HUMAN CAPITAL AND WELFARE

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FOREWORD

The collection of papers in this book study human capital and welfare from different perspectives and offer new insights on determinants of human capital accumulation and the importance of welfare states for economic development. The first six chapter in the book study phenomena of human capital while the last three chapters focus on welfare. The first chapter studies youth policy preferences for public spending in the EU and compares them to middle-aged population. Chapter two aims to characterise youth not in employment, education and training in Serbia, while chapter three studies a program implemented in Serbian secondary schools which helped pupils in their school-to-work transition. Chapter four takes a different perspective at youth and it studies their entrepreneurial intentions. In chapter five the authors study the impact of over- and under-education on the wage penalty. Chapter six explores whether the usage of smartphones has a detrimental effect on academic performance. The second part of the book studies welfare issues. Chapter seven studies hybrid organizations and aims to characterise an enabling ecosystem for such organisations. Chapter eight studies the important topic of child poverty in four countries. The chapter nine compares welfare regimes in OECD countries and studies how they affect inequality.

Editors

YOUTH IN NEW EUROPE: ECONOMIC ACTIVITY AND EU POLICY PREFERENCES

Valerija Botrić[*]
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Abstract: *Extant studies document youth disentanglement from participation in many social spheres. The study investigates into differences in policy preferences between youth and middle-aged in post-transition EU economies. Based on the Eurobarometer 93.1 Survey, the respondents' preferences for one of the 15 different EU budget categories have been analysed. The findings reveal that there is a strong agreement between the youth and the middle-aged in terms of ranking for different policy options. By relying on the multinomial logit approach, the mediating role of respondents' economic activity (i.e. employment) on the policy preferences has been explored, because youth has been especially adversely affected by unemployment during the latest global financial crisis. The results confirm mediating role of employment, both for the youth and the middle-aged. In the case of youth, the results imply that the school-to-work transition makes them more knowledgeable of, and concerned for, the economy in general. In general, most of the findings confirm the self-interest hypothesis, both in the case of youth and the middle-aged.*

Keywords*: Youth, post-transition, (un)employment, policy preferences.*

JEL Classification*: J40, H39*

1. INTRODUCTION

The general support for European Union is correlated with the degree of fit between individuals' policy preferences and European norms (Belot and Guinaudeau, 2017). At the same time, whether a country's citizens recognize specific EU policy as valuable, depends on its relative importance for local circumstances. Thus, an investigation into citizens' policy preferences provides an opportunity to gain deeper

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insight into EU cohesive or disruptive features. Differentiating youth preferences from the average additionally enables the detection of possible trend formation.

Youth has been colloquially blamed for disentanglement from participation in many social spheres. While some argue that this is the consequence of their own choice, others suggest that institutional setups are not adequate to create luring enough features to support young people participating in different social activities (Schneider and Makszin, 2014). Although previous literature has established that youths are less likely to take an interest in politics, vote, trust in institutions or engage in civic participation (Mascherini, Salvatore, Meierkord and Jungblut, 2012), the evidence is relatively scarce for post-transition societies. In line with the notion that previous socialist systems adopted many aspects of developed market economies, it can be assumed that the trends in political participation in post-transition countries resemble the patterns established in the Western economies.

The pre-pandemic global economic crisis significantly more adversely affected European youth (Tomić, 2018), to the extent that they were "a kind of 'buffer' that absorbed the effects of the recession" (Michoń, 2019, p.72). Throughout the whole transition period, unemployment was one of the unresolved economic issues in most Central European countries. Some studies argue that although unemployment rates in post-transition economies are on average higher than in Western Europe, they are much less sensitive to business cycle fluctuations (Pastore, 2017). But high unemployment rates imply that a large percentage of the population experienced unemployment spells, which affects persons' policy preferences (Lorenzini and Giugni, 2012) in favour of more redistributive policies (Hacker, Rehm, and Schlesinger, 2013). While most studies focus on market economies and mature democracies, the open question remains to what extent increased adverse labour market situation affects policy preferences in new European Union members' economies.

The paper seeks to offer two contributions. The first is to provide evidence on youth policy preferences for common budget spending in European New Member states and contrast them to the preferences of the older generation, thus paving the way for future trends discussions. The second is to explore the mediating role of personal economic activity (i.e. employment) on the policy preferences in the region where youth has been especially affected by unemployment.

The structure of the paper is following. The next section briefly summarizes relevant literature. Section 3 presents data and empirical strategy, while section 4 presents the main results. The last section offers conclusions.

2. LITERATURE REVIEW

Political participation has decreased in most Western economies in recent decades; the trend has been more pronounced for youth (Quintelier, 2007; Marien, Hooghe and Quintelier, 2010; Sloam, 2013). Youth have been more socially disengaged, less likely to take an interest in politics, to vote, to trust in institutions or to engage in civic participation (Mascherini, Salvatore, Meierkord and Jungblut, 2012). Traditional studies usually find that propensity to vote depends on the socioeconomic status and educational attainment of the individual (Schneider and Makszin, 2014), while changes in the overall trends in the past have also been attributed to increased female participation in the political process (Shapiro and Mahajan, 1986). The reasons why trends for youth had even steeper trajectories were attributed partially to their characteristics, such as relatively higher impatience (Harris, Win and Younes, 2010).

While a general decline in political interest has been frequently interpreted in the context of profound changes to the democratic systems (Ekman and Amnå, 2012), some authors argue that the manifestation of policy participation has changed, and especially in the case of younger generations (Jugert, Eckstein, Noack, Kuhn and Benbow, 2013). Recently, the studies suggest that young population is more focused on issues such as improving the environmental or social and economic conditions of a community, therefore directly acting towards enhancing quality of life for its members (Mannarini, Fedi and Trippetti, 2010). Political interest is subsequently oriented more towards "latent" forms of participation, such as civic engagement and social involvement (Amnå and Ekman, 2014), i.e. activities where the specific outcomes can be observed. National (and international) policy affairs are frequently perceived beyond the citizens' reach. Indeed, it has long been established that EU citizens have low interest and knowledge about the EU level politics, and they are not aware of the activities of the European Parliament members (Marsh and Norris, 1997).

Trends in political participation in post-transition countries resemble those in other European economies. Lavrič, Tomanović and Jusić (2019) for youth in Southeast Europe find that the vast majority feel poorly represented in national politics and believe that they should have a more substantial say. At the same time, the authors suggest that youth have little experience with political and civic participation, their political knowledge is poor, and they are disinterested

in politics. This is especially the case for youth from underprivileged social backgrounds and NEETs. Although on individual level studies assume a positive correlation between education and civic and political engagement, increased average educational attainment of youth does not guarantee increased average engagement. Ilišin (2008), for the sample of Croatia students, finds that they attribute their lack of political interest to inability to make positive changes, lack of trust in politics, the irrelevance of youth interests in policy discussions and dominance with other preoccupations in daily life.

One of the most important daily life preoccupations can be found in school to work transition, with many young people experiencing unemployment. Overall, unemployment has countercyclical dynamics, and in cross-country comparisons, Okun's law can be frequently observed. Additionally, Tola and Waelti (2018) suggest that the 2008 financial crisis had deeper and longer-lasting effects on economic activity, employment and unemployment than normal downturns. Boeri and Jimeno (2016) suggest that the main driver of European cross-country unemployment divergence during the crisis can be attributed to youth unemployment.

Youth unemployment disproportionally increases during the crisis mainly due to their lower propensities to find a job, especially the first-time job seekers who lack previous work experience (Brada, Marelli and Signarelli, 2014). The youth are also more likely to lose a job due to the seniority rules (Michoń, 2019) enabled by the widespread application of temporary contracts (Pastore, 2018). Sharma and Winkler (2018) identify the negative impact of the crisis on aggregate employment in European countries, mainly for temporary, young and low-skilled workers, but combined with stronger employment protection of permanent workers. The effects of the economic crisis have also spread to other segments of life. For example, the unemployment experience had an adverse effect on young peoples' engagement in political activities (Lorenzini and Giugni, 2012). However, does it also change the individual's policy preferences?

An individual develops preferences through intergenerational transmission (Bisin and Verdier, 2001) and/or by imitating role models (Possajennikov, 2000). Thus, certainly, there is a segment of stability in preferences related to the underlying personal values. The literature, in general, finds that people's values (Blekesaune and Quadagno, 2003) affect their policy preferences, but there is no firm conclusion on the effect of party attachment (Branham and Jessee, 2017). Yet, public policies change more frequently than values. Previous literature has established self-interest as an individual's main mechanism for developing policy preferences (Iversen and Soskice, 2001). In that context, it is

highly expected that unemployed persons will favour redistributive policies (Fraile and Ferrer, 2005; Schwander and Häusermann, 2013) because such policies are more likely to change their prospects (Hacker, Rehm, and Schlesinger, 2013). However, the literature is not decisive whether the unemployment experience only temporarily induces changes in preferences (Margalit, 2013) or causes a permanent shift towards more generous government welfare support (Naumann, Buss and Bähr, 2016). In a cross-country perspective, Vlandas and Halikiopoulou (2019) claim that unemployment leads to higher far-right support in a situation when unemployment benefits replacement rates are low. Vlandas (2020) recently suggested that not only personal unemployment experience shapes the labour market policy preferences, but also occupational unemployment (in the role of perceived potential unemployment).

Political science is, in general, interested in respondents' policy preferences because political candidates as 'professional position takers' (Branham and Jessee, 2017, p. 168) have a vital interest in feeling the public pulse on the most important issues. It is essential to recognize electorally important issues or those that could gain importance over time to specific population subgroups (Shapiro and Mahajan, 1986). Thus, changes in policy preferences are closely monitored both by political analysts and political actors, not only because of pragmatic electoral practices but also because of the notion that the democratic process entails reflection of public preferences in government actions.

Individuals' socioeconomic characteristics have been found important predictors for their policy preferences. For example, Iversen and Soskice (2001) offer an explanation related to the correlation between an individual's educational attainment and support for redistributive government roles. They suggest that from the perspective of an individual, education is a risky investment activity, for which the individual would like to have insurance against the possible future losses. In a similar vein, some studies argue that spending preferences are similar across income levels (Branham and Jessee, 2017). Page, Bartels and Seawright (2013) on the US data show that relative affluence modifies policy preferences and that with higher income people become more conservative, at least regarding economic issues.

