

CLUJ-NAPOCA WITHOUT STUDENTS: AN ESTIMATION OF THE GAP IN THE CITY'S ECONOMY*

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Abstract

In the new context of COVID-19, the authors assess the economic gap of the absence of students from Cluj-Napoca for one month due to the pandemic quarantine and isolation. The economic gap is presented in terms of estimated expenditures that did not occur, on an average monthly basis. The estimations are based on the survey data carried among Babeş-Bolyai University students that assessed students' expenditure for the year of 2015 in Cluj-Napoca. Our results suggest that due to the absence of the student population from Cluj-Napoca, around 33.4 million Euros is the expected amount of loss per month through spending that does not occur.

Keywords: student expenditure, economic impact, higher education, Cluj-Napoca.

1. Introduction

In March 2020, due to the ongoing pandemic of the coronavirus disease 2019 (COVID-19), universities across Romania suspended face-to-face instruction. Most academic activities moved online, most important activities – teaching and students’ interaction with the professors and the administrative staff – being carried on exclusively online. This unprecedented situation cancelled students’ on-site presence at the university, and so the need for the students to live in the university city has also become optional.

The absence of students from the university city becomes visible where usually the ratio of students to city residents is high. In Romania, the largest university centers are Bucharest, Cluj-Napoca, Iași, and Timișoara, however the highest ratio of students to residents is in Cluj-Napoca (Figure 1).

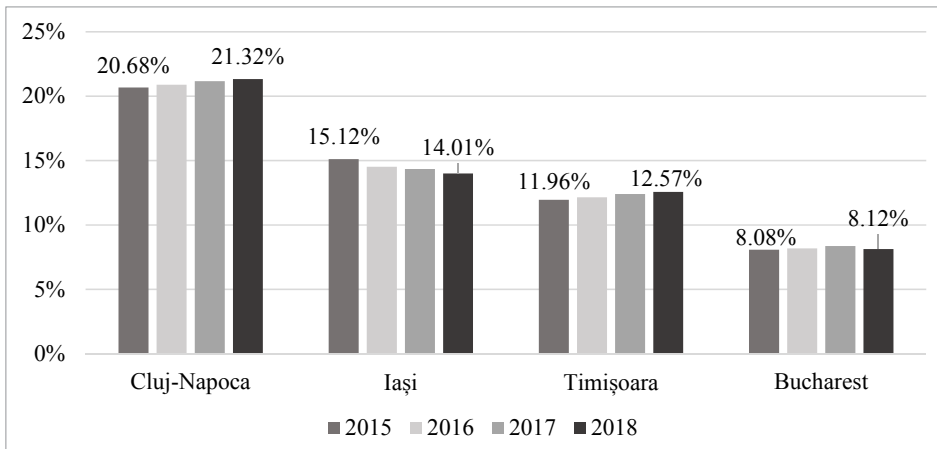


Figure 1: The ratio between total number of students and city residents

Source: Own elaboration based on data from the National Institute of Statistics

In terms of economic impact, the visitors of students enrolled at Babeș-Bolyai University alone spent an estimated 7.5 million Euros in the city of Cluj-Napoca in the year 2015 (Chircă and Lazăr, 2019). And since only 9.3% of those visitors spent a night in a hotel or hostel during their stay in Cluj-Napoca, the type of tourism they perform remains unexplored and mostly untraceable in the official tourism data (Chircă and Lazăr, 2019).

The university has a significant impact on the economic life of its host city: a large number of people who are not residents shop locally, salaries are paid to academics, a significant number of students from other places decide to stay after graduating becoming city residents (Pastor, Pérez and de Guevara, 2013). In economic impact studies, these are known as short-term and demand-side effects. As a large-scale consumer of inputs such as labor, goods and services, and generator of outputs: skills,

know-how, and local attractiveness, the university is a major factor in metropolitan economic development (Felsenstein, 1996, p. 1566).

