Why does not a professional sport team impact local economy, or does it?
An explanation and extension from earlier studies in Sweden
Abstract

Subsidies to professional sports teams remain a controversial issue, and in most European countries these subsidies have decreased over the past decades. However, in Sweden they are a common occurrence, municipalities are giving generous amounts of money to their local team. To justify these subsidies, proponents of sports team claim their great economic impact on the local area. Nevertheless, in the sport economic literature, most of the researchers cannot find any positive impact and some of them even find negative impact from a hosting a professional sports team. This study will give an explanation and extension to the earlier articles about sport economics written in Sweden by Emelie Värja (2014) and Lars Behrenz (2009). In this essay we will present two models. The idea behind our first model is to investigate if professional sport events should be considered as a substitute to other leisure activities. This model indicates that there is a substitution effect between ice hockey games and cinema admissions in Sweden. The outcome from our other model which studies the condominium market strongly contradicts the generous sport subsidies given by Swedish municipalities. The results indicate that the presence of a professional ice hockey team lowers the condominiums prices.

“All I remember about my wedding day in 1967 is that the Cubs lost a double-header.”

Quote from news columnist and supporter George Will remembering his favorite baseball team Chicago Cubs which lose two games in one day 1967 - Quoted in The Economist of Sports (Leeds and von Allmen, 2001)

Keywords

Acknowledgements

First, we would like to address our gratitude to our supervisor Associate Professor Lars Behrenz for his guidance throughout this work. It has been a pleasure to have a true expert in the topic of sport economics to support us.

Also thank you to Abdulaziz Abrar Reshid, Phd Student at the Department of Economics and Statistics, who has been a great support during our whole year here at the Linnaeus University.

We would also like to thank Emelie Värja at Örebro University who through her article developed the research area of sport economics and inspired us to do our study about sport in Sweden.

Thank you Heba Issa and Marie Dumoulin, our discussant, for their advices.

And last but not least we would like to express our gratefulness to Professor Dominique Anxo for his wise comments and quick correspondence to our questions.
Contents

1 Introduction ........................................................................................................... 4

2 Historical evolution .............................................................................................. 6

3 Literature review ................................................................................................. 9

4 Theoretical framework ......................................................................................... 14

5 Data .................................................................................................................... 15
   5.1 Substitution between leisure activities ......................................................... 15
   5.2 The willingness to pay for sport through the condominium market ............ 17

6 Methodology ......................................................................................................... 18
   6.1 Substitution between leisure activities ......................................................... 19
   6.2 The willingness to pay for sport through the condominium market ............ 21

7 Empirical considerations ...................................................................................... 22

8 Results ................................................................................................................. 23
   8.1 Substitution between leisure activities ......................................................... 23
   8.2 The willingness to pay for sport through the condominium market ............ 24

9 Discussion ............................................................................................................ 25

10 Conclusion .......................................................................................................... 27

11 Reference list ..................................................................................................... 29

12 Appendix ............................................................................................................. 34
1 Introduction
Promoters for professional sports teams often talk about their team’s great impact on the local areas economy. They claim that sports teams provide huge tax revenues, contribute to economic growth or attract people to move to the municipality. Art Modell, former businessman and owner of the American football teams Baltimore Ravens and Cleveland Browns often made controversial statements in which he highlighted the significant economic impact that his teams had on the surroundings. In an interview Art once stated:

“The pride and the presence of a professional football team is far more important than 30 libraries” Quoted in The Economist of Sports (Leeds and von Allmen, 2001).

However, over the past decades the majority of the researchers have disputed the fact that professional sports teams have a positive economic impact on the local area. Most of the researches in the interesting area of sport economics use data from the US. However, sport in the US has to be considered as very different to sport in Sweden, these differences will be discussed more in the historical evolution. Studies about sport economics in Sweden are rare. Our study has its starting point from the two eminent articles about sports economics in Sweden. The first one was done by Emelie Värja at Örebro University in 2014 and the second by Lars Behrenz at Linnaeus University in 2009. Our objective is to go beyond these two works to give a new and developed view about the topic.

Although Värja did a lot of improvements in comparison with earlier studies she did not find any positive impact on the local area from hosting a professional sports team (Värja, 2014). As mentioned earlier Värja is not the only one to find this kind of result, many other researchers have drawn the same conclusion. However, one exception is Behrenz who claims that sport should be considered as a common good, and that it exists a willingness to pay for living in a municipality with a professional sports team (Behrenz, 2009).

In this essay we investigate the reason why most of the earlier studies do not find any positive impacts on the local economy from hosting a professional sports team. We will present two models which content data from twelve Swedish municipalities. Six of these municipalities host a professional ice hockey team and the six other municipalities host neither a professional ice
hockey team nor a professional soccer team\textsuperscript{1}. The first of these models concerns the substitution effect between sport and other leisure activities. The substitution effect is a common explanation given by authors to justify why they could not find positive results of sport’s economic impact (Baade, 1990, Coates and Humphreys, 2003a) even though sports teams in the US have turnovers of millions of dollars. If sport should be classified as a substitute to other leisure activities this could be an answer why Värja could not find positive results.

To investigate the substitution between sport and other leisure activities, we have studied the number of cinema tickets sold in our sample municipalities during the playoff in the Swedish ice hockey league (SHL) with a Difference-in-Difference (DiD) methodology. Although many researchers assume that sport could be a substitute to other leisure activities, no proper studies was done about it until Sanchez et al. (2016) investigated this in a recent article. Sanchez et al. investigated international football tournaments impact on the cinema box office revenue in Belgium, UK, Finland and Spain, and also did a robustness check with the US. We have been inspired by this article, although our work differs in several ways. First, we increased the number of investigated areas and tournaments. Second, in this essay the research is taken down to a country level where a sample of Swedish municipalities have been investigated. This makes the results less sensitive to biases from domestic differences across countries. Third, in the article by Sanchez et al. only the nonmonetary cost is considered due to the fact that they have looked upon international tournaments which took place in different countries than the investigated ones. Therefore, the decrease in cinema box office revenue is mostly caused by the fact that people are watching the games on TV. In this essay, we investigate both monetary and nonmonetary cost. The fact that professional sport in Sweden differs to professional sport in Europe and the US also make this essay interesting.

For our second model we have been inspired by Behrenz (2009) to investigate sport as a public good. This by measuring the willingness to pay for living in an area with a professional sports team. In line with Carlino and Coulson (2004), we believe that if there exists a willingness to pay for living in a municipality with a professional sports team, it could be captured by studying the difference in the property values in the municipalities with and without a professional sports

\textsuperscript{1} Due the fact that the attendance to women’s sport games is lower compare to men’s sport, we do not take the females team into consideration
team. Moreover, the earlier mentioned differences in the sport environment between the US and Sweden make our model different.

