of the IPO (Krigman et al,. 2000).

10

3.1 The Set-Up of a Syndicate

Setting up the syndicate is often one of the first things to be done in the initiation of an IPO. The lead Bookrunner is first to be set, for the latter syndicate members to be given their respective allocation afterwards.

When initiating a syndicate, the first order of business is the selection of a Bookrunner. This is most commonly decided by the issuing firm. For the most prominent IPO's the fight to become the top Bookrunner, the leader of the syndicate, is ferocious and competitive. The reasoning may be that the recurring theme the leader of the syndicate tends to receive the most rewarding fees from the transaction, thus substantiating the fight for the Bookrunner title. In the search for a Bookrunner, there are historically many factors mentioned as principal factors determining the choice for lead Bookrunner. The most prominent reasons for choosing one Bookrunner over the other can be reputation, research support, their industry knowledge and also preceding relationships with the Issuer as well as the risk involved. Risk management are related to reputation as well, whereas more prominent actors are associated with a lower risk (Carter & Manaster, 1990; Song, 2004; Burch & Foerster, 2005). When it comes to smaller IPO's that seem less appealing to the larger financial brokerage actors, the Issuer may stand without a choice for themselves and are deemed lucky to get the support from a financial actor (Krigman et al., 2001).

A common theme is, when there are several actors attempting to be the Bookrunner, the Issuer often uses several co-managers to fill the remaining parts of the syndicate. The co-managers are used for sub-problems, advisory, research or other areas that may need tending for completion of the IPO. The Issuer may also be influenced by the Bookrunner for their choosing of potential co-managers, as the Bookrunner may want to have a say in the matter. Commonly the Bookrunner tends to or aims to limit the number of co-managers as they consequently will get a smaller cut of the stake, referring to the fees allocated post IPO.

In addition to the Bookrunner and the co-managers, there are also other underwriters included in the syndicate. Their position is not always only a research/analysis or financial assistance, but rather more commonly an actor that

may be used to add info-, lend capital to the syndicate, or have a close relationship with the Issuer. It may also be that the Issuer want minority owned firms to participate in the IPO (Corwin & Schultz, 2005).

3.2 Barriers to a Syndicate Membership & the Importance of Reputation

Barriers to becoming a fully functional and respected member of a syndicate for an IPO seems to be fully present. Pichler and Wilhelm (2001) made the remark of so in the American market especially, where reputation and relationships were the dictating factors for the creation of syndicates. These barriers were strong anchoring points that determined the entry of actors into, or not into, a syndicate. The size of the companies does also have an impact for barriers, as Hoang and Rothaermel (2005) elaborates on. In smaller firms there is a tendency to be only a few key-determining factors enabling a syndicate entry or activating an exit. Scaling this scenario up, there is suddenly several people trying to manage the portfolio of alliances present. However, smaller firms tend to have fewer alliances and hence are easier to control, and consequently easier to enter, manager or exit. So, in inclusion of the size of the firm, the size of the alliance-portfolio is also a significant barrier. This is usually due to the restriction another syndicate-membership may put on you as a company (Pichler & Wilhelm, 2001).

A major part of the membership-criteria is not only the reputation of the firm, but also the reputation of the personnel, and perhaps most importantly the leading personnel, such as key brokers and managers. Arguably the way to become acknowledged in a competitive landscape is focusing on a set of interconnected points such as having the best people, having the best solutions, getting the best applicants and consequently having the best word of mouth (Ambler & Barrow, 1996). These are the foundations of the brand the firm and its people exert, that again builds the reputation for the individuals as well. Reputation and trustworthiness are qualities built up over time, based on previous meetings, collaborations and other relationships. These are the same for companies as well as personnel, and either may be just as important as a barrier or entrance into a collaborative effort (Carter et al., 1998, Josang & Ismail, 2002).

12

4.0 THEORETICAL FRAMEWORK

Prior research within the stock literature have been grounded within the long-term performance of the IPO stock (Carter et al, 1998), Bookrunner characteristics (Corwin & Schultz, 2005), aspects of the post-issuance activities by underwriters and other market participant (Schultz & Zaman, 1994), literature related to underwriter mispricing (Liu & Ritter, 2011) and effects of underwriter reputation on the initial performance of IPO (Titman & Trueman, 1986; Maksimovic & Unal, 1993). However, the geographical clustering of the investment banks has not been previously assessed. Each syndicate reflects a possibility to assess the geographical location of the involved banks. No prior academic work has applied cluster theory to distinguish geographical areas in order to look at locational performance. We will therefore look further into to what extent we can distinguish historical performance differences based on geographical areas in Norway. If so, are there reasons to believe there are micro-clusters in Norway which provides abnormal performance to the IPO scene? This will provide an understanding of the local differences in Norway, as will define geographical areas of interest for further research.

4.1 Research Question

Following the current landscape of research conducted in this field, we have developed a research question to uncover a framework in uncharted areas of micro-clustering in the strategy-literature:

> *To which extent can we distinguish historical performance differences based on geographical areas in Norway?*

We anticipate cluster-theories to be the most fitting theoretical frameworks to our study, where we use network-theories to understand underlying the mechanism within the expected geographical cluster. Nonetheless additional material outside of the scope of these will also be applied to better understand and supplement our findings so to create a more complete picture. We intend to utilize the collective knowledge from papers written on IPOs as a base for comprehending the Norwegian market on Oslo Stock Exchange and tune this to our advantage so to understand our defined market.

14

4.2 Cluster Theory

Cluster theory is a concept many became familiar with when Michael Porter described the phenomena in the 1980s. He categorised a cluster as a "…geographic concentration of interconnected companies and institutions in a particular field" (Porter, 1998). As Porter denotes, a cluster is the collection of several firms or institutions often collected in a smaller geographical area that we can define with what Porter calls and "critical masses – in one place of unusual competitive success in particular fields" (Porter, 1998). Clusters are the occurrences of geographical proximate firms sharing their expertise of knowledge, skills as well as technology and resources to enhance the general level of the cluster. As well as enhancing the collective level of the cluster, there is an escalating theme of cluster-companies specializing within a certain field, or specialized industry, of the cluster-chain, as such to attain profitability and economies of scale (Malakauskaite & Navickas, 2010).

However, it may not always be the case that these cluster-bound companies operate in the same industry or the same sector. Cluster do trickle down from the top firms to the smaller sub-category firms. An example may be a large service-supplying company, that is included in a cluster, where sub-suppliers may be office supplies that supply them with necessities and other complementary products. Further may be other sub-category firms that supply the cluster with complementary skills and technologies in a knowledge flow in-between the units of the cluster. In addition to firms there are often institutions like universities, trade associations, governmental institutions and other service, or supply organizations imbedded in the cluster (Reve & Sasson, 2015b).

Cluster can also be a platform for growth and success. A preconception is that for an industry to thrive a well-developed financial system is the cornerstone for any success (King & Levine, 1993; Rajan & Zingales, 1998). However, more recent studies have found that clusters may as well have just as much an impact as any well-developed financial system. A study focused on clusters in China have shown that within industrial clusters a division of labour lowers the entailed capital barriers a financial environment often necessitates (Long & Zhang, 2011). That is while a barrier for success in many industries is the substantial capital and knowledge required for startup diminishes through the exploitation or

15

capitalization of clusters. Thus, resulting in an emergence of more and smaller firms within clusters as a consequence of a decreasing reliance on external financing (Summers, 2007).

Commonly we tend to denote clusters as a collaboration force, but the trend of competing against other cluster companies is also very often seen. Porter (1998) claims that cluster companies both collaborate as well as compete against each other within the cluster and can coexist as both collaborators and competitors. The distinction that Porter (2000) notes is that many of the cluster companies tend to compete, but not necessarily within the same sector. The participants of a cluster may be competitors as they serve different segments of the customer-portfolio. However, they may be competitors in the manner that their requirements, opportunities, financial-, knowledge, technical- limits and other impediments are a definite set within the cluster, hence leading to competition in the acquisitions of these (Porter, 2000). Campaniaris et al, (2011) substantiate the remark that cluster companies are independent actors with specialization within their field, and within the cluster, but are not necessarily neither competitor nor collaborator but identifies within both roles based on circumstances denoting one or the other.

The Norwegian climate for clusters have rapidly developed in the past few decades. The Nordics have provided an ideal socio-political context for the creation and formulation of cluster policy and its following implementation (Reve & Sasson, 2015a). This has much to do with the openness and trust that typifies the Norwegian and the Nordic market. As many companies in Scandinavia and the Nordics have a flat structure with what Hofstede (1984) denotes as short power distance, a phenomenon not found as clearly explicit outside of the Nordics. However, Norwegian companies does also historically know how to cooperate as well as compete (Reve & Sasson, 2015b). Piore and Sabel (1984) label this as a vital trait and expresses the importance of both competition and cooperation as key characteristics for any cluster to function optimally.

It has arguably become a more common theme of collaboration, at least openly, amongst companies. The prime example is most certainly Silicon Valley, a hub and classical example of a near perfect cluster. Many companies have emerged from the valley to become world leaders and prime examples of what a cluster

16

may add to the mix. Most frequently spoken about is the knowledge flow that emerges as a key part of any cluster, where smaller firms can take advantage of the overflow of information spreading in the cluster (Audretsch & Lehman, 2005; Iammarino & McCann, 2006).

4.3 Micro-Cluster Theory

The City Cluster Algorithm (CCA) was familiarised through Rozenfeld's et al., (2008) work based off of studies published by Makse et al. (1995). The essence of the CCA was to construct cities "from the bottom up". The "city" aspect in the algorithm refers to maximizing the clustering tendencies in a densely populous highly adamant definition. The populous cluster boundaries are made up within the given distance ℓ that may not stretch beyond its set perimeter. What is outside the perimeter boundary limited by ℓ is precluded from the cluster. A common method of determining cluster boundaries are the boundaries of the municipality. The method of Rozenfeld et al. (2011) is rather focused in the cells with a predetermined radius ℓ that connect or disconnect nodes resulting and an agglomeration of a cluster within the predetermined ℓ boundaries. Hence, by the CCA method we eliminate the fixed boundaries of geography and apply restrictions not altered by adjustments done to inter-dependable variables.

4.4 Informal & Formal Clusters

There are several variations of clusters being named by authors that has some key features distinguishing them from others. Two characterized form are the formal- or informal-clusters. Whereas a formal cluster is usually characterized by a planned development. The Fornebu IT-cluster is an example of this, before the venture began at Fornebu a board of shareholders sat together to set a plan for the area so to construct it into a cluster. Now the area is filled and robust with a number of companies operating within specialized industries whom nourish off of one another for a combined greater outcome (Gundersen et al., 2017). On the other hand, we have the informal cluster, which may also be called unorganized or undefined. These are clusters that as well develop over time but without a predetermined plan that a formal cluster tend to have. An informal or unorganized cluster develops over time with the initial settling of a key actor at the base. A notation for this aggregation of companies may also be suggested as a microcluster. The development starts off with an industry-specific company that

17

draws similar companies to the area so to reap the benefits of the accumulated expertise developed by the first settler (Isaksen, 2004). As Bathelt et al. (2002) argues, the cluster-bound firms have an indirect impact on one another as mistakes and successes of the companies in the area creates learning for the other companies through their monitoring and observing. The microcluster is a very specific industry cluster with a knowledge base and it creates a milieu for enhancement for all involved. Porter (2000) argues that clusters are not merely competition, but just as much cooperation, hence the overall knowledge of the microclustering is understandable as the companies takes on and utilizes the success of their adjacent companies. This process continues as then again, their adjacent firms copy their positive behaviour and enhance it once again in a never-ending loop of self-improvement.

4.5 Stock Literature

Stock literature elaborates on the effect of and the composition of the syndicate and underpricing (Schadler & Manuel, 1994; Corwin & Schultz, 2005). In this area researchers have rigorously emphasised the importance of Bookrunners individual characteristics, such as reputation, knowledge and capacity as primary performance indicators post-IPO (Carter & Manaster, 1990; Fang & Yasuda, 2005). The focal papers also exhibit a market which is a vigorous and concentrated competition with few actors. As the U.S. markets are used to larger syndicates, but fewer book-managers (Chen & Ritter, 2000; Corwin & Schultz, 2005). The data from Corwin & Schultz (2005), also revealed a highly concentrated market following Herfindahl Index of 29.4 (mean) and 24.7 (median). Schadler and Manuel (1994) provided similar results with about 20% of all issues underwritten every year was being conducted by the bulge-bracket investment bankers. More recent research expounds a similar distribution (Marston et al., 2006; Hu & Ritter, 2007). The development from having only a few to a handful of co-managers and underwriters when conducting IPOs have been growing since the late 1990s. The use of multiple partnering financial institutions have created a more complex, but yet also a more complete picture of the IPO process (Corwin & Schultz, 2005). Historically we have seen a growing trend toward using more financial actors as sparring partners when initiating in the process of an initial public offering. IPO-bound firms are getting more and

more complex as well as the market is both thickening and becoming more convoluted than ever before (Carter et al., 1998).

In the late 1990's the common theory was to be more economical with the use of Bookrunners or underwriters. Since then we have seen a huge increase in the use of multiple Bookrunners, with an increase of 11,3% between 2000 and 2001. Coincidentally we have seen a decrease of IPO's, and especially smaller IPO's, whereas IPO's now tend to of the larger sort as well as have a larger base of underwriters, substantiating the view of a more popular joint-Bookrunners trend. As a result, active Bookrunners diminished by half as well as the median syndicate size went from 19 to 5 syndicate members in a span of 10 years. Following this a clear trend in IPO-proceeds became apparent as difference in mean offer-proceeds from 2000-2001 was a notable $250 million (Chen & Ritter, 2000; Marston et al., 2006; Hu & Ritter, 2007). This development has furthermore created an IPO-market with fewer actors in the syndicates, and higher IPO-proceeds, and a more concentrated competition between the financial actors.

4.6 Network

Network is a sub-category of clusters in our paper. As the cluster is the main area of focus we also aim to utilize the theories of networks as the focal point of the sub-category. Network has its counterpart in alliance, and both may seem similar in essence as they both connect previously disconnected parties. However, there are an abundance of definitions labelling the two as distinctive features of many of the same attributes (DiMaggio & Louch, 1998; Hoffman & Ventresca, 2002; Thornton & Flynn, 2003). Gulati (1998) categorised a strategic alliance as a "… voluntary arrangements between firms involving exchange, sharing or co-development of products, technologies or services." These creations of alliances vary in origin but often occur as when there is a "… wide range of motives and goals, (that) take a variety of forms, and occur across vertical and horizontal boundaries." (Gulati, 1998). An alliance can take a multitude of shapes and forms, these can be contract regulated or have a shared ownership form, such as a Joint Venture or R&D-collaborations. Just like a cluster is a gathering of parties, so are networks, and commonly a massively featured outcome is the knowledge flow that emerges as a central end product of a network (Almeida et al., 2002; Lunnan, 2008).

19

Networks is a linkage of groups or individuals that are interconnected in a social circle in a horizontal and/or vertical manner. The horizontal networks relate to the cooperation among firms whom predominantly compete, while vertical refers to cooperation between partners that operate within the same chain (Gellynck & Kühne, 2010). However, in laymen terms the essence is that one person knows another and an exchange of knowledge between the two leads to an enhanced knowledge platform combined. The market, networks play a significant role as they are channels for- and flows of information and resources in-between the positions of the social organisation (Lunnan et al., 2004). The social construction as a product of networks are a strong influencer for the creation and sustainability of ties in-between firms while also on the personal level. As well as creating ties between actors the network may also have a defining factor when it comes to the design of the social organisation (Gulati, 1998).

Alliances and networks are in close proximity and do overlap in many instances, but the major differences can be elaborated as follows. An alliance is the combination of resources, capital or knowledge of multiple organizations, it is often in a limited time-span with a specific goal organized by a facilitator or managing organization. A network is also by several organizations however not necessarily with a convener of sort. The network evolves over time and can endure beyond the completion of the goal(s) set prior to the establishment. A network has neither the compulsion to be formal or goal oriented but may be set up to be operated as a broader support function for organizations (Gulati, 1999a; Gulati et al., 2000).

We can see historically that the establishment of alliances and networks often have been initiated to gain knowledge of your market or the markets beyond your reach. Through the combination of knowledge primarily, and the tacit and explicit knowledge found in organisations a collaboration amongst parties can enhance the overall comprehension of the markets they operate or intend to operate in (Inkpen, 1998).

The syndicate, including the issuer can by the aforementioned characteristics be perceived as a short-term alliance. Our paper focuses on a time span of 15 years,

20

from 2002-2017 rendering the alliance aspect obsolete as an explanatory factor for the collaborations amongst firms over this time-period. The network theory incorporates the time span as presented in our study and is therefore much more fitting and is something very closely related to IPO's. As one of the underwriters' main areas of expertise is adding info to the IPO-bound firm regarding the market they intend to sell to. Underwriters whom are acquired to map the market may utilize their networks (and short-term alliances) to deliver a more comprehensive report of the market they, and their network-counterparts reside in. Thus, handing the IPO-bound firm a better report of the market, and hence enabling them to set a better asking price for their offering shares.

