RELATHIONSHIP BETWEEN AGGLOMERATION AND PRODUCTIVTY IN A NORWEGIAN CONTEXT: ESTIMATES FOR TRANSPORT INVESTMENT COST-BENEFIT ANALYSIS

(working paper)

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Word count: 5540 words text + 6 tables/figures x 250 words (each) = **7,040** words,

ABSTRACT

Cost-benefit analysis (CBA) is an important tool in many countries in the evaluation of transport investments. The main objective of CBA is to allocate society's shared resources by considering *all* costs and benefits to society as a whole. While direct costs and benefits are often straightforward to calculate, indirect cost and benefits are more challenging to include in CBA. Among indirect benefits, there has been increased attention to potential productivity benefits for firms, which results from reductions in distance to other firms, workers or costumers. The literature on wider economic impacts and agglomeration economies suggests that such benefits usually exist but varies between sectors and nations. However, there seems to be little consensus on the size of the benefits.

This paper analyzes the relationship between agglomeration, productivity and transport investment in a Norwegian context. We use a total factor productivity approach to calculate productivity for 17,000 firms along the western coast of Norway within eight sectors from 2009 to 2013. For each firm an agglomeration index is calculated and a regression model is used to find the relationship between productivity and agglomeration. Our results show that productivity varies between sectors and that there is no clear trend across all sectors that increased agglomeration leads to increased productivity. The implications of these results in a CBA perspective is that one should be careful seeing agglomeration as solely beneficial for all sectors, but be more specific regarding which sectors are affected in each transport investment project.

1. INTRODUCTION

The main objective in a cost benefit analysis (CBA) is to facilitate the allocation of society's shared resources by considering *all* costs and benefits to society as a whole. Estimation of these benefits and costs is often straightforward in markets directly affected by transport investment. For markets indirectly affected (i.e. secondary markets) the task can become challenging. Changes in secondary markets have been addressed in an increasing number of studies on wider economic impacts over the last decade (see (*1*)). Nevertheless, there is little consensus in the literature as to the exact size of these wider impacts and when they actually occur (*2*). Even though the estimated size of the impacts in most studies seems to be minor, ignoring such impacts in cost-benefit analysis is controversial (*3*). Furthermore, the estimates done in Norway vary substantially in size (*4–6*) which emphasizes the need for national specific estimates and further research.

Currently, many countries are considering including additional economic benefits in their cost benefit analyses (*7*). Therefore, it is essential to shed light on different aspects of wider economic impacts of transport investments. One of the main potential benefits is agglomeration. Agglomeration effects are external economies from which firms can benefit through co-location, which endogenously induces localized economic growth (*8*, *9*). This means that firm productivity rises with the overall amount of activity in other nearby firms, or with the number of nearby workers or consumers (*10*). The main sources of agglomeration externalities are reduction in search costs for suitable employees, access to specialized suppliers, and benefits from knowledge spillovers from other similar firms. Agglomeration effects can be divided into two main categories: 1) co-location of similar firms (localization economies) and 2) co-location with other firms (urbanization economies). The increase in firms' productivity resulting from transport investment and reinforced agglomeration has been investigated in several previous studies (*8 -11*).

In a CBA framework, agglomeration and productivity are important in several ways. Firstly, if the presence of individuals or firms in one area creates benefits for other firms in that area there is an additional benefit not accounted for in the user benefits. Secondly, a small number of workers in one area might use a transport improvement. However, if the investment brings the firms closer together, it may generate productivity effects, which is beneficial for all firms in that area, even those that do not use the transport improvement. This is because the firms benefit from a larger labor market, access to more specialized suppliers and might benefit from knowledge spillovers from other similar firms. These are also benefits not accounted for in the current CBA method. For example, a new bridge may facilitate commuting between an island and a city on the mainland. This is beneficial for the commuters using the fixed link of course, but it might also be beneficial for firms on both sides of the fixed link.

