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## **Intraregional financial constraints**

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### **Abstract**

The literature on financial constraints has hitherto addressed regional finance gaps by analysing one metropolitan area, often capitals, and comparing with peripheral areas. This paper takes ex-plores if there are intra-regional differences in financial gaps between firms in urban areas and firms in peripheral areas even within a peripheral region. The hypothesis is that as soon as there is an urban centre of a certain size or relative dominance, financial capital is likely to be attracted to this urban centre. In this using only averages for comparing regions may be misleading. The literature has been silent in specifying a size of a financial centre.

Comparing financial gaps in two models with different levels of geographical aggregation we indeed find differences in whether firms are financially constrained. The marked difference between the results from two aggregation show that geography matters ? the level of geographical aggregation is vital to a meaningful discussion of financial constraints of firms.

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# Intraregional financial constraints

Abstract:

The literature on financial constraints has hitherto addressed regional finance gaps by analysing one metropolitan area, often capitals, and comparing with peripheral areas. There is consensus that financial capital tends to be concentrated in these metropolitan areas. This paper explores if there are intra-regional differences in financial gaps between firms in urban areas and firms in peripheral areas even *within* a peripheral region. The *hypothesis* is that as soon as there is an urban centre of a certain size or relative dominance, financial capital is likely to be attracted to this urban centre. If so, using only averages for comparing regions may be misleading. The literature has been silent in specifying a size of a financial centre, and the paper contributes to pointing out the importance in scale in this analysis.

Telephone interviews with management in 1000 firms make up the primary data. Comparing financial gaps in two models with different levels of geographical aggregation we indeed find differences in whether firms are financially constrained depending on the scale. The marked difference between the results from two aggregations show that geography matters – the level of geographical aggregation is vital to a meaningful discussion of financial constraints of firms.

The results have implications for the assessment of the need and rationale for policies. It could be argued that the intra-regional differences accentuate the needs for policy in the first place. But at least for design of potential policy making implications are that it should be considered carefully what the appropriate regional level of policy making is. There are also implications for research as it opens a research agenda on *how much* are regions intra-regionally uneven.

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## 1. Introduction

Both in academia and among policy makers it has long been discussed if firms are hindered too much in their development by lack of finance, and if there is a rationale for government intervention to alleviate some of the financial constraints in firms. For example, as far back as in the Macmillan report (1931) this was called a ‘financial gap’ for the development of businesses, and was in the UK later followed by similar considerations in the Bolton report (1971) and the Wilson report (1979). More recent research has specified the character and size of the financial gap, e.g. in a number of reports in the UK by The Bank of England (1996, 1998, 2001, 2004) and academic researchers (Storey, 1994, Murray, 1998, Martin and Scott, 2000; Harding, 2000, Canepa and Stoneman, 2008). After this earlier research the discussion has intensified as a result of the financial crisis and subsequent increased financial constraints imposed upon a broad range of firms.

The above-mentioned and several other studies have primarily focused upon differences between firms in different size classes and industries in how much these firms are financially constrained. In particular, small and new firms seem to meet more financial obstacles due to severe problems with asymmetric information, agency problems and the high fixed costs in screening and monitoring such firms compared to the potential profit for the financing institution (Murray, 1999, Gertler, 1988, Fazzari et al., 1988, Beck et al., 2006, Carreira and Silva, 2010). Innovative firms have also been said to experience financial constraints. This may be explained by the intrinsic uncertainty and increased problems with asymmetric information related to innovation that may result in credit rationing or an excess interest rate premium. The fact that innovation financing is also widely believed to enhance growth and employment (Commission of European Communities, 1998) has encouraged policymakers to initiate regional, national and supranational programmes for supporting financing innovation<sup>1</sup>.

Another characteristic of financially constrained firms has to do with their location. In addition small, new, innovative firms as well as firms in peripheral areas have been argued to be particularly finance constrained as discussed in more detail in section 2. This paper adds a further dimension to these (potential) characteristics enhancing financial problems, specifically the geographical dimension. In the literature generally the approach taken is to analyse regional disparities with respect to financial capital between prosperous and periphery regions (regions being most often defined as political-administrative regions) or between the major metropolitan area and other parts of a country. While briefly also discussing such disparities, this paper takes a novel approach as it explores if there are intra-regional differences in financial gaps between firms in urban areas and firms in peripheral areas even within a peripheral region. The *hypothesis* is that as soon as there is an urban center of a certain size or relative dominance, financial capital is

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<sup>1</sup> See Carreira and Silva (2010) for a survey of some of the empirical studies of firm characteristics (cash flow sensitivity, firm age, ownership, R&D etc.) associated with financial constraints. Their survey does, however, not at all include geographical aspects of the financial constraints debate despite the fact that this has been an important aspect (except pointing out that firms in more developed financial markets may be less financially constrained).

likely to be attracted to this urban center despite the general tendency for capital in a country to cluster in the major city. If this is the case, using only averages for comparing regions may be misleading if not then certainly not rendering the full picture.