5.0 PROPOSITIONS

Proposition 1 & 2 is linked to the geographical scope that distinguish areas of activity. Proposition 3 is linked to the individual performance that create historical performance differences, and also create an environment for regional impact. Which in addition creates the market entry barriers in case of high concentration. Proposition 4 is linked with the collaborative network between the actors within the boundaries of the regional area. Proposition 4 is dependent on proposition 1 & 2 to be valid. Combined the 4 propositions creates the foundation of whether our research question can be answered;

To which extent can we distinguish historical performance differences based on geographical areas in Norway?

5.1 Defining Regions

Defining the cluster geographically may present new challenges as it is often difficult to determine something often spoken about as tacit and abstract in classification. This is an enormous field with an abundance of various descriptions and definitions of a cluster. Some authors, as Baptista and Swann (1998; 1999), thought the level of employment as an important part of identifying a cluster region. Furthermore, they saw innovations as a product of growth in a geographical region. Porter (2003) further elaborated on the employment as a clustering boundary as well as including wages and the patent creation of the economic area. The city of Toronto was branded as a cluster by Zaheer and Bell (2005), whom presented the idea that any firm operating within its vicinity had an involvement in the cluster. Another approach is labelling the cluster as the geographical region incorporating firms surrounding top level universities with "Star Scientist" (Zucker & Darby, 1998; Reve & Sasson, 2015b).

Aharonsen et al. (2008) determined the boundaries as set by the postal codes/zip codes in Canada and counted the number of Biotech firms operating within it. Contrary to Aharonsen, Jennings (2008) elaborate on the use of other building blocks as opposed to the use of zip-codes as a measure of the clustering tendencies. However, zip-codes are not a constant and are hence exposed to alteration over time. Jennings (2008) propose census geographical boundary definitions such as "… minor civil divisions, census county divisions, census

22

tracts, block groups, or even census blocks". He bases his proposition on Werner's et al. (1999) article concerning the alterations of some building blocks over time. The list includes the boundaries such as; the building block must be no larger than it to be homogenous concerning the geographic risk as well as it must have a reasonable size to produce a trustworthy end-products. Simultaneously as the building block must preserve its geographical boundaries constant, it should maintain verifiable.

The definitions mentioned above are sufficient for determining a cluster within Norway, as a municipality may serve as a satisfactory perimeter for a cluster. However, the various definitions and disagreements above does not constitute an applicable definition of a micro-cluster. Therefore, we propose a new method with more precise factors for determining the boundaries of the cluster. Our definition of determining the boundaries is to use geographic coordinates as a measure to create boundaries. The aforementioned methods do not consider the geographical ease of doing business in a certain area based on the firms spatial location, and our proposed method will be applicable to micro-clustering, in order to define a potential clusters in Norway. We utilize the fixed barriers of a municipality, as it is simple and comparable limit. We expect a high degree of activity in Oslo, where we can define as a cluster within the boundaries of Oslo Kommune.

> *Proposition 1: We expect a corporate finance cluster located within the boundaries of Oslo Kommune.*

Following the theory of informal and formal cluster, where formal clustering is characterized by a planned development, and informal clustering is an undefined clustering. As we perceive the potential financial cluster in Oslo as an informal cluster, we expect the initial location of the firms to be scattered, where some areas - based in the individual firm's demand and client environment - will be more populated. This could create micro-clusters. We propose the following proposition.

> *Proposition 2: We expect geographic spread between the firms to a degree we can identify micro-clusters within Oslo Kommune.*

23

5.2 Individual Firm Influence

Clusters tend to have several impacts on the individual firm level. Several researchers tend to praise the cluster for the direct input a functional cluster tend to have on its occupying firms. The most prominent features are that firms within the cluster has historically had an accelerated growth, as well as patented or non-patented innovations far greater compared to its counterparts outside of the cluster (Baptista & Swann, 1998).

In terms of influence, the underwriters can have a substantial influence in the cluster. More prestigious underwriter firms are in a position of power in the IPO-process, as they are more likely to have "All-star" – analysts, and hence a very competent force of analysts (Fang & Yasuda, 2005). Firms does therefore have a major incentive to hire these top underwriters to acquire the best possible foundation for prosperity, as these underwriters can aid the IPO-bound firms in gaining firm value through analyst coverage and a thorough forecast of the environment (Loureiro, 2010).

Earlier research has suggested that a potential Issuer tend to go to the same banks. Corwin & Schultz (2005) displayed a high concentrated industry in their assessment of U.S IPO, with a high Carter-Manaster mean - which suggest that the Issuer tend to go to the more reputable banks. Dunbar & King (2018) showed in their working paper that underwriter concentration is increasing. Ellis et al (2000) shows that the majority of IPOs is concentrated in the bulge-bracket (top-tier), where 15 investment banks underwrote for 58% of all deals. Both researches is consistent with Hu & Ritter (2007), which found correspondingly phenomena. In contradiction, Kollo (2005) found a Herfindahl Index (%) below 10 in European markets, which represents a highly competitive market. On the basis of previous research, we expect to see a highly concentrated marked, where we challenge this on the Norwegian platform. Hence we propose the following proposition:

> *Proposition 3: We expect a highly concentrated competition between the actors involved, where few actors represent a high share of total gross proceeds.*

24

5.3 Network

Banks and investment brokers are bound to be focused on the relationship-oriented philosophy of the modern era. To be successful while also opening yourself up to new markets, there is a certain need to collaborate with your fellow brokers in the area. Relationships are the cornerstone of, and a shared practice for creating underwriting prospects as well as boosting reputation (Podolny, 1994; Chung, Singh, & Lee, 2000; Li & Rowley, 2002).

Bookrunners who take part in syndicates tend to have interactions outside of the boundaries of the syndicate, furthermore with embedded ties, banks are less inclined to form non-local ties (Baum et. al, 2003). Non-local ties are dependent of each actors' sense of risk, their experience and performance. Non-local ties between banks are commonly more inclined to be created by more recent members of a syndicate network, henceforth the longer-serving and larger banks are less inclined to create non-local ties. Lead-banks in syndicates tend to have a greater prudence in selecting partners for co-lead positions of the syndicate. In essence the propensity of collaborating with the same actors on several occasions are a coherent with the idea that a small set of well-connected financial institutions are precarious to the structure of the network (Baum et al., 2004). A study from New Zealand indicated that the larger players had little or no interest in including new and smaller firms into the network. The prior familiarity with other actors, affected the initiation of new members, and kept the barriers and the willingness to include at a standstill (Guthrie, 2001).

By following the rationalization of Baum et al, (2003;2004) and providing local boundaries e.g. micro-clustering, we present the following proposition;

> *Proposition 4: Firms located in the MC are more likely to collaborate with each other than other firms located outside the MC.*

6.0 METHODOLOGY AND DATA COLLECTION

6.1 Breaking down the cluster in Norway

The research design is essential to fulfil the potential of the thesis, and choosing the right design is critical to obtain the correct data for processing. Easterby-Smith, et al. (2012) argues that the research design is the tool to which you can explain and validate what data is necessary to collect, from where and how you may obtain it. Moreover, the research design chosen should be the chosen with the aim to achieve the end goal of answering the research question. Our methods follow the technique shown in Corwin and Schultz (2005) article as their practices coincide very close to our approach regarding the collection and the processing of data. Hence, we have taken advantage of their setup as a framework for our thesis.

We aim to apply an exploratory factor analysis (EFA) process in our approach as we attempt to detect correlating variables related to our preconceived views beforehand. However, by this reasoning we may argue that this also will overlap with a confirmatory factor analysis (CFA) approach as based upon our theories prior to our analysis initiation. Thus, utilizing our dataset to confirm or potentially deny some of our post-dataset-completion predictions. The approach of having an overlapping CFA and EFA is arguably a common approach as they tend to be interdependent as the EFA approach is a tool used to reach the CFA (Hurley et al., 1997).

6.2 Data Collection and Tools

Our data-collecting method and data-processing is based similar research and has a foundation of other similar articles that again substantiates our approach. The SDC Platinum database was used to find managers, Bookrunners and gross proceeds. Combined with the SDC database we also used Oslo Børs webpage Newsweb as a supplementing source where prospectus for the IPO's are published. On Newsweb we found the mobility between stock exchanges from Merkur, Oslo Axess and Oslo Børs where the SCD databased lacked said information. Our aim is not to obtaining primary data, nor conduct interviews as we do not render it pertinent to our cause. In addition, we discovered the where foreign firms used Norwegian stock exchanges as a secondary stock exchange and

their primary stock exchange were based elsewhere (Ellis et. al., 2000; Corwin & Schultz, 2005; Hu & Ritter, 2007; Lureiro, 2009).

Firms that have merged with others, or changed names are not to be found on the SDC, and hence we utilized secondary sources to complete the dataset. Firms like Norway Peligac – Austevoll; Nøtterø Sparebank, and other such as Maritime Industrial Services and EOC Limited, were found through public available prospectus and other secondary sources. Furthermore, in our research, the gross proceeds were often denoted in their respective countries currency. We have converted all to dollar at the exchange rates on the day of the listing. The gross proceeds were found in the prospects published aligned with the IPO, by their respective firms. To comply with this, we also used the statistics on Oslo Børs to verify the gross proceeds. If indicative gross proceeds range is listed, the average between low and high will be applied, to find gross proceeds for the actual listing.

The SDC Platinum database assigns one of six role designations to each underwriter in the syndicate. These are; book manager, joint book manager, joint-lead manager, co-manager, syndicate member, or global lead. For IPO's that include shares offered outside the United States, syndicate participation and underwriting allocations for internationally offered shares are generally listed separately. In many cases, this results in the same underwriter being listed twice within the syndicate. When double listing occurs, we combined domestic and international underwriting allocations to determine the total allocations received by each underwriter and the total number of underwriters within the syndicate. In most cases, underwriters listed as global leads are also listed as co-managers, allowing us to ignore the global lead designation. We also performed several checks of the SDC co-manager designations to remove potential data errors. These checks resulted in underwriter role corrections for 17 IPOs.

To collect information concerning the focal brokerages office localizations and office relocations we used Brønnøysundregisteret to obtain the aforementioned data. Brønnøysundregisteret is a Norwegian Government agency, under the Norwegian Ministry of Trade and Industry, and is responsible for the management and distribution of the Register of Business Enterprises.

Further examination of location data is done in Google Maps, where we collected 2D Cartesian Coordinates for each business address located in Oslo.

To ensure we have measurement for reputation, we find the annual benchmark report of TNS Sifo Prospera as sufficient proxy for reputation. The benchmark report is based on multivariate market intelligence data, including interviews with Issuers, industry leaders, etc., in order to rank the best brokerages in Norway.

6.3 Method

We want to find a geographical proximate group of interconnected companies within the Corporate finance sector, and the localization of the geographical scope in this thesis (Porter, 2000). In order to find the clustering of the underwriters we used decimal degree coordinates for respectively latitudes and longitudes obtained from Google maps. This was in order to determine the basic distanced between each underwriter. In our process we did not consider Non-Norwegian firms as we intend to find the regional clustering within Norway, and furthermore establish micro-clusters in the identified region. The classification to determine a firm to be Norwegian-based is that the underwriter has to be active in the IPO-scene; meaning that their syndicate involvement should exceed more than one. Furthermore, these underwriter-firms must have a developed branch in Oslo dedicated to corporate finance and financial advising. We define a "Developed branch" as;

- The focal firm must have a registered address in Oslo, where Oslo is defined within the boundaries of the Municipality of Oslo, also denoted as Oslo Kommune.
- The focal firms cannot be a branch in Oslo registered as a Norwegian Registered Foreign Company "NUF", as per definition by the Brønnøysundregisteret (2018).
- Nor can the focal firm have a provided address at a local law firm, or a third-party service provider.

We will consider co-manager in our analysis; however, co-managers tend to have minimal contact with each other within the syndicate and their participation in the syndicate are limited to our research (Baum et al., 2004).

6.3.1 - Proposition 1

28

"We expect a corporate finance cluster located within the boundaries of Oslo Kommune."

Based on 184 IPOs, and their corresponding coordinates, we can define a particular cluster region based on a simple formula for concentration:

$$Concentration_m = \frac{NIPO_m}{NIPO_t} \qquad (1)$$

$NIPO_T$, is the total number of IPOs in the period t, and it is the fixed value equal to the sum of IPOs in the sample data. $Concentration_m$ is the share each identified location M has relative to the total amount of IPOs $NIPO_m$ is number of unique IPOs located in certain region. A region is in our thesis contextualized as a proxy for the firms respective municipality. Therefore, $NIPO_m$ has the following definition:

$$NIPO_m = \sum IPO_{n,(j,m)} \qquad (2)$$

Where $IPO_{N,(j,m)}$ takes the number 1, if the firm j, located in m, has functioned as Bookrunner of a particular IPO n, and 0 if there is no involvement from firm j. If two or more firms is from the same location M, i.e. m = m, and the focal Bookrunners function as Bookrunners in IPO_N, i.e. $IPO_{1,(j,m)} = IPO_{1,(j \neq j, m)} = 1$, since we want to look further into total involvement as share of total IPOs from location m, rather than firms overall contribution. For example, $IPO_{3,(ABG, Oslo)} = 1$ and $IPO_{3,(Arctic, Oslo)} = 1$, will be combined to following notation $IPO_{3,((Arctic, ABG), Oslo)} = 1$. If the firms are from different locations m, i.e. m $\neq$ m, the notation will be $IPO_{N,(j,m)} = 1$ and $IPO_{N,(j, m \neq m)} = 1$. If m not located in Norway, the $IPO_{N,(j,m)}$ will nevertheless be 0, since we want to define a Norwegian cluster. $Concentration_m$ is the share each identified location M has relative to the total amount of IPOs.

We eliminated potential clusters with $Concentration_m < 80\%$, as our thesis aims to look further into high-activity clusters, and we believe that < 80% represent a

significant share in order to eliminate all other non-attractive clusters in our sense. We assign Concentration$_m$> 80%, as C$_n$, where *n* is the identification number of a cluster C.

6.3.2 Proposition 2

> *"We expect geographic spread between the firms to a degree we can identify micro-clusters within Oslo Kommune."*

We want to look deeper into the focal clusters, C$_n$, by looking at the Micro-Clusters within. This is to provide an understanding of local mechanism and the regional cluster situation with the different areas. There are certain pre-conditions whom we utilized as to have sufficient information on defining the micro-clusters. The following conditions are as follows:

- The municipality, as mentioned above, must have a Share(M) > 80%.
- The municipality, or the regional cluster, must have a sufficient amount of unique activity in the IPO scene. Whereas we presume "unique activity" as how the total amount of IPO's are distributed among firms in the focal area. Sufficient amount is to the degree to how well we can identify clusters based the distribution, and we set it to Firm(J, M) > 5.
- The firms involved must meet the conditions as developed branch.

If all conditions are met, we propose the following method to find micro-clusters within C$_n$. The method will be stepwise in order to define micro-cluster in the respective C$_n$:

Step 1 - Coordinates

In order to find how the underwriters are clustered, we used decimal degree coordinates for latitudes and longitudes obtained from Google Maps, to find basic distances between each underwriter. We use a Cartesian coordinate system, where longitude$_i$ = X and latitude$_i$ = Y. We want to find a cluster centre, i.e. the firms that are located within the shortest distance to all other firms in C$_n$.

Step 2 - Adjusting for movement

30

If a firm has moved their location within the defined period, we generated new coordinates based on the weighted IPO activity to the date of movement and after movement, after the formula of:

$$NewLognitudeX_j = \sum (weight_{IPO,P} * Lognitude_X) \quad (4)$$

$$NewLatitudeY_j = \sum (weight_{IPO,P} * Latitude_Y) \quad (5)$$

where $weight_{IPO,n}$ is share of IPO at location P of total IPO for firm j. $Lognitude_X$ and $Latitude_Y$ is the firms location before movement. The sum of $weight_{IPO,P} = 1$, and $New\ LognitudeX_j$ and $New\ LatitudeY_j$ is the new longitude and latitude for firm j.

