# Local Development Policy

## Do New Culture Houses have an Impact on Migration? The Case of Norway

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# Local Development Policy:
# Do new culture houses have an impact on migration?
# The case of Norway

Trine Bille* and Hanna Nyborg Storm**

**Abstract**

During recent decades, most Western European countries and the US have seen massive investments in culture houses designed to host cultural activities like theatre performances, concerts, and exhibitions. They are often large with spectacular architectural design, and the main political purpose is often to attract the attention of potential tourists, investors and future residents who could contribute to the economic and demographic development of places. The existing literature contains mainly single case studies of successful places. There is a lack of comprehensive and systematic evidence of the causal effects of new culture houses on attraction and migration. This paper sets out to fill this gap by investigating the effect on migration of the opening of 52 culture houses in Norway in the period 2001-2014; the study uses a panel data structure and a difference-in-difference approach, and the impact of an architectural 'wow factor' is tested. The results show that no causal effect on migration of opening a culture house can be identified. The results contradict political rhetoric in many Western countries, and the results have relevance for local politicians who are responsible for planning of local culture and economic development.

Keywords: Local development, culture houses, migration, causal effects.

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## 1. Introduction and motivation

This article provides new evidence relating to the effect of new culture houses that offer some outstanding features in their architecture in terms of their potential ability to attract people to cities. The study is based on high-quality data from Norway, and uses difference-in-difference techniques to evaluate the differential results between a treatment group (municipalities with a new culture house) and a control group (cities without this new facility) on the power of migration attraction. Norway in Northern Europe is used as a case.

In Western Europe as well as in the United States (Woronkowicz et al., 2012; Woronkowicz, 2013) there has been a growing trend to build new culture houses, often with spectacular architecture, hosting a range of different cultural activities: concerts, theatre performances, cinema, library, museums etc. The construction of these large-scale and prestigious architectural projects is often used as a strategy for economic growth and local or regional development, with the expectation of improving attractiveness to tourists as well as new potential citizens and businesses (Andersson, 2014; Bille & Schulze, 2006; Grodach, 2010). In Europe, the northern Spanish city of Bilbao is in particular associated with its iconic Guggenheim Museum, opened in 1997, a building that has contributed to making Bilbao a famous tourist destination and a symbolic site of cultural regeneration – "the Bilbao effect" (Bille & Schulze, 2006; Heidenreich & Plaza, 2015; Henningsen et al., 2015; Plaza, 2006), and many cities and regions have since then tried to imitate the success.

We see the same trend in Norway. Public expenditure on the culture sector has increased considerably since the beginning of the millennium, and a huge part of this expenditure is related to investments in culture houses (Henningsen et al., 2015). More than 60 new culture houses have been commissioned in the period 2003–2018, at an estimated investment cost of approximately 1.6 billion EUR (Gjestad et al., 2014; Henningsen et al., 2015). The culture houses are often large and extravagant architectural structures, and are intended not only to serve as arenas for local community life but also to attract the attention of the outside world and contribute to the economic and demographic development of these places (Aagedal et al., 2009; Henningsen et al., 2015; Lysgård, 2012).

Even though huge sums of public money are spent on these new houses, no comprehensive studies with representative qualities have been undertaken. Most existing studies are case studies of (successful) culture houses/institutions (e.g. Johnson (2009)), which makes it difficult to discuss the impact of investment in culture houses in general. Given the enormous scale of investment in new culture buildings, more work is required in systematically analysing the impact on the attraction on new citizens, as it is clear that policy-makers continue to use new culture buildings as an instrument to increase attractiveness (Campbell et al., 2017). There is a need for tests of impact using a systematic, quantitative approach applied to a national sample of culture buildings. Such an approach is still lacking in the literature (Brooks & Kushner, 2001; Campbell et al., 2017; Markusen & Gadwa, 2010), and testing the causal links is a high-priority research agenda.

This study taps into this research agenda and is one of the first of its kind. The aim is to analyse the effect on migration of the opening of new (spectacular) culture buildings, with Norway as the case.

Norway is, in our opinion, a good case for solid empirical testing. Norway is geographically a long country, approximately 1,800 km from north to south (see Figure 1), 5.3 million inhabitants with a population density of 14 persons per km2. Local and regional development has always been a politically high-priority issue, with an aim to guarantee the habitation and continuation of communities in all municipalities. Investment in new culture houses is one of the strategies used. Furthermore, we have access to reliable, high-quality and detailed data.

It is evident that ideas, strategies and theories developed in larger European cities ("the Bilbao effect") and in the US (such as the theory of the creative class by Florida 2002) have been used in political argumentation and applied in the relatively small Norwegian municipalities (Henningsen et al., 2015). From earlier research, we know how ideas spread from one city to another (seminal contributions include Hägerstrand, 1967). Depending on the context, however, outcomes vary, and results from one city or case study cannot be uncritically transmitted to another context.

The question of evidence is important as the scarce public resources used for building new culture houses could alternatively have been used for other purposes. The money could have been spent on cultural activities, which might cater more for the local population, or other investments that might be better at generating migration and economic growth.

This article sets out to analyse the effect of new culture houses on migration, using a panel data structure and a difference-in-difference (DiD) approach, and tests the impact of an architectural 'wow factor'. The aim is to investigate if the new culture houses have made municipalities more attractive in terms of attracting more residents. The main conclusion is that there is a positive correlation between new culture houses and net migration, but the results further show that the dominant explanation is that they were opened in municipalities where net migration was already increasing. Opening a new culture house does not lead to the municipalities breaking out of the pre-existing trend. This is important new knowledge for local policy makers.

The article is organised as follows. Section 2 presents a literature review and accounts for the context and theoretical relevance. Section 3 describes and discusses the concept of culture houses. Section 4 outlines the model and the empirical method, and section 5 presents the data and descriptive statistics. Section 6 presents the results, section 7 accounts for the biases and limitations of the study, while section 8 concludes the article.