The paper specifically focuses upon firms' perception of whether there is a financing gap in a peripheral area, North Jutland, Denmark. Our case region is well-suited for testing the hypothesis above as it is a peripheral area in Denmark, and one with a clear urban center, Aalborg. Much of the region's economic activity and high-tech industries are located in this city. It could be expected that firms in this centre get relatively more attention from financiers leaving firms in more peripheral areas deprived of financing.

The analysis is based on data from telephone interviews with management in a panel of 1000 private firms in North Jutland covering different aspects of access to capital and needs of policy initiatives to close financial gaps.

In section 2 the paper provides a discussion of theories and earlier studies that may render justification for the hypothesis tested in the paper and gives a conceptual background for financial constraints from a geographical perspective. The third section presents the data and methodology as well as the case region, North Jutland. Fourthly it is briefly discussed if there are differences in the supply of financial capital among regions in Denmark. Results with respect to potential intra-regional differences are unfolded in section 5 before concluding and discussing policy implications in section 6.

## ***2. The geography of financial constraints***

Economic geography has generally not been very concerned with financial constraints (Pollard, 2003). Neither has the entrepreneurial finance literature been very concerned with geographical aspects of finance (Mason, 2010). Some studies have, though, appeared lately. A finding from what may now be denoted the geography of money (Martin, 1989, 1999, Mason and Harrison, 2002, Zook, 2002) is that the supply of financial capital is spatially heavily skewed, with a relatively large share being managed and invested in metropolitan areas (Martin et al., 2002, 2003; Mason and Harrison, 2002, Powell et al., 2002). In particular, within venture capital research this issue has been prominent (Mason, 2007, 2010, Chen et al., 2009, Harrison et al., 2010). The uneven geographical distribution of venture capital found in most countries, both with respect to the location of the venture capital firms and the actual investments (Martin et al., 2003), is in the U.S. said to be concentrated in California, especially Silicon Valley, and Boston, Route 128 areas. In most years California accounts for a third or more of the total sum of venture capital in the U.S. (Powell et al., 2002, Zook, 2002, Mason, 2007). Similarly, Mason and Harrison (2002) show that venture capital investments in the UK remain highly concentrated in the London and South East regions, the same regions that also attract net capital inflows from pension funds (Martin and Minns, 2005). Even in the informal venture capital market, which is usually said to be more evenly dispersed (Harrison et al., 2010), there is a concentration of this type of finance as well, again in the London and South East regions (Jones-Evans and Thomson, 2009). For the venture capital market this picture is not as sharp when weighted with the share of GDP, however, the venture capital funds in more peripheral areas are to a higher extent involving public funds (Mason and Pierrakis, 2009). Comparing concentrations of financial capital in the UK and Germany

Martin et al. (2003) find that the German financial capital is less concentrated and involves more financial centres. This may have to do with the differences in political-administrative structures but it may also be related to a different city structure with several larger, central cities in Germany. To a varying degree this concentration of financial capital in prosperous, urban areas is found in virtually all countries. It remains, however, an under researched area in the economic geography literature to explain more precisely *why* these flows come about and what are their magnitude and implications.