Sociological studies argue that the young people's views are formed based on the experience of precarious employment, higher levels of education, digital communications facilitating wider cultural flows, and new attitudes towards relationships and career and that they will face a different set of experiences and challenges from those faced by the previous generation at a similar life

point (Woodman, 2016). But, the question remains whether a similar experiences result in similar policy preferences across the generations.

Beyond the importance for redistributive policy preferences (specifically, the unemployment benefits), the role of employment has not been frequently studied as a crucial predictor of policy preferences. More often, it has been bundled under the general socioeconomic characteristic of the person. The present paper aims to contribute to the literature by revealing the differences in preferences between youth and older population in post-transition economies. Additionally, the mediating role of employment on preference formation is explored due to the pronounced youth unemployment in the aftermath of the global financial crisis in the post-transition economies.

3. DATA AND METHOD

The data comes from Eurobarometer 93.1 Survey by the European Commission. It comprises individual-level data collected in July-August 2020 via face-to-face interviews and self-administered web-based questionnaires.[1] The survey covers all EU member states, plus a couple of other European countries. In our analysis, we focus on the following post-transition members of the EU: Bulgaria, Czechia, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia, and Slovakia.[2]

The object of our study, policy preferences, is defined by the specific closed question in the survey: "On which of the following would you like EU budget to be spent?". The respondents are asked to choose one of the following spending categories as their first choice (i.e., their number one spending priority):

1. economic and monetary policy;
2. scientific research and innovation;
3. education, training, culture, and media;
4. transport and energy infrastructures;

[1] More detailed information on the survey is available at: https://search.gesis.org/research_data/ZA7649. The data are also available free of charge at the latter link.

[2] There are four additional post-transition countries available – Albania, Montenegro, North Macedonia, and Serbia – but the focus is on the EU members, as we study policy preferences using a question on how one would like the EU budget to be spent (see immediately below), which applies to EU member states only.

5. SMEs[3] and competitiveness;
6. digital infrastructures;
7. climate change and environmental protection;
8. agriculture and rural development;
9. regional investment;
10. assistance to EU neighbours, including candidate countries;
11. development and humanitarian aid to countries outside the EU;
12. defence and security;
13. immigration issues;
14. employment, social affairs, and public health;
15. administrative and personnel costs, buildings.

The same spending categories are also offered in an additional question asking about the second choice (i.e., the number two priority), but we consider only the question on the first choice.

This way of representing policy preferences resembles the traditional "most important policy problem" question, frequently used to estimate the relative importance of specific policy topics for voters (e.g., Binzer Hobolt and Klemmemsen, 2005; Burden and Sanberg, 2003). As a potential limitation, we acknowledge that the respondents might not be familiar with the EU budget policy context.[4] However, we argue that the answers refer to common "buzzwords" appearing in the media on a daily basis, and as such, are hardly unknown to anyone but public policy very ignorant citizens. Thus, even though an individual might not be fully aware of the specific EU-level policy context associated with the specific EU budgetary items, she could still form an opinion regarding different policy allocations according to her preferences. Moreover, the respondents were allowed to choose none of the fifteen answers listed above but rather say they "don't know." Although the respondents who chose the latter answer should not necessarily be considered well informed on the

[3] Small and medium enterprises.
[4] In a different context, Lergetporer, Wener and Woessmann (2020) recently argued that providing information about the extent of policy-related problem strongly increases concerns about related policy measures.

policy context, we note that only a bit more than 1 percent of the whole sample said they "don't know." These were dropped from the sample.[5]

As stated in the introduction, we examine the differences in policy preferences by age; more precisely, how the youth differ from the middle-aged. Besides, we examine how working status influences policy preferences in different age groups. We define the youth as persons aged 18 to 29. Persons aged 15 to 17 were also interviewed, but we do not include them as the countries in our sample do not grant suffrage to minors.[6] The middle-aged are defined as those aged 30 to 64. When it comes to working status, persons considered as working are those having any kind of employment, including self-employment, while the group of non-working individuals comprises students, the unemployed, and the inactive. Thus, in comparisons by work status, the non-working group will vary with age: while within the middle-aged, the non-working includes the unemployed and inactive, within the youth, a large portion of the non-working pertains to students. When interpreting the within-group differences by working status, this should be borne in mind.

Age group and working status are not the only factors affecting policy preferences, as documented in the literature review section. Thus, in our analysis, we control for several additional covariates of policy preferences. We define two sets of control covariates: (i) basic and (ii) additional covariates. Our main results will be based on the basic covariates, whereas the additional covariates will be used to explore the mediating role of certain factors frequently mentioned in the literature. The basic covariates include:

- gender – a dummy for female; reference: male;
- education level – dummies for primary and tertiary education as the highest level attained; reference: secondary education;
- living with a partner – a dummy for living with a partner, either in marriage or an informal union; reference: living without a partner (single, divorced, widowed);
- degree of urbanisation – dummies for residing in a small and large town; reference: residing in a rural settlement;
- country-level fixed effects – dummies for the countries covered by the sample; reference: Slovakia.

[5] If a respondent answered with "other" or "none," these answers were re-coded although they were not offered. Less than half percent of the sample answered in this way, and they were dropped as well.

[6] Minors make up slightly more than 2 percent of the entire sample.

The additional covariates include:

- social class – dummies for considering oneself to be a member of a "lower middle," "middle," "upper middle," and "high" class; reference: "working class";
- difficulty with paying bills – a dummy for having difficulties with paying bills; reference: no difficulties;
- trust in people – a dummy for trusting ("totally trust" or "tend to trust") people in the country; reference: distrust ("tend not to trust" or "do not trust at all") of people in the country;
- political interest – a dummy for strong or medium political interest; reference: low or no political interest;
- political leaning – dummies for leaning very left (level 1 or 2 on a 1-10 scale where 1 is the most left, and 10 the most right) and very right (level 9 or 10 on the scale); reference: neither very left nor very right (levels 3-8 on the scale);
- trust in European institutions – dummies for trusting the European Parliament, the European Commission, and the European Central Bank; reference (for each institution separately): distrust of the institution;
- image of EU in one's eyes – a dummy for "very" or "fairly" positive image; reference: "neutral," "fairly negative," or "very negative" image;
- satisfaction with democracy in EU – a dummy for being "very" or "fairly" satisfied; reference: being "not very" or "not at all" satisfied;
- having own voice count in EU – a dummy for agreement ("totally agree" or "tend to agree") with the statement that the person's voice counts in the EU; reference: disagreement ("tend to disagree" or "total disagree");
- personally important issues – dummies for each the following issues being important for the person: crime, economic situation, inflation, taxation, unemployment, terrorism, housing, household financial situation, immigration, health, education system, environment and climate change, pensions, working conditions, living conditions; reference (for each issue separately): issue not important for the person.

We analyse policy preferences using a multinomial logit model. The policy preferences of a person are depicted as a discrete probability distribution over the fifteen budget spending categories. Every person chooses one of the fifteen categories as her/his number one priority, and every category has a certain probability of being chosen. The probability varies across persons and spending

categories. Formally, let a person i choose a category j (j = 1, 2, …, 15) with probability $p_{i,j}$. This probability is modelled as conditional on covariates comprising i's working status W_i and a set of control covariates collected in vector $\mathbf{X}_i$: $p_{i,j} = \Pr(i \text{ choses } j \mid W_i, \mathbf{X}_i)$. Assuming that the log-odds of each category j relative to a reference category J, $\eta_{ij} \equiv \ln(p_{i,j}/p_{i,J})$, can be described parametrically by the linear model

$$\eta_{i,j} \coloneqq \ln(p_{i,j}/p_{i,J}) = \alpha_j + \beta_j W_i + \boldsymbol{\gamma}_j' \mathbf{X}_i \tag{1}$$

then the probability $p_{i,j}$, for j = 1, 2, …, 15, can be expressed as

$$p_{i,j} = \Pr(i \text{ choses } j \mid W_i, \mathbf{X}_i) = \frac{\exp(\eta_{i,j})}{\sum_{k=1}^{J} \exp(\eta_{i,k})} = \frac{\exp\left(\alpha_j + \beta_j W_i + \boldsymbol{\gamma}_j' \mathbf{X}_i\right)}{\sum_{k=1}^{J} \exp\left(\alpha_j + \beta_j W_i + \boldsymbol{\gamma}_j' \mathbf{X}_i\right)} \tag{2}$$

where $\left(\alpha_j, \beta_j, \boldsymbol{\gamma}_j\right)_{j=1}^{J}$ are parameters to be estimated. The parameters are estimated by maximum likelihood, and separately for the youth and the middle-aged. Thus, there will be two sets of parameter estimates, one for the youth (label Y), the other for the middle-aged (label M): $\left(\alpha_j^Y, \beta_j^Y, \boldsymbol{\gamma}_j^Y\right)_{j=1}^{J}$ and $\left(\alpha_j^M, \beta_j^M, \boldsymbol{\gamma}_j^M\right)_{j=1}^{J}$.

With the estimated parameters at hand, we use the model in the analysis of policy preferences in two ways. First, we look at the policy preferences at the age group-level, by averaging $p_{i,j} = \Pr(i \text{ choses } j \mid W_i, \mathbf{X}_i)$ over i for each j within a given age group, obtaining $\left(\bar{p}_1^Y, \ldots, \bar{p}_J^Y\right)$ and $\left(\bar{p}_1^M, \ldots, \bar{p}_J^M\right)$. The difference in policy preferences between the young and the middle-aged is then represented by the differences $\left(\bar{p}_1^Y - \bar{p}_1^M, \ldots, \bar{p}_J^Y - \bar{p}_J^M\right)$.[7]

Second, to explore the effect of working status on policy preferences, we perform counterfactual calculation as follows. For both the youth and the middle-aged, we compute two sets of average probabilities: one where all individuals are assumed to work (i.e., we set $W_i = 1$ for all i), and the other where all individuals are assumed not to work (i.e., we set $W_i = 0$ for all i). Take

[7] The average probability of choosing a given spending category as the number one priority is by construction equal to the share of individuals choosing this category as the number one priority. Thus, for a given category, the difference in average probability between two groups equals the difference in the corresponding share between the groups.

the youth as an example. We compute $\left(\bar{p}_1^Y(W=1), \ldots, \bar{p}_J^Y(W=1)\right)$ as the set of average probabilities assuming everyone is working, and $\left(\bar{p}_1^Y(W=0), \ldots, \bar{p}_J^Y(W=0)\right)$ as the set of average probabilities assuming everyone is not working. Then, we consider

$$\left(\bar{p}_1^Y(W=1) - \bar{p}_1^Y(W=0), \ldots, \bar{p}_J^Y(W=1) - \bar{p}_J^Y(W=0)\right) \quad (3)$$

and

$$\left(\bar{p}_1^M(W=1) - \bar{p}_1^M(W=0), \ldots, \bar{p}_J^M(W=1) - \bar{p}_J^M(W=0)\right) \quad (4)$$

as the impact of working status on policy preferences of the youth and the middle-aged, respectively.