**2. Literature review**

How can culture houses create in- migration to a municipality? The mechanisms by which iconic cultural landmarks may bring about demographic change are multiple. In theory, new culture houses can create migration directly by attracting new citizens, and indirectly, by attracting businesses and firms creating new jobs in the local area. Likewise, if the new cultural facility attracts tourists, it can lead to new jobs in the service sector.[1]

The impact of cultural offerings on tourism and thereby on new jobs is a much-researched topic. Culture houses and large events can attract tourists to a region, and numerous economic impact studies have been conducted to show how many jobs cultural-led tourism can create (Seaman, 2006). Even though research have shown that the results of economic impact studies often are exaggerated (Seaman, 2006), it is evident that there are positive examples where a single event or culture institution can spur economic development. The Guggenheim Museum in Bilbao (Spain) opened in 1997 and has become one of the most iconic examples of culture-led development, especially in relation to its impact on tourism (Alaily-Mattar et al., 2018; Bille & Schulze, 2006; Franklin, 2016; Henningsen et al., 2015; Plaza, 2006; Plaza et al., 2009). Bilbao has become a role model for the regeneration of declining urban and industrial regions, and the term "the Bilbao effect" refers to the use of a flagship building characterized by an iconic architecture, designed by a "starchiect", as a means for a culture-driven revitalization of a rundown city or region into an attractive location for tourism and business (Heidenreich & Plaza, 2015). However, the museum was not

[1] For new jobs to have an impact on in-migrations it will in most cases require full employment, which is the case for Norway.

the only element in the redevelopment of the city, and the process of urban change had started before the museum opened. Several activities were launched to improve the infrastructure of the area, to promote economic growth and to stimulate cultural demand and activity (Plaza & Haarich, 2015). Not surprisingly, politicians in many countries have tried to imitate the "Bilbao effect" to start urban regeneration. After the success of the Bilbao, there have been an emerging trend of local governments constructing large-scale and prestigious architectural projects as strategies for economic development with the expectation that projects with a good reputation will spur prestige and an attractive image of the city (Andersson, 2014; Grodach, 2010; Smith & von Krogh Strand, 2011). However, it is evident that there are many intertwined internal and external factors of important, including the timing of the projects. It is simply not a matter of "add culture and stir" (Gibson & Stevenson, 2004).

When it comes to location choices of people and business, especially Florida (2002) has had a huge impact. His emphasis on lifestyle amenities such as art and culture for the location choices of talent have likewise made local governments in many Western countries to invest in culture-led development. Florida (2002) has turned the traditional causality (jobs and business attract people) around by suggesting that lifestyle amenities, arts and culture, open-mindedness and tolerance will attract talented people, which in turn will get business to move where the attractive people live. In this way, making places attractive for people will generate innovative new industries, business development and economic growth. Even though the causality has never been confirmed, and research has been critical to Florida's theories (Andersen et al., 2010), then is it evident that Florida's theories are still alive in policy making in Scandinavia (Henningsen et al., 2015).

While the focus in the literature on culture-led development has been on the impact of culture on economic development and job creation, the interdependence obviously has a dual causality: Development in the cultural sector has an effect on overall economic development (like job creation and in-migration), but at the same time general economic development affect the cultural sector. To put is simple: when societies (and municipalities) get richer, more resources will be available for investments in culture. Former research has shown that the income elasticity for investments in arts and culture is larger than 1 (Bille et al., 2003).

The question of causality is important, as the public investment in culture can take many different forms, and different investments may cater for different purposes. While many investments in cultural houses have been made with the purpose to create economic development (Henningsen et al., 2015), the demand by the local population may be of a different kind, and there is a growing understand of the importance of addressing agents and networks engaging in the city's cultural development and community life rather that investing in flagship project (Comunian, 2010).

While much of the literature on culture-led development is based on case studies, the positive and successful cases stand out as model of success in an actual practical political context, even though several internal and external factors as well as timing are important for the outcomes. Based on the massive investments in culture houses there is a need for quantitative studies where all the investments are considered, and not only the successful few. The necessity for long-term studies and production of longitudinal data in this field has been pointed out (Campbell et al., 2017). Likewise, there is a lack of comparative studies, or the use of control groups to test the effects of cultural activities. When studying the impact of cultural activities on attractiveness, it is of great importance to consider the causal effects. The main question is whether it is cities and municipalities already experiencing positive development that choose to invest in culture houses, or if it is the cultural investment that attracts new inhabitants and creates economic growth?

One general challenge in analysing the effect of local culture houses is that they are not exogenously determined, unlike natural amenities such as weather. The use of data on arts and culture is highly sensitive to endogeneity issues (Tubadji et al., 2014), which is associated with the ability and willingness of the local high-human-capital-population to pay for cultural services. Few studies have addressed this endogeneity problem properly, but an interesting exception is Falck et al. (2011), who examines the effect of 29 baroque opera houses built before the industrial revolution. They argue that proximity to these opera houses should be exogenous to the distribution of high human-capital that originates from the period of and after the industrial revolution. Another exceptions is Noonan (2013), who studied the impact of cultural districts on economic development. The evidence is mixed: There seems to be a positive effect on turnovers and a null effect on increase in population. The study highlights the importance of separating causality from mere correlation when evaluating the impact of cultural districts. The models allow for controls over the previous trends in neighbourhoods that might explain why some neighbourhoods received a district and others did not. In this way it considers Brooks and Kushner (2001) concerns about pre-existing trends. Apart from these studies, we are not familiar with any studies implementing a framework that takes account of causal interferences on a larger geographical scale. Other relevant studies such as Buch et al. (2013), Rodríguez-Pose and Ketterer (2012) and Glaeser et al. (2001) are not designed as causal studies.

**3. Culture houses**

A culture house is designed to host cultural activities, but what is covered by the term is a matter of definition. The Norwegian network of culture houses uses the definition: "A culture house is a professionally managed building for culture and cultural production. A local and regional meeting place and arena for amateur and professional performers of art and cultural activities. Depending on the content, culture house can also be termed as an art and culture institution specialising in cultural production and dissemination." (Norsk Kulturhusnettverk, 2017, own translation). The culture houses often receive funding from the state and county, as well as public and private foundations, but most of the investment costs are usually borne by the municipalities.

There is no register of the number of culture houses, but the national network of culture houses had at the time of study 115 members (Norsk Kulturhusnettverk, 2017). We have selected the 52 culture houses that opened in the period 2001-2014. In this sample, there is a large variation in sizes and types of houses. The culture house often includes a cinema and a stage that can be used for theatre performances and concerts. Some have also located the library and culture schools for children in the building.

Figure 1 shows the location of the 52 municipalities that have opened a new culture house in the period 2001-2014. The map shows a relatively even geographical distribution, with municipalities in all parts of the country being represented. Larger cities like Oslo, Bergen, Trondheim and Stavanger, are represented in the sample, and regional centres in more sparsely populated areas are also represented. With a national population of 5.2 million distributed across 428 municipalities, most Norwegian municipalities are small in population size. The sample ranges from Lom with a population of 2,361 in 2014 to Oslo with a population of 634,463.

**Figure 1. Municipalities that have opened culture houses in the period 2001-2014, marked in red.**

The architectural expression of the culture houses varies from spectacular structures to renovated buildings that do not attract particular attention. Several terms are used for projects with spectacular architecture, including 'signature buildings', 'destination icons' and 'cultural flagships'. The terms are often used

interchangeably, and the terminology is not clear (Smith & von Krogh Strand, 2011). These types of buildings often have a 'sensational' appearance, unusual visual effects and/or use of unusual materials – sometimes also referred to as a 'wow factor'. In short, a building that distinguishes itself radically from its surroundings.