Finding good ways to measure the relationship between the degree of agglomeration and productivity is essential to get an indication of the size of these benefits. There have been several attempts to calculate how productivity changes with the degree of agglomeration. Melo et al. (*1*) compared 563 estimates from 33 international studies and found that elasticities can vary between industry groups and countries, suggesting that agglomeration effects could be industry and nation specific. In Norway, there have been a few studies looking at agglomeration effects (see (*4*), (*5*), (*13*)). However, these studies have either looked at wages/ labor level as an indicator of firms' productivity or have not considered the industry-specific features of elasticities (*14*, *15*). The problem with just using wages/labor productivity is that the firm's productivity might be dependent on inputs factors other than labor, such as capital and material input. To capture all inputs in firm productivity, a total factor productivity approach is recommended (*2*, *10*). This stresses the importance of making national sector-specific total factor productivity estimates to

improve the estimates of potential agglomeration benefits in a Norwegian framework.

In this paper, we empirically investigate the degree of relationship between total factor productivity and agglomeration in a Norwegian context. For this purpose, we use firm-level data from the western coast of Norway. Our hypothesis is that there are differences between the sectors, but the overall picture is expected to be a positive relationship between the degree of agglomeration and productivity.

The structure of the paper is as follows. Section 2 describes the area studied. Section 3 describes the methodology, including the estimation of the agglomeration index and total factor productivity, and the relationship between the two. In Section 4, the total factor production parameters, agglomeration elasticities, and their relation to transport investments are presented and discussed. Section 5 summarizes the main findings from our investigation.

2.   STUDY AREA

This paper focuses on four counties on the western coast of Norway (see <FIGURE 1). The study area is approximately 58,500 km^2 large with some 1,360,000 inhabitants. Two of the largest cities in Norway are located within the area with a population of 130,000 and 280,000. Otherwise, the study area has a relatively low population density with many small cities in the range of 10,000 to 40,000 inhabitants.

<FIGURE 1 >

Industries and companies in these four counties generate about half of Norway's traditional export and 70 % of the total gross national product of Norway. This is mainly due to high activity in the fishing, maritime and oil-related businesses. Characteristics of the four counties are presented in <TABLE **1** (from (*16*)).

<TABLE 1 >

The area is interesting because many transport infrastructure investment projects are being implemented or are planned to be implemented within the region, and will significantly change the accessibility between work regions (*17*). Looking more closely at the relationship between transport investment, agglomeration and productivity can help making more precise cost-benefit analysis for future projects in the region.

3.   METHODOLOGY

In order to calculate the relationship between agglomeration and productivity, we need a unit of measure for agglomeration and a measure for productivity. In this section, we will first explain how the agglomeration index is estimated and then the total factor productivity. In the end, the model for evaluating the relationship between the two models and how it is related to transport investment is presented.

3.1 Agglomeration measure

The agglomeration index should generally reflect the degree of economic activities in one area as a function of the distance to and from the economic activities in other nearby areas. It should also address how agglomeration effects between different areas decay with distance, suggesting that firms located in close proximity should have a higher weight than firms further away.

In a Norwegian context both the travel time and the direct costs (e.g. tolls) are interesting because many areas on the western coast of Norway have ferry connections which might have a significant impact on the total cost, or generalized cost, of travelling between area i and area j. The economic activity in zone i is represented by the number of employees divided by the radius of zone i (a_0 in Equation 1). The economic activity in the neighboring zone j is captured by dividing the number of employees in zone j by the generalized cost of travelling between i and j. Therefore, in this paper the following agglomeration index is used (based on (*18*)):

Equation 1: Agglomeration index used in this paper

$$A_i = a_0 + \sum_{i \neq j} \left(\frac{E_j}{GC_{ij}} \right) \tag{1}$$

Where

$a_0 = \frac{E_i}{\sqrt{AREA_i / \pi}}$

E_j = number of workers in area j.

GC_{ij}= general cost of travel between i and j

A_i = agglomeration index for area i

$AREA_i$ = the size of the area i, $[km^2]$

By including the generalized travel cost in Equation 1, the link between transport investments and agglomeration is captured.

3.2 Productivity – a total productivity approach

Productivity is the ratio between firm output and firm input (*19*). There are several kinds of productivity ratios. The most common are total productivity and partial productivity.

An example of partial productivity is labor productivity ratio, which is output per person-hour ratio. However, some issues arise if analyzing partial productivity alone, which could lead to misinterpretation the overall growth of the firm. For instance, labor productivity could increase significantly due to higher quality and more expensive raw materials or technology improvement investments. Even though labor productivity increases, the overall profit for the company might not.