4. RESULTS AND DISCUSSION

We start by examining the policy preferences among the youth and the middle aged. These are average policy preferences, based on the average probabilities $\left(\bar{p}_1^Y, \ldots, \bar{p}_J^Y\right)$ and $\left(\bar{p}_1^M, \ldots, \bar{p}_J^M\right)$, respectively.[8] The difference in preferences is examined by considering the differences $\left(\bar{p}_1^Y - \bar{p}_1^M, \ldots, \bar{p}_J^Y - \bar{p}_J^M\right)$.[9] These probabilities and differences are displayed in Figure 1.

[8] See the preceding section.
[9] See the preceding section.

EU budget spending category	Probability of being number one spending priority		Difference
	Youth	Middle-aged	
	[1]	[2]	[1] – [2]
Administrative and personnel costs, buildings	0.013	0.013	0.000
Development and humanitarian aid to countries outside the EU	0.015	0.016	-0.001
Immigration issues	0.017	0.027	-0.010
Digital infrastructures	0.029	0.017	0.012
Assistance to EU neighbours, including candidate countries	0.031	0.021	0.009
SMEs and competitiveness	0.036	0.039	-0.003
Transport and energy infrastructures	0.038	0.037	0.001
Regional investment	0.051	0.052	-0.001
Economic and monetary policy	0.071	0.078	-0.007
Agriculture and rural development	0.072	0.109	-0.036
Defence and security	0.075	0.076	-0.001
Scientific research and innovation	0.078	0.073	0.005
Climate change and environmental protection	0.104	0.075	0.029
Education, training, culture and media	0.142	0.086	0.056
Employment, social affairs and public health	0.227	0.280	-0.053

Figure 1. Policy preferences of the youth and the middle-aged

Source: Authors based on Eurobarometer 93.1 Survey.

In terms of the ranking among the spending categories by the average probability of being the number one spending priority, we see that the categories are ranked quite similarly for the youth and the middle-aged. However, although high, the overlap between the rankings is not perfect: the Spearman rank correlation is 0.91. For 10 out of 15 categories, the youth fully agree with the middle-aged on the ranks of five categories, and for the additional five the ranks differ by one only. They agree on the most preferred category, namely "employment, social affairs, and public health." This is perhaps because this category, in comparison to the other ones, seems to encompass most of what people generally care about when it comes to public service provision. Other categories arguably either pertain to specific, relatively narrow areas of public services (e.g., "immigration issues" or "development and humanitarian aid…") or tend to be tied to specific subpopulations of beneficiaries (e.g., "scientific research and innovation" or "agriculture and rural development"), or tend to seem abstract and/or distanced from people's immediate interests (e.g., "digital infrastructures"). In short, "employment, social affairs, and public health" seems to be the most preferred category for both groups because it is broad enough in scope, brings benefits universally, and refers to well understood, tangible public services. The two groups also agree on the least preferred category, namely "administrative and personnel costs, buildings." This category is clearly narrow in scope, pertains to a specific subpopulation, and does not cater to the immediate interests of most people.

For both the youth and the middle-aged, the preferences are quite concentrated, in the sense that a few most preferred categories carry most of the total probability mass (equal to 1). Put differently, in both groups, most of the sample chose one of only a few most preferred categories as the number one spending priority. Concretely, for both groups, the five most preferred policy options carry more than 3/5 of total mass, while the five least preferred carry only about 1/10 of total mass.

Even though the two groups have quite similar rankings of spending categories and although their preferences are similarly concentrated, there are some notable differences in the average probability for some categories. Although "employment, social affairs, and public health" is the preferable spending category for both groups, the youth are significantly less likely (prob. = 0.227) than the middle-aged (prob. = 0.28) to consider it the number one priority. Another category that is less likely to be the number one priority for the youth (prob. = 0.072) than for the middle-aged (prob. = 0.109) is "agriculture and rural development," which is, for this reason, the second most preferred for the middle-aged but only the sixth most preferred for the youth. The difference is notable as well for "education, training, culture, and media," but in this case, unlike the previous two, the youth are more likely to opt for this category as the number one spending priority.

These differences seem to be in line with the self-interest argument. Unlike the middle-aged, a large fraction of the youth is still in education or training as opposed to the labour market, and thus it makes sense for them to be, relative to the middle-aged, less supportive of spending for employment and more supportive of spending on education and training. Moreover, simply as a matter of age, the youth tend to be healthier than the middle-aged, making the youth less likely to benefit from health spending. Finally, the lower interest in spending on "agriculture and rural development" on the part of the youth might be explained, partly at least, by the ageing of European farmers as one of the most significant challenges facing rural areas (Micha, Dwyer, Kubinakova, Brunnen, Schuh, Maucorps and Mantino, 2019).

Figure 1 also shows that the youth tend to support spending on "climate change and environmental protection," a result in line with the findings of the stronger pro-environmental orientation of younger generations that have already been well documented in the literature (Hume, 2010; Belundė, Perlaviciute and Truskauskaitė-Kunevičienė, 2020). Moreover, the youth are more supportive of spending on "digital infrastructures," which could be related to the age-based digital divide (Hargittai, Piper and Morris, 2019; Schehl, Leukel and Sugumaran,

2019). The youth are also more supportive of spending on "assistance to EU neighbours, including candidate countries," possibly because they are in general less conservative than the middle-aged. Finally, the youth are less likely to opt for "immigration issues" as the number one spending priority. This may or may not be in line with the youth being, on average, less conservative, depending on exactly how the youth understand what is meant by spending on "immigration issues." One understanding might be that higher spending on this category is associated with stricter control of the arrival of new immigrants, which would discourage new arrivals. If this understanding is predominant, then the lower support for spending on "immigration" issues seems in line with the youth being less conservative. If, on the contrary, the predominant understanding is that higher spending on this category is associated with policies making the country more immigration-friendly, then the lower support for spending on this category does not seem to be in line with the lesser conservatism of the youth. Conceivably, the situation in a given country regarding immigration, including both historical and recent experiences, is a key factor, and one that varies largely across countries.

We now turn to the impact of work status on policy preferences. Figure 2 displays the differences in the average probability of being the number one spending priority between two counterfactual samples: the sample where everyone's working status is set to "working" ($W_i = 1$ for all i) and the sample where everyone's working status is set to "not working" ($W_i = 0$ for all i).[10]

[10] See equations 3 and 4 in the preceding section.

EU budget spending category	Difference in probability of being number one spending priority: Working − Not working	
	Youth	Middle-aged
Education, training, culture and media	-0.067	0.018
Climate change and environmental protection	-0.012	0.002
Digital infrastructures	-0.009	0.012
Immigration issues	-0.008	-0.004
Scientific research and innovation	-0.004	0.027
Regional investment	-0.004	0.002
Defence and security	-0.003	-0.001
Transport and energy infrastructures	-0.001	0.006
Assistance to EU neighbours, including candidate countries	0.002	0.005
Employment, social affairs and public health	0.006	-0.053
Administrative and personnel costs, buildings	0.006	0.002
Development and humanitarian aid to countries outside the EU	0.012	-0.001
Economic and monetary policy	0.020	0.005
SMEs and competitiveness	0.022	0.002
Agriculture and rural development	0.038	-0.022

Figure 2. Impact of working status on policy preferences of the youth and the middle-aged

Notes: Based on multinomial logit model; see text for details. Basic covariates used.

Source: Authors based on Eurobarometer 93.1 Survey.

In general, the results suggest that working status does modify the policy preferences of both the youth and the middle-aged. For the youth, the largest impact is in the category "education, training, culture, and media:" Working significantly lowers the probability (by 0.067 from the base of 0.142) of this category being the number one spending priority. The probability decreases for several other categories, but only that pertaining to "climate change and environmental protection" falls by more than 0.01. Among the categories where working increases the probability of being the number one priority, the largest increase (0.038 from the base of 0.072) is for the category "agriculture and rural development." Working also increases the youth support for spending on "SMEs and competitiveness" and "economic and monetary policy." We see these results as suggesting that, among the youth, working increases the interest for public spending directed to the economy. For a large fraction of this age group, the distinction between working and not working amounts to the distinction between working and being in education. The school-to-work transition might make them more knowledgeable of, and concerned for, the economy in general. Besides, many among the youth in their transition to work, either from

education, unemployment or inactivity, might be among the direct or indirect beneficiaries of public policies directed towards the economy. If they are aware of that, they might increase their support for spending associated with these policies. The increased awareness of and care for the economy might also be behind the negative impact of working on preference for policy option "climate change and environmental protection," to the extent that promoting environment-friendly policies is (publicly presented to be) in conflict with improvements in economic efficiency.

We also observe that working somewhat increases the youths' support for spending on "development and humanitarian aid to countries outside the EU." The latter might be because the youth, once in work, is less in need of state support in any area, and thus increase their willingness to share public resources from the EU budget with citizens of developing countries outside the EU. In a sense, spending on "development and humanitarian aid to countries outside the EU" is for them a "normal" good (for which demand increases with resources).

The policy preferences of the middle-aged are affected by working as well, but the changes are different from those for the youth. In particular, the category with the largest impact of working is "employment, social affairs, and health," whose probability of being the number one spending category goes down significantly (by 0.053 from the base of 0.28). The probability falls significantly for one more category, namely "agriculture and rural development" (by 0.022 from the base of 0.109). Significant impacts in the other direction (i.e., raising probability) is observed for "scientific research and innovation" (0.027 from the base of 0.073), "education, training, culture, and media" (0.018 from the base of 0.086), and "digital infrastructures" (0.012 from the base of 0.017). Note that for every category where the impact of working for the middle-aged is sizeable, it is of the opposite sign to the respective impact for the youth. (There are categories where the impact of working has the same sign for both groups, but the very impacts are small.)