There is overriding anecdotal evidence that many of these houses are built with the purpose of attracting new citizens and creating economic development in the municipalities. Just to mention a few examples:

In Hamar Municipality (30,000 inhabitants) a culture house opened in 2014 and had investment costs of 7.8 million EUR. The strategy documents for the municipality explicitly mention that the culture house is an important factor in making the municipality attractive to people and businesses (Hamar kommune, 2011; Hamar kommune, 2015). The former mayor of the municipality says: "Richard Florida has meant a lot to Hamar […] When we asked ourselves how to develop Hamar further, we used Florida […] We must attract intellectual and high educated people that can give us a better foundation for the future" (Arkitektnytt, 2017, own translation). In Os Municipality (19,000 inhabitants) a new culture house opened in 2011, hosting a gallery, a dance studio, a restaurant and a large amphitheatre in an architecturally spectacular building. The mayor of the municipality has said: "If we are to get hold of the 'right' kind of inhabitants, we must offer something beyond primary services. We are continually moving up Maslow's hierarchy of needs, and if a municipality cannot offer these types of facilities, they will move to another place." (Selmer (Selmer-Anderssen, 2015, own translation).

**4. Empirical method**

The purpose of this article is to study the impact of culture houses on net migration in the Norwegian municipalities. A DiD approach has been used to estimate the effects. DiD estimation can be applied in situations where groups are observed over time, and certain groups are exposed to a treatment and others are not (Angrist & Pischke, 2009; Schlotter et al., 2011). The development in net migration in municipalities that have not opened a culture house is used as a counterfactual scenario for the development in the treatment group municipalities that have opened a culture house.

In the empirical specification, the fact that culture houses are built in different municipalities and in different years is exploited by contrasting net migration in municipalities with and without new culture houses in the period 2000-2014. A difference-in-difference (DiD) model is estimated:

$$\mathrm{Nm}_{jt} = \alpha + \delta(\mathrm{Ch}_{jt}) + \mu_j + \tau_t + \varepsilon_{jt} \qquad (1)$$

The dependent variable is net migration in percentage of population in municipality *j* in year *t*. Ch is the binary treatment variable indicating whether the municipality has a new culture house, and it is equal to one from the year the culture house opened and zero otherwise. Year dummies, $\tau_t$, control for net migration that is common to all municipalities. A vector of regional dummies, $\mu_j$, controls for mean differences in net migration across residence and labour market regions. $\varepsilon$ represents the unobserved characteristics of the municipality, which is assumed to be independent to the opening of the culture house, have the same distribution over time and is normalised to have zero mean (Imbens & Wooldridge, 2009).

The main equation says that, in the absence of new culture houses, net migration is determined by the sum of a time-invariant regional effect and a year effect that is common across municipalities. The treatment effect is the average effect on net migration of opening a culture house. In the ideal case, the establishment of culture houses would be independent, random events that varied in timing, according to

size and geographical location and had no spill-over effect on neighbouring municipalities. If these conditions are met, the equation will provide an unbiased estimate of the average treatment effect.

However, the opening of a culture house cannot be claimed to be entirely random. It can, for instance, be dependent on a minimum size of the municipality and the possibility of financing. An apparent concern is that the treatment and comparison groups are different types of municipalities. The descriptive statistics show that on average the municipalities with new culture houses are larger and more urban compared to the control group. The difference between the treatment group and the comparison group is, however, meant to be captured by the regional fixed effects (Angrist & Pischke, 2009; Cameron & Trivedi, 2009). A key identifying assumption is that migration trends would be the same for both groups of municipalities in the absence of the opening of the new culture houses. We therefore add regional-specific time trends to model 1, which will allow treatment and control municipalities to follow different trends.

Model 2 includes dummies that control for linear and quadratic regional time trends:

$$\mathrm{Nm}_{jt} = \alpha + \delta(\mathrm{Ch}_{jt}) + \mu_j + \tau_t + \mu_j \mathrm{t} + \mu_j \mathrm{t}^2 + \varepsilon_{jt} \qquad (2)$$

An additional concern is that the events are perhaps not entirely independent events, with the decision to build a new culture house being affected by the presence of other culture houses in the region. Following the same line of reasoning, it is plausible that there might be spill-over effects, with neighbouring municipalities also being affected by the opening of a culture house. The opening of a culture house in a municipality can make the neighbouring municipality more attractive.

There is a further concern that the effect of a culture house might not be discernible before some time has passed, or the effect might be reduced or vanish after some time. It is also plausible that an ongoing project of building a culture house can contribute to increasing the attractiveness of a place even before it has opened. Extended versions of model 2 control for possible lagged or spill-over effects. The model will also be extended to include the architectural expression and content.

As an alternative specification, model 3 controls for labour market and demographic characteristics of the municipalities and includes dummies for county and year instead of region and year fixed effects. It also includes a dummy, ECh, for having a culture house prior to 2001:

$$\mathrm{Nm}_{jt} = \alpha + \delta(\mathrm{Ch}_{jt}) + \rho(\mathrm{ECh}_{jt}) + \gamma(\ln \mathrm{Labour}_{jt-1}) + \varphi(\mathrm{Dem}_{jt-1}) + \tau_t + \lambda_c + \varepsilon_{jt} \qquad (3)$$

If model 3 is correctly specified, it is expected to produce similar results as model 2. However, it depends on having included the relevant covariates that control for observable differences in the distribution of characteristics between treatment and comparison groups. The literature is, according to Imbens and Wooldridge (2009), not helpful as a guide to which type of covariates to include, beyond warning about including covariates that are themselves influenced by the treatment. Finding control variables that are not outcome variables affected by the treatment itself, however, can be a challenge. Labour market factors can, for instance, be directly affected by the opening of the culture house generating new jobs. The control variables related to labour market and demographics are lagged by one year to reduce this problem.

The main concern when using a DiD approach is possible time-varying omitted variables that might systematically affect either the treatment or the comparison group. A central assumption is that there are no unobserved characteristics associated both with the potential outcome and the treatment (Imbens & Wooldridge, 2009). Substantial changes over time in the differences between observable characteristics of the two groups might suggest unobserved compositional changes that can call the empirical strategy into

question. Norway is a vast country with regional differences. County is included as a dummy to control for county-specific shocks.

Standard errors are clustered at municipality level to prevent serial correlation producing biased standard errors, due to the presence of correlation between outcomes within regions and time periods.