Going to the explanations of why this may be so it is useful to define the geographies of entrepreneurial finance which may be denoted as effects of space, place and flows (Mason, 2010). The *space* dimension refers to the proximity in interactions between investor and investee firm. Highly innovative firms and new, small firms may represent greater uncertainty. These firms require more intense monitoring and financial institutions may benefit from geographical proximity to investee firms as this may facilitate transfer of the relevant knowledge for supervision of the firms. Additionally, much of the knowledge in investments in small, new, innovative firms is tacit. Whereas budgets, progress reports and similar codified information can be transferred across distance by mail, an assessment of the trustworthiness of management, etc., may require face-to-face contact, which is facilitated by geographical and other types of proximity. The investment process is, on the investor side, often based upon ‘... opinions, projections and conjecture, which may be extremely difficult to codify’ (Zook, 2004, p.634). Hence, the information involved is quite weak, especially in small firms, and geographical proximity may be important for financing such firms. Therefore, such tacit knowledge may be said to be spatially grounded (Gertler et al., 2000; Zook, 2002, 2004). This implies that transaction costs are higher if the financier is not close to the firm, and it may also be argued that such transaction costs are higher in small firm investments. Such firms often lack managerial skills and organisational capabilities, which may render more needs for guidance. This in turn may urge financial institutions to restrict their geographical scope of their investments (Christensen, 2007). A more densely located cohort of portfolio firms reduces agency and transaction costs. The agency costs associated with long-distance investments may contribute to explaining why Cumming and Johan (2006) find that funds prefer intra-province investments rather than investing across provinces.

Spatial proximity and densely located economic activities may also be attractive prior to the investment process because the informants of the financial institutions are often spatially bounded. Thus, Sorenson and Stuart (2001) contend that information on the potential of new, high-growth investment opportunities is not publicly available and is spatially limited. In the absence of this information, financial institutions such as venture capital firms and business angels rely on personal and professional relationships, which in turn are most often localized in close proximity to their offices (Powell et al., 2002, Florida and Kenney, 1988). Firms, production firms as well as financial institutions, operate in networks that are spatially grounded. Also the conditions for entrepreneurs to mobilize resources are dependent upon spatially grounded networks (Stuart and Sorenson, 2003). Moreover, because of easy flows of local knowledge firms may restrict themselves from opportunistic behaviour to stay credit worthy in the local financial community<sup>2</sup>.

Concerning the effect of *place*, just as the characteristics of firms may influence how attractive the firm is for investors also the location may impact financing possibilities. The characteristics of a region can influence the possibilities for firms to obtain financial capital in several ways.

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<sup>2</sup> Despite many arguments for why close spatial proximity may benefit the investment process and reduce transaction costs the literature has not explored a lot on how this relates to performance (Cumming and Dai, 2010).

One obvious explanation why investments tend to be so spatially uneven as indicated above is that the investment opportunities and business activities are unevenly distributed (Davidsson et al., 1994, Mason 2007). Financing therefore also has a demand-side aspect, which potentially differs depending on regional context. Different regions can have different levels of entrepreneurship, technological development, clusters, etc. (Florida and Kenney, 1988) but also both firms and intermediaries can differ in their awareness of sources of capital from region to region (Mason and Harrison, 1998, Mason, 2007).

A virtuous circle may be initiated because regions with high-growth, high-technology environments attract not only other such firms but also venture capital and business services including technology experts, head hunters, access to qualified staff, and access to syndication partners. This contributes to agglomeration economies and enhanced efficiency in the venture investment process, for example by facilitating the screening and monitoring process and reducing transaction costs in the use of intermediaries, but also to induce synergies both among businesses and among venture capital firms themselves. The agglomeration of venture capital firms may thus increase the use of networking, which in turn may influence performance (Holbeck et al., 2007). This further adds to the attractiveness of the region for venture capital, perhaps even in the form of establishing an office on location, although there are considerable costs associated with this strategy (Christensen, 2007).

Uneven *flows* of financial capital have real effects although this is not researched very much in the literature. The presence of venture capital in prosperous and high-tech areas does not indicate that venture capital necessarily was a driving factor in the development. It is often difficult to establish causation and there is debate on whether venture capital is leading or lagging the development. Chen et al. (2009) find that increase in localisation of venture capital firms in a region disproportionately increases venture capital investments in the region and cite evidence (Mollica and Zingales, 2007) that finds that venture capital is spurring entrepreneurial communities. Mason (2007) on the other hand, refers to several studies and a case study from Ottawa that points out that venture capital lags rather than leads development of clusters and entrepreneurial activity. Although exceptions do exist, Silicon Valley being the most prominent, the general rule is that technology clusters outside major urban areas do not generate a substantial number of venture capital firms.

In addition to knowledge flows, geography may impact the possibilities for firms seeking finance by providing collateral. Buildings and houses are often used as collateral and are intrinsically spatially bounded. Whereas their use value may be relatively constant, their exchange value may be heavily affected by ups and downs of business cycles as is visible in the current financial turbulence. The decreasing prices in the housing market and downswing of business cycles have reduced the value of these as collateral.

