You cannot win without losing

Erasmus University Rotterdam

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What impact does sport have on the economy of districts in Rotterdam?

Master Thesis Urban Port and Transport Economics

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Abstract

Many studies showed the relationship between large sport events and the organizing city, but what effect does amateur sport has on the economy of city districts? This question is important for municipalities to obtain subsidies. This study researched if there is a relation between sports participation and local economies. The variables that can influence the economy of a district are the liveability, the average disposable income, the number of new business start-ups, the unemployment rate and the number of high school dropouts. This research found a positive direct effect of sports on the average disposable income and a positive effect on the employment rate. But this is not enough to argue that a high sport participation rate has a large positive impact on the economy of a district. However, health does have a positive effect on the economy of a district. Because other research has shown the positive effect of sports on health, this research has proven that sport has a small positive effect on the economy of city districts, based on the five variables.

Key words

Sport participation | Economic impact | Districts | Health | Liveability

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1 Introduction

Sports are more than some games at a football field or in a gym, it connects people and makes people healthier. This has effects on a city community. A city in the Netherlands is divided in several districts. A district is a part of the city and was created when the city was developed. Every community has its own strengths and has different inhabitants. In some communities the sport participation is higher than in other communities. This can have many reasons, e.g. number of sport facilities, cultural differences or the expenses of sports. The effects of sports in a community are difficult to measure because of all these differences. It is possible that the effects differ per district. This thesis will focus on the economic impact of sports on a city district level.

1.1 Background

Many people are interested in sports and due to the technological development, the media adopted this in their program. People can watch and read about sport 24/7, not only watching sports results in entertainment for non-professionals, also practicing sports themselves is popular. Both men and women are playing sports and many industries are involved around sports. Therefore not only the athletes are earning money with sports but many others as well, such as sport facilitators, clothing industries and the media. The amateur sport is very popular, practicing sports is important to remain healthy and be in good physical shape, other than that it also increases social contacts. Sports is derived from the French word *desport*, which means leisure (Fernando, O.E.V., 2007). People see sports as a chance of relaxation and to meet up with others.

Research has shown (Rogerson, R.J., 1999) that people want to live in the, for them, most optimal location where their quality of life is high. Sports can play an important role in this decision. Amateur sportsmen like to exercise close by their home. Sallis (1990), proved that the number of sport facilities nearby one's home is associated with people's sport habits. But Hoekman (2011), argues that the distances to sport facilities in poor neighbourhoods is lower than for other neighbourhoods, and still people in these poor neighbourhoods are reluctant to participate. Therefore distance is not the main reason why people do not sport. Sport participation rate is very important for a city municipality in order to obtain the subsidies from the government and for sport facilities to receive sponsors. Not only the sport participation rate is important, also the economic value of this participation is essential, especially for the national government. Subsidies are given to cities to promote sports to the inhabitants and to improve the sport environment of sport facilities. Governments give the subsidy only because they want to see some (economic) benefits in return for the city.

Therefore, it is important for the sport department to show what the economic value is of their department and sports in their community, and why they need the subsidies to obtain this value. It is difficult to express the health of a human being or the value of a park in Euro's. The purpose of this thesis is creating a model that can express the accurate economic value of sport for a district, with a case study for the city of Rotterdam.

2 Problem Statement

The credit crisis has influenced almost every sector in the world. It has also influenced the (municipal) government of the Netherlands, which result in cutting down budgets for many departments (Government budget, 2010). The Sport and Recreation departments (S&R) suffer also from the budget cuts. Even if the government wants to increase the sport participation, the budget of the municipal governments for the regional sports departments are small, therefore it is difficult to improve the sport participation rate within a city. Sport is considered not important enough to have a large share of the budget, because there is no accurate model that shows the economic value of sports in a community.

The department S&R of the city of Rotterdam, needs to cut spending as well cuts (Annual report Rotterdam, 2010), recently they have developed a model that shows the economic impact of sports in a community. This was done in order to enhance the budget share for their department. The created model measures the economic impact of sports in the city, with a cost benefit analyses. This model was chosen because it shows a clear outcome in Euro's and this important because the department relies on this outcome. There are some critiques on this model; therefore this thesis will research if sports have an impact on the economy of the districts of Rotterdam. The economy is for example determined by the liveability. This factor is very important for a district because it shows the attractiveness of a district, which can lead to a better liveability (Economist, Liveanomics Urban liveability and economic growth, 2011). The outcome of the existing model of the city of Rotterdam will be compared to the outcome of this research. If the existing model is not sufficient enough, recommendations will be given.

2.1 Research question

What impact does sport have on the economy of districts in Rotterdam?

Sub questions

- *Why is the relationship between sport and the economy of a city important?*
- *What are the negative economic effects of sports in a district?*
- *What are the positive economic effects of sports in a district?*
- *How can the city of Rotterdam improve the positive economic effects and decrease the negative economic effects of sports?*
- *Which factors are needed to investigate the economic impact of sports?*
- *Does sport participation increases the economy of districts in Rotterdam?*

Hypothesis

To answer the research question, the hypothesis has to be formulated. Since economic impact is a broad issue that cannot easily be narrowed down into one concept, several hypotheses are outlined. However, the main hypothesis is as follows:

1) Sport participation in a district of Rotterdam has a **positive** impact on the economy of a district in Rotterdam.

To assist the main hypothesis in defining and analysing economic impact an attempt will be made to approach the following sub-hypotheses:

2) Sport participation in a district of Rotterdam has a **positive** impact on the liveability of a district in Rotterdam.
3) Sport participation in a district of Rotterdam has a **positive** impact on the average disposable income of people who live in a district of Rotterdam.
4) Sport participation in a district of Rotterdam has a **positive** impact on the business climate of a district in Rotterdam.
5) Sport participation in a district of Rotterdam has a **negative** impact on the unemployment rate of a district in Rotterdam.
6) Sport participation in a district of Rotterdam has a **negative** impact on the high school dropouts in a district in Rotterdam.

The hypotheses shall be rejected if there is no or an opposite effect concerning these hypothesis, if so, the H0 = Sport participation has no effect on the economy of a district in Rotterdam, shall be accepted.

2.2 Research methods

To find the answer to these questions a quantitative research method will be used. Firstly the existing literature about the impact of sports will be conducted. Expert interviews with multiple S&R departments, the Mulier Institute, NOC*NSF and other prominent people who are involved with research on sport economics will be taken in order to complete the literature study (appendix 8 E). Hereafter a multiple regression analyses will be used to test the hypothesis. This report will focus on the city Rotterdam. The city of Rotterdam was chosen because the S&R department of this municipality has created a model that has been criticized (Onderzoek sport in de wijk, Flux, 2010, appendix 8 A). This thesis will research if the critiques were correct, which will be done by comparing the outcomes of the existing model and the outcomes found by this research.

2.3 Overview Report

This paper examines the impact of the sport on the economy in different districts of Rotterdam. The first section will give an overview on the effects of sports on a local community. A distinction will be made between large events and amateur sports and economic and social aspects of sports. The next section will give an overview of the direct and indirect effects of sports in a district and the variables that reflect the economy of a district. The research section provides a theoretical and a statistical analysis about the impact of sports on the economy of the districts in Rotterdam. This will lead to the last section with the conclusion, limitations and recommendations for future research.

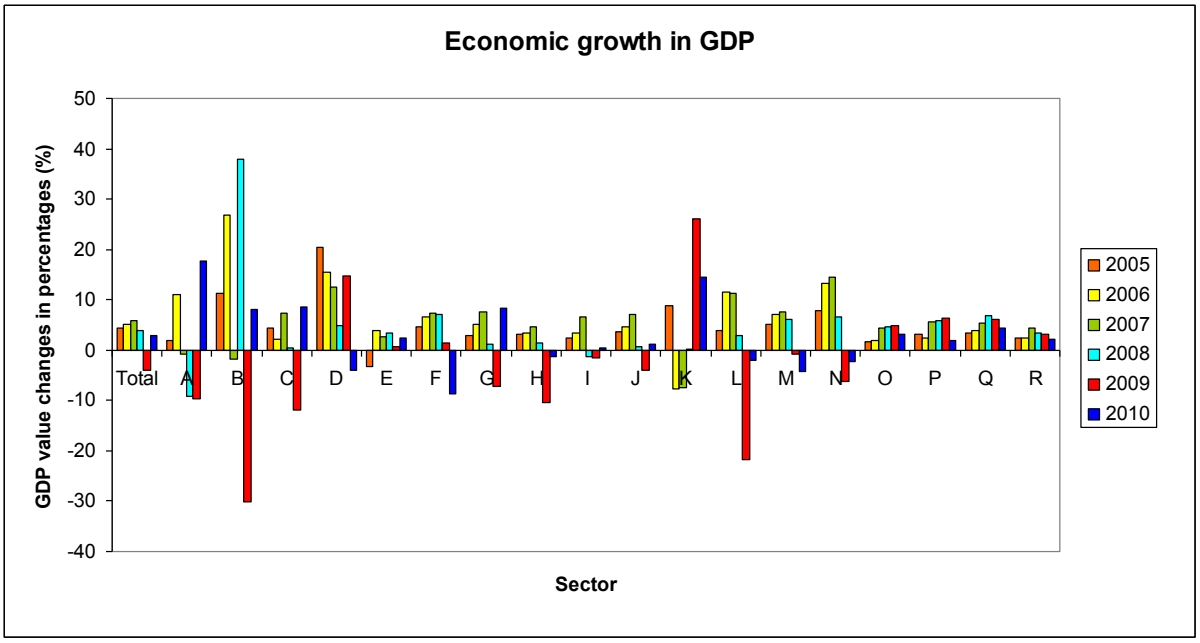
3 Literature review

The direct income for a city is mostly created by taxes, therefore large buildings and many inhabitants lead to more money for the municipality and economic growth. But there are other ways to created economic growth for a city that can improve the local district. This chapter will give the outcomes of previous research on why sports are important for people, districts and the economy. At first, the impact of large events on a district will be discussed. Hereafter the aspects, health, societal and performances of people who sport in local communities and which effect it has on the local economic growth of a district is reviewed.

3.1 Economic growth in a district

Cities are great economic drivers for a country, they have many inhabitants and many sectors are active within a city. The high level of companies in a city lead to many jobs and also creates high incomes for the city, such as taxes and rent (Porter, M.E., 1995). A city has many benefits for a company to settle there, such as good infrastructure and a large pool of employees.

Graph 1 shows the economic growth between 2005 and 2010 in the Netherlands for all sectors, what is clearly visible is the effect of the economic crisis in 2008, the economic growth in 2009 is for 11 sectors negative. The overall strong economic sectors of a country are mostly the trade and transport sector, industrial sector and the health sector (Central Bureau voor de Statistiek, 2010 (CBS)).



Graph 1: Gross Domestic Product per sector between 2002-2010. Source: CBS

Agriculture, forestry and fishing	A	Information and communication	J
Mining and quarrying	B	Financial institutions	K
Industry (no construction)and energy	C	Renting, buying, selling real estate	L
Electricity and gas supply	D	Other specialized business services	M
Water supply and waste management	E	Renting and other business support	N
Construction	F	Public administration and services	O
Wholesale and retail trade	G	Education	P
Transportation and storage	H	Health and social work activities	Q
Accommodation and food serving	I	Culture, sports and recreation and other service activities	R

These sectors serve many people and the economic development in this sector is very large. Therefore it is easy to say that these are the most important drivers for the Netherlands. The calculation of the GDP, account the added value of the produced product in the Netherlands. But not every city is alike, there are many different cities and districts within those cities. In the early 1960's the city centre was the economic driver of a city, all the companies were located in the centre since the transportation costs were high. Nowadays transport is not exclusive anymore and companies are much more flexible in their decision where to locate.

Most cities in the Netherlands were established between the 16th century and the 19th century, this is nowadays called the inner city and is mostly used for offices and stores. Outside the inner city you find houses where the working class used to live, most of it was built after the 19th century. In the 20th century, around 1950 more people moved towards the city to find jobs, but they also wanted to raise a family in an environment that met their standards, a quiet place near the city. New houses were built for families together with a new phenomenal, the apartment flats. This was done to increase the number of inhabitants on less space. These new houses were built outside the inner city, since there was more space available for new projects. After the 1970's these houses became too small and people wanted to live further away from the city since having a car was not exclusive anymore. The modern suburbs were built, outside the city and created suburbanisation, people moved away from the city and lived in quiet villages just outside the city. The improved infrastructure increased the possible living locations for people. In the 1990's the inner cities started to change, new offices were built together with apartments for the young urban professionals. They want to live where the action is, within a city close to their work and where they will not get stuck in a traffic jam, which is also called the re-urbanisation. This is the new image of the inner city. The area around the inner city is used for student housing, elderly and immigrants. These houses are cheap but are located near the city centre, which attracts people with less money or less space needed.

Box 1: The development of a city and its different districts

There is no straight definition of a district but it can be considered as unity of experience, as community, as physical spatial unit, as a social-cultural unit, administrative unit or abstraction of the reality (Ouwehand, A., and Meijeren, van A., 2007). People feel often more connected with their local community then with their city and because people are flexible about where they live, municipalities should make their city and districts attractive for the inhabitants, so that they will not leave. Every city is unique and has its own advantages. Cities try to exploit these advantages to attract people to live, work or just visit. Sport is one of those aspects that cities use to attract people, not only by providing sport facility centres but also with parks and lakes. But the sport sector is an example of a sector that cannot be expressed in terms of money very easily. It is difficult to measure the economic growth of sports for a district, because districts do not have their own GDP database, therefore other factors should be used to calculate the benefits for the economic growth. The difficulty makes politicians reluctant in providing municipalities with money to enhance sports in a city or district, even though sports can have many positive effects on people and for the district. This will be elaborated in the upcoming paragraphs.

The definition of district economy is as follows: "Fully exploiting the economic potential of a neighbourhood and its inhabitants, and thereby making a contribution to the economic vitality and viability of a neighbourhood" (Handboek Wijkeconomie, 2010). This manual for the district economy, written for the Dutch government, shows that the local economy stimulates the whole Dutch economy. Therefore, it is important to keep enhancing the local economy and stimulate the local inhabitants. Companies are very important to stimulate the economy in a district. These companies can decrease the unemployment rate (Ouwehand, A., and Meijeren, van A., 2007). To increase the economic development in a district the focus lies more on small groups, with new initiatives that decrease the number of high school dropouts and the unemployment rate. Municipalities try to do this by stimulating to social contact between people to increase the economic benefits.