The most important inference issue in this type of DiD-model is the behaviour of regional-year shock. The assumption that shocks are independent across regions and over time, and that they are serially uncorrelated, is rarely met. According to Angrist and Pischke (2009), regional shocks are almost certainly serially correlated. There is no consensus on how best to approach the serial correlation problem, but the simplest and most widely used approach is to cluster the standard error at the highest group level, which works well when numbers of groups are large (Angrist & Pischke, 2009). Matching is an alternative method that can be applied, but this method is criticised for producing biased results (Arceneaux et al., 2006). We have implemented propensity score matching as a robustness test and compared the results to the results of the DiD approach.

## 5. Data and descriptive statistics

Information on culture houses has been collected from a survey by Gjestad et al. (2014) and the member list of the network of culture houses (Norsk Kulturhusnettverk, 2017). This is supplemented with information from official webpages, public documents etc. We have also categorised the type and content of the culture houses, such as cinema, library, culture school etc. This information has been collected online from, for example, the webpages of the culture houses and municipalities. We are confident that the list of cultural houses is comprehensive, and that the online data used is a reliable source. The data are rich, and the quality of the data is high as it comes from official webpages.

As a response to the observation that the list of culture houses seems to range from spectacular structures with a clear 'wow factor' to more modest buildings, we have categorised the architectural expression of the 52 culture houses. We have not succeeded in finding a good description of the term 'iconic building' with a 'wow factor' in its architectural expression. As far as we know, there are no examples in the literature of objective indicators of what makes a building iconic or having a 'wow factor', apart from possibly the type of method as described in Patterson (2012), which uses winners of the renowned Pritzker Architecture Prize to categorise iconic buildings. This is not, however, a feasible method in our context, as few culture houses are projects on this type of scale. As there are no clear definitions to go by, we have thus outsourced the task of categorising the houses according to their architectural expression to an architect, who has long experience of working on an architecture magazine. We chose not to have definite criteria, but rather have the architect subjectively label the culture houses by assessing the scale and volume of a building, combined with aesthetic and design-related criteria. The architect found that some of the houses have had a clear ambition of being extraordinarily spectacular and/or innovative and were designed with an aim of having a 'wow factor'. We emphasise that having had an ambition of being extraordinary is not equivalent to being innovative or even successful in their expression. Several of the culture houses seem to have been heavily influenced by famous buildings or trends. We ended up splitting the culture houses into three categories: 1) the ones that have had a strong ambition of a 'wow factor', 2) the ones that have elements of a 'wow factor' ambition, and 3) the ones that do not have had an ambition of having a 'wow factor'. 23 culture houses were found to have a clear expression of an ambition of a 'wow factor', and 8 have a smaller 'wow factor' ambition, while the remaining 21 culture houses did not seem to have an ambition of having a 'wow factor'.

All data on demographics and labour market have been collected from Statistics Norway's databases and cover the years 2000-2014. We have used the following measures: net migration, in total and net immigration/domestic migration (dependent variable), size of population, share of population living in urban settlements, share of population with college or university education, share of population employed, number of jobs in municipality, share of population unemployed, number of jobs in service industries, median taxable income of residents, income distribution, average house prices, rate of new enterprises established. In addition, we have used a classification of municipalities into residential and labour market regions (R&L regions) developed by Gundersen and Juvkam (2013).

Table 1 shows some descriptive statistics. The municipalities that have opened a culture house in the years between 2001 and 2014 are shown as the treatment group, and compared to the group of municipalities that have not opened a new culture house in this period (comparison group). Statistics for the beginning and end of the period are reported, as well as the development. The appendix shows descriptive statistics such as minimum and maximum values and standard deviation.

**Table 1. Descriptive statistics on labour market and demographic factors in municipalities with and without new culture houses, mean values. * indicates a difference of p < 0.05.**

| | | 2000 | 2014 | Growth 2000-2014 | Percentage growth 2000-2014 |
|---|---|---|---|---|---|
| Population | Treated | 37 567.31 | 44 351.83 | 6 784.52 | 18.06 |
| | Comparison | 6 715.42 | 7 454.15 | 738.73 | 11.00 |
| | Difference | 30 851.89* | 36 897.68* | 6 045.79 | 7.06 |
| Net migration as percentage of population | Treated | 0.15 | 0.70 | 0.55 | 358.60 |
| | Comparison | 0.03 | 0.34 | 0.30 | 870.45 |
| | Difference | 0.12 | 0.36* | 0.24 | -511.85 |
| Share of population living in urban settlements | Treated | 70.16 | 74.59 | 4.43 | 6.32 |
| | Comparison | 45.12 | 50.20 | 5.08 | 11.26 |
| | Difference | 25.04* | 24.39* | -0.65 | -4.94 |
| Share of population with college or university education | Treated | 21.46 | 30.44 | 8.98 | 41.83 |
| | Comparison | 16.27 | 24.30 | 8.03 | 49.33 |
| | Difference | 5.19* | 6.15* | 0.95 | -7.50 |
| Share of population below age 40 | Treated | 54.19 | 49.60 | -4.58 | -8.46 |
| | Comparison | 52.34 | 46.73 | -5.61 | -10.71 |
| | Difference | 1.85* | 2.87* | 1.02 | 2.25 |
| Jobs as percentage of working-age population | Treated | 66.12 | 66.86 | 0.74 | 1.12 |
| | Comparison | 57.23 | 56.99 | -0.24 | -0.42 |
| | Difference | 8.89* | 9.87* | 0.98 | 1.54 |
| Employment as percentage of working-age population | Treated | 69.96 | 69.43 | -0.53 | -0.76 |
| | Comparison | 69.09 | 68.40 | -0.69 | -1.00 |
| | Difference | 0.86 | 1.03 | 0.16 | 0.24 |
| Share of working-age population unemployed | Treated | 1.86 | 1.81 | -0.06 | -3.04 |
| | Comparison | 1.86 | 1.71 | -0.15 | -8.15 |
| | Difference | 0.00 | 0.10 | 0.10 | 5.11 |

| | | | | | |
|---|---|---|---|---|---|
| Share of new enterprises (new/existing enterprises) | Treated | 11.85 | 6.57 | -5.29 | -44.61 |
| | Comparison | 8.54 | 5.46 | -3.08 | -36.05 |
| | Difference | 3.32* | 1.11* | -2.21 | -8.56 |
| Number of jobs in service industries as percentage of population | Treated | 7.50 | 7.73 | 0.23 | 3.01 |
| | Comparison | 5.25 | 5.56 | 0.32 | 6.03 |
| | Difference | 2.26* | 2.16* | -0.09 | -3.02 |
| Median income | Treated | 196 288.50 | 359 046.20 | 162 757.70 | 82.92 |
| | Comparison | 182 283.20 | 340 786.90 | 158 503.70 | 86.95 |
| | Difference | 14 005.30* | 18 259.30* | 4 254.00 | -4.04 |
| Income distribution (mean/median income) | Treated | 1.15 | 1.13 | -0.02 | -1.72 |
| | Comparison | 1.13 | 1.12 | -0.02 | -1.52 |
| | Difference | 0.02 | 0.02* | -0.00 | -0.20 |

| | | 2002 | 2014 | 2002-2014 | % 2002-2014 |
|---|---|---|---|---|---|
| Average house prices per $m^2$ | Treated | 10 547.74 | 19 364.12 | 8 816.38 | 83.59 |
| | Comparison | 9 104.28 | 15 996.32 | 6 892.04 | 75.70 |
| | Difference | 1 443.46* | 3 367.80* | 1 924.34 | 7.88 |