Therefore, estimating students' expenditure is subject to universities' local economic impact studies. It is also explored in studies on the economic struggle to obtain higher education or simply on the cost of living for students. The complexity of the economic impact of the universities has on one hand generated a diversity of economic impact studies, but on the other hand discouraged such attempts (Pellenbarg, 2005). Studies linking university spending to the local economy can be traced back to 1949 (Florax, 1992): Tully, A.M., 'The Economic Contribution of Rutgers University to the Welfare of the City of New Brunswick during the Fiscal Year 1947-1948'.

Compared to the results of a survey conducted in 2016 to measure the expenditure of the Babeş-Bolyai University (BBU) students in 2015, we can estimate a gap in the local economy of Cluj-Napoca caused by one month of coronavirus (COVID-19) pandemic quarantine in 2020, as the quarantine completely changed the ways in which the university functions. For that, the students' expenditure assessed for 2015 was adjusted with the annual inflation rate, with the number of BBU students enrolled in January 2020 (a total of 31,570), and with the total number of students studying in all universities in Cluj-Napoca.

The paper consists of three sections. The next section explores the conceptual aspects of some studies on economic impact of universities in which student expenditure issues are analyzed. The third section presents the methodology and the main results of the survey carried out among BBU students to assess their expenditure in the reference year 2015 as part of a broader study on the BBU impact on the local economy of Cluj-Napoca. Finally, the estimations of BBU student expenditure are adjusted to quantify total student expenditure in Cluj-Napoca for one month in 2020.

2. Theoretical framework

Universities leave marks on the local community, some of them tangible, others intangible, overt or covert as they are caused by factors both internal and external to the academic environment (Chircă and Lazăr, 2018). Warsh (2006) argues that it is enough to look at any map to observe that cities hosting universities have remained on top or reinvented themselves after decline, inferring that knowledge is a powerful factor of production. The implications of hosting a major university campus by a community, such as the economic value and contribution of the university and its impact on the socio-economic development of the community are well-discussed in the literature (Armstrong, 1993; Bleaney *et al.*, 1992; Blackwell, Cobb and Weinberg, 2002; OECD, 2007; Pastor, Pérez and de Guevara, 2013; Schubert and Kroll, 2016).

Universities, the traditional providers of human resources and knowledge, are critical socio-economic development actors (Dzisah and Etkowitz, 2008, p. 101). Etkowitz (2008) places universities in the Triple Helix (university – industry – government) – an interaction that is key to innovation in an increasingly knowl-

edge-based society. Universities are assigned the role of catalysts of local and regional economy development increasingly more often (Steinnes, 1987).

Considerable efforts to understand the contributions of universities to the functioning of regional economies can be found in regional studies focused on their roles (Drucker and Goldstein, 2007; Goldstein and Renault, 2004; Florax, 1992). The 2011 EU Guide 'Connecting Universities to Regional Growth' calls for an active engagement of public authorities to involve universities in cooperation with research centers, businesses and other civil society actors, in regional innovation strategies for smart specialization (Hahn and Vassiliou, 2011).

Due to the rapid growth of the higher education sector in the United States in the 1960s, the first official methodology to research the local impact of a university on income and employment appeared in 1971. Caffey and Isaacs (1971) designed it for the American Council on Education as a template methodology to quantify the short-term economic impact on local economy of the demand-side effects – the economic impact in a certain year (or fiscal year) of the university and its related spending.

More than twenty years later, Goldstein, Maier and Lueger (1995) proposed eight distinctive university outputs that can have an impact on economic development. Such varied and complex outputs of the higher education led to numerous discussions either on improving the ACE methodology (Bluestone, 1993; Brown and Heaney, 1997; Elliott, Levin and Meisel, 1988), or on creating a better classification of the impact (Beck *et al.*, 1995; Leslie and Slaughter, 1992), or even on proposing a different methodology, such as the Ryan short cut method (Ryan and Malgieri, 1981).

Schubert and Kroll (2016) summarized the complexity of the university factors of impact as inputs, outputs, first order effects and second order effects. The clear distinction between long-term, knowledge-based supply-side, and the short-term, expenditure-based demand-side, of the same inputs is very helpful (Figure 2) because they allow for a complex and nuanced assessment of the economic contribution of higher education institutions.