The economy on a district level is import to analyse because it can show the differences between districts, e.g. the economy of a city can grow, but the differences between districts can increase or remain equal. Also is there a significant difference between districts and the employment rate (Cijfers: COS, Sociale Index 2010). Having a job is mostly defined by education, which is indirectly, connected with the district where people live and what they learn from each other.

Because sports are accessible for almost everybody it can be used as a tool to increase the economic development within districts. Because many sport clubs are focused on the local inhabitants.

3.2 Definition of sports

It is important to know what the definition of sport is before the impact of sports in a district is discussed. There are many definitions for the term sport, a combination of these definitions[1] is made and the following definition is created:

"Sport is a human physical activity that requires skills and often occurs in an organizational context, but can also be performed unbound, on condition that the rules for performance are internationally developed, and the activities can be performed in a team or individually, in a league or competition element of the activity or related activities."

With this definition it is important to keep in mind that school sports will not be taken into account since this is obliged for every pupil and was not chosen to obtain, and does not show the effects of a sports club. This report will focus on the effects of sports in a district that people choose to do. It is important that the decision that people make to sport is not forced, it needs to be something people want to do. Because only than it is possible to train more, to become better in one specific sport and obtain the positive effects of sports. Extra sport activities, which children can choose to do, designed in combination with schools, are taken into account.

3.3 Stadiums and sport events

Nowadays, cities try to achieve the title "sport city" because being a vital city contains sports. The last couple of years the Netherlands has shown that they are good in organizing large sport events. Such as the Grand Départ, Bavaria City race, ABN AMRO Tennis tournament etc. These are examples of commercial events that attract people from all over Europe. The large sport events are held at locations in a city centre, because here the hotels are easily accessible and the infrastructure is good, therefore people can easily access the event, which will lead to more visitors. These events are expensive to organise, but the city hopes that during these events people spend a lot of money on hotels and food so they can earn it back. These are direct benefits of the events, the economic impact of the Grand Départ was 20.8 million Euro (Vogelaar, D., 2010) and was visited by 100.000 people, but does this also contribute to the economy of the district. Van Bottenburg, (2003) argued that there is no impulse for people to sport when there is a top sport event. Therefore, it is not possible to have top sport without amateur sports but you can have amateur sport without top sport. A high amount of sport participation in a country increases the chance to win an Olympic medal, but the number of Olympic medal winners does not increase the sport participation within a country per se. Therefore, during the Grand Départ side events were organised to show the amateur side of this sport. This was done to show people that it was possible to practice this sport in their

own region (Hethartvanzuid, 2009), which can increase the awareness of this sport and give it a boost for local cycling clubs. Van Bottenburg created strict rules to determine the impact of the side events:

1. The federation's growth in membership must be more marked than before the championship. It is therefore essential to look at the figures over a long period of time.
2. The federation's growth in membership must be more marked than that of other sports federations, in which no major championship win has been achieved. Otherwise, the rise in membership could simply reflect a general trend. In other words, it is important to look at relative, not absolute growth.
3. The federation's growth in membership must be more marked that in other countries, in the same sport, where no major win has been achieved. So, international comparison must be part of the analysis.

Box 2: Three criteria for "Boris Becker effect". Source: Van Bottenburg (2002)

Large sports events are all about improving the image of a city and to attract as much people as possible, in a way to market the city to foreigners and new companies. If a city wants to host the largest sport event in the world, the Olympic Games, they need to built an Olympic Village for the sportsman and there crew, press etc. This is expensive, but the city makes these investments (e.g. infrastructure, housing, parks etc.) also for future use. Such an event will contribute to the marketing of a city. Not only the event itself will lead more visitors for the city, also after the event people are drawn to this location, to work or to live here. Tu, (2005) argues that new sport stadiums increase the value of houses in the surrounding area, because the infrastructure will be improved and especially for the low-income groups new jobs are created, such as construction. But according to Barclay (2002) the costs for this will not measure up to the benefits, take for example the cost and benefit models for the Olympics in London 2012, Barclay argues that the benefits such as the creation of jobs, is not a direct benefit, people who do the job are shifted from one job to another. Rosentraub et al., (1994) researched eight construction projects of large sport stadiums in Indianapolis, between 1970 and 1988, and concluded that the growth of employment had not significantly increased while building the stadiums. Therefore, large events do not contribute to more employment. Another impact on the district is that the houses that are built for the village have a higher value than houses that used to be in that area, which means that the poor people who live in this part of the city, will eventually leave this part of the city because of the high expenses. This means that most of the benefits of large events are not really benefits for the district. The city will of course gain a lot of publicity, new buildings and infrastructure, but this will not measure up against the costs.

Besides these commercial sport events, there is also the returning football competition throughout the year. The Netherlands counts 37 stadiums, these are mainly used for football clubs from the premier league and the first division. The municipalities are fond of these football stadiums, because they provide pride and a healthy, sportive image to a city. (Ahlfeldt, G.M., and Feddersen, A., 2008). Municipalities are so keen on their rural teams and their stadiums, because it gives the city a good image. This may attract new sponsors or large sport events in the future, such as the Olympics or a world championship.

But the municipality should not pay for these stadiums, since it is not beneficial for the city itself. Sport economist argue that there is no net economic benefit of a sports stadium, because the spending in a stadium, which is seasonal, are expenditures that could have better been spend on other things such as restaurants, since these have more economic benefits for a city or community (Miller, P.A., et al. 2002). Restaurants who will not earn those incomes cause more economic damage for a city than the incomes the stadium gains, since this will disappear in the stadium maintenance and its employees. Also the expense for a ticket to a football match cannot be used for other social events. On the other hand, if there are eating or drinking establishments in the area of the stadium, then it is possible that they receive direct effects from the stadium during a sport event. This will also increase the salary of the employees, but even though the earnings of the employees in the amusement and recreation sector increases, other economic sectors show a small decrease (Coates, D. and Humphreys, B.R., 2003). This means that it is not a benefit for the total community surrounding the sport stadium. Therefore, most benefits from the stadium are created by the image of the sports club (Ooijendijk, W.T.M., et al., 2000).

3.4 Health

In graph 1 it is viseable that the serivice sector has a high GDP level, but the people who work in these sectors need to be fit and able to perform well. To increase ones health, sport participation is a possible option. People who do not earn their income with sports but like to play sports are amateur sportsmen. They sport because sports are commonly known for a healthy life style and to keep your body in shape. Other reasons to sport are to be actively involved in a club (a social aspect), love for a game, to improve your ability and for relaxation (CSB Rapportage sport, 2010). The most important reasons why people do not sport are lack of time, too expensive and some people do not see it as a habit.

According to the CBS there are visible differences in sport participation between cultures, as can be seen in table 1. Not only is there a difference between cultures, there is also a difference in sport participation between different education levels, see table 2.

Age:	15-17	18-24	25-34	35-44	45-54	55-64	Older than 65
Turkish	58	46	38	30	31	26	13
Moroccans	70	59	41	29	19	8	5
Surinamese	67	62	49	53	43	26	23
Antilles	74	56	57	46	28	40	13
Autochthon	76	66	65	59	57	51	34

Table 1: Sport participation at least once a week, in ethnicity and age above 15, in 2006 in percentages. Source: CBS, Rapportage sport 2010.

Age:	6-11	12-17	18-24	25-34	35-44	45-54	55-64	65-74	Older than 75
Lo, lbo, mavo	-	63	39	31	32	35	383	31	15
Havo vwo mbo	-	48	56	43	46	54	46	47	16
College University	-	-	58	57	55	59	61	54	26

Table 2: Sport participation frequency, in education and age, in 2007. Source: CBS, Rapportage sport 2010.

People with a lower education, sport less than people with a higher degree. These differences are created through different lifestyles, people do not have enough money to sport, or not enough time. People who follow a bachelor or master course have a more flexible time schedule than people who are the same age but who have a full time job. The positive aspects of sports are better known by the higher educated people and therefore sport participation is higher in this category. This group was raised with sports, where as the other groups were not or at least less. This also accounts for non-western immigrants, which have a different cultural background and therefore do not see sport as an advantage for their life. A Canadian research by, Kremarik (2000), showed that children whose parent sport, tend to participate more often than other children. This research investigated that the income of parents is an important factor for children's sport participation, equipment and contribution is obliged and therefore, sport is not accessible for every child.

Playing sports can also have a negative effect on your health. Sports can lead to injuries that cost money, on a yearly basis 1.4 million sport injuries are medical treated from which 160,000 are treated in the emergency room. On average eight people die because of a sport injury. Contact

sports, futsal and hockey have a high number of injuries. The most risky group are guys under the age of 25, since they are the most active at sports (Rijksinstituuut voor Volksgezondheid en Mileu (RIVM), Sportblessures, 2010)

Calculated is that the costs of sport injuries are about 1.4 billion Euro's per year. 370 million from direct medical costs and 990 million from absenteeism costs (TNO, 2009). But does this measure up to the benefits of sports? The combination of playing sports and good food, decreases the number of obese people. The number of people with a BMI higher than 25 in the Netherlands is 40%[2] for both man and woman.

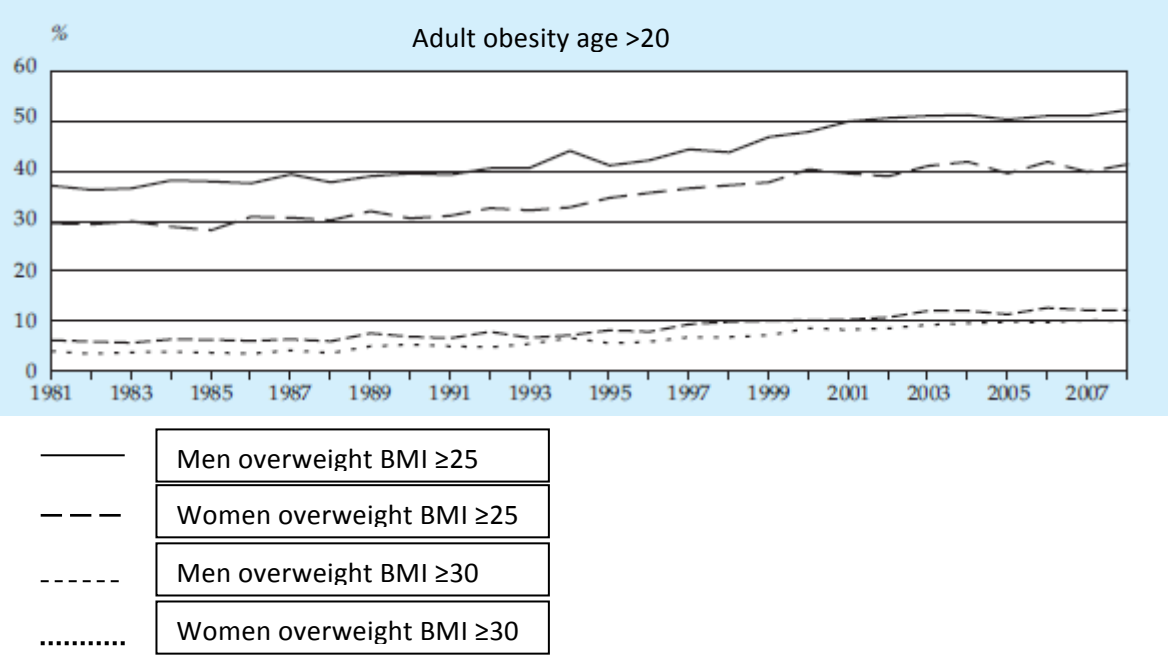


Figure 1: CBS, Permanent Onderzoek LeefSituatie (POLS), 2009

This is a serious problem, because the costs for obese people are higher than for normal weight people. The number of absentees are higher, which costs companies a lot of money, also the medical costs are higher. The duration of the illness is also longer and more often. Hence it is important that people lose weight, this is more expensive than the injuries that are caused by sports. A study by Guo and Chumlea (1999) found out, that the probability of children with high a BMI still being overweight and obese at the age of 35 years rises significantly throughout childhood, this means that young children under the age of five have less chance of becoming obese at a later age if they lose their extra weight. For older children the chances increase.

Losing weight can lead to a lower risk of diabetes type 2, heart diseases, infertility, high blood pressure etc. This can lead to less medical costs and less absentees at work. The promotion of sport

is done by communities and cities to achieve other goals in a city such as the health of people and social cohesion, sport is not a goal itself. Though the NOC*NSF has created a standard of 75% sport participation, that each municipality must achieve, this 75% is reached when the 75% of the inhabitants participate in a sport 12 times within 12 months for at least 30 minutes. With the *pressure* of this number, cities try to stimulate people to sport. This is done by asking which sports they like and try to put this in their community. The NOC*NSF has created this percentage to improve the direct effects that a sport can achieve, such as social interaction, health, national pride and so on. Also people who sport, move more actively in a day than people who do not sport. (Hildebrandt, V,H, et al., 2010). Therefore, the effect of the 75% participation will have extra effects for the people who start exercising.

Research has shown that people that sport are better in school, they feel more confident about themselves and feel more fit. This means they can work better in class and receive better grades. (Mulier Instituut, 2011). This can have an impact on their life expectations. People who have a higher education are more likely to live longer (RIVM, 2010).