The results seem to suggest that in the case of the middle-aged, working decreases their support for spending on economy-related categories and increases their support for spending on categories related to education, culture, science, and new technologies. This is quite unlike for the youth, where we saw that working has the opposite impact. But why is that? It might be that the working middle-aged, as the least vulnerable group on the labour market, care less for the economy-related public spending. At the same time, they might recognise, perhaps based on their own experience, the importance of formal

education and other types of training for one's prospects in the labour market. Thus, for the benefit of their offspring on the labour market, they might be more willing to support public spending that promotes skill formation than the non-working, whose immediate concerns perhaps force them to focus more on the present.[11] Why would this not hold for the youth as well? As already mentioned, many non-working youth are still in education, and thus can hardly be expected to support spending on education and training less than the working youth.

The above-presented results on the impact of working on policy preferences are based on the probabilities from the logit model with the basic set of control covariates. Since extant literature claims that other factors, such as ideology, play an important role in shaping policy preferences, we examine to what extent our results change if we include the additional covariates. The results are presented in Figure 3, and the results from Figure 2 are reproduced for comparison.

EU budget spending category	Difference in probability of being number one spending priority: Working – Not working			
	Youth		Middle-aged	
	Basic covariates	Basic & additional covariates	Basic covariates	Basic & additional covariates
Education, training, culture and media	-0.067	-0.061	0.018	0.010
Climate change and environmental protection	-0.012	0.003	0.002	0.017
Digital infrastructures	-0.009	0.001	0.012	0.011
Immigration issues	-0.008	-0.005	-0.004	-0.003
Scientific research and innovation	-0.004	-0.006	0.027	-0.003
Regional investment	-0.004	-0.006	0.002	-0.002
Defence and security	-0.003	0.019	-0.001	-0.004
Transport and energy infrastructures	-0.001	0.000	0.006	0.001
Assistance to EU neighbours, including candidate countries	0.002	0.005	0.005	0.005
Employment, social affairs and public health	0.006	0.009	-0.053	-0.032
Administrative and personnel costs, buildings	0.006	0.006	0.002	0.004
Development and humanitarian aid to countries outside the EU	0.012	0.004	-0.001	-0.002
Economic and monetary policy	0.020	-0.011	0.005	0.006
SMEs and competitiveness	0.022	0.017	0.002	0.000
Agriculture and rural development	0.038	0.023	-0.022	-0.008

Figure 3. Impact of working status on policy preferences of the youth and the middle-aged – robustness to controlling for additional factors

Notes: When for a given spending category and group (all, youth, or middle-aged) the differences for both sets of covariates are italicised, the difference between them (i.e., difference in difference) is not statistically significant at the 5% level.

Source: Authors based on Eurobarometer 93.1 Survey.

[11] The working middle-aged might also be more aware of the importance of life-long learning for remaining competitive on the labour market.

When we include the additional covariates, the support for spending on "climate change and environmental protection" policies of the working youth is higher relative to the non-working youth. The same is in the case of "defence and security", while the opposite holds in the case of the support for spending on "economic and monetary policy." It could be that the support for these specific policies is more under the influence of ideology factors than an employment relationship. For other policies, the difference between the working and non-working youth remains practically unchanged upon the inclusion of the additional control covariates. In the case of the middle-aged population, the inclusion of the additional covariates changes the direction of the impact of working in two cases. One is the fall in support for spending on "scientific research and innovation", and the other is their decreased support for "regional investment".

Thus, after controlling for additional covariates, the impact of working status remains the same for the majority of spending categories for both the youth and the middle-aged. Based on this finding, we propose that working status should not be bundled together with other socio-economic characteristics, particularly because its effect on policy preferences differs between the youth and the middle-aged.

5. CONCLUSION

The paper explored differences in preferences for EU budget spending between European youth and the working-age population. Based on the Eurobarometer 93.1 Survey, the respondents' preferences for one of the 15 different EU budget categories have been analysed. The findings reveal that the youth completely agree with the middle-aged on the ranks of five categories. Both groups agree on the most preferred category, namely "employment, social affairs, and public health." We propose that this is because this category, in comparison to the other ones, seems to encompass most of what people generally care about when it comes to public service provision.

Even though the two groups have quite similar rankings of spending categories, we have identified notable differences in the average probability for some public policy options, in accordance with the self-interest hypothesis. For example, the youth are significantly less likely than the middle-aged to consider "employment, social affairs, and public health" as the most preferable spending category because a large proportion of youth is still in education.

Furthermore, we have identified a significant modifying role of working status that has different effects for the youth and the middle-aged, but the modifications were mostly in line with the self-interest hypothesis for both age groups. For youth, the school-to-work transition might make them more knowledgeable of, and concerned for, the economy in general, and they might be among the direct or indirect beneficiaries of public policies directed towards the economy. This is reflected in the changes of preferences for specific policies of those working in comparison to those not working.

We find that for the middle-aged working decreases their support for spending on economy-related categories and increases their support for spending on categories related to education, culture, science, and new technologies. It remains unclear whether this is in accordance with the self-interest hypothesis, where the middle-aged see the benefits of the life-long learning concepts or the reasons are less self-centred but more oriented towards ensuring quality education for the next generation.

Contrary to previous literature that has been strongly focused on ideological differences in public preference formation, our results imply that they do matter, but only marginally. The ideological differences do modify preferences between working and non-working population, but only for some policies. For example, in the case of youth, the inclusion of ideology-related covariates increases the support for "defence and security" or "climate change and environmental protection" policies.

There are two important limitations of the present research. The first is that the preferences rely on a pre-defined set of EU public policy issues, which might not be entirely understandable to the survey respondents. So, to remedy this, targeted comparative research should be conducted. Another limitation is that the empirical results are based on a single pandemic year dataset, which could be rather specific. To be able to provide more elaborate trend discussions, a time dimension should be included in the empirical estimates. Both issues are left for future research endeavours.

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A PROFILE OF YOUTH NOT IN EMPLOYMENT, EDUCATION OR TRAINING (NEET) IN SERBIA

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Abstract: *Youth face difficulties when entering the labour market. Of particular concern are those who are not employed and are not in education and training (NEET), as they are characterized by low motivation/self-confidence as well as insufficient interest in social events and inadequate skills to find gainful employment. In the Republic of Serbia, NEET rate has decreased in the last five years, but is still roughly 20%, high compared to their EU counterparts (Eurostat, 2019). Due to research into Serbian NEET youth being relatively rare, this paper seeks to establish characteristics of Serbian NEET youth and how they successfully return to education or gain employment. The aim of this paper is to compare NEET unemployed, inactive in the labour market and not in education with youth who are employed to identify what social differences may increase the likelihood of being NEET and the risks associated with transitioning into the labour market.*

Keywords*: NEET, youth, Serbia, labour market*

JEL Classification*: J01, J13, J21, J64*

1. INTRODUCTION

Most Balkan countries face high unemployment rates among young people. Despite decades of policies to assist them, young people in the Balkans continue to have difficulty entering the labour market, as evidenced by youth unemployment rates which are still above the EU average. In the last few years, Serbia's labour market has gone through noticeable shifts in its indicators which is reflected in the youth unemployment rate (15 to 24 years of age) falling from 34.9% in 2016 to 26.6% in 2020. But still Serbian youth are at an extreme disadvantage when entering the labour market, especially youth who are unemployed as well as not in the process of education or training (NEET).

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According to statistical data, the NEET rate of the Republic of Serbia (RS) is 20.7%, almost 5 p.p. higher compared to the EU's average (the Statistical office of the Republic of Serbia, 2020; Eurostat, 2020). NEET are usually young people without labour skills, with lower education, and mostly they live in rural areas (Djukic, Pavlovic, 2021). In the Republic of Serbia (RS), NEET rate has been shown to be higher in rural than urban areas (Ognjenović, Kuzmanov, Pavlović, 2021) by 2.2 p.p.

Regardless of their position, research into NEET youth in the RS is relatively rare, generally focusing on their position within the context of overall youth employment. Moreover, it has mainly dealt with the economic position of youth (Stanojević and Tomanović, 2012; Stanojević, Petrović, 2018), their transition into the labour market (Tomanović and Stanojević, 2015) or problems facing those at risk of social exclusion (Aleksic, et al., 2021). Some studies have concerned existing youth-employment policies, such as innovative approaches to increase employment and strengthen youth employability (Cerovic et al,, 2013) or the implementation of youth policy strategy (Pavlović et al. 2017). Low employment rates among youth in the RS are commonly associated with misalignment between labour market demand and the supply of graduates in specific fields (Bijelović et al. 2017), skill mismatch (Aranderenko and Bartlett, 2012), a lack of relevant work experience (Pavlović et al., 2019) and an absence of interest in gaining competencies beyond one's formal education (Jojkić and Mitrović 2017).

The research conducted indicates that the current competencies of NEET youth do not correspond with those sought in the labour market as well as that it is necessary to improve existing active employment policies in order to act in a more effective way to assist NEET in gaining employment. While all previous NEET research in Serbia has been based on secondary statistics or online survey data, the majority has drawn on the same data from the same Labour Force Survey (Pavlović et al., 2019, Zubović et al., 2015) as well as the same reports originating from RS institutions. However, there have been instances of online surveys being applied (Djukic and Pavlovic, 2020). In this regard to the uniformity of all previous research found in the literature, our study is novel as it is the first to exclusively focus on NEET youth in Serbia based on micro-data from the Labour Force Survey 2019 (Note: this study omits the year 2020 due to the inordinate shift in the labour market caused by the coronavirus which would distort all prior data up to 2019).

This paper seeks to better characterize NEET youth as well as how NEET transitions into the labour market or disengage from it by comparing those who

are unemployed and inactive as well as those not in education with youth who are employed to identify social differences that are factors in determining if one is at risk of being NEET. The research also seeks to establish risks associated with transitions into the labour market through asking the following questions:

1. What characteristics shared by youth are more likely to determine them as being NEET (such as gender, education attained, age, place of residence)?
2. What youth are more capable of transitioning into the labour market and find ready employment compared to those that are NEET?
3. What kind of work do young people find during this transition into the labour market? Are there any differences in terms of job security and employment rights in the jobs found when transitioning into the labour market?
4. What youth most likely disengage from the labour force and become NEET?

This study is the first of its kind to examine Serbian NEET youth in order to identify specific subgroups of job seekers, the long-term unemployed, inactive persons-the completely discouraged and those who may face significant barriers (such as disability or low level of education). The results and conclusions of the research will assist redressing public policy by allowing for a more accurate targeting of heterogeneous subgroups of youth.