As mentioned above, financial capital tends to be located primarily in urban areas. Given the pre-conditions for efficient screening and monitoring of firms a spatially uneven distribution of the capital and management of that capital may result in a relatively small share of capital going to firms in regions far from the centre. This applies especially to the type of capital where hands-on assistance is needed. It may be hypothesized that the traditional pecking order explanation of the financial structure in firms is disregarding this geographical aspect because firms in peripheral areas may be particularly constrained with certain (equity) types of financing that require hands-on involvement, which in turn is restricted by the geographical distance. Firms in this situation may have a higher propensity to prefer financing (debt) instruments and institutions that are present in their close proximity. According to this argument we would expect to find equity, hands-on investments in close proximity to where this type of capital is managed, whereas debt is likely to be more evenly distrib-

uted, perhaps even more frequently used in firms in the periphery because these firms would need to compensate for the lack of equity finance and because debt financing institutions, especially banks, are more geographically dispersed. On the other hand it may be argued that other types of capital, debt financing, may also be in shorter supply in the periphery than in urban areas. Even if the financial infrastructure is in place conditions for access to capital may differ. Bank of England (2002) find a significant difference between margins on bank loans paid by SMEs in deprived areas compared to those in other areas.

In sum, the literature has established that financial capital tends to be spatially concentrated around a large metropolis and in relatively prosperous regions of a country. Moreover, because of e.g. reduction of agency costs and informational asymmetries, investments tend to be spatially restricted<sup>3</sup>. The literature has failed though, in being precise in what is the relative scale of cities and regions and this location/place effect of attracting investments. Only scarce and brief accounts of financial capital in respective regions/states and cities provide hints on some aspects of the basic problems (Cumming and Johan, 2006, Mason, 2007) and no studies explicitly focus upon the intra regional financial constraints in peripheral areas. This paper contributes to this end.

### **3. The data and case region**

The *data* are based on telephone interviews with the management teams in a representative panel of 1000 private firms with at least 5 employees in North Jutland, Denmark. This data collection is part of a quarterly regional business cycle indicator established back in 1998 in North Jutland. Respondents were interviewed about their view of the past and future development of variables like production, employment, profits and orders. The interviewed firms represent approximately 30% of employment in the region. A set of questions were posed on access to financial capital. These questions thus directly addressed the issues in this paper and were answered by all 1000 respondents allowing industry breakdown of the results as well as a division into urban and peripheral areas. The data were analysed with frequency analyses and logistic regressions.

Our *case region* is located in the north of Denmark and has traditionally been characterised as a peripheral area. It has an unemployment rate among the highest in Denmark (historically about 1.7 percent point above national average). Aalborg (the capital city of the region) has previously been dominated by traditional labour intensive manufacturing industries while other parts of the region have been dominated by the primary sector, especially agriculture and fishing, and in more recent decades, tourism. During the 1990s the region has experienced a process of structural change toward other industries as some parts of the region became specialized in machinery and equipment as well as electronics. However, the region can still be characterized as periphery, which is evident from statistics on e.g. unemployment, income per capita, the specialization pattern, and GDP growth. Moreover, the share of people with highest education is 1.5 times lower in North Jutland than in the whole of Denmark. Similarly, the R&D level in the region weighted with the North Jutland's share of Danish firms is for North Jutland approximately 2/3 of Denmark's level. The same shares apply to the number of patents per 1000 inhabitants. The periph-

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<sup>3</sup> For the same reasons, if investments are undertaken over distance, even across borders, then e.g. venture capital firms often use local venture capital firms as spearheads for investing forming syndicates with these (Mäkelä and Maula, 2008)

eral character of the region also has an 'official' label as it has for many years had the status of EU Objective 2 areas as one of the few, and by far the largest, areas of Denmark.

Aalborg is the metropolitan centre of the region. The city had by 2008 162,000 inhabitants, which make up 33 % of the region, and many (a similar share) of the firms are located here. In addition, spurred by the university the city hosts a number of high-tech industries, in particular in ICT. A few other towns in the region may qualify as urban areas although not as large as Aalborg. The cities of Frederikshavn, Hjørring and Hobro may thus perhaps be classified as urban areas even if they only have 35,000, 35,000 and 15,000 inhabitants respectively. In this small region (in a small country with only one large city, Copenhagen) these are relatively large, and they have a number of well-known, relatively large firms.

This region is particularly well suited for the present analysis not only because of its relative peripheral status in Denmark, also it is characterised by a relatively even pattern of cities compared to other regions in Denmark. Hence, North Jutland Region (2004, p.92) compares the city pattern in three Danish regions and find that Århus and Funen regions are much more dominated by one large and a number of small cities, whereas the North Jutland region has more cities of an intermediate size.