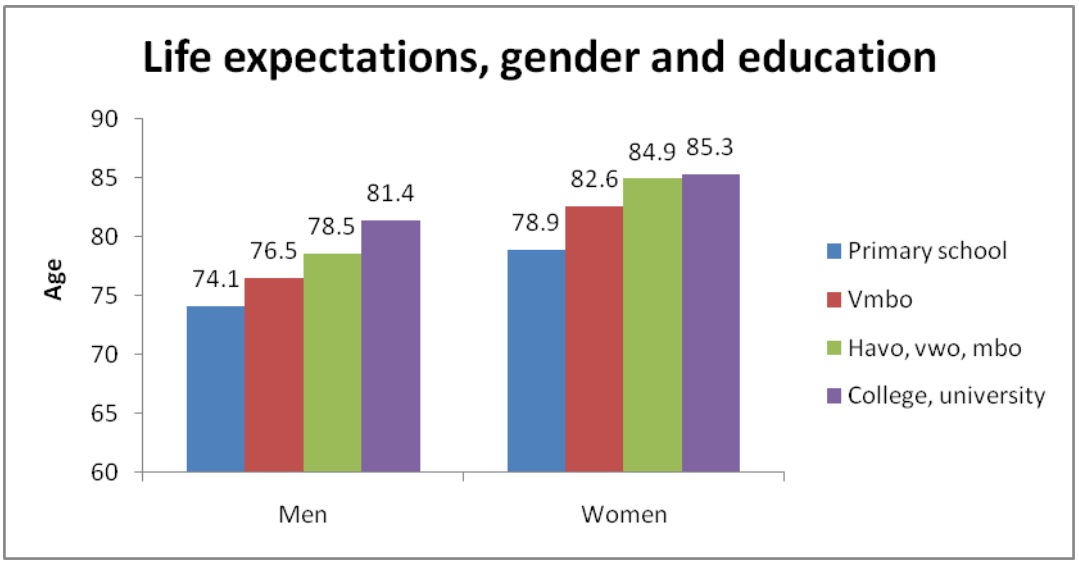


Figure 2: Life expectations in age compared to Dutch education levels, source: RIVM 2010

Not only do people live longer, they also grow older with smaller chances on health complications. (Warburton D.E.R., et al., 2006). This means that the absenteeism costs and the healthcare costs for people who are higher educated will decrease. A negative (economic) issue is that this will have an impact on the pension funds, if the sport participation will increase, people are likely to live longer every decade. This will increase the number of fit elderly, people are still in shape when they are 65 (the pension age) which can costs the government millions of Euro's to maintain the elderly with a pension fund. Therefore, the pension age will also increase, to cover these extra costs.

In conclusion, sports is very good for people's health, people perform better and can therefore improve their lifestyle, which can have an effect on the district where they live. The next paragraph will discuss the social impact of sports.

3.5 Social capital

Another reason to sport besides improving your health is the social aspect of sport. The social aspect should not be underestimated when it comes to economic benefits for a district, it is maybe one of the most important factors of the economic impact of sports. This chapter shall focus on the social effects of sports.

The social impact of sport for people is important because it can contribute in having a wider social network, where you can learn from and feeling more confident about yourselves (Uslaner, E.M., 1999).

This also accounts for children, because they learn in an interactive way to develop themselves, and within a team they learn how to communicate, play by the rules and learn about morality. Sports can also teach children to step up for themselves and learn how to lead a team. This can be beneficial for their future. In sports it is important that parents are supportive when a child is untalented and not enthusiastic, because not only is sport good for their social development, it also improves their health and physical shape, like it is for adults (McLaughlin, M., 2011).

This social impact can increase the social cohesion in a district, which is called *bonding* (Putnam, R.D., 2000). Social cohesion can be created by the interaction of (team) sports, even with individual sports such as running or skating, people like to do this together. When bonding occurs, people interact more with people who have the same cultural background and economic background. For social capital, bridging between the bonded groups is necessary, during this process social trust is very important (Knack, S., and Keefer, P., 1997). There is no clear definition for social capital, most definitions are in line with each other but focus on other aspects. But these two express the economic value of social capital in their definition:

'the web of social relationships that influences individual behaviour and thereby affects economic growth' (Pennar, 1997).

'friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital' (Burt, 1992).

These definitions of social capital suggest that social relations can stimulate the economic growth. Putnam (2000) also argues in his book that sport can increase the social capital whereas it can increase economic growth.

Networks are very important in social capital, because these social contacts can improve your financial status or bring you new job opportunities. The impact of sports on someone's social life is not difficult to determine, people who interact with other people have more understanding for other cultures (Delany. L., and Keany, E.,2005) and also is there a correlation between a membership of a sports club and the display of social trust[3]. Another issue that can increase the social capital is when people own their own house, if people have a higher education will this increase the chance of the possibility to buy a house (Iyer, S., et al. 2005). Because sports can improve people's performance and therefore can increase their income.

To enhance this social capital it is important to listen to the inhabitant and participants on their needs. This became clear after the experts interviews with sport facilitators and municipalities from Capelle aan den IJssel and Arnhem. The people in the neighbourhoods would like to practice a sport they have chosen themselves and should not be forced into football if they want to play volleyball. The supply should fit the demand if you want to increase the sport participation. If the inhabitants of the district are satisfied with the accommodation they are more willing to maintain the facility, this will increase the social relationship with the sport facility as a keystone.

Social capital can also increase people's opinion on their *quality of* life, which is a measurement that evaluates the well being of an individual. This standard can change over time, due to age and health etc. A community's environment can be changed if people in the same district increase in social capital. People would like to renovate their houses if this will increase the value of the district. This can attract new people and businesses, which can increase the economic growth of this district.

According to a research of the municipality of Rotterdam, parks, woods and public roads are the most popular place to practice sports. Another research has shown that attractive landscapes can increase house prices (Luttik, J. 2000), people want to pay more for a house if there is a lake or park nearby. Therefore large parks in a city are not only attractive for individual sportsmen who are unbound with a sports club, for example people who like to run or rollerblade, but this also increases house prices. Therefore, these locations can have a positive influence on a city and on the community.

3.6 Conclusion

This chapter showed that the economic impact of large sport events is not as large as people would think, overall the city will receive more income during an event, but afterwards the economy of a city will not grow because of this event. Therefore, a city must consider the pro's and con's of an event, because it should not bear the debts for a long time after the event. For that reason, to improve the economy in local districts, the municipality focuses more on local sport clubs and parks where people can sport at an amateur level. The number of (sport) amenities is also important for the valuation of the liveability within a district. Thereby a better health and social life are a direct effect of sport participation.

Overall sport affects the economy within a district, if people sport more they become healthier and can thus work more efficiently because they feel fit and have less absence days caused by illness. If they work more, people will earn more income, which they can spend on e.g. maintenance for their house, which can increase their house value. These are indirect effects based on theory, which will be examined for the municipality of Rotterdam in the upcoming chapter.

4 Sport effects on the local economy

This chapter will show the effects of sports on the economic impact of a district. The first part of this chapter will discuss the direct and indirect effects of sports in a district. After this the factors that improve the economy of a district will be discussed.

4.1 Effects

There are two types of effects that sport can have on a district, these are direct and indirect effects. The distinction between both effects on sport will be made in this paragraph. The effects of sport accommodations and sport facilitators will be considered.

Box 3 shows an overview of the number of sport and recreational facilities of the city of Rotterdam that can be used by the inhabitants. The city has created these facilities because it enhances the development of children and social activity of people. But what is the economic driver behind the construction of the facilities. This chapter will focus on the economic effects and which effects are increased by the sport participation.

377 sports fields (leased to 130 sports clubs) - 114 gymnasiums and sports halls -9 indoor pools and two outdoor pools - 10200 neighbourhood sports with 339,767 participants - 10,844 school sports with 353,992 participants - 25 community accommodations - 110 health accommodations - 62 (construction) playgrounds - 56 youth fields - 44 allotments - 4 utility garden complexes - 34 marinas / berthing accommodations - 7 petting zoos - 8 centres for Environmental Education - 2 special gardens - 2 school outhouses - 23 educational garden complexes

Box 3: Number of sport and recreational facilities of the City of Rotterdam 2009. Source: Feiten en cijfers, 2009 Municipality of Rotterdam

The people who sport in Rotterdam are on average high educated and between the age of 13 and 24. Almost 70% of this group, sport more than 12 times per year. The most favourite places to practice sport are unbound and in a park (36%) or along a road (29%). But the commercial sport facilitators are also important to enhance the sport participation, 32% of the people sport in a gym or sports hall and 29% at sports fields (Statistieken, Bevolkingsopbouw, Sociale index, VTO, Basisvoorzieningen; Gemeente Rotterdam, 2010).

4.1.1 Direct effect

The direct effects of sports are the investments costs and the benefits of the usage of sport accommodations and facilities. Sport facilities are expensive, they need a lot of space but are not occupied the whole day. But because sport is good for people's health the city can subsidize those sport clubs by decreasing the land price. Therefore, they can locate centrally in a community and also attract people who are depending on public transport. This is also a negative direct effect of sports,

since this ground could be used for a more economic beneficial activity, such as real estate for large multinationals. A sport club has many expenditures, such as rent for the property, nuts, salary for trainers, maintenance work, and sport attributes (e.g. outfits). These costs are directly for the club, and if these are neglected the club will not survive. It will also ensure that the club will actively try to attract new members and sponsors, which is necessary to reimburse the expenses.

The direct income of a club are membership contribution fee, subsidies from the municipality, sponsoring from companies, the income from the bar at the canteen, rental of the sport facility, lotteries, gifts from members or companies, fees for advertisement in club magazines and promotion merchandise (Sport & Fiscus, NOC*NSF Ernst & Young, 2007). If the sports club wants to stay vital, they must earn these incomes.

The people who sport have also direct benefits from their sport participation, if they sport they will lose weight, feel more confident and this will lead to healthier lifestyles. Which than lead to the indirect effects of sport participation.

4.1.2 Indirect effect

The indirect effects of sports are the effects that occur because of the direct effects. Such as the purchases of the sport accommodations and sport article suppliers, at other economic sectors who are not related to sports in the first place, and who stimulate the economy of a country. Examples are clients from sport supplies, such as manufacturing companies and logistic companies. Other indirect effects can be the effects on a district, such as the construction of a sports park or a stadium are two examples. An environmentally appearance of a neighbourhood can increase the value of a house (Luttik, J., 2000). Also the people who sport can create indirect effects, the sport participants create externalities that are positive for the neighbourhood. As seen in chapter two, the effect of sport participation, can increase the social cohesion of a neighbourhood. This social cohesion can lead to a higher satisfaction of the neighbourhood, and therefore it can lead to a cleaner and safer environment. All these effects are indirectly consequences of the sport accommodation or a green environment. These benefits may increase in housing prices, which can attract people to the neighbourhood that are willing to maintain their house. This clear appearance can lead to new investments from property developers, since this district has potential. The project “Kansenzones” is an example of a project created by the municipality, to increase the popularity of a district for the inhabitants. The city of Rotterdam has given neglected neighbourhoods a chance to create a new image and try to stimulate entrepreneurs to create a business, this in order to improve the economy within this district, which can eventually lead to a attractive location for (new) business and families.

4.2 Economic impact

Earlier this research discussed the impact of sports on people's social life and how sports can improve someone's health. But what are the economic effects of sports? To determine the economic impact in a district, it is important to know what defines the economy of a district. This thesis will describe the economy of a district with the following factors; the liveability of a district; the average disposable income of people within a district; the business climate; unemployment rate; school performance and the economic growth. These variables are chosen to determine the economic impact because each factor has an impact on the district economy (Handboek Wijkeconomie, 2010). If one of the variable improves it will, according to the definition visible in chapter three, improve the economy of a district. The combination of these factors give a good overview of the economic welfare in a district. Living and working are the two most important factors within a district (Beek, ter B., 2005), with the addition of the school performance of children and adolescents, these factors have an impact on children and therefore it affects the district.

4.2.1 Liveability

The liveability of a neighbourhood is one of the most important factors why people move to a district or move away from a particular district. The definition liveability has often been mixed up in studies by other terms, such as the quality of life, environmental quality and sustainability (Leidelmeijer and van Kamp, 2003). The most common mix up liveability and the quality of life will be further explained. The difference between liveability and the quality of life, is the different perspective of both terms. The definition of *liveability* uses the human being as their perspective while the term *quality of life* uses the environment as a focus point. For liveability this means: "fits the environment to the needs of the human being?" in this case the human being adds meaning to the liveability. The definition of the *quality of life* is: "How much does the environment affect the quality of living?" (Leidelmeijer and van Kamp, 2003) in this case the focus lies more on the environment. Visible in figure 1, is the connection between both definitions.

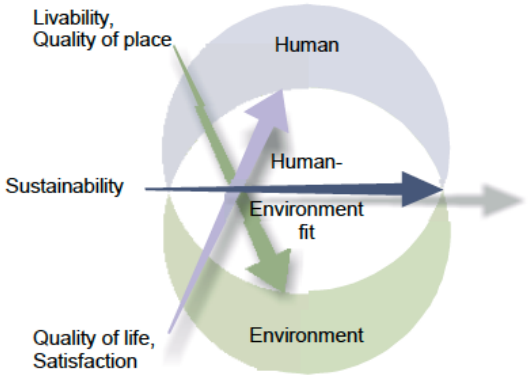


Figure 3: Perspectives on the connections between people and their environment, source: Leidelmeijer en van Kamp, 2003

4.2.1.1 Liveability dimensions

The liveability is difficult to measure because of the high emotional factor it contains (Veenhoven, R., 2000). To determine the liveability of a district, seven dimensions (Leefbarometer, 2010) can be defined, that has in total 49 indicators (see appendix 8 B). These dimensions are, housing, public spaces, facilities, demographics, social cohesion, safety and three other indicators that are not defined as a dimension. The literature review shows that sports is socially interactive and connects people, therefore this research assumes this has a positive effect on the liveability. The expert interview with Ruud Koning, a sport economist, from the University of Groningen, explained that there are two important factors that indicate the economic growth, this is the liveability and the price of a house. The price of a house is determined by the market, what do people want to pay for it? An appraiser will judge the value of a house on it state but also on its location. If the environment around the house is clean and green, the value will increase. The liveability plays an important role here. This aspect is important for people in their decision where they want to life. Therefore, the price of a house and the liveability of the neighbourhood represent the economic growth of a district. The liveability of a neighbourhood can change, if the inhabitants are willing to change it. This change can emerge when people feel the social cohesion in their neighbourhood, and when then think that the other people also want to change the image. But what looks cosy for the other can look messy for other people.

4.2.2 Income

The average disposable income within a district is the income that people have after taxes. This is the income they are able to spend. A study done by Deaton and Kahneman in 2010 shows that the annual income that people have, rise steadily with the evaluation of people's life, but at a certain income level will this not improve. This implies that money does not buy happiness, but it can make you believe you can live the life you desire. The income that you earn can therefore determine where you will live. Sport can be an important factor to increase your income, sport increases the health, which can increase performance at work and therefore the average disposable income.

4.2.3 Business climate

The business climate between districts can very much differ within a city. The reason for this can be clustering. Companies locate at the, for them, right location, where the market is large and where other companies are already located. Districts that need more companies are often not attractive to locate, otherwise companies would already be there. Therefore, small local projects are established to enhance the economy with new businesses. The research in "Bedrijvigheid en leefbaarheid in stedelijke woonwijken" showed that large companies do not have an impact on the employment and

liveability of a district. The same research *did* show that, if entrepreneurship within a district is stimulated, it increases the liveability in a district, because of the social control function of the small shops or restaurants. The social aspect of sports can possibly enhance the start-ups of new businesses, caused by the large network of sport facilities.