One term which comes up several times in previous studies is the notion of opportunity cost. All municipalities have a limited amount of financial resources and the politicians have a great responsibility to spend the taxpayers’ money on the right purpose. When the municipality spend money on sport subsidies there is an opportunity cost to not spend this money on schools, infrastructure, health care etc. Negative effects could arise due to the crowding-out of other, more productive, public expenditures (Baade, 1994; Coates and Humphreys, 2003b). One example of this is the municipality of Leksand which gave subsidies for over 30 million SEK and during the same year closed a school (Lagnelius, 2012). Our model about the condominium market measure the willingness to pay for living in a sport municipality. In Sweden, where the sport subsidies are high, the condominiums prices could be a sign of opportunity cost. Perhaps the condominium prices would have been higher if the sport subsidies would have been spent on education instead.

In order to understand the importance of sports economics and why Sweden is an interesting country to investigate, we will present the historical evolution of sports in the next section. There we will also be a discussion about the differences in the sport environment between Sweden and some European countries and the US. In the third section we will discuss the earlier studies about sport economics in a literature review. In section four we will present the theoretical framework. Sections five and six include the data and the methodology used in this essay. Further, in the sections seven and eight we will present and discuss our results. Finally we conclude in section nine.

2 Historical evolution
Many people’s health and happiness have been impacting by sport for as long as people remember. The games in Olympia which are the precursor for the Olympic Games were first held 774 BC (Sandy et al., 2004). However, the commercialization of sport as we know it today with wide broadcasts, big arenas and international sport stars, started in the 1950’s. Today the sports sector overall accounts for 2% of the EU global GDP, and the total employment generated by sports activities represent 3.5% of the total EU employment (European Commission, 2014). The revenues for sport events worldwide had a value of $80 billion in
2014, and are growing rapidly. Between 2009 and 2013 the sports market grown faster than GDP in most countries around the world, including major markets like US and UK, with an average growth of 7% annually (Collignon and Sultan, 2014). So the greatness of sport cannot be ignored. However as mentioned before, many researchers are not certain about the economic impact from hosting a professional sports team. In fact, most of them are skeptical about the subsidies that the municipalities give to their local sports team.

The subsidies to professional sports teams have proliferated in both Europe and the US post Second World War. Proponents of sport subsidies praised the tangible economic benefits of a sports team on the economy such as new jobs, increase in local income and tax revenues. However, already in the 1950’s economists started to investigate the economic impact of sport stadiums (Huang and Humphreys, 2014). Due to the fact that researchers could not find any positive economic impact, the sport subsidies have decreased in Europe since the 1970’s (Andreff and Staudohar, 2000). Although sport subsidies are decreasing in most countries in Europe, this is not the case in Sweden. In fact, they are even increasing (Värja, 2014). Today in the US there is a discussion about sport subsidies (Povich, 2015). The US took one step closer to lower the sport subsidies when president Obama presented the budget for 2016. In the *General Explanations of the 2016 Revenue Proposals* they explain following:

“Allowing tax-exempt governmental bond financing of stadiums transfers the benefits of tax-exempt financing to private professional sports teams because these private parties benefit from significant use of the facilities”

The fact that the amount of sport subsidies is going in the reverse direction in Sweden compare to the rest of Europe makes a study about the country interesting. A country which gives generous subsidies to some of the actors on the market, in this case professional sports teams, should of course be investigated. The municipalities’ financial assets are limited and should be placed where they lead to the highest utility.

Alan Tomlinson et al. (2011) have in their book “*Sport and the Transformation of modern Europe*” written about sport in an international perspective. The authors argue that the major sports teams today could rather be considered as business firms than sports teams like we knew them a couple of decades ago. It is alike in most countries around the world, especially in the
US and in some European countries like UK and Spain which have been investigated by Sanchez et al. (2016). The professional teams in these countries have huge turnovers and most of them are run by businessmen who own the club in economic purpose (Tomlinson, et al., 2011). In Table 1 the turnovers from the two best teams of the 2014-2015 season in the Spanish and English soccer leagues are presented together with the revenue from the winners of the East and West Ice Hockey conferences in the US 2014-2015. And to see the differences in financial capacity also 2015 SHL champions Skellefteå AIK and Swedish Soccer champions IFK Norrköping are included.

Table 1 Turnovers in millions of Euro

<table>
<thead>
<tr>
<th>Sports Team</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Madrid</td>
<td>577,1</td>
</tr>
<tr>
<td>Barcelona</td>
<td>560.8</td>
</tr>
<tr>
<td>Manchester City</td>
<td>463.5</td>
</tr>
<tr>
<td>Chelsea</td>
<td>420.2</td>
</tr>
<tr>
<td>Chicago Blackhawks</td>
<td>162.6</td>
</tr>
<tr>
<td>Tampa Bay Lightning</td>
<td>108.0</td>
</tr>
<tr>
<td>Skellefteå AIK</td>
<td>15.7</td>
</tr>
<tr>
<td>IFK Norrköping</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Source: Doloitte (2016), Statista (2016), Forbes (2016) and own calculations with the exchange rate from Valuta.se (2016).

As we can see in Table 1, the turnovers of Swedish teams are significantly smaller than the European teams. However, they have been through a big change and have remarkably increased their turnovers during the last decades. During the 1990s the Swedish sports teams, especially in the two biggest sports ice hockey and soccer, went through a time of commercialization. Due to the team’s growth the Swedish sport association made a new rule to protect the sports team from private investors called 51% regeln, the 51% rule. The rule makes it impossible for private owners to take full control of a sports team. At least 51% of the votes must be hold by the members of the sports team. For more information about the 51% rule, see Föreningsdemokrati (2014). This rule makes economic support from municipalities even more important for the Swedish sports teams. In most of the European leagues and in the US where private investors own many of the biggest teams, the clubs are more independent from community financial support. But the Swedish teams have to face another reality and cannot rely on a rich owner in times of trouble or when a bigger stadium is requested. Two teams that have had great success in the SHL during the last years are Skellefteå AIK and Växjö Lakers. According to an
investigation from the Swedish newspaper Aftonbladet, these teams also happen to be the ones that have had the biggest support from their municipality (Käck and Andersson, 2015).

