

Sport Participation Rate And Labor Market Outcomes

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Abstract: Sportive activity contributes to the development of human capital and forms the infrastructure of a qualified labor by enabling the training of physically and mentally healthy generations. The recent studies have shown that there exists a correlation between sport participation rate and labor market outcomes. This article examines the relationship between sport participation rate of high school teenagers, employment rate and wage level in the USA for the period of 1971-2016. In this study, the correlation between the variables was surveyed by means of Johansen cointegration test and error correction model, and the positive correlation was identified between wage level variable and sport participation rate in the long run.

Key words: Sport Participation Rate, Labor Markets, Employment, Wage Level.

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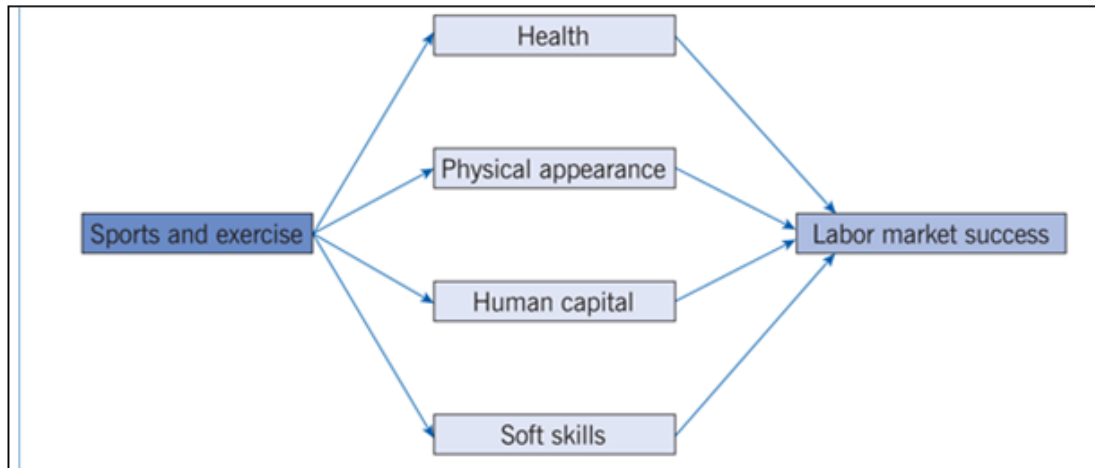
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I. INTRODUCTION

One of the pre-requisites of a healthy human capital is physical activity, namely sportive activities. Affecting human's health positively, sportive activities increase his/her efficiency. A healthy and qualified labor is the outcome of the development processes structured within the education system and supported by the philosophy of life-long learning. For this reason, the recent studies carried out in various developed and developing countries have focused on the measurement of the effect of sport participation rate on labor markets.

In the literature, participating in sportive activities brought out health, physical appearance, human capital and increasing abilities. Dealing with sport and exercise can increase efficiency by improving an individual's physical and mental abilities including endurance, stress management and group work. These channels do not only increase productivity, but also affect the labor market participation process and individual success positively (Lechner, 2015:2).

Figure 1: Sport and Exercise Lead to Labor Market Success



Source: Lechner M. (2015), Sports, exercise, and labor market outcomes, IZA World of Labor 2015.

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When the historical development of the domain-related studies is analyzed, it is seen that since the middle of nineteenth century, the reformers working in the fields of education and urban development in England have suggested that sport can be beneficial for the society by developing features such as character development, business discipline and inclination to group work. In today's world, the notion of sport is associated with economic development. In 2004 Athens Summer Olympiads, a roundtable meeting was held and a group of UN government representatives suggested the integration of sportive activity into local and international development strategies (Mandle, 2012: 1-2).

The governments can determine active labor market policies such as encouraging sport in order to increase the re-employment chance of unemployed workers. In the second half of 2014, the Belgian government announced that it was planning to apply this policy. Some time is needed in order to see the effects of this new policy. However, it is possible that encouraging sport and popularizing physical activity through public funds will increase efficiency among the workers (Lechner, 2015: 9).