4.2.4 Unemployment

Usually a job is the most important resource of income. Not only is it financially important to have a job, it also improves your personal skills and your social life. Being unemployed can therefore have a negative influence on your health and your social life (Dooley, D., Fielding J., and Levi, L., 1996). The unemployment rate can be calculated by dividing the number of people between the ages 15-65 who are searching for a job, by the total number of the labour force (CBS). If this rate is too high in a district it can lead to impoverished neighbourhoods since people have not enough money to maintain their house (Beek, ter B., 2005). Also does the creation of extra jobs not lead to more employment in the district because the knowledge does not correspond with the knowledge of the inhabitants (Bedrijvigheid en leefbaarheid in stedelijke woonwijken, 2010). Sports can be a factor that can increase someone's network or intention to attend a training or course in order to find a job.

4.2.5 Education

The goal of education is to prepare individuals for the workforce. However, of equal importance is that education provides lives of dignity and purpose; to create knowledge; to develop personal skills, and to participate as informed citizens in a democratic society. In this globalized knowledge-based economy, education is widely recognised as a key driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. Education helps individuals to make better-informed and competent decisions in life, since education provides information, improves cognitive skills and strengthens socio-emotional capabilities. As such, education can help individuals to follow healthier lifestyles, manage illness, increase their interest in political issues and understand why immigrants can bring substantial benefits to society. Since education is very important for the development of a child, sports can be an important factor during this period for children. Sports can playfully teach children social skills and leadership skills as was discussed in in chapter three. People who do not have a high school diploma tend to have lower (healthy) life expectations and sport less, which means that they do not enjoy the benefits of sports, hence it is important to have a diploma.

5 Research design

5.1 Terminology and measurement

This research will analyse the effect of sports on the economy of a district. The city of Rotterdam, with his 74 districts, is chosen to be examined. Research is not focused on the industrial areas, but on the districts where people live and sport. The economic growth effects caused by sport cannot be measured since only data from 2009 about sport participation is available. Also causality is something we will not analyse in this study. Therefore, focus lies on the *relation* between sport and the dependent variable for one year.

5.1.1 Economic impact

In the previous chapter the factors that indicate the economic impact were discussed; liveability, average domestic income, the business climate, the unemployment rate and the high school dropout rate. To measure these factors this research used variables that describe these factors most optimal. For the variable sport participation is only data available from 2009. Because this is the most important variable for this research, only data from 2009 is used. Overall every variable has data available for 2009. The following economic variables will be used as the dependent variables.

To measure the factor liveability of a district this research will use the variable, *Liveability of 2010*, 2010 is used because 2009 was not available, since there is no or a small difference between 2008 and 2010, the study assumed that 2009 would have the same value. The hypothesis argues that sport can increase the liveability. People are healthier and are physically more able to maintain their house, which increases the liveability in a neighbourhood. This variable shows a complete overview of the liveability in a district. It contains many dimensions that cannot be reviewed separately.

For income the *Average disposable income for 2009* is used, this variable is adjusted for differences in size and composition of the household. The hypothesis “people who sport have more income” is based on the fact the people who sport have a wider network, which can lead to new, more satisfying jobs. If people like their job they are willing to work more. Also sport improves your health, which can also improve your performance at work, which can lead to a higher income. Income can also influence the sport participation. As seen in the literature review, the equipment to participate is expensive therefore this factor can interfere in sport participation. Hence, this variable should be carefully discussed with respect to the causality.

The variable used for the business climate for Rotterdam, is the *new business start-ups in 2009 per square kilometre*. The hypothesis “sport increases the number of new business start-ups” is assumed

because sport increases the personal network, which can be used for opening new businesses. This variable was created with two variables, business start-ups in 2009 and the surface of the districts, this in order to receive the number of businesses per square kilometre.

The unemployment rate is defined by the number of registered unemployed job seekers (longer than one year at CWI) divided by the working age population (15-64 years). This unemployment rate in 2009 is used as a variable in the hypothesis "higher sport participation decreases the unemployment rate". As discussed above, sport can increase your social network, which can lead to new job opportunities.

The variable *high school dropouts* is measured by the number of people *without a high school diploma between the age 17 and 22*. In the literature study it became clear that people without a high school diploma have more health problems and sport less. Therefore, the hypothesis argues that sport has a negative effect on the number of people without a high school diploma. This means that if the sport participation rate increases the number of people without a high school diploma decreases.

Concept	Measure
Liveability of a district	Liveability 2010
Income	Average disposable income 2009
Business climate	New business start-ups per km^2 2009
Unemployment rate	Percentage of people without a job 2009
High school dropouts	Percentage of people without a high school diploma 2009

Table 3: Variable overview

5.1.2 Sport variables

Sport will be used as independent variable. To use it as an independent variable the right variables must be defined, which can predict the impact of sports most optimal. Sport participation and the number of sport accommodations are the two main factors that are used. The sport participation for Rotterdam is registered at the municipal department Sport and Recreation. This number (2009) contains the amount of people per district in Rotterdam that sport more than 12 times per year, once a month. (COS, Sociale Index 2010). The numbers of sport facilities are counted per district and divided by the surface of the district to visualize the rate per km^2, even though the distances to sport facilities is not the main argument why people sport (Hoekman, R., et al. (2011)), this number does not say anything about the sport participation, since people are not bounded to one sport facility to sport. It does indicate that there is a possibility to sport and together with sport participation it gives

a complete overview of the sport behaviour in the districts. Health will be the last independent variable; it is an independent variable because this study wants to identify if health is significant important for all the depended variables. Assumed is that sport causes a healthier lifestyle and because it is combined with sport participation and sport facilities, this research can use this as another sport indicator. The health indicator is developed by a questionnaire from the research bureau of the Rotterdam municipality COS[4]. The correlation between the independent or dependent variables should not exceed |0.7|, if this occurs this variable will be left out of the equation (Field, A., 2005).

5.2 Control variables

When a control variable is added to the model, the output of the model has more value. Control variables are added to make sure that the output is not influenced too much by less important variables. Table 4 gives an overview of the control variables used for this research. The control variable cannot have multicollinearity |0.7| between the independent variables, because the overlap will be too high and they might control for the same thing, hence it will limit the size of R square. The relation between the independent variable and the dependent variables will be analysed with a regression analyses, the causality will not be tested, the assumptions are based on the literature review in chapter three.

Dependent variable	Control Variable
Liveability	Percentage of vacant houses
Average disposable income	High school dropouts, Safety index
Business settlement	Population density, Total number of businesses/km^2
Unemployment	No high school diploma, Safety index, Population density, Total number of businesses/km^2
High school dropouts	Ethnicity, Income, Drug disturbance

Table 4: Control variables

The percentage of vacant houses is used as control variable for liveability because this variable shows that people do not want to live in that house. Vacant houses can affect the liveability, because a high rate gives a negative image to a neighbourhood. The concept liveability consists of many dimensions (appendix 8 B) therefore it is difficult to control with other variables. Liveability has a too high correlation with income. It is logic that income and liveability are correlated, if within a district the average income is high, the houses are larger and better maintained, this enhances the liveability

dimension 'housing'. Unfortunately the dimensions of the variable liveability cannot be reviewed separately. Therefore *income* cannot be used as control variable.

The average income will be controlled with the percentages of high school dropouts and the safety index. This research used these two variables because assumed is that these two variables are affecting the income of people, therefore as well the disposable income. Assumed is that people in a safe environment tend to have less problems and intentions to commit crimes, and that this causes a higher income, according to the literature review.

For the dependent variable *business start-ups per km^2*, the population density per km^2 will be used as control variable. Assumed here is that more densely places will have more business start-ups because the number of customers is higher. The total number of businesses will be used as well, because of the cluster effect, more companies in a district lead to more companies.

The unemployment rate will be controlled with the variables, the percentage of people with no high school diploma, safety index, population density and the total number of businesses. The first variable is quite logic, if people do not have a high school diploma it will be more difficult to find a job. The safety index will be used in order to see if safety has an impact on the unemployment rate, because people in an unsafe/criminal environment might be affected by this and can lose their job because of undesired behaviour they might have adopted from their neighbourhood. This research will also use the population density, if there are more people living in a district the unemployment rate is assumed to be high, because there are too many people that can work but there are not enough jobs. Therefore this research will also use the variable, the total number of businesses in a district. Income of people is an important variable, which can indicate the unemployment rate, but since this variable shows multicollinearity with health and the variable high school dropouts, this variable cannot be used as control variable, because it will bias the model.

The high school dropout variable will use ethnicity, income and drug disturbance as control variables. The difference between ethnicity is visible in the CBS database, 7.1% of autochthone men compared to 14.5% of non western men immigrants leave high school without a diploma and 5.5% autochthone girls compared to 8.1% of non western girl immigrants have no high school diploma (see also table 1 and table 2). This variable will check if districts with a high number of immigrants will have a higher dropout rate. The average disposable income of parents can have an effect on the children, if the income is low, children tend to look for a job themselves, even though they are still in high school. Drug disturbance in the neighbourhood can have a negative effect on the children who live there, if they decide to do drugs the change of dropping out will be higher.

5.3 Data collection

The data to explain the variables that are needed for this research were mostly available at online databases, based on the advice from the interviewed experts about which data would be most valid to research this topic and the data used in literature for similar research is used.

The data about sport participation and the number of sport facilities is provided by the Rotterdam department of Sport and Recreation. This data is based on the response of 175 people per district. The output is a percentage of people who sport at least 12 times per year. The measurement of the sport participation is done with the survey of RSO, Richtlijn Sportdeelname Onderzoek. The data for the health index can be found at the COS Buurtmonitor Rotterdam, the Centre for Research and Statistics (Cijfers: COS, Sociale Index 2010). The data for the dependent variables were also derived from the COS database. Thereby, data from the CBS is used, to check for additional data. The liveability data is available at the database of the Rijksoverheid, the government website of the Netherlands.

The data used for the number of sport facilities is counted without paintball, laser game, cultural activities, playgrounds, snooker and pool centres, dog training centres, and overlapping sport halls is accounted as one. Even though these activities can possibly increase the social activities of people, it does not overlap with the definition of sports.

5.4 Research method

This research will use the multiple regression analyses in SPSS to test the different hypothesis. This in order to find not only the impact of sport participation, but also for health and sport facilities. Moreover, an analysis of variance, ANOVA, is performed and executed for every hypothesis, to analyse the explanatory power of the models.

The main hypothesis will be tested with sub hypotheses, these will have the following formulas:

H 2)	$Liveability = \beta_0 + \beta_1 * Sport\ participation + \beta_2 * Health\ index + \beta_3 * Sport\ facilities\ per\ km^2 + \beta_4 * Vacant\ houses\ rate + \varepsilon_i$
H 3)	$Ln\ Average\ Income = \beta_0 + \beta_1 * Sport\ participation + \beta_2 * Health\ index + \beta_3 * Sport\ facilities\ per\ km^2 + \beta_4 * High\ school\ diploma + \beta_5 * Safety\ index + \varepsilon_i$
H 4)	$Business\ start\text{-}ups\ per\ km^2 = \beta_0 + \beta_1 * Sport\ participation + \beta_2 * Health\ index + \beta_3 * Sport\ facilities\ per\ km^2 + b_4 * Population\ density + \beta_5 * Total\ businesses\ per\ km^2 + \varepsilon_i$
H 5)	$Unemployment\ (percentage) = \beta_0 + \beta_1 * Sport\ participation + \beta_2 * Health\ index + \beta_3 * Sport\ facilities\ per\ km^2 + \beta_4 * High\ school\ diploma + \beta_5 * Safety\ index + \beta_6 * Population\ density + \beta_7 * Total\ businesses\ per\ km^2 + \varepsilon_i$
H 6)	$No\ high\ school\ diploma\ (percentage) = \beta_0 + \beta_1 * Sport\ participation + \beta_2 * Sport\ facilities\ per\ km^2 + \beta_3 * Ethnicity + \beta_4 * Income + \beta_5\ Drug\ disturbance + \varepsilon_i$

Due to the fact that the data of the average disposable income is not normally distributed, the natural logarithm is taken from this variable. This transformation produces a new variable that is mathematically equivalent to the original variable, but expressed in other measurement units so it becomes (more) normally distributed, even though for a multiple regression this is not necessary. It does also improve the normality or the distribution of the errors, which is an assumption of the multiple regression analyses. Overall a one-tailed significance test is used, in order to identify if sport has a positive effect on H1, H2, H3 and H4, and a negative effect on H5 and H6.

6 Sports in Rotterdam

6.1 Empirical results

The descriptive statistics in table 5, will give a summary of the variables that this research will use for the regression analysis, these values are not necessary for the interpretation of the regression analyses. The mean for sport participation is 56.53% this means that the target of the NOC*NSF, which is 75% sport participation, is not reached yet. There are also some missing values, they are caused by the lack of information.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Sport participation (Percentages)	74	39	79	56,53	9,219	,346	,279	-,660	,552
Health index 2009	71	1	5	3,21	1,158	,198	,285	-1,313	,563
Total number of sport facilities per km2	74	,00	19,44	6,3305	4,14203	,860	,279	1,395	,552
Unemployment rate	69	1,00	11,10	4,8464	2,70101	,299	,289	-,845	,570
No high school diploma	70	4,00	29,00	15,3571	4,50454	-,105	,287	,502	,566
Liveability	74	1	6	3,88	1,033	,097	,279	-,258	,552
Ln Average disposable income	73	9,72	10,67	10,0051	,22273	1,090	,281	,810	,555
Total number of business start ups per km2	74	,00	90,00	23,8319	21,54353	1,163	,279	,800	,552
Total number of businesses per km2	74	6,53	1596,72	287,8826	274,60232	2,078	,279	6,279	,552
Drug disturbance	68	1	37	9,91	7,113	1,381	,291	2,457	,574
Non wersten immigrants (Percentages)	73	2,00	79,00	33,7808	20,64666	,440	,281	-,745	,555
Safety index	69	3,9	10,0	7,336	1,8481	-,073	,289	-1,136	,570
Population per km2	74	39	19117	8008,09	5570,383	,464	,279	-1,108	,552
Vacant houses	73	2	19	9,03	4,024	,718	,281	,023	,555
Valid N (listwise)	63								

Table 5: Descriptive statistical output

Visible is that the Skewness and Kurtosis is normal distributed for the dependent variables. The statistic of the Skewness and the Kurtosis cannot exceed|2|to be normal distributed. This implies that the distribution of the errors will also be close to normal.