Siegfried, Sanderson and McHenry (2007) examined 138 studies covering 241 institutions and presented their reliability limitations: the selection of multipliers for indirect and induced impacts; the measuring methods they used, double counting of data, as well as unclear counterfactual scenarios and delimitation of the areas of impact.

More recently in Europe, Pastor, Pérez and de Guevara (2013) improved Caffrey and Isaacs' methodology by adding stochastic processes for assumptions with uncertainty. Thus, by using the requirements specified by Siegfried, Sanderson and McHenry (2007), the methodology based on Monte Carlo simulations allows for a clearer estimation of students' expenditure through a survey design that distinguishes between students based on where they live and between types of spending, and by filtering the results through counterfactual scenario.

In Romania, the doctoral research of the author, 'Estimating the impact of the university on the local economy. Case study: Babeş-Bolyai University in Cluj-Napoca' (unpublished), addressed the complete lack of efforts to estimate the role, importance

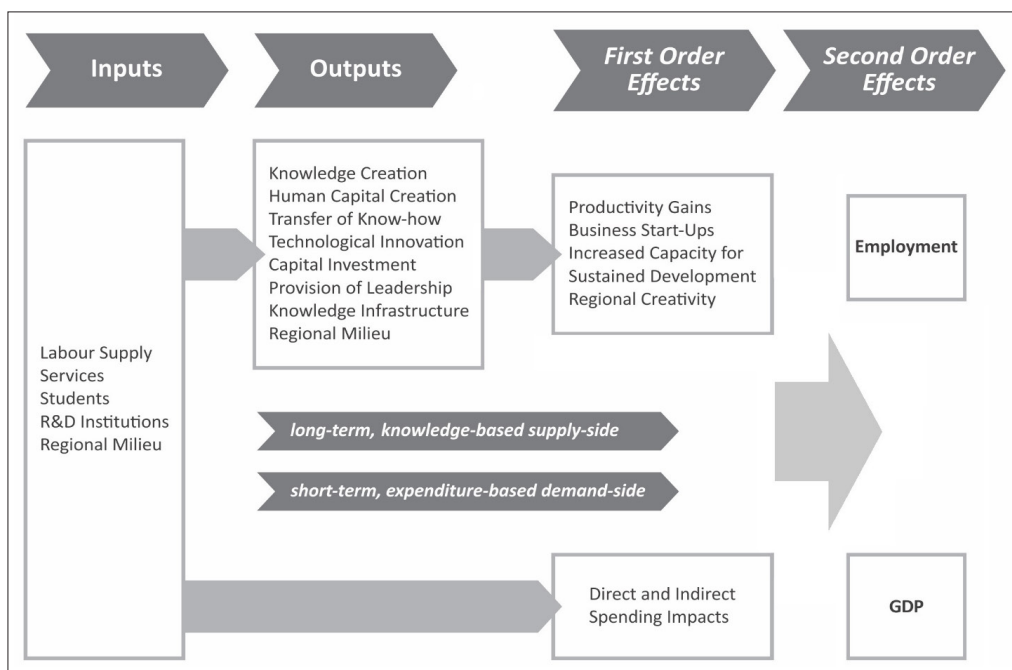


Figure 2: Inputs to, outputs from and regional effects of universities' activities

Source: Schubert and Kroll (2016)

and impact of any Romanian universities on the economies of the cities where they are located. It is the first and it remains the only research to date of this kind in Romania. The authors use the results of that survey as a starting point in assessing the economic gap in Cluj-Napoca, caused by the absence of students for one month, imposed by the quarantine.

3. Students' expenditure findings

The methodology to quantify student expenditure is an important part of a broader study to estimate the economic impact of universities on hosting cities. It includes two main aspects: identifying the students as impact generating agents, and quantifying and estimating the total student spending.

When estimating the economic impact of the universities, four impact agents are identified:

1. The university – its own spending, minus employee salaries;
2. University employees – their salaries paid by the university and their spending;
3. Students – their spending in Cluj-Napoca, throughout their studies;
4. Visitors to Cluj-Napoca city when their visits are related to the university. This category targets students' visitors such as friends and family members, as well as visitors applying to college admissions.