2. LITERATURE REVIEW

The NEET rate is a relatively recent indicator. Emerging in the 1990s in the UK, it was designed to include a particularly vulnerable group of young people who had not been sufficiently treated by active employment policy measures and posed a particular challenge to economic policy makers (Eurofound, 2012). Since then, NEET has grown to become a subject of growing interest among researchers, in order to pinpoint its causes and create preventive measures in terms of economic policy. Djukic and Pavlovic (2020), ETF (2020) and Eurofound (2014), among others, have claimed that NEET youth are the consequence of a number of interdependent institutional, structural and individual factors. According to these authors, two highly predictable contributing factors to becoming a NEET are background (such as poor education and family life) or dissatisfaction. The latter ultimately concerns the attitudes youth develop towards their education as well as developing their skills. These two risk groups are certainly interrelated and which numerous

factors influence (e.g., parents, employment, residence and ethnicity) (Sergi, et al. 2018). The probability and risks of becoming NEET have been mainly methodologically investigated using logit models taking into account multiple individual socio-economic characteristics (such as gender, age, education level and health.). In addition, family factors (such as income level, education level attained by the parent and place of residence) have also been analyzed in literature research by O'Reilly et al. (2015) who point out that becoming NEET in the European countries is more likely for immigrants and those whose parents have only attained a lower level of education or among those young people where at least one parent does not work.

NEET are the most difficult to address, consisting of those who could be deeply alienated, lead alternative lifestyles, and at risk of being involved in the gray or even black economy, and potentially use alcohol or psychoactive substances excessively (Barth et al., 2019). Mascherini and Ledermaier cite five groups of NEET youth: 1) conventionally unemployed, 2) unavailable, 3) non-engaged, 4) opportunity seekers and 5) voluntary (Eurofound, 2016). Conventionally unemployed may be unemployed in the short-term or long-term unemployed but generally represent the most substantial NEET group. Each of these groups requires separate, specifically targeted active employment measures. A significant body of research analyses the effectiveness of economic policy measures in order to select the most effective at solving the problems of the conventionally unemployed. Alegre et al. (2015) using "propensity score matching" evaluates the effectiveness of diverse active employment measures in effect from 2009 to 2013 in terms of their ability to return NEET youth in Catalonia to full-time employment or education of NEET. The best effects were found to be recorded in younger groups (up to 18 years of age) and in measures aimed at returning them to the education system. Kluve et al. (2018) present the findings of a systematic review of past policies based on 113 impact studies. They report that programs are more successful in low- and middle-income countries as well as that the measures themselves are not as important as their design and implementation. Programs based on a multidisciplinary approach were also found to be more effective in the long-term. A survey conducted in Serbia indicated that NEET youth are mostly unemployed (short term - 29.8% and long term - 22%) and those taking care of their family members (15.4%). Strikingly, only 7.8% of NEET are made up of those who are entering the labour market, starting/continuing their education or training. 6.8% are disabled and the lowest, 5.8%, are discouraged from participating in the labour market (Foundation of Ana and Vlade Divac, 2020).

2. NEET YOUTH IN SERBIA- FACTS AND FIGURES

Since 2014, data on the NEET rate have been published annually in Serbia based on the implementation of the Labour Force Survey[1]. In the EU, the NEET rate has been published since 2010 (Foundation of Ana and Vlade Divac, 2020). On the publicly available portal of the Republic Statistical Office of the RS, data on the NEET rate can be found for two groups of youth: 1) 15 to 24 years of age and 2) 15 to 29 years of age. As our research focuses on youth 15 to 35, a general overview of them in terms of their economic situation will be presented utilizing the Eurostat database.

The overall NEET rate found in Serbia is higher than the general NEET rate across Europe as a whole. However, Europe is diverse, representing economies of varying strengths. Norway, for instance, had one of the lowest NEET rates at 7.3% but Turkey was the highest at 30.9%, in 2019. Countries throughout the EU itself might range wildly in their NEET rates as long standing member Italy reported 23.8% rate while the more recent member state of Croatia only reported 15% rate. In contrast, the Netherlands only was a 7% rate (Eurostat, 2019). These contrasting numbers show that NEET is a problem that spans across cultures where no rate is 0 as well as that, despite Serbia's efforts to combat NEET, it still will face issues as other countries do.

With the exception of Croatia, the share of NEET in the total youth population of Serbia was generally somewhat lower than the other countries of the region. Montenegro and Macedonia, for instance, both faced a NEET rate which was about 25%. In contrast, according to Eurostat data, it was estimated that there were approximately 19.9% of NEET youth 15 to 34 years of age in 2019 in Serbia (Figure 1).

[1] For more information https://publikacije.stat.gov.rs/G2017/PdfE/G20177069.pdf

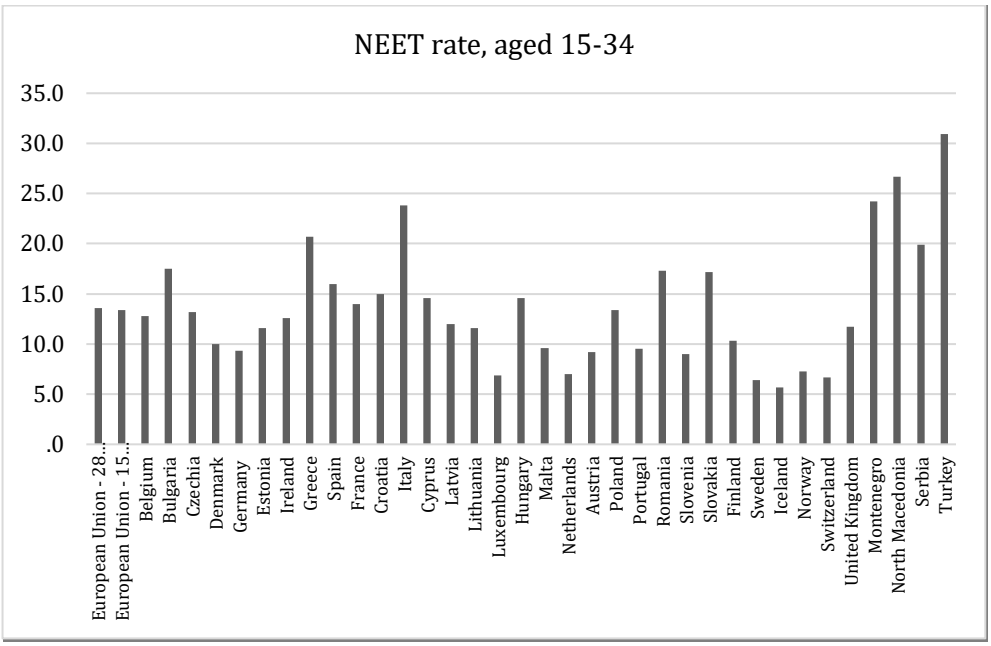

Figure 1. NEET rate in Europe, 2019.

Source: Eurostat, 2019.

However, the male NEET rate (15 to 34) was higher than females. In 2019, females NEET rate was 23.2% while for male population was 6.4 p.p. lower (Figure 2). Among NEET youth 15 to 34 years of age, in 2019 NEET rate was a lower in comparison from 2018. There is a decrease in the NEET rate for both gender groups according to the 2020 data. Whereas for males 15 to 34, the NEET rate decreased from 17.8% to 16.8%.

Males were more likely to be unemployed in the labour market (10% in 2019 for those 15 to 34 years of age) than were females (8.3% in 2019 for those 15 to 34 years of age).

Conversely, there are more NEET females who are inactive (14.8% in 2019) than males (6.8% in 2019). NEET males and females inactive in the labour market did not changed a lot in comparison with 2018. For inactive females 15 to 34 years of age, there was a sudden increase from 14.4% (2018) to 14.8% (2019), while those who are females NEET but unemployed fell from 10.3% (2018) to 8.3% (2019).

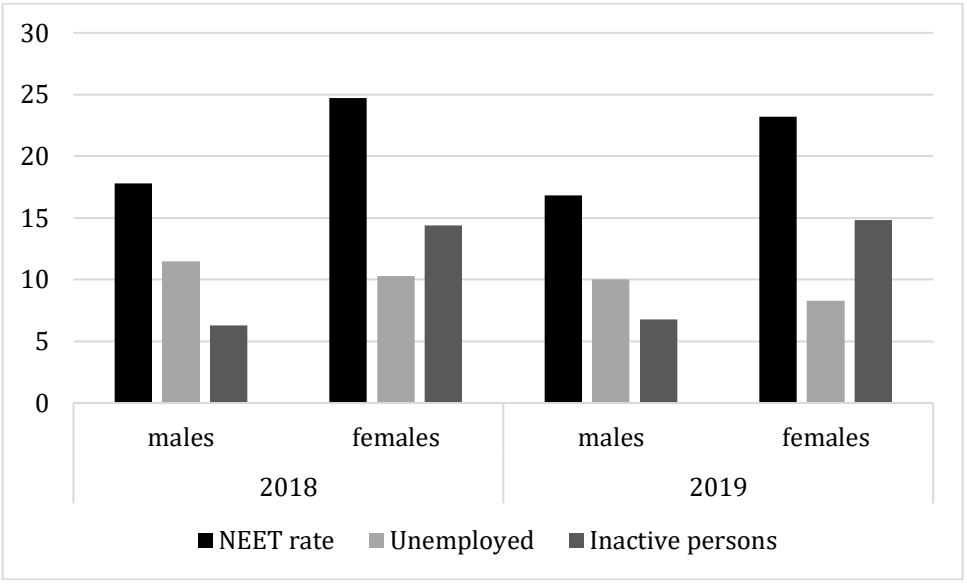

Figure 2. NEET rate in Serbia by gender, 2018 and 2019.

Source: Eurostat, 2019.

By age group, the lowest NEET rate is among those 15 to 24 years of age (15.3% in 2019). However, at over 19%, it is considerably higher among youth in general (15-34 years of age). There are significant differences when comparing education and age between those 15 to 24 and 15 to 34 years of age. To illustrate, those who are 15 to 24 and who have achieved only a less-than-primary, primary and lower secondary education (Levels 0-2) had an approximate NEET rate of 10%, while it was 19.9% for those 15 to 34. The NEET rate is slightly higher for youth 15 to 24 years of age who have achieved a higher education (25.2%) than for youth 15 to 34 in general (19.5%) (table 1).

