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Economics of sport

The impact of professional sports on the local economy

Master's thesis within Economics

Author: Christopher Kloow

Tutor: Johan Klaesson

Johan Larsson

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Author: Christopher Kloow
Tutor: Johan Klaesson
Johan Larsson
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Abstract

Economics of sport is not an extensively well covered subject in Sweden and the purpose of this study is to examine the impact of professional sport on the local economy, and also shed some light on the situation of this subject in Sweden.

Seven municipalities housing a professional hockey team and seven municipalities without any hockey team was compared and analysed to view any difference of two sets of local economies. The finding was that professional sport has no effect on the number of workers in the restaurant sector. This sector act as an indicator on how the local economy was affected. Therefore, the local government should not motivate investments and subsidies aimed at professional sport with the promises that it will increase income and job in the municipalities.

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I Introduction

Over the last decades sport has been more professionalized and commercialized, and the funding situation of sport is changing, but yet sport is financially supported by the public sector (Bergsgard and Norberg, 2010). It is difficult to overlook the total support from the public sector due municipal self-determination. Municipal self-determination gives a great variety in local sport structure and sport funding. The Swedish Sports Confederation (Riksidrottsförbunden, RF), which is an umbrella organisation with 68 specialized federations, 22.000 clubs and approximately three million members, support local sports through the so called LOK-support (Local activity support). In turn, the government subsidizes RF through the government owned company Svenska Spel AB with SEK 1,7 billion in 2010 (Budget-proposition 2010). The municipality of Borås donated properties to the local football team IF Elfsborg where the club could start building a new football arena, Borås Arena. The arena was financed through selling one of the stands for SEK 30 million to the municipality and borrowing SEK 80 million with the municipality as security. The cost for the municipality is SEK 10,1 million and the revenue is SEK 5,6 million which makes it a deficit of SEK 4,5 million (Föreningen svensk elitfotboll). On the other side, IF Elfsborg estimates an increase in income of sponsorship and attendance of SEK 12 million. Also the municipality of Leksand subsidizes the local professional hockey club Leksands IF with SEK 1 million per year for five years, and this can be viewed as an aim for the club to reach the highest division in Sweden, Elitserien. This is because if the club reaches Elitserien the municipality before the end of these five years the municipality stops to pay this million a year to the club. In the US during the last decade of the 20th century and beginning of the 21st century 95 new arenas were built to a cost of \$21,7 billion, which was financed by two-thirds from a government source (Siegfried and Zimbalist, 2000).

Many new arenas have been built in Sweden in different sports with public fundings since the municipality declare that it will bring economic activity to the municipality. Also in North America, where it is more common for clubs to move to another municipality, municipalities do offer new sporting facilities if the club move there with the reason that it will bring income and jobs to the region. In Sweden, the number of sport organizations have more than doubled over the last 50 years increasing from just under 10.000 organisations in 1960 to over 20.000 in 2010 (Riksidrottsförbundet, (RF)). The number of members today is estimated by The Swedish Sport Confederation (RF) to be approximately 3 million Swedes which is almost 1/3 of the population. These 3 million people constitute a rather big market, for example footwear¹ which is an over €20 billion global market (Andreff and Szymanski, 2006). The demand for live sports events and broadcasting of sporting events has increased rapidly too. The value of the broadcasting rights for the Summer Olympics grew annually with 19% between 1960-2000, where the rights of the Summer Olympics in 1960 in Rome was worth \$1.2 million and then grew to be worth \$1332 million in 2000 when the Summer Olympics took place in Sydney (Andreff and Szymanski, 2006). Due to increase in broadcasting of sport people can watch sport wherever they are, at a sports bar or at home.

¹ Which is one important component of clothing when exercising indoor or outdoor sports.

1.1 Purpose

The purpose of this study is to investigate whether there is any significant difference regarding the number of employees in the restaurant sector for a municipality to house a professional hockey team playing in the highest division compared to when playing in the second highest or any lower division in Sweden.

1.2 Description of the problem

In United States the majority of the 120 teams playing in one of the four professional leagues have newly constructed or refurbished facilities to use. These facilities are partly paid with taxmoney. According to analysts performing the impact analysis method beforehand in North America it is economically beneficial for the municipality to subsidy construction of sports infrastructure. On the other side, economists argue that analysts overstate the benefits and understate the cost, hence subsidising professional sports is not beneficial, implying that professional sports has no or negative effect on the local economy. There is not the same amount of literature in this subject in Sweden as in North America, and in Sweden there are many opinions about the impact of professional sport on the local economy, positive or negative, but there are few, if any, studies in this matter. So, the impact of professional sport on the local economy still is unexplored in Sweden and the research question remains:

What is the impact, if any, of professional sport on the local economy?

To put the work into context we will start off with a literature review where I will present the subject sports economics in general which, if you are not familiar with the subject of economics of sport, is as an extension of the background. Then the motivation for why the restaurant sector would be a good and potential indicator of the impact of professional sport in section three. Using paired-observations a comparison can be done together with regression analysis to investigate the potential impact in section four and five. From there the empirical study will be done and the results will be presented and discussed.

2 Review on the economics of sport

This section is motivated by the fact that the literature in Sweden regarding this subject of economics of sport is rather scarce and this review will be illuminating for those not so familiar within this subject.

2.1 Economic impact of sport

The impact of sports on the economy is frequently analysed in US through impact analysis to justify public expenditure on sport infrastructure. In the US, the majority of the teams playing in the four big professional leagues have access to newly constructed or renovated facilities since 1990 with a total expenditure of \$16 billion. A great deal of that amount was paid by the local taxpayer with the motivation that the benefits for the community would be large. Humphries, (1994), estimated the benefits of one single game, the superbowl² in Atlanta 1994, to be \$166 million, but economists argue that analysts are overstating the true benefits of professional sports. One argument is that it is rather easy to confuse cost with benefits and the other way around. Sport infrastructure is ofcourse stimulating for the economy, but if the government increase spending on it other services will be reduced, or it will lead to an increase in government borrowing or taxation which will be a cost for the local economy (Siegfried and Zimbalist, 2000). Furthermore, it is also rather common that analysts ignore cost associated with sporting events. The crowd coming to participate in a sporting event will imply extra spending on for example public safety and public transportation, the larger the event the larger the cost could be.