3.1. Research methods

The assessment of BBU student spending was carried out through a sociological inquiry in 2016. The survey comprise questions aimed at quantifying students' spending during their residence in Cluj-Napoca, during the admission period, and the spending of their visitors.

3.1.1. Studied population

In December 2015, BBU reported 41,690 students of all categories attending its courses. From that total we need to exclude: (1) the 3,340 students who were studying in 15 other cities where BBU has faculties; (2) 4,069 postgraduates and teacher training programs; and (3) 3,648 students enrolled in distance learning or part time learning programs. Thus, our general population was 29,754 BBU students in Cluj-Napoca. The BBU statistics office provided the above data, mentioning that a student registered in two faculties would be double counted.

3.1.2. Research instrument

For 74 days, starting February 24th, 2016, a voluntary non-probabilistic survey in the form of an online questionnaire was disseminated among BBU students. The questionnaire consisted of four parts: (1) socio-demographic questions; (2) questions about direct student expenditure on the duration of studying in Cluj-Napoca – divided into 24 different types of spending; (3) questions about student expenditure during admission period; and (4) questions about spending generated by students' visitors (family and friends).

3.1.3. Data analysis procedures

Based on results from a total of 1,159 valid questionnaires, a multiple linear regression using the backward elimination method was applied to identify the most significant independent variables that induce the expenditure dimensions. The total BBU student expenditure was then calculated based on weighted average from regression results. To assess the total student expenditure in 2020, the total BBU student expenditure estimated for the year of 2015 has been adjusted with: the annual inflation rates; the number of BBU students in different categories as reported by BBU for January 2020; and with the total number of students in all Cluj-Napoca's universities.

3.2. Research results

3.2.1. Sample characteristics

We gathered 1,225 answers from BBU students from a convenience sample, 1,159 of them passing the validity checks¹. The sample covers students in all 21 faculties of

1 66 answers were from students not belonging to the general population (30 answers from distance learning BBU students), or had missing values for all 24 different types of spending, or were double records.

the BBU, each program (undergraduate's, master's, PhD) and year of study, students coming from Bucharest (the capital city) and 40 out of 41 Romanian counties (NUTS 3 regions). The sample also includes foreign students and students from the Republic of Moldova – the latter have a special status among students from other countries.

Table 1 contains descriptive statistics on the structure of the general population versus our sample, as the survey was a voluntary and non-probabilistic one.

Table 1: Socio-demographic characteristics of the initial general population and the sample

Variables	Categories	Percentages	
		General Population	Sample
Year of study	Undergraduate 1 st year	28.9	33.4
	Undergraduate 2 nd year	20.7	24.1
	Undergraduate 3 rd year	20.2	18.9
	Undergraduate 4 th year	2.6	3.8
	Masters 1 st year	12.1	7.8
	Masters 2 nd year	11.4	8.5
	PhD 1 st year	1.4	0.7
	PhD 2 nd year	1.4	2.2
	PhD 3 rd year	1.3	0.6
Type of tuition	Without tuition fee	69.6	74.7
	Paying tuition fee	30.4	25.3
Gender	Male	35.3	29.2
	Female	64.7	70.8
Scholarship	Yes	17	16.8
	No	83	83.2
Coming from	Cluj-Napoca area*	19	7.3
	Other areas	81	92.7
Resident in student dormitory	Yes	20	32
	No	80	68

* Cluj-Napoca area will cover the city of Cluj-Napoca and the surroundings within 20km (university standard in terms of being eligible to receive dormitory).

Source: Own elaboration

3.2.2. BBU students' variables that induce the expenditure dimensions

Table 2 presents the regression results, the dependent variable in the total average student expenditure using monthly data. The dummy coding technique was used for seven independent variables: program (undergraduate's, master's, PhD), year of study, tuition fee, gender, urban or rural, students' origin (from the Cluj-Napoca area or other), and their type of accommodation in Cluj-Napoca.