Therefore, a total productivity perspective is necessary when analyzing productivity changes at a firm level. In a transportation context this view is supported by (*2*, *10*, *20*) who suggested that total productivity is the preferred method when addressing firm productivity. Furthermore, they argue that other indicators such as wages or labor productivity are not very useful because they may simply indicate high capital intensity. Therefore, total productivity is the preferred indicator when analyzing agglomeration effects on productivity.

In a transportation context, productivity is often estimated by using Total Factor Productivity (TFP). The TFP function is based on the Cobb-Douglas production function (see (*21*), (*22*)).

Equation 2: Cobb-Douglas production function

$$Y_{ft} = TFP_{ft} * K_{ft}^{\beta k} * L_{ft}^{\beta l} * M_{ft}^{\beta m} \tag{2}$$

Where

-    Y_{ft} is the output of firm f in period t

- K_{jt} is the capital input of firm f in period t
- L_{ft} is the labor input of firm f in period t
- M_{ft} is the material input of firm f in period t
- TFP_{ft} is the total factor productivity of the firm f in period t
- $\beta_k, \beta_t, \beta_m$ are the output elasticity of capital, labor and material inputs respectively.

The production function can be written in linear form by taking the logarithm from both sides of the equation. It can be reformulated as:

$$y_{ft} = \beta_0 + \beta_k * k_{ft} + \beta_l * l_{ft} + \beta_m m * m_{ft} + \epsilon_{ft}$$

where the lowercase symbols represent the natural logs of variables used in non-linear formulation of production function, and:

$$\ln(TFP_{ft}) = \beta_0 + \epsilon_{ft}$$

Where β_0 and ϵ_{ft} can be interpreted as:

- β_0: the mean efficiency level across firms
- ϵ_{ft}: the deviation from the mean level for the firm f at period t

If we estimate the parameters β_k, β_t and β_m in Equation 2, we can then estimate the total factor productivity for each firm as:

Equation 3: Total Factor Productivity estimation model

$$TFP_{ft} = \exp(\beta_0 + \epsilon_{ft}) = \exp(y_{ft} - \beta_k k_{ft} - \beta_l l_{ft} - \beta_m m_{ft}) \tag{3}$$

However, the parameters of the model in Equation 2 cannot be directly estimated using Ordinary Least Squares (OLS) due to two main reasons. The first reason is that the input level – capital, labor and materials- is chosen by firms after observing the productivity level. In other words, the input level might be correlated with the firm's specific productivity level. For example, the labor level might be adjusted based on the capital level and productivity level of the firm. Another reason is that firms might decide to exit the market after observing the productivity level and the sell-off value of the firm. This creates a selection problem and negative correlation between the capital input and ϵ_{ft} (*22*).

Due to correlation problems between variables and the error term, we need to use some estimation methods, which can handle the endogeneity problem. Several estimation methods have been proposed in the literature. Van Beveren (*23*) has reviewed these estimation methods.

In this paper, we use the fixed effect method. This method assumes that the productivity level varies among firms, but is constant over time. Using fixed effect method, we shed light on the relationship between agglomeration and productivity without looking at how the productivity or agglomeration develops over time.

To apply this method, we first divide the firm-specific unobservable productivity level ϵ_{ft} into two components: ω_{ft} which is observable by the firm itself, and η_{ft} which is *not* observable to the firm. Therefore, η_{ft} is not correlated with the input variables while ω_{ft} might still be correlated

with them. If we assume that the ω_{ft} is invariant over time $(\omega_f = \omega_{ft} = \omega_{ft-1})$, we get:

Equation 4: Parameter estimation model for Cobb-Douglas production function

$$y_{ft} - y_{ft-1} = \beta_k(k_{ft} - k_{ft-1}) + \beta_l(l_{ft} - l_{ft-1}) + \beta_m(m_{ft} - m_{ft-1}) + (\eta_{ft} - \eta_{ft-1}) \tag{4}$$

Since the variables are not correlated with the error term, $(\eta_{ft} - \eta_{ft-1})$, the parameters β_k, β_l and β_m can be estimated by OLS.