Rarely reported are also external cost e.g. traffic congestion or vandalism (Lee, 2001). When handling intangible benefits you have to be careful. Carlino and Coulson (2004) found that cities with a professional sports team tend to have higher housing prices, implying that people have a higher willingness to pay to live there. However, these cities are usually large metropolitan areas and the supply of cultural attractions is plausibly higher, so it is not necessary that the sport team is the crucial factor.

The substitution effect in short is that people reallocate the spending between commodities (Siegfried and Zimbalist, 2000). Analysts do often assume that no spending would occur when a local team is absent, but in fact, people would increase their spending on other activities, hence the substitution effect. Furthermore, the substitution effect together with a low multiplier for the sporting event could lead to a lower benefit for the metropolitan area, since people might reallocated spending from a business with a high multiplier to the sporting event with a lower multiplier.

An example of being a high leakage in the local economy is that only 29% of the NBA players live in the metropolitan area where their team plays (Siegfried and Zimbalist, 2002). A sporting event could also lead to that other tourist will be crowded out by sport fans. If the host city's hotels in general have a high occupancy rate there is a sort of competition for the rooms which could lead to that other tourist do not get a room and hence chooses to travel somewhere else and spend their money there (Baade and Matheson, 2001). Big sporting events like the World Cup in football attracts many tourist and the World Cup in South Africa in 2010 brought over 300.000 tourist to the country according to the Sout Africa Tourist Board. Wanting to participate in these festivities will attract lots of people

² Super bowl is the final game in the National Football League in North America, and is very popular.

and given this, investments has to be made regarding safety and infrastructure to make it possible to handle all these people in the same area. Advocates of subsidizing events like the World Cup argue that these events will have a great economic impact on the economy, and when evaluating the event researchers can tend to be biased. For example, after the Super Bowl 1999 NFL estimated that taxable sales increased over \$670 million (NFL 1999). Maybe this amount of money is too good to be true when economists declare that there is investigator bias and error in the measurement of the data and overestimated the impact with a factor of 10. (Porter, 1999), (Baade and Matheson, 2000).

2.2 The impact of sporting facilities

The impact of sporting facilities on the local economy has been discussed back and forth for some years now. In the first half of the 20th century in North America around 20 new sport facilities were built with a small contribution from the taxpayers of 30% of the construction cost, but in the later part of that century both the number of new sport facilities and the portion of the public largesse grew. In the second half over 70% of the construction cost were paid with public funds contributing to the construction of over 100 new facilities (Andreff and Szymanski, 2006). Only in the 1990's the cost was over \$11 billion in North America.

The research studying the impact of sporting facilities is divided into two parts: prospective research and retrospective research. Prospective research is in advance and estimates the economic benefits from a construction of a new sporting facility. With the support of these prospective researches construction of new sporting facilities is publicly financed with the findings that it will increase the income and create jobs in the region (Andreff and Szymanski, 2006). After it is done, retrospective research is taken on to observe the effect of the new sporting facility, and with historical data and econometrics models researchers of retrospective investigations find no positive benefits of new sporting facilities. Very shortly discussed earlier, the prospective researches of estimating the impact of sporting infrastructure suffer from some methodological errors with incorrectly estimated multipliers, confusing cost with benefits and ignoring opportunity cost (Siegfried and Zimbalist, 2000). For example, the construction of a new hockey arena is a big construction which employs a lot of constructions workers and can take years to construct. Prospective research estimates thousands of new jobs, but what they fail to distinguish between is gross jobs and new jobs. According to reotrspective researches the number of new jobs is not as large as estimated by the prospective reasearches and if not the new hockey arena was constructed a new construction project would be invested in. Coates and Humphryes (1999) even found a negative relationship between sport environment and real per capita income. This sport environment factor is a set of variables like the presence of sport and sporting facilities and facility capacity. This is rather interesting since other retrospective researches found no impact at all which raise many unanswered questions in the literature. The economy of sporting facilities are quite small economies in the context of large metropolitan areas and some methodoligcal errors can contribute to the question, but to find a negative impact some other factors have to be in play. Siegfried and Zimbalist (2000) provides one possible solution, called "*the substitution in private spending*" which implies that when no sport is present people spend their money on alternative entertainment e.g. the cinema. In turn the cinema owners spend their income in the municipality compared to when spending money on sports, then the spending usually ends up as salary for well paid players or club owners

which usually³ do live outside the municipality. Supporting this “substitution in private spending” argument is the finding of Coates and Humphreys (2003). They find evidence of sport facilities do increase the employment and wages in the sporting facility sector and decreases the employment and wages in food services and hotel sector.

However, sport is appreciated by many and serve as a public good, since sport share the same characteristics as a public good as it provides free advertisement for the municipality and works as a image enhancement, which beneficiaries are impossible to exclude (Siegfried and Zimbalist, 2000), so it is not true that sporting facilities are not worthy of public subsidies. The intangible benefits could be greater than the tangible since people benefit from it through going to a live game, listening, talking about it with friends and so on (Noll and Zimbalist, 1997). It creates a bond between the inhabitants/fans in the municipality and the presence of a high quality professional sport team helps the municipality the be a “world class” city/municipality with a magnificent sporting facility construction, thus attracting a creative class and providing a higher social equity for the inhabitants, a world class city (Richard Florida, 2002).

