



## IMPACT OF A UNIVERSITY ON A LOCAL ECONOMY: SARAJEVO EXAMPLE <sup>1</sup>

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### ABSTRACT

*Universities are not only centers for education but also serve as centers for knowledge production, innovation and technical development. However, in recent decades, universities are also considered as one of the key regional economic development engines for local economies. Universities contribute a great deal of economic activity in various forms to the geographical area within proximity of the campus. This study aims to be the first such study done in Bosnia and Herzegovina using the information and data obtained from International University of Sarajevo (IUS), its students and its staff members as well as their visitors. This study aims to find out direct economic impact of IUS on local spending and employment, and indirect and induced economic impacts of IUS on Sarajevo economy. The study finds that IUS contributes to the Ilidza and Sarajevo economy around 10 million KM in the form of direct economic benefits, over 24 million KM in indirect benefits, and 41 million KM in induced benefits. Total of these contributions reach to 75 million KM a year. In addition, IUS creates 231 jobs directly and 1,065 jobs indirectly (1,296 jobs in total) in Ilidza and Sarajevo area.*

**Keywords:** *Local Economic Impact, University Impact Studies, Sarajevo Economy, Direct Economic Impact.*

**JEL Codes:** *D12, I23, R11.*

## ÜNİVERSİTENİN YEREL EKONOMİYE ETKİSİ: SARAYBOSNA ÖRNEĞİ

### ÖZET

*Üniversiteler sadece eğitim merkezleri değil aynı zamanda bilgi üretimi, inovasyon ve teknik gelişim merkezleridir. Bununla birlikte son yıllarda üniversiteler, yerel ekonomiler için kilit bölgesel ekonomik kalkınma merkezlerinden biri olarak kabul edilmektedir. Üniversiteler, kampüsün yakınındaki*

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*coğrafi bölgelere çeşitli biçimlerde ekonomik aktivitelerle büyük katkı sağlamaktadır. Literatürde üniversitelerin bölgesel ekonomik etkisini araştıran birçok çalışma bulunmaktadır. Bu çalışma, Uluslararası Saraybosna Üniversitesi (IUS)'nden, öğrencilerinden ve çalışanlarından ve ziyaretçilerinden elde edilen bilgileri ve verileri kullanarak Bosna Hersek'te bu alanda yapılan yapılan ilk çalışmadır. Bu çalışma, IUS'in yerel harcama ve istihdam üzerindeki doğrudan ekonomik etkisini ve IUS'un Saraybosna ekonomisi üzerindeki dolaylı neden olduğu ekonomik etkilerini bulmayı amaçlamaktadır. Çalışma, IUS'nin Ilidza ve Saraybosna ekonomisine doğrudan ekonomik faydalar şeklinde yaklaşık 10 milyon KM, dolaylı faydalarda 24 milyon KM ve 41 milyon KM uyarılmış katkısı olduğunu ortaya koyuyor. Bu katkıların toplamı yılda 75 milyon KM'ye ulaşmaktadır. Ayrıca IUS, Ilidza ve Saraybosna bölgesinde 231 doğrudan ve dolaylı olarak 1.065 istihdam (toplamda 1.296 kişi) yaratmaktadır.*

**Anahtar Kelimeler:** *Yerel Ekonomik Etki, Üniversite Etki Çalışması, Saraybosna Ekonomisi, Direk Ekonomik Etki.*

**JEL Kodu:** *D12, I23, R11.*

## 1. INTRODUCTION

University, as a word, comes from *universus* in Latin and derived from *universitas magistrorum et scholarium* which means “community of teachers and scholars” (Bolay, 2011). Universities are the core of knowledge production in the information driven society that we live in. They are expected to educate individuals who share universal values and are rational and able to think critically and scientifically. Universities are also expected to produce new knowledge and technologies, and share this with the industries in their region.

In recent years, universities have become much more than just educational institutions. They, especially campus universities, also serve as social, cultural and economic engine of the region where they are located. Universities contribute a great deal of economic activity in various forms to the geographical area within proximity of the campus at a decreasing rate. In addition, these contributions, unlike tourism activities, are not seasonal and they are expected to be long term or permanent activities.

Universities contribute to the local economy in various forms but these contributions can be classified mainly in two forms; supply side effects in the form of providing better equipped and highly skilled workers, and demand side effects in the form of increased spending in the region. Thus, the universities increase the overall direct and indirect spending in the region as well as the employment opportunities for various types of workers and therefore increase the level of income in the region (Bleaney, 1992). They help to improve the transportation, communication and health infrastructure in the region. They attract migration into the region from other parts of the country and likely improve the demographic structure as they attract and breed intellectuals and highly educated people (Florax, 1987).

They help to reduce crime rates and provide better living conditions for families. They furnish their students with the newest technology and help to improve working conditions (Ozturk et al., 2011). They also contribute to the region by making the region a center of attraction and thereby increasing the rental rates and home prices. Finally, the universities contribute significantly to technological development as they serve a core for knowledge production (Tekir, 1987).

This paper aim to calculate the impact of International University of Sarajevo which is located in Ilidza suburb of Sarajevo Canton. With numerous new development projects, Ilidza area is fast becoming the area of city's most notable infrastructural expansion and is the new university center of the Sarajevo Canton. Ilidza area is also the city's most popular picnic destination and tourist hub, and it is famous for the natural beauty of its surroundings and historical tradition dating back to pre-Roman times. Sarajevo International Airport and the incredible Vrelo Bosne springs are located in the close vicinity of Ilidza.