Faced with the tax bill for hosting a professional sports team, the taxpayers, at least those who are not fans, can ask why they are forced to pay for these sport teams when most of the locals do not attend to any of the games. There are no professional teams in the highest Swedish league in ice hockey or soccer that have financed their own stadium all by themselves. Most of the stadiums are built with money from the municipality. Building a stadium is expensive, the biggest of the Swedish Stadiums, Friends Arena in Solna, costed around 2.8 billion SEK (Swedish krona). The arena is not doing well economically and the owners have lost over 200 million SEK annually since the construction (Skött, 2016). There are not just the biggest clubs that have stadiums with thousands of seats built with money from municipalities. For example, Öster IF, a soccer team in Växjö which plays in the third Swedish division, play their home games at a stadium built in 2012 with a total construction cost of about 200 million SEK. Öster IF is a former big team but not anymore and last year they played with an average audience less than 2 000 people (Ernstsson, 2015).

A quote that we started to think about while studying this topic is “Build it and they will come”, the mantra for Kevin Costner character in the movie “Fields of Dreams”. It seems to have been adopted by Swedish municipalities with big stadiums built all across Sweden. New stadiums are built despite the lack of significant proof that it will contribute economically to the society. While municipalities build new stadiums or help their local team financially at the same time as schools are closed one could ask himself “what is actually the municipality’s mission?”.

3 Literature review
This essay is about sport’s impact on the local economy in Sweden. However, the literature review also includes studies from the US due to the fact that most of the studies in this area are written there. Even though the US articles do not discuss sports economics in Sweden they are important and relevant to understand the topic of sport economics.

One of the well-known researchers in the area of sport economics is Robert Baade who wrote articles especially during the 1990s which still have an impact on the today’s research. Although Baade’s articles are still relevant, they should be questioned in comparison with the more recent
studies like Värja (2014). The models today are often more accurate, include more variables and data. However, his studies are like a base for the today’s work and should be included in the literature review. In 1990 Baade published an article in where he studied nine metropolitan areas in the US with stadiums which had been built or renovated recently. Baade investigated if these new stadiums had an impact on personal income and/or the development of the local area relative to the regions. The result is not significant about the impact from these stadiums on personal income, and further he argues that they possibly had a negative impact on the local development.

In another article named *Professional sports as catalysts for metropolitan economic development* published in 1996 Baade included employment to see if professional sports team could create jobs and increase the income. Baade discussed subsidies and claims that if the employment and incomes are higher in sport cities it could justify the huge amount of money the municipalities have been giving to their local team. However, also in this article the author is skeptical to the economic impact from hosting a professional sports team and the subsidies. The conclusion is that the subsidies do not increase the income or the employment rate in the local area. The beneficiaries of the subsidies are the owners and the players, not the taxpayers (Baade, 1996). In 2003 Baade published an article where he discussed the difference in the amount of subsidies between the US and Europe. He investigates cities in the US with recently build stadiums that have been receiving subsidies from their city. Once again he is critical toward the sport subsidies. Baade argues that in Europe the governments do not longer pay subsidies because people think that the money could be spent on better sectors of the economy, and there should be a discussion about it in the US.

Except Baade, two writers that have to be included in a literature review in this topic are Dennis Coates and Brad Humphreys. In 1999 these authors published an article about how professional sports teams affect the per capita income growth. The authors extend the research done by Baade in several ways. They increase the number of metropolitan areas and correct potential econometric problems. The conclusion is that a professional sports team do not have any positive influence on the per capita income in the metropolitan area. Actually the authors argue that some professional sports teams reduce the level of per capita income. A possible explanation given by the authors is that the local government’s sport subsidies could reduce other possible investments in other sectors, like education, health care, local infrastructure etc.
Spor\
Economics in Sweden

Kalmar Växjö

(11) Coates and Humphreys (1999). The subsidies to professional sports teams have been investigated by Whapels (2006). In a survey, he asked a sample of economists what their opinion is about sport subsidies. It turned out that almost all of the economists have the same opinion, they agree that subsidies to professional sports teams should be eliminated.

In 2003, Coates and Humphreys focused on the effects that the sports teams have on workers’ wage and employment in the services and retail sectors (restaurants, hotels, sports and recreation etc.). The approach differs from previous research which focused on aggregate measures of income. Since it could not be captured, the authors investigated just the service and retail sectors instead. They found a small positive effect on earnings in the recreation sector which is closely linked to the sports environment. However, this positive effect is canceled out by a decrease in both earnings and employment in other sectors of the economy. Furthermore, they found that direct spending on sport does not lead to additional earnings in other sectors of the economy like restaurant, bars and hotels. They conclude that spending on sports and on other related areas seem to be substitute to each other, but no research has been done about it (Coates and Humphreys, 2003a). Furthermore, Coates and Humphreys (2008) summarize the results of all the literature on sport impact on the local economy. They find that almost all researchers are unanimous in the conclusion that sports stadiums and professional sports teams do not have any positive impact on income, tax revenues or employment.

Although improvements have been done to the models, authors in the US often find the same results, namely, no or negative effect from hosting a professional sports team. But among the few Swedish articles there is one article that has a slightly different approach, the article is written by Lars Behrenz (2009). Behrenz states that his work was made to start a scientific discussion about which economic impact professional sports have on both the public sector and the society of Sweden. The author mentions many ways to measure the impact of sport. A comparison was made about the population growth which was slightly higher in the cities with a professional sports team than the four cities which did not have any professional sports team. However, this seems mainly to be shown if professional sport has been established in the municipality for a long time. And the author himself makes it clear that it is not easy to identify the impact from professional sports. There are many other things going on in a municipality that affect population trends, which mean one should be careful with the interpretations. Further an interesting survey was done to see if people in four Swedish municipalities valued to live in
an area with an elite team nearby. The survey indicates that sport should be considered as a public good, people have a willingness to pay in order to live in an area with a professional sports team (Behrenz, 2009). If there exists a willingness to pay for living in a municipality with a professional sports team it could be seen like a magnet that attracts people to the municipality.

The other research that have been contributing to the research area of sports economics in Sweden was done by Emelie Värja (2014). In Värja’s introduction she refers to some of the earlier literature, and mention for example Coats and Humphreys (1999), and argues that they have been using “Simple models with few other explanatory variables then sport environment variables, estimated on a selection of local areas, and with just one dependent variable”. This could be seen as harsh but Värja has strong and good arguments. Her model concludes an advanced matrix with spatial panel-data for the Swedish municipalities and she used considerably more explanatory variables than usually used in regional-growth modeling literature. Värja’s article is the first in its kind to investigate whether the local labor supply market is effected through net migration, further she also studied the effects on per capita income. In spite of the improvements and the fact that she included all municipalities that have had an ice hockey and/or soccer team in the premium league Värja did not find any positive effects from hosting a professional sports team.

As mentioned earlier we will present two models in this essay. For the first model we have been inspired by the article from Sanchez et al. (2016). And for our second model we have been influenced by the discussion about the impact of professional sport on the property value. Particularly by studying the articles by Carlino and Coulson (2004), Coates et al. (2006), Huang and Humphreys (2014) and Agha and Coates (2015).