2.3 Municipalities and regional sports

Sport is excersied on the national level as on the regional municipality level, where we have the national team in hockey or football playing in Ericsson Globe Arena or Råsunda National Stadium as Swedens home field when playing a national game. Ericsson Globe Arena is, or was, shared by Djurgårdens IF and AIK in ice hockey as home field. Both rival teams from the Stockholm region and have a large amount of fans implying a good foundation for income as fans buy tickets or accessories, there is a relationship between club dimension and city dimension. The clubs fans are drawn from the population of the city, the bigger the city, the bigger amount of potential fans (El-Hodiri and Quirk, 1971). The Ericsson Globe Arena is owned by Stockholm Globe Arenas and Råsunda National Stadium is owned by the Swedish Football Association and because they are not owned by the clubs the clubs have to pay fees to book these arenas to have a playing location, and also they cannot enjoy income from selling, for example, beverage and hot dags, hence a big part of the clubs revenue is disappearing. If a club has many fans, and fans and other gameday revenue is one of the clubs four souces of income (Andrew, 2004), derived from a large city, the large club can earn and spend money on high quality players which the small municipalities cannot afford, then of course the performance of the team from the larger city will be better (Szymanski and Kuypers, 2008). As one may have noticed is that much of the literature is done in North America, which present evidence that professional sport has no impact on the local economy (Andreff and Szymanski, 2006), and some of the literature address public involvement in financing new sporting facilities (Siegfried and Zimbalist, 2000). On later years researchers has been conduting investigations studying peoples willingness to pay for professional sport in the form of contingent valuation methods (Castellanos and Sánchez, 2007). In Sweden, Behrenz 2009 attempted to start a discussion concerning the effects of professional sport on the local economy through studying peoples willingness to pay for having a professional sports team in the county. The author found that residents are willing to pay approximately SEK 43-73 million for it per county.

³ Usually in North America. However I do not believe it to be equally common in Europe or, in this study’s case, Sweden.

3 Theory

This study is based on a rather small foundation of literature from Sweden and the reason for that is that there is not overwhelmingly much literature covering the subject of professional sport impact on a certain sector in a municipality, so it is like making your way through the jungle with a machete.

3.1 People's desire for sport

What is the attraction of sport? Well, one would then wonder what sport is, and the answer is that it is very hard to make a fair definition of it. A common definition of sport in a dictionary would be "*an individual or group activity pursued for exercise or pleasure, often taking a competitive form*" (WHSmith/Collins, 1988). This would inform us about the ludic nature of sport which would in a sense represent uncertainty of outcome of a game. This uncertainty of outcome is exciting for the spectator where sport also sanctions display of physical prowess⁴ which enrich the spectators involvement in sport (Hinch and Higham, 2001). Hinch and Higham also discuss competition "*as a continuum that ranges from recreational to elit both between and within sports*". In the daily newspaper it even has its own section dealing only with sport which provides us with the perception of what sport is (Bale, 1989).

So, there is an attraction of sport for spectators. In Elitserien one match during the last season (2010/2011) drew on average 6.160 people to attend a game, and in total of all games played 2.032.810 people bought a ticket (hockeyligan.se). Allsvenskan, the division just below Elitserien, drew almost 1 million people in attendance in total over the season (hockeyallsvenskan.se). The supply of sport is widely spread and feeds the perception and awareness of it. Even though Baade, 1996 alongside with Coates and Humphreys, 1999 and Porter, 1999 provides evidence that there is no correlation between economic growth and new sports, municipalities still subsidize sports with land or other facilities in the belief of it bringing more jobs and higher incomes to the municipality (Leksand municipality; KF-beslut 2003.06.18; KS-ärende 2011.03.07). Leksand municipality has decided to support the local professional hockey team Leksands IF with SEK 1 million per year for five years and if the club gets promoted from Allsvenskan to Elitserien before the end of these five years the municipality cease to pay this million a year. Why this is, as far as the author knows, could be because of municipalities oblivious conviction that a professional sports team is beneficial for the area through intangible benefits like civic pride (Noll and Zimbalist, 1997). The municipalities wants to be associated with values of sport, which would be very positive standing for good health and the spirit of sportsmanship which would pervade the area. Regarding very small municipalities, professional sport would put the municipality on the map which would be an intangible benefit. Sport and physical activity is associated with lower smoking, marijuana use and higher consumption of fruit and vegetables (Pate et al. 1996). Sure, the municipality enjoy these intangible benefits such as lower health problems when many more gets fed by the incentive to exercise more, keep young people out of criminal activity when given the possibility to participate in sports or increase civic pride with discussions with friends at work or during the game at a bars which are social activities that increases the local identity, but is it worth investing in new facilities or subsidizing professional sport in the area? Intangible benefits are hard to measure and attempts have been

⁴ Physical prowess consist of physical speed, stamina, strength, accuracy and coordination.

made to quantify the economical impact of sport on the municipality (See Castellanos and Sánchez, (2007), Behrenz, (2009)).

This study will shed some light on the subject to see if it is beneficial for the local economy to subsidize professional sport in Sweden regarding smaller municipalities. Small municipalities because of the fact that the impact of sport would be more obvious in small municipalities than in big municipalities such as Stockholm, Gothenburg or Malmö areas which is clear since, for example in Stockholm municipality the overall economy is very big and the impact of sport would be relatively small compared to the impact on the Leksand municipality where the local economy is much smaller. Seven municipalities with professional hockey present will be used in this study and data between 1993 – 2008 will be collected which implies panel data. Seven similar municipalities will be chosen to act as a control group and the two sets of municipalities will be observed to see if there is any difference between municipalities with hockey and municipalities without hockey. One possible measurable entry of impact on the local economy could be to measure the effect on the restaurant sector, meaning that the more fans the team has the more will follow its progress and jointly with friends meet up at a bar to chat and have a beer or food due to the fact that more sport is being broadcasted and also that sport fans are more likely to engage in drinking (Nelson and Wechsler, 2003). In turn, when people spend money in restaurants, the restaurant owners will spend it too and cause a multiplier effect. Substitution effect might be present as people choose to shift their spending to or from sport depending if sport appears or disappears.

3.2 Multiplier effect of visiting fans

As a chain reaction, the regional multiplier effect is due to additional currency spent in the municipality. The regional multiplier effect informs us about how much the regional income could be expected to increase due to an additional dollar of export sales or income (Hoover, 1971). On the other side we have demand leakage which would be represented by import expenditure and makes the regional multiplier smaller. Or for this matter, fans going on an away game and spend money in another municipality. Teams with many fans might have a bigger leakage since more fans travel to an away game, but still teams with many fans would originate from larger municipalities, hence the effect could be estimated to have the same magnitude in small as in big municipalities. Other leakages could be that well-paid players pay a higher tax to the state or that higher income often imply higher savings rate and in both cases the municipality does not enjoy this currency (Siegfried and Zimbalist, 2000). Therefore, it would be a good idea to view the direct effect of visiting fans in the restaurant sector.