In the proceeding analysis the test of our hypothesis is based on three geographical aggregations. One is Aalborg as the urban centre. A second aggregation is Aalborg plus the above-mentioned three smaller, but perhaps still urban areas. The third is the residual, peripheral areas within North Jutland. The reason for including this intermediary level where 4 towns make up the urban area, and the rest is classified as peripheral is that we do not know a priori what is the appropriate size level for cities to be 'urban'. By including both the extreme case where Aalborg is the only urban centre in the region and the intermediary level it is possible to get closer to determining which is the financial centre; is the only (financing - ) interesting town in a peripheral area the regional centre or do firms localised in other, medium-sized cities attract the attention of financiers?

#### ***4. Regional differences in financial capital in Denmark***

This section provides a brief summary of secondary empirical evidence on regional differences in access to capital in Danish regions. This discussion is kept short as it is merely a warm-up to the core analysis in section 5. Cf. Section 2 spatial differences may be assessed as general availability of financial capital, which is firstly in focus in this section. Additionally, it was indicated in section two that there may also be a substitution effect between types of financial capital. Because of the uneven supply of certain types of finance, in particular equity, some firms are forced to take up debt finance even if equity would be preferred. These two issues are here looked into in the Danish setting.

Generally there is consensus in the literature on the opinion that financial capital is geographically skewed / distributed. Some even argue that there is a flow of accumulated savings in peripheral areas to investments in more prosperous areas (Mason and Harrison, 2002, Mason, 2010). Mason and Harrison (1991, 2002) point to these flows in relation to the UK case and claim that less prosperous areas in the Midlands and Northern England are net exporters of finance to the southern regions. In the US, Florida and Kenney (1988) show that finance migrates

from the central and mid Western states to more successful coastal areas. In Sweden Avdeichova (2009) shows that the informal venture capital market is concentrated in metropolitan areas and university cities.

Most previous studies on this issue are on the US and the UK, thus relatively large countries. It may be questioned if there is even a question that (in a relatively small country like Denmark) there is an uneven distribution of financial capital between metropolises and other regions (in Denmark) as found in the literature for other countries (e.g. Mason and Harrison, 2002 and other work as explained above). Denmark is not only characterised by its small size but also by a relatively equal economic status and development between regions. Nevertheless, some regions may in relative terms be characterised as peripheral, even if these regions may be seen in absolute terms as being wealthy. Moreover, as different types of infrastructure also are well developed in the Danish peripheral regions it may be expected that financial capital is also readily available.

Despite the fact that a relatively small share of investments are financed by venture capital this type of finance may be an indicator of whether North Jutland firms are better or worse off with respect to access to capital. Venture capital is a typical hands-on, equity-based financial instrument. Because data on venture capital investments are very sensitive to abnormal activities in single years due to their small absolute numbers in small markets such as the Danish market, the statistics become more reliable when taken over a period of several years. Consistent with the studies from other countries as reviewed above, venture capital in Denmark tends to be regionally concentrated.

The majority of the venture funds are located in greater Copenhagen as more than 90% of capital under management is located in this area. Venture capital investments in regions outside Copenhagen such as North Jutland are considerably below the Danish average. Correspondingly roughly two thirds of all investments were made in the Copenhagen region, in the 2003 – 2009 period despite the fact that this region accounts for a much lower share of the total number of firms (around 40% of all Danish limited firms) or economic activity (38%). Venture capital investments are clearly concentrated in the metropolitan areas although not to the extent as the management of funds.

We supplement venture capital statistics with an account of a debt instrument, loan guarantees as registered by The Danish Growth Fund. The Danish Growth Fund monitors the development of the market for innovation financing, in particular the venture capital market and loan guarantees. A closer look at the geographical distributions of these two types of financing may render indications on the validity of a possible substitution effect. The data for loan guarantees show on the other hand that North Jutland has a share of loan guarantees clearly above the share of firms in the population in Denmark. According to the Growth Fund (2011) 75% of loan guarantees are for firms located in the western part of Denmark and North Jutland is the region with the largest number of guarantees.

This is not a complete analysis of the geographical differences in the capital structure of firms, which is a story in its own right. The results presented here are, though, indicating that there may be geographical differences in access to financial capital and that the hypothesized substitution effect, that is firms seek debt when access to equity is restricted, may be in play. The results are in line with the expectation that debt is used more often in peripheral regions such as North Jutland, Ringkøbing and Ribe, and much less in the Copenhagen regions.