Ilidza suburb of Sarajevo has been home to the campuses of three private universities. This study intends to provide a possible insight to the actual impact of the universities in the area, using International University of Sarajevo data. As IUS is the first university established in the area and the largest one in terms of student and staff population, it is likely to be a good indicator for other universities, present or future ones which could be established in the region along with the future vision of the municipality.

International University of Sarajevo was established in 2003 by SEDEF (Sarajevo Education and Development Foundation) and began its academic services in 2004-2005 academic year in its temporary campus in Cengic Villa and then in 2010, it was moved to its current campus in Ilidza. According to information provided by IUS Finance Office, the land of the campus was purchased for 4.2 million KM and 40 million KM was spent to construct the buildings in the campus.

The university accepts students from all over the world, and the language of instruction and communication is English. Students without English proficiency are required to attend a one-year intensive English Language Program organized by English Language School. IUS, together with its founding foundation SEDEF, provide many scholarships for Turkish, Bosnian and foreign students. Majority of the students are awarded typical 100, 75, 50 and 25 percent scholarships based on their success in entrance exams or their school type and diploma degree. Currently 63 percent of IUS students receive some level of scholarship from the IUS. IUS Finance Office records show that only 37 percent of the students pay the full tuition.

## **2. LITERATURE REVIEW**

There exists extensive literature on economic impact studies of individual universities on their surrounding area and higher education institutions as a whole in overall economy, especially in the

United States, the United Kingdom and other major European countries. Majority of these studies use either Input-Output model or spending multiplier model. Due to enormous number of these studies, we will mention here only few of them.

Munnich and Nelson (2003) argue that the universities can contribute to the economic development of their cities in various forms such as creating jobs, producing theoretical and technical knowledge, attracting highly skilled labor force to the city, higher amount of procurement, technology transfer, increase in tax revenues, and creating brand value. They point that the universities can be used as a pull factor in initiating economic development of relatively less developed areas of the countries.

Ewing (2010) studied the economic impact of Angelo State University using Input-Output model. The economic impact of Angelo State University is measured from spending on payrolls, operating expenses, and capital spending (e.g., construction projects), which in turn generate jobs and income in the San Angelo regional economy. He reports that economic impact of Angelo State University reaches to \$209 million per year, provides 2,000 jobs and creates household earnings of approximately \$102 million for the region.

Hodges et. al. (2011), analyze the overall economic impact of University of Florida which is one of the biggest public universities in the United States. Regional economic input-output model was used in order to estimate economic impacts including spending by University of Florida, its students and their visitors. They find that university operations, students, staff, visitors, healthcare services and direct support organizations created total spending of \$5.8 billion; direct employment of over 40,000 jobs; and total output of approximately \$9 billion.

Robert et. al. (2015), investigate the economic impact of the University of New York at Fredonia. They estimated the overall economic impact of the university by utilizing an industry-standard input-output model widely known as IMPLAN. Data from 2012-2013 academic year show that total university-related spending, on and off the campus (employee wages, operations, capital construction, students and visitors), have the value of \$215 million while generated income of \$140 million. They estimated the economic contribution of the university as \$331 million for the national income, \$204 million additional income for the region and \$157 million for the local Fredonia-Dunkirk community.

Using IMPLAN input-output model, Bunting et. al. (2006) analyze the economic impact of Eastern Washington University. They find that the university and its students spent around \$175 million, earned personal income of approximately \$94 million, and the university created 3,266 jobs. They also contributed around \$2.4 million in the form of local taxes to the local county authorities. After taking direct, indirect, induced, and taxes impact, into consideration; the research show that total economic impact reaches to \$448 million income effect and 5,055 employment effect.

Umbach (2011) analyzed the economic impact of University of Minnesota System on the state economy. Using IMPLAN data and software, input-output model revealed that the economic impact of

the university is around \$8.6 billion in terms of state income generated while over 80,000 jobs were created by the university in the state level.

Bleaney et. al. (1992) and Huggins and Cooke (1997) used multiplier method in the absence of complex Input-Output tables for the country. Bleaney et. al. investigated the economic impact of University of Nottingham using the multiplier analysis. Huggins and Cooke (1997) extended the model developed by Bleaney et. al. and used this new model to measure the economic impact of Cardiff University in U.K. They estimated the economic impact of the university on the city as almost £100 million using the following parameters: 90 percent for marginal propensity to consume, direct tax rate of 42 percent, indirect tax rate of 14 percent. They estimated that, in total, 3,350 additional jobs were created by the spending of the university and its people. The study estimated the income multiplier as 1.13 and personal disposable income multiplier as 0.61. Kotosz (2013) investigated the economic impact of Kodolanyi Janos College in Szekesfehervar using multiplier method. The study finds around 3 billion HUF total economic impact, which is roughly 10 percent of the city budget and slightly over 1 percent of the local GDP.

There are also many similar studies done on the impact of Turkish universities. Gokalp (2013) analyzes the spending of the students of Ataturk University and its economic impact on the city of Erzurum using a sample of 386 students. Average monthly income for students is found to be 825 TL while the average spending by students is found to be 745 Turkish Lira (TL). Thus, the marginal propensity to consume is estimated to be around 0.90. The study calculated that annual direct spending by students was equal to 186.3 million TL, considering that the total number of students who study at the main campus of Ataturk University was 31,276 and assuming that they spend in average 8 months a year in Erzurum.