Furthermore, at a rate of 22.2% in 2019, a deeper analysis shows that NEET youth who had achieved a Tertiary Education were mostly women, compared to the males at 15.4%. For both sexes, it was interesting to note that the males NEET rate for those 15 to 34 years of age who had completed their Tertiary Education had decreased compared to 2018. While females NEET rate did not changed in comparison with 2018.

Table 1. NEET rate in Serbia by age and educational attainment level, 2019.

	15-24	15-29	15-34
NEET RATE (All levels)	15.3%	19%	19.9%
Less than primary, primary and lower secondary education (Levels 0-2)	10.5%	15.1%	19.9%
Upper Secondary and Post-Secondary Non-Tertiary and Tertiary Education (Levels 3-8)	18.6%	20.5%	19.9%
Upper Secondary and Post-Secondary Non-Tertiary Education (Levels 3-4)	18.2%	19.7%	20.1%
Tertiary Education (Levels 5-8)	25.2%	23.7%	19.5%

Source: Eurostat, 2019.

Eurostat data show that women are more likely to be NEET if they come from rural areas. The NEET rate for women aged 15 to 34 living in rural areas is around 30% while for men it is 17.8%. In contrast, the NEET rate for men and women living in urban areas is almost equal, at around 16% and 18%, respectively.

Analysing Eurostat statistical data (2019) of current position of youth in RS, it could be concluded that youth from rural areas are at a higher risk to be in NEET status compared to youth from cities. Furthermore, it is a larger share of rural female NEET (28.2% in 2019) in comparison than males (16.9% in 2019) (table 2). Also, education have a significant influence on the position of females in rural areas (Ana and Vlade Divac foundation, 2020). For instance, women who only possess a primary education are the most likely to be NEET.

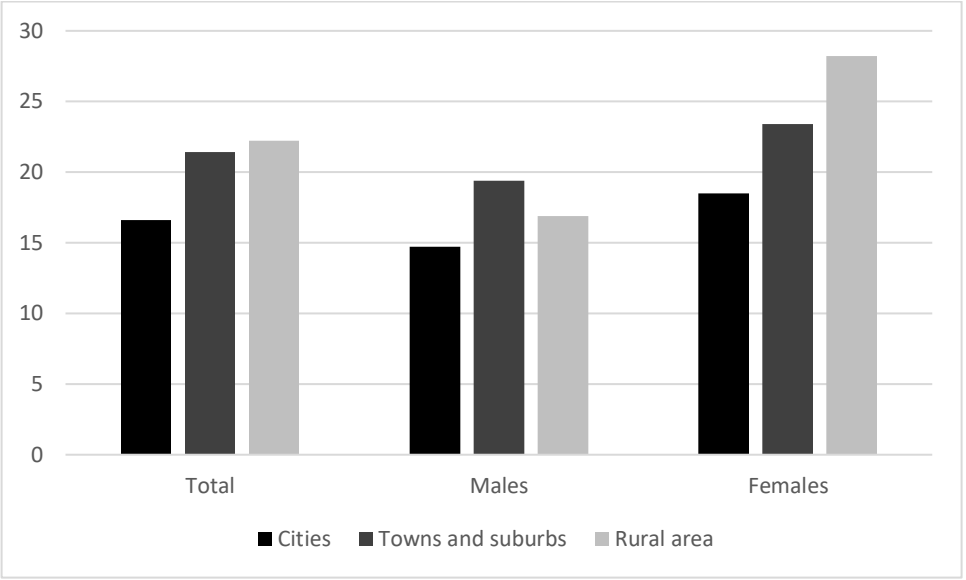

Figure 3. NEET rate in Serbia by gender and degree of urbanization

Source: Eurostat, 2019.

3. DATA AND METHOD

For the aforementioned purpose we used data from the 2019 Labour Force Survey. These data are organised in a panel survey design, in the sense that one set of respondents is interviewed in two successive waves, the subsequent two waves are then skipped and the respondents are interviewed again in two successive waves. Bearing in mind that we are using annual results, we are in possession of data covering two successive waves for 90 percent of the respondents, which enables us to conduct analysis on the individual level over time. Even though the interval was relatively brief (three months), we believe that this survey design makes it possible to identify differences in individual trajectories through the labour market. As part of the analysis we singled out young people aged 15-35, excluded all young people who are currently in formal education and used data only for those young people who participated in both waves. This enabled us to track any changes to their position in the labour market.

The data were reformulated from a wide to a long format, thus excluding the possibility of the same individuals appearing twice in the analysis from different quarters. Bearing in mind both that the purpose of the analysis was to

identify links between young people's socio-demographic characteristics and employment status, and also the fact that the participation of various categories of young people is relatively uneven, we employed this design in an effort to avoid increasing collinearity.

The surveyed population of young people consists of NEETs and the employed. In the category of young people who are NEET – not in education, employment or training – we included all young people who are no longer in formal education, who are not working (regardless of the type of employment or type of contract) and who are not engaged in any kind of training. In the category of employed persons, we included all young people who are in employment according to the definition used in the Labour Force Survey, irrespective of the kind of work (i.e. whether they are employed under a formal contract) or the level of compensation received.

The analysis was conducted in three stages: First, we descriptively present young people's status and change of status in the labour market by gender, education and place of residence. In the second stage, through three models of logistic regression, we endeavour to examine the following: 1) links between the socio-demographic characteristics of the respondents – gender, age, education, place of residence and region – and their NEET status; 2) links between the socio-demographic characteristics of young people and their transition from employment to NEET status – i.e. the likelihood of losing employment given a respondent's socio-demographic status; and 3) links between the socio-demographic characteristics of young people and their transition from NEET status to employment. The third stage analyses links between the respondents' socio-demographic characteristics, the type and stability of their employment during their transition from unemployment – in other words, which young people find more stable and which less stable employment.

In 2019, around 15 percent of young people were NEETs, six percent transitioned from this status into employment and a significantly smaller group of three percent transitioned from employment into NEET status. Three quarters of young people remained in stable employment – i.e. they did not change their employment status, though they may have changed jobs. Examining these changes from the perspective of education, we can identify the following patterns: Those who retained their status as NEETs are represented across all educational categories at practically the same rates. Transitions from employment to NEET status increase as the level of education increases, while transitions from NEET status into employment are lower for those with only

primary education. The stability of employment is somewhat higher for young people with only primary education.

When it comes to gender, young women are more frequently in stable NEET status and fluctuate less in terms of their status than do men, but there are also slightly fewer of them in continuous employment. Differences between rural and urban communities are not significant, being expressed as a slightly higher incidence of rural young people being NEET and slightly lower number in continuous employment. Fluctuations in status are identical across the urban-rural divide.

Table 3. Transitions of NEET

		Transitions			
		NEET – NEET	**EMPL. – NEET**	**NEET – EMPL.**	**EMPL. – EMPL.**
Total		15	3	6	76
Education	Primary	15	1	3	81
	Secondary	15	3	7	75
	Higher	16	7	7	74
Sex	Men	12	3	7	78
	Women	19	2	5	74
Place of Residence	Urban	13	3	6	78
	Rural	17	3	6	74

Source: Author's calculations.

A somewhat more detailed insight is provided by the following table, where data on gender, education and place of residence intersect. Among men there are no significant differences in terms of education and stable NEET status, while among women there is a small increase for those with secondary education. When it comes to gender and place of residence, there are no differences among men but some differences are evident among women. There are more women with a stable NEET status, fluctuations in either direction are effectively the same, while women in urban environments are more likely to be in continuous employment.

Table 4. Transitions of NEET

Gender			Transitions			
			NEET – NEET	**EMPL. – NEET**	**NEET – EMPL.**	**EMPL. – EMPL.**
Education	Men	Primary	13	2	5	81
		Secondary	11	4	8	78
		Higher	13	3	7	77
	Women	Primary	17	1	2	80
		Secondary	20	3	6	72
		Higher	18	4	7	71
Place of Residence	Men	Urban	12	3	7	78
		Rural	12	3	7	78
	Women	Urban	15	2	5	77
		Rural	23	3	5	70

Source: Author's calculations.

In the first model, for the dependent variable we used the dichotomous variable of NEET status (1) and employment (0). All other statuses were excluded from the analysis, enabling us to compare only those who either remained NEET or were in continuous employment. This enabled us to see the likelihood of a young person with given socio-demographic characteristics being NEET, as compared with young people in employment. Young people with only primary education are more likely to be NEET, compared with their peers who have completed university degrees. Meanwhile there is no significant difference between young people with secondary education and those who have finished university. Gender is also linked with NEET status, in the sense that women are almost twice as likely to be NEET as men. Place of residence is also associated with the risk of NEET status, where young people in urban areas are more likely to be NEET. Age is also linked with NEET status, with a higher NEET rate among young people over the age of 25.

Our second model analysed links between education and the transition from NEET status. As the dependent variable we used a dichotomous variable that expresses the status of those who last year transitioned from NEET to employed (1) and NEET (0). In using this model, we sought to identify those young people with NEET status who have better chances of finding work. Interestingly, our analysis shows that young people who have completed only primary education have a better chance of finding work, women have a better chance than men, urban youth have a better chance than rural youth and those living in the

Belgrade region have a better chance than those in the south or east of the country.

The third model was used to analyse the likelihood of someone who is in employment transitioning back to NEET status. As the dependent variable, we chose a dichotomous variable that expresses the status of those who last year transitioned from employment to NEET status (1) and employment (0). All other statuses were excluded from the analysis, as we sought to examine the differences between those who remained in (stable) employment and those who lost this status. The analysis shows that the risk of this transition is significantly lower for those with only primary education, that it is higher in urban areas, among younger age groups and in the south and east of the country, as compared with the Belgrade region.

Table 5. Likelihood of changing of status in the labour market

	NEET compared to those in Employment		**Transition from NEET to Employment**		**Transition from Employment to NEET**	
	B	**Exp(B)**	**B**	**Exp(B)**	**B**	**Exp(B)**
Primary	1.027***	2.793	-1.554***	0.211	0.747***	2.110
Secondary (ref. Higher)	0.108	1.114	-0.279	0.756	0.005	1.005
Female (ref. male)	0.562***	1.754	-0.128	0.880	0.783***	2.188
Urban (ref. rural)	0.195**	1.215	0.291*	1.338	0.245*	1.278
Age 14-19	-1.890***	0.151	0.473*	1.605	0.119	1.127
Age 20-24 (ref. Age 25-35)	-0.278**	0.757	-0.132	0.876	0.090	1.094
Vojvodina	0.316**	1.371	0.250	1.284	-0.042	0.958
Sumadija and Western	0.397***	1.487	0.031	1.032	-0.103	0.902
South and Eastern Serbia (ref. Belgrade)	0.578***	1.782	0.423*	1.526	-0.104	0.902
Constant	-2.994***	0.050	-3.371***	0.034	-0.727*	0.483
Nagelkerke R Square	.094		.070		.028	

Source: Author's calculations.