As an example of multiplier effect we can consider the Kalmar FF – Djurgården IF case in previous paragraph, saying that some fans of Djurgården comes to Kalmar and spend some money on food and beverage in a restaurant. That would be the direct multiplier effect and in turn, the restaurant, as a recipient of this direct effect, of course not all of the inflow of currency will stay in the area as restaurant owners will have to rebuild their inventories and possibly spend money outside the municipality. However, part of the new currency will stay in the municipality to use when rebuilding their inventories, with e.g. raw food or other input components to the business, which would be called indirect multiplier effect. In the third instance, the induced multiplier effect, recipients of the direct and indirect effect spend this money on unrelated goods and services which would circle around in the local economy with diminishing effects due to savings, leakages and imports (Kahn, Phang, Toh,

1995). To conclude, money spent in the municipality will contribute more than once with a diminishing effect as it is spent more than once in the municipality.

3.3 Substitution effect in the municipality

The substitution effect has previously already been touched upon, but a deeper acknowledgement would be in order. As stated, substitution effect is when spending in a municipality change from one sector to another. Remember the finding of Coates and Humphreys (2003) where they found that employment and wages decreased in the restaurant sector and increased in the sporting facility sector, and this could be because of a shift in the private spending (Siegfried and Zimbalist, 2000). Since sport seems to rearrange spending instead of adding to it in a municipality, the inflow of visitors of a game will be of higher impact. But the number of visitors depends on where the line is drawn for the municipality. A strict drawn boarder to the club and arena with many municipalities in the surroundings will imply a higher rate of visitors(Siegfried and Zimbalist, 2000). Further discussion of those authors leads to what reasons people visit the municipality. Of course people visit the municipality in business or family, and if the reason of the visit is not the sporting event the visitor would not spend on alternative entertainment either.

3.4 The impact on the restaurant sector

With economic impact analysis we want to measure benefits increase or decrease in a municipality. The definition of impact is the net economic change a host municipality experiences as a result of investing in sport facilities or subsidising professional sports (Turco and Kelsey, 1992). The impact of professional sport on the local economy is ambiguous and in this study an attempt to view the economic impact on the local economy will take the form of viewing the restaurant sector and the number of people employed. The conceptual thinking for officials in municipalities to create liking for subsidising sport among the inhabitants is to prove that it will bring income and jobs to the municipality (John Crompton, 1995). To begin with, the officials convince the inhabitants to accept public funding for an arena investment or other subsidies to professional sport through taxes. This new arena or subsidies to improve the local professional sports team attract people from outside the municipality which spend money both in and outside the facilities. This money from outside the municipality creates new income and jobs for the initial inhabitants, which they might pay in taxes to enhance the arena or improve the local professional sports team, hence the circle is complete.

To put it in to context, we can think of an example. The hockey club Djurgårdens IF has a fan club called Järnkaminerna. Pre to an away game, they usually tell fellow fans to meet up at a bar to have a pre-game drink and from there make company to the arena. The most recent game, sure enough in football, but it is the same fan club and the same members, was an away game against Kalmar FF. Information about where to meet up in Kalmar is spread in the official website of the fan club: *"We meet at larmtorget close to the central station. We will go to the following two bars:"* (Järnkaminerna). An other example of why choosing the restaurant sector can be gathered from Blue Lightnings, the fan club of Södertälje SK. Pre to an away game against Brynäs IF they range a bus which stops at a chosen bar to talk up the game (Blue lightnings). Fans of Djurgården comes to Kalmar from outside the municipality of Kalmar and spend some money there and watches the game between Kalmar FF and

Djurgårdens IF. This increases the stock of currency in circulation in the municipality of Kalmar. As television appear it was possible to participate in two interest at once, to have a drink and to watch sport at a sports bar. Sport fans are more likely to grab a beer or for that matter engage in binge drinking (Nelson and Wechsler, 2003). For a regular game with their favourite team, some fans meet up at a sports bar and have a drink and talks about the match. An example of a sports bar where the fans of Djurgårdens IF often meets up is "*kerogen östra*". Money spent of local fans in a local sports bar is money that will stay in the local economy and cause a multiplier effect, but it is also money that could have been spent on something else (Siegfried and Zimbalist, 2000). It is not for certain that sports imply a higher consumption in the local economy, if any effect at all, but it might be the case of substitution effect. Substitution effect together with different multiplier effects for different sectors can cause a lower economical impact on the economy since if people switch their consumption from a sector with a higher multiplier effect to a sector with lower multiplier effect is self-evident that it will decrease the impact on the local economy. Remember that Coates and Humphreys (2003) found out that sport facilities do increase the employment and wages in the sporting facility sector and decreases the employment and wages in food services(restaurant sector) and hotel sector. This finding could, according to Siegfried and Zimbalist (2000), be caused by the so called "*the substitution in the private spending*" meaning that if no sport was available in the municipality people would spend this money on alternative entertainment like a cinema ticket or bowling. Why this could have negative effect on the local economy is because this shift in private spending from restaurant sector to the sporting facility sector where there would be a higher leakage in the sporting facility sector and a higher multiplier in the restaurant sector.

Even though sport is proven to have no effect at all on the local economy (Baade and Matheson 2000; Porter 1999; Siegfried and Zimbalist 2000) or even a negative impact (Coates and Humphreys 1999) some municipalities still view professional sport as a good investment. Remember the municipality of Borås which subsidies the construction of Borås Arena. What we might conclude from this study is that the motivation for subsidizing professional sport cannot be that it will increase income or jobs. Sure it can be intangible benefits, but that is not part of this study, here the central view is the impact of professional sport jobwise. What we also should bear in mind is the difference between sport in Sweden and in North America where much of the literature is done. The magnitude of foreign sports is much bigger than Swedish sports because Sweden is a relatively small country seen to the population⁵. More people interested in sports and how the local team is doing will imply a bigger impact on the local economy. However, the cities usually studied in North America which do have a team playing in one of the major leagues have at least houndred thousand inhabitants in the urban center and up to a couple of millions, and probably many more in the metroplitan area which make the local economy pretty big and thereby pretty hard to observe the difference a team makes. Therefore, and yet another reason, this study will observe small to medium municipalities in Sweden with at most 115.000 inhabitants to easier observe a potential impact of professional sports on the local economy.