Yildiz (2011) investigate the role of higher education institutions in regional development using the data obtained from a sample of 488 students (out of 932 students in total) from Babaeski Vocational School. The study calculates the total contribution by students of the vocational school to Babaeski economy is to be around 4.3 million TL, annually. Combined with personel salaries, utility and school related expenses by the school and student expenditure, it was estimated that the school has approximately 4.9 million TL direct impact on town economy.

Ceyhan and Guney (2011) evaluate the potential impact of Bartın State University on the economy of Bartın city in a 20 year horizon projection using a sample of 991 students (out of 2,608 students in total). The study estimates the spending multiplier of the university as 3.77 and predicts that the university will generate additional income of approximately 250 million TL, around 166 million TL additional investment effect in the city and will create 5,865 additional jobs. The projections for 2020 and 2030 are much higher than this estimate.

Korkmaz (2015) analyzes the impact of spending by Bayburt University students on the economy of the city using a sample of 300 students selected among Faculty of Economics and Administrative Sciences (out of 1,364 students in total). The average monthly spending of the sample is found to be 432.7 TL and the total direct spending contribution by student population of the university to the city economy is estimated to be around 16.6 million TL annually.

Yayar and Demir (2013) investigates the economic impact of Gaziosmanpaşa University on the Tokat province by using a sample of 900 participants (300 staff members, 400 students and 200 companies around the university). The study finds from the sample that the average monthly income for students is 647 TL and with marginal propensity to consume is around 0.995. Considering the total number of students in Gaziosmanpaşa University is equal to 20,659, the total income of students is equal to 13.3 million TL (monthly) of which 11.8 million TL is spent within the city of Tokat. They estimate the minimum annual expenditure by students as 106.4 million TL, of which 94.4 million TL is spent within the city annually. In addition, they estimate 51.6 million TL annually is spent within the city limits by the university staff. Excluding staff expenses, the university spends around 87.8 million TL annually.

Cayin and Ozer (2015) surveyed the students of Mus Alparslan University in order to find out the impact of the university on the city of Mus in terms of income, employment and spending. They predict that the university created 417 direct jobs and 477 indirect jobs, 894 jobs in total, in 2010-2011 academic year. They also estimate that the university created over 11 million TL direct income contribution and 29.6 million TL indirect income contribution, 40.6 million TL in total, to the city of Mus. They find that the marginal propensity to consume is very high, 0.971.

Gorkemli (2009) analyzes the impact of Selçuk University on the economy of city of Konya using the multiplier method with the data provided by the finance department of Selçuk university and surveys conducted in 2005 on students of Selçuk University. He estimates that Selçuk University and its students contributed to the Konya city economy as a direct income effect of 41.1 million TL and created 4,205 jobs. The combined amount of indirect income contribution by the university and its affiliations through their budgetary spending on the city economy was 54.6 million TL and the created 2,182 jobs in the city. The indirect income and employment effect of the student expenditures were found to be 183.0 million TL and 7,315 jobs, respectively. The study estimated that the spending by the university and its students induced a total of 852.6 million TL and 34,085 jobs.

Akcakanat et al. (2010) analyzes the spending tendencies and economic contribution of university students on the economy of the city where they live in, using a sample from Suleyman Demirel University in Isparta. The paper uses data obtained from four surveys conducted in 2003, 2005, 2007 and 2009. They find that the average monthly spending per student is 474 TL in 2009 and the total amount of spending by the students of the university exceeds 80 million TL in the same year. They

conclude that the amount of this spending is highly significant considering the total export by the firms located in Isparta province was around 120 million USD in the same year.

Atik (1999) studied the economic contribution of Erciyes University in Kayseri on the city economy using a survey conducted in 1997-1998 academic year and estimated that the university provided employment to 2,313 people through direct economic effect and to 5,362 people through indirect economic effect, 7,675 new jobs in total. The study also estimated that the university contributed the Kayseri economy around 13.7 million TL through direct and indirect economic contributions. Erkekoglu (2000) conducted a similar study in Cumhuriyet University in Sivas city. The study estimated that the university created approximately 15.4 million TL additional income and 4,965 jobs through direct and indirect economic effects.

### **3. METHODOLOGY AND THE MODEL**

In the absence of extensive input-output tables for Bosnia and Herzegovina, though it was not the best method, this study opted for Keynesian multiplier method. This method basically quantifies the expenditure impacts of the university through the use of an econometric model. This kind of quantitative studies are increasingly becoming an important part of university policy making processes in terms of dealing with the issues of accountability in addition to establishing more socially responsible approaches by the local community to the utilization of resources that are allocated for the university.

These studies use the basic assumption that an injection of spending by a university leads to an increase in staff salaries and spending on goods and services by the institution. This, together with spending by students, increases the output and thus income in the local area. This increase in income is called as “first-round” increase in income in the region and that leads to subsequent rounds of increase in spending by those who benefit from this surge of expenditure. This effect is usually called as “induced effect” and generally referred to as “the Keynesian multiplier process.” (Huggins and Cooke, 1997).

Keynesian Multiplier model of impact studies consider the following items in the direct and indirect effect calculations: Salary payments by the University on staff who live in the region, employees pension deductions and health insurance payments for the staff, local spending by the university staff who live outside of the region, non-staff spending by the university spent in the region, student spending in the region by the student who are in the region because of the university, and spending by the visitors of staff and students in the region who come to the region because of the university’s presence in the region (Huggins and Cooke, 1997).