Step 3 - Creating a distance matrix

In the third step we utilized the Haversine formula, a navigational equation-tool. The Haversine formula is beneficial for determining the great-circle intervals in a province between two points based on longitude and latitude. The Haversine functions is given by; *haversin (θ) = sin2 (θ/2)*. Its main purpose is calculating the intervals, identified through longitudes and latitudes linking two points on the surface of the Earth.

$$\Delta\partial = 2\arcsin\left(\sqrt{sin^2\left(\frac{\Delta\emptyset}{2}\right) + cos\ \emptyset_s cos\emptyset_f sin^2\left(\frac{\Delta\vartheta}{2}\right)}\right) \quad (6)$$

where $\Delta\partial$ is the Interior Spherical Angle, $\Delta\emptyset$ = latitude$_i$ − latitude$_j$, $\emptyset_s$ is latitude$_{i,}$, $\emptyset_f$ is latitude$_j$ and $\Delta\vartheta$ = longitude$_j$ − laditude$_i$. To get the $\Delta\partial$ in kilometre, we multiply $\Delta\partial$ with R, which is the earth mean radius, and it is equal to 6371,1km. (Chopde & Nichat, 2013)

Step 4 - Finding a centre for micro-cluster Zn

To assign an arbitrary location to the new cluster we use the data obtained from the distance matrix to find the underwriters which are closest in distance. In order to find the centrality in-between underwriters, we used the formula for closeness centrality. Closeness centrality, C_i^C, is a measurement of the distances between given nodes. It measures the extent

to which a node is within the vicinity of, or proximate to its nearest node. Closeness centrality is defined as:

$$C_i^C = \frac{N-1}{\Sigma_{j \in G; j \neq i} d_{ij}} \qquad (7)$$

where d_{ij} is the notation of length between *i* and *j*, in our case the Haversian distance, giving the shortest distance. *N* is the number of firms located within the cluster. We assign Z_1 to the firm that has the highest C_i^C. Z_1 is defined as a centroid for MC_1

Step 5 – Centralizing Data

When we have selected an arbitrary location, Z_1, we assign all nodes, or firms, to the centroid. To distinguish and divide the current Z_1 into smaller micro-clusters. We take each coordinate, X_i and Y_i and calculate $X_{J, z}$ and $Y_{J, z}$, by:

$$X_{j, z} = X_j - X_z \qquad (8)$$
$$Y_{j, z} = Y_j - Y_z \qquad (9)$$

Where X_j and Y_j is the NewLongitude (3) and NewLatitude (4) for firm *j*, and X_z and Y_z is the longitude and latitude coordinates for centroid, Z_1, defined in Step 3. Further, we scale up $X_{i, z}$ and $Y_{i, z}$ by 1000 to see the finer disparities in the descriptive graph.

Step 6 - CCA

Kaufman and Rousseeuw (1990) distinguishes between two main clustering algorithms (CCA), partitioning and hierarchical algorithms. We intend to determine the local activity areas, therefore we adopted the City Cluster Algorithm (CCA) to identify $MC_n = 1,2,3,..., n..$ Partitioning algorithm will be our focus of this step, and thus hereunder elaborated on. Our adoption of the partitioning algorithm is built upon a set of data, *D*, which is here the Haversine Distance Matrix created under step 3, which is

constructed by *n* firms into a set of MC clusters, where MC is the input variable. *N* firms is decided after conditions under 6.3.

The dataset is normally divided initially, and then applied to a repetitive managing strategy so to optimize the objective function (Ester et al., 1996). Essentially the partitioning algorithm utilizes a twofold setup. The MC types must be decided in advance, and secondly their adjacent objects linked. We decided that MC = 2, as we do not expect MC > 2, as we are looking at contracted micro-clusters. As seen in *Figure 1*, the points in the table symbolize a position of a financial company in our example. We set one point as a base and built from
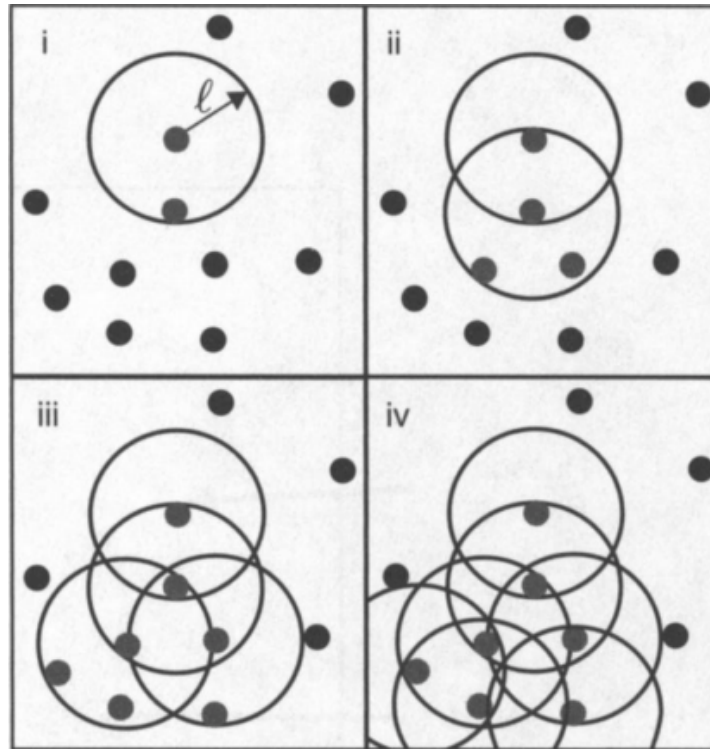
Figure 1: CCA Cluster (Visualization)

thereon out. We are using the node which is within the closest distance to Z_1, as a base. From that node a circle is drawn with radius ℓ=250m. Where the circle meets the other points the cluster expands, and a circle is drawn from the secondary points included in the first circle from our base (ii). From there on circles are drawn from the points that are included in the previous step (iii). Finally, we have drawn circles that no longer overlaps with the remaining points in the sample, the distance is now further than ℓ. Since the distance from the points are now a distance longer than ℓ, the cluster cannot grow beyond this set point (Rozenfeld et al., 2011). The firms which are connected as a result of aforementioned method, will be affiliated with MC_1.

Since we expect two micro-clusters within an area, we need to identify a Z_2, which we can use as a centroid of MC_2. This will be found by using descriptive statistics from step 5 in order to find concentrated areas and

select a fitting node from the identified concentrated area. From the focal node, we will apply the same method as the identification of MC_1 to identify neighbours. The firms which are connected as a result of aforementioned method, will be affiliated with MC_2.

The remaining nodes, that have not been cover in the predetermined areas, or zones (less dense areas) of MC_1 and MC_2 will be classified as a Support Micro-cluster (SMC) and its function is to look at dynamics within C_n, where C_n is defined by the boundaries described under *4.2 - Prop 2*. If the number of firms in MC_n is less than 3, we determine the firms located within this domain as SMC.

The overall condition is that MC_1, MC_2 and SMC is near equally distributed with regards to the number of firms within the MC.

6.3.3 - Proposition 3
"We expect a highly concentrated competition between the actors involved, where few actors represent a high share of total gross proceeds."

Following the method of Corwin and Schultz (2005) we are using the Herfindahl-Hirschman index as a measurement to discover the concentration among the actors in question.

$$HHI = \sum (\text{mkt share}_j)^2 \qquad (10)$$

The market share is a measurement of total gross proceeds to actor *j*. Henceforth, the Department of Justice (U.S.) classifies an unconcentrated industry or market by the Herfindahl-Hirschman index when it reads below 0.10. On the other hand, is a concentrated market defined by an index read above 0.20.

6.3.4 - Proposition 4
"Firms located in the MC are more likely to collaborate with each other than other firms located outside the MC."

Following the method of Baum et al. (2005) we adapt the theory of sector specialization formula to fit our proposition. Sector specialization fits our framework as the theory is transferable and can be used as to explain local and non-local ties in the network.

We like to know the share to which the focal firms have collaborated within the network (-cluster). We propose the following formula:

$$S_{jt} = \frac{s_j}{\Sigma_j \left({S_{jt}}/{k_{it}} \right)^2} \qquad (11)$$

Where s_i = number of ties to local MC/ sum of ties, for bank j. K_{jt} is the total number where bank$_j$ has acted as a Bookrunner, in a fixed period t. S_{jt} is the number of joint Bookrunners relations denoting the number of times bank$_j$ have collaborated with a firm in Micro-cluster i. SS_{jt} takes the number 1 if a firm has only collaborated within their own micro-cluster, and 0 if they have not collaborated with actors within their own micro-cluster. A high average of: ΣSS_{jt} will signify a likeliness of collaboration within the same Micro-cluster.

7.0 FINDINGS

7.1 Distribution of the Dataset

Information drawn from SDC, NewsWeb/Oslo Børs and different prospectus issued in the IPO, generates a list of 184 IPOs in the period between 2002-2017. The database provides detailed information on each IPO, which include variables gross proceeds, share price, number of Bookrunner for each IPO. The database also comprises of which firm/firms that are the Bookrunner, number of Co-managers, which firm/firms that are the Co-managers, and the total number of syndicate members.

The SDC did not separate the roles between the firms other than the labelling as Bookrunner and Co-manager. As explained in the *5.1 Data Collection*, the database did not fully cover all IPO in the period of interest. To secure validity of the data, we inspected similitude between SDC and the Issuers respective prospectus and found no diverging results of the examining.

The distribution of the IPO dataset, and how the activity and IPO constellations on Oslo Stock Exchange has change over the years is presented in Table 1. The mean gross proceeds within the research period was $95,58 million, and each Issuer uses in average 1,86 Bookrunners per IPO, where the median is 2 Bookrunner per issue. With references to panel C; The smallest IPO in light of gross proceeds was $0,38 million, which was the IPO of B+H Ocean Carriers Ltd in 2006. The biggest listing during the period was Renewable Energy Corporation ASA, also in 2006.

Panel B describes how the IPO situation at OSE has developed over time. 2006-2009 stands out as good period with a lot activity, with 69 IPOs, where 57% was with one Bookrunner. Furthermore, the period, not surprisingly, had the highest sum of gross proceeds. If we look at the median proceeds, we can see from out data that it has been a stable increase in gross proceeds, from $21,32m in period 1 to $45,25m in 4. We can see the same trend in *Mean Bookmanagers per listing,* which is consistent with earlier litterateur within the field (Corwin & Schultz, 2005). The Herfindahl Index has been stable over the periods between 10-14%, and that represents an evenly distributed industry. The distribution of the dataset is showed in Table 1, panel A.

36

Table 1: The distribution of the dataset, and the exhibition of how the variables have change over the years

Panel A shows the destitution of the data set. "Offer proceeds" referrers to total gross proceeds in the respective IPO. Closest path between Bookrunner is the closest path the Bookrunners within the IPO, and the distance are in kilometres. Non-Oslo banks are omitted, as there is just one active Bookrunner outside Oslo.

Panel A: Distribution						
	Mean	Min	25th Percentile	Median	75th Percentile	Max
Offer proceeds ($mil)	97,58	0,38	10,45	31,18	109,22	1102,96
No. of book managers per issue	1,86	1,00	1,00	2,00	2,00	6,00
No. of book co-manager per issue	0,38	0,00	0,00	0,00	0,00	4,00
No. of syndicate members per issue	2,24	1,00	1,00	2,00	3,00	7,00
Closest path between Bookrunners (Oslo-Based)	0,61	0,00	0,24	0,45	0,70	2,50

Panel B shows how the IPO-scene at Oslo Stock Exchange have changed over time. The Herfindahl Index is calculated with formula (10), where market share is calculated by the firms individual Total Gross Proceeds. Number of active Bookrunners, co-managers and syndicate members is equal to the number of unique actors during the period.

Panel B: IPO development at Oslo Stock Exchange				
Period	*2002-2005 (1)*	*2006-2009 (2)*	*2010-2013 (3)*	*2014-2017 (4)*
Number of IPO	42	69	32	42
Number of IPO – One Bookrunner	14	39	7	10
As % IPO	0,33	0,57	0,22	0,24
Number of IPO – One Syndicate member	14	22	7	10
As % IPO	0,33	0,32	0,22	0,24
Offer proceeding	2753,87	5724,06	4469,85	5105,16
Mean proceeds	65,57	82,96	139,68	121,55
Median proceeds	21,32	28,77	41,18	45,25
Herfindahl Index (%)	14,13	13,48	9,95	10,23
No. Of active book managers	13	18	19	19
Mean Bookmanagers per listing	1,76	1,51	2,19	2,31
No. Of active Co-managers	7	13	14	12
Mean no. Co-managers per listing	0,26	0,32	0,75	0,31
No. active Syndicate members	15	25	25	23
Mean no. Syndicate member per listing	2,02	1,83	2,94	2,62
No. Of Non-Norwegian Syndicate	3	7	8	6
No. Of Non-Oslo Syndicate	0	1	1	1

Panel C is a representation of the 5 largest and the 5 smallest IPOs in sample period. Number of Bookrunners and - Co-Managers are the count of Norwegian actors.

Panel C: Biggest and smallest IPO at Oslo Stock Exchange (2002-2017)			
Firms	Gross Proceeds ($m)	Number of Bookrunners	Number of co-managers
1. Renewable Energy Corporation ASA	1102,96	2	2
2. Statoil Fuel & Retail ASA	807,93	3	3
3. Entra ASA	798,54	3	3
4. BW Gas ASA	654,30	2	2
5. Aker Drilling ASA	634,43	3	0
.			
.			
.			
180. Bridge Energy ASA	1,04	2	0
181. Medi-Stim ASA	0,72	2	0
182. Serodus ASA	0,69	1	0
183. Team Tankers International Ltd.	0,44	1	0
184. B+H Ocean Carriers Ltd.	0,38	1	0

7.2 Proposition 1 - Clustering in Norway

We aim to look closer into the geographical data from Google Maps and the corresponding coordinates obtained for pinpointing the various financial actors. We apply the clustering methods previously elaborated on as grounds for defining the geographical boundaries of clusters and micro-cluster in Norway.

Table 3 and Panel A shows the different locations of the financial actors, where Panel A represents the coordinates of all the involved financial actors, where it also becomes clear the re-locating of certain actors. One of the main actors, Carnegie have relocated thrice in the time-span 2002-2017. Their initial location in our study was vacated in 2013 for a new location at Aker Brygge before their latest relocation, in 2017, was fulfilled just a few meters further down within the same vicinity. It is no reason to believe that there are any clustering tendencies regarding the firms external to the municipality of Oslo. We can already conclude that there are clear signs of a cluster within the Municipality of Oslo, based on Panel A and Panel B. Looking at Panel B we see that the number of firms located in Oslo is 23 while Non-Oslo firms have a grand total of 3. Furthermore, is the number of IPOs of Oslo-bound firms 184, compared to Non-Oslo's 3. Finally looking at the concentration of offer proceeds there is a grand total of 99.9% taken

by the Oslo-firms, in contrast to non-Oslo's claim of only 0.11%. Based on these findings we conclude that there is no reason to expect a cluster outside of the boundaries of Oslo. In the further analysis of our data we aim to exclude non-Oslo firms from the clustering examination. We conclude that proposition 1 holds, and we assign C (Since there are no other corporate finance-clusters in Norway, $C_1 = C$) to Oslo.

Table 3 - Coordinates and Region Performance

Lognitude (X) and Latitude (Y) represent an exact location of a bank's headquarter. Firms with several locations and listed with (N). "" equal a location change. We have only registered activity in either the previous address or the new address. The X and Y for the firms are set to the address we have registered activity. Panel A also includes a visual representation of the Cartasian coordinates.*

Panel A: Coordinates			
Firm	Period of location	Longitude (X)	Latitude (Y)
Oslo			
ABG Sundal Collier		59,9110067	10,723824
ABN Amro		59,9125083	10,730937
Alfred Berg		59,911823	10,7256256
Arctic Securities*		59,9139294	10,7312901
Argo Securities *		59,9125083	10,730937
CAR AS		59,9136034	10,7220227
Carnegie Investment Bank* (1)	2002-2013	59,9105024	10,7285086
Carnegie Investment Bank* (2)	2013-2017	59,9103539	10,7278114
Carnegie Investment Bank* (3)	2017-	59,9095744	10,7249978
Clarkson Platou Securities *		59,9140952	10,7300517
Danske Markets		59,9095434	10,7248778
DNB Markets (1)	2002-2012	59,9099782	10,7256575
DNB Markets (2)	2012-	59,9075877	10,7598423
Fearnley Securities		59,9076383	10,7442565
First Securities (1)	2002-2011	59,9095744	10,7249978
First Securities (2)	2011-	59,9105064	10,7230265
Fondsfinans Kapitalforvaltning		59,9128789	10,7310855
Handelsbanken Capital Markets*		59,9082557	10,7221608
Netfonds		59,9130579	10,7512873
Nordea Markets (1)	2002-2016	59,927533	10,7110886
Nordea Markets (2)	2016	59,92926	10,7108293
Nordnet (1)	2002-2013	59,9309416	10,7095731
Nordnet (2)	2013	59,9140349	10,7420537
Norne Securities		59,9135231	10,7354255
Norse Securities*		59,9119252	10,7360507
Pareto		59,9126386	10,7297047
SEB		59,9105064	10,7230265
Sparebank 1 Markets*		59,9125083	10,730937
Swedbank* (1)		59,9095744	10,7249978
Swedbank (2)		59,9105064	10,7230265
Other			
Sparebanken Nord-Norge		69,6493117	18,9559686
Sparebank 1 Midt-Norge		63,4309127	10,3998918
Sparebank 1 SR-Bank		58,9700956	5,7325564

OSLO	
ABG Sundal Collier	Fondsfinans Kapitalforvaltning
ABN Amro	Handelsbanken Capital Markets*
Alfred Berg	Netfonds
Arctic Securities*	Nordea Markets*
Argo Securities *	Nordnet*
CAR AS	Norne Securities
Carnegie Investment Bank*	Norse Securities*
Clarkson Platou Securities *	Pareto
Danske Markets	SEB
DNB Markets*	Sparebank 1 Markets*
Fearnley Securities	Swedbank*
First Securities*	

Panel B shows the distribution of the sample data in the respective regions. Non-Oslo firms have been combined, so the comparison will be somewhat equal and to point out the domination of Oslo-Banks. Concentration of offer proceeds are computed by formula (1). "Without involvement from Oslo/Non-Oslo" is the number of IPOs the regions have done without the influence or participation of a different region. As said earlier, offer proceeds are only distributed among the Bookrunners. Therefore, the non-Oslo Gross proceeds is calculated by one IPO.