A third source of information is an independent survey based upon the interview respondents' perception of this issue. Data from interviews allows us to include the demand perspective more explicitly. A panel of 1000 managers were asked questions about whether they believed that possibilities for financing activities are better, the same or worse compared to the rest of Denmark. It should be emphasized that the answers on these questions are purely subjective<sup>4</sup>.

Table 1 shows the aggregated results from the survey concerning this belief. 1009 respondents answered the question "Is access to finance better, the same, or worse in North Jutland compared to the rest of Denmark". Totals show that only a small fraction see the access to finance as better than in other parts of Denmark<sup>5</sup>. The majority see it as the same but one out of four firms see financing options as worse than in other parts of Denmark. It is natural that a large proportion, 19%, of respondents answer 'do not know', as it requires specific knowledge on the conditions elsewhere in Denmark.

**Table 1: Perception of financing opportunities in North Jutland. N=1009.**

<i>Better</i>	<i>The same</i>	<i>Worse</i>	<i>Do not know</i>
4%	53%	24%	19%

Note: question = "Is access to finance better, the same, or worse in North Jutland compared to the rest of Denmark"

Disaggregating on sub-regions shows that perceptions are relatively homogeneous across these sub-divisions, although there seems to be a less pessimistic view in firms located in the metro-pole, Aalborg. Firms in semi-urban and peripheral areas think to a higher extent that access to capital is worse<sup>6</sup>.

## ***5. Perceptions of financial constraints within North Jutland***

As indicated above the literature has not been precise in specifying the relevant geographical aggregation level when discussing financial constraints. The discussion has primarily been centered around differences between major political-administratively defined prosperous areas – often capitals – and peripheral areas. In this paper, survey data are used to analyse this problem of specifying the relevant geographical scale.

In telephone interviews respondents were asked questions on both their perceptions of access to finance in the past few years and expectations to the coming years.

Thus, three questions on access to external capital were asked;

1) Do you think that access to capital has improved, remains the same, has worsened in the past 3 years,

<sup>4</sup> On the other hand they do represent the common belief in businesses about how financing opportunities are compared to other parts of Denmark.

<sup>5</sup> Here, and in the remainder of the paper, we talk broadly about all types of financing regardless that different types of capital may have different geographies. (Mason, 2007).

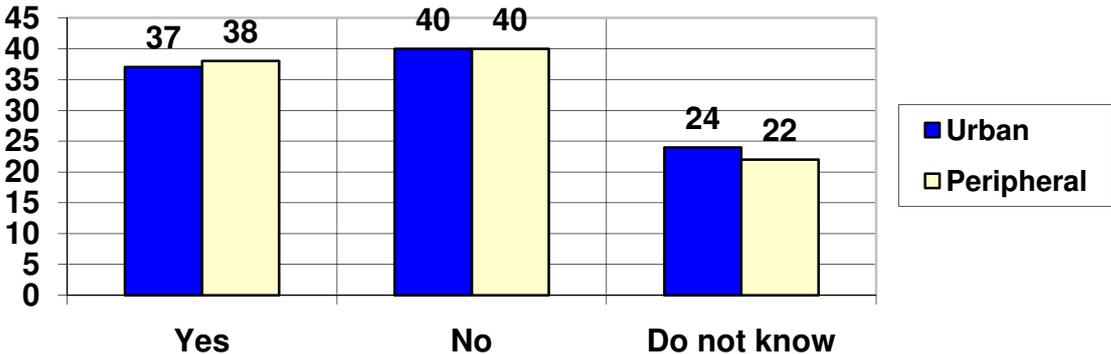
<sup>6</sup> Note that respondents are here asked about their perceptions of the situation in the whole region, not their specific case. In theory it may be that a respondent in the urban centre answered 'worse' because he/she is aware of the worse situation in the peripheral areas and takes this into account in the assessment.

- 2) how do you think the access to capital will develop in the coming three years worsen/improve/unchanged, and
- 3) Do you think there is a need for policy initiatives alleviating financial constraints in North Jutland? Yes/No/do not know.