Out of 15 dummies variables of the seven categories, five variables are significant at 1%, one is significant at 5% and another at 10%. The results suggest that a student at a master's program spends annually on average 844 Euros² more than an undergraduate student, *ceteris paribus*. If the student opts for a rent instead dormitory, the annual cost will rise by 1,732 Euros.

Table 2: Multiple linear regression (using the backward method) results at the final 9th step, dependent variable: total student expenditure using monthly data

	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
Program (reference category Undergraduate)				
Dummy Masters	375.002***	111.741	3.356	.001
Dummy PhD	907.835***	214.388	4.235	.000
Tuition fee (reference category No tuition fee)				
Dummy With tuition fee	511.987***	96.460	5.308	.000
Gender (reference category Male)				
Dummy Female	- 184.762**	87.981	- 2.100	.036
Urban or Rural (reference category Urban)				
Dummy Rural	- 191.427*	111.472	- 1.717	.086
Accommodation (reference category Student dormitory)				
Dummy Renting house	770.014***	84.080	9.158	.000
Dummy Own house	881.283***	180.442	4.884	.000
(Constant)	1437.18***	92.390	15.56	.000
No. Observation	1159			
R square	0.137			
Adjusted R square	0.131			
F-statistic	25.307			
p-value (F-stat)	0.000			

*** - significant at 1%, ** - significant at 5%, * - significant at 10%,

Source: Own elaboration

3.2.3. BBU total student expenditure for 2015

Combining BBU available data with our findings, we then estimated the total amount of spending for BBU students in the 2015 year. The total amount was obtained by using different mean values of the most significant variables (program,

² The results in Table 3 are monthly expenditure and are in Romanian currency – RON. We use the average exchange rate for 2015, 1 Euro = 4.4450 RON, from Romanian National Bank (<http://www.bnr.ro/Cursul-de-schimb-3544.aspx>). The average monthly expenditure is then multiplied by 10 for annually expenditure.

with or without a tuition fee, type of accommodation) showed by the regressions above. Where possible, in case of undergraduate students, we kept a separate category for students coming from Cluj-Napoca area. In calculating the mean values, we treated the missing values for eight categories³ as no expenditure.

Tables 3 and 4 show the annual expenditure of the BBU students based on different spending categories of students, and they are also divided by categories of goods and services. The first division is between undergraduates, master students and PhD students, as obtained from the BBU official data. Of 21,546 undergraduates, 17.8% are from Cluj-Napoca area and 37.7% are paying a tuition fee. We divided them into two groups: (1) coming from Cluj-Napoca area and (2) coming from other areas. Then we further distinguished between students paying a tuition fee from those who do not pay a tuition fee, assuming the same percentage of students paying a tuition fee exist in both groups. Undergraduates who reside outside Cluj-Napoca opt for a bigger variety of accommodations, therefore we further divided them in groups according to the type of their accommodation. The BBU data shows that 4,463 undergraduate students were granted a place in the university dormitories. Our findings suggest that 9.3% of these students pay a tuition fee, so we divided them accordingly. The remaining two groups based on accommodation type were also divided in: (1) those who rent or own a house and (2) those who live in other type of accommodation (with relatives, private dormitories).

We divided the master students only by the type of accommodation, and we did not apply any distinctions in the group of the PhD students due to lack of data and the limited size of our sample. The total BBU student expenditure amounts to over 141 million Euros for 2015.

Implicitly, Tables 3 and 4 show the industries that benefit more from student expenditure and the estimate value of the direct impact of student expenditure into those economic sectors. As an example, the BBU students spent more than 5 million Euros on cigarettes in 2015, while other 5.5 million were spent on medical services, medications and dentists. The divisions in Table 3 were created to reflect the primary spending categories. Thus, almost 60% of the student expenditure is presented in Table 3. The results suggest that primary necessity products (foods, drinks, and hygiene) take more than 27% of the students' budget, while housing costs represent 23%. Spending for meals in cafeterias, bars, cafes and restaurants presented in Table 4 amount to 10.6% and could also be placed in the food and drinks category, among the primary ones shown in Table 3.