The correlation between the variables can be found in appendix 8 D. The independent variables are not allowed to correlate more than |0.7| with each other to avoid multicollinearity. The first model for the dependent variable *liveability* shows no multicollinearity but there is a highly positive significant* correlation between liveability and the health index. This is not surprising because health and income are positively related to each other according to the theory, and income is a dimension

* Statistically significant: p (one tailed) <0.05

in the liveability variable. Liveability is not measured by the variable health hence, this variable can be used for the model H3. Sport participation has a positive significant correlation. The variables sport facilities and vacant houses are negatively correlated with the dependent variable, but only sport facilities is statistically significant. The negative correlation of sport facilities can by caused by the location of sport facilities. Mostly these facilities are located at densely populated areas, these areas are highly negatively correlated with liveability (it is also an indicator in the dimension, see appendix 8 B). The reason why vacant houses is not significant can be caused by the small size of the sample is or the great variance between the data.

The average disposable income is positively significant correlated with sport participation, the health index and the safety index. The percentage of people with no high school diploma and the number of sport facilities per km^2 are negatively significant correlated with income. This correlation matrix shows only the relation between variables, it does not indicate causality between variables. These outcomes were already assumed. The reason why the correlation between sport facilities and the average disposable income is negative can be caused by the location of the sport facilities. The correlation matrix with all variables, shows a significant correlation of 0.38 between population density and the sport facilities rate, and a densely populated area does not have a positive effect on a district.

The number of new business start-ups per km^2 in 2009 is positively correlated with the percentage of sport participation and it is statistically significant at a 5% level. The business start-ups variable is also positive statically significant correlated with the number of sport facilities per km^2, population density and total number of businesses per km^2. The positive correlation between population density and total number of businesses was already predicted. The clustering effect and the high customer rate are assumed to be stimulating factors for new business start-ups. The fact that number of sport facilities per km^2 is positive significant correlated can be caused by the popular location of sport facilities, near people, and therefore this location is also interesting for new businesses.

Model H5, the hypothesis for unemployment, has a statistically significant negative correlation between health and unemployment of -0.820. Because these variables are not both predictors in the equation, this will not be changed. The model does not have multicollinearity between the independent variables in its output. The other predictor variable, sport participation is also negatively statistically significant, this was already expected, note that this is research only shows a relation between the variables and not the causality. The safety index has also a statistically

significant negative effect on the unemployment rate. The population density shows a positive relation with the unemployment rate, which indicates that in densely populated areas, a higher unemployment rate is detectible. The percentage of people without a high school diploma is statistically significant positively correlated, which means that people without a high school diploma will have more chance of being unemployed. The number of sport facilities is positively correlated with the unemployment rate, which can probability be allocated to the fact that sport facilities are located at densely populated places which has also a positive effect on the unemployment rate. But since no test of causality is taken, this cannot be proved.

In the results based on the correlation analyses it is visible that sport participation has a statistically significantly negative effect on the number of people without a high school diploma, the number of sport facilities is positive correlated but this is not statistically significant. This analysis did not use the variable health, because this leads to too much multicollinearity between the dependent variables. This factor is also not as important as income and non-western immigrants. The income showed a negative statistically significant correlation whereas drug disturbance and the percentage of non-western immigrants leads to a positive statistically significant correlation. There is a sign of a small multicollinearity between drug abuse and the variable non-western immigrants (0.711), but both variables are calculated with different records and are therefore not linked. This multicollinearity will not bias the outcome, because the correlation between the two variables remains the same if the similar independent variables are used (in a linear regression) with a different dependent variable.

This research also tested the correlation between health and sport participation and results show that these two variables are statistical significant positive correlated. An odd thing that can be seen in the correlation matrix is that the relationship between the number of sport facilities and the sport participation for all the models is negatively correlated. Again, Hoekman (2011) concluded this also in his research about distance to sport facilities. A high rate of sport facilities does not increase the sport participation. The number of sport facilities per km^2 only shows a positive correlation for the dependent variable business start-ups. This can be caused by the location of the sport clubs, at densely populated areas. The densely populated areas have a negative relation with the other dependent variables. Before more conclusions are drawn, the regression output should be analysed. But overall this correlation output has given a few hints about the outcome for the rest of this research.

6.2 Regression analysis

To discuss the output of the regression, the tests to check the assumptions of a multiple regression must be analysed. This needs to be done to test if the analyses are not biased and to give a true and powerful meaning to the regression output. The regression output will be discussed per hypothesis.

	Model 1a Liveability	Model 1b	Model 2a Income	Model 2b	Model 3a Business Start-ups	Model 3b
Sport participation	0.483****	0.004	0.644****	0.281***	0.223*	0.129*
Sport facilities	x	-0.323****	x	-0.009	x	0.034
Health index	x	0.692****	x	0.529****	x	0.140*
Vacant houses	x	-0.168**	x	x	x	x
Population per km^2	x	x	x	x	x	0.445****
No high school diploma	x	x	x	-0.093	x	x
Safety index	x	x	x	0.090	x	x
Total businesses per km^2	x	x	x	x	x	0.595****
F test	20.704****	42.596****	46.032****	27.397 ****	3.596*	62.026****
Adjusted R-square	0.222	0.707	0.406	0.667	0.036	0.813
Observation #	70	70	67	67	71	71

	Model 4a Unemployment	Model 4b	Model 5a No high school diploma	Model 5b
Sport participation	-0.564****	-0.228**	-0.438****	-0.231
Sport facilities	x	-0.038	x	-0.073
Health index	x	-0.394****	x	x
No high school diploma	x	-0.04	x	x
Safety index	x	-0.225*	x	x
Population per km^2	x	0.307***	x	x
Ethnicity	x	x	x	0.134
Drug Disturbance	x	x	x	0.113
Ln Average disposable income	x	x	x	-0.243
Total businesses per km^2	x	-0.132	x	x
F test	29.431****	27.893****	15.198****	5.646****
Adjusted R-square	0.308	0.746	0.179	0.263
Observation #	65	65	66	66

*NB. t-values in parentheses; * p<0.1, ** p<0.05, *** p<0.01, **** p<0.001.*

Table 6: Regression output

The assumptions of the predictors must have some variance and should be homoscedastic. Again there should be no multicollinearity between the variables, therefore this study used the standard of |0.7|. The independent errors are tested with the Durbin-Watson test. If this outcome is smaller than two and greater than one, it means that there is a positive correlation and if this number is larger than two and smaller than three, than there is a negative correlation between the variable residuals. If the value lies between these ranges, the outcome is not disturbing. If the outcome is exactly two, it means that the residuals are uncorrelated, which is the most appropriate outcome. All data is independent and linear, which is tested by scatter plots. Every hypothesis has two models, (A) without the control variables and (B) with the control variables.

The betas in the model predict, that if the independent variable increases by one standard deviation (sd), the dependent variable will increase or decrease with the beta from the independent variable times the sd of the dependent variable, if the other independent variables remain equal (A. Field, 2005) (appendix 8 D). Below, every hypothesis will be analysed with the output given in table 6.

*H 2) Sport participation in a district of Rotterdam has a **positive** impact on the liveability of a district in Rotterdam.*

The liveability is an ordinal category, assumed is that this is an interval, because the value *two* is twice as bad as the value *four*, therefore this study use this as an interval variable. Non-zero variance means that the errors are homoscedasticity and are normally distributed; this is the case for this analyses. The Durban Watson test gave an output of 1.628, therefore there is a small positive correlation between the residuals. This study meets all the assumptions and it is therefore a valid regression. Now the regression output can be analysed.

The betas in this model show that there is a positive effect of the predictor variables, sport participation and health. Sport facilities and the percentage of vacant houses are negative coefficients. Sport participation is the only variable that is not statistically significant at a $P<0.05$ level. Looking at model 1a, it is clear that sport participation is statistically significant, but together with the other three variables the significance decreases. This means that the other variables have more impact on the liveability than income.

The adjusted R square for this model is 0.707 this means that 70.7% of the liveability is explained by this model. The adjusted R square takes into account the multiple independent variables that are used for this equation. The adjusted R square only increases when the new variable adds a significant contribution to the model. The F test is also statistically significant, which means that the model is a good predictor for the effect on the liveability in Rotterdam.

*H 3) Sport participation in a district of Rotterdam has a **positive** impact on the average disposable income of people who live in a district of Rotterdam.*

The average income is a quantitative variable and does not have zero variance. The Durban Watson test gave an output of 1.684, therefore there is also small positive correlation between the residuals.

The betas for this equation found in the coefficients test show that all variables are positive except for the variables sport facilities per km^2 and the percentage of people with no high school diploma. But the only variables that are statistically significant are the sport participation and the health index. The other variables are not statistically significant. Because the dependent variable is normilized with a natural logaritm it is important to know how to interprete the ln dependent variable. This can be interpreted by taking the inverse of the ln(dependent). The inverse of ln(x)=y is given by $Y = e^x$

An increase by one sd (8.8%) of sport participation:

*X=Ln (Average disposable income) = 0.281 ($\beta_{Sport\ participation}$) * 0.21743 ($SD_{Ln\ Average\ disposable\ income}$) + ε_i*

0.061=X

If you calculte e^x will it give the Average disposable income.

Average disposable income will increase with 1.063 Euro, when the sport participation increases with 8,8%.

Box 4: LnX inverse

This box shows that sport participation has a small impact on the average disposable income, because health is statistically significant as well. The indirect effect of sport participation is assumed to be larger. The adjusted R square for this model is 0.667, therefore this equation shows 66.7% of the effect of income. When looking at model 2a, sport participation alone predicts 40.6%. This means that 26.1% is explained by the other four variables. The F test of the first model, shows that the test for both models is statistically significant at a P< 0,05 level, but the value of the F test in the second model decreased, which means that the extra variables decrease the ability to predict the outcome.

*H 4) Sport participation in a district of Rotterdam has a **positive** impact on the business climate of a district in Rotterdam.*

The number of business start-ups had a value of 2.120 in the Durban Watson test, which means there is a very small negative correlation between the residuals. All the assumptions are met, therefore this is a valid regression. This model is mostly explained by the total number of businesses per km^2 and the population density, since both variables are the only statistical significant variables

at a 5% level. The sport participation is for both models statistically significant at a 10% level. Health is also statistically significant at a 10% level, with respect to the business start-ups per km^2. The variable sport facilities per km^2, has no significant effect within this model.

The adjusted R square for this model is 0.813, which means that 81.3% is explained by this model. The F test output is higher and statistically significant for model b, which means that the predictors for the number of new business start-ups improved with the extra variables.

*H 5) Sport participation in a district of Rotterdam has a **negative** impact on the unemployment rate of a district in Rotterdam.*

The unemployment rate is the first variable where the hypothesis states a negative influence. The Durban Watson test gave an output of 1.857, which means there is a very small positive correlation between the residuals. All assumptions are met and therefore it can be concluded that this regression is also valid. Now the regression output can be analysed.

When checking the significant value of the variables it is clear that the variables; number of sport facilities, people with no high school diploma and the total number of businesses are not statistically significant. Sport participation, the health index, the safety index and the population density on the other hand are statistically significant. The negative relationship between the dependent variable and the sport participation, health index and safety index was already predicted in the hypothesis. The population index shows a positive effect, meaning that in a district with more people the unemployment rate is significantly higher is. The adjusted R square shows a high explanatory power of this model of 74.6%, which implies that the unemployment rate can be explained with this equation. Clearly the addition of the variables health, sport facilities and the control variables increases the predictive power. The F test slightly decreases, which may imply that there is another variable that has a significant impact on the unemployment rate.

*H 6) Sport participation in a district of Rotterdam has a **negative** impact on the high school dropouts in a district in Rotterdam.*

This regression shows the impact of five variables on the percentage of people with no high school diploma. The Durban Watson test gave an output of 1.769, which means there is small positive correlation between the residuals. All assumptions are met and therefore it can be concluded that this regression is again valid. The initial model had also health as an independent variable in the equation, but since this is highly correlated with income, it was decided to leave this measure out. Income is for the dependent variable more meaningful.

This model shows no statistically significant effects on the percentages of high school dropouts in Rotterdam districts for all the independent variables. But when looking at model 5a visible is that the impact of sport participation alone is higher than in model 5b, also the F test shows that modal 5a is a better predictor. The adjusted R square is for model 5b higher than for model 5a, although it does not differ much. The model has an explanatory factor of 26,3%, which is not high for a regression analysis, this means that other variables predict the number of people without a high school diploma better. Therefore, it can be concluded that the variables used are not the ones which predict the high school dropout numbers. This in spite of literature, which suggests these variables are important (Russell W. Rumberger, 1987).

6.3 Discussion

Control variables are used in the regression analysis to test the model on false interpretation. This leads to an increasing R square, which means that the output gets more accurate by including more variables. This is quiet logic because the dependent variables are not influenced by one variable. When the adjusted R square is statistically significant it means that the variance of the predicted scores are statistically significantly different than (larger than) the residual variance, which is tested with the F-test (A. Field, 2005). Even though the regression is statistically significant, overall it leads to a lower significance of the sport participation, which implies that the other variables have a greater impact on the model.

Evaluating the regression analysis results it can be noted that not every coefficient (beta) is significant, which means that the probability of occurrence depends more on chance. The reason behind this can be devoted to the fact that the data sample is not large enough or that the data is not measured well enough. The data for sport participation received from 175 participants from every district this can lead to large differences. A too large variance can also lead to less significance of the data, but this problem can be solved by scaling the data. The output of the regression analyses shows the existence of a relation between the dependent and independent variables, causality cannot be measured with a linear regression. Therefore, the interpretation of the output should carefully be discussed, with help from the literature review.

*H 2) Sport participation in a district of Rotterdam has a **positive** impact on the liveability of a district in Rotterdam.*

This hypothesis must be accepted when looking at the simple linear regression with sport participation as only variable. Sport participation has a significant positive effect on the liveability in Rotterdam. But this research must look at the entire model to decrease the chance of accepting a

false hypothesis, which is called a type I error. So when looking at the model with four independent variables, this hypothesis must be **rejected**, because sport participation is not significantly positive. The cause for this is that liveability contains many dimensions, where the influence of sport is so small compared to other explaining variables, such as health. Sport can have an indirect effect on the liveability, because sport increases the health of people. But because the causality was not tested the indirect relation, though health, cannot be fully confirmed. Even though the relation between health and sport participation was explained in the literature, there is no empirical evidence about the causality. For now sport participation gives no statistically significant direct effect on the liveability factor of a district.