Panel B: Oslo vs Non-Oslo		
Firm	*Oslo*	*Non-Oslo*
Number of firms	23	3
Number of IPO	184	3
- As Bookrunner	184	1
Gross proceeds (in $m)	13692,19	14,71
Concentration of Offer proceeds	99,9 %	0,11 %
Without involvement from Oslo/Non-Oslo	184	0

7.3 Proposition 2 - Micro-Clusters in Oslo

In order to define the micro-cluster of Oslo, C, we need a fixed point of location to fully examine the cluster effects, as Table 4 Panel A describes. There were several financial companies that operated with various addresses throughout the time-span set for our data. To accommodate for this, we developed an adjusted location based on the previous locations as well as the number of IPOs conducted at the respective grids (4.2.2). With this information we managed to calculate a locational grid that we aimed to use as grounds for the clustering examination. Table 4 shows how the different locations are weighted and the new coordinates

for the locational grid that represents the adjusted location over the time-span 2002-2017. The sum of weighted coordinates will be fixed variable for further exploration.

Table 4 - Movement – New Coordinates

In order to assign a bank to a micro-cluster, we did simplification by assigning each bank to a static address. Panel A shows the period of location in the respective addresses, where the weight denotes the final coordinate. The weight is the number of IPOs in location (L) *as a share of total IPOs done by the bank over the period T. The formulas (4) and (5) is used to denote the final coordinates.*

Panel A: New Coordinates				
Firm	Period of location	Weight	Longitude (X)	Latitude (Y)
Carnegie Investment Bank* (1)	2002-2013	63 %	37,61822244	6,736505
Carnegie Investment Bank* (2)	2013-2017	33 %	19,50569662	3,492775805
Carnegie Investment Bank* (3)	2017-	5 %	2,786491833	0,498837107
Carnegie Investment Bank (NEW)	*New*	*Sum*	*59,91041089*	*10,72811831*
DNB Markets (1)	2002-2012	67 %	40,37411574	7,228127846
DNB Markets (2)	2012-	33 %	19,53526527	3,508676976
DNB Markets (New)		*Sum*	*59,90938102*	*10,73680482*
First Securities (1)	2002-2011	93 %	55,63031909	9,958926529
First Securities (2)	2011-	7 %	4,279321886	0,765930464
First Securities (New)		*Sum*	*59,90964097*	*10,72485699*
Nordea Markets (1)	2002-2016	86 %	51,36645686	9,180933086
Nordea Markets (2)	2016	14 %	8,561322857	1,530118471
Nordea Markets (New)		*Sum*	*59,92777971*	*10,71105156*
Nordnet (1)	2002-2013	67 %	39,95396107	7,1397154
Nordnet (2)	2013	33 %	19,97134497	3,580684567
Nordnet (New)		*Sum*	*59,92530603*	*10,72039997*
Swedbank* (1)		36 %	21,39627657	3,830356357
Swedbank (2)		64 %	38,51389697	6,893374179
Swedbank (New)		*Sum*	*59,91017354*	*10,72373054*

7.3.1 Distance Matrix in Oslo

Based on the Haversine distance matrix we can partially understand that there is a centre where ABN Amro, Sparebank 1 Markets and Argo Securities are located at the same address, Olav V's gate 5, 0161 Oslo. In close proximity to these again we found Fondsfinans merely 40 meters away, and Pareto 70 meters away, as well as Arctic 160 meters. To define a centre Zn we applied the Closeness Centrality formula to define the firm that has the shortest path between their adjacent firms.

The results of the Closeness Centrality are summarized in *Table 5*. We set centre Z_1 to Olav V's gate, 0161 Oslo, as a result of ABN Amro, Sparebank 1 Market and Argo Securities' is situated in that focal address and has the highest Closeness Centrality variable.

41

Distance Matrix - Result of Haversine

The numbers in the Haversine Distance matrix based on the Formula (6), with the results multiplied by 6371,1km to get the result in kilometres. We used the new coordinates created in Table 4 to compute the respective distances.

Haversine Distance Matrix

	ABG	ABN Amro	Alfred Berg	Arctic*	Argo Sec.*	CAR AS	Carnegie	Clarkson Platou*	Danske Bank	DNB Markets	Fearnley	First Sec.	Fondsfinans	Handelsbanken	Netfonds	Nordea	Nordnet	Nome	Norse	Pareto	SEB	Sparebank 1 Markets	Swedbank
ABG		0,43	0,14	0,53	0,43	0,31	0,25	0,49	0,17	0,75	1,20	0,16	0,46	0,36	3,07	2,32	2,73	1,32	1,36	0,68	0,10	0,43	0,21
ABN Amro	0,43		0,31	0,16	0,00	0,51	0,28	0,18	0,47	0,48	0,92	0,47	0,04	1,09	2,27	2,77	3,14	0,51	0,57	0,14	0,91	0,00	0,74
Alfred Berg	0,14	0,31		0,39	0,31	0,28	0,21	0,35	0,26	0,68	1,14	0,25	0,33	0,55	2,86	2,38	2,78	1,11	1,16	0,46	0,32	0,31	0,26
Arctic*	0,53	0,16	0,39		0,16	0,52	0,43	0,07	0,60	0,59	1,01	0,60	0,12	1,20	2,23	2,71	3,07	0,46	0,57	0,23	1,00	0,16	0,85
Argo Sec.*	0,43	0,00	0,31	0,16		0,51	0,28	0,18	0,47	0,48	0,92	0,47	0,04	1,09	2,27	2,77	3,14	0,51	0,57	0,14	0,91	0,00	0,74
CAR AS	0,31	0,51	0,28	0,52	0,51		0,49	0,45	0,48	0,95	1,41	0,47	0,51	0,60	3,26	1,97	2,38	1,49	1,57	0,86	0,36	0,51	0,56
Carnegie (W)	0,25	0,28	0,21	0,43	0,28	0,49		0,42	0,20	0,50	0,95	0,20	0,32	0,75	2,55	2,71	3,10	0,84	0,85	0,27	0,61	0,28	0,40
Clarkson Platou*	0,49	0,18	0,35	0,07	0,18	0,45	0,42		0,58	0,65	1,07	0,57	0,15	1,09	2,37	2,59	2,95	0,60	0,71	0,17	0,88	0,18	0,75
Danske Bank	0,17	0,47	0,26	0,60	0,47	0,48	0,20	0,58		0,67	1,10	0,01	0,51	0,33	2,97	2,52	2,93	1,25	1,27	0,64	0,23	0,47	0,01
DNB Markets (W)	0,75	0,48	0,68	0,59	0,48	0,95	0,50	0,65	0,67		0,46	0,67	0,50	0,43	2,87	2,54	2,94	1,16	1,18	0,54	0,30	0,48	0,09
Fearnley	1,20	0,92	1,14	1,01	0,92	1,41	0,95	1,07	1,10	0,46		1,10	0,94	2,46	0,99	4,31	4,65	1,18	1,03	1,71	2,38	0,92	2,15
First Sec. (W)	0,16	0,47	0,25	0,60	0,47	0,47	0,20	0,57	0,01	0,67	1,10		0,50	0,35	2,95	2,53	2,93	1,24	1,26	0,63	0,24	0,47	0,00
Fondsfinans	0,46	0,04	0,33	0,12	0,04	0,51	0,32	0,15	0,51	0,50	0,94	0,50		1,12	2,25	2,76	3,13	0,49	0,56	0,16	0,94	0,04	0,77
Handelsbanken Markets*	0,32	0,68	0,44	0,81	0,68	0,59	0,41	0,78	0,21	0,83	1,23	0,22	0,72		3,29	2,47	2,89	1,59	1,60	0,97	0,27	0,68	0,35
Netfonds	1,55	1,14	1,44	1,12	1,14	1,63	1,32	1,19	1,52	0,90	0,72	1,52	1,13	1,71		4,76	5,05	1,77	1,70	2,40	3,16	1,14	2,95
Nordea (W)	2,00	2,03	1,95	1,91	2,03	1,69	2,15	1,85	2,17	2,50	2,91	2,16	2,00	2,26	2,78		0,42	3,13	3,28	2,65	2,31	2,03	2,53
Nordnet (W)	1,60	1,54	1,53	1,40	1,54	1,30	1,71	1,36	1,77	1,99	2,37	1,76	1,50	1,90	2,20	0,59		3,47	3,63	3,03	2,72	1,54	2,93
Norne Sec.	0,70	0,27	0,58	0,23	0,27	0,75	0,53	0,31	0,74	0,47	0,82	0,73	0,25	0,94	0,89	2,09	1,55		0,19	0,64	1,42	0,27	1,24
Norse Sec.*	0,69	0,29	0,58	0,35	0,29	0,80	0,47	0,41	0,68	0,29	0,66	0,67	0,30	0,88	0,86	2,25	1,72	0,18		0,71	1,46	0,29	1,26
Pareto	0,37	0,07	0,24	0,17	0,07	0,44	0,26	0,16	0,44	0,54	0,98	0,43	0,08	0,64	1,20	1,98	1,50	0,33	0,36		0,78	0,07	0,63
SEB	0,07	0,49	0,21	0,60	0,49	0,35	0,28	0,56	0,15	0,78	1,23	0,14	0,52	0,25	1,60	2,03	1,65	0,77	0,74	0,44		0,49	0,24
Sparebank 1 Markets*	0,43	0,00	0,31	0,16	0,00	0,51	0,28	0,18	0,47	0,48	0,92	0,47	0,04	0,68	1,14	2,03	1,54	0,27	0,29	0,07	0,49		0,74
Swedbank (W)	0,09	0,48	0,21	0,59	0,48	0,39	0,25	0,56	0,09	0,73	1,18	0,09	0,51	0,23	1,57	2,08	1,69	0,75	0,71	0,43	0,05	0,48	

Table 5 - Finding Centre

Finding Z_1 is done by selecting the highest Closeness Centrality, C^C. C^C is calculated by formula (7), and a higher C^C reflects the firm with the closest distance to the other firms in the data set. Average Distance equal the mean distance between all actors.

Finding Z_1			
Firm	Average Distance	C^C	Of highest C^C
ABG Sundal Collier	0,5773	0,0597	89 %
ABN Amro	**0,5109**	**0,0675**	**100 %**
Alfred Berg	0,5508	0,0626	93 %
Arctic Securities*	0,5689	0,0606	90 %
Argo Securities *	**0,5109**	**0,0675**	**100 %**
CAR AS	0,6978	0,0494	73 %
Carnegie Investment Bank* (New)	0,5555	0,0621	92 %
Clarkson Platou Securities *	0,5701	0,0605	90 %
Danske Markets	0,6257	0,0551	82 %
DNB Markets* (New)	0,7663	0,0450	67 %
Fearnley Securities	1,1466	0,0301	45 %
First Securities* (New)	0,6201	0,0556	82 %
Fondsfinans Kapitalforvaltning	0,5207	0,0662	98 %
Handelsbanken Capital Markets*	0,9503	0,0363	54 %
Netfonds	2,2002	0,0157	23 %
Nordea Markets* (New)	2,5073	0,0138	20 %
Nordnet* (New)	2,6315	0,0131	19 %
Norne Securities	1,1105	0,0311	46 %
Norse Securities*	1,1451	0,0301	45 %
Pareto	0,8170	0,0422	63 %
SEB	0,9936	0,0347	51 %
Sparebank 1 Markets*	**0,5109**	**0,0675**	**100 %**
Swedbank* (New)	0,9274	0,0372	55 %

We want to see whether there are several segments within Oslo, therefore we created a new set of coordinates based on Z_1 as a result of subtracting the individual coordinates of the firms with coordinates of Z_1. Then we scaled these up to create Cartesian Coordinates for visualization of the area around Z_1. The new coordinates are listed in Table 6, with the output of Table 6 visualized in Graph 1.

Table 6 – New Coordinates to find $Z_{2,...,n}$

$X_{i,z}$ and $Y_{i,z}$ is calculated with formula (8) and (9), and represents nodes in a Cartasian Coordinate System. This has been scaled to see bigger differences in the graph.

Finding $Z_{2...n}$			
Firm	Scale	$X_{i,z}$	$Y_{i,z}$
ABG Sundal Collier	1000	-1,502	-7,113
ABN Amro	.	0	0
Alfred Berg	.	-0,685	-5,311
Arctic Securities*	.	1,421	0,353
Argo Securities *	.	0	0
CAR AS	.	1,095	-8,914
Carnegie Investment Bank* (New)	.	-2,097	-2,819

Clarkson Platou Securities *	.	1,587	-0,885
Danske Markets	.	-2,965	-6,059
DNB Markets* (New)	.	-3,127	5,868
Fearnley Securities	.	-4,87	13,3195
First Securities* (New)	.	-2,867	-6,080
Fondsfinans Kapitalforvaltning	.	0,371	0,149
Handelsbanken Capital Markets*	.	-4,253	-8,776
Netfonds	.	0,550	20,350
Nordea Markets* (New)	.	15,271	-19,885
Nordnet* (New)	.	12,798	-10,537
Norne Securities	.	1,014	4,489
Norse Securities*	.	-0,583	5,114
Pareto	.	0,130	-1,232
SEB	.	-2,002	-7,910
Sparebank 1 Markets*	.	0	0
Swedbank* (New)	1000	-2,335	-7,206

Graph 1 - Visualization of Table 6

A visualization of Table X. The graph is rotated to represent a realistic picture of their location if you consider +Y as north, -X as west, +X as east and –Y a south.
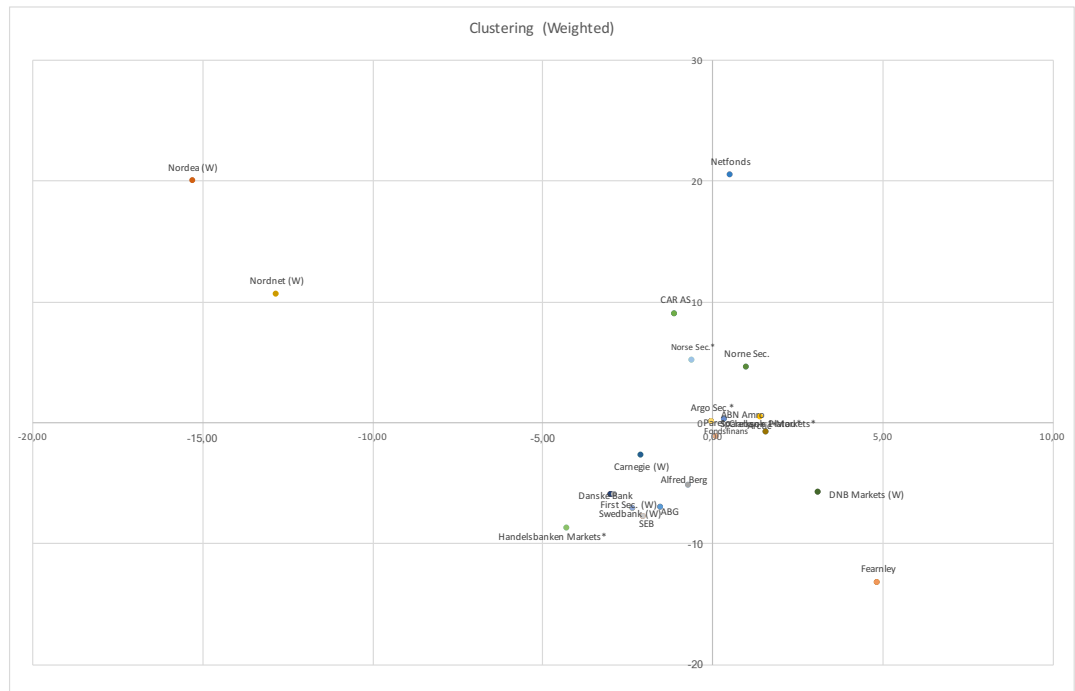
Looking at *Graph 1*, we see tendencies of clustering around *Skandinaviska Enskilda Banken (SEB)* therefore we expect a Z_2 and we set Z_2 to SEB. Furthermore, to assign firms to either Z_1 or Z_2 we applied CCA method to connect the firms to either Z_1 or Z_2. The radius, ℓ, was set to 250 meters so that any firm found within the given radius ℓ was assigned to its corresponding MC (MC_1/MC_2) and renamed as MC_1 and MC_2 (Micro-Cluster). In addition, we notated the firms found outside of the scope of the set ℓ-boundary were denoted as SMC (Supporting-Micro-Cluster). *Table 7* shows an overview of which firms that are assigned to

44

the different Micro-Clusters (MC$_n$ and SMC)

Table 7: Result of CAA (Micro-Clustering)

Shows the assignment of the actors to the different MCs based our result of CAA, as described in the Method, Prop-2, step 5, with l=250m.