The goal of this study is to calculate the direct, indirect and induced economic impacts of the International University of Sarajevo on Ilidza region and Sarajevo City. In order to reach this goal, this study uses the theoretical model developed by Bleaney et al. (1992) and later modified by Huggins and Cook (1997) which employs demand side Keynesian spending and income multipliers. This model was

also used later by Ceyhan and Guney (2011), Yayar and Demir (2013), Cayin and Ozer (2015) and many other studies. The model, first, estimates the marginal propensity to consume for students and staff using the sample data by employing separate OLS regressions. Then using the result, it calculates the implied spending multipliers for the subgroups. The detailed version of the modified model can be found in Ceyhan and Guney (2011).

### **3.1 Initial Injection of Spending (Expenditure Base)**

As it was the case with Huggins and Cook (1997), the model involves a number of stages in terms of expenditure and generated income calculations. The first step is to estimate the size of initial monetary injection to the local economy. This injection can be calculated as:

$$EB = W + G \quad (1)$$

where  $EB$  is the spending base,  $W$  is the labor services purchased by the university or simply the personnel expenditure of the university in form of wages, and  $G$  is the goods and services purchased by the university from the outside economy as well as local economy.

### **3.2 First-round Gross Local Output (GLO) – Direct Effect**

The impact of initial spending by the university in the region will be seen as a sudden surge of local sales, hence local income, in the region. The model can be constructed using:

$$Y_1 = h. G \quad (2)$$

where  $Y_1$  is the first-round GLO,  $h$  is the proportion of university spending on goods and services on locally produced goods and services. From this formula, the next step will be the calculation of local disposable income ( $DI_1$ ) generated at the end of first-round. This can be calculated as:

$$DI_1 = (1 - t). (Y_1 - h. i. G) \quad (3)$$

where  $DI_1$  is the first-round change in disposable income of local residents,  $i$  is the rate of indirect or sales tax,  $t$  is the rate of direct or income tax in the region.

### **3.3 Second-round Gross Local Output – Indirect Effect**

Second-round contributions to GLO can be calculated as:

$$Y_2 = m. S + n. c. (W + W_o) + k. V + n. c. DI_1 \quad (4)$$

where  $m$  is the proportion of spending by students of the university on locally produced goods and services,  $n$  is the proportion of spending by staff of the university as well as ordinary citizens in the area on locally produced goods and services,  $c$  is the average marginal propensity to consume of the households in the region,  $W$  is the salaries paid to the university employees,  $W_o$  is the additional income earned by the university employees from their outside teaching jobs or research projects,  $V$  is the



spending by the visitors of students and staff who come to the region mainly because of the presence of university, and  $k$  is the proportion of spending by visitors on locally produced goods and services. Value of  $n$  is obtained from the staff survey and value of  $k$  is estimated using the import figures of Bosnia and Herzegovina. Then, it is now possible to calculate the second-round disposable income formula. This can be calculated as:

$$DI_2 = (1 - t). (1 - i). Y_2 \quad (5)$$

### 3.4 Third-round Gross Local Output and Disposable Income

Third-round contributions to GLO can be calculated as:

$$Y_3 = n. c. DI_2 \quad (6)$$

and the resulting disposable income contribution in the region can be found with the following formula:

$$DI_3 = (1 - t). (1 - i). Y_3 \quad (7)$$

The same process continues with fourth-round, fifth-round and sixth round etc. Since the rest of the cycles or rounds are essentially same, there is no need to continue with the remaining steps. The final full multiplier for Gross Local Output can be calculated as:

$$\begin{aligned} Y_f/Y_1 &= (Y_1 + Y_2 + Y_3 + \dots). Y_1 = 1 + (1 + n. c. (1 - t). (1 - i) + \dots). Y_2/Y_1 \\ &= 1 + Y_2/([1 - n. c. (1 - t). (1 - i)]. Y_1) \quad (8) \end{aligned}$$

where  $Y_f$  is the final GLO after all rounds of multiplier process.

The full multiplier for local disposable income can be calculated as follows:

$$\begin{aligned} D_f/D_1 &= (D_1 + D_2 + D_3 + \dots). D_1 \\ &= 1 + (1 - t). (1 - i). (1 + n. c. (1 - t). (1 - i) + \dots). Y_2/D_1 \\ &= 1 + (1 - t). (1 - i). Y_2/[1 - n. c. (1 - t). (1 - i)]. D_1 \quad (9) \end{aligned}$$

where  $D_f$  is the final disposable income after all rounds of multiplier process.

### 3.5 Induced Investment

Following Ceyhan and Guney (2011), this study also calculates the amount of induced investment in the region as a result of physical investment by SEDEF as well as annual spending by the university itself, IUS students and staff members. This calculation is made by the following formula using accelerator principle:

$$\Delta I = \alpha. \Delta Y$$

where  $\alpha$  is the investment multiplier,  $\Delta I$  is the induced investment through the additional spending by the university and  $\Delta Y$  is the induced change in income. Student and staff spending items were calculated from the surveys. Institutional spending figures were obtained from the accounting office of the International University of Sarajevo. Indirect tax rate or value added tax rate is taken as 17 percent since this is the current rate in the country. Direct tax rate or income tax rate is reported to be 10 percent.

#### **4. DATA**

This study uses the data set constructed from the surveys conducted at IUS as part of a project entitled “Economic Impact of IUS on Local Economy of Ilidza and Sarajevo” which was implemented at the International University of Sarajevo in March-June 2016 period. Main goal of the project was to analyze direct and indirect income and employment impact of initial investment spending by SEDEF foundation to establish the university and personal spending of IUS staff and students on the local economy since the establishment of the university. Three separate surveys were conducted in April, May and June of 2016.