Young people who have progressed from their NEET status and found employment do not nonetheless enjoy the same position in the labour market. Although there are no differences in terms of working hours between men and women, there are some differences when it comes to the type of contract, with men somewhat more likely to be working without a contract. Much clearer differences are evident when it comes to place of residence and educational attainment. Full time work with a formal contract is significantly more common in urban areas than in rural. Moreover, young people with only primary education are less likely to work full time when compared to their peers who have completed secondary or higher education. As educational attainment increases, the likelihood of working without a formal contract decreases. These data show, therefore, that young people in rural areas are at greater risk of this kind of transition and that the risk rises as educational attainment decreases.

Table 6. Likelihood of changing of status in the labour market

Transition from NEET to employment		Type of Employment		Type of Contract	
		Full time	Less than full time	Informal	Formal
Sex	Men	81	19	44	56
	Women	80	20	34	66
		X^2=0.082. p=0.774		X^2=3.051. p=0.08	
Place of Residence	Urban	89	11	32	68
	Rural	71	29	50	50
		X^2=18.836. p=0.000		X^2=12.08. p=0.000	
Education	Primary	67	33	71	29
	Secondary	83	17	39	61
	Higher	84	16	20	80
		X^2=7.354. p=0.03		X^2=32.128. p=0.000	

Source: Author's calculations.

Additional risks associated with this transition can be identified through analysis of the workplace rights young people are able or unable to secure. Above all, we identified a fairly high rate of jobs that do not provide labour rights to all categories of young people, which points to the fact that their transition to employment is relatively precarious. Men were more at risk of failing to secure any of the analysed rights – to pension contributions, health insurance, paid sick leave and paid annual leave. Differences were also

identified according to place of residence, where securing such rights was less likely in rural areas. As educational attainment increases, so does the rate of young people securing some of the mentioned rights.

Table 7. Transition from NEET to employment (%)

Transition from NEET to employment		Without rights			
		Pension Contributions	Health Insurance	Paid Sick Leave	Paid Annual Leave
Sex	Men	50	50	59	60
	Women	37	35	42	43
		X^2=5.17, p=0.02	X^2=7.711, p=0.005	X^2=9.568, p=0.002	X^2=10.214, p=0.001
Settlement	Urban	36	35	47	48
	Rural	57	56	60	61
		X^2=16.784, p=0.000	X^2=16.687, p=0.000	X^2=6.302, p=0.012	X^2=5.453, p=0.02
Education	Primary	73	71	77	77
	Secondary	44	44	51	52
	Higher	30	28	42	42
		X^2=22.636, p=0.000	X^2=22.989, p=0.000	X^2=15.811, p=0.000	X^2=15.258, p=0.000

Source: Author's calculations.

4. DISCUSSION

The analysed data indicate that, compared to their counterparts in other European countries, the NEET rate among Serbian young people is significant. This makes them, as a group, vulnerable in the labour market since a high unemployment rate and lack of training makes them ready to look for and accept work in less than favourable conditions.

Particularly at risk are young people without formal qualifications – i.e. those who have only finished primary school. Their risk of having NEET status is significantly higher than those who have completed higher education (when other covariates are controlled). They are more likely to find work – i.e. to transition from being NEET to employment – but are also more likely to lose their jobs – i.e. to transition back from employment to being NEET. This indicates the relatively high level of risk and fluctuations in terms of employment status to which they are exposed. When in employment, they are

less likely to work full time than their counterparts who have higher educational attainment and are significantly more likely to be employed without a formal contract. This results in as many as three in four people with only primary education failing to secure basic workplace rights such as pension contributions, health insurance and paid sick leave or annual leave. Young people who have completed secondary education are in something of a better position, who differ from their higher educated peers by being less likely to be employed with a formal contract and by securing fewer workplace rights. Almost one in two people who transitioned from NEET status into employment in 2019 fails to secure the aforementioned rights.

Women experience a higher NEET rate than men, which indicates that a patriarchal culture responds to the high degree of precarity in employment by excluding a certain portion of the female population (or otherwise allowing them to exclude themselves). This applies particularly to those women who can afford it – i.e. with educational attainment beyond primary school. The analysis also indicates that, during the period under study, women lost their jobs more frequently, indicating that short-term fluctuations are potentially more likely to affect them. Men, on the other hand, find themselves in employment at more or less the same rate – irrespective of their educational attainment – but are more exposed to the risks of an unregulated labour market. They are more likely to work without a formal contract, which leads to them failing to secure workplace rights at a greater rate – which, in a patriarchal society, is linked to a transition to adulthood and financial autonomy as a significant rite of passage.

As is to be expected, the labour market is more dynamic in urban rather than rural areas. On the one hand, towns and cities experience a much higher NEET rate, reflecting a lack of jobs in urban areas and the peculiarities of agricultural production, which employs significant numbers of workers. Young people in urban areas are more likely both to find work and to lose their jobs than their rural counterparts. When they do find employment – i.e. when they transition from NEET to employment – young people in rural areas are significantly less likely to work full time or to have a formal contract, which results in them being less able to secure workplace rights. When it comes to regional differences, the Belgrade region proves to be the region of Serbia where young people are least at risk of having a NEET status.

5. CONCLUSION

Unfortunately, Serbian NEET face a multitude of challenges in the labour market that leave them less likely to be employed than their peers in many other European countries. Despite fluctuations in their overall employment over the last decade they still are least likely to be employed and suffer from significantly high NEET rates.

In Serbia, NEET rate is extremely high and small number of strategies are paying attention to this problem. Labour market measures need to be more effective. The problem of this group of young people is a problem that does not involve only one sector. Trends of globalization, demographic problems such as population aging and depopulation, and the need to adopt development policies taking into account the sustainability component are factors that require policy makers in Serbia to constantly adapt to change. Policies should change in line with changing challenges and their effectiveness should be monitored, evaluated and continuously improved in order for the implemented measures and activities to lead to the desired results. Systemic support to young people is just one of the many challenges of the reform process, but at the same time it is their common denominator. Without investing in young people, and according to their needs, social and generational inequalities only deepen in the long run. Finally, a society that does not support young people does not make optimal use of its talents and abilities can hardly be called sustainable. At the same time, it is necessary to keep in mind all subgroups of young people, especially vulnerable groups and young people who face difficulties in entering the labour market, because solving their problems often requires additional efforts and unconventional solutions.

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AN EVALUATION OF MODERNISED VOCATIONAL PROFILES IN SERBIAN SECONDARY SCHOOLS

Lara Lebedinski*

Abstract: *This paper studies the labour market outcomes of graduates of three modernised vocational profiles in Serbian schools six months after finishing secondary school. As part of this process existing vocational profiles were modernised and a close cooperation with companies where pupils had their practical training was established. We employ a difference-in-difference methodology to estimate employment effects and self-reported quality of modernised educational profiles. Our dataset consists of 32 schools and 723 interviewed pupils. Our findings suggest a higher subjective quality of innovated profiles especially how pupils perceive their secondary education experience. With regards to employment, we do not find a higher employment rate for graduates of innovated profiles, but we find that the quality of their jobs is higher compared to the comparison pupils. While short-term impacts are encouraging, the literature emphasises that one should consider also the long-term perspective especially because vocational skills can depreciate at a faster rate than general skills.*

Keywords*: impact evaluation, secondary school education, vocational education training*

JEL Classification: *I28, J24, M53*

1. INTRODUCTION

In 2014/2015 a certain number of vocational education training (VET) profiles were modernised in Serbian secondary schools with the support from the German Development Cooperation. This paper studies the labour market outcomes of the third cohort of pupils who attended modernised vocational education training (VET) profiles in Serbian secondary schools and the goal is to validate the findings from the first evaluation which included the second cohort.

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These modernised profiles differ from the classic vocational profiles and are called vocational profiles with elements of dual education.[1] They have been developed based on the qualification standards and they are outcome based. The amount of practical lessons with outcomes that need to be reached in the company have been increased compared to the classic vocational profiles. The most important difference is that it was envisaged that students who are going to companies for practical lessons were active participants in the working process and that they had a trained instructor supporting them in this process. These modernised profiles were available in 15 schools in 2016/2017.

The cohort that we study entered school in 2016/2017 and finished school in 2019/2020 and we study their labour market outcomes six months after school completion. We focus on the following three modernised vocational profiles in this paper: locksmith-welder, electrician, and industrial mechanic, all three profiles last 3 years. We study employment effects and hence we focus on the outcome of being employed and on other employment characteristics. In addition to this, we study the impact of the intervention on the quality of educational profiles. We rely on a difference-in-difference methodology where we compare treated pupils with other pupils in the same school as well as pupils from a different, but similar school. The impact evaluation for the second cohort of pupils who graduated in modernised profiles, found that they were more likely to be employed, they had higher incomes and they judged their quality of education higher than comparable pupils (Bachmann et al., 2019).

In terms of quality of modernised educational profiles, we find that some improvements in terms of subjective quality of modernised profiles and in particular, self-reported quality of education was rated higher in modernised profiles. Turning now to employment impacts, we find that treated pupils were not more likely to be employed 6 months after graduation than their comparable peers, but the quality of their jobs was higher. We find that treated pupils were more likely to get their first job in the training company and they were more likely to hold a written contract. They were also more likely to respond that their current work is related to VET and that their education was useful, but these outcomes do not reach statistical significance.

The remainder of the paper is structured as follows. In section 2 we summarise the context and relevant literature, in section 3 we proceed with the discussion of the methodology, we then describe the sample in section 4. In section 5 we discuss the results and section 6 concludes.

[1] More details about the program can be found in Bachmann et al. (2019).

2. CONTEXT AND LITERATURE

Youth in Serbia is considered a vulnerable group. In 2020, youth in the age group 15 to 24 in Serbia had an activity rate of 28.3% and the employment rate of youth stood at 20.8% (SoRS, 2021). These two indicators reflect the fact that a large share of this age group is still in education, however, the unemployment rate stood at 26.6% in 2020, much above the unemployment rate of 9% in the whole population suggesting that youth has difficulties on the labour market. The share of youth not in education, employment or training stood at 15.6% in 2020. Among youth, young Roma are considered especially vulnerable as their low educational background and possible discrimination makes it difficult for them to find good quality jobs.[2] A majority of the Serbian youth have completed secondary education (56.5%) and only every fourth young person has a tertiary degree (Marjanović, 2016). This study focuses on youth who have completed secondary education and hence is relevant for a large share of the young population. Interestingly, youth with secondary vocation education have a faster school-to-work transition than other youth (Marjanović, 2016).