3.2.4. The total expenditure of Cluj-Napoca students in a month

1. Starting from the total expenditure of the BBU students in 2015, the following steps were taken to estimate the total expenditure of Cluj-Napoca students in a month in 2020.

³ Eight categories of expenditure – parking, cigarettes, personal care services, electronics, appliances, furniture and household items, donations and other expenditure.

Table 3: BBU student expenditure in 2015 in Cluj-Napoca (Euros/year)

	Undergraduate students												PhD students	Total
	From Cluj-Napoca area						Not from the Cluj-Napoca area							
	without the tuition fee	with the tuition fee	in student dormitory	renting or owning a house	other accommodation	with the tuition fee	in student dormitory	renting or owning a house	other accommodation	in student dormitory	renting or owning a house	other accommodation		
Accommodation and utilities	601	608	278	1,422	882	256	1,684	768	324	1,594	912	1,011	32,404,565	
Food and drinks	794	1,256	887	921	875	1,008	1,042	942	1,024	1,154	1,076	1,416	30,056,177	
Personal hygiene products	328	368	201	262	246	198	296	228	280	326	234	363	8,375,002	
Transportation	199	423	121	189	167	137	245	221	235	222	301	264	6,418,741	
Health	240	218	136	162	204	206	193	126	176	193	278	228	5,567,150	
Total average spending	2,162	2,874	1,623	2,957	2,374	1,805	3,460	2,285	2,040	3,490	2,800	3,282	82,821,635	
BBU Students	2,404	1,431	4,049	5,642	1,341	414	5,404	860	1,341	4,511	1,140	1,216	29,754	
Sample	39	20	254	286	68	26	201	32	74	91	23	42	1,156	
Total spending	5,197,663	4,112,467	6,571,802	16,680,343	3,183,817	747,428	18,699,279	1,965,845	2,735,113	15,743,992	3,192,542	3,991,343	82,821,635	

Source: Own elaboration

Table 4: BBU student expenditure in 2015 in Cluj-Napoca (Euros/year)

	Undergraduate students												PHD students	Total		
	From Cluj-Napoca area			Not from the Cluj-Napoca area						Masters students						
	without the tuition fee	with the tuition fee		without the tuition fee			with the tuition fee			in student dormitory	renting or owning a house	other accommodation			in student dormitory	renting or owning a house
Cafeterias, bars, cafes, restaurants	407	714		407	490	377	527	497	509	546	543	551	546	543	774	15,025,963
Clothing, shoes	326	462		253	290	304	246	345	259	341	366	350	341	366	415	9,631,656
Leisure, cinema, sport activities	169	376		175	248	218	202	234	211	257	206	299	257	206	378	7,130,370
Electronics, house-hold appliances, furniture	217	380		81	158	73	58	237	75	375	224	170	375	224	468	6,496,846
Cigarettes	99	43		69	141	61	137	467	120	139	239	91	139	239	78	5,257,877
Education*	37	557		31	35	75	321	391	168	83	82	46	83	82	194	4,465,057
Telecommunication	114	108		86	123	129	79	143	107	135	108	88	135	108	136	3,552,915
Books, office products	90	161		89	100	121	138	145	99	85	70	67	85	70	136	3,178,577
Other expenditure**	179	151		64	97	96	68	132	77	202	203	89	202	203	281	3,992,765
Total average spending	1,639	2,952		1,255	1,683	1,452	1,776	2,591	1,625	2,163	2,041	1,750	2,163	2,041	2,860	58,732,026
BBU Students	2,404	1,431		4,049	5,642	1,341	414	5,404	860	4,511	1,140	1,341	4,511	1,140	1,216	29,754
Sample	39	20		254	286	68	26	201	32	91	23	74	91	23	42	1,156
Total spending	3,939,660	4,224,859		5,080,938	9,494,552	1,948,208	735,213	14,003,439	1,398,358	9,756,422	2,326,185	2,346,440	9,756,422	2,326,185	3,477,753	58,732,026

* University administrative fees, specialized courses, languages, IT; does not include university tuition fees.