Defined Micro-Clusters and support micro-cluster		
MC$_1$	MC$_2$	SMC
ABN Amro	ABG Sundal Collier	Car AS
Arctic Securties	Alfred Berg	DNB Markets
Argo Securties	Carnegie Investment Bank	Fearnley Securities
Clarksons Platou Securities	Danske Markets	Norne Securities
Fondsfinans Kapitalforvaltning	First Sec Securities	Norse Securities
Pareto Securities	Skandinaviska Enskilda Banken	Handelsbanken Capital Markets
SpareBank 1 Markets	Swedbank	Netfonds
		Nordea Markets
		Nordnet

In the discussion part we want to investigate what is the difference between the clusters and how we may differentiate. What are common, or different characteristics on the various clusters. How the IPO data are distributed among the micro-clusters. This is based on the discussion part and our intentions are whether to discuss this data, if there are any clear distinction between the MC's and how they relate to one another. Our findings suggest that proposition 2 holds, as the geographical spread indicate two different micro-clusters, with a support micro-cluster surrounding the two identified micro-clusters.

7.4 Proposition 3 – Individual impact

Table 2; Panel A explains the distribution of the IPO-activity conducted at the Oslo Børs and Oslo Axess. Looking at the table we can clearly see some of the actors' profound impact on the number of IPOs conducted. ABG Sundal Collier and Pareto are prime examples of this as they are the most distinct figures on the Oslo Stock Exchange with 59 and 55 involvements as Bookrunners. ABG and Pareto distinguish themselves as primary leading IPO-companies in that they have the tendency to be the leading Bookrunner. Both have been the Bookrunner in over 95% of the syndicates they have been a part of.

The second next most prominent financial actors operating on the Oslo Stock Exchange is SEB and Carnegie. Looking at these two individually we discovered that all of the leading financial actors have similar involvement in IPOs. They have the same traits as we see by table A that their common platform is taken the

45

seat of Bookrunner with only a sparse 3 or 4 involvements as Co-manager. The 4 most prominent financial actors as mentioned above has a total of 56% share of the offer proceeds of the market. Furthermore, if we exclude the Non-Norwegian based companies the grand total rises to 72% for these four main actors. If we look at the total involvement as a Bookrunners in the IPOs conducted at the Oslo Stock Exchange since 2002 until 2017 these four main actors have had a total involvement of 85%. Oslo Stock Exchange has also a high degree of exposure towards foreign or non-Norwegian financial actors. These financial actors have had a total involvement in 16% of all IPOs conducted as well as a 22% market share of the offer proceeds procured. This is explained by their involvement in "high proceeds-IPOs". DNB Markets and Nordea have comparably a high number of Co-manager positions in IPOs, while both also happens to be institutional banks.

We also looked at the annual ratings from TNS Sifo Prospera that gathers information on the brokerage firms through surveys as to gain insight into the rankings of these companies. These surveys have been conducted since 2002 and we found that the overall best ranked brokerage firm is SEB (Inc. Enskilda). Closely followed by them are ABG, DNB Markets and Carnegie, whereas Carnegie have been at the top 5 level since 2002 (Panel C).

Table 2 – Firms induvial affect

Panel A shows how the IPOs is distributed among the actors. If two or more actors have been involved as a Bookrunner, the total gross proceeds for the respective IPO, is divided by the number of actors involved and distributed equally. Offer Proceeds in Panel A is the accumulated Gross Proceeds for each actor.

	Panel A: Distribution		
Financial Actor	*Bookrunner*	*Co-lead manager*	*Syndicate involvement*	*Offer proceeds ($m)*
ABG Sundal Collier	59	3	62	3178,72
ABN Amro	0	1	1	0
Alfred Berg *(Now ABN AMRO)*	1	0	1	11,89
Arctic Securities	20	3	23	893,86
Argo Securities *(Now Sparebank 1 Markets)*	0	1	1	0
CAR AS	3	0	3	11,98
Carnegie Investment Bank	39	4	43	2634,22
Clarkson Platou Securities	1	0	1	18,20
Danske Markets	6	5	11	292,32
DNB Markets	32	14	46	1164,03
Fearnley Securities	7	1	8	67,14
First Securities *(Now Swedbank)*	12	2	14	289,91
Fondsfinans Kapitalforvaltning	3	0	3	42,50

Financial Actor				
Handelsbanken Capital Markets	0	2	2	0
Netfonds	0	1	1	0
Nordea Markets	5	9	14	173,57
Nordnet	0	3	3	0
Norne Securities	10	0	10	89,45
Norse Securities	1	0	1	2,85
Pareto	55	2	57	2073,54
Skandinaviska Enskilda Banken (SEB)	43	3	46	2007,00
Sparebank 1 Markets	6	2	8	132,81
Swedbank	11	3	14	608,21
Non-Oslo	1	3	4	14,71
Non-Norwegian	29	7	36	3888,40

Panel B displays the numbers of Panel A as percentage of total, for a single actor.

Panel B: Percentage of total (n=184)				
Financial Actor	Bookrunner	Co-lead manager	Syndicate involvement	Offer proceeds ($m)
ABG Sundal Collier	32 %	2 %	34 %	18 %
ABN Amro	0 %	1 %	1 %	0 %
Alfred Berg *(Now ABN AMRO)*	1 %	0 %	1 %	0 %
Arctic Securities	11 %	2 %	13 %	5 %
Argo Securities *(Now Sparebank 1 Markets)*	0 %	1 %	1 %	0 %
CAR AS	2 %	0 %	2 %	0 %
Carnegie Investment Bank	21 %	2 %	23 %	15 %
Clarkson Platou Securities	1 %	0 %	1 %	0 %
Danske Markets	3 %	3 %	6 %	2 %
DNB Markets	17 %	8 %	25 %	7 %
Fearnley Securities	4 %	1 %	4 %	0 %
First Securities *(Now Swedbank)*	7 %	1 %	8 %	2 %
Fondsfinans Kapitalforvaltning	2 %	0 %	2 %	0 %
Handelsbanken Capital Markets	0 %	1 %	1 %	0 %
Netfonds	0 %	1 %	1 %	0 %
Nordea Markets	3 %	5 %	8 %	1 %
Nordnet	0 %	2 %	2 %	0 %
Norne Securities	5 %	0 %	5 %	1 %
Norse Securities	1 %	0 %	1 %	0 %
Pareto	30 %	1 %	31 %	12 %
Skandinaviska Enskilda Banken (SEB)	23 %	2 %	25 %	11 %
Sparebank 1 Markets	3 %	1 %	4 %	1 %
Swedbank	6 %	2 %	8 %	3 %
Non-Oslo	1 %	2 %	2 %	0 %
Non-Norwegian	16 %	4 %	20 %	22 %

Panel C is created by using the annual ranking of Corporate Finance-departments in Norway done by TNS Sifo Prospera. Top 5 is the number of times the respective firm has been ranked among the top 5 best corporate finance-departments in Norway. The points are computed by following rules: 1st) 5 points, 2nd) 4 points, 3rd) 3 points, 4th) 2 points and 5th) 1 point. Points is the overall score between 2002-2017.

Panel C: Reputation		
Financial Actor	Top 5	Points
SEB (including Enskilda Securities)	13	58
ABG Sundal Collier	14	55
DNB Markets	12	45

|		
Carnegie Investment Bank	16	43
First Securities *(Now Swedbank)*	8	22
Pareto	9	22
Alfred Berg	2	9
Swedbank	5	9
Arctic Securities	3	7
Nordea Markets	3	7
Handelsbanken C Markets	2	4
Danske Markets	1	2

Based on the data we clearly see individual performance differences. By looking at the Herfindahl Index, where we define market share as the number of IPO, we can observe a highly concentrated competition around the top 5-bracket, where Pareto and ABG represent a significant share. As a result, the Herfindahl Index is 37,25%, which is equal to a concentrated industry around few actors. Even a higher HHI is observed if you take syndicate membership into account, which amounting to almost 50%. In terms of proposition 3, where we look at market share as Total Gross proceeds, we discover a diverse industry, with an HHI at 13,92%. This is significantly lower than other researchers have found. Following our process, we cannot confirm proposition 3 based on our data.

7.5 Proposition 4 - Networking

Figure 2: Constellation of Network Ties
Shows the different constellation between the Bookrunners of an IPO. Square symbol equal MC_1, triangle equal MC_2 and SMC equal circle.
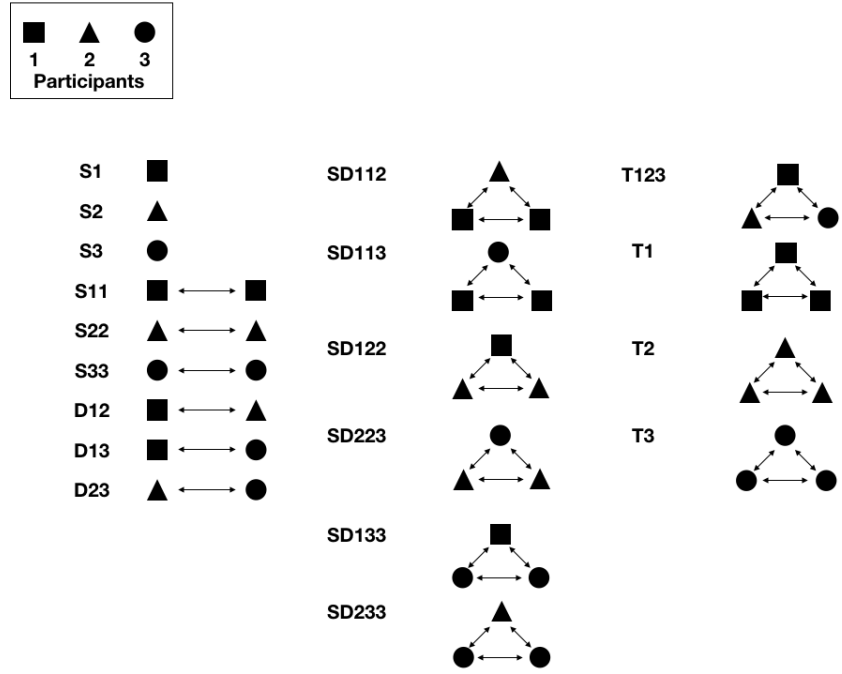
Participant 1, 2 and 3, with following symbol square, triangle and circle, symbolize the respective MC_1, MC_2 and SMC. Square symbolize MC1, triangle refers to MC2 and circle to SMC. The different constellations and their notations have following logic:

S1	S22	SD112	T1
The respective IPO has only Bookrunner from MC_1.	The respective IPO has two Bookrunners from MC_2.	The respective IPO has two Bookrunners from MC_1 and one Bookrunner from MC_2	The respective IPO has three Bookrunners from MC_1

Table 8 shows the appearance of the different ties between and within the respective MC's. By looking at the table, we can observe that the most common constellation is the occurrence of S22, which refers to an IPO with two Bookrunners within the same MC_2. This is according to our expectation. The network ties between MC_1 and MC_2 is strong, which indicates the need for further investigations.

Table 8: Network Constellations

Show the appearance of the different network ties. "Total" is the number of that kind has happen in our database.

Network ties between the Micro-clusters					
Constellation	*Total*	*Constellation*	*Total*	*Constellation*	*Total*
S1	24	SD112	4	T123	9
S2	28	SD113	1	T1	0
S3	13	SD122	5	T2	1
S11	2	SD133	0	T3	0
S22	29	SD223	4		
S33	3	SD233	1		
D12	21				
D13	8				
D23	15				

To further investigate, we looked at the firms' individual influence. We see that the sum of non-local ties is significantly bigger than local-ties. This is contradictory to what we expected in our hypothesis, where we proposed that firms within the same MC is more likely to collaborate. Looking at Pareto's S_{it}, which represents share of local cluster exposure, we can observe that Pareto have a S_{it} as low as 0,027. Which is coherent with other firms situated in MC_1. Firms in MC_2 is more loyal with an average S_{jt} at 0,630 against 0,332 in MC_1. This could indicate that firms in MC_2 are more likely to collaborate. The overall average of S_{it} is at 0,349, which represents a lower result than we expected, as it shows low loyalty to their assigned micro-cluster. Based on the low count of local ties and the low S_{it}, we cannot provide a positive result of proposition 4.

Table 9: Individual Network Ties

Shows the firms individual exposure to the respective MCs. MC_j indicates in which MC the firm is located. MC_1 is the number of ties registered to MC_1. The same with MC_2 and SMC. S_{it} is computed by formula (11), and non-local and local-times indicates how many times they have collaborated with a firm from a different cluster, and how many times they have collaborated within the own cluster.

	Individual Exposure							
Bank	MC_n	MC_1	MC_2	*SMC*	*SUM*	S_{jt}	*Non-local ties*	*Local ties*
ABG Sundal Collier	2	11	21	13	45	0,603	24	21
ABN Amro	1				0		0	0
Alfred Berg	2	1			1	0,000	1	0
Arctic Securities*	1	6	11	5	22	0,198	16	6

Argo Securities *	1				0		0	0
CAR AS	3	1			1	0,000	1	0
Carnegie Investment Bank*	2	9	20	5	34	0,791	14	20
Clarkson Platou Securities *	1	1	1		2	0,500	1	1
Danske Markets	2		6	3	9	0,800	3	6
DNB Markets*	3	18	19		37	0,000	37	0
Fearnley Securities	3	1	6		7	0,000	7	0
First Securities	2	2	3	2	7	0,529	4	3
Fondsfinans Kapitalforvaltning	1				0		0	0
Handelsbanken Capital Markets*	3				0		0	0
Netfonds	3				0		0	0
Nordea Markets	3	2	2	2	6	0,333	4	2
Nordnet	3				0		0	0
Norne Securities	3		1	2	3	0,800	1	2
Norse Securities*	3			1	1	0,000	1	0
Pareto	1	6	33	14	53	0,027	47	6
SEB	2	18	11	5	34	0,257	23	11
Sparebank 1 Markets*	1	3	1		4	0,900	1	3
Swedbank*	2	6	3	1	10	0,196	7	3
Average S_{it}						0,349		
Sum		85	138	53	276		192	276

8.0 DISCUSSION & CONCLUSION

Based on our findings, we conclude that there is a cluster in Oslo grounded in our data. As Porter (1998) argued a cluster is a collection of several firms collected in a smaller geographical area that he defines as the *critical mass*. Our findings show that there is a critical mass in and around Oslo, as 99,9% of the value creation is found within the boundaries of Oslo municipality. The data definitely shows a concentration of firms and value creation within the boundaries of Oslo Kommune, but is the concentration enough to call it a cluster? Whether a formal cluster is correct annotation for Oslo is questionable, and not something we can say without knowing more about the predispositions of the responsible personnel at the various institutions. Thus, as far as we know there is no indication for us to support the idea of a formal cluster-organisation within Oslo. We may however support the notion of an informal cluster as a far more plausible idea. As we know there are certain key-actors who settled in areas whom then again attracted other, similar, institutions and henceforth developed a network or debatably a micro-cluster.

Our geographical findings indicate an unbalanced distribution of firms. Of 26 Norwegian banks, which have been active during our research period, only 3 have been located outside Oslo - and only one has run as Bookrunner (Sparebank 1 SR-Bank - IPO: Webstep 2017). We wanted to look further into how concentrated Oslo really is, and whether Micro-clusters can provide further insight into the clustering in Oslo and add further reasons to call Oslo a financial cluster. There are limited reasons to believe there is not a cluster within Oslo, the argument is whether Oslo is a large enough area to be determined a cluster.

The question we want to answer is how we can define the different MC's based on our data. This question is not just geographically, but the characteristics of the activities in the different MC are relevant factors. The fundamental question is; is micro-clustering a strategic phenomenon? From our geographic data; The longest distance we found in our data, was 5,05 km, which is approximately an hour walk and around 8-minute drive. Such distance is not a problem when the bank can potentially earn millions by taking that trip every day. However, areas such like Fornebu, which is a 14-minute drive from Aker Brygge, with a developed IT-cluster and several Oslo Stock Exchange-listed firms, has no banks with corporate

finance-department located in the area. The formal vs. informal may be interesting to re-visit here. As we know Fornebu was a formal, and planned cluster, and it may also beg to ask if the Fornebu cluster was established too late to have an impact on the formation and sustaining of the already established *informal-banking cluster* in downtown Oslo. Furthermore, one may argue that the attraction of some of Oslo's largest banking-institutions, whom already was located in Oslo, settled the debate of where the rest would be located. These banking-institutions drew the other actors towards downtown Oslo, and hence neglected the possibility of a sub-category-banking cluster at Fornebu. Besides, Olav V's street have historically been an area occupied by financial institutions and brokerage firms throughout the latter decades.