3.3 Estimating the relationship between agglomeration and productivity

The agglomeration index presented in Equation 1 is used along with the TFP factor from Equation 3 to calculate the relationship between productivity and agglomeration. Assuming a non-linear relationship between agglomeration and productivity, we transform Equation 5 and take the log of both sides of the equation. The relationship between these two variables is then calculated using OLS in a linear regression model based on the logarithm of TFP and the agglomeration index:

Equation 5: Relationship between agglomeration and productivity

$$TFP_{ft} = A_{ft}{}^{\alpha_1} + \varepsilon_{ft}$$
$$ln(TFP_{ft}) = \alpha_0 + \alpha_1 * ln(A_{ft}) + \varepsilon_{ft} \tag{5}$$

where TFP is the total factor productivity for a firm f in period t and A_{ft} is the agglomeration index of firm f in period t. α_1 is the estimate of elasticity of TFP with respect to agglomeration.

3.4 Transport investment and changes in agglomeration index

Improvements in the road network are likely to reduce the generalized cost between i and j and therefore also increase the agglomeration index in equation 1. Together with the elasticities found in chapter 4.3, the change in agglomeration can be used to get an indication of how firm productivity is affected by a transport investment. The relationship between transport investment and productivity change can be written as (based on (6)):

Equation 6: Relationship between transport investment and change in total factor productivity

$$\Delta TFP_g = \sum_i \sum_f \alpha_1 * \frac{\Delta A_i}{A_i} * TFP_{f|f \in i, f \in g} \tag{6}$$

Where α_1 is the sector-specific elasticity and ΔA_i is difference in agglomeration index of area i before and after the transport investment. The TFP_f is the total factor productivity for firm f, located within area i and belong to sector g, and ΔTFP_g is the estimated change in productivity of all the firms in sector g due to the transport investment. In order to get the total change in TFP Equation 6 has to be applied for each sector in <TABLE 2.

3.5 Data collection

Employment density
We use basic statistical units as the geographical units for calculating agglomeration index. Each geographical unit contains information about the number of employees. In total, there are 3,452 basic statistical units in the analyzed area. This data set is originally from 2009 and is produced by Statistics Norway. Only employment data from 2009 were used in this paper to calculate the agglomeration index.

For calculating generalized travelling costs between geographical units, we use the level of service data from the regional transport model (*24*, *25*). The general costs are calculated using time weights from the Norwegian time study (*26*) between all areas. The travel time includes congestion and waiting time for ferries (half the headway). The time values for personal trips are used as a basis for estimating generalized cost.

In order to relate agglomeration and productivity, we need to calculate both measures in the same geographical unit. The firm data used in the productivity measures is on a postcode level. Therefore, we aggregate the agglomeration measure to a postcode level. For simplicity, we used the effective density for all geographical units, and the average within each postcode. In total, there are 1,155 postcodes in the analyzed area.

Firm data
For TFP calculation, we use data from the Brønnøysund Register Centre (Register of Business Enterprises). The dataset includes firm localization at a postcode level. From 2009, turnover, costs and profits are registered for many of the firms. The annual update of the firms' data and their detailed geographical level makes the dataset suitable for analyzing the relationship between agglomeration and productivity at a firm level. In this paper, we focus on eight sectors: **forestry/agriculture, fishing, manufacturing, construction, transport, hospitality, retail business and business services**. In total, approximately **17,000** firms are included in the analysis (see <TABLE 2).

<TABLE 2 >

   Some firms lack firm classification data, number of employees and profits. Moreover, there might be skewedness in the lack of data based on firm size, as larger firms have stricter requirements when it comes to which data to report than smaller ones.
   The analysis is based on differences in TFP for four years (2009-2013). Therefore, the total number of TFP observations is around 68,000. We use sales income as the output measure for each firm. For labor cost, the total wage cost for the firm was used, while commodity cost was used for material input. Firms' depreciation costs are used for capital input.

4.   DISCUSSION OF RESULTS

4.1 Agglomeration indicator – effective density

<FIGURE 2 depicts calculated agglomeration measure geographically based on Equation 1. Red areas have a high effective density while areas that are orange have a lower effective density.

<FIGURE 2: Effective density on western coast of Norway>

Postcodes that have a high effective density are in or near large cities, but the majority of the postcodes have relatively low employment density.