Differences in local tax levels are often included in studies similar to this one. The level of taxes is relatively uniform across Norwegian municipalities, except for tax on the value of property. However, the major source of tax financing is the income tax paid by individuals. Municipalities and counties are allowed to set their own tax rates within a narrow band, but they all use the maximum rate (Borge et al., 2014). Therefore, we have not included the local tax levels in the study.

**6. Results**

The aim of the study is to analyse the extent to which the opening of a new culture house might benefit a municipality in terms of attracting new residents.

Table 2 shows the initial estimates of equation 1. The first column shows net migration as percentage of population regressed on the dummy for new culture houses, which is the same as the correlation between the two variables. The two variables are significantly correlated, but the low $R^2$ shows that the dummy of opening a culture house explains little of the variation in net migration. The results are similar when time dummies are included in the model, but the coefficient of opening a culture house is reduced to 0.261 and $R^2$ has increased to 0.085, which is still very low.

The third column records net migration regressed on indicator variables of having a culture house and region and time dummies. The results show that the effect of opening a culture house vanishes once mean regional net migration rates and common year effects have been removed.

The results are similar when regional linear time trends are included in column 4. Column 5 includes quadratic regional time trends, which allow net migration to trend nonlinear. The effect of having a new culture house is higher when including time trends but is still not significant. An effect of 0.082 can be interpreted as the opening of a new culture house being associated with an extra net migration of 0.08 percent of population on average. In 2014, the average population of municipalities with new culture houses was 37,567, so the extra migration will be equivalent to 30 persons. However, it should be emphasised that the estimates are not significant.

**Table 2. Estimated effects of new culture houses on net migration, 2000-2014.**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| New culture house | 0.474*** | 0.261*** | 0.043 | 0.074 | 0.082 |
| | (0.091) | (0.091) | (0.063) | (0.062) | (0.064) |
| Year | No | Yes | Yes | Yes | Yes |
| Residence and labour market region | No | No | Yes | Yes | Yes |
| Region * time trends | No | No | No | Yes | Yes |
| Region * quadratic time trends | No | No | No | No | Yes |
| N | 6420 | 6420 | 6420 | 6420 | 6420 |
| $R^2$ | 0.008 | 0.085 | 0.276 | 0.319 | 0.348 |

Note. Dependent variable: Net migration as percentage of population. Ordinary least squares estimates. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each municipality. Level of significance indicated by asterisks: * p < 0.10, ** p < 0.05, *** p < 0.01.

As an alternative specification, table 3 includes control variables describing factors related to the labour market, demographic characteristics of the municipalities, and year and county dummies. The controls are lagged by one year. We also include a dummy for municipalities that already had a culture house prior to 2001. Both the opening of a new culture house and the pre-existence of a culture house are positively correlated with net migration in column 1 and are still significant when year and county dummies are included in column 2. The results, however, change when the control variables are included.

The log of population is entered in (3) as a strong and significant predictor. The main variable of interest, new culture house, becomes negative and significant, however only at ten percent level. This is still a surprising result, indicating that the new culture houses have a negative effect on net migration. Having an established culture house is also negative, but insignificant. This is an important result, indicating that there are no significant long-term effects of having a culture house in terms of attracting residents.

Share of working-age population registered unemployed is entered in (4) as negative and significant, while share of new enterprises is entered as positive and significant. This means that a high share of unemployed people is associated with lower net migration, while a high share of start-ups is associated with higher net migration, which is in accordance with expectations.

The significant effect of opening culture houses vanishes once demographic characteristics have been entered in (5). The share of population below the age of 40 is positively associated with net migration, while the share of population with college or university education and the share living in urban settlements are both negative and insignificant. The indicators relating to the demographic composition are highly correlated, which explains why the situation changes to the opposite in (7) and (8).

Share of jobs in service industries is included in (6) to indicate whether the municipality is a tourist destination. This can also be considered as an indicator of urban amenities such as restaurants, cafes and bars. The coefficient is not significant and seems to have little effect on the other coefficients in the model.

(7) includes median income and income distribution in the population, which are both positive and significant, showing that having a population with high income are positively associated with net migration.

When house prices are introduced in (8), many of the coefficients change. Population size and unemployment are no longer significant. House prices are strongly correlated with population size, population share with college or university education, and median income. As not all municipalities are included in the statistics on house prices, the sample is limited to 2,565 in (8).

The effect of introducing the demographic variables and house prices illustrates the challenge of having highly correlated variables in the same model. Many of the variables reflect the same urban/rural scale, which makes for difficulties in disentangling the effects. In these situations, there is always a concern about the true relationship between the variables, and the ultimate concern about the extent to which control variables might be affected by the treatment of opening a culture house. However, as we have lagged the control variables by one year, the risk of this should be smaller.