The first one was conducted on approximately one-third of the student population of IUS, partially online and partially on face to face in computer. The survey asks mainly about personal information on students such as faculty, program, their family income, detailed spending information, housing features, transportation, their reasons for selecting IUS, their satisfaction levels from IUS etc. The survey was conducted on randomly selected 498 students (out of 1,765 total registered students for the Spring semester of 2016 at the IUS), providing overall participation ratio of 28.2 percent. The Cronbach Alpha coefficient of the survey is found to be 0.8063. Therefore, the survey results can be considered as highly reliable.

Table 1 presents the summary statistics of survey responses for Turkish students, Bosnian students and all students. Table 1 allows across group comparison between Turkish students and Bosnian students as well. Table 1 clearly shows that there are significant differences between the characteristics of Turkish students and Bosnian students. Turkish students spend much more money every month as they are wealthier compared to Bosnian students. As part of this, they also spend more money on grocery shopping, leisure, dining out, clothing, taxi ride, traffic tickets (fines) and technology. Also, a closer look on rental data reveals that Turkish students spend significantly more on accommodation as they generally prefer to live in newer and higher quality homes.

Data show that, not surprisingly, majority of Turkish students live in rental apartments or homes. A smaller percentage stay in dormitories. Very small percentage of Turkish students live in their own homes. On the other hand, majority of Bosnian students (62.8 percent) live with their families or alone in their family owned homes or apartments in Sarajevo. Only 23.1 percent of the Bosnian students live in rental apartments or homes while 14.1 percent of them stay in dormitories.

The second survey was conducted on all IUS and SEDEF foundation staff members in the form of traditional paper survey by distributing questionnaires to all available employees. 161 of the surveys were collected back as completed out of 231 surveys distributed to the employees at IUS and SEDEF foundation. Thus, the participation rate of 69.7 percent was achieved. The Cronbach Alpha coefficient of the survey is found to be 0.7945. Therefore, the survey results can be considered as highly reliable. Table 2 presents summary statistics of staff survey and allows across group comparison between non-Bosnian and Bosnian staff of IUS.

**Table 1. Student Survey: Summary Descriptive Statistics**

Variables	Turkish Student		Bosnian Student		Overall	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Male***	0,721	0,449	0,528	0,500	0,653	0,477
CGPA***	1,521	0,980	2,719	1,078	2,040	1,170
Attendance***	0,856	0,155	0,912	0,092	0,880	0,130
Family Income***	4.922,2	6.696,7	2.786,7	3.097,3	3.914,2	5.481,9
Duration***	3,732	1,72	2,533	1,306	3,199	1,639
Monthly Spending***	870,8	544,4	470,3	351,2	697,2	517,4
Scholarship***	0,313	0,265	0,54	0,338	0,43	0,33
Work***	0,052	0,223	0,141	0,349	0,096	0,295
Work Income**	22,9	118,1	54,6	182,6	43,7	178
Grocery*	165,2	122,3	140,3	160,6	153,4	138,4
Accommodation***	317,6	315,3	89,4	134	213,5	273,3
Restaurant***	209	152,3	99,3	83	165,2	140,3
Leisure***	170,8	211,3	90	103	136,9	186
Communication	21,5	28,2	19,5	16,4	21,8	31,9
School Supplies***	28,9	42,4	17,5	22,9	24,3	37,3
Cleaning***	7,8	20,6	4,3	16,1	6,8	20,4
Public Transportation	18,9	25,1	19,7	29,3	19,5	27,1
Taxi***	27,5	46,6	8,7	18,7	19,1	37,7
Own a Car	0,201	0,401	0,266	0,443	0,223	0,417
Fuel	38,6	114,7	35,3	71,1	36,4	97
TrafficTicket**	42,2	154,3	14,8	60	29,9	121,7
Insurance	133	415,3	119,1	239,4	121,3	342,7
Health**	56,6	110,9	126,3	424,4	93,4	314,8
Clothing***	224,3	403,3	570,3	628,4	371,1	527
Technology**	1.331,2	3.954,1	686,1	985,2	1.037,7	3.623,9
Auto Expenditure*	3.177,7	1.215,0	724,1	4.375,3	2051	9.433,3
Rental***	0,680	0,467	0,231	0,423	0,472	0,500
Family***	0,030	0,075	0,628	0,512	0,273	0,458
Dormitory***	0,290	0,454	0,141	0,349	0,255	0,436
Roommate***	0,572	0,828	0,231	0,649	0,404	0,758