4.2 Productivity measure- Total Factor Productivity
As explained in section 3.2, we use Equation 3 to estimate total factor productivity. For this purpose, we first estimate parameters for Cob-Douglas production function using Equation 4. Each parameter represents the elasticity of its corresponding variables. In other words, β_l is the labor elasticity of a firm's production, β_k is capital elasticity and β_m is material elasticity. The higher an estimated elasticity parameter, the higher impacts it has on a firm's productivity.

The coefficients presented in <TABLE **3** are elasticities for different sectors defined in <TABLE 2. As the table shows, the coefficients varies between sectors, which implies different importance of labor, material and capital input from one sector to another. In all sectors, the three independent variables are statistically significant.

<TABLE 3 >

In general, material input is the most important factor for firm productivity for manufacturing, retail business and construction. This is logical, as these industries are highly dependent on materials in their production and their final output. For transport, hospitality and fishing, capital input (cars, houses etc.) is more important than in other sectors in explaining productivity. This is also logical as the number of cars a transport operator has or the number of rooms a hotel consists of should be important in explaining how productive these are.

It is also important to note that considering different levels of adjusted R-square, the Cobb-Douglas production function is a better fit for some sectors compared to others.

4.3 Productivity and agglomeration
The relationship between firm productivity and degree of agglomeration seems to vary between sectors. There is no clear overall indications of to which extent a higher employment density triggers higher productivity across all sectors (see <TABLE 4).

The results are shown to be statistically insignificant for agriculture/forestry and fishing based on the p-values for these two sectors reported in <TABLE 4. This is probably because firms within these sectors are heavily dependent on other factors such as access to natural resources. Existence of these factors are often less probable in areas with high employment density.

For the manufacturing, construction and the retail sector, the degree of agglomeration impact on productivity seems minor. For manufacturing and construction, these findings are consistent with Melo et al. (*27*) who find little impact from employment density on productivity within these sectors. A reason for this might be that manufacturing and construction industries have moved out of the dense areas of cities to cheaper areas in the outskirts of big cities or smaller cities. Manufacturing and construction might also be sectors where there is less demand for specialized labor making it easier to operate in less employment dense areas. In addition, these industries might be less dependent on direct contact with customers and supplier than private services.

<TABLE 4 >

The results for the retail sector are a bit surprising. The effect of increased employment density seems to have a minor effect on productivity. A reason might be that shops in the central areas of the city usually are small, and the shops in the outskirts of the city are larger, attracting more customers. Furthermore, the competition in dense areas might be tougher, suggesting a lower price for the merchandise they sell. However, the answer might also be weaknesses in the model used for calculating TFP or agglomeration index. In the agglomeration index, for instance, only the density of employees is included. For the retail sector, the population density might be more important.

Companies within the transport sector (transport of goods and persons), hospitality and business sector seem to benefit from a higher employment density and there seem to be agglomeration benefits. These findings are supported by elasticities from the service sector in (*18*, *27*). Higher employment density might also mean more potential customers. For these industries, direct contact with customers and suppliers might also be more important than for the other sectors.

The results are in line with earlier studies on agglomeration elasticities that are based on firm data (*10*, *18*). For the manufacturing sector, earlier studies find an elasticity of 0.024, while for construction an elasticity of 0.03 is estimated. For business related services, an elasticity of 0.08 to 0.197 is found and for retail sector an elasticity of 0.041. For the economy as a whole, agglomeration elasticities seem to be around 0.04 for European countries (*1*) which is in line with the results from this study.

One reason for the increased productivity in denser areas might be that less productive firms leave the market due to tougher competition. However, in a comprehensive study of firms throughout France, Combes et al. (*28*) show that these impacts are minor and can be neglected. Furthermore, studies done by Combes et al. (*29*), show that more productive workers tend to locate in denser areas and that this explains more of the changes in TFP than the agglomeration (selection of workers). According to the findings of Combes et al. (*29*) the TFP elasticities should be about 50 % of what is found in <TABLE 4.

4.4 Transport investments and agglomeration elasticities

The results above indicate that reductions in generalized cost could be associated with productivity increases via agglomeration. To which degree a transport investments affect firm productivity seem to be dependent on the changes in generalized cost to other areas and the number of workers in these areas. Furthermore, which sectors experience these changes seem to have an impact on the size of the productivity change. For instance, will an increase in agglomeration by 1 % give a productivity increase for firms within the manufacturing sector of 0.04 % and 0.15% within the hospitality sector (see <TABLE 4). While transport investments are likely to reduce generalized cost, transport policies that increases the costs could have a negative effect on productivity. An example of such policy is tolls. Thus, transport projects that have high tolls might actually have a negative impact on productivity.