*H 3) Sport participation in a district of Rotterdam has a **positive** impact on the average disposable income of people who live in a district of Rotterdam.*

This hypothesis must be accepted when looking at the simple linear regression, because sport participation has a significant positive relation with the average disposable income in Rotterdam. When looking at the model with three independent variables this hypothesis must be **accepted** as well, because sport participation has again a significantly positive relation with the average disposable income. This is also what was expected, health and sport participation are both positive significant predictors because income is very much affected by the job performance. If people feel healthy and fit they are much more efficient in their job which leads to more income. But even though the literature states this, the causality between the variables is not tested in the research, this research can only reveal that there is a relationship. The sport participation can be higher in districts with a higher average disposable income. These people can pay contribution for sport clubs and facilities easily, which enhances the sport participation. A higher education level, which was explained in chapter three, is also a factor that can explain a higher sport participation rate, because people with more money tend to have a higher education. But since there is no causality test this effect cannot be confirmed. The reason why the control variable *'having no school diploma'* is very low, can be explained if another variable is more important such as experience. Unfortunately, this data is not available.

*H 4) Sport participation in a district of Rotterdam has a **positive** impact on the business climate of a district in Rotterdam.*

This hypothesis must be rejected when looking at the simple linear regression, because sport participation has no significant positive effect on the new business start-ups in Rotterdam. Also the model with five independent variables must be rejected, because sport participation is not

statistically significantly positive. The assumption made about the positive relationship between new businesses and population density is correct, a high population leads to more new businesses in a district. The total number of businesses has also a positive statistically significant effect, which means that the new business start-ups like to operate where other businesses are already located. The reason why companies locate close to each other is to increase the conveniences for their clients and therefore to gain more clients. There are more important factors to start a new business than the sport participation. An odd thing is that the relationship between health and the business start-ups has changed from negative not significant in the correlation matrix, to positive not significant in the coefficient matrix. This is caused by the impact of the other variables, but since this is not significant this cannot be further explained.

*H 5) Sport participation in a district of Rotterdam has a **negative** impact on the unemployment rate of a district in Rotterdam.*

When analysing the simple linear regression, with sport participation as only variable, this hypothesis needs to be accepted, which means that sport participation has a significant negative effect on the unemployment rate in Rotterdam. When adding six other variables to control the impact of sport participation, it remains statistically significantly negative. Health has an even larger negative statistical significant relation with the unemployment rate. Health and sport participation are also 0.553 correlated, which means there is a relationship between both variables. Therefore, this hypothesis must be **accepted**. Sport participation has a negative relationship with the unemployment rate, which indicates that if people sport more often they chances of getting unemployed is lower, or that people who are unemployed sport less. Research done by A.R. Thurik et al. in 2008, showed that self-employment reduces the unemployment after a few years, which means that the entrepreneurial mentality has an impact on the unemployment rate. This can be assigned to social cohesion, which can indirectly be caused by sports as assumed in the literature. A positive statistically significant effect of the population density is also visible, therefore this research can prove that in densely populated districts, the unemployment rate is higher. A possible cause for this can be the lack of jobs, but when looking at the correlation output it can be assumed that this has another reason, since this variable is significantly negatively correlated with the variables health and no high school diploma. Therefore, the population density can influence the unemployment rate, but only and only if this variable is negatively related to liveability and the health index.

*H 6) Sport participation in a district of Rotterdam has a **negative** impact on the high school dropouts in a district in Rotterdam.*

The last sub hypothesis that will be analysed can be accepted when looking at the simple linear regression, with sport participation as only variable. Here sport participation has a significant positive effect on the school performance in Rotterdam. Because when the number of sport participants increases, the number of people without a high school diploma will decrease, which shows a positive relation. With the addition of the control variables, the significance of sport participation decreases and is not significant anymore. Therefore, this hypothesis must be **rejected**, the variables are not significant and have therefore no impact on the dropout percentage in districts of Rotterdam. The cause for this can be explained by the fact that other variables play a more important role e.g. intelligence, but this data is not available. The literature review showed a difference in high school dropout rates between sex, This research does show the negative effect of income and sport participation on high school dropouts, therefore there is a negative correlation but it is not significant. As seen in the literature review, sport can improve ones ability to lead and interact. This can enhance school performance, even though the results does not show a significant evidence for this, the literature does describes a positive effect.

*H 1) Sport participation in a district of Rotterdam has a **positive** impact on the economy of a district in Rotterdam.*

The main hypothesis must be accepted when only taking sport participation as independent variable and the economy of a district explained with the five dependent variables. Sport participation has a significant positive relation ($P<0.1$ level) for all hypotheses. But when looking at the complete model with control variables, only two out of five hypotheses are accepted, the average disposable income and the unemployment rate. Considering the regression results in table 4 and explaining the meaning of the coefficients, the main hypothesis cannot be fully confirmed. The factors that were created to identify the economy of a district are not all statistically significant related to sport participation. Therefore, this research needs to make some concessions to confirm the main hypothesis. Sport participation has only an impact on the economy, when looking at the income of people and the unemployment rate within a district. Although the coefficients of sport participation in the multiple regression analyses are not all significant, they all are pointing to the same direction as the hypothesis would assume (a positive or negative effect). Hence no unexpected outcomes occurred in this research.

To conclude, this research verified that when adding more variables into the model, the hypothesis that sport participation has a positive impact on the economy of districts could not be completely confirmed. This research concludes that sport participation has no large direct effect on the economy of the districts in Rotterdam when taking all five dependent variables as economic indicators.

7 Conclusions, limitations and recommendations

7.1 Conclusions

This report tried to answer the question: What impact does sport have on the economy of districts in Rotterdam? Sport has a positive effect on people's lives, but that sport participation has a positive impact on the economy of a district cannot be completely confirmed. The regression analyses showed that from the five economic indicators that were used, *liveability, average disposable income, new business start-ups, unemployment and high school dropouts*, only income and the unemployment rate are statistically significant related to sport participation. The impact of sports on the economy is thus very small. However, it must be noted that the causality between the variables was not tested. The literature review discussed the personal positive effects that are caused by sports, the social network of people and ones health can increase if people are able to sport. These are two effects that can have an effect on the economy as well. Also, there is a relation between sport participation and the health index. The regression analyses showed that there is a statistically significant positive connection between health and the variables liveability, average disposable income and the unemployment rate. Hence, health has a somewhat larger positive effect on the economy measured with the five dependent variables. This can give an indirect relation between the liveability and sport participation. This increases the effect of sport participation and a districts economy. Therefore the economy of a district has thus a relation with health and sport participation, but it is not significantly large.

Because the causality between the health and sport participation was not tested, the relationship between health and sport participation can work both ways. Healthy people are more likely to sport, which is impediment accounts for all variables. Based on the literature review a positive effect of sport participation was found. This means that if people sport more often they become healthier and will have less absence days at work and if they work more, they will earn more income, which they can spend on e.g. maintenance for their house, which can increase the value of their house. An increase in housing prices in a district leads to economic growth for that specific district. But this cannot be confirmed with the regression analyses in this report. However this research can support the fact that there was no negative effect found in the regression analyses caused by sport participation on any of the five variables.

To improve the positive effects of sport participation the municipality should improve the sport participation rate by making sports available for everybody. This can be done by discussions with inhabitants of different districts about their sportive wishes. This will assure the participation and the maintenance of the sport facility or club. The literature review indicated that sport participation

differs among groups, younger people sport more often, immigrants sport less etc. and because of this there is a difference of sport participation between districts. Therefore, there will always be people who have no time or are not physically able to sport, but there is a change to reach the 75% sport participation goal.

Last remark, even though there is a small effect of sport participation on the economy of districts in Rotterdam, health has a larger effect on the economy of a district, therefore the municipality of Rotterdam must invest in sport because without losing some money on sport investments the city cannot win healthy inhabitants!

7.2 Limitations

Every research has its limitations. This is not automatically a bad thing or a sign that the study is not reliable, but it means that you will have to make concessions and keep in mind the limitations when analysing the data and reading the outcomes. This study has some limitations in the data gathering. Sport participation is the only available data that explains the sport behaviour of people in a region, this study tried to expand this variable with the number of sport facilities, but this outcome is (only) negatively significant for the variable liveability in this research, as is visible in table 6. This variable has a positive correlation with population density, which has also a negative correlation with liveability. Therefore the rate of sport facilities does not say anything about the sport behaviour in a district and it has a negative correlation with sport participation.

The research used existing data found on Cos, the database with facts and figures about Rotterdam. The data collection of Sport Participation is based on 175 respondents per district, which can lead to a large variance among different districts. Another aspect about this variable is that the data is only available for 2009, therefore this study cannot measure the impact of sports over time or the impact on the economic growth in a district. The recommendation that this research can provide for further research about the impact of sports on the economy of districts, is that the municipality should use multiple years of data about sport participation to determine the impact of sport over a longer period. After a couple of years the department of S&R can see which variable has the largest effect on sport on the long run and which variable is mostly affected by sports. This can change the policy that tries to increase the sport participation. Another limitation about the sport participation data analyses is that the variables sex and age are not considered. These variables are not used because this study focussed on the effect of sports on the economy and not on the question: “How can sport participation be increased?” Further research on this topic can investigate this question, because this topic is in line with this research, the increase of sport participation can exploit the positive outcomes of sports.

Another limitation is that this research could not measure the effect of sport participation on the housing prices per square meter, the department of municipal taxes of Rotterdam was not willing to release this dataset because the effect would be too far fetched and would not lead to any statistical significance, they argued that other factors, such as construction date, liveability and the type of object would have a much more significant impact on the values.

Additionally, as has been mentioned before the coefficients of the independent variables in the regression are not all significant. This is not self-evident and might be caused by variables that have a large variance in the data or are not related to the dependent variable. Especially for the variables *number of new business start-ups* or *no high school diploma*.

The limitation on the data analyses concerns the fact that the causality of the variables could not be tested, due to the lack of advanced statistical programs using s*tructural equation modelling*. This research only explains if there is a relationship but does not explain if the dependent variable causes an effect on the independent variable or the other way around. The literature was used to explain the causality as much as possible, but this does not exclude the existence of the third-variable problem.

This study recommends testing the causality between the dependent variables and sports, to give a better supported interpretation to the outcome. Also the causality between sport and health should be tested. If health is caused by sport participation and not the other way around, the dependent variables will increase in significance since health is a much broader definition than sport participation and better applicable to the dependent variables that define the economy of a district. The variables that were now used to determine the economic effect can also be changed to more abstract variables such as networking, social cohesion and work absence rates. Sport can have a direct effect on these variables, which will have on their turn a significant relation with the original dependent variables. So that sport participation has a larger indirect effect on the dependent variables.

7.3 Recommendations

This research would like to comment on the model for the city of Rotterdam created by Flux, which has another approach than this study. This study has created five models to discuss the relationship between sport participation and the five economic variables that *can* be influenced by sports without calculation the direct monetary effect. Whereas the model by *Flux* calculated the benefits of sport for Rotterdam, in Euro's without testing the relationship between sports and the variables (Health, Employment, Income and Schooling, Liveability and Real estate) upfront, assuming that this relationship exists and that sport is a main factor that causes the large effects. This report shows that sport is only significant accountable for a small part of the income and the unemployment rate, which are only two items of the five items that Flux discusses. Although sport is partly responsible for a better health, health can also calculate the indirect effects of sport participation.

Another shortcoming of the Flux model is the expenditures of sportsman at sport facilities. If people spend on average seven Euro's per visit at a sport facility, they cannot spend this at other facilities, a restaurant or a cinema etc. Therefore this amount does not increase the economy because of sports, they would have used it for other alternatives as well.

Another aspect that Flux should have done is to explain the use of the gravity model. The literature study indicated that the number of sport facilities does not increase the sport participation per se, therefore the gravity model of Flux does not mean anything for their research. Hoekman (2011) proved that distance has no significant effect on the sport participation. Perhaps narrow communication with the inhabitants of a district can increase the sport participation, when the municipality creates sport facilities they like to use (Hulligie, L., 2011), but existing sport facilities will not be used more without a discussion about the needs of the inhabitants. The good thing that Flux discussed in their model is the distinction between men, women and age, it clarifies the differences between age and sex when it comes to sport participation.

Overall can be concluded that the department of Sport and Recreation can use parts of this model, because the relationship between sport, health, unemployment and income does exist, but S&R should not base there complete budget on this model, because it can lead to a disappointing output.

8 Appendix

A Flux, economic impact of sports model

Baten van Sport in de Wijk



In een consortium van Innosport NL (dochter van NOC NSF) Gemeente Amsterdam, BPF Bouwinvest, Ymere en Stadsgenoot hebben fluX en Kadenza een software programma ontwikkeld dat inzicht geeft in de baten van nieuwe (of verplaatste) sportvoorzieningen in de wijk. De baten zijn onderverdeeld in:

- gezondheid
- (minus) zorgkosten
- werkgelegenheid
- scholing
- leefbaarheid
- vastgoed

Zowel voor een nieuwe als een bestaande wijk kan het programma inzicht geven in de verwachte baten. Niet alleen georganiseerde sport maar ook ongeorganiseerde sport is meegenomen (trapveldjes, basketbalveldjes etc).

We hebben dit software pakket gemaakt ter ondersteuning van ruimtelijk beleid ten aanzien van investeringen in sportvoorzieningen. De verschillende baten van sport hebben namelijk niet allemaal dezelfde eigenaar. Sommige baten zullen bij de gemeente vallen, sommige baten bijvoorbeeld bij de eigenaren van het vastgoed in het gebied. De huidige trend dat maatschappelijke partners investeren in openbare ruimte en voorzieningen vraagt om een onderbouwing welke investeringen zij kunnen terug verdienen in de waarde van de wijk. Tevens is het voor de gemeente belangrijk te wete welke baten bepaalde sportvoorzieningen creëren en welke plaats in de stad de meeste baten genereert.

Dit software pakket is een eenvoudige tool die de baten voorspeld van een nieuwe (of herstructurering van een oude) sportvoorziening. Het is gekoppeld aan google earth om daarmee

een overzicht te geven van hoe de baten verspreid zijn in de gemeente.

Uiteraard is het mogelijk om het pakket uit te breiden met analyse tools die voor het consortium dan wel klant specifiek van belang zijn.