** Other miscellaneous service (hairdresser), press, parking, donations and any other expenditure

Source: Own elaboration

2. Adjusting the total amount of the BBU student expenditure in 2015 with the annual inflation rate: based on the data from the National Institute of Statistics, we adjusted the student expenditure with the annual inflation rate for the years 2016, 2017, 2018, and 2019.
3. Adjusting the total amount of the BBU student expenditure for the academic year 2019/2020 with the current number of students in various categories: we obtained the total number of students enrolled in the BBU in January 2020 from the BBU statistical bureau, and then we divided that number into the same categories used to calculate student expenditure for 2015, excluding the same categories excluded in the 2015 study. We came to a total number of valid BBU students of 31,570.

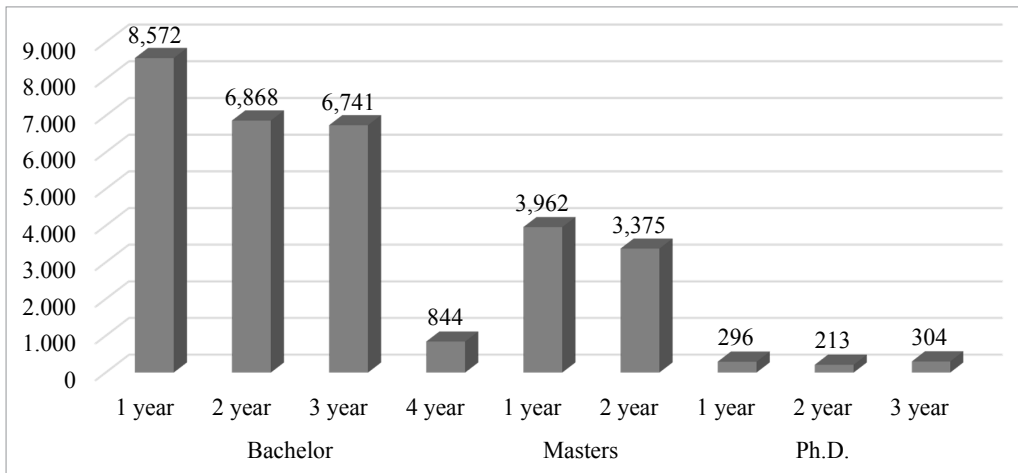


Figure 4: The total 31,570 BBU students divided by level and year of study

Source: Own elaboration based on the data from BBU Bureau of Statistics

We extended the research to the whole population of students in Cluj-Napoca by looking at the ratio of BBU students in the total student population of the city. Figure 5 below shows, for different years, the proportion of students in Cluj-Napoca’s universities. It becomes visible that the BBU students have accounted for more than half of the student population in Cluj-Napoca in recent years.

The results show that the absence of student spending for one month in Cluj-Napoca generates an estimated loss of **33,390,572 EUR**. We argue that this amount remains underestimated as in the initial estimations we excluded the spending of the distance learning and part-time students, postgraduates, and teachers in training. Also, the estimated 7.5 million EUR spent by the BBU students’ visitors in Cluj-Napoca in 2015 (Chircă and Lazăr, 2019) can account for a monthly loss of 625,000 EUR.

Another underestimated factor is the ratio of the foreign students – the category with the highest spending budget – in other universities than the BBU. For example, their ratio is much higher in universities like ‘Iuliu Hatieganu’ University of Medicine