**Table 3. Estimated effects of new culture houses on net migration, 2000-2014.**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| New culture house | 0.47*** | 0.26*** | -0.14* | -0.13* | -0.10 | -0.10 | -0.11 | -0.05 |
| | (0.09) | (0.09) | (0.08) | (0.07) | (0.08) | (0.08) | (0.08) | (0.07) |
| Established culture house | 0.31*** | 0.31*** | -0.05 | -0.05 | -0.03 | -0.02 | -0.02 | 0.01 |
| | (0.08) | (0.08) | (0.07) | (0.07) | (0.07) | (0.06) | (0.06) | (0.06) |
| Log of population $_{t-1}$ | | | 0.31*** | 0.24*** | 0.25*** | 0.25*** | 0.24*** | 0.00 |
| | | | (0.02) | (0.02) | (0.03) | (0.03) | (0.03) | (0.05) |
| Share unemployed $_{t-1}$ | | | | -0.21*** | -0.22*** | -0.22*** | -0.16*** | -0.03 |
| | | | | (0.03) | (0.03) | (0.03) | (0.03) | (0.06) |
| Share of new enterprises $_{t-1}$ | | | | 0.07*** | 0.06*** | 0.06*** | 0.05*** | 0.06*** |
| | | | | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) |
| Share of population below age 40 $_{t-1}$ | | | | | 0.03*** | 0.03*** | 0.01 | 0.01 |
| | | | | | (0.01) | (0.01) | (0.01) | (0.01) |
| Share of population with college or university education $_{t-1}$ | | | | | -0.01 | -0.01 | -0.02*** | -0.01* |
| | | | | | (0.01) | (0.01) | (0.01) | (0.01) |
| Share of population living in urban settlements $_{t-1}$ | | | | | -0.00 | -0.00 | -0.00** | -0.00** |
| | | | | | (0.00) | (0.00) | (0.00) | (0.00) |
| Share of jobs in service industries $_{t-1}$ | | | | | | -0.00 | -0.00 | 0.00 |
| | | | | | | (0.01) | (0.01) | (0.01) |
| Median income $_{t-1}$ | | | | | | | 0.00*** | 0.00** |
| | | | | | | | (0.00) | (0.00) |
| Income distribution $_{t-1}$ | | | | | | | 0.66* | 1.05** |
| | | | | | | | (0.39) | (0.42) |
| House prices $_{t-1}$ | | | | | | | | 0.00*** |
| | | | | | | | | (0.00) |
| Year and county dummies | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 6 420 | 6 420 | 5 992 | 5 905 | 5 482 | 5 482 | 5 481 | 2 565 |
| $R^2$ | 0.02 | 0.09 | 0.17 | 0.20 | 0.20 | 0.20 | 0.21 | 0.18 |

Note. Dependent variable: Net migration as percentage of population. Ordinary least squares estimates. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each municipality. Level of significance indicated by asterisks:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To investigate whether type of building is of significance, in table 4 we have included dummies for extraordinary architectural expression. In table 4, category 1 is called large 'wow factor', category 2 is called small 'wow factor', and category 3 (no 'wow factor') is used as a reference.

The results show that having a large 'wow factor' is positively associated with net migration, while the category of less ambitious 'wow factor' is negatively associated with net migration. None are, however, significant.

**Table 4. Estimated effects of new culture houses on net migration, 2000-2014.**

| | (1) | (2) | (3) | (4) | (5) | N |
|---|---|---|---|---|---|---|
| Culture house | 0.451*** | 0.259* | 0.056 | 0.084 | 0.084 | 52 |
| | (0.15) | (0.14) | (0.07) | (0.08) | (0.08) | |
| Large 'wow factor' | 0.157 | 0.120 | 0.057 | 0.053 | 0.061 | 23 |
| | (0.20) | (0.19) | (0.13) | (0.13) | (0.13) | |
| Small 'wow factor' | -0.185 | -0.225 | -0.190 | -0.168 | -0.139 | 8 |
| | (0.18) | (0.20) | (0.12) | (0.12) | (0.13) | |
| Year | No | Yes | Yes | Yes | Yes | |
| Residence and labour market region | No | No | Yes | Yes | Yes | |
| Region * time trends | No | No | No | Yes | Yes | |
| Region * quadratic time trends | No | No | No | No | Yes | |
| N | 6420 | 6420 | 6420 | 6420 | 6420 | |
| $R^2$ | 0.01 | 0.09 | 0.28 | 0.32 | 0.35 | |

Note. Dependent variable: Net migration as percentage of population. Ordinary least squares estimates. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each municipality. Level of significance indicated by asterisks: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Tables 2, 3 and 4 provide no information on the dynamics of the effect of the culture houses. Net migration can be expected to be a sluggish variable that responds slowly, and it might not be possible to trace an effect until some time has passed. The effect might also stabilise or vanish after some time has passed. It is also plausible that an ongoing project of building a culture house could contribute to increasing the attractiveness of the place for potential residents even before the house has opened. According to correspondence with a representative of the network of culture houses, it typically takes 5-6 years from when a project is launched until the house has opened.

To explore these dynamics, table 5 provides estimates with leads and lags of the year of opening. Indicator variables include dummies for year opened, 1-3 years before opening, 1-3 years after opening, four years after opening and onward. Granger causality testing means a check on whether past policy variables predicts outcome while future policy variables does not (Angrist & Pischke, 2009), conditional on region and year effects. The idea is to see whether causes happen before consequences, and not vice versa, in this case the opening of the culture house and the growth in migration.

**Table 5. Estimated effects of new culture houses on net migration, 2000-2014.**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| $Opening_{t-3}$ | 0.14 | 0.18* | -0.05 | -0.04 | -0.05 |
| | (0.12) | (0.11) | (0.09) | (0.09) | (0.09) |
| $Opening_{t-2}$ | 0.12 | 0.07 | -0.14* | -0.14* | -0.14* |
| | (0.11) | (0.09) | (0.07) | (0.08) | (0.08) |
| $Opening_{t-1}$ | 0.23* | 0.17 | -0.03 | -0.02 | -0.01 |
| | (0.13) | (0.12) | (0.10) | (0.10) | (0.11) |
| Year of opening | 0.41*** | 0.29*** | 0.08 | 0.10 | 0.12 |
| | (0.11) | (0.11) | (0.09) | (0.09) | (0.10) |
| $Opening_{t+1}$ | 0.38*** | 0.23** | 0.01 | 0.05 | 0.07 |
| | (0.09) | (0.10) | (0.08) | (0.09) | (0.09) |
| $Opening_{t+2}$ | 0.47*** | 0.29* | 0.05 | 0.07 | 0.11 |
| | (0.15) | (0.15) | (0.14) | (0.15) | (0.15) |
| $Opening_{t+3}$ | 0.49*** | 0.29** | 0.06 | 0.10 | 0.11 |
| | (0.14) | (0.13) | (0.12) | (0.12) | (0.12) |
| Four years after opening and onward | 0.53*** | 0.25** | 0.02 | 0.05 | 0.05 |
| | (0.11) | (0.11) | (0.07) | (0.06) | (0.06) |
| Year | No | Yes | Yes | Yes | Yes |
| Residence and labour market region | No | No | Yes | Yes | Yes |
| Region * time trends | No | No | No | Yes | Yes |
| Region * quadratic time trends | No | No | No | No | Yes |
| N | 6420 | 6420 | 6420 | 6420 | 6420 |
| $R^2$ | 0.01 | 0.09 | 0.28 | 0.32 | 0.35 |

Note. Dependent variable: Net migration as percentage of population. Ordinary least squares estimates. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each municipality. Level of significance indicated by asterisks:* p < 0.10, ** p < 0.05, *** p < 0.01.

The first column presents the regression with only leads and lags. The coefficients from one year before opening and all years after opening are significantly positive. As we have seen earlier, however, the picture changes when the control variables are included. Two years prior to the opening is significant at a ten percent level in (3)-(5). None of the other coefficients are significant, but the sign changes from negative in the years prior to opening to positive from the year of opening and onward.