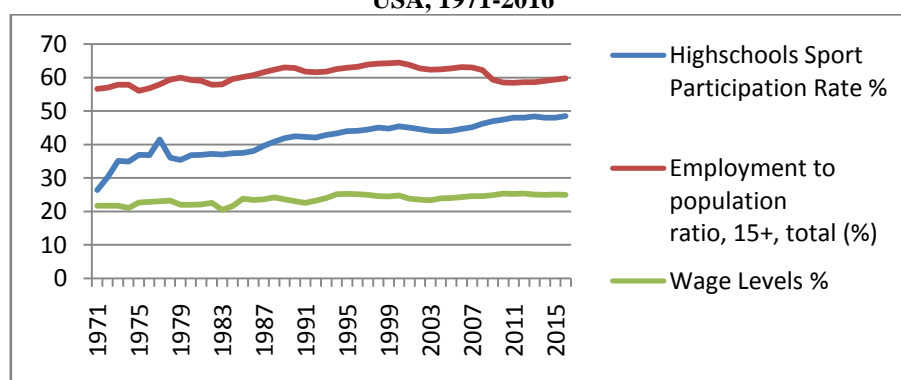
In this study, the correlation among sport participation rate, employment rate and wage levels in the USA was analyzed for the period of 1971-2016. In the first part of the study, the data regarding sport participation rate, employment rate and wage levels were analyzed for the period of 1971-2016. In the second part, relevant literature review was mentioned while data set and methodology were explained in the third part. In the fourth part, empirical findings were presented and results were shared in the fifth part.

II. SPORT PARTICIPATION RATE, EMPLOYMENT AND WAGE LEVELS

It is an accepted belief that sportive activities create positive effects on every individual's health, physical appearance, behavioral and cognitive abilities. Especially sportive activity that starts at early ages is one of the important indicators of individual's life quality. In this respect, the recent studies carried out by reseachers from different countries mostly focus on the outcomes of sport participation during childhood and youth.

Aspen Institute Project Play Working Group Youth Report (2015) shows that active participation in sport provides combined benefits. According to the report, the children doing sport from their early ages earn benefit throughout their lives. The probability of their becoming obese is ten percent while their exam success is forty percent more. The risk of their getting in the habit of smoking and using drugs is less. The probability of their entering into a university is fifteen percent more. Their annual income in labor markets is 7-8% more and they are more active at their working place. In other words, the children doing sport are more highly to become productive when compared to those who do not do sport. Therefore, the studies examining the correlation between sport participation espacially during youth and labor markets outcomes are of high importance. Within the framework of this study, data related to labor market indicators such as highschool sport participation rate, employment rate and wage levels were gained. Graphic 1 displays the development of Highschool Sport Participation Rate, Employment Rate and Wage Levels in the USA during 1971-2016.

Graphic 1: Highschool Sport Participation Rate, Employment Rate and Wage Levels Percentage in the USA, 1971-2016



Source:

http://www.nfhs.org/ParticipationStatistics/PDF/2016-17_Participation_Survey_Results.pdf
<https://www.statista.com/statistics/183996/us-high-school-enrollment-in-public-and-private-institutions/>
<https://data.oecd.org/earnwage/wage-levels.htm>

<http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#>

Highschool Sport Participation Rate was measured by dividing the numer of students doing sport at highschool level which was prepared by National Federation of State Highschool Associations to highschool enrolment. According to the obtained data, the rate of highschool students' participation in sport in the USA

during 1971-2016 increased continuously. During 2015-2016, the number of highschool students participating in sport reached 7.963.535. In 2006, the participants increased by 97.270 people. This increase in participant number was the highest annual increase since 2008-09. In every branch of sport, increases were observed and the number of girls reached to the highest amounts of all times (3.400.297). The increase of 75.971 girls in highschool sport participation was the highest increase since 2000-2001. Stevenson (2007) mentioned that enlargement in IX Article of the Law titled Education Changes Civil Rights dated 1972 in the USA to include highschool athletics opportunities and girls affected collective sport participation. Upon the law's entering into force, the rate of girls' participation increased. According to Graphic 1, Highschool Sport Participation Rate in the USA during 1970's was 34.77% while it was 38.28% during 1980's, 43.50% during 1990's and 46.24% between 2000-2016. While employment rate showed increase from 1970's to 2000, it decreased between 2000-2016. The employment rate realized as 57.58% during 1980's and 62.84 during 1990's while it decreased to 61.05% during 2000's. Wage levels also increased for the mentioned period. The wage levels (22.17%) of 1971-1979 followed a horizontal axis and increased to 22.69% during 1980's, 24.18% during 1990's and 24.52% during 2000's.