Network ties can be an explanation for the clustering of the various firms. As we know there are certain firms who tend to be more familiar with each other than others. Debatably could these network ties have an impact on the localization of the Network-imbedded firms. Thereafter it is arguably an argument to state that the cluster-formation of both MC_1 and MC_2 are products of network ties. However, our findings do not substantiate these claims and does not support the argument that clustering in Oslo are a product of network ties. We found twice the amount of non-local ties than local ties, suggesting a repeated flow between the MC's and low affiliation to the MC's. However, our data shows a higher affiliation for firms located in MC_2, which is again found in both MC_1 and the SMC. MC_1 and the SMC have a stronger relationship with banks in MC_2 than towards banks in their own clusters, which may be related to the MC_2-firms strong reputation. These ties between firms have drawn collaborating partners to each other and created the micro-clusters. Yet again, the argument can also be regarding the nature of the ties, either direct- or indirect ties. Does the strength of indirect ties have an impact, especially when the actor-pool is this small and arguably every actor considered in our thesis will have indirect ties to all the other actors? We may argue that the indirect ties are not as critical in this scenario, rather the direct ties may be more *valuable* in a multitude of scenarios.

Both direct ties and *influence* are important in the financial milieu. Highly influential actors have become clear in aspects of our study. Actors like DNB Markets is quite clearly an important and highly influential actor, as one of the

53

oldest and largest financial-institutions of Oslo. ABG and SEB are together with DNB Markets the most reputable banks in Oslo, which prompts to believe the statement that these banks are more influential than others. Over the last 15 years these banks have been continually scoring high on the reputation ranking by TNS Sifo Prospera, which again does arguably accumulate more induvial firm influence. Practically we have seen that these firms are has also done the most IPO's and overall done the most IPO's with their respected, reputable partners.

The underwriter(s) has come under scrutiny, as we have been taught their role in the IPO-process and the syndicate. The question is to an extent whether the role of the underwriter is of any importance in the sense of liberty. Does the Issuer take full control of the process and merely delegates tasks to the underwriter(s) or is there a potential for the underwriter(s) to have an impact on the process; If the underwriter(s) has full control of their role factors like capacity and service portfolio have a bigger impact on our result. However, these can be interpreted through the results we have presented above. An explicit example is ABG and Pareto who have a great capacity and service portfolio exerting a high amount of (59, 55) IPO's as Bookrunners compared to Fearnley with a smaller capacity and more specialised service portfolio (7).

In the time period between 2005-2007 about 50% all IPO's in our time-span was conducted. Which draws the attention to the fact that whomever was at the top of the business in this time-frame will have a greater impact on the overall ranking. One specific example is Artic who was founded after this busy IPO period and hence may be statistically exempt by this. On the other hand, Pareto had 54,5%, and SEB 53,5% of their total IPO's conducted within this time-frame labelling their strong presence in the statistics as highly influenced by this time-frame.

The size of the companies does also have an impact on barriers of syndicate inclusion. In smaller firms there is a tendency to be only a few key-determining factors enabling a syndicate entry or activating an exit. We can see from our data that between 2006-2017 there is only one more Bookrunner who is active in the IPO-scene. This could indicate that the larger firms create barriers for smaller firms to find it difficult or close to impossible to enter the market. Also, during this period the median proceeds have grown with 60,7%. In the larger IPO's, our

data shows that 25% of the largest IPO's average 2,6 Bookrunners, in comparison the 25% smallest IPO's average 1,47 Bookrunners. Arguably this is an indication of the market being saturated with suppliers of banking-services, are henceforth making it difficult for these suppliers to attain the positions of Bookrunners as the Issuer(s) requires a larger service-portfolio. In the smaller IPO's the Issuer will hire the services of a bank that covers all the knowledge required to be listed, as the cost of hiring two (or more) is substantially large compared to having one supplier that covers your needs. Comparatively larger IPO's need more Bookrunners to cover the entire banking-services needed and is usually tended to by the most reputable bank-service providers. E.g. the two highest scoring banks for the last 15 years according to TNS Sifo Prospera is ABG and SEB (Enskilda), with respectively 39% and 31% involvement in the focal quantile (largest IPO's).

Another interesting aspect is that 15 biggest IPOs have a 73% involvement from a Non-Norwegian bank. Meaning that the biggest IPOs will require some sort of international experience. ABG has been involved in 60% of the IPO in the same bracket. During the period, 20% of all the companies listed on the Oslo Stock Exchange, is non-Norwegian. This also shows that international experience is important and gives a foundation for contending that this will have even greater importance in the future. Consequently, the international experience and its importance may be yet another barrier for larger corporations to lock out smaller competing companies trying to enter the scene. As seen there are and have been about the exact same amount of banking-institutions for the last 8-10 years after the financial crisis. Does the financial crisis have an impact on the number of firms, or is the result a product of a chosen strategy by the larger corporations for sustain survival? Without knowing their predispositions post-financial crisis, nor their network, and the importance of it, it is hard to say whether this is a possibility or not.

Network ties is one explanation for the cluster-creation as elaborated on in proposition 2. MC_2, and the actors who reside within it, have arguably strong ties to several actors also outside of MC_2 as mentioned in proposition 2. SEB and Swedbank have more ties to MC_1 than to MC_2, and both reside within MC_2. SEB and Pareto are two main actors that have strong ties to a series of actors, but are more likely to collaborate with actors outside of their respective MC.

55

If we look at the MC's we see that there is strong collaboration between the actors. More unexpectedly there are strong ties and a common platform for collaboration between actors from the different micro-clusters we have identified. This debates the legitimacy of claiming there are three different micro-clusters, while it may just be one large cluster, or one *larger* micro-cluster with a support cluster surrounding it.

We have managed to determine geographical differences. Therefore, the question is to distinguish or divide the different areas based on historical performance. In proposition 1, we discovered that we have enough claims to determine the validity of a cluster located in Oslo. Furthermore, we managed to define the areas using coordinates, and could therefore distinguish three distinctive areas in Oslo which to some degree are geographically different. The difference in geography is substantial and hence approves our expectations of proposition 2, claiming there to be micro-clusters within Oslo based on geographical assumptions. Thereafter; can substantiate the geographical assumptions based on historical performance?

Based on the individual and firms' performance we can clearly see differences in the past 15 years. Total gross proceeds are threefold in MC_2 compared to its counterparts MC_1 and six times as great as in the SMC. MC_2-actors have accumulated 20% more IPO's as Bookrunner than MC_1 and the SMC combined. Additionally, MC_2 have a significantly higher firm-reputation pool than the other two clusters, with 198 compared to 52 (SMC) and 29 (MC_1). It should be made clear that DNB are responsible for 86% of the reputation points in the SMC and has previously been localized in the MC_2.

Table 10: MC_j Performance

Show the performance of the Micro-clusters. Compactness is the average distance between the firms within the MC_n. Market share is calculated taking the firms offer proceeds divided total offer proceeds. Herfindahl within the MC is computed by formula (10).

Performance of the individual Micro-Clusters			
	MC_1	MC_2	SMC
Companies	7	7	9
Number of IPO (Involvement)	65	102	81
Number of IPO without involvement from other zones	28	53	17

Offer proceeds (Book - Total)	3161	9 022	1509
Compactness	0,13	0,27	2,21
Market Share	23,09 %	65,89 %	11,02 %
Herfindahl Within MC_i	51 %	27 %	61 %

By looking at the Herfindahl Index for the micro-cluster (MC_1, MC_2, SMC), it is very apparent that in MC_1 and SMC there are one or two major actors (oligopolies) controlling the cluster, with MC_2 displaying a more balanced distribution. This may indicate that only MC_2 is a real cluster while others are more closely defines as oligopolies controlled by few major actors, in this case Pareto, Arctic (MC_1) and DNB Markets (SMC). Regarding network ties a clear trend shows that 56% of the total ties are directed towards MC_2. Pareto is geographically closest to MC_2 of all the actors in MC_1, explaining some of the strong influence Pareto have towards MC_2. The CEO of Arctic was the former CEO of SEB, with DNB Markets formerly located in MC_2 we can argue that these ties do have an impact on the sustaining and development of the MC's.

We can argue that MC_1 and MC_2 should in essence be one cluster, with the SMC staying as the SMC. MC_1 and MC_2 have as one cluster been responsible for 68% of all gross proceeds and has been involved in 90% of all IPO's in the 15-year period. Between the two MC's there has been 47 network ties which represents 25% of all IPO's on the Oslo stock Exchange. Additionally, the furthest distance between two actors in MC_1 and MC_2 is 1 km, between SEB and Arctic. Therefore, we may argue that MC_1 and MC_2 should in principle be one combined cluster; MC, with SMC staying as the SMC.

Seeing the two distinct MC's there is evidence to believe that all the actors in MC2 should be in a combined MC, while not all in MC_1 should. Furthermore, there are actors who distinguish themselves as leaders or giants of the MC and has thorough their network and their ties a substantial impact on the cluster and other actors. Their impact is additionally also on sustaining and developing the cluster, while their presence and control does also limit the entry-possibility for other companies.

In retrospect of the last 15 years we can determine a few main actors with distinguishably historical performance differences compared to its counterparts in

the cluster. We can clearly see that there are geographical areas with far superior historical performance compared to other areas. However, we cannot argue that is a result of collaboration internally between actors or that the individual firms success is purely a product of their own ingenuity. We can argue the plausibility of cluster-effects may have had an impact on the individual-firms performance based on network ties and our definition used of a cluster.

We can argue by our definitions that there are MC's within Oslo and that they could very possibly have been heavily affected by the network theorem presented in our paper. Even so, it is difficult to determine unquestionably that the positioning is the reasoning for a distinguishably historical positive performance, or the ties or network of the respective firms that are the foundation for success. To systemize the process within Oslo, utilising cluster-theory has been very useful in order to understand local mechanisms. Cluster theory has also additionally been advantageous in determining network patterns. Our approach provides a solid foundation for further research, in areas as network patterns and economical clusters in Oslo. It has also provided a new method to distinguish high-activity-, small geographic-areas. For us the cluster theory helpful, especially in the geographical term. Porters definition of a cluster is far from what we see in Oslo. The lack of supporting institutions, and interconnected companies and institutions has not been identified by us, hence we cannot determine successful geographical clusters. By identifying the MCs, stakeholders may be in a position of better localising clientele and customer base. Furthermore, it provides information for the expansion of inner-city-Oslo in determining areas of financial-success and financial clustering and raising awareness of the further development of these areas with the financial aspect as a vital part of the city planning. Following the theory of Porter, the awareness we have created may help to provide the support functions that has been lacking, and henceforth sustain success in the future.

9.0 CONTRIBUTION AND LIMITATIONS

We have written this paper as a contribution to the local dynamics of the IPO-scene in Oslo and contributed to the understanding of influence and competition. Our method of thoroughly rendering the status of the economic foundations on the Oslo Stock Exchange has given a clearer picture of the current state and importance of the various institutions located within Oslo. Our paper has produced a platform for further exploration into the field of a financial clusters located within Oslo. The paper has also introduced a new method of determine or distinguish micro-clusters. Micro-cluster is field within strategy and finance that has yet to be explored enough, and we hope that our approach may intrigue others to explore the field further. Our paper proposes an approach on, and a foundation for looking closer at micro-clustering and the network aspect interconnected with the MC's. Especially interesting is the mobility of brokers from firm to firm within the network or MC, with the explicit examples of the former CEO of SEB became the CEO of Arctic and the owner of Pareto was heavily involved in the establishment of Sundal Collier, later ABG Sundal Collier. An interesting aspect is how these networks and key personnel may potentially affect the clustering characteristics of the MC's. Besides, does this potentially have an impact on the expansions of the cluster, or conversely a tightening of the rigid admission requirements to be part of the MC/Network.

10.0 REFERENCES

Aharonson, B. S., Baum, J. A., & Plunket, A. (2008). Inventive and uninventive clusters: The case of Canadian biotechnology. *Research Policy*, *37*(6-7), 1108-1131.

Almeida, P., Song, J., & Grant, R. M. (2002). Are firms superior to alliances and markets? An empirical test of cross-border knowledge building. *Organization Science*, *13*(2), 147-161.

Ambler, T., & Barrow, S. (1996). The employer brand. *Journal of brand management*, *4*(3), 185-206.

Audretsch, D. B., & Lehmann, E. E. (2005). Does the knowledge spillover theory of entrepreneurship hold for regions?. *Research Policy*, *34*(8), 1191-1202.

Bathelt, H., Malmberg, A., & Maskell, P. (2004). *Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation.* Progress in human geography, 28(1), 31-56.

Baum, J. A., Rowley, T. J., Shipilov, A. V., & Chuang, Y. T. (2005). Dancing with strangers: Aspiration performance and the search for underwriting syndicate partners. *Administrative science quarterly*, *50*(4), 536-575.

Baum, J. A., Shipilov, A. V., & Rowley, T. J. (2003). Where do small worlds come from?. *Industrial and Corporate change*, *12*(4), 697-725.

Baptista, R., & Swann, P. (1998). Do firms in clusters innovate more?. *Research policy*, 27(5), 525-540.

Baptista, R., & Swann, G. P. (1999). A comparison of clustering dynamics in the US and UK computer industries. *Journal of evolutionary economics,* 9(3), 373-399.

Brau, J. C., Francis, B., & Kohers, N. (2003). The choice of IPO versus takeover: Empirical evidence. *The Journal of Business*, *76*(4), 583-612.

Burch, J. C., & Foerster, B. S. (Eds.). (2005). *Capital Markets Handbook*. Aspen Publishers.

Cai, Y., Tian, X., & Xia, H. (2016). Location, proximity, and M&A transactions. *Journal of Economics & Management Strategy*, *25*(3), 688-719.

Campaniaris, C., Hayes, S., Jeffrey, M., & Murray, R. (2011). The applicability of cluster theory to Canada's small and medium-sized apparel companies. *Journal of Fashion Marketing and Management: An International Journal*, *15*(1), 8-26.

Carter, R. B., Dark, F. H., & Singh, A. K. (1998). Underwriter reputation, initial returns, and the long-run performance of IPO stocks. *The Journal of Finance*, *53*(1), 285-311.

Carter, R., & Manaster, S. (1990). Initial public offerings and underwriter reputation. *the Journal of Finance*, *45*(4), 1045-1067.

Chen, H. C., & Ritter, J. R. (2000). *The seven percent solution*. The Journal of Finance, 55(3), 1105-1131.

Chopde, N. R., & Nichat, M. (2013). Landmark based shortest path detection by using A* and Haversine formula. *International Journal of Innovative Research in Computer and Communication Engineering*, *1*(2), 298-302.

Chung, S., Singh, H., & Lee, K. (2000). Complementarity, status similarity and social capital as drivers of alliance formation. *Strategic management journal*, 21(1), 1-22.

DiMaggio, P., & Louch, H. (1998). Socially embedded consumer transactions: For what kinds of purchases do people most often use networks?. *American sociological review*, 619-637.

Dunbara, C., & King, M. R. (2018) Multiple Bookrunners, Bargaining Power, and the Pricing of IPOs. *Working paper.*

Fang, L., & Yasuda, A. (2005). *Analyst reputation, conflict of interest, and forecast accuracy.* RODNEY L WHITE CENTER FOR FINANCIAL RESEARCH-WORKING PAPERS-, 7.

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2012). *Management research*. Sage.

Ellis, K., Michaely, R., & O'hara, M. (2000). When the underwriter is the market maker: An examination of trading in the IPO aftermarket. *The Journal of Finance*, *55*(3), 1039-1074.

Ellis, K., Michaely, R., & O'hara, M. (2000). When the underwriter is the market maker: An examination of trading in the IPO aftermarket. *The Journal of Finance*, *55*(3), 1039-1074.

Espinasse, P. (2014). *Ipo: A Global Guide*. Hong Kong University Press.

Ester, M., Kriegel, H. P., Sander, J., & Xu, X. (1996). A density-based algorithm for discovering clusters in large spatial databases with noise. In *Kdd* (Vol. 96, No. 34, pp. 226-231).

Gellynck, X., & Kühne, B. (2010). Horizontal and vertical networks for innovation in the traditional food sector. *International Journal on Food System Dynamics*, *1*(2), 123-132.

Gibson, L. J., Lim, J., & Pavlakovich-Kochi, V. (2013). The university research park as a micro-cluster: Mapping its development and anatomy. *Studies in Regional Science*, *43*(2), 177-189.

Gulati, R. (1998). *Alliances and networks*. Strategic management journal, 19(4), 293-317.

Gulati, R. (1999). Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic management journal*, *20*(5), 397-420.

Gulati, R., & Gargiulo, M. (1999). Where do interorganizational networks come from?. *American journal of sociology*, *104*(5), 1439-1493.

Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. *Strategic management journal*, 203-215.

Gundersen, F., Langeland, O., & Aarhaug, J. (2017). Work place location, transport and urban competitiveness: the Oslo case. *Transportation Research Procedia*, *26*, 196-206.

Guthrie, J. P. (2001). High-involvement work practices, turnover, and productivity: Evidence from New Zealand. *Academy of management Journal*, *44*(1), 180-190.

Hamel, G. (1991). Competition for competence and interpartner learning within international strategic alliances. *Strategic management journal*, *12*(S1), 83-103.

Hoang, H., & Rothaermel, F. T. (2005). The effect of general and partner-specific alliance experience on joint R&D project performance. *Academy of Management Journal*, *48*(2), 332-345.