Sanchez et al. (2016) have in their article contributed with something new by taking a step further than earlier studies in the topic of sport economics. While many other researchers have mentioned it, Sanchez et al. made a model to measure the substitution effect between sport and other leisure activities. By studying what happened with the cinema box office revenues during the two biggest soccer tournaments in the world, the European Football Championship and the FIFA Football World Cup. These soccer tournaments that take place every four year provided an opportunity for the authors to do a quasi-natural experiment to see the trade-off between the
leisure activities with a Difference-in-Difference methodology. To investigate if there is a substitution or not between the leisure activities they use a four-country data set. They study a period of time from 2008 to 2012 during which three big sports events took place. The result is that these events lead to a huge decrease in cinema box office revenues indicating that mega sport events are substitute to cinema.

Since the beginning of the 21st century researchers have been investigating how the housing market is impacted from hosting a professional sports team. The first article of this kind was done by Carlino and Coulson (2004). The authors look on professional sports as a no excludable public good. People can obtain benefits from having a sports team without going to the games. And the authors try to measure those benefits by using the compensating differentials. People show their willingness to pay directly through the purchase of season ticket, but maybe also indirectly by paying a higher rent or accepting a lower wage while living in a sport city. The hypothesis is that people in cities with an NFL team have higher quality of life and therefore the rents are higher in those cities. The result shows that the presence of an NFL team increases the annual rents by 8% in the central cities but the increase is less important in expanded geographic areas. The fact that professional sports teams could be associated with higher quality of life could justify the subsidies that cities give to their team with hope that their success will get people to move to the city.

Coates et al. (2006) have given criticisms to the article by Carlino and Coulson (2004). They re-estimated the model by using alternative specifications and argue that the results of Carlino and Coulson are not robust after these changes. Coates et al. argue that the presence of a NFL team does not appear to have a positive impact on the rents. Rather the effect on the rents seems on its best to be non-existent, and may in fact reduce the rents. Coates et al. are very critical and argue that the misleading results from Carlino and Coulson have led to an increase of the sport subsidies.

Unlike earlier articles Agha and Coates (2015) studied sport at a lower level and focused on the Minor Baseball Leagues. Coates have earlier been criticizing the results from Carlino and Coulson (2004), but in this work from 2015 he and Agah investigated the impact on the rents from hosting a team in the Minor Baseball League. Just like in many other leagues almost all of the stadiums that was built during the studied time were 100% publicly financed. However, a difference from the Major Baseball League is the size of the stadiums, and of course also the
construction cost. However, there can be substantial for the smaller communities. This leads to the result that the cities with a total population less than 0.4 million inhabitants were associated with a negative effect on the rents from building a new stadium. Nevertheless, the bigger cities with a population between 0.4 million to 1.4 million inhabitants were associated with a 6–8% increase in the rents. Maybe it is better economically for a US middle size city to host a minor sports team than a major. The minor league does not have the same glamour and media attention, however they seem to provide with civic pride enough for the inhabitants to be willing to pay higher rents.

4 Theoretical framework
To get a better understanding about the results of our study, we will here present the theory about substitution between two leisure activities. This section explains the economic effect of a substitution between two leisure activities and how watching sport on TV could be a non-monetary cost.

As mentioned in the literature review a possible explanation for the negative results found in the earlier studies is the fact that sports could be a substitute to other leisure activities. The time allocation between leisure and work has been studied by economists like Becker (1965) and Lancaster (1966). To be able to spend time on leisure activities people have to earn money by spending time working. The hours of work and leisure are selected in order to reach the maximizing time allocation point where an individual’s utility is equal to a budget constraint. Except the time individuals spend on working, they spend time on sleeping and eating which limits the time to spend on leisure activities. Considering this, people could in some occasions have a lack of time to enjoy all the leisure activities that they would like (Borjas, 2012). Leisure services are usually normal goods. A substitution between two leisure activities means that an increase in the cost of one activity will lead to an increase in the demand for the other activity, ceteris paribus. This cost can be monetary, for example an increase in the cinema tickets prices. Our essay also gives an example of a nonmonetary cost. During the playoff people have different ways to follow the event. They can watch it on TV, listen to it on the radio or follow on the internet. This media channels are considered as free in comparison of going to the game. So instead of going to the restaurant, the theater or the cinema, people could attend to sport games which then is a monetary cost, or stay at home and watch TV a nonmonetary cost. In this

---

2 Every game in the SHL are broadcasted on TV.
essay we consider both the monetary and nonmonetary cost. When people decide to watch the
game at home instead of going to the arena or going to the cinema, there are no benefits for the
local economy. If a substitution effect is found between sport and other leisure activities in
Sweden it would be negative for the municipalities that give these generous subsidies.

5 Data

5.1 Substitution between leisure activities

The aim of our first regression is to analyze how monthly cinema admissions are affected by
the annual ice hockey playoff in Sweden. If cinema admissions decrease significantly during
this period, there is a substitution effect between the two leisure activities. The eight teams that
are placed highest in the SHL qualify for the playoff that is played in March and April. This
gives us the opportunity to make a quasi-natural experiment to see the trade-off between these
leisure activities with a DiD methodology. During the playoff the teams play games more often,
the games are more important and have a higher number of audience. Therefore, we are able to
investigate the presence of a substitution between ice hockey and cinema admissions during
this period of time. We used data from twelve Swedish municipalities, six of these
municipalities host a professional ice hockey team which has been in the playoff at least six out
of seven years during the period from 2009-2015. The six other municipalities host neither a
professional ice hockey team nor a professional soccer team\(^3\). We chose municipalities which
have approximately the same characteristics, for example in population size and average age
(Table 2). It is not easy to find high populated municipalities without a sport team in the highest
leagues in neither ice hockey nor soccer. However, we found twelve municipalities which made
up a good sample without using for example teams from the million people town Stockholm
which would make the interpretations difficult. Moreover, the municipalities do not differ much
in the average age, unlike extreme outliers like Överkalix (49.4) or Knivsta (36.7). We also
took into consideration to have municipalities which are located both in the north and in the
south. This is one of the reasons why we chose to take ice hockey teams and not soccer teams,
the Swedish hockey teams are more spread out in the country than the soccer teams.