⁵ I view the population because it is the amount of people that primarily can be interested in sports performed in Sweden.

4 Statistical framework

4.1 The municipalities

The municipalities observed in this study are small to medium sized with between 15.000 and 115.000 inhabitants and at the same time is the origin of a hockey team that has played in Elitserien for at least one seasons between the years of 1993-2008. In table 1 we have the municipalities that are chosen out of size and if they have a team which has played in Elitserien for at least one season between the years of 1993-2008, hereforth to be called hockey municipalities. The reason for choosing clubs that have been playing both in Elitserien and in Allsvenskan implies that the municipality has experienced both the effect of having a club in Elitserien and in Allsvenskan. This makes a good feature for using a dummy variable for when the club played in Elitserien and when it did not. The possible municipalities to choose is limited by the presence of a professional sport team, and that is rather obvious since the sporting factor is central in this study. Furthermore, the possible municipalities to choose was limited by size to small-medium ones because it would be difficult to observe the effect that sports may have for example in Stockholm area. The metropolitan area of Stockholm is occupied by more than 2 million people which constitute the largest market in Sweden and there are many factors that explains the growth of number of employees in the reastaurant industry, hence the effect of sport will be hard to observe. In table 1 you can see the choosen municipalities with professional sport present in form of a hockey team. These seven teams has played at least one season in Elitserien between the years 1993 to 2008 which provides 112 observations. In general these are to most frequent in the promotion and relegation between the highest and second highest league. In fact there has not been too many other clubs, and the exclusion of them are because of the size of the market in that municipality. Clubs that was excluded is Malmö IF (Malmö), AIK (Stockholm) or Linköping HC (Linköping).

Table 1 – *The chosen municipalities*

Municipality	Population (2009)	Growth in population (2009)	Hockey team	Seasons in Elitserien 1993-2008	Twin Municipality	Population (2009)	Growth in population (2009)
Umeå	114,075	1,19%	Björklöven	3	Östersund	59,136	0,38%
Skellefteå	71,77	-0,13%	Skellefteå AIK	3	Piteå	40,86	-0,10%
Timrå	17,902	-0,43%	Timrå IK	8	Kramfors	19,214	-1,33%
Mora	20,146	-0,03%	Mora IK	4	Ludvika	25,65	0,50%
Leksand	15,303	0,10%	Leksands IF	12	Ljusdal	19,077	-0,29%
Södertälje	85,27	0,61%	Södertälje SK	8	Eskilstuna	95,577	0,84%
Ängelholm	39,083	0,59%	Rögle BK	4	Karlshamn	30,918	-0,13%

Source: SCB and the Swedish Ice Hockey Association

A couple of municipalities with similar properties but without a professional hockey team present will be used as a control group, and these municipalities will be called twin municipalities also found in table 1. In the process of finding twin municipalities a geographical sense has been incorporated alongside with similar size of population. It is desirable that they are as similar as possible regarding the size and geographical location to the hockey municipalities so that the twin municipalities has the same conditions for having a professional hockey team, which will make it a good comparison. Of course many other factors

can be taken into account when choosing twin municipalities but it is the authors opinion that the geographical and size features enclasp the similarities rather well. The idea is to choose municipalities with the same features as the hockey municipalities, but it is more or less impossible to find municipalities that are identical except for the presence of professional hockey, hence finding good twin municipalities was a challenge. For example, it was a hard finding a fine twin municipality with reasonable population size close to Umeå and Skellefteå since there is not any other municipality with the same size of population and without the presence of professional hockey.

4.2 The model

There are reasons to believe that the restaurant sector will be affected by professional sport. How this will be investigated is with regression analysis and with dummy variables check for when a hockey club plays in Elitserien and when it plays in the second highest division Allsvenskan or any lower division. Using a dummy variable the seasons played in elitserien can be isolated.

In difference from North America, clubs in Sweden does not just change location if a municipality offers to build a new arena. It is also a fact that the major leagues in North America are closed meaning that there are no promotions or relegations of clubs. Success for a club is a forward-looking work and if the club work hard it will in the long-rung enjoy success. Success in the long-run can have positive effects on the immigration of people (Behrenz 2009), and it is rather easy to understand that increase in population would be one explanation of an increase in the number of employed people in the restaurant sector. Moreover, Gross regional product (GRP) per capita (GRP/capita) would also explain the variation in the number of employed people in the restaurant sector. As GRP/capita increase one would expect people to go out to a restaurant more often since their wealth is greater and they could enjoy an evening out. It is very believable that these two variables, population and GRP/capita, would explain most of the variation in the number of employed people in the restaurant sector. Regarding the inclusion of hockey a dummy variable, it is incorporated in the model to view if there is any effect of professional hockey on the number of workers in the restaurant sector as a club plays in Elitserien compared to when playing in Allsvenskan. The dummy variable could turn out positive, negative or insignificant since previous researches has in North America proved the impact to be positive, negative and insignificant. It would be believable that it could turn out positive since, when it is 1 the team is playing in Elitserien and more people are interested in Elitserien. Furthermore, it could also be interesting to incorporate yet another two dummy variables, one for when the club is promoted to Elitserien and one when the club is relegated from Elitserien which also would be ambiguous regarding the expected outcome of the variable. A promotion could have a positive effect since the club will meet better teams with more fans, hence the attraction would be greater. On the other side relegation would have the opposite effect. These three dummy variables would be the test to see if professional sport do affect the local economy postiviely, negatively or no effect at all. Therefore, the model of most interest looks like this:

$$Workers_{it} = \beta_1 + \beta_2 Pop_{it} + \beta_3 \frac{GRP}{Capita_{it}} + \beta_5 D_{1it} + \beta_6 D_{2it} + \beta_7 D_{3it} + \varepsilon$$

Table 2 presents the variables and their expected outcomes.