Hoffman, A. J., & Ventresca, M. J. (2002). *Organizations, policy and the natural environment: Institutional and strategic perspectives*. Stanford University Press.

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific journal of management*, *1*(2), 81-99.

Hovakimian, A., & Hutton, I. (2010). Merger-Motivated IPOs. *Financial Management*, *39*(4), 1547-1573.

Hu, Y., & Ritter, J. R. (2007). *Multiple bookrunners in IPOs*(Doctoral dissertation, University of Florida).

Huemer, L., Becerra, M., & Lunnan, R. (2004). Organizational identity and network identification: relating within and beyond imaginary boundaries. *Scandinavian Journal of Management*, *20*(1-2), 53-73.

Lunnan, R., Becerra, M., & Huemer, L. (2008). Trustworthiness, risk, and the transfer of tacit and explicit knowledge between alliance partners. *Journal of Management Studies*, *45*(4), 691-713.

Hurley, A. E., Scandura, T. A., Schriesheim, C. A., Brannick, M. T., Seers, A., Vandenberg, R. J., & Williams, L. J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 18(6), 667-683.

Iammarino, S., & McCann, P. (2006). The structure and evolution of industrial clusters: Transactions, technology and knowledge spillovers. *Research policy*, *35*(7), 1018-1036.

Inkpen, A. C. (1998). Learning and knowledge acquisition through international strategic alliances. *The Academy of Management Executive*, *12*(4), 69-80.

Isaksen, A. (2004). Knowledge-based clusters and urban location: the clustering of software consultancy in Oslo. *Urban Studies*, *41*(5-6), 1157-1174.

Jain, B. A., & Kini, O. (2006). Industry clustering of initial public offerings. *Managerial and Decision Economics*, *27*(1), 1-20.

Jenkinson, T., & Jones, H. (2009). Competitive IPOs. *European Financial Management*, *15*(4), 733-756.

Jennings, P. J. (2008). Using cluster analysis to define geographical rating territories. *Applying Multivariate Statistical Models*, 34.

Jeon, J. Q., & Lee, C. (2015). A new measure for heated negotiation in the IPO syndicate. *The North American Journal of Economics and Finance*, *33*, 278-304.

Josang, A., & Ismail, R. (2002, June). The beta reputation system. In *Proceedings of the 15th bled electronic commerce conference* (Vol. 5, pp. 2502-2511).

Kale, P., Singh, H., & Perlmutter, H. (2000). Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic management journal*, 217-237.

King, R. G., & Levine, R. (1993). Finance, entrepreneurship and growth. *Journal of Monetary economics*, *32*(3), 513-542.

Kollo, M. G. (2005). Underwriter competition and gross spreads in the eurobond market.

Krigman, L., Shaw, W. H., & Womack, K. L. (2001). Why do firms switch underwriters?. *Journal of financial economics*, *60*(2-3), 245-284.

Li, S. X., & Rowley, T. J. (2002). Inertia and evaluation mechanisms in interorganizational partner selection: Syndicate formation among US investment banks. *Academy of Management Journal*, *45*(6), 1104-1119.

Liu, X., & Ritter, J. R. (2011). Local underwriter oligopolies and IPO underpricing. *Journal of Financial Economics*, *102*(3), 579-601.

Long, C., & Zhang, X. (2011). Cluster-based industrialization in China: Financing and performance. *Journal of International Economics*, *84*(1), 112-123.

Loureiro, G. (2010). The reputation of underwriters: A test of the bonding hypothesis. *Journal of Corporate Finance*, *4*(16), 516-532.

Makse, H. A., Havlin, S., & Stanley, H. E. (1995). *Modelling urban growth patterns*. Nature, 377(6550), 608.

Maksimovic, V., & Unal, H. (1993). Issue Size Choice and "Underpricing" in Thrift Mutual-to-Stock Conversions. *The Journal of Finance*, *48*(5), 1659-1692.

Malakauskaite, A., & Navickas, V. (2010). THE ROLE OF CLUSTERS IN THE FORMATION PROCESS OF TOURISM SECTOR COMPETITIVENESS: CONCEPTUAL NOVELTIES. *Economics & Management*.

Marston, F., Ljungqvist, A., & Wilhelm Jr, W. J. (2006). *Competing for securities underwriting mandates: Banking relationships and analyst recommendations*. The Journal of Finance, 61(1), 301-340.

Maylath, E., Seidel, J., Werner, B., & Schlattmann, P. (1999). Geographical analysis of the risk of psychiatric hospitalization in Hamburg from 1988–1994. *European psychiatry*, *14*(8), 414-425.

Morsfield, S. G., & Tan, C. E. (2006). Do venture capitalists influence the decision to manage earnings in initial public offerings?. *The Accounting Review*, *81*(5), 1119-1150.

Mudambi, R., & Swift, T. (2012). Multinational enterprises and the geographical clustering of innovation. *Industry and Innovation*, *19*(1), 1-21.

O'Brien, P. C., & Tan, H. (2015). Geographic proximity and analyst coverage decisions: Evidence from IPOs. *Journal of Accounting and Economics*, *59*(1), 41-59.

Pichler, P., & Wilhelm, W. (2001). A theory of the syndicate: Form follows function. *The Journal of Finance*, *56*(6), 2237-2264.

Piore, M., & Sabel, C. (1984). *The second industrial divide: prospects for prosperity*. New York.

Podolny, J. M. (1994). Market uncertainty and the social character of economic exchange. Administrative science quarterly, 458-483.

Porter, M. E. (1998). *Clusters and the new economics of competition* (Vol. 76, No. 6, pp. 77-90). Boston: Harvard Business Review.

Porter, M. E. (2000). *Location, competition, and economic development: Local clusters in a global economy*.

Economic development quarterly, 14(1), 15-34.

Porter, M. (2003). *The economic performance of regions*. Regional studies, 37(6-7), 549-578.

Rajan, R. G., & Zingales, L. (1998). Power in a Theory of the Firm. *The Quarterly Journal of Economics*, *113*(2), 387-432.

Reve, T., & Sasson, A. (2015). Theoretical and methodological advances in cluster research. *Competitiveness Review*, *25*(5), 524-539.

Roosenboom, P., & Van Den Bosch, B. W. (2012). Syndicate Partner Selection: who Syndicates with Whom?. *The Oxford Handbook of Private Equity*, 199.

Rousseeuw, P. J., & Kaufman, L. (1990). *Finding groups in data*. Hoboken: Wiley Online Library.

Rowley, T., Behrens, D., & Krackhardt, D. (2000). Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic management journal*, *21*(3), 369-386.

Rozenfeld, H. D., Rybski, D., Andrade, J. S., Batty, M., Stanley, H. E., & Makse, H. A. (2008). *Laws of population growth*. Proceedings of the National Academy of Sciences, pnas-0807435105.

Rozenfeld, H. D., Rybski, D., Gabaix, X., & Makse, H. A. (2011). The area and population of cities: new insights from a different perspective on cities. *American Economic Review*, *101*(5), 2205-25.

Sasson, A., & Reve, T. (2015a). Complementing clusters: a competitiveness rationale for infrastructure

investments. *Competitiveness Review*, *25*(3), 242-257.

Reve, T., & Sasson, A. (2015b). Theoretical and methodological advances in cluster research. *Competitiveness Review*, *25*(5), 524-539.

Schadler, F. P., & Manuel, T. L. (1994). Underwriter choice and announcement effects for seasoned equity offerings. *Journal of Financial and Strategic Decisions*, *7*(2), 53-65.

Schultz, P. H., & Zaman, M. A. (1994). Aftermarket support and underpricing of initial public offerings. *Journal of Financial Economics*, *35*(2), 199-219.

Sjostrom Jr, W. K. (2001). Going public through an internet direct public offering: A sensible alternative for small companies. *Fla. L. Rev.*, *53*, 529.

Song, W. L. (2004). Competition and coalition among underwriters: The decision to join a syndicate. *The Journal of Finance*, *59*(5), 2421-2444.

Summers, L. H. (2007). History holds lessons for China and its partners. *Financial Times*, *25*.

Thornton, P. H., & Flynn, K. H. (2003). Entrepreneurship, networks, and geographies. In *Handbook of entrepreneurship research* (pp. 401-433). Springer, Boston, MA.

Titman, S., & Trueman, B. (1986). Information quality and the valuation of new issues. *Journal of accounting and economics*, *8*(2), 159-172.

Torstila, S. (2001). What determines IPO gross spreads in

Europe?. *European Financial Management*, 7(4), 523-541.

Wendt, S. (2008). Direct public offering. *Encyclopedia of alternative investments*, 141.

Werner, Geoffrey, "The United States Postal Service's New Role: Territorial Ratemaking," Casualty Actuarial Society Forum, 1999, Winter, 287-308.

Williams, L. J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of organizational behavior*, 667-683.

Williamson, O. E. (1975). Markets and hierarchies. *New York, 2630*.

Williamson, O. E. (1979). Transaction-cost economics: the governance of contractual relations. *The journal of Law and Economics*, *22*(2), 233-261.

Zaheer, A., & Bell, G. G. (2005). Benefiting from network position: firm capabilities, structural holes, and performance. *Strategic management journal*, 26(9), 809-825.

Zucker, L. G., & Darby, M. R. (1998). Entrepreneurs, star scientists, and biotechnology. *NBER Reporter Online*, (Fall 1998), 7-10.

Webpages:

Nasdaq. (2017). Initial Public Offering. Retrieved 22.03.2018, from: https://www.nasdaq.com/investing/glossary/i/initial-public-offering

Oslo Børs (2018). Notering. Retrieved 19.03.2018, from: https://www.oslobors.no/Oslo-Boers/Notering

Herfindahl-Hirschman Index. (2015, July 29). Retrieved 21.04.2018, from: https://www.justice.gov/atr/herfindahl-hirschman-index

Transparancy International. (2016). Corruption by country/territory Norway. Retrieved, 23.04.2018 from: https://www.transparency.org/country/#NOR_PublicOpinion

Registersøk. (n.d.). Retrieved June 12, 2018, from https://www.brreg.no/produkter-og-tjenester/registersok/

APPENDIX

APPENDIX 1 - THE IPO PROCESS
The IPO process is a thorough and encumbering affair that starts months before the actual completion and listing of the company. Underneath is an elaborate description of the process from start to finish based on the Norwegian model from the Oslo Stock Exchange (oslobors.no). The roles of the actors are to the appropriate extent included in the process as to set an image to how their roles may be influences and determined by the process of which they are incorporated in (Jenkinson & Howard, 2009). Referring to section 2.2.2; Bookrunner may also denote multiple bookrunners in this paragraph.

I.I The Initial Phase

The first step is to select the book-running manager and the co-manager(s) and setting the frame of the project. Usually the primary Bookrunner(s) is chosen at least 6 months prior to the initiation of the IPO. The Bookrunner(s) is chosen by the issuing firm and gets to work alongside the Issuer in setting up the syndicate and commence the process.

This initial step is the function where the Issuer does the analysis, and quality research in the industry to find the matching manager(s). The task given to the book-running manager is to form the syndicate alongside the Issuer and be in charge of the process from start to finish.

The agreement between the Issuer and the underwriter is pivotal for the process proceeding. Following the agreement, the facilitator, the Bookrunner(s), will handle the coordination of the team or syndicate. The team is often compiled by a managing director, a board and legal advisors as well as representatives from the accountancy managers company. To be able to control the flow of information and diminishing the flow of mis-information an information-advisor is often hired to control the amount and contents of the information distributed outside of the IPO.

The proceeding process is setting the goals for the IPO, which includes the amount of capital intended to gain through the IPO as well as how this will be executed. In this phase it is important to determine the number of shares that will

be distributed as well as the price-interval deemed applicable for the transaction. With smaller IPO's it is often only one lead-manager, while conducting larger IPO's there is a need for several managers, denoted as co-managers. These co-managers will play their part in the syndicate as a subordinate to the lead-manager and share the responsibilities of coordination with the lead manager. They may also assume the role of co-Bookrunners, whom are designated to the responsibility of selling stocks (Corwin & Schultz, 2005).

I.II Preparation Phase

In the following step, the managing Bookrunner will on behalf of the Issuer contact the Oslo Stock Exchange, Oslo Børs, to apply to be noted for their initial public offering. This is a tedious process and is initiated early on so that it coincides with the completion of the IPO. Simultaneously is the valuation of the company conducted by the subordinate underwriters of the syndicate, they are set to focus on this in their analytical work.

For the valuation to be correct and in line with the current state of the company, the due diligence must be conducted. The due diligence is the legal, commercial and auditory checks that needs to be gone through. This is so that the syndicate has a view of the current status so that any circumstances that may alter the company value is deducted in the process. This is an important job for the underwriters analytical work to present the correct valuation of the issuing company.

After the valuation has been completed, the structure of the transaction is due to be set. Meaning the model of the IPO, its size, use of first refusal, "lock-up" owner-structure and so forth. The issuing company must also determine the price point the stocks will be traded at, often denoted through book-building (which is a systematic process where the Issuer generates, capture and record the demand of investors for the shares in the IPO so to deduct the demand and set a price) or a set price.

With that base of the structure of the transaction, the work starts to work out the written material utilized in the remaining process of the IPO. This material is used for the next part, the presentation of the prospect to interested parties, also called

"road-show". A road show is the action of executives from the syndicate-member companies traveling around to interested parties and potential buyers, presenting the issuing company as a viable, interesting and highly successful party, all based of the initial analysis conducted by the underwriters of the syndicate comprised around the issuing company.

I.III IPO Road-Show

In this phase the syndicate members allocated to the task, promote the issuing company to the potential investors and buyers. A determining phase of the IPO-process. Initially the prospect is presented to stock analytics and stock brokers at the offices of the brokerage. Furthermore, is the listing prospect publicised at the website of the brokerage, which also includes the written material for the IPO. Based on the publicly available information, the analysts produce a rapport used in the road-show. The purpose of these road-shows is to gain interest surrounding the IPO and the issuing company. Afterwards, the syndicates managing Bookrunner, or whomever have been decided to do so will usually travel around conducting the "management road-show".

In parallel with this is the book-building conducted, if the approach is chosen. In the end of the marketing phase, the book is closed and there is no longer the option possible for investors to list themselves for stocks. The Bookrunner will then go through the book and divide investors into different classes based upon how attractive they are as owners for the issuing company. The most attractive investors will end up on the top tier class and are typically institutional and long-term investors that will not look for a quick flip immediately after the listing. The bottom class is often the smaller, private investors, and other short-term focusing investors.

Finally, the price of the stock will be set by the issuing company based off of the analytical work done by its operating syndicate. In addition, as well as whom of the investors will be given shares and how many they will be given. The time for allocation of the shares are set and announced to the investors, denoted t. The investors are given two, three days to pay for the shares. When the payment has come through the shares will be registered and issued to the investors shortly after. Trading of the stock can be initiated the day after they have been issued. In

the case when some of the existing shareholders may borrow out stocks or the acquirers retrieve a payment guarantee, it can move even faster from time, *t,* to listing.

I.IV The Fourth Step - The Aftermarket

This phase is initiated by the issuing company's initial public offering. After the company is listed it is important that the management builds a strong foundation of trust towards the company. This is sought after by the managing Bookrunner and done through a thorough and well executed communication strategy so that the liquidity of the company increases.

Prior to the listing the issuing company must decide whether to give the members of the syndicate the anticipation of a "green show option". A green show option is an option that allows the syndicate members the possibility to issue more shares than initially indicated (commonly 15%). If these syndicate members expect a high demand for the shares post listing, they typically tend to sell of the 15% ad on shares with the expectation to take advantage of the *green shoe option*. However, on the other hand, if the expectations are low following the issuing of the shares one tend to typically sell 35% over the given sum of shares so that approximately 20% can be bought back post issuing of the shares. These shares can thereafter be annulled, as if they never existed. Following this procedure, the Bookrunner manages to stabilize the stock price post issue. Such thereafter, preventing the stock price to fall and the trust, or goodwill, of the company to suffer a parallel descent.

I.V The Final Step - The Listing Application

In parallel with the IPO preparations, work is also conducted with regards to the application where the Issuer seeks to be listed. In Norway a company can be listed either on the Oslo Børs or Oslo Axcess. The Issuer has the same stock exchange responsibilities whether listed on one or the other. The differences between the two respectively is in essence that Oslo Axcess has somewhat less demands towards the Issuer when it comes to the history of the company as well as its assumed market value.

The process to be accepted for listing on the stock exchange takes at least eight weeks and consist of multiple steps. Firstly, a statement is sent by the Bookrunner to the administration of the stock exchange, where the issuing company is describes concerning how they satisfies the demands needed to be listed. Thereafter, a meeting is set with the representatives from the syndicate, with the advisors and the administration from the Oslo Stock Exchange. In this meeting the issuing company presents itself and how they satisfy the demands again. Later, usually a few days post the initial meeting, a second meeting is set up with the same representatives, where the results from the previously conducted due diligence is presented.