III. LITERATURE REVIEW

Long and Caudill (1991), examined the correlation between college sports participation and wage incomes and found out that male's annual income increased by four percent. Ewing (1995), analyzed the effects of highschool sport participation on future wages of black males by using the data of National Longitudinal Survey of Youth. The study shows that old black sportsmen earned higher wages than their colleagues. Curtis, McTeen and White (2003), examined the correlation between organized youth sport participation and the incomes earned during adulthood, using the data of a sample questionnaire carried out for adult Canadians. The findings gained from the study show that the youth participating in an organized sport earned higher incomes as adults. Barron et. al. (2000) tried to explain highschool students' sport participation and the effect of this choice on education and labor outcomes by means of time series. According to the findings obtained from two data sets, namely National Youth Research and national study on 1972 highschool classes, it was found out that sport participation affected wages and education directly.

Postlewaite and Silverman (2005), revealed that there was a dramatic difference between the wages of sportsmen and non-sportsmen and that the ones participating in highschool athletics earned 26% more than the ones who did not participate. Ewing (2007), analyzed the effects of highschool athletics participation on labor market by means of 1990 National Longitudinal Surveys of Youth data set and concluded that old highschool sportsmen earned better wages in terms of salary and vested benefits. In the microeconomic study carried out by Lechner (2009) for the period between 1984-2006, departing from main data obtained from German Socio-Economic Panel study, the effects of individual free time sport participation on long-term labor market outcomes, health and subjective issues in West Germany were analyzed. The findings of the study showed that physically active persons earned 1200 Euro more than inactive or rarely active persons. It was foreseen that the wage difference resulting from sport ranged from 5% to 10%.

Stevenson (2010), showed that 10% increase in intrastate sport participation of women in the USA led to 1% increase in women' participation in university education and 1-2% increase in women labor participation. Kavetsos (2011), examined the correlation between physical activity and employment by using 2004's Eurobarometer research. The study indicates that physically active persons are more likely to get employed and the possibility of getting employed increases in accordance with the frequency of exercise.

Lechner, M., and P. Downward (2013), analyzed the effect of sport participation on the employment of different age groups. This study suggests that there exists a negative correlation between physical activity and unemployment. In addition, the study revealed that there exists a positive correlation between physical activity and employment of individuals at the age of 26-45. Hyytinen and Lahtonen (2013), surveyed the effects of physical activity on income. The findings show that being physically active has positive effects on long term income.

Cabane (2014), revealed that there is a positive correlation between physical activity participation and transition from unemployment to employment of women who have three-year job experience.

Lechner and Sari (2014), surveyed the effects of individual sports and exercise of working adults on labor market outcomes, based on Canada National Population Health Survey. It was found out that sport and exercise created a strong positive outcome on labor markets for the period of 1994-2008.

In their analyses, Cabane and Clark (2015) associated childhood sport with various dimensions of their jobs that they carried out thirteen years later. In this respect, five fields were defined: employment probability, wage, management responsibilities, autonomy and business prediction. The study was structured by considering various sport types of the schools (individual or group) as well as the difference between men and women. The obtained findings underlined the effects of childhood sport on management responsibilities and autonomy. Researchers such as Downward (2007) carried out studies emphasizing the positive correlation

among employment, income and sport participation. According to these studies, sport participation increases as income and education level increase. Kosteaş (2012) showed that inactive individuals earned less than the ones doing any kinds of sport. This study revealed that regular exercise led to 6% or 10% percent wage increase in labor markets.

Despite different results, most of the studies on the relevant issue suggest the possible correlation between physical activity and labor markets. However, there still exist many areas that require detailed analysis such as the most effective sport branch, the significance of health, physical attractiveness or social integration in outcomes (Cabane and Lechner, 2014:42). In the literature, there are also studies focusing on the indirect effect of sportive activities participation on labor market in terms of individual's health, education duration and development of special talents.

Godoy and Triches (2017), developed the approach that the health obtained through sport can lead to wage advantages by increasing the marginal efficiencies of the workers. Their analysis revealed that the effect of physical activity in Brazilian labor markets on wages ranged from 15% to 31%.

Participating in sportive activities does not only determine individual's health and education processes, but also their physical appearances. Averett and Korenman (1996), showed that the ones with a balanced weight-height ratio earn higher wages than the overweight persons. Loureiro, Sachsida and Mendonça (2011), suggested that physical appearance is not only a subjective notion that determines wage level, but also effective in recruitment processes.