The implications of these results in a CBA perspective is that one should be careful in analyzing which sectors that are affected in each transport investment project as significant heterogeneity in agglomeration benefits between sectors exists. Also using average elasticities found in the literature for all sectors from other places might be misleading since it might be

influenced by the firm structure in the area the estimate was found.

Including these benefits or costs in the transport appraisal could add additional information to projects and help the decision makers in prioritizing the projects that are most beneficial; both for the society as a whole, and to foster economic growth. Furthermore, a higher user benefit could release more public funds for transport investment from other competing sectors.

4.5 Limitations with the approach and further research

The productivity elasticities are essential in estimating potential additional benefits for changes in agglomeration caused by infrastructure projects. A logical next step will be to implement the elasticities found in actual projects in order to get a deeper understanding of the method. Further research is needed on how much the selection of workers affects the estimates, as earlier studies indicate that there seem to have significant impacts on the elasticities found.

The parameters calculated are based on the input variables that are thought to be important in firm productivity. Failure to include all the relevant variables is likely to cause omitted variable bias. This is a general problem in all regression analysis, and also in this study. Therefore, there might be variables, not included in the TFP model, which might affect productivity.

Although the fixed effect estimation method used in this paper overcomes endogeneity issues, it has some underlying assumptions. For example, we assume that $\omega_j s$ are time-invariant and firm specific. Relaxing these assumptions and using other methods with more realistic assumptions is left for future research. It is mentioned in the literature that the fixed effect method gives relatively low estimates for the capital coefficient (*23*). This is also observed in the results in this paper.

Another possible direction for further research would be to address the different aspects of the agglomeration index and maybe look deeper into how the population density might affect firm productivity.

5   CONCLUSION

In this paper, we have analyzed the relationship between agglomeration and productivity for approximately 17,000 firms on the west coast of Norway. Our results show that there are differences in how productivity is affected by the degree of agglomeration. However, we are not able to see an overall clear positive trend regarding the impact from agglomeration on productivity. The results indicate that the picture is more complex and a significant heterogeneity between sectors exists. The implications of these results in a CBA perspective is that one should not necessarily see agglomeration as solely beneficial for all sectors. Which sectors affected by each transport investment could influence the size of the impact on productivity.