Succeeding the meeting, the application for listing is sent to Oslo Børs. Oslo Børs is the institution that has the final say in the decision whether the issuing company may be listed on the stock exchange or not. When the board has approved the application for listing the issuing company may be issued immediately, and the trading of the shares commence

Msc In Business

Strategy Major

Preliminary Master Thesis Report

Rolv Petter Storvik Amdam (Supervisor)

1.0 Introduction

In the market of Initial Public Offerings (IPO's) and other issues there has been a growing trend towards the use of a more extensive portfolio of co-managers and multiple underwriters. The issues have become more complex and thus necessitates a larger base of interorganizational relationships that closely relates to the successfulness of the IPO's.

2.0 Literature Review

There has been a growing need and demand for assistance when conducting these elaborate actions for companies, and this is where the financial brokerages come in. The development from having only a few to a handful of co-managers and underwriters when conducting IPOs have been growing since the late 1990s. The use of multiple partnering financial institutions have created a more complete, but yet also a more complex picture of the IPO process (Corwin & Schultz, 2005).

Corwin & Schultz continue to label these co-managers, inclusive the underwriters as a consortium or more precisely as a syndicate. The Syndicate is often referred to as a group of individual actors collaborating or combining their expertise to achieve or promote a common goal (snl.no). Several authors including the likes of Torstila (2001) and Joen & Lee (2015) have shed light upon the heated internal battles taking place within these IPO-syndicates as a liability for the companies conducting the IPO's, however this is not considered a part of our paper as our focus will be drawn more towards the making and sustaining of said syndicates including how and where the financial actors within the syndicates are presented.

In this paper we aim to get a more clear understanding of the financial supporting institutions that aim to contribute with their knowledge and facilitating units when companies intend to conduct Initial Public Offerings, Public- or Repair issues. Continuous collaboration between the supporting financial institutions is a vital part to create and sustain a lasting profitable interorganizational relationship towards the stakeholders in their endeavours. Utilizing the concept of the syndicates we believe to

find a trend of actors collaboration more frequently together. Following these findings there is a general consensus that the same actors collaborating will substantiate the views of a more coherent cooperation and more fruitful action (Gulati & Higgins, 2003; Kist, 2001).

The importance for the companies attempting the IPO's is to build and maintain a strong relationship with the financial institutions and perpetuate the interorganizational relationships to successfully complete the IPO (Gulati & Higgins, 2003). Our area of focus is primarily Oslo and the financial institutions located in Oslo as we have seen by the dataset that the major players are all located in Oslo. Financial centre bias is seen as a common theme in the European market as we frequently see the centre-based financial brokerages conducting IPOs rather than the ones in the periphery (Wojcik, 2009).

The reasoning behind our paper is that we believe there are several synergies and potential benefits that can come from collaboration as Sundaramurthy et al (2014) discussed in their paper. They highlight the potential cost reducing and revenue increase as a result from synergies created, and collaboration between CEOs and employees as well as board interlocks in the various financial brokerages. Through the utilizing of a network between financial institutions there are large potentials for a favourable and profitable outcome. However, studies have also shown that there is a clear distinction between the larger and the smaller companies in the concern of financial support institutions. Smaller companies tend to not be financially viable enough to employ a greater portfolio of financial advisors in the IPO, while larger companies tend to have several advisors when conducting the IPO. We know that IPOs are both a very stressful venture but can also be a strain on the financial side for companies. Hence there must be a trade-off between having enough financial advisors to sustain or attempt to sustain a financial profit versus having the capital to employ these advisors are challenging (Beatty & Ritter, 1986; Chemmanur, 1993; Siming, 2010). Through our *working* hypotheses we aim to detect intriguing results connecting to the above;

1. Financial actors that often collaborate will often be located in close vicinity.

2. Financial actors will often collaborate with the same offering companies more than once.

3. Financial actors will often cooperate with the same actors multiple times.

4. Issuer tends to hire more financial actors when the deal size increase.

5. Issuer tends to hire fever financial actors when the deal size is smaller.

An interesting aspect we aim to look closer at, is the hypothesis that we believe several of the commonly cooperative institutions tend to be located within a smaller geographical area. Building on this we believe this will be making it potentially possible to utilize the principles concerning clustering-theory. Considering that the close proximity between financial actors is not randomly accumulated rather than constructed through other phenomena such as potential board interlocks, discovered synergies between financial actors, or networks constructed by the employees of the financial firms. Furthermore, we believe that financial actors that have previously collaborated in the IPO or Public-, Repair-issues will have a tendency to collaborate in later arrangements of the same sort. Based on the works of Carpenter & Westphal, (2001), Grabner et al, (2008) and Sundaramurthy et al, (2014) amongst other, we have seen a strong presence of continuous collaboration based on previous positive collaborations around IPO's.

We will not be focusing on one specific corporation or company, but rather on the various financial actors and potentially legal advisors to find connections between them. We believe there will be some financial actors that will have a stronger presence on the thesis as they are more used and more active. However, if this does occur, we will utilize that data found on this actor in combination with the other financial actors to try and paint the full picture of the situation and the organisation of activities and offerings conducted on the Oslo Stock Exchange and the Oslo Axess.

We will go deeper into the dataset in the data collection section. However, we aim to try and find the actors that, throughout the time-period we have set as our target, stand out as the most important, or the most utilized by the market. These financial actors, if found, will be given additional attention and we will attempt to disclose more data on these actors to better understand the underlying reasoning for their

collaboration. This will include the collaboration with other actors and the offering companies as well as their positioning in the market. There have been several studies done on joint bookrunning, several bookrunners on IPO's, alliances in IPO's and public offerings and networks in the same segment (Allen & Gale, 1990; Loughran & Ritter, 2004). We hope to elaborate on this subject within the Norwegian market and try to pinpoint the most prolific and employed financial brokerages.

Our intention is to take advantage of the abundance of theories and studies done on the subjects of alliance, network, clustering tendencies and joint bookrunning concerning IPOs so to get a better understanding of the previous ways of operating and put this into the context of Norway and the companies operating on the Norwegian Stock Exchange which we presume often utilize Norwegian financial actors, or at least Norwegian based financial actors.

Firstly we need to conduct research in theory and find useful information and theory on the topics of concern, which here we so far have limited to network and alliance in the sub-segment of IPO's. However we aim to have a basic understanding of the field of alliance and network before diving into the more specific research done on said elements in regards to IPO's. We believe to be able to understand the setting of a company conducting an IPO with the assistance of one or several financial actors, we need to have a throughout understanding of the theoretical framework to build upon and thereafter limit to our scope.

3.0 Rudimentary Research Design

The aim of this paper is to accumulate data from the Oslo Stock Exchange and utilize the collected data to either confirm or deny our hypotheses.

The approach is to some extent, in the beginning, an exploratory process as we attempt to detect correlating variables related to the hypotheses. However we can argue that this is also a confirmatory approach as we had some theories surrounding our hypotheses beforehand. Thus utilizing our dataset to confirm or potentially deny some of our post-dataset predictions.

As of now we our intentions are not to commit to obtaining primary data as we see it fit to utilize the data we have found and will find through the published figures from the Oslo Stock Exchange and Oslo Axess.

Our aim is to utilize pre-existing literature and apply these theories to our findings to be able to get a better understanding of our findings. As mentioned previously we see alliance-, network- and cluster-theories as the most fitting to our study. However additional material outside of the scope of these will also be utilized to better understand our findings. We intend to utilize the vast amount of papers written on IPOs as a base for comprehending the Norwegian market on Oslo Stock Exchange and tune this to our approach so to understand our market.

4.0 Working Research question

> *How can cluster theory contribute to understand the relationship between the issuer and financial institutions?*

The objectives is to contribute to the cluster literature, and give an overall understand of the relationships at Oslo Stock Exchange. The research will aim to define the boundaries of the cluster both in geographical proximity and relational cluster connected to networks with OSE.

5.0 Data Collection

The first aspect we want to address is if there is any clustering tendency at Oslo Stock Exchange both geographical and relationship-based over a period of 20 years (1997-2017). This applies to both typical issuer-brokerage-relationships and broker-broker-relationships.

In order to assess the issuer-brokerage-relationships, we will look at how the issuer in overall change their preferences based on deal/issue size and the collaborators location, and how that will affect the amount of financial issue managers/book runners. Under deal/size, we will assess if a bigger deal size affects the amount of co-managers, and if the deal size affects which brokerage that the issuer hires. This analysis will not include the behaviour of a particular issuer, but every firms that have done an issue in past 20 years will be accumulated in to one entity. From the brokerage standpoint, we want to assess which sector/industry they typically collaborate with. In Broker-broker-relationships we want to assess the relationships between banks. We want to look at the amount of how many times they have collaborated, if there are any repetitive collaborations, if there is any concentration around one particular brokerage, geographic distance between the two offices and which sector the relationships typically acts together as co-managers.

Both Issuer-Brokerage-relationships and Brokerage-Brokerage-relationships will be a contribution to understand the concentration cluster and the informal boundaries within the expected cluster. The research will also contribute the understanding of a undefined network of financial intuitions at OSE.

The second thing we want to look at is how progression of the particular financial institutions, which includes how many issues they have managed, how many times they have done an issue solo, deal amount, etc.. This will contribute to the understanding of attractiveness, and which we consider as a cluster attribute.

To sum up; we want to assess the Issuer-Brokerage-relationships and Brokerage-Brokerage-relationships at OSE, and if there are any geographical and relationship-based clustering tendencies at Oslo Stock Exchange.

5.1 Data Sources

In order assess the research question, we need to create an overview of financial issues at Oslo Stock Exchange. The data we will gather will provide a foundation for understanding the trends and define typical relationships within Oslo Børs and Oslo Axess.

The foundation is Oslo Børs own statistics that addresses all private-, public, -IPO and repair issues from 1997 to 2017. The statistics includes the issuer, date, type of issue, price per share, no. shares and the total deal size. We will also gather data additional data from Brønnøysregisteret's Entity register, through the database of Proff Forvalt (Proff) to support the statistics from Oslo Børs. The data that will be gathered from Proff is postal codes, firm revenues and Classification of Standard Industrial Classification (Nace), and ownerships. Other data such as stock price history, can be added in the future in order to understand positive and negative relationships. This is existing archive data.

In order to identify relationships within Oslo Børs and Oslo Axess, we need to generate new data based on the existing data foundation and several other sources, such as issue prospects and stock exchange announcements. This will be gathered through Newsweb, which is Oslo Stock Exchange news distribution system. The relationship counts will be generated in Microsoft Excel, and later exported to Stata or similar data management programs.

We have no plans as of now to find primary data to support our research questions. This could maybe happen in the future, if we get some information constraints that affects our validity.

5.2 Sample data

We have gathered in total 251 data points between 2008-2017. From the existing data provided by Oslo Stock Exchange, all private issues have been removed, and public, -IPO and repair issues have been retained. Private issues have been removed, as a result of a lack of information regarding bookrunners and information regarding relationships between banks.

Table 1: Bank-specific data

Company name	Postal code	Number for IPO/Emisjon	Public	IPO	Repair	Solo IPO/Public	Percentage
DNB Markets	0196	69	42	20	7	13	19 %
Pareto	0250	64	44	17	3	16	25 %
ABG	0250	58	23	26	9	13	22 %
Arctic	0161	53	32	14	7	16	30 %
Carnegie	0250	45	26	15	4	12	27 %
SEB	0252	37	28	7	2	7	19 %
Nordea	0368	27	14	10	3	2	7 %
Swedbank	0252	16	6	5	5	3	19 %
Sparebank1 Markets	0161	14	7	5	2	2	14 %
Danske Bank	0250	12	2	9	1	0	0 %
First Sec. /Swedbank	0250	12	10	2	0	4	33 %

Table 2: Most frequent relationships

Bank 1	Bank 2	No. IPO/Public emisions relationships
ABG	DNB Markets	17
DNB Markets	Pareto	17
Pareto	SEB	14
ABG	Carnegie	12
DNB Markets	Nordea	12
DNB Markets	SEB	11
ABG	Pareto	10
Carnegie	DNB Markets	10
ABG	Arctic	9
Arctic	Pareto	9

With references to table 1. During the period of 2008-2017, DNB Markets was involved in 69 deals, where 81% of the deals were joined by other banks. An interesting observation is Nordea, with in total 27 issues, had only 2 issues without a joint bookrunner. First Securities got acquired by Swedbank in 2010, and therefore have the notation First Sec./Swedbank. Merger and acquisitions events involving the banks in the data set will be illustrated in the final master thesis. First Sec./Swedbank will be notated as Swedbank in the final assignment.

Table 2 shows the most frequent relationships as of now is ABG-DNB Markets and DNB Markets-Pareto, where the brokerages has collaborated 17 times in both occasion. An interesting aspect is that DNB Markets is central in 55% of the top 10 collaborations, with ABG following at 33%. As mentioned, DNB Markets has collaborated with other financial institutions 81% of all issues, and it is expected result that DNB Markets has a high concentration in table 2. The contradiction is Arctic, with a fairly low collaboratory presens at top 10, has done 30% of all issues solo, which can explain how some firms has a higher relation count than others.

5.3 Further steps

We have identified 21 firms that are more likely to collaborate, and get hired to manage financial issues. In order to narrow our thesis, the 21 firms will be our sample banks. This means that all IPO and issues that includes firms outside the sample banks will be excluded. Based on our sample data at 251 registered issues, the

amount of 28 banks will be excluded, based on low probability to affect the final conclusion.

The second step is banks that have been acquired/merged. For example, First Securities got acquired by Swedbank in 2010, and therefore have the notation First Sec./Swedbank. First Sec./Swedbank will be notated as Swedbank in the final assignment. In the period 2007-2017, we have registered 6 banks that have been acquired/merged during the period, and are in the current data set notated as individual banks, similar to "First Sec./Swedbank". This accumulation will consider 5 of 6 banks, and the focal banks registrations will be added to the acquiring bank, and excluded. This means that the final number of sample banks adds up to 21, and in total 33 banks will be excluded.

Merger and acquisitions events involving the banks in the data set will be illustrated in the final master thesis. See table 3 for an overview of the sample banks.

Table 3: Sample Banks

DNB Markets	Merill Lynch
ABG	Netfonds
ABN AMRO	Nordea
Arctic	Nordnet
Carnegie	Norne Sec.
Clarkson Platou	Pareto
Danske Bank	SEB
Fearnley	Sparebank1 Markets
Fondsfinans	Sparebank1 SR-Bank Markets
Goldman Sachs	Swedbank
Handelsbanken	

The sample banks can be adjusted in the final thesis, when data from 1997-2007 will be added. There are also four banks that are located outside of Oslo, which can be excluded in the final thesis.

6.0 Project plan

So far in the project we have gather data from the Oslo Stock Exchange news distribution system, Newsweb. We have so far gathered data from the last ten years (2008-2017) on IPOs, Repair- and Public-issues, and will in the next step gather data from the previous ten years (1997-2007). We have worked through the data to try and find a basis for our assumptions and hypotheses. Furthermore we have continued finding theoretical papers in the aim to understand the background before attempting to utilize this data post data collection.

	2017	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Hand-In thesis registration	■								
Literatature review		■	■	■					
Data Collection		■	■	■	■				
Data Analysis			■	■	■				
Hand-in preliminary				■					
Write thesis				■	■	■			
Finish first draft							■		
Revision							■		
Submission								■	■

Figure 1: Progress Chart

References:

Beatty, R. P., & Ritter, J. R. (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of financial economics*, *15*(1-2), 213-232.

Carpenter, M. A., & Westphal, J. D. (2001). The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making. *Academy of Management journal*, *44*(4), 639-660.

Chemmanur, T. J. (1993). The pricing of initial public offerings: A dynamic model with information production. *The Journal of Finance*, *48*(1), 285-304.

Corwin, S. A., & Schultz, P. (2005). The role of IPO underwriting syndicates: Pricing, information production, and underwriter competition. *The Journal of Finance*, *60*(1), 443-486.

Ellis, K., Michaely, R., & O'hara, M. (2000). When the underwriter is the market maker: An examination of trading in the IPO aftermarket. *The Journal of Finance*, *55*(3), 1039-1074.

Gulati, R., & Higgins, M. C. (2003). Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. *Strategic Management Journal*, *24*(2), 127-144.

Jeon, J. Q., & Lee, C. (2015). A new measure for heated negotiation in the IPO syndicate. *The North American Journal of Economics and Finance*, *33*, 278-304.

McDonald, M. L., Westphal, J. D., & Graebner, M. E. (2008). What do they know? The effects of outside director acquisition experience on firm acquisition performance. *Strategic Management Journal*, *29*(11), 1155-1177.

Siming, L. (2010). *Private equity and advisors in mergers and acquisitions*. EFI-Economic Research Institute.

Store Norske Leksikon, (2018), https://snl.no/syndikat, retrieved 12/2-18.

Sundaramurthy, C., Pukthuanthong, K., & Kor, Y. (2014). Positive and negative synergies between the CEO's and the corporate board's human and social capital: A study of biotechnology firms. *Strategic Management Journal*, *35*(6), 845-868.

Torstila, S. (2001). The distribution of fees within the IPO syndicate. *Financial Management*, 25-43.

Wójcik, D. (2009). Financial centre bias in primary equity markets. *Cambridge Journal of Regions, Economy and Society*, *2*(2), 193-209.