\(^3\) Umeå’s team, IF Björklöven, have been in the second highest league for three of the investigated years. However, the size of their games cannot be considered as big as the games in the playoff. None of the municipalities have had a team in the two highest leagues of men’s soccer during these years.
Table 2 Population and average age in the municipalities in 2014

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Municipality</th>
<th>Average age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linköping*</td>
<td>151 881</td>
<td>Skellefteå*</td>
<td>43,2</td>
</tr>
<tr>
<td>Jönköping*</td>
<td>132 140</td>
<td>Kristianstad</td>
<td>41,9</td>
</tr>
<tr>
<td>Umeå</td>
<td>119 613</td>
<td>Östersund</td>
<td>41,8</td>
</tr>
<tr>
<td>Lund</td>
<td>115 968</td>
<td>Karlstad*</td>
<td>41,5</td>
</tr>
<tr>
<td>Eskilstuna</td>
<td>100 923</td>
<td>Luleå*</td>
<td>41,5</td>
</tr>
<tr>
<td>Gävle*</td>
<td>98 314</td>
<td>Gävle*</td>
<td>41,3</td>
</tr>
<tr>
<td>Karlstad*</td>
<td>88 350</td>
<td>Eskilstuna</td>
<td>40,9</td>
</tr>
<tr>
<td>Kristianstad</td>
<td>81 826</td>
<td>Skövde</td>
<td>40,8</td>
</tr>
<tr>
<td>Luleå*</td>
<td>75 966</td>
<td>Jönköping*</td>
<td>40,3</td>
</tr>
<tr>
<td>Skellefteå*</td>
<td>72 024</td>
<td>Linköping*</td>
<td>39,4</td>
</tr>
<tr>
<td>Östersund</td>
<td>60 495</td>
<td>Umeå</td>
<td>38,7</td>
</tr>
<tr>
<td>Skövde</td>
<td>53 134</td>
<td>Lund</td>
<td>38,5</td>
</tr>
</tbody>
</table>

*represents municipalities with an SHL team

Source: Statistic Sweden (2016a)

Based on the article from Sanchez et al. (2016) we used data about weather (temperature) and the unemployment rate to control for the differences between the cities. From SMHI, the Swedish government meteorological agency, data about the average monthly temperature were collected. The temperature could have an impact on cinema admissions, it is reasonable to think that people would rather go to the cinema on a cold day. And in order to capture the economic health and the overall time available to spend on leisure activities, we used data on the annual unemployment rate from Arbetsförmedlingen, the Swedish public employment service. Figure 1 shows the number of monthly ticket sold per capita in the twelve cities, in other word it shows how many times the inhabitants on average go to the cinema. The data were obtained from the Swedish Film Institute. From the article by Sanchez et al. (2016) we have done some changes in the collection of data that we consider as improvements. For example, instead of studying four areas, we have increased it to twelve. The fact that we have studied different municipalities in one country instead of four different countries makes the regression less sensitive to biases due to differences across countries like the occurrence of domestic movies.

---

4 During June and July 2014 the biggest cinema in Kristianstad was renovated which could be seen in the dip in Figure 1. But due to the even trends in the cinema audience per capita we could calculate an average for this two months which should not be far from what the real numbers would have been.
5.2 The willingness to pay for sport through the condominium market

For our second regression in this essay we took inspiration from the discussion about sport’s impact on the rents (Carlino and Coulson 2004; Coates 2015). In our essay we use the property value, because in Sweden the rents do not change as much as they do in the US due to the Swedish rent control. So even though we have used some variables that are included in the article of Carlino and Coulson (2004), we have been looking more on an article by Lars-Eric Ericon et al. (2013). Just like us these authors studied the Swedish housing market and the condominium (bostadsrätter) prices.

A number of different sources have been used in order to gather data for our condominium model. We use cross-sectional data that includes the number of transactions and price per square meter of condominiums (Figure 2) in the twelve Swedish municipalities. The data set covers 70 to 80% of all broker transactions done in Sweden during our investigated period, which is from January 2009 to December 2014. The data source is broker statistics supplied by Mäklarstatistik AB. All sales in our sample have a contract date. This is a big advantage in comparison from using data from when the transaction is recorded in official registers which is often done several months after the buyers and sellers have agreed upon the sales price. Further Mäklarstatistik AB supplied us with the size (number of rooms) of the sold condominiums in the municipalities presented in Figure 5 in the appendix.

---

5 To protect the tenants, rents are regulated which makes the landlord unable to overcharge. (Hyresförhandlingslag, 1978)
Based on the research from Wilhelmsson and Ceccatol (2011) we used the number of violent crimes\(^6\) per one hundred thousands of inhabitants collected from Brå, the Swedish National Council for Crime Prevention. From the Statistics Sweden, we collected data on number of high educated people\(^7\), population growth, tax per capita, municipality spending per capita, average income per capita, stock of condominiums and the year of construction.

Ice hockey and soccer are by far the two biggest sports in Sweden. In the highest league of ice hockey the average audience has been 6 000 per game the latest years. In total 2 127 944 spectators visited the SHL during season 2015/2016. This can be compared to the highest league in speedway, second highest league in ice hockey and soccer which all had less than 3 000 spectators per game in 2015 (Bänholm, 2016). The reason we choose to study ice hockey teams is that the playoff gives a great opportunity to use a DiD methodology for the cinema audience.

Figure 2: Average condominium price

![Average condominium price graph](source)

Source: Mäklarstatistik AB (2016)

6 Methodology

In this section we present the two models that we used to investigate the economic impact of a professional sports team on the local area. An explanation about the models and why it suits to investigate our research question. We believe that the DiD methodology with its characteristics is a suitable method to measure the substitution between leisure activities. Moreover, it has been used before by Sanchez et al. (2016). In line with many other studies (Carlino and Coulson

---

\(^6\)In violent crime we include murder, manslaughter, aggravated assault, rape and robbery.

\(^7\)High educated people refer to the percent of people with three or more years of University studies.
2004; Coates2015) about how sport influences the housing market an OLS is used where we control for different characteristics in the cities.

6.1 Substitution between leisure activities

As mentioned earlier we want to investigate if there is a substitution effect between the two leisure activities ice hockey and cinema. They are two leisure activities with similar prices. Moreover, we assume that the consumers have similar characteristics. Both activities attract people of every generation and every social class. To see how cinema admissions in a municipality are affected from hosting a professional sports team, we measure the difference in cinema admissions between municipalities which host a SHL team and those which do not. And we measure a second difference across time, between March and April when the playoff takes place and the rest of the year. Data about the whole month’s cinema attendance are used which means that we control for the fact people do not just wait until the games are played and then go to the cinema. We use municipalities which do not host a SHL team as a control group and the municipality which host a professional sports team as a treatment group. The control group allow us to exclude the changes in exogenous variables during the investigated period, then these changes are assumed to be identical for both groups. To estimate the double difference across time and municipalities, the DiD is an appropriate method because it takes away the distortions in the comparison between treatment and control groups which may occur due to the permanent differences between municipalities (Murray, 2006).