Previous research has identified a spill-over effect of cultural services between neighbouring municipalities (Lundberg, 2006; Werck et al., 2008). Culture houses and their activities will also be available for residents in neighbouring municipalities, and it is plausible that this can influence the attractiveness of these municipalities as well. One way to investigate if municipalities bordering municipalities with culture houses have had higher net migration rates than municipalities not bordering municipalities with culture houses is to include them in the model by using dummies. Table 6 shows estimates in which controls of neighbouring municipalities are included.

**Table 6. Estimated effects of new culture houses on net migration, 2000-2014.**

| | (1) | (2) | (3) |
|---|---|---|---|
| Culture house | 0.082 | 0.087 | 0.095 |
| | (0.064) | (0.065) | (0.065) |
| Neighbour definition 1 | | 0.022 | |
| | | (0.056) | |
| Neighbour definition 2 | | | 0.051 |
| | | | (0.051) |
| Year | Yes | Yes | Yes |
| Residence and labour market region | Yes | Yes | Yes |
| Region * time trends | Yes | Yes | Yes |
| Region * quadratic time trends | Yes | Yes | Yes |
| N | 6420 | 6420 | 6420 |
| $R^2$ | 0.348 | 0.348 | 0.348 |

Note. Dependent variable: Net migration as percentage of population. Ordinary least squares estimates. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each municipality. Level of significance indicated by asterisks:* p < 0.10, ** p < 0.05, *** p < 0.01.

Column 2 includes municipalities with new culture houses and dummies for neighbouring municipalities connected by land. The treatment effect of culture houses is positive, but small and insignificant. Column 3 uses a different definition, which also includes borders at sea. This second group includes neighbouring municipalities across fjords and islands. All coefficients remain positive and insignificant.

Overall, the results suggest that the opening of the culture houses has not made the regions significantly more attractive for residents.

**7. Robustness tests[2]**

We have taken several additional precautions. The results are dominated by the large cities in the sample, in particular Oslo, Bergen, Trondheim, and Stavanger, and this remains a concern. These municipalities differ from the average municipality in many aspects, and their culture houses are also more specialised. Apart from Bergen, they are all professional concert halls or music venues, while the typical culture houses outside the largest cities are multifunctional houses with a cinema and perhaps the local library, culture school or sporting facilities. In an unreported analysis, we left out the four large cities of Oslo, Bergen, Trondheim, and Stavanger, but this did not change the overall results. It is therefore unlikely that these cities are distorting the results to a significant degree.

Another concern of our main empirical method could be that the regional fixed effects are unable to take account of the municipalities within the regions having different trends. Even though the alternative specification in model 3 should control for this, we have also used municipality fixed effects, municipality time trends and county by year dummies, and furthermore we have tested for spill-over effects, architectural expression etc. In general, the results were similar to those using regional fixed effects and time tends, but with more variation in the outcomes. This can probably be ascribed to smaller units providing more 'statistical noise'.

[2] All the robustness tests and additional analyses mentioned in this section can be obtained, upon request, from the authors.

As a robustness test, in an unreported analysis we used propensity score matching, which can be an alternative when the assignment to treatment is not randomised. Based on the same background variables as used in table 3, the matching process identified municipalities with the same characteristics as the municipalities in the treatment group. The expectation is that the remaining differences between the groups can be attributed to the treatment of opening a culture house. However, this did not produce any significant results or information that shed a different light on the main analysis.

A dataset with individual migration was also applied. Modelling in- and out-migration gave very similar results, which is in line with the conclusion that there seems to be very little effect of opening a culture house. The results showed a pattern of high in-migration to the treatment municipalities, but also high out-migration. These models were not preferred, however, because it was more challenging to control for the differences in municipalities and trends.

The main concern using a DiD approach is of unobserved events systematically affecting either the treatment or the comparison group. The establishment of larger institutions (e.g. universities) or infrastructure projects (e.g. a new railway or bridge) could have a significant impact on the migration trend. But for these events to have an impact on the results, they must systematically affect the treatment and control group differently. We have no reason to believe that there are events that have systematically affected the groups differently. One major event deserving of discussion is the immigration wave Norway experienced following EU enlargements in 2004 and 2007. It is unlikely that this would have systematically affected municipalities with or without new culture houses, but it would seem that immigration has had a different and more uniform geographical pattern than the strongly centralised domestic migration pattern. Therefore, in an unreported analysis we used net domestic migration as dependent variable. The results are in general very similar to the results when using total net migration as dependent variable in tables 2 and 3. We cannot rule out that opening culture houses has had an effect on attracting certain population groups, such as immigrants, younger and/or with a level of higher education, but the results clearly show that there is no significant effect on net migration.

An additional concern is that migration to a municipality can be restricted due to lack of housing, and that the municipality is unable to respond to the increased demand in the short term. As an alternative, we have tested the effect of opening culture houses on average house prices measured per square metre of detached houses, given that we can assume increased demand will have a positive effect on house prices. The results in table 3 also indicate that house prices have strong explanation power. House pricing is a commonly used indicator of attractiveness. However, the results when testing this were ambiguous. The effect was significantly positive when controlling for region and trends, but not significant when using coefficients similar to model 3. The data on housing prices have some important limitations: we only have house price data from 2002 and we do not have data on house prices in all municipalities and for all years, especially in smaller municipalities.

**8. Implications for planning and cultural policy**

There are many case studies addressing the economic growth effects of culture, but few studies have taken applied a quantitative empirical setup using panel data that allows to test for causal effects. In this article we have studied the causal effects, which makes it a novel contribution to the discourse.

The results show that there is a positive correlation between culture houses and net migration, but no causal treatment effect of opening a culture house was identified. The culture houses were opened in municipalities where net migration was already increasing. Opening a culture house does not lead to the group of municipalities breaking out of the pre-existing trend.

Is it possible that culture houses might have an effect over a longer time period than the one we have measured? Perhaps it will be possible to see an effect after 15 or 20 years? As a test of this, we have included 52 municipalities that have culture houses built prior to 2001. The results show that these municipalities do not have a higher level of net migration than other municipalities. This means that the initial effect has vanished or was never there.

It cannot be ruled out that the earliest projects might have had an effect. The first culture houses to be opened might have had an advantage, but when there are already 100 culture houses then the effect of opening the 101st can be expected to be small. The competition between communities to attract residents is a zero-sum game, and this type of contest could lead to culture houses becoming increasingly spectacular in an attempt to draw attention, as suggested by Bille (2013) and Grodach (2010).

In addition, perhaps only the largest and most spectacular buildings might be expected to have an effect. To test this, we included characteristics of the building. We received help from an architect in specifying the culture houses that seem to have had an ambition of being a venue with a 'wow factor'. However, having an extraordinary architectural expression is not significantly associated with net migration.