Number of Observations **269** **199** **498**

Source: IUS Student Survey, 2016

\*,\*\*,\*\*\* Significant 10%, 5 % and 1% significance level, respectively

**Table 2. Staff Survey: Summary Descriptive Statistics (combined)**

Variables	Non-Bosnian Staff		Bosnian Staff		Overall	
	Mean	St Dev.	Mean	St Dev.	Mean	St Dev.
Male***	0,794	0,41	0,441	0,498	0,516	0,501
Age	35,9	7,9	37	8,8	36,7	8,6
Doctoral Degree***	0,5	0,508	0,15	0,358	0,224	0,418
Teaching***	0,853	0,359	0,504	0,502	0,578	0,495
Single	0,294	0,462	0,26	0,44	0,267	0,444
Number of Children**	0,706	1,031	1,11	1,048	1,025	1,054
Percent Income from IUS	82,2	27,4	<b>74,3</b>	25,1	75,9	25,7
Family Income***	3.151,5	2.259,5	2.129,7	1819	2345,5	1958
Monthly Spending	1.262,9	833,6	1289,4	721,8	1.283,8	1.082,7
Groceries	446,8	27904	459,4	200,3	456,8	218,5
Monthly Rent***	442,6	256,8	58,4	133,8	167,1	247,7
Restaurant***	249,6	150,3	149	131,9	170,2	141,6
Leisure***	160,3	139,7	104,7	95,4	116,5	108,2
Phone*	46,7	50,1	62,9	46,6	59,5	47,7
Heating	115	78,6	111,9	70,4	112,5	72
Utilities***	45,4	24,2	65,7	31,3	61,4	31
Cable***	34,8	23,2	54,2	29,8	50,1	29,5
Public Transportation	37,9	51,1	42,3	40,7	41,4	43
Education Expenses***	268,7	357,7	134,7	184,8	163,2	237,4
Daycare	41,2	89,2	71,1	168,1	64,8	155,1
Taxi	17,6	24,3	15,6	27,8	16	27,1
Number of Cars***	0,647	0,774	0,984	0,6	0,913	0,684
Fuel**	113,2	122	157,3	96,3	148,6	103,4
Insurance*	416,9	580,1	578,3	450,3	544,2	483,2
Repair	313,2	467,6	343,4	466	337,1	465,2
Auto Expenditure**	125,9	195,2	227,2	217,7	205,8	216,6
Health	371	698,9	468,2	653,6	447,7	662,4
Clothing	776,4	969,6	840,3	830,2	826,8	858,7
Technology**	742,4	1032,2	432	649	496,8	758,2
Home Owner***	0,118	0,327	0,764	0,426	0,627	0,485
<b>Number of Observations</b>		<b>34</b>		<b>127</b>		<b>161</b>

Source: IUS Student Survey, 2016

\*,\*\*,\*\*\* Significant at 10%, 5% and 1% significance level respectively

The third survey was conducted randomly on approximately half of the 2016 graduates in June 2016 at the graduation ceremony in order to measure the impact of spending on local economy by visiting parents, relatives and friends of the students who come to Sarajevo specifically to be present at the graduation ceremony. The survey was conducted only on Turkish student. The Cronbach Alpha coefficient of the survey is found to be 0.7009. Therefore, the survey results can be considered as reliable. The survey results indicate that 68.9 percent of the students had one or more family member present in their graduation ceremony in 2016. Including student with no visitors in the sample, the mean

value of number of visitors turn out to be 2.31 visitors, with standard deviation of 2.85 visitors. Mean value of number of days per visitor is found as 5.09 days, with standard deviation of 5.66 days. Finally, mean value of spending during Sarajevo visit is found as 2,735.6 KM, with standard deviation of 3,728.9 KM.

## **5. EMPIRICAL RESULTS**

As it was mentioned above, marginal propensity to consume (MPC) values are needed in order to calculate indirect economic impact of student spending. In order to predict the MPC coefficient, linear regression was run for student sample. Following the examples in the literature, these regressions were run with gender and nationality variables as independent variables. The resulting regression result is presented in Table 3 for all students. As expected, the dependent variable for the regression was monthly spending while the other independent variable was monthly income or allowance for students.

R-square of the student regression is around 54 percent and this is relatively in line with the finding of most other similar studies. The study finds that MPC is around 0.90 for students of IUS and this finding is highly significant along with nationality variable while the gender coefficient is found to be insignificant.

### **5.1 Financial Data of IUS and Economic Impact Calculations**

As explained earlier, IUS is a foundation university and it operates as a non-profit organization. Its fixed capital investments have been financed through the endowments of its foundation. According to the information provided by IUS Finance Office, SEDEF foundation spent around 2.4 million KM to purchase the land of the current campus and spent around 40 million KM in order to build campus buildings as well as furnishing them with state-of-the-art equipment in the period of 2010-2015.

On the other hand, IUS finances large part of its operating expenses through its tuition revenue from its students. The larger part of this revenue comes in the form of international tuition mainly from Turkish students as well as from other foreign students.

### **5.2 Direct Economic Effect**

According to information obtained from IUS Finance Office, IUS spent 8,184,707 KM in 2016. Combined with the expenditure of SEDEF, total spending injected to Sarajevo economy by IUS and its affiliations reaches to almost 10 million KM (Direct Economic Impact of 9,872,530 KM exactly). Over 3 million KM of spending by IUS is earned by the IUS staff in the form of employee compensation and majority of this amount is spent in Ilidza and other parts of Sarajevo Canton. In addition, IUS contributes over 1.1 million KM to the social security system of the Federation and also 584 thousand KM is paid to local authorities in the form of payroll taxes. This amount allows local authorities to finance

significant amount of public services in the region. In addition, IUS over 4 million KM is spent on locally purchased good and services in the region by IUS and its affiliations.

**Table 3. Regression Results (All Students)**

Source	SS	df	MS	Number of observations		498
				F(3, 494)		197
Model	115230864	3	38410288	Prob >F		0
Residual	96098696	494	19431,77	R-squared		0,5423
				AdjR-squared		0,5425
Total	211329560	497	425210,38	Root MSE		441,06
MONTHLY SPENDING	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
MALE	-1,517381	42,49458	-0,04	0,972	-85,00979	81975
TURKEY	93,87035	42,76464	2,2	0,029	9,847345	177893
MONTHLY INCOME	0,8942118	0,041514	21,54	0	0,8126453	0,97578
CONSTANT	224.374	41,37881	5,42	0	143,0739	305674

### 5.3 Indirect Economic Effect

Indirect Economic Effect happens as a result of spending created by the existence of university in the area but the spending is not directly done by the university. In other words, this effect arises because of the spending by students, staff of the university and visitors of students and staff whom would not have been in the region if the university was not located in the region.