To estimate this double difference we use the following econometric model:

\[
\log Y_{ijt} = \beta_1 + \beta_2 * UR_{ijt} + \beta_3 * Temp_{ijt} + \beta_4 * sport + \beta_5 * Time + \beta_6 * DiD + u_{ijt}
\]

\(Y_{ijt}\) = Number of tickets sold in municipality i, month j, year t.
\(UR_{ijt}\) = Unemployment rate
\(Temp_{ijt}\) = Monthly average temperature
\(Time\) = Dummy variable which takes the value 1 if we are in March or April (playoff period) and take the value 0 otherwise.
\(u_{ijt}\) = Disturbance term
Sport is a dummy variable which takes the value 1 if the municipality hosts a hockey team and take the value 0 otherwise. Moreover, if a team misses the playoff they take the number 0 during the playoff. And if they are eliminated during the quarter finals which take place in March they will be treated with a 0 during April when the semifinals and the finales are played.

$\beta_6$ represents the DiD estimator which measures the double difference over time and across municipalities. A negative $\beta_6$ is means that the cinema admissions are lower during the ice hockey playoff which indicates that there is a substitution between the two leisure activities. Therefore, $\beta_6$ shows how cinema admissions are affected during the playoff period in each municipality.

The advantages of the DiD methodology lie in its simplicity and its ability to avoid the correlation problems between parameters and the error term. However, the method also has a weakness which means that we should be careful in the interpretation of the results. One assumption of the DiD is that both the control and the treatment group are equally affected by shocks. This is the main limitation of the method, it is hard to find the right groups because there are a lot of things which are going on besides the sport environment (Murray, 2006). However, we use only Swedish municipalities, which are more similar than the four countries used by Sanchez et al. (2016). Countries are more likely to be affected differently by economic shocks than municipality from the same country. Therefore, we think that we reduced the risk that the assumption does not hold.

Although we think that the assumption holds, one has to be careful and to further clarify our results several robustness checks were done by taking away outliers. The number of tickets sold in each municipality follow the same trend (Figure 3). Therefore, there does not exist clear outliers. However, in Eskilstuna the number of tickets sold per capita is slightly lower compare to the other municipalities and in Lund the numbers tend to be higher (Figure 1). In this essay we will present a robustness check by taking away those two cities.
6.2 The willingness to pay for sport through the condominium market

In order to capture the impact of a professional ice hockey team on the value of condominiums in the municipalities we use an OLS regression. In some ways our method is similar to earlier work (Carlino and Coulson, 2004). However, the differences in the housing market made us use condominium price instead of rent as the dependent variable, and also some differences exist among the independent variables.

\[
\log Y_{it} = \alpha_0 + \beta_1 \text{educ}_{it} + \beta_2 \text{income}_{it} + \beta_3 \text{stock}_{it} + \beta_4 \text{crime}_{it} + \beta_5 \text{growth}_{it} + \beta_6 \text{tax} + \beta_7 \text{sport} + u_{it}
\]

\(Y_{it}\) = average price per square meter of a condominium
\(\text{educ}_{it}\) = Percentage of high educated people
\(\text{income}_{it}\) = Average income per capita
\(\text{stock}_{it}\) = Stock of condominiums
\(\text{crime}_{it}\) = Number of violent crimes per one hundred thousands of inhabitants
\(\text{growth}_{it}\) = Population growth level
\(\text{tax}_{it}\) = Tax per capita
\(\text{sport}\) = Dummy variable which take the value 1 for our ice hockey municipalities and it takes the value 0 otherwise.

---

8 The correlation matrix is available in Table 5 in the appendix. The table indicates that there is no high correlation among the independent variables.
\( \beta_7 \) is our coefficient of interest here. If \( \beta_7 > 0 \) this means that the value of condominiums is higher in municipalities which host a professional ice hockey team. We can interpret it as people’s willingness to pay for living in a municipality with a professional ice hockey team, just as Behrenz (2009) expressed in his article. Therefore, \( \beta_7 \) indicates how the price per square meter of condominiums is affected by the fact that a municipality hosts a professional ice hockey team.

Also for this model several robustness checks were done\(^9\). Lund and Kristianstad had the highest and lowest numbers of sales per capita (Figure 4 in the appendix) but there were no big changes after taking them away. The number of rooms of the sold condominiums were stable and did not vary much across the different municipalities (Figure 5 in the appendix). Therefore, we did not do any robustness check. The variations in the year of construction (Figure 6 in the appendix) was a bit bigger, therefore a robustness check was done by taking away the outliers Umeå with the highest percent of new condominiums and Kristianstad with the highest percent of old condominiums.

For both of our results we used the robust standard error to avoid the risk of heteroscedasticity.

7 Empirical considerations

In order to obtain a causal estimates of the economic impact of a professional sports team, we would ideally like to have a random allocation of professional sports teams between the Swedish municipalities. Unfortunately, this is of course not the case, all cities differ in characteristics like population size, age, local enterprises etc. Therefore, it can occur problems of identification. This is a recurrent issue in this area of sport economics. Carlino and Coulson (2004) have in their sample included teams which have had an NFL team but lost it and cities which have not had an NFL team earlier but taken over a team. They conclude that hosting a professional sports team is a sign of good quality of life. However, the regulation system is different in the US compare to European countries. The first criteria to play in the highest league is to have enough money. The team does not especially have to be successful. The selection is based on the economic assets (Andreff and Staudohar, 2000). Obviously many US teams will end up in the richest cities, those which give the highest amount of subsidies and have successful

---

\(^9\) We tested the robustness of our results in both our models by taking away different municipalities. The results were stable, here above just some of the robustness checks are presented.
companies. Therefore, the cities hosting an NFL team could be associated with a good quality of life due to the cities’ characteristics more than the presence of an NFL team. Värja (2014) has the same problem with identification and so do we. In fact, the condominiums’ prices could for example be higher in the municipalities with a higher population, and these municipalities are more likely to host a professional sports team. We have worked to avoid this problem but like earlier studies we cannot totally avoid the differences between cities and control for all characteristics. Therefore, one should be careful in the interpretation of our results, it is hard to capture the real relationship between professional sports and the economic health of a municipality. However, Per Pettersson-Lidbom (2015) argue that using a standard DiD methodology makes the assumption of common trends much more plausible because it allows to isolate local or regional economic shocks. Thus, this method is the most adequate to limit the differences between municipalities.