Even though we find no effects on migration, the culture houses can bring many positive contributions and benefits to the community. Designed to host professional performing arts events, they make these cultural goods accessible to a wider audience, also outside the big cities. They create new and perhaps needed meeting place. These are important measures, not related to economic development but to the wellbeing and quality of life of the population.

It is important to remember that from an economic theoretical perspective, there is consensus in the literature that the arguments for public support to cultural activities must be based on market failures and non-market benefits such as consumer externalities linked to the welfare and wellbeing of the population (Frey & Pommerehne, 1989; Throsby, 2001). Therefore, the positive effects of arts and culture on economic development have long been subject to criticism in the academic literature for essentially being a form of misguided political rhetoric (Campbell et al., 2017; Henningsen et al., 2015). If economic development is the main argument, this may lead to 'wrong' investments in the sense that public support to other cultural activities may lead to a higher social value and welfare. New cultural buildings displacing and disrupting 'local' cultural activities could decrease the social value, also noted by Evans and Foord (1999) and Evans (2005). Woronkowicz et al. (2012) and Woronkowicz (2013) further argue that investment in new cultural facilities has exceeded the demand for these facilities.

The findings in this article provide important information for local policy makers in municipalities and regions, not only in Norway, but in other countries using culture houses as a means of migration and economic growth. While a few examples, such as Bilbao, may stand out, the positive effects on net migration cannot be generalised and are certainly not typical.

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## Appendix

**Descriptive statistics**

| | | Year | Min | Mean | Max | SD |
|---|---|---|---|---|---|---|
| Population | Treated | 2000 | 2 567.00 | 37 567.31 | 507 467.00 | 77 977.32 |
| | | 2014 | 2 361.00 | 44 351.83 | 634 463.00 | 96 708.26 |
| | Comparison | 2000 | 256.00 | 6 715.42 | 59 145.00 | 8 220.49 |
| | | 2014 | 211.00 | 7 454.15 | 71 900.00 | 9 904.79 |
| Net migration as percentage of population | Treated | 2000 | -1.34 | 0.15 | 3.89 | 0.83 |
| | | 2014 | -0.64 | 0.70 | 2.15 | 0.58 |
| | Comparison | 2000 | -7.81 | 0.03 | 3.69 | 1.19 |
| | | 2014 | -4.82 | 0.34 | 3.24 | 1.06 |
| Share of population living in urban settlements | Treated | 2000 | 23.35 | 70.16 | 99.39 | 22.96 |
| | | 2014 | 29.84 | 74.59 | 99.14 | 20.09 |
| | Comparison | 2000 | 0.00 | 45.00 | 98.10 | 26.93 |
| | | 2014 | 0.00 | 50.20 | 98.77 | 26.80 |
| Share of population with college or university education | Treated | 2000 | 11.68 | 21.46 | 45.10 | 7.36 |
| | | 2014 | 19.78 | 30.44 | 55.10 | 8.53 |
| | Comparison | 2000 | 7.51 | 16.27 | 34.34 | 4.40 |
| | | 2014 | 13.53 | 24.30 | 45.26 | 5.24 |
| Share of population below age 40 | Treated | 2000 | 48.21 | 54.19 | 59.94 | 3.01 |
| | | 2014 | 42.95 | 49.60 | 58.49 | 3.41 |
| | Comparison | 2000 | 30.37 | 52.34 | 66.52 | 4.37 |
| | | 2014 | 34.71 | 46.73 | 60.61 | 4.84 |
| Jobs as percentage of working-age population | Treated | 2000 | 29.48 | 66.12 | 107.86 | 12.97 |
| | | 2014 | 33.74 | 66.86 | 92.79 | 13.47 |
| | Comparison | 2000 | 20.52 | 57.23 | 118.66 | 12.54 |
| | | 2014 | 23.87 | 56.99 | 136.52 | 13.32 |
| Employment as percentage of working-age population | Treated | 2000 | 61.55 | 69.96 | 76.83 | 3.45 |
| | | 2014 | 62.51 | 69.43 | 75.54 | 3.44 |
| | Comparison | 2000 | 54.87 | 69.09 | 139.06 | 5.93 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 2014 | 56.32 | 68.40 | 81.25 | 4.54 |
| Share of working-age population unemployed | Treated | 2000 | 0.81 | 1.86 | 3.11 | 0.57 |
| | | 2014 | 0.47 | 1.81 | 2.92 | 0.59 |
| | Comparison | 2000 | 0.31 | 1.86 | 7.49 | 0.93 |
| | | 2014 | 0.33 | 1.71 | 4.78 | 0.67 |
| Share of new enterprises (new/existing enterprises) | Treated | 2000 | 5.70 | 11.85 | 21.30 | 3.99 |
| | | 2014 | 3.03 | 6.57 | 9.26 | 1.47 |
| | Comparison | 2000 | 2.35 | 8.54 | 18.79 | 2.86 |
| | | 2014 | 1.61 | 5.46 | 10.83 | 1.62 |
| Number of jobs in service industries as percentage of population | Treated | 2000 | 2.32 | 7.50 | 11.51 | 2.26 |
| | | 2014 | 3.31 | 7.73 | 12.92 | 2.16 |
| | Comparison | 2000 | 1.05 | 5.25 | 19.84 | 2.75 |
| | | 2014 | 1.10 | 5.56 | 16.54 | 2.68 |
| | | | | | | |
| Median income | Treated | 2000 | 159 300.00 | 196 288.50 | 256 900.00 | 23 625.62 |
| | | 2014 | 303 700.00 | 359 046.20 | 436 400.00 | 28 840.72 |
| | Comparison | 2000 | 135 300.00 | 182 283.20 | 245 100.00 | 19 776.15 |
| | | 2014 | 269 700.00 | 340 786.90 | 433 700.00 | 27 566.07 |
| Income distribution (mean/median income) | Treated | 2000 | 1.05 | 1.15 | 1.37 | 0.07 |
| | | 2014 | 1.05 | 1.13 | 1.31 | 0.06 |
| | Comparison | 2000 | 1.00 | 1.13 | 1.85 | 0.07 |
| | | 2014 | 1.01 | 1.12 | 1.36 | 0.04 |
| Average house prices per $m^2$ | Treated | 2000 | 5 211.00 | 10 547.74 | 20 687.00 | 3 855.94 |
| | | 2014 | 9 860.00 | 19 364.12 | 42 606.00 | 7 679.02 |
| | Comparison | 2000 | 4 139.00 | 9 104.28 | 17 411.00 | 2 453.60 |
| | | 2014 | 7 006.00 | 15 996.32 | 32 422.00 | 5 223.92 |