According to Table 1, IUS student survey indicated that IUS students spend in average 697. KM monthly for their personal expenses, excluding tuition. This amount is calculated as 940.6 KM when responses for individual spending items were taken into account and the difference between these two figures is statistically significant. It should be noted that the second figure include spending items like traffic insurance, car parts, car repairs, clothing expenditure which are not generally considered as part of the monthly spending due their less frequent occurrences. Therefore, this study will use the higher figure as average monthly student spending since these extra items are also integral part of personal spending. According to IUS Student Survey results, students report that, in average, they spend 27 days of their holidays in Sarajevo. Considering that the academic year is approximately 9 months, adding this 27 days as one full month, this study will assume that students spend 10 months of a year in Ildza and Sarajevo region.

According to Table 2, IUS Staff Survey indicated that IUS staff spend in average 1283.8 KM monthly for their families. This amount is calculated as 2103 KM when responses for individual spending items were taken into account and the difference between these two numbers is statistically significant. Again, this study will use the higher figure as average monthly student spending since these

extra items are also integral part of family spending. The survey results reveal that IUS staff spend around 11 months a year in Ilidza and Sarajevo region.

According to IUS Student Survey results, in average they have 2.2 times visitors including visitors from Bosnia, Turkey and other countries. These visitors, in average, spend 6.8 days in Sarajevo and spend 938 KM during their visits for their accommodation and personal expenses. 34.5 percent of the visitors are reported to stay in a hotel or short-term rental apartment during their visit.

In addition, as it was explained earlier, many overseas visitors come to IUS every year for graduation ceremony. According to the results of the graduation ceremony survey, in average, graduating students have 2.31 visitors who spend 5.1 days in Sarajevo and spend 2,735.6 KM during their visit.

Using these figures, Indirec Economic can be calculated as follllows:

From student expenditure ( $S$ ) =  $940.6 \times 1765 \times 10$  months = 16,601,590 KM

From staff expenditure ( $W+W_0$ ) =  $2103 \times 231 \times 11$  months = 5,343,723 KM

From visitor spending ( $V$ ) =  $938 \times 1765 + 2735.6 \times 274$  = 2,405,124 KM

Total Indirect Economic Effect = 24,350,437 KM

#### **5.4 Induced Economic Effect**

As explained in the model section, this study uses demand-side Keynesian spending and income multipliers in order to determine induced economic effect of the university.

##### Expenditure Base:

Expenditure base can be calculated using the data provided by IUS Finance Office. IUS spent 3,172,333 KM for total employee compensation including the transfer to the employees ( $W$ ) and to 2,740,913 KM for the purchase of goods and services ( $G$ ) in financial year of 2016. Using the information above, Expenditure Base ( $EB$ ) can be calculated as shown below:

$$EB = W + G = 3,172,333 + 2,740,913 = 5,913,246 \text{ KM}$$

##### First-round Gross Local Output Effect:

IUS student spends almost their entire allowance and income locally while they are in and around the campus (hence  $m = 1$ ). According to the responses of staff in the survey, it is estimated that IUS staff spend approximately 62.3 percent ( $n$ ) of their income in Sarajevo. IUS finance office reports that approximately 92.8 percent of entire spending by IUS administration ( $h$ ) is done locally in 2016. As a result, the combined local spending rate of IUS and its people is estimated to be around 0.825, using the weighted average of these spending tendencies.

$$Y_1 = h. G = 0.928 \times 2,740,913 = 2,543,567 \text{ KM}$$

#### Second-round Gross Local Output Effect:

This initial expenditure surge by IUS would trigger sales and income in the region. The resulting increase in the local output can be calculated by equation (3) in the model, using the local income or earning tax rate ( $t$ ). Value added tax or indirect sales tax ( $i$ ) in Sarajevo is 17 percent. Income tax rate in Sarajevo is not high. However, considering all deductions from the gross salary, including social security contributions, would be more appropriate to calculate the effective and more actual earning tax rate. Using the average net and gross salary information by industry, it is found that the average earning tax rate out of gross salary is found to be around 36 percent. Using this estimate, the net income or output created by the university in the second-round is calculated as follows:

$$DI_1 = (1 - t). (Y_1 - h. i. G) = (1 - 0.36). (2,543,567 - 0.928 \times 0.17 \times 2,740,913)$$

$$DI_1 = 1,351,143 \text{ KM}$$

This increase in output would be the result of the impact of university's initial expenditure on goods and services. However, as explained above, this figure would be incomplete if the additional output created through student, staff and visitor expenditure after value added tax deductions (*i.e indirect economic impact* calculated in the previous section minus the indirect sales tax). Therefore, the correct version of  $DI_1$  would be as follows:

$$DI_1 = 1,351,143 + (1 - 0.17). (24,350,437) = 21,562,005 \text{ KM}$$

#### Second-round Gross Local Output Effect:

Second round contributions to gross local income combined with indirect economic contribution can be calculated using formula (4) in the model section as follows:

$$Y_2 = m. S + n. c. (W + W_o) + k. V + n. c. DI_1$$

$$Y_2 = 1. (16,601,590) + (0.623). (0.7416). (5,343,723) + (0.80). (2,405,124)$$

$$+ (0.623). (0.7416). (21,562,005)$$

$$Y_2 = 30,956,588 \text{ KM}$$

Here, following Ceyhan and Guney (2011), it is assumed that the staff's additional income through their outside employment as well as research involvement will be implicitly included in their spending which was calculated in the indirect economic impact section. In addition, based on the visitor survey results, it was estimated that visitors make approximately 80 percent of their spending in Sarajevo ( $k = 0.80$ ). Marginal propensity to consume number for staff (0.7416) is taken from the staff regression



results in Table 12, assuming that the MPC value for general public of Bosnia would be similar to IUS staff's figure.