8 Results

8.1 Substitution between leisure activities

The estimated coefficients for the substitution model are reported in Table 3 (the whole table is presented in the appendix). In the first set of results, with all the municipalities included in the sample, in line with Sanchez et al. (2016) the coefficient on the DiD variable is negative and significant at the 10% level, close to the 5% level (Table 3 (1)). The results support the idea that the number of tickets sold decrease during the ice hockey playoff in Sweden. Therefore, a substitution effect between cinema admissions and professional sport events is identified. The results suggest that cinema admissions decrease by 15.5% during the ice hockey playoff. Therefore, economic benefits from hosting a sports team are partly cancelled out. Whether people go to sport games or cinema do not make a large difference for the local economy. However, professional sports events are not the only variable which have an impact on cinema tickets sold. Indeed, the difference in cinema admissions between municipalities could also be explained by the differences in weather condition and unemployment levels. The coefficient on average monthly temperature and the unemployment rate are negative and significant at the 1% level. An increase in temperature or unemployment rate has a negative impact on cinema admissions. Here again our results are right in line with Sanchez et al.
### Table 3 Substitution Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cinema Log</th>
<th>Cinema Log (2)</th>
<th>Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>-0.0932***</td>
<td>-0.0631***</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-0.0167***</td>
<td>-0.0171***</td>
<td></td>
</tr>
<tr>
<td>DiD</td>
<td>-0.155*</td>
<td>-0.202**</td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>0.121***</td>
<td>0.232***</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>-0.358***</td>
<td>-0.311***</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>10.66***</td>
<td>10.28***</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>864</td>
<td>720</td>
<td></td>
</tr>
</tbody>
</table>

*** p<0.01, ** p<0.05, * p<0.1

As mentioned, a robustness check (Table 3 (2)) was done by taking away the outliers Lund and Eskilstuna. After this the coefficient on the DiD variable is significant at the 5% level and still negative. The coefficients on unemployment and temperature are still negative and significant at the 1% level, moreover the magnitude of the coefficients are similar. Therefore, we can conclude that there exists a substitution effect between sports events and cinema admissions. We ran several tests by excluding different municipalities and the results were stable with the same magnitude and always significant. Therefore, we consider our results robust.

### 8.2 The willingness to pay for sport through the condominium market

The estimated coefficients of the condominium model presented in the methodology, including all twelve municipalities, are reported in Table 4(1). The coefficient for population growth, tax per capita and stock of houses are low as expected. The crime coefficient is low but positive in line with the earlier study from Carlino and Coulson (2004), however it is not statistically significant. The income coefficient is positive as expected. The coefficient for sport, which is our coefficient of interest, is high, negative and significant at the 5% level. The results indicate that the presence of a sports team decreases the condominium prices by 9.6%. This could be a consequence from the crowding-out of other public expenditures. People might have a higher willingness to pay for better schools and hospital instead of stadiums and successful sports team.
Table 4 Condominium Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1) Price Log</th>
<th>(2) Price log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>0.00880</td>
<td>-0.00271</td>
</tr>
<tr>
<td>Growth</td>
<td>-0.000113**</td>
<td>-0.000221***</td>
</tr>
<tr>
<td>Income</td>
<td>0.00971***</td>
<td>0.00758***</td>
</tr>
<tr>
<td>Tax</td>
<td>3.00e-05*</td>
<td>5.93e-05***</td>
</tr>
<tr>
<td>Stock</td>
<td>2.65e-05***</td>
<td>3.28e-05***</td>
</tr>
<tr>
<td>Sport</td>
<td>-0.0956**</td>
<td>-0.136***</td>
</tr>
<tr>
<td>Crimes</td>
<td>0.000181</td>
<td>0.000151</td>
</tr>
<tr>
<td>Constant</td>
<td>4.930***</td>
<td>4.607***</td>
</tr>
<tr>
<td>Number of observations</td>
<td>72</td>
<td>60</td>
</tr>
</tbody>
</table>

*** p<0.01, ** p<0.05, * p<0.1

After the robustness check (Table 4 (2)) all the coefficients remained with the same sign except the education coefficient which was not significant. The sport coefficient becomes lower with a value that indicates a negative impact on condominium prices, from hosting a professional sports team, of 13.6%. After taking away the outliers, the sport coefficient was significant at the 1% level.

9 Discussion

There are many things about Sweden that makes it an interesting country to write an essay about in the topic of sports economics. First, the sport environment in Sweden differs from many other countries, particularly with the 51% rule. Second, the Swedish sports teams are significantly smaller than the teams in the US where most of the studies are done. This makes the results about sport in the US hard to applicate on the Swedish municipalities. Furthermore, the most important fact is that Sweden is one of the few countries in Europe which still have high sport subsidies. Värja (2014) found no significant impact from hosting a professional sports team in Sweden. Her study gave us the interest to do this essay because although sport has no positive impact on the economy, municipalities in Sweden still provide teams with generous subsidies. The fact that this study brings new things to the research area and
investigate sport economics in Sweden is of course interesting, although it is important to be careful with the interpretation. There is a lot of things that are going on and the municipalities differ in many ways. The substitution effect between sport and cinema have been found by Sanchez et al. (2016) but not tested in Sweden. And even if our condominium model controlled for many variables it cannot control for everything.

Our substitution model indicates that sport should be considered as a substitute to other leisure activities. This means that the positive economic impact from hosting a professional sports team is partly cancelled out. The money that the municipalities spend on sport subsidies could instead have been spent on more productive public sectors like education, health or infrastructure. Hence, there is an opportunity cost from hosting a sports team. In these municipalities the property values of condominiums are lower, people might be more willing to pay for better infrastructure, schools, hospitals etc. This assumption holds only if the municipalities which host a professional sports team are not richer than the others. Which is why we looked at the spending per capita of our twelve municipalities (Figure 7 in the appendix). We see that each municipality spends approximately the same amount of money, suggesting that the municipalities giving sport subsidies invest less in other public sectors compare to the municipalities which do not give sport subsidies. In earlier studies (Baade 1994; Coates and Humphreys 2003b) it is mentioned that this opportunity cost should be taken into consideration. Behrenz (2009) argues that there exists a willingness to pay for living in an area with a professional sports team, and we do not disagree. However, our condominium model shows that the rents are lower in sport municipalities. Which indicates that the willingness to pay for other sectors is probably higher. Municipalities that have spent their money on other public sectors seem to attract more people.

Researchers have always been skeptical about the sport subsidies due to the fact that no positive impact on the local economy was found by investigating the sport’s impact on employment, wage and tax revenue. Therefore, the subsidies started to decrease during the 1970’s. However, in the 2000’s proponents of sport found a new way to justify the subsidies. They started to claim that stadiums have a good impact on the local area because it increases the demand in the housing market (Huang and Humphreys, 2014). So researchers started to investigate the truthfulness of this statement. Carlino and Coulson (2004) were the first to investigate the professional sports teams’ impact on the rents in US cities. Unlike us these authors found a
small but positive impact on rents from hosting a professional sports team. However, this result was contradicted by Coates et al. (2006) which argued that the result was not robust. To clarify our results, we have done several robustness checks and could say that the condominium prices are not higher in the sport municipalities, probably lower. Agha and Coates (2015) were not certain about the result from Carlino and Coulson (2004). They did their own research about the rents by investigating the Minor Baseball League in the US. The results indicate that cities with less than 400 000 inhabitants do not have positive impact on the rents from hosting a minor team. Due to the fact that the stadiums are smaller and the construction cost is lower in minor league also the sport subsidies are lower. All the cities investigated in this essay have less than 400 000 inhabitants, thus maybe it is too expensive for these cities to subsidize a professional sports team. In fact, there is just two cities in Sweden with a population over 400 000, Stockholm and Gothenburg. This could explain why we find a negative impact on property values.