Table 2 – *The variables and their expected outcome.*

Variables	Description	Source	Expected outcome
Workers	The number of employed people in the restaurant sector in municipality i at time t .	Statistics sweden	Dependent variable
Pop	Population in municipality i at time t .	Statistics sweden	+
GRP/Capita	GRP/capita in municipality i at time t .	Statistics sweden	+
D_{1it}	Division dummy variable for municipality i at time t .	Swedish hockey association	Ambiguous
D_{2it}	Promotion dummy variable for municipality i at time t .	Swedish hockey association	Ambiguous
D_{3it}	Relegation dummy variable for municipality i at time t .	Swedish hockey association	Ambiguous

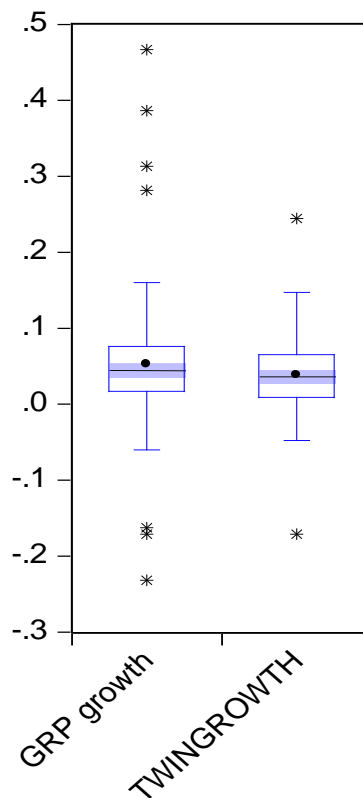
5 Empirical work and results

Observing economic impact of sports usually implies estimating increases of jobs or income. In this case I will be very narrow and focus on jobs in a specific sector. What this study is looking for is whether there is any correlation between the number of employees in the restaurant and a season which is played in Elitserien, which will be done using standard regression analysis. In an attempt to isolate the seasons played in Elitserien I will use dummy variables. I will also incorporate two other dummy variables which will isolate whether the team is promoted or relegated. Before the regressions are run some descriptive statistics will be shown to examine the difference between the two groups of municipalities, the hockey municipalities and the twin municipalities.

5.1 Checking for a difference in GRP growth mean

The municipalities in the two groups are chosen to be as similar as possible regarding the size of the population and geographical location. This is because these two factors would represent the two main features for a municipality when observing the potential impact professional sport could have. To find identical municipalities with the only difference of having the presence of sport is impossible, so one could be worrying about finding no impact at all. So the more similar the municipalities are the closer to a finding an effect of professional sport will be. Using descriptive statistics we can compare the two groups of municipalities, and the comparison will take the form of comparing the GRP growth mean and calculate confidence intervals together with a t-statistic to see if it is any significant difference between the two groups. A comparison of the two groups is shown in graph 1 which shows the mean, median and far outliers.

Graph 1 – Box and Whisker plot of the GRP growth



Graph 1 shows that there is not a significant difference between the hockey municipalities and the twin municipalities regarding the GRP growth. GRP growth mean and median for the hockey municipalities are a tiny bit greater, but not significantly different from the twin municipalities GRP growth mean and median since the intervals are overlapping. What is noticeable is that there are a wider spread regarding the GRP growth for hockey municipalities and outliers are further away. Calculating a confidence interval for the two means of the groups would make the case even more certain and this equation can be found in any basic statistics book:

$$Mean \pm t_{\left(\frac{\alpha}{2}, N-1\right)} \left(\frac{s}{\sqrt{N}} \right) \quad (1)$$

Where:

t = upper critical vaule of the t-distribution with the desired degrees of freedom.

s = sample standard deviation

N = sample size

Using equation 1 a confidence interval can be calculated which are presented in table 3.

Table 3 – *Confidence intervals for the GRP growth means*

α -level	90%		95%	
	Low	High	Low	High
Hockey mean	0.039	0.067	0.034	0.069
Twin mean	0.029	0.048	0.027	0.050

The annually GRP growth mean for the hockey municipalities is 0,053 and for the twin municipalities it is 0,039 which is in percentage form. The intervals for both groups on both the 90% and 95% level are overlapping which means that they are not significantly different from each other. However, the hockey intervals is wider (which was hinted by the boxplot) than the twin municipality intervals, and this can be due to much noiser data for the hockey municipalities. As the standard deviation increases so does the width of the confidene interval. If we want narrower intervals and more precise estimates of the mean, one could increase the sample size because as N increases the interval gets narrower. A narrowing trend is also obvious for the intervals as the probability of containing the true mean decreases. This shows that the two groups of municipalities are very similar and observing an effect of professional sport would be hard, it might just end up insignificant.

So far the two sets of municipalities has been treated separately, and now a t-test is introduced to handle the difference in the GRP growth regarding each pair of municipality, a paired-observation comparison. It is somewhat more sensitive than previously performed tests and we use the equation, which also can be found in any basic statistics book:

$$t = \frac{\bar{D} - \mu_{D0}}{\frac{s_d}{\sqrt{n}}} \quad (2)$$

Where:

\bar{D} = sample mean difference between each pair of observation.

μ_{D0} = the mean difference under the null hypothesis.

s_d = sample standard deviation

n = number of observations.

This test requires a hypothesis test:

$H_0: \mu_D = 0$

$H_1: \mu_D \neq 0$

The null hypothesis states that there is no difference between the two sets of municipalities regarding the GRP growth mean and the alternative hypothesis states that there is a significant difference. Using equation 2, a t-statistic of 1,4689 is calculated. At n-1 degrees of freedom and at the 5% level the critical value is 1,645. Since $1,4689 < 1,645$ the null hypothesis cannot be rejected, hence there is no difference in the GRP growth between the two sets of municipalities. However, if the t-test is tested at a 10% level the critical value is 1,282 which is less than the observed t-statistic, $1,4689 > 1,282$. This implies that the null hypothesis can be rejected and that there is a significant difference between the two sets of municipalities, about 1,4% difference per year which is the mean difference between the two sets of municipalities. The hockey municipalities have experienced slightly higher GRP growth than the twin municipalities.

5.2 Testing the impact of professional sport

When running regressions for a comparison between the two sets of municipalities the dummy variables has to be excluded since there is no hockey factor to check for regarding the twin municipalities. To start with, two regressions without dummy variables will be presented to view any difference between the two sets of estimations and explanatory power of the model. After those two regressions for comparison, the dummy variables will be included to see if one season played in elitserien has any impact on the number of employed people in the restaurant sector when only using the data from the hockey municipalities.