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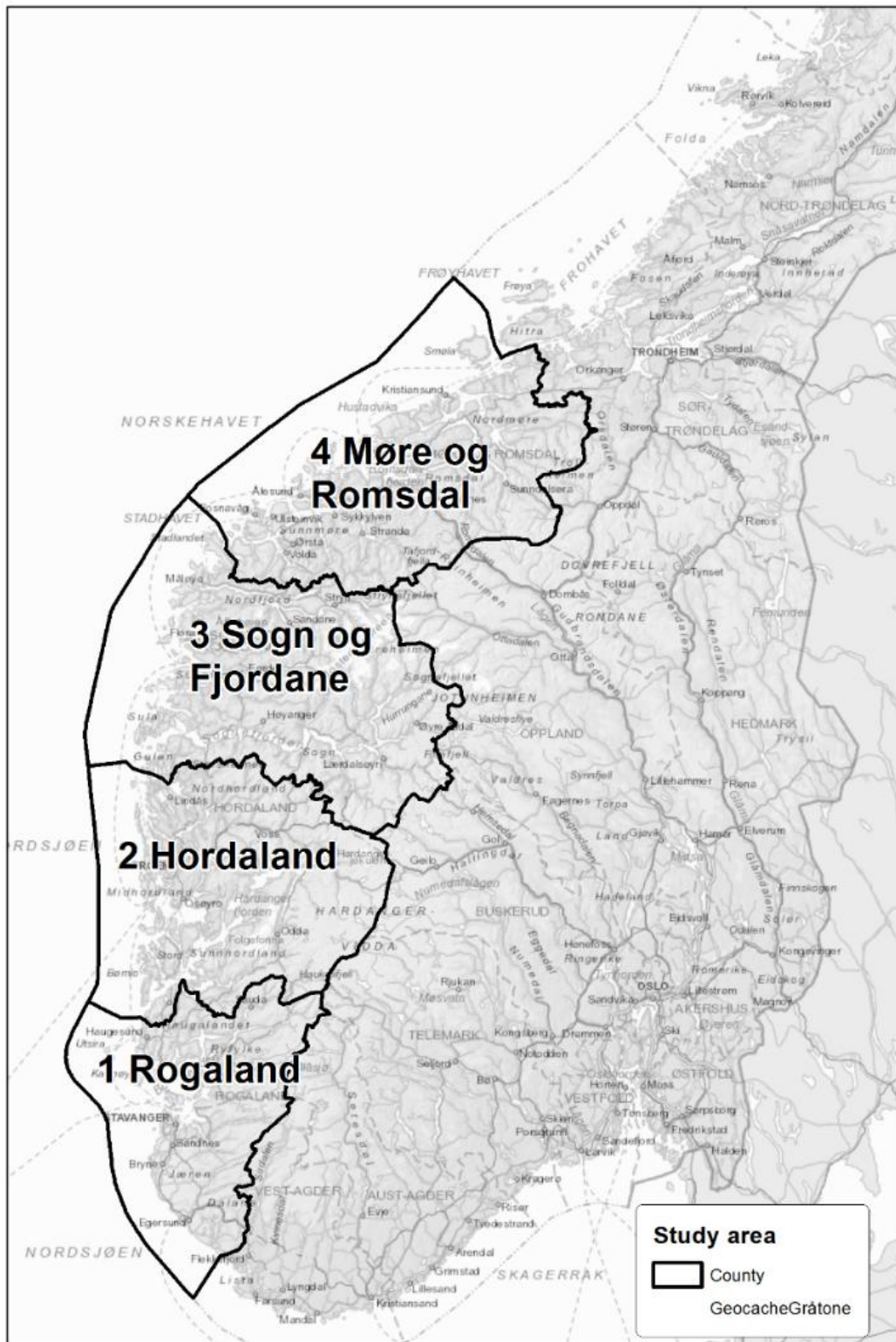List of table titles:

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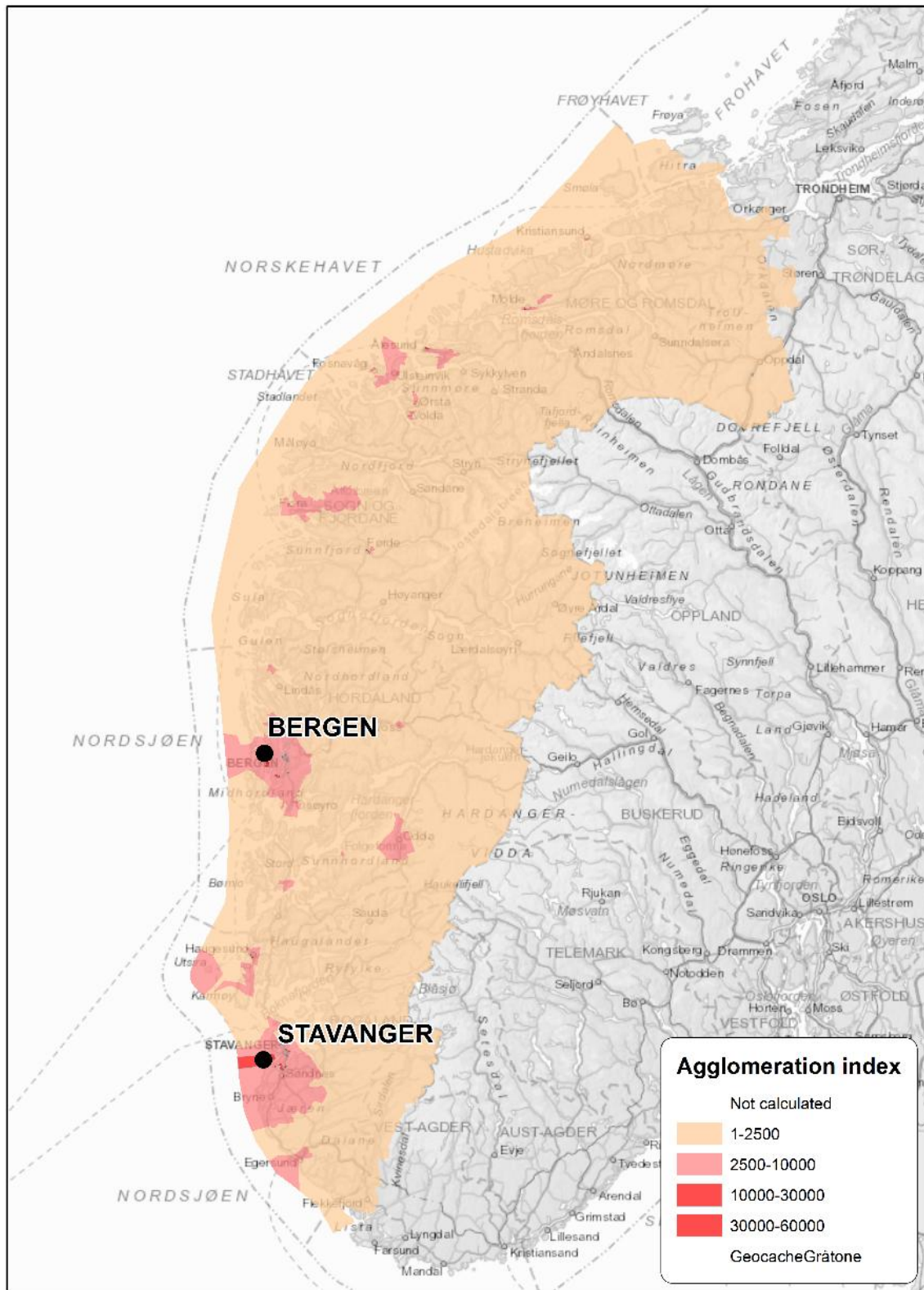
FIGURE 5: Study area marked with black