The first and second questions asked are phrased dynamically. It may thus be that respondents claim that it has improved from a very poor point of departure. It does not ask if respondents think that access to capital is currently good/bad/middle. The third question regards policies, which may be viewed as necessary (or not) for ideological reasons rather than because of the need for it. None of these three indicators are ideal, but as the third is directly related to policy initiatives that are later discussed, this is highly relevant for this analysis. The question is therefore best suited for the present analysis, and is in focus below as our dependent variable<sup>78</sup>.

Frequency analysis of the answers to question three is depicted in figure 1, using the geographical aggregations into Aalborg plus the three smaller, but perhaps still urban areas, Hjørring, Frederikshavn, Hobro. The residual is then peripheral areas within North Jutland.

**Fig. 1: The need for political initiatives to improve access to finance. By sub-regions**



Clearly the results indicate that the perceptions of the extent of a need for policy measures to alleviate financial constraints remains very similar between firms located in urban centres and peripheral areas if urban areas are taken as the primary centre, Aalborg, plus semi-urban areas. Our hypothesis may on these grounds, seem to be rejected; intra-regional financial constraints do not seem to differ between these two areas. However, it may be that other geographical disaggregations are more relevant, and it may be the case that when disaggregating geographically, different industry structures may result, and perhaps even a different size distribution of firms. It may also be that intra-regional differences in innovation activity or in business cycles impact on the perceptions of financial constraints. To control for these effects a model was estimated where

<sup>7</sup> Regressions were run using the two former indicators also. The results from the model then changed on some parameters, indicating that the two questions do in fact capture different things. For example, a variable on economic results in the previous quarter becomes highly significant, which is not surprising as both variables are a product of asking about the development, which ought to be highly correlated with how the development is experienced.

<sup>8</sup> Regarding the results from the data on the *future* development of the access to capital (question 2), 24 percent contends that access to capital will improve, 5% think it will become worse in the coming years. Differences among sub-regions are small, although Aalborg-firms seem more optimistic. This may impact on their (lack of) perception of need for policy in this: if more firms in Aalborg think that things will improve fewer will see a need for government intervention.

independent variables were indicators of these effects together with the geographical disaggregation. Table 2 provides an overview of the variables.

**Table 2: Measurement of variables**

<i>Variable</i>	<i>Indicator</i>
<b><i>Independent</i></b>	
<i>Geographical areas</i>	Aalborg, Aalborg+Semi-urban, Peripheral
<i>Size of firm</i>	Number of empl. in full time equivalents
<i>Economic performance of the responding firm</i>	Whether the firm experienced improved/unchanged/worsened development in economic results in the quarter prior to the interview
<i>Industry</i>	NACE2-sectors
<b><i>Dependent</i></b>	
<i>Need for policy initiatives for improving access to capital</i>	Perception of the need for such initiatives – Yes/No/do not know.

Two models were estimated: One has a geographical aggregation of Aalborg plus the above-mentioned three smaller urban areas as the urban centre and the residual the periphery. The other model singles out the town of Aalborg as the urban centre, the rest is considered the peripheral area. Thus, as we do not know a priori what is the appropriate ‘urban level’ we include both the extreme case where Aalborg is the only urban center in the region and the intermediary level. Tests were expected to reveal two things: if there is a difference in attitudes towards initiatives alleviating financial constraints between urban and peripheral areas, and if there is – at what geographical level is this the case. Table 3 provides the results of the estimations of the two models.

**Table 3: Independence between likelihood of call for political initiatives and indep. var. Parameter estimates from logistic regressions.**

<i>Model</i>	<i>1: Semi-urban</i>	<i>2: Aalborg only</i>
<b><i>Independent variables</i></b>		
<i>Geographical area</i>	-0.100	-0.485**
<i>Size of firm</i>	0,000	0.000
<i>Economic performance of the responding firm</i>	-0.047	-0.049
<i>Industry</i>	0.041	0.057*
<i>Constant</i>	-0.158	-0.157
<i>Chi-square</i>	2.7	9.8*

Significance level: \*: 5% \*\*: 1%

Data source: survey

From the results of the first model where the urban area is defined as Aalborg plus the semi-sized towns there are no significant parameter estimations, in particular the variable geographical area is not significant. The results from model 2, however, changes radically. It is particularly interesting to observe that the geographical area variable is now highly significant – there is a difference in which firms who call for political initiatives to alleviate financial constraints. Those located in peripheral areas have the highest propensity to point to this need. Also the industry vari-

able is now significant, indicating that the urban centre may represent a different industry structure; one that may impact on the perception of the need for lesser financial constraints.