But first, estimating the comparisons is a linear regression and is straight forward:

$$Workers_{it} = \beta_1 + \beta_2 Pop_{it} + \beta_3 \frac{GRP}{Capita_{it}} + \varepsilon \quad (3)$$

In table 4 the output of the regression is presented when using the data set of the twin municipalities and equation 3. This will show how much the GRP_capita and population variables explain the change in the total number of workers in the restaurant sector in municipality i .

Table 4 – *Regression output for twin municipalities*

Dependent variable: Workers

Explanatory	Coefficient	T-statistic
C	-274.0229	-9.43413
GRP_CAPITA	0.001280	22.40337
POPULATION	0.005512	9.819959
R-square	0.860996	
Number of observations	112	

It is a good model with R-square being 0,86 and all of the explanatory variables are significant. The signs of the coefficients are as expected where both GRP/capita and population is positively correlated. Through a correlation matrix the correlation between `grp_capita` and population can be found, and it is 0,14 which is low and implies that there is no multicorrelation and in a scatterplot one can see no tendencies for heteroscedasticity when plotting the residuals against one of the control variables (`GRP_capita`), hence these two variables explains the change in the amount of workers in the restaurant sector very well⁶. For example, 1 unit change in `GRP_capita` increase the number of workers in the restaurant sector by 0,00128. However, `GRP_capita` is measured in SEK and it would be more practical to assume an increase in `GRP_capita` by SEK 1.000 which would imply an increase in the number of workers in the restaurant sector by approximately 1, rounded off. Similarly, if an increase in population of 1.000 people is assumed the number of workers in the restaurant sector would increase by approximately 6, rounded off from 5,5512.

For the hockey municipalities I will use the same variables as in equation 3 but with the data from the hockey municipalities, and running this we get the following presented in table 5:

Table 5 – *Regression output for hockey municipalities*

Dependent variable: Workers

Explanatory	Coefficient	T-statistic
C	-149.8916	-5.92825
GRP_CAPITA	0.000426	20.59735
POPULATION	0.006813	4.389438
R-square	0,856616	
Number of observations	109	

For the hockey municipalities R-square is marginally lower, 0,856616. It means that the model explains marginally a little less for the hockey municipalities than for the twin municipalities. It is so small that it is neglectable, but theoretically, it is something out in the world explaining that small difference, and it could be professional sport explaining a tiny

⁶ The correlation matrix and scatterplot can be found in the appendix together with the original regression outputs.

bit of the change in the number of workers in the restaurant sector. According to the correlation matrix for this dataset the correlation between GRP_capita and population is a bit higher with 0,42 but still no indications of multicollinearity and when viewing the scatterplot in the appendix no tendency for heteroscedasticity is present. Furthermore, a change in GRP_capita does not imply equally large impact on the number of workers as in the twin municipalities. Regarding the hockey municipalities it is only 1/3 as powerful where a change of SEK 1.000 in GRP_capita would imply not even 0,5 (it would imply 0,000426) more workers in the restaurant sector. The population variable has more or less the same impact in the hockey municipalities as in the twin municipalities where an 1.000 people increase in the population would imply an increase of the workers by 7, when rounded off from 6,813. The number of observations is lower when using the data from the hockey municipalities because of missing data where three observations were excluded.

The model has now been tested for the two sets of municipalities and some differences have been viewed using regression analysis. Now three dummy variables will be incorporated in the model, one showing when a team is playing in Elitserien, one showing when the team is promoted to Elitserien and one showing when it is relegated from Elitserien.

$$Workers_{it} = \beta_1 + \beta_2 Pop_{it} + \beta_3 \frac{GRP}{Capita_{it}} + \beta_5 D_{1it} + \beta_6 D_{2it} + \beta_7 D_{3it} + \varepsilon \quad (4)$$

When using equation 4 with the data set of the hockey municipalities, this yields:

Table 6 – Regression output with sport dummy variables

Dependent variable: Workers		
Explanatory	Coefficient	T-statistic
C	-151.8527	-5.739687
GRP_CAPITA	0.000415	3.951705
POPULATION	0.006853	18.93853
DIVISIONS_DUMMY	8.277313	0.308723
PROMOTION_DUMMY	3.925542	0.114701
RELEGATION_DUMMY	-6.052054	-0.150935
R-square	0.856752	
Number of observations	109	

Here we find the grp_capita and population variables significant. The R-square is still very high and basically the same as in the previous regressions. The correlation is the same as in the latest regression for hockey municipalities (0,42), also the heteroscedasticity looks the same when viewing the scatterplot for the same dataset. However, neither of the dummy variables are significant which implies that professional sport has no effect on the number of workers in the restaurant sector.

6 Analysis

Initially it is hard to measure the impact of sport on the local economy where some studies find no impact, some find negative and some, often pre to an investment, find positive impact⁷. To view the whole local economy would mean that the impact of professional sport would be hard to observe since the effect from the beginning was ambiguous. Therefore, the restaurant sector was chosen to stand for an indication of what the impact of professional sport has on the local economy. This sector was chosen because of the knowledge that fans of clubs and sports fans overall tend to go to a bar to view a game. However, it seems like the effect is absent or very small so it is neglectable, and the reason for subsidizing professional sport should not be that it increases jobs or incomes. As in the case of the municipality of Leksand they cannot expect to experience an increase in jobs or incomes due to the SEK 5 million in total they will pay to the local professional hockey team Leksands IF for five years. The remaining reasons for subsidizing could be to put the municipality on the map, but, perhaps just in the case of Leksands IF which is a very ancient lineage club, it does not really affect peoples perception and awareness of the club and the municipality since it already has a long successful history and people do, in time, know about it. What it could be is to minimize the risk of the name and brand to fade away. Regarding the municipality of Borås and the effect of professional sport putting the municipality on the map could be little lower since the local professional club's name is Elfsborg IF and people who are not that into sport does not know and probably does not care where the team is from, hence they do not hear the name of the municipality. In the long run people will find it out and there is some effect of people moving to the municipality as professional sport has been present for a couple of years (Behrenz, 2009). This trend can be due to that people get charmed by the team the more successful it is, and success is reached in due time, hence the effect on the number of workers in the restaurant sector can be delayed. But this delay should be caught up by the fact that this study covers 16 years and some variables has been tried lagged. One could believe that the bigger the municipality gets, the greater chance of housing a professional team will be since more people implies a greater crowd of fans, and in a sense that is true. Stockholm has two hockey teams on the highest level, alongside with 3-4 football teams on the highest level in the Swedish football divisions. Gothenburg has 1 hockey team and 3-4 football teams on the highest level and so on and so forth. This shows that the causality could be the other way around that more people brings better conditions for professional sport and not the other way around⁸.