When the relevant studies are analyzed, it is seen that the positive correlation between sport participation rate and wages has been explained with some specific reasons. Behind this approach, there is the belief that the students participating in sportive activities have such skills as leadership, high motivation, social network and resistance. To sum up, sport enables the youth to gain more by encouraging the development of efficiency increasing skills (Stevenson, 2007:19). These results are in close connection with the behavior models changing from individual to individual and the expectations of those doing sport.

At this point, it is important to question why an individual does sport. The individual does sport for some motives, one of which is consumption. Sport and exercise is a free time activity that increases benefit in a direct manner. Another motive is investment. The individuals invest in themselves so that their health and physical appearance get better. The third motive is related to expectations. Investing in health is considered to result in additional labor market outcomes in the future through development in various skills. However, the results regarding labor market are not as definite and clear as those related to health (Lechner, 2015:4).

In other words, it can be said that whether the increased physical activity creates huge positive effects on labor market performance by increasing productivity levels of workers has not been proven yet. It would be beneficial to make analyses that would pay attention to investment and consumption dimension of physical activity as well as heterogeneous, optimum behavior mechanisms (Cabane and Lechner, 2014: 42).

IV. DATA SET AND METHODOLOGY

This study examines the correlation among the United States' sport participation rate, employment rate and wage level in econometric terms. In terms of data, the USA's annual data of 1971-2016 were analyzed. Highschool sport participation rate was measured by dividing the number of highschool students doing sport, which was prepared by National Federation of State Highschool Associations, to highschool enrolment. While the number of highschool students doing sport was obtained from 2016-2017 High School Athletics Participation survey, high school enrolment rate Statista data base and Wage Levels OECD data base while employment rate while employment rate was obtained from World Development Indicators data base. In order to examine time series features of each variable, the study analyzed their stability. As a result of unit root test, it was found out that the series were stable on the same level and they were subjected to cointegration analyses so that the long term correlation between the series were identified.

V. EMPIRICAL FINDINGS

In time series analysis, it is required to have stability between the data. In any prediction made with non-stationary data, unreal regression problems occur. Finding out a real correlation in a model is closely related to the stationarity of the series (Gujarati, 1995: 709). For this reason, USA unit root test was applied in order to predict the correlation among sport participation rate, employment rate and wage levels in the USA. In addition, whether the examined series of the model were stationary or the level on which they were stationary in the course of time was analyzed. The results of ADF unit root test applied to level first difference of variables are presented in Table 1.

Table 1: ADF Unit Test Results

Variables	Level	First Difference
Y	-2.8167	-7.5621*
X	-1.9212	-4.2464*
Z	-3.2658	-6.7096*

* %5 implies the rejection of unit root hypothesis that is null hypothesis at significance level Y: sport participation rate, X: employment rate Z: wage level variables

When the results of ADF unit root test are analyzed, it is understood that Y, X and Z variables are not stationary at 5% significance level, but stationary at their first difference. After realizing that the variables of the analysis was stationary variables at the first level, Johansen cointegration test and error correction model were used for examining the correlation among the variables.

Table 2: Johansen Cointegration Test Results

Cointegrating Number	Vector	Trace Statistics	Critical Value	Maximum Statistics	Eigenvalue	Critical Value
Zero		45.33598*	35.19275	34.38502*		22.29962
At most 1		10.95095	20.26184	7.17537		15.89210
At most 2		3.77558	9.16454	3.77558		9.16454

Not: * %5 denotes the rejection of null hypothesis at significance level

When the results presented in Table 2 are analyzed, when the null hypothesis suggesting that there does not exist a cointegrating relation among the variables, in other words rejecting the existence of a cointegrating vector, is tested against an alternative hypothesis that mentions the existence of one cointegrating vector, the null hypothesis at 5% significant level is rejected according to both trace and maximum statistics.

There exists a cointegrating, in other words long term relation, among sport participation rate, employment rate and wage levels. The obtained results imply the existence of one cointegrating vector among these variables.

After determining the existence of one cointegrating vector, the exogeneity of variables were analysed. The results of weak exogeneity test are presented in Table 3.

Table 3: Weak Exogeneity Test Results

Exogenous Variable	χ^2 Test Statistics	Decision
Y	10.32676*	Exogenous
X	0.23093	Not exogenous
Z	8.34061*	Exogenous

Not: * denotes the rejection of null hypothesis implying that it is not weak exogenous at 5% significance level.