Neither the size of the firm nor the economic performance in the previous period seems to have an impact in any of the models, which may be somewhat surprising. The latter may be explained by the fact that finance for the short-term performance, three months back, is associated with internal working (debt) capital, whereas long-term investment needs is more related to external (equity) capital.

## **6. Policy implications and discussion**

The story in this paper is perhaps simple, but is overlooked and important.

The literature has established that firms located in urban areas are less financially constrained. Empirically this was shown to be the case e.g. in the US where firms in only three cities New York, Boston, and San Francisco attract half the venture capital finance (Chen et al., 2009) and in the UK where the London and South East attract more financial capital than their relative share of economic activity. Even if interesting in itself the story should not end here.

The perceptions of the extent of a possible financial constraint in the region remains very similar between firms located in urban centers and peripheral areas if urban areas are taken as the primary center, Aalborg, plus semi-urban areas. This holds also when controlling for differences in size- or industry structure and economic performance. Our hypothesis was thus at first glance clearly rejected; intra-regional financial constraints do not seem to differ between these two areas. However, when dividing into Aalborg vis-à-vis the rest of the region the results changed. Now the geographical area variable became highly significant. This may be interpreted as that Aalborg is not only considered by financiers as the primary growth pole, it may in fact also be the only growth pole<sup>9</sup>. The marked difference between these two results show that geography matters – the level of geographical aggregation is vital to a meaningful discussion of financial constraints of firms.

Policy makers have used a wide spectrum of instruments to alleviate financial constraints in less favoured regions. Both demand side instruments and supply measures to increase the supply of capital have been used, although the latter has clearly been predominant. Arguments for why finance should have a regional orientation note that the local operators are better equipped to respond to regional specificities, to use local knowledge and networks, and to better coordinate with other regional support programs (Heger et al., 2005).

Debate has questioned the general rationale for regional capital as a response to the challenge of stimulating innovation and growth in less favoured regions<sup>10</sup>. Mason and Harrison (1998), Mason (2007) and Murray (1998) for example, are sceptical regarding the role of public policies in

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<sup>9</sup> In the debate on regional planning and industrial development of the region one design is to have a three-tier level where Aalborg is the prime motor, the second is a number of semi-urban towns as in this study, and the third the smaller towns. The results in this paper point to a potential irrelevance of the intermediary level when talking about finance.

<sup>10</sup> It has even been argued that there is likely to be very little rationale for policy at all in the financing of small firms (e.g. deMeza, 2002).

filling regional equity gaps. Some of the criticism of the public regional venture capital model has been that the size of funds are generally too small, which limit the capacity to make follow-on investments (Murray, 1999). In turn, this means that fund managers must direct a lot of their attention to seek further finance (Mason and Pierrakis, 2009). This problem has escalated during, and as a result of, the financial crisis<sup>11</sup>. The small size of funds also impacts upon the abilities to attract talented managers and, related, the abilities to provide added value (ibid.). Also, policy circles have disagreed about the diagnosis of the problems and the appropriate policy response in the first place (Martin et al., 2003). Sunley et al., (2005) point out that the rationales for regionally targeted policy programmes and the ongoing debate seem to lie in efficiency and also a need to compensate conditions in less favoured regions, as also argued by OECD (1996).

The results in this paper have implications for the assessment of the need and rationale for policies. In a sense the story is one of going behind the averages usually used in many analyses and in the policy process as it points to a potential second-order problem: the averages comparing the major metropolitan area in a country and peripheries may find disparities between their respective access to capital. But in case there are intra-regional differences the needs for policy may be enhanced. Comparing means across regions as is usually done, may be hiding the real problems. There are also implications for research as it opens a much needed research agenda on *the extent* to which there are clear disparities *intra-regionally*. Geography is very much like a Russian babushka doll: each layer you peel off reveals a new but also like set of features, structures and problems at the higher level. Similarly, problems of center-periphery are also likely to be present at other levels of aggregation than hitherto addressed in the literature. In terms of policy making, implications are that the appropriate regional level of policy should be considered carefully not only because of different efficiencies at different levels but also because the rationale for policy in the first place may be dependent upon the level of aggregation.

We used a case from Denmark in this paper, and on these grounds one may question how general the results are. However, if anything, this case perhaps illustrates the importance of the findings because the analysis is applied in a country where regional differences are said to be relatively small, and a region where differences between the urban centre and the periphery are not particularly large.

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<sup>11</sup> On a higher level of aggregation a parallel difficulty in raising new funds has arisen as a consequence of the financial crisis.

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