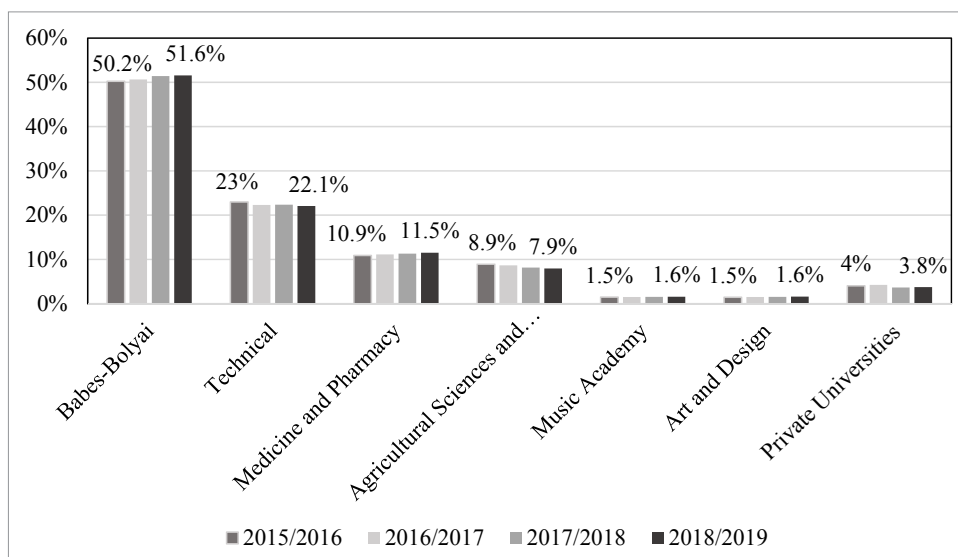


Figure 5: The total number of students in Cluj-Napoca divided among city's universities for different years

Source: Own elaboration based on data from National Institute of Statistics

and Pharmacy. According to the National Institute of Statistics (private correspondence with the Executive Director of County Statistical Direction Cluj July 14, 2020), in the recent years, around 33% of the University of Medicine and Pharmacy students were foreigners in comparison with only 3.5% enrolled in the BBU. On average, the proportion of foreigners in the total student population in Cluj-Napoca is around 7%.

4. Conclusions

This study shows that one month of lockdown have halted the regular university life with a large scale impact on the local economy of the city, suggesting that the ongoing pandemic of the coronavirus disease 2019 (COVID-19) is impacting heavily all economic sectors and is changing the economic framework of the city. Estimating the social-economic impact of the pandemic is a complex and difficult task, but we can anticipate some of the possible directions and future problems. One of the major possible outcomes is that at the rate of 33.4 million EUR loss per month, the industries and businesses that benefit most in a university city will face severe economic difficulties in the short and middle term.

We can also infer that if the pandemic continues in the long term, the economic sectors of the city impacted indirectly will also suffer a downfall. Therefore, further extending the research into student expenditure to indirect and induced impacts can reveal some of the possible outcomes and risks, helping universities as well local communities to adjust their long-term strategies to the new realities. Thus, estimating the student expenditure becomes relevant not only in measuring the impact of

the university on the local economy, but also as important information that universities, as well as the local authorities, need to have for themselves.

Another possible direction of research that can be developed from this type of study is assessing the students' quality of life in Romania in general, not only in the context of the pandemic. In that respect, the 2015 study revealed that the total of the BBU student expenditure estimated for that year was almost twice (183%) the total university budget. This suggests that the burden of obtaining higher education is carried mainly by the students' families while the students are enrolled in state universities in Romania.

Cluj-Napoca has the biggest student ratio per capita and hosts the largest university in Romania, which makes it the most relevant case study for this type of research. Moreover, a very interesting particularity of this university center is that only around 25% of the BBU students in need for housing – those who come from beyond the 20km radius from Cluj-Napoca – are accommodated in university dormitories. Thus, the BBU student population is a very dynamic one in terms of their spending: they are important actors on the real estate market, especially in terms of renting, and most of the student expenditure in the other categories occurs outside the campus, impacting a large spectrum of economic sectors. Therefore, if the city of Cluj-Napoca loses all its student population due to the ongoing pandemic or for any other reason, we can expect the local economy to shrink by around 33.4 million EUR per month. As a valuable indicator of the general economic impact of universities on communities, as a particularly powerful indicator of the possible short, mid and long-term consequences of the pandemic on the university centers, as well as a potential indicator of the higher education burden and of the level of underfunding of the education system in Romania, estimating student expenditure should be viewed as a crucial task by the higher education and government institutions.

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