De training om met het programma te leren werken zal een dagdeel in beslag nemen en daarnaast wat voorbereiding treffen:

- opleveren van relevante cases
- opleveren van scenario's voor de omvang en de aard van de sportvoorzieningen

Ter ondersteuning van:

- beleidsplannen intern
- onderhandelingen met maatschappelijke partners
- inzicht in dynamiek van sportparticipatie (voor kinderen en volwassenen)
- inzicht in de (positieve) invloed van sport op vastgoed en leefbaarheid

Source: Tielen. E., 2010. Onderzoek Sport in de wijk. [online]Firma Flux. Available at: <http://edbr.nl/Documenten/presentatie%20onderzoek%20niet%20financiele%20waarden%20sport%20Rotterdam.pdf > [Accessed 9 January 2012]

B Liveability indicators

	Indicator	Peildatum[18]	Dimensie
1	Dominantie vrijstaande woningen	1-1-2010	Dimensie "Woningvoorraad"
2	Dominantie tweekappers	1-1-2010	
3	Dominantie flats met meer dan 4 verdiepingen	1-1-2010	
4	Dominantie etagewoningen	1-1-2010	
5	Dominantie boerderijen en tuinderijen	1-1-2010	
6	Dominantie stedelijke statuswoningen	1-1-2010	
7	Dominantie suburbane statuswoningen	1-1-2010	
8	Dichtheid	1-1-2010	
9	Percentage sociale huurwoningen	1-1-2010	
10	Dominantie 1940-1959 bouw	1-1-2010	
11	Dominantie 1970-1979 bouw	1-1-2010	
12	Dominantie vroeg naoorlogs (1945-1960)	1-1-2010	
13	Dominantie vooroorlogse bouw (tot 1940)	1-1-2010	
14	Waarde verkochte huurwoningen	2009	Dimensie "Publieke ruimte"
15	Aandeel sloop	2009	
16	Geluidsbelasting railverkeer	2009	
17	Geluidsbelasting totaal	2009	
18	Nabijheid groot water	1-1-2010	
19	Groene ruimte tussen vroeg naoorlogse bouw	1-1-2010	
20	Water in de wijk	1-1-2010	
21	Uitzicht op binnenwater	1-1-2010	
22	Nabijheid supermarkt	1-1-2010	Dimensie "Voorzieningen"
23	Nabijheid bankfiliaal	1-1-2010	
24	Nabijheid groot winkelcentrum	1-1-2010	

	Indicator	Peildatum[18]	Dimensie
25	Aandeel niet-werkende werkzoekenden	31-12-2009	Dimensie "Bevolkingssamenstelling"
26	Dominantie inkomens tot 2x modaal	1-1-2010	
27	Dominantie minimuminkomens	1-1-2010	
28	Dominantie inkomens meer dan 2x modaal	1-1-2010	
29	Aandeel niet-westerse allochtonen	1-1-2010	
30	Aandeel hoogopgeleiden	1-1-2010	
31	Dominantie middelbare paren zonder kinderen	1-1-2010	Dimensie "Sociale Samenhang"
32	Dominantie jonge paren zonder kinderen	1-1-2010	
33	Dominantie oudere paren zonder kinderen	1-1-2010	
34	Dominantie jong alleenstaand	1-1-2010	
35	Dominantie middelbaar alleenstaand	1-1-2010	
36	Aandeel ouderen	1-1-2010	
37	Aandeel gezinnen met kinderen	1-1-2010	
38	Homogeniteit gezinnen met oudere kinderen	1-1-2010	
39	Homogeniteit gezinnen met jonge kinderen	1-1-2010	
40	Dominantie eigenaar bewoners	1-1-2010	
41	Verhuizingen (mutatiegraad)	2009	
42	Vernielingen	2009	Dimensie "Veiligheid"
43	Verstoring openbare orde	2009	
44	Geweldsmisdrijven	2009	
45	Diefstal uit de auto	2009	
46	Overlast	2009	
47	Nabijheid natuurgebied	1-1-2010	Niet toebedeeld aan een dimensie
48	Nabijheid bos	1-1-2010	
49	Nabijheid kust	1-1-2010	

Table 7 Source: Leefbaarheid in Balans Ontwikkeling van de leefbaarheid in de periode 2008-2010 op basis van de Leefbaarometer. 2010, Ministerie van Binnenlandse Zaken, The Netherlands.

C Districts of Rotterdam

Source: Cijfers COS, Sociale Index 2010

Stadsdriehoek
Oude Westen
Cool
Cs Kwartier
Nieuwe Werk
Dijkzigt
Delfshaven
Bospolder
Tussendijken
Spangen
Nieuwe Westen
Middelland
Oud Mathenesse
Witte Dorp
Schiemond
Kleinpolder
Schieveen
Zestienhoven
Overschie
Landzicht
Agniesebuurt
Provenierswijk
Bergpolder
Blijdorp
Liskwartier
Oude Noorden
Schiebroek
Hillegersberg Zuid
Hillegersberg Noord
Terbregge
Molenlaankwartier
Rubroek
Nieuw Crooswijk
Oud Crooswijk
Kralingen West
Kralingen Oost
Kralingse Bos
De Esch
Struisenburg
Kop van Zuid
Kop van Zuid - Entrepot
Vreewijk
Bloemhof
Hillesluis
Katendrecht
Afrikaanderwijk
Feijenoord
Noordereiland
Oud IJsselmonde
Lombardijen
Groot IJsselmonde
Beverwaard
Pernis
s Gravenland
Kralingseveer
Prinsenland
Het Lage Land
Ommoord
Zevenkamp
Oosterflank
Nesselande
Tarwewijk
Carnisse
Zuidwijk
Oud Charlois
Wielewaal
Zuidplein
Pendrecht
Zuiderpark
Heijplaat
Hoogvliet Noord
Hoogvliet Zuid
Strand en Duin
Dorp

D SPSS output

Correlations

		Sport participation (Percentages)	Total number of sport facilities per km2	Health index 2009	Unemployment rate	No high school diploma	Liveability	Ln Average disposable income	Total number of business start ups per km2	Total number of businesses per km2	Drug disturbance	Non wersten immigrants (Percentages)	Safety index	Population per km2	Vacant houses
Sport participation (Percentages)	Pearson Correlation	1	-,194*	,580**	-,537**	-,485**	,424**	,655**	,243*	,147	-,231*	-,250*	,310**	-,075	,044
	Sig. (1-tailed)		,049	,000	,000	,000	,000	,000	,018	,105	,029	,016	,005	,262	,355
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Total number of sport facilities per km2	Pearson Correlation	-,194*	1	-,237*	,236*	,112	-,486**	-,264*	,368**	,400**	,219*	,390**	-,341**	,381**	-,126
	Sig. (1-tailed)	,049		,023	,025	,178	,000	,012	,001	,000	,036	,000	,002	,000	,145
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Health index 2009	Pearson Correlation	,580**	-,237*	1	-,823**	-,517**	,785**	,776**	-,069	-,066	-,531**	-,732**	,579**	-,531**	-,013
	Sig. (1-tailed)	,000	,023		,000	,000	,000	,000	,284	,293	,000	,000	,000	,000	,459
	N	71	71	71	67	69	71	70	71	71	68	70	69	71	70
Unemployment rate	Pearson Correlation	-,537**	,236*	-,823**	1	,564**	-,788**	-,762**	,147	,137	,606**	,820**	-,655**	,581**	,066
	Sig. (1-tailed)	,000	,025	,000		,000	,000	,000	,114	,130	,000	,000	,000	,000	,295
	N	69	69	67	69	67	69	69	69	69	65	69	66	69	68
No high school diploma	Pearson Correlation	-,485**	,112	-,517**	,564**	1	-,488**	-,547**	,006	,018	,358**	,374**	-,355**	,213*	,101
	Sig. (1-tailed)	,000	,178	,000	,000		,000	,000	,480	,443	,002	,001	,002	,038	,204
	N	70	70	69	67	70	70	70	70	70	66	70	67	70	69
Liveability	Pearson Correlation	,424**	-,486**	,785**	-,788**	-,488**	1	,709**	-,402**	-,430**	-,640**	-,826**	,773**	-,652**	-,083
	Sig. (1-tailed)	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,244
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Ln Average disposable income	Pearson Correlation	,655**	-,264*	,776**	-,762**	-,547**	,709**	1	-,126	-,113	-,491**	-,615**	,516**	-,525**	,052
	Sig. (1-tailed)	,000	,012	,000	,000	,000	,000		,144	,171	,000	,000	,000	,000	,333
	N	73	73	70	69	70	73	73	73	73	67	73	68	73	72
Total number of business start ups per km2	Pearson Correlation	,243*	,368**	-,069	,147	,006	-,402**	-,126	1	,844**	,549**	,410**	-,526**	,683**	,142
	Sig. (1-tailed)	,018	,001	,284	,114	,480	,000	,144		,000	,000	,000	,000	,000	,115
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Total number of businesses per km2	Pearson Correlation	,147	,400**	-,066	,137	,018	-,430**	-,113	,844**	1	,505**	,356**	-,604**	,528**	,181
	Sig. (1-tailed)	,105	,000	,293	,130	,443	,000	,171	,000		,000	,001	,000	,000	,062
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Drug disturbance	Pearson Correlation	-,231*	,219*	-,531**	,606**	,358**	-,640**	-,491**	,549**	,505**	1	,708**	-,825**	,590**	,323**
	Sig. (1-tailed)	,029	,036	,000	,000	,002	,000	,000	,000	,000		,000	,000	,000	,004
	N	68	68	68	65	66	68	67	68	68	68	67	68	68	67
Non wersten immigrants (Percentages)	Pearson Correlation	-,250*	,390**	-,732**	,820**	,374**	-,826**	-,615**	,410**	,356**	,708**	1	-,729**	,750**	,160
	Sig. (1-tailed)	,016	,000	,000	,000	,001	,000	,000	,000	,001	,000		,000	,000	,089
	N	73	73	70	69	70	73	73	73	73	67	73	68	73	72
Safety index	Pearson Correlation	,310**	-,341**	,579**	-,655**	-,355**	,773**	,516**	-,526**	-,604**	-,825**	-,729**	1	-,549**	-,385**
	Sig. (1-tailed)	,005	,002	,000	,000	,002	,000	,000	,000	,000	,000	,000		,000	,001
	N	69	69	69	66	67	69	68	69	69	68	68	69	69	68
Population per km2	Pearson Correlation	-,075	,381**	-,531**	,581**	,213*	-,652**	-,525**	,683**	,528**	,590**	,750**	-,549**	1	,001
	Sig. (1-tailed)	,262	,000	,000	,000	,038	,000	,000	,000	,000	,000	,000	,000		,497
	N	74	74	71	69	70	74	73	74	74	68	73	69	74	73
Vacant houses	Pearson Correlation	,044	-,126	-,013	,066	,101	-,083	,052	,142	,181	,323**	,160	-,385**	,001	1
	Sig. (1-tailed)	,355	,145	,459	,295	,204	,244	,333	,115	,062	,004	,089	,001	,497	
	N	73	73	70	68	69	73	72	73	73	67	72	68	73	73

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Liveability	3,84	1,016	70
Sport participation (Percentages)	56,80	9,380	70
Total number of sport facilities per km2	6,6817	3,97922	70
Health index 2009	3,23	1,157	70
Vacant houses	9,00	4,000	70

Correlations

		Liveability	Sport participation (Percentages)	Total number of sport facilities per km2	Health index 2009	Vacant houses
Pearson Correlation	Liveability	1,000	,483	-,489	,783	-,135
	Sport participation (Percentages)	,483	1,000	-,257	,585	,051
	Total number of sport facilities per km2	-,489	-,257	1,000	-,269	-,126
	Health index 2009	,783	,585	-,269	1,000	-,013
	Vacant houses	-,135	,051	-,126	-,013	1,000
Sig. (1-tailed)	Liveability	.	,000	,000	,000	,132
	Sport participation (Percentages)	,000	.	,016	,000	,338
	Total number of sport facilities per km2	,000	,016	.	,012	,149
	Health index 2009	,000	,000	,012	.	,459
	Vacant houses	,132	,338	,149	,459	.
N	Liveability	70	70	70	70	70
	Sport participation (Percentages)	70	70	70	70	70
	Total number of sport facilities per km2	70	70	70	70	70
	Health index 2009	70	70	70	70	70
	Vacant houses	70	70	70	70	70

Liveability

Descriptive Statistics

	Mean	Std. Deviation	N
Ln Average disposable income	9,9960	,21743	67
Sport participation (Percentages)	56,30	8,821	67
Total number of sport facilities per km2	6,7160	4,03013	67
Health index 2009	3,13	1,140	67
No high school diploma	15,3433	4,45024	67
Safety index	7,257	1,8159	67

Correlations

		Ln Average disposable income	Sport participation (Percentages)	Total number of sport facilities per km2	Health index 2009	No high school diploma	Safety index
Pearson Correlation	Ln Average disposable income	1,000	,644	-,223	,787	-,524	,496
	Sport participation (Percentages)	,644	1,000	-,213	,561	-,439	,268
	Total number of sport facilities per km2	-,223	-,213	1,000	-,218	,096	-,333
	Health index 2009	,787	,561	-,218	1,000	-,520	,559
	No high school diploma	-,524	-,439	,096	-,520	1,000	-,355
	Safety index	,496	,268	-,333	,559	-,355	1,000
Sig. (1-tailed)	Ln Average disposable income	.	,000	,035	,000	,000	,000
	Sport participation (Percentages)	,000	.	,042	,000	,000	,014
	Total number of sport facilities per km2	,035	,042	.	,038	,219	,003
	Health index 2009	,000	,000	,038	.	,000	,000
	No high school diploma	,000	,000	,219	,000	.	,002
	Safety index	,000	,014	,003	,000	,002	.
N	Ln Average disposable income	67	67	67	67	67	67
	Sport participation (Percentages)	67	67	67	67	67	67
	Total number of sport facilities per km2	67	67	67	67	67	67
	Health index 2009	67	67	67	67	67	67
	No high school diploma	67	67	67	67	67	67
	Safety index	67	67	67	67	67	67

Average Disposable Income

Descriptive Statistics

	Mean	Std. Deviation	N
Total number of business start ups per km2	24,6449	21,59014	71
Sport participation (Percentages)	56,80	9,313	71
Total number of sport facilities per km2	6,5876	4,02949	71
Health index 2009	3,21	1,158	71
Population per km2	8276,61	5509,778	71
Total number of businesses per km2	299,0781	274,76424	71