FIGURE 6: Effective density on western coast of Norway

TABLE 9: Description of the characteristics for the four counties analyzed

	County 1 (Rogaland)	County 2 (Hordaland)	County 3 (Sogn og Fjordane)	County 4 (Møre og Romsdal)
Number of inhabitants	470.000	516.000	110.000	265.000
Workforce in employment	237.000	261.000	55.000	132.000
Unemployment rate	4.7 %	3.5 %	2.3 %	3.4 %
Size	9.400 km^2 (3.630 mi^2)	15.400 km^2 (5.950 mi^2)	18.600 km^2 (7.180 mi^2)	15.100 km^2 (5.830 mi^2)

TABLE 10: Sectors analyzed

Sector	Number of analyzed firms
Agriculture & forestry	254
Fishing	620
Manufacturing	2472
Construction	4257
Transport	1675
Hospitality	405
Retail business	3201
Business services	4133
In total	17017

TABLE 11: Estimated elasticities for each variable in Cobb-Douglas production function

Sector	Labor input coefficient, (β_l)	Material input coefficient, (β_m)	Capital input coefficient, (β_k)	Adjusted R^2
Agriculture and forestry	0.262	0.216	0.081	0.412
Fishing	0.353	0.079	0.210	0.158
Manufacturing	0.253	0.401	0.028	0.534
Construction	0.288	0.354	0.033	0.537
Transport	0.298	0.118	0.146	0.425
Hospitality	0.318	0.314	0.145	0.498
Retail business	0.063	0.654	0.029	0.663
Business services	0.336	0.183	0.051	0.393

TABLE 12: Agglomeration elasticity for different sectors

Sector	Agglomeration elasticity (α_1)	Std. error	T-value	p-value	Valid Obs.
Agriculture and forestry*	0.11	0.06	1.89	0.06	148
Fishing	-0.08	0.10	-0.85	0.39	233
Manufacturing**	0.04	0.01	2.72	0.01	1786
Construction**	0.04	0.01	3.60	0.00	2642
Transport**	0.16	0.03	4.91	0.00	600
Hospitality**	0.15	0.05	3.03	0.00	254
Retail sector**	0.02	0.01	3.00	0.00	2200
Business services**	0.15	0.02	7.26	0.00	1426
All sectors (weighted average)	0.06				9289
* EXTREME values excluded **Significant at a 95 % significance level					