The results from this study is that professional has no impact on the number of workers in the restaurant sector, but still municipalities offer to subsidies professional sport to keep the local team playing in the highest division. Of course sport could have a positive impact on the municipality through intangible benefits such as healthier population or lower crime rate, but it is rarely investigated and this study indicates that professional sport has no effect on the number of workers in the restaurant sector. Therefore, it would be hard for municipalities that wants to subsidies professional sport to motivate this subsidy with the promise of increase in job and income. What was observed instead was that there is a significant difference regarding the GRP growth for hockey municipalities versus the twin municipalities in the favour for the hockey municipalities. This could be due to the findings of Behrenz (2009), that in the long run when a municipality is housing a professional sports

⁷ Which have some methodological errors to take into account.

⁸ This would lead into a discussion about why people move to a municipality which is not a theme in this study.

team more people tend to move to the municipality which in turn creates a GRP growth. From this the conclusion can be drawn that it is beneficial for the municipality to subsidize sport as municipalities with professional sport experience a higher GRP growth. Bearing this in mind together with the fact that the number of workers in the restaurant sector is perceiving no effect of professional sport would lead to further conclusions that the number of workers in the restaurant sector is not a good representative for the local economy. However, the difference in GRP growth between the two sets of municipalities is very small and it is not for certain that the hockey factor is the determinant factor of this difference.

Due to increased televised sports people can watch it where they are, they do not have to go to the arena and watch it live. This would be beneficial for a sports bar since people could then go there and enjoy the game with congenial people, but it could also mean that people stay home and watch the game. These effects might take each other out and explain why there is no effect of professional sports on the number of workers in the restaurant sector due to technological developments. Other factors why it is no significant difference between one season played in Elitserien compared to when playing in Allsvenskan or any lower division could be the fact that smaller municipalities are chosen, and rather common in smaller municipalities is that the local hockey team is the pride of the municipality and the fans follow the team's performance no matter what division it plays in⁹. In the local government there could be fans of the local team and it would not be surprising if it was easier for hockey teams in smaller municipalities to receive subsidies from the local government. Furthermore, the difference between the two series might not be that big, even though the fact that double as much people attend Elitserien than Allsvenskan. This could be because that the media exposure of Elitserien is not double as much as the exposure for Allsvenskan or that the fan base of all clubs in both divisions are very loyal.

The impact of sport on the local economy is not clear. This study shows that there is no impact on the number of workers in the restaurant sector and at the same time show that hockey municipalities can experience a higher GRP growth than municipalities without professional hockey present when the acceptance level is higher and outcome can not be concluded with the same guarantee. Regardless of what reason a municipality uses to motivate subsidies of professional sport, sport does engage and bring together people in a municipality which would be an intangible benefit. Especially for Sweden which takes on a high rate of immigrants and sport helps people to get integrated in the society. But that would mean youth teams and overall sporting incentives and not professional sport, but then again, professional sport provides better knowledge and more interest of sporting activities which is beneficial for the municipality.

⁹ Except for when it would be relegated to the third or fourth division, then people would probably lose interest.

7 Concluding remarks

It is a grey area whether sport do have an impact on the local economy or not, and if the impact is positive or negative. It was the purpose of this study to provide some colors to this grey area. The literature is very scarce in Sweden, but in North America this subject is better covered. However, Swedish sport and North American sport is not too alike with differences of promotion and relegation, the magnitude of the domestic sport and the fact that some teams move to another municipality in North America which is not at all common in Sweden.

To color this subject this study observed the number of workers in the restaurant sector in two similar municipalities with the major difference being that in one of the municipalities professional hockey is present over the years 1993-2008. The impact was checked through dummy variables isolating when a team is playing in the highest division, Elitserien and when it is playing in the second highest division, Allsvenskan, or any lower division. The difference between the municipalities in GRP growth was also investigated. The findings was that professional sport has no impact on the number of workers in the restaurant sector which would be inline with some studies made in North America and also clarify the case in Sweden since the literature is very scarce. This could be due to that there is not that big of difference between Elitserien and Allsvenskan, but also that sport is being more and more televised and people can then watch a game wherever they are. The restaurant sector would benefit from this through people going out with friends to a bar and watch the game, but it could also have opposite effect of people staying home to watch the game and perhaps invite some friends over. Further reasons for no impact is that, when playing in the highest division, more fans of one team can go on an away game and usually they meet up at a bar in a foreign municipality and spend some money which has a positive impact on the local economy through multiplier effect, but on the other hand, this would also imply a leakage for the municipality as more fans also would travel to another municipality to view the local team play an away game.

Regarding the difference in GRP growth a significant difference was found in the favour of the hockey municipalities, on the 10% level should be said so it is weak. This could be because in the long run people tend to move to municipality where professional sport has been present for a while, and a greater number of inhabitants implies higher GRP for the municipality. However, in which direction the causality goes is hard to know, if more people implies a better chance of success for the local team, or if the success of the local team implies greater immigration to the municipality.

The conclusion of this study, and the answer to the researched question stated in the beginning of the study, is then that many investments and subsidies municipalities takes on cannot and should not be motivated by the promise of it bringing more jobs and income to the municipalities as professional sport has no impact on the number of workers in the restaurant sector. However, sport has intangible benefits as sport brings together a municipality and lower health problems. Future research could be to view the impact on the hotel sector, as it was desired to be incorporated in this study but the time was not enough. It could also be interesting to quantify the advertisement a municipality receives through having the municipality name in the club name as media exposure increases or for that matter conduct a case study observing one chosen municipality with a professional sports club that has been promoted or relegated through many divisions, lets say for example Enköpings SK in football which played in the highest division a couple of years ago but now plays in Division 2 which is 3 divisions lower.

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