Now, later stages can easily be calculated as follows:

$$DI_2 = (1 - t) \cdot (1 - i) \cdot Y_2 = (1 - 0.36) \cdot (1 - 0.17) \cdot (30,956,588) = 16,444,140 \text{ KM}$$

$$Y_3 = n. c. DI_2 = (0.623) \cdot (0.7416) \cdot (16,444,140) = 7,597,469 \text{ KM}$$

$$DI_3 = (1 - t) \cdot (1 - i) \cdot Y_3 = (1 - 0.36) \cdot (1 - 0.17) \cdot (7,597,469) = 4,035,776 \text{ KM}$$

$$Y_4 = n. c. DI_3 = (0.623) \cdot (0.7416) \cdot (4,035,776) = 1,864,596 \text{ KM}$$

$$DI_4 = (1 - t) \cdot (1 - i) \cdot Y_4 = (1 - 0.36) \cdot (1 - 0.17) \cdot (1,864,596) = 990,473 \text{ KM}$$

$$Y_5 = n. c. DI_4 = (0.623) \cdot (0.7416) \cdot (990,473) = 457,615 \text{ KM}$$

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Calculating all the stages of this multiplier process provides that after all rounds; total induced economic impact of the university in the long-run will be around 41,028,423 KM of additional gross local output and 21,802,371 KM of additional disposable income in the region.

The final multiplier for the gross local output and also for local disposable income, after slight modification because of the explanation above, can be calculated as:

$$Y_f/Y_2 = 1 + Y_3/([1 - n. c. (1 - t) \cdot (1 - i)] \cdot Y_2) = 41,028,423/30,956,588 = 1.325$$

$$D_f/D_2 = 1 + (1 - t) \cdot (1 - i) \cdot (1 + n. c. (1 - t) \cdot (1 - i) + \dots) \cdot Y_3/D_2$$

$$D_f/D_2 = 21,802,371/16,444,140 = 1.325$$

## 5.5 Employment Effect

IUS, together with SEDEF companies, already directly provide 231 jobs in Ilidza and Sarajevo area. In addition, as a result of indirect and induced spending caused by its own expenditures as well as the expenditure by its students, staff and their visitors, creates and sustains additional jobs in the area. In order to calculate the indirect employment effect, two parameters are needed: total amount of indirect and induced expenditure, and per capita production value in the region. The first value is already calculated above. In order to calculate the second value, total GDP contribution of Sarajevo Canton is needed. Then, it is possible to find per capita production value by dividing this number to total employment number in the region obtained from Canton Sarajevostatistics (129,031 workers).

According to Statistical Institute of Federation of Bosnia and Herzegovina GDP of Sarajevo Canton in 2016 was 4,972,000,000 KM. Dividing this figure to the total employment number in the canton, per capita production value is found as 38,533 KM. Using this result, total employment contribution of the university can be calculated as follows:

Indirect Employment Effect =  $41,028,423/38,533 = 1,064.7$

As it can be seen from this result, indirect and induced spending caused by the existence of IUS in Sarajevo creates around 1,065 additional jobs in the region. In other words, IUS and its affiliates create 1,296 jobs in total, direct and indirect effect combined. This contribution is extremely important for a small country like Bosnia and Herzegovina where the official unemployment rate is reported to be over 40 percent. This effect would be even higher if we consider the total capital spending over 40,000,000 KM by IUS in last 10 years.

## 6. CONCLUSION

In recent years, Ildza is on the way to become a university hub for the Sarajevo Canton. Currently three private universities are located in the area and attract over 5000 students and 500 employees. Ildza municipality is lobbying for making Ildza as a university center of Bosnia and Herzegovina. IUS is the first university moved to the area and currently is the largest one in terms of student and staff population. It set an example for other universities in line with the future vision of the municipality.

The specific area that is used in this study, Ildza, has recently become a major business center for the city of Sarajevo with numerous new development projects, and increasing number of foreign tourists because of its natural beauty and hot springs with healing power dating back to pre-Roman times. In addition, Sarajevo International Airport and the beautiful Vrelo Bosne springs are located in the close vicinity of Ildza.

IUS spends over 8 million KM a year and this spending reaches to 10 million when combined with the expenditure of SEDEF. Over 3 million KM of spending by IUS is earned by the IUS staff in the form of employee compensation and majority of this amount is spent in Ildza and other parts of Sarajevo Canton. In addition, IUS contributes over 1.1 million KM to the social security system of the Federation and also almost 600 thousand KM is paid to local authorities in the form of payroll taxes. IUS also spends over 4 million KM on locally purchased good and services in the region.

This study estimates that IUS contributes to the Ildza and Sarajevo economy around 10 million KM as direct benefit, over 24 million KM in indirect benefits, and 41 million KM in induced benefits. Total of these contributions reach to 75 million KM a year. In addition, IUS together with SEDEF owned companies, create 231 jobs directly and 1,065 jobs indirectly (1,296 jobs in total) in Ildza and Sarajevo area. This effect is estimated to be even higher when considering the total capital spending over 40,000,000 KM by IUS in last 10 years.

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