Departing from the results obtained from weak exogeneity test, it was understood that sport participation and wage level variables are weak exogenous variables at 5% significant levels. According to these results, that each of the variables (one cointegrating vector, sport participation rate and wage level) are exogenous variables can be expressed in two different ways as long term models. Long term models are as follows:

$$Y = -34.008 - 0.078X + 3.446Z$$

$$(SE)(8.159) \quad (0.147) \quad (0.277)$$

$$t \quad -4.167 \quad -0.534 \quad 12.410$$

$$Z = 9.867 + 0.290Y + 0.022X$$

$$(SE)(2.300) \quad (0.022)(0.042)$$

$$t \quad 4.289 \quad 12.788 \quad 0.533$$

When the long term model presented above is taken into consideration, it is seen that in the model where sport participation rate is exogenous variable, wage level variable is a statistically significant variable at 5% significant level in the model while employment variable is statistically insignificant.

Accordingly, wage level variable is an effective variable on sport participation variable in the long term and there exists a positive correlation between these two variables. 1% increase in wage level increases sport participation rate by 3.446%. Employment variable, on the other hand, does not have any effect on sport participation rate in the long term.

It is seen that, in the model where wage level is exogenous variable, sport participation rate is statistically significant at 5% significant level while employment variable is statistically insignificant. Accordingly, sport participation variable has an effect on wage variable in the long term and there exists a positive correlation between these two variables. 1% increase in sport participation increases wage level by 0.290%. Labor variable, on the other hand, does not have any effect on wage level variable in the long term.

The results of the Error Correction Model (Short Term Model) belonging to sport participation rate and wage level variables and Granger causality test are presented in Table 4 and Table 5.

Table 4: Error Correction Model Results

Dependent Variable: ΔY			
$\Delta(Y)_{t-1}$	$\Delta(X)_{t-1}$	$\Delta(Z)_{t-1}$	ε_{t-1}
-0.01959	-0.22273	-0.61489	-0.3506
[-0.15171]	[-0.85321]	[-1.80934]	[-3.56607]*
Dependent Variable: ΔZ			
$\Delta(Z)_{t-1}$	$\Delta(Y)_{t-1}$	$\Delta(X)_{t-1}$	ε_{t-1}
0.21667	0.06254	0.18854	-0.52905
[1.31157]	[0.99640]	[1.48571]	[-3.18048]*

Note: denotes significance in terms of statistics at 5% significant level.

When the results presented in Table 4 are taken into consideration, the error correction variable ε_{t-1} , is statistically significant in both models and has gained value between 0 ile -1 as expected. That the error correction notion is a significant variable is considered to indicate that a short term imbalance will be solved in the long term. Therefore, it is foreseen that the sport participation rate variable will gain balance about three terms (years) later according to the result of 1/0.3506. In addition, wage level variable is foreseen to gain balance about two terms (years) later according to the result of 1/0.52905.

Table 5: Granger Causality Test Results

Null Hypothesis	Lag Length	Test Statistics
$\Delta Z \not\rightarrow \Delta Y$	1	0.72796*
$\Delta X \not\rightarrow \Delta Y$	1	3.27369*
$\Delta Y \not\rightarrow \Delta X$	1	0.44517*
$\Delta Z \not\rightarrow \Delta X$	1	0.69044*
$\Delta Y \not\rightarrow \Delta Z$	1	0.99281*
$\Delta X \not\rightarrow \Delta Z$	1	2.20732*

Note: * denotes that the hypothesis that the null hypothesis at 5% significant level does not Granger-cause is not rejected.

According to the results of Granger causality test, there do not exist any causality relations among sport participation, employment and wage level variables in short term at 5% significance level. In short term, variables do not affect each other.

VI. CONCLUSION

According to the findings obtained from the study, there exists a positive and bidirectional relation between wage level and high school sport participation rate in the long term in the USA for the period of 1971-2016. 1% increase in wage level increases sport participation rate by 3.446% while 1% increase in sport participation increases wage level by 0.290%. On the other hand, no relation between employment rate variable and sport participation variable has been observed in the short or long term.

The obtained findings comply with the studies that foreground the positive relation between income and sport participation rate. However, the findings related to the relation between employment rate and high school sport participation rate is not as clear as the effect on income. It is obvious that the parameters related to labor market such as gender, age, living place (urban-village) and family related differences, occupational groups and working styles as well as other factors including the type, duration and place of sport lead to different results in terms of employment. For this reason, it is believed that micro studies that will analyze the effect of especially youth and childhood sport participation on employment rate in terms of such indirect effects as health, physical appearance, increasing skills (investment motive) and free time (consumption motive) will make some contributions to this field.

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