Correlations

		Total number of business start ups per km2	Sport participation (Percentages)	Total number of sport facilities per km2	Health index 2009	Population per km2	Total number of businesses per km2
Pearson Correlation	Total number of business start ups per km2	1,000	,223	,334	-,069	,668	,839
	Sport participation (Percentages)	,223	1,000	-,253	,580	-,115	,122
	Total number of sport facilities per km2	,334	-,253	1,000	-,237	,336	,364
	Health index 2009	-,069	,580	-,237	1,000	-,531	-,066
	Population per km2	,668	-,115	,336	-,531	1,000	,506
	Total number of businesses per km2	,839	,122	,364	-,066	,506	1,000
Sig. (1-tailed)	Total number of business start ups per km2	.	,031	,002	,284	,000	,000
	Sport participation (Percentages)	,031	.	,017	,000	,171	,156
	Total number of sport facilities per km2	,002	,017	.	,023	,002	,001
	Health index 2009	,284	,000	,023	.	,000	,293
	Population per km2	,000	,171	,002	,000	.	,000
	Total number of businesses per km2	,000	,156	,001	,293	,000	.
N	Total number of business start ups per km2	71	71	71	71	71	71
	Sport participation (Percentages)	71	71	71	71	71	71
	Total number of sport facilities per km2	71	71	71	71	71	71
	Health index 2009	71	71	71	71	71	71
	Population per km2	71	71	71	71	71	71
	Total number of businesses per km2	71	71	71	71	71	71

Business Settlements

Descriptive Statistics

	Mean	Std. Deviation	N
Unemployment rate	4,9415	2,72603	65
Sport participation (Percentages)	55,95	8,675	65
Total number of sport facilities per km2	6,7742	4,04695	65
Health index 2009	3,11	1,147	65
No high school diploma	15,3077	3,93670	65
Safety index	7,323	1,8016	65
Population per km2	8905,98	5312,557	65
Total number of businesses per km2	311,9989	277,65241	65

Correlations

		Unemployment rate	Sport participation (Percentages)	Total number of sport facilities per km2	Health index 2009	No high school diploma	Safety index	Population per km2	Total number of businesses per km2
Pearson Correlation	Unemployment rate	1,000	-,564	,231	-,820	,607	-,646	,571	,107
	Sport participation (Percentages)	-,564	1,000	-,217	,553	-,595	,328	-,022	,166
	Total number of sport facilities per km2	,231	-,217	1,000	-,211	,046	-,368	,321	,354
	Health index 2009	-,820	,553	-,211	1,000	-,609	,607	-,483	-,014
	No high school diploma	,607	-,595	,046	-,609	1,000	-,428	,301	-,031
	Safety index	-,646	,328	-,368	,607	-,428	1,000	-,593	-,601
	Population per km2	,571	-,022	,321	-,483	,301	-,593	1,000	,492
	Total number of businesses per km2	,107	,166	,354	-,014	-,031	-,601	,492	1,000
Sig. (1-tailed)	Unemployment rate	.	,000	,032	,000	,000	,000	,000	,197
	Sport participation (Percentages)	,000	.	,041	,000	,000	,004	,432	,093
	Total number of sport facilities per km2	,032	,041	.	,046	,358	,001	,005	,002
	Health index 2009	,000	,000	,046	.	,000	,000	,000	,457
	No high school diploma	,000	,000	,358	,000	.	,000	,007	,404
	Safety index	,000	,004	,001	,000	,000	.	,000	,000
	Population per km2	,000	,432	,005	,000	,007	,000	.	,000
	Total number of businesses per km2	,197	,093	,002	,457	,404	,000	,000	.
N	Unemployment rate	65	65	65	65	65	65	65	65
	Sport participation (Percentages)	65	65	65	65	65	65	65	65
	Total number of sport facilities per km2	65	65	65	65	65	65	65	65
	Health index 2009	65	65	65	65	65	65	65	65
	No high school diploma	65	65	65	65	65	65	65	65
	Safety index	65	65	65	65	65	65	65	65
	Population per km2	65	65	65	65	65	65	65	65
	Total number of businesses per km2	65	65	65	65	65	65	65	65

Unemployment

Descriptive Statistics

	Mean	Std. Deviation	N
No high school diploma	15,3636	4,48120	66
Sport participation (Percentages)	56,15	8,806	66
Total number of sport facilities per km2	6,7860	4,01982	66
Non wersten immigrants (Percentages)	36,2576	19,91004	66
Ln Average disposable income	9,9952	,21900	66
Drug disturbance	10,09	7,135	66

Correlations

		No high school diploma	Sport participation (Percentages)	Total number of sport facilities per km2	Non wersten immigrants (Percentages)	Ln Average disposable income	Drug disturbance
Pearson Correlation	No high school diploma	1,000	-,438	,092	,429	-,523	,358
	Sport participation (Percentages)	-,438	1,000	-,198	-,307	,646	-,203
	Total number of sport facilities per km2	,092	-,198	1,000	,303	-,221	,218
	Non wersten immigrants (Percentages)	,429	-,307	,303	1,000	-,683	,711
	Ln Average disposable income	-,523	,646	-,221	-,683	1,000	-,489
	Drug disturbance	,358	-,203	,218	,711	-,489	1,000
Sig. (1-tailed)	No high school diploma	.	,000	,232	,000	,000	,002
	Sport participation (Percentages)	,000	.	,056	,006	,000	,051
	Total number of sport facilities per km2	,232	,056	.	,007	,037	,039
	Non wersten immigrants (Percentages)	,000	,006	,007	.	,000	,000
	Ln Average disposable income	,000	,000	,037	,000	.	,000
	Drug disturbance	,002	,051	,039	,000	,000	.
N	No high school diploma	66	66	66	66	66	66
	Sport participation (Percentages)	66	66	66	66	66	66
	Total number of sport facilities per km2	66	66	66	66	66	66
	Non wersten immigrants (Percentages)	66	66	66	66	66	66
	Ln Average disposable income	66	66	66	66	66	66
	Drug disturbance	66	66	66	66	66	66

No High School Diploma

E Interview

In mijn thesis zal ik onderzoeken wat de beste manier is om de economische invloed van sport in een wijk te meten. Het gaat hier om amateur sport in een wijk. Zoals verenigingen, cruijffcourts en trapveldjes

Baten

Wat zijn directe opbrengsten van een sportvereniging in een wijk?

En wat de voordelen?

Belangrijk zijn de sport uitgaven maar wat valt er onder sport uitgaven? Want als mensen niet zouden sporten kunnen ze het geld ergens anders aan uitgeven, zoals bv de bioscoop, in hoeverre kan hier rekening mee worden gehouden? In het model van de gemeente Rotterdam is heel kort door de bocht genomen en worden alle consumpties bij een kantine

Wat zijn indirecte opbrengsten van een sportvereniging?

Zijn dit alleen voordelen voor een vereniging? Of ook voor een wijk?

Wat voor voordelen zijn dit dan voor een wijk?

Kosten

Hoe worden de indirecte kosten gemeten?

Meten

Wat zijn belangrijke economische factoren om sport in een wijk te meten?

Wat is economische groei voor een wijk?

Hoe kan dit gemeten worden?

Huizen prijzen of groen voorzieningen, gezondheidzorg?

Wordt er bij deze metingen ook gekeken naar de toekomst van kinderen? Schooluitval/gezondheid/ meer vrienden, sociale aspecten dus ook meegerekend?

<u>Is minder school uitval wel een bate voor een wijk? Of is dit alleen maar goed voor het kind?</u>

<u>Rond hangen op straat, geen spullen vernielen, goede vrienden.</u>

In hoeverre kan een wijk dit als baten rekenen?

Kinderen die willen sporten zijn al vaker doortastend dan andere kinderen?

Hoe belangrijk is sociaal kapitaal en hoe druk je dit uit in economische groei voor een wijk?

Sportvereniging hebben vaak veel vrijwilligers, zij verdienen niets en doen veel voor de club. Dit is wel een economisch voordeel lijkt mij, ook voor een afdeling sport en recreatie omdat de overige gelden ergens anders aan uit kunnen worden gegeven. Dus ook weer goed voor de wijk?

Hoe kan het model gevormd worden zodat het wel vergelijkbaar is met andere wijken uit andere steden?

Wat zijn de belangrijkste factoren die beïnvloed worden door sportverenigingen of fitnesscentra? Tellen sport winkels ook mee? Door een hogere omzet zal de stad meer belastinginkomsten krijgen…?

In het model van de gemeente Rotterdam wordt het Imago van een sport weg gelaten, denk u dat dit nuttig is voor een onderzoek naar de impact van sport in de wijk, zal een wijk met veel dure sporten beter presteren dan een andere wijk?

- Of is dit weer het geval dat andere naar de wijk komen om te sporten en zelf niet in de wijk wonen. Omdat dit meestal sporten zijn die niet in elke wijk aangeboden worden.

9 References

9.1 Interviewees

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Paul Hover (Mullier Instituut) - November 2011.

Luscas Hullegie (Gemeente Arnhem) - 1 November 2011.

Ruud. H. Koning (Rijks universiteit Groningen) - 18 November 2011.

Egbert Oldenboom (Sporteconomen) - 24 October 2011.

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10 Notes

1) Sport definition

Mulier institute:

"Sport is a human activity that often occurs in a specific organizational context but can also be performed unbound, generally using a - whether in one's residence located - land and / or environment, in a way that is related to rules and practices that are internationally developed, for performances in a league or competition element of the activity or related activities."

Van Bottenberg (1996):

"a series of in principle testable or similar activities, where achieving a goal for the sake of activity, is important, and that the activity with any regularity and in a specific organizational connectio, possible with more people, takes place, on conditions that the practices are internationally developed, for performances in a league or competition element of the activity or related activities."

Oxford dictionary:

"An activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment."

2) The Body mass index (BMI), is an index number that shows you if your weight compared to your length is healthy, You can calculate the BMI with:
Weight / (Length*Length)=BMI

BMI range	category
less than 16.5	severly underweight
from16.5 to 18.5	underweight
from18.5 to 25	normal
from 25 to 30	overweight
from 30 to 35	obese
from35 to 40	clinically obese
above 40	dangerously obese

Source: BMI Chart, 2010.

3) Social trust is one of the variables to measure social capital,

Source: Putnam, P., Leonadri, R., & Nanetti, R.Y., 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, New Jersey: Princeton University Press.

4)

Ervaren gezondheid en beperkingen

'Ervaren gezondheid en beperkingen' is gemeten met behulp van twee stellingen in de Enquête Sociale Index. Het meet de mate waarin men goede gezondheid ervaart en de mate waarin men van oordeel is dat de gezondheid beperkingen oplegt aan wat men in het dagelijks leven kan. We maken gebruik van de volgende twee vragen uit de Enquête Sociale Index:

'Is uw gezondheid over het algemeen uitstekend, (zeer) goed, matig of slecht?', met als antwoordcategorieën:

Uitstekend (+++)

Zeer goed (++)

Goed (+)

Matig (-)

Slecht (--)

'Heeft u door gezondheidsproblemen of lichamelijke beperkingen moeite met alledaagse handelingen als traplopen, lichamelijke verzorging en/of huishoudelijke activiteiten (zoals schoonmaken of boodschappen doen)?', met als antwoordcategorieën:

Nee (+)

Ja, soms (-)

Ja (--)

Ja, veel moeite (---)

Ja, erg veel moeite (----)

We berekenen de ervaren gezondheidstoestand per leeftijdsgroep op basis van de twee bovengenoemde vragen middels het optellen de waardering die achter de antwoordcategorieën tussen haakjes staat (waarbij elk plusje telt als 1 en elk minnetje als -1). De rekenkundige maximale score bedraagt dan een +4 en de minimale score -6. We transformeren beide zijden van de verdeling tot een verdeling die loopt van -100 tot +100. Gemiddeld gezien neemt de gezondheid van mensen af naarmate men ouder wordt. Wanneer we eenzelfde normering zouden toepassen voor zowel jongeren als ouderen zouden we vooral demografische kenmerken meten in plaats van de gezondheidssituatie.

De ervaren gezondheid is derhalve apart berekend voor onderstaande drie leeftijdscategorieën:

15 t/m 34 jaar
35 t/m 64 jaar
65 jaar of ouder

Meldingen lokale zorgnetwerken

Als indicator voor het thema 'goede gezondheid' is het jaarlijks aantal meldingen bij lokale zorgnetwerken opgenomen. Het aantal meldingen is gedeeld door het gemiddeld aantal inwoners in het desbetreffende jaar en vermenigvuldigd met 1000, resulterend in een promillage meldingen (aantal meldingen per 1000 inwoners) bij lokale zorgnetwerken. Een hoger promillage meldingen duidt op meer gezondheidsproblemen in desbetreffende gebied en leidt tot een lagere score voor 'meldingen lokale zorgnetwerken'.

Normering

Het promillage meldingen bij de lokale zorgnetwerken voor geheel Rotterdam wordt op advies van de GGD Rotterdam genormeerd op een 5. De situatie met relatief tweemaal zoveel meldingen wordt genormeerd op een 3 en de situatie met tweemaal zo weinig meldingen wordt genormeerd op een 7; nogmaals tweemaal zo weinig meldingen geeft een score 9. Omdat de meldingen per jaar sterk afhankelijk zijn van gevoerde campagnes om het aantal meldingen te verhogen is gekozen elk jaar opnieuw te normeren. *Bron* Meldingen lokale zorgnetwerken, GGD en Gemeentelijke Basisadministratie (GBA) (bewerking COS).

Meldingen huiselijk geweld

Ook het promillage meldingen van huiselijk geweld (aantal meldingen per 1000 inwoners) is opgenomen als indicator voor het thema 'goede gezondheid'. Het aantal meldingen is gedeeld door het gemiddeld aantal inwoners in het desbetreffende jaar en vermenigvuldigd met 1000, resulterend in een promillage meldingen huiselijk geweld. Een hoger promillage meldingen duidt op meer gezondheidsproblemen in het gebied en leidt tot een lagere score voor 'meldingen huiselijk geweld'.

Normering

Het promillage meldingen van huiselijk geweld voor geheel Rotterdam wordt op advies van de GGD Rotterdam genormeerd op een 5. De situatie met relatief tweemaal zoveel meldingen wordt genormeerd op een 3 en de situatie met tweemaal zo weinig meldingen wordt genormeerd op een 7; nogmaals tweemaal zo weinig meldingen geeft een score 9. Omdat de meldingen per jaar sterk afhankelijk zijn van gevoerde campagnes om het aantal meldingen te verhogen is gekozen elk jaar opnieuw te normeren.

Source: Meldingen huiselijk geweld, GGD en GBA (bewerking COS) 2010