10 Conclusion

We wanted to explain why Värja (2014) could not find any positive impact from hosting a professional sports team on the regional growth while the municipalities in Sweden give generous sport subsidies. We thought that one explanation could be a substitution effect between sport and other leisure activities. This could cancel out a part of the economic benefits from hosting a professional sports team. Indeed, we find in our results that during the ice hockey playoff the cinema admissions decrease in sport municipalities, people are watching ice hockey games instead of going to the cinema. What is even worse is that people can watch the games on TV and there are no economic benefits for the local area.

In line with earlier studies (Coates et al., 2006; Huang and Humphreys, 2014) we did not find positive effects from hosting a professional sports team while investigating the Swedish condominium market. Instead the results clearly indicate that the presence of a professional sports team decreases the condominium prices.

Fact is the main purpose of sport is not to provide economic impact, but instead it could bring pride and a sense of belonging to a community. And even though one should be careful in the interpretation of our results, we think that Swedish municipalities should rethink the sport subsidies.
In future researches, it would be interesting to see if investing in sport decreases the subsidies to other sector such as education, social infrastructure etc. For instance, are people more educated in municipalities where there is no professional sports team? This could be an indication on the opportunity cost for the municipalities when they choose to give subsidies to their professional sports team.


http://www.sfi.se/sv/statistik/ [accessed 2016-03-07].


### Table 3 Substitution Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1) Cinema Log</th>
<th>(2) Cinema Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>-0.0932***</td>
<td>-0.0631***</td>
</tr>
<tr>
<td></td>
<td>(0.00614)</td>
<td>(0.00891)</td>
</tr>
<tr>
<td>Temperature</td>
<td>-0.0167***</td>
<td>-0.0171***</td>
</tr>
<tr>
<td></td>
<td>(0.00209)</td>
<td>(0.00233)</td>
</tr>
<tr>
<td>DiD</td>
<td>-0.155*</td>
<td>-0.202**</td>
</tr>
<tr>
<td></td>
<td>(0.0819)</td>
<td>(0.0860)</td>
</tr>
<tr>
<td>Sport</td>
<td>0.121***</td>
<td>0.232***</td>
</tr>
<tr>
<td></td>
<td>(0.0340)</td>
<td>(0.0361)</td>
</tr>
<tr>
<td>Time</td>
<td>-0.358***</td>
<td>-0.311***</td>
</tr>
<tr>
<td></td>
<td>(0.0453)</td>
<td>(0.0543)</td>
</tr>
<tr>
<td>Constant</td>
<td>10.66***</td>
<td>10.28***</td>
</tr>
<tr>
<td></td>
<td>(0.0659)</td>
<td>(0.0862)</td>
</tr>
<tr>
<td>Observations</td>
<td>864</td>
<td>720</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.307</td>
<td>0.236</td>
</tr>
</tbody>
</table>

*** p<0.01, ** p<0.05, * p<0.1

### Table 4 Condominium Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1) Price Log</th>
<th>(2) Price Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>0.00880</td>
<td>-0.00271</td>
</tr>
<tr>
<td></td>
<td>(0.00589)</td>
<td>(0.00526)</td>
</tr>
<tr>
<td>Growth</td>
<td>-0.000113***</td>
<td>-0.000221***</td>
</tr>
<tr>
<td></td>
<td>(4.88e-05)</td>
<td>(5.78e-05)</td>
</tr>
<tr>
<td>Income</td>
<td>0.00971***</td>
<td>0.00758***</td>
</tr>
<tr>
<td></td>
<td>(0.00253)</td>
<td>(0.00258)</td>
</tr>
<tr>
<td>Tax</td>
<td>3.00e-05*</td>
<td>5.93e-05***</td>
</tr>
<tr>
<td></td>
<td>(1.59e-05)</td>
<td>(1.52e-05)</td>
</tr>
<tr>
<td>Stock</td>
<td>2.65e-05***</td>
<td>3.28e-05***</td>
</tr>
<tr>
<td></td>
<td>(3.73e-06)</td>
<td>(3.21e-06)</td>
</tr>
<tr>
<td>Sport</td>
<td>-0.0956**</td>
<td>-0.136***</td>
</tr>
<tr>
<td></td>
<td>(0.0409)</td>
<td>(0.0399)</td>
</tr>
<tr>
<td>Crimes</td>
<td>0.000181</td>
<td>0.000151</td>
</tr>
<tr>
<td></td>
<td>(9.45e-05)</td>
<td>(0.000111)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.930***</td>
<td>4.607***</td>
</tr>
<tr>
<td></td>
<td>(0.475)</td>
<td>(0.444)</td>
</tr>
<tr>
<td>Observations</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.852</td>
<td>0.907</td>
</tr>
</tbody>
</table>

*** p<0.01, ** p<0.05, * p<0.1
Table 5 Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>educat~n</th>
<th>growth</th>
<th>income</th>
<th>tax</th>
<th>stock</th>
<th>sport</th>
<th>crimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>education</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>growth</td>
<td>-0.2037</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>income</td>
<td>0.3859</td>
<td>-0.0945</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tax</td>
<td>0.3060</td>
<td>0.2398</td>
<td>0.7600</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stock</td>
<td>0.6114</td>
<td>0.0808</td>
<td>0.1319</td>
<td>-0.0703</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sport</td>
<td>0.1228</td>
<td>-0.1158</td>
<td>0.2210</td>
<td>0.2642</td>
<td>0.1653</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>crimes</td>
<td>-0.4663</td>
<td>0.1429</td>
<td>-0.5772</td>
<td>-0.4254</td>
<td>-0.0627</td>
<td>-0.3066</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Figure 4 The number of sales per capita

Source: Mäklarstatistik AB (2016) and own calculations
Figure 5 Number of rooms in the sold condominiums from 2009-2014

Source: Mäklarstatistik AB (2016) and own calculations

Figure 6 period of construction of the condominiums

Source: Sweden Statistic (2016b) and own calculations
Figure 7 Municipality spending per capita

Source: Sweden Statistics (2016c) and own calculations