In the recent years policy makers are promoting vocational education and they are emphasising the importance of practical training in education. More practical experience is expected to help pupils ease the school to work transition and this is confirmed in the literature (Ryan, 2001; Shavit and Muller, 2018; Biavaschi et al., 2018). However, recent research emphasises that the short-term gains in terms of faster school-to-work transition are offset in the long-term. Due to technological change, the focus on specific job-related or firm-specific skills during education can have negative impacts on later life employability. By studying IALS data for 11 countries, Hanushek et al. (2015) find support for this hypothesis and show that individuals with general education have difficulties at the beginning of their career, while their employability improves over time. In contrast, individuals with vocational education find a job easier at the start of the career, but they face more difficulties later as their skills depreciate. Hanushek et al. (2015) stress that vocational education and training cannot be a substitute for providing strong basic skills. If the educational system equips students with general cognitive skills, the vocational education and practical training will not be a hurdle in the future. Weber (2014) shows that for an equal level of schooling, human capital depreciation is higher for vocational studies than for academic studies.

[2] Some efforts in the educational system are made to improve the educational outcomes of Roma and these could show positive effects in the medium term. For further details see Battaglia and Lebedinski (2015, 2017, 2022).

However, there are studies which cannot confirm this stylised fact (Stenberg and Westerlund, 2015) suggesting that there are country specific factors at play too and that case studies can provide important policy implications. Overall, this literature suggests that when studying the impacts of vocational education on labour market outcomes, one should keep both the short- and long-term perspective.

3. METHODOLOGY

We aim to estimate the effect of attending a modernised profile on labour market outcomes of graduates. We refer to these pupils as the "treatment group". Related, we call newly introduced (modernised) profiles in these schools the "treated profiles" and the collaborating school "treated" schools. In order to estimate the true impact of being in the treatment group, we select three comparable groups of pupils, so-called comparison groups:[3]

1. Comparison group 1: Pupils attending a non-treated profile in a treated school.
2. Comparison group 2: Pupils attending a profile similar to the modernised profile, who are attending a comparison school
3. Comparison group 3: Pupils attending a non-treated profile in a comparison school. Ideally, comparison group 1 and comparison group 3 profiles should be the same.

We rely on the so-called difference-in-difference methodology[4] to estimate the effect of attending a modernised profile. We calculate the difference in terms of outcomes, e.g. employment, *within* the GIZ schools by subtracting the average outcome of pupils in comparison profiles from outcomes of pupils in treated profiles within the same treated school. Similarly, we calculate the difference in outcomes *within* comparison schools between the profile similar to the modernised profile (comparison group 2) and the comparison profile (comparison group 3). Finally, the two simple differences are subtracted from each other and by doing so we account for both the problem of pupil, school and area selection.

[3] This paper uses the same methodology as the impact evaluation of the second cohort conducted by Leibniz-Institut für Wirtschaftsforschung (RWI) and FREN. More details can be found in Bachmann et al. (2019).

[4] For more details about the methodology see Angrist and Pischke (2008) or Cunningham (2021).

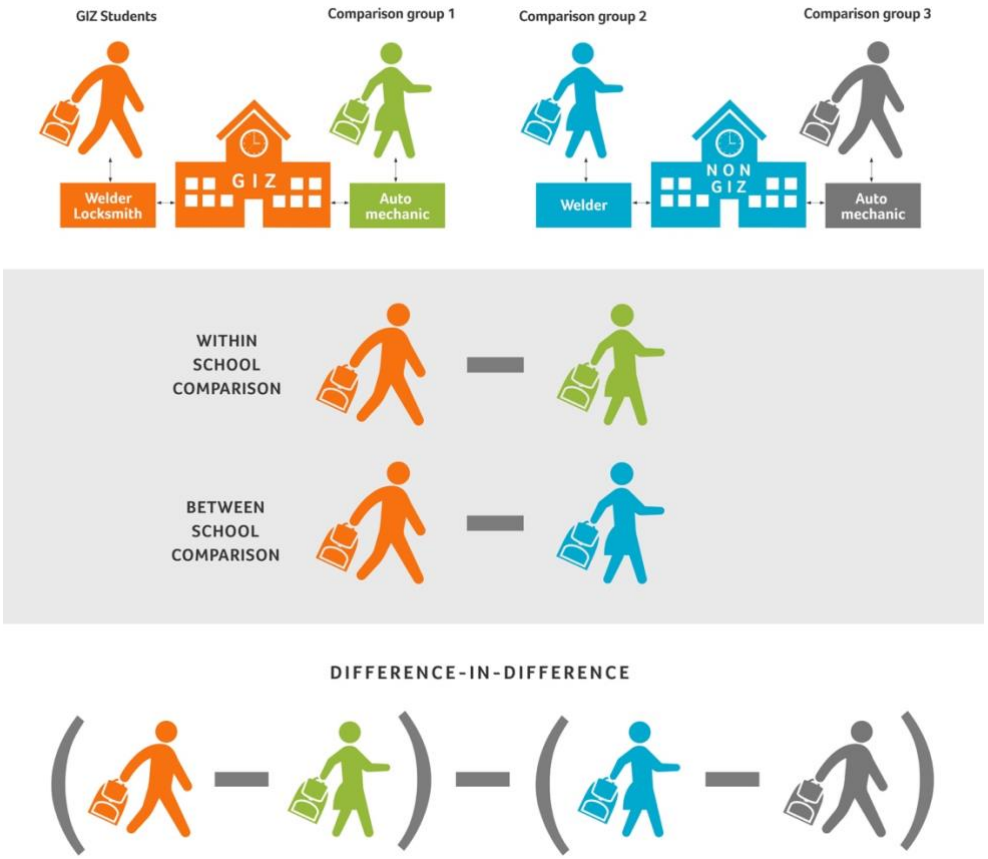

Figure 1. Illustration of difference-in-difference methodology

Source: Bachmann et al. (2019)

4. SAMPLE DESCRIPTION

As part of the impact evaluation, a baseline and a follow-up survey were conducted in schools with modernised vocational profiles and comparison schools. The baseline survey was conducted in spring 2019 and pupils were asked to give consent so that their data can be used for research purposes. In the case of pupils who were minors when the baseline survey was conducted, they were asked to provide the consent from their legal guardian. The follow-up survey was conducted in the winter 2020 over phone.

The sample includes 15 schools with modernised profiles and 17 comparison schools. For each of the 15 schools with modernised profiles, at least one comparable control school was selected.[5] Each comparison school has at least one profile comparable to the GIZ modernized profile. In both treated and comparison schools we chose comparison profiles 1 and comparison profiles 3, that is profiles which are not necessarily related to the GIZ profile and these profiles serve the purpose to account for differences in school quality and local labour markets between treated and comparison schools.

Table 1 summarises the number of schools, profiles and pupils included in the survey. In total, all 15 schools with 3 new modernised profiles in 2016/2017 are in the sample. In treated schools, there are 17 treated class/profile combinations[6] and 24 comparison class/profile combinations with 18 different profiles. In the 17 comparison schools, there are 21 different profiles and 38 different class/profile combinations.

Table 1. Number of schools, profiles, classes and pupils in baseline sample

School	**Total**	**Treated**		**Comparison**	
Profile		T	C1	C2	C3
Number of schools	32	15	15	17	17
Number of distinct profiles	31	3	18	8	13
Number of class/ profile combinations	84	17	24	18	25
Number of pupils enrolled in last year	1,255	169	466	153	467

Source: Author's calculations from survey administered in the project

Table 2 summarises the response rates, the rejections rates and the unreachable rates based on the sample of pupils who completed a baseline questionnaire. Not all pupils who enrolled in the third year of school (last row in Table 1) completed a baseline questionnaire. The main reasons for not participating in the baseline questionnaire were the following: pupils were not at school at the time of the survey, pupils did not provide a consent from parents

[5] The comparison profiles were selected with the help of the Institute for the Improvement of Education and Upbringing and the Institute for the Evaluation of Education.

[6] We use the term class/profile to express that a profile is within a specific class. One class can have more than one profile, e.g. in one class it is possible to have one, two or three class/profile combinations.

(in case of minors) and some pupils refused to participate. Overall, we reacged close to 63% of pupils form the baseline and 57.61% of pupils from baseline were interviewed in the follow-up survey. The rejection rate for the sample was 5.10% while the rate of pupils who couldn't be reached stood at 37.37%. The two reasons for not being able to reach a pupil were either that the phone number was incorrect or there was no response when the person was called. The unreachable rate among pupils from treated profiles stood at 30.18% and it was half of the unreachable rate of comparison profiles in both treated (33.26%) and comparison schools (45.75% and 41.11%).

Table 2. Follow-up sample size and response rate

Schools	**Total**	**Treated**		**Comparison**	
Profiles		T	C1	C2	C3
# Baseline questionnaires completed	1,255	169	466	153	467
# Follow-up questionnaires completed	723	115	287	72	249
Response rate	57.61%	68.05%	61.59%	47.06%	53.32%
Persons who rejected	64	3	24	11	26
Rejection rat	5.10%	1.78%	5.15%	7.19%	5.57%
Persons who were unreachable	468	51	155	70	192
Unreachable rate	37.37%	30.18%	33.26%	45.75%	41.11%

Source: Author's calculations from survey administered in the project

As a first step we examine whether pupils who were surveyed at baseline and follow-up differ in their socio-demographic characteristics from pupils surveyed only at baseline (survey dropouts). Ideally there should not be any differences between those two groups and we could infer that the sample of pupils included in the baseline and follow-up survey represents well the overall sample of pupils surveyed at baseline. Table 3 compares the gender, number of points for enrolment in secondary school, position of the enrolled school on wish list and mother's education between the pupils included in follow-up survey and those not included in follow-up. The comparison of baseline characteristics suggests that mother's education is somewhat higher among dropouts, but the difference is small and it is unlikely that this can have significant implication for the analysis.[7]

[7] Note that even if the different education of the mother would impact our results, we know from theory that mother's education has a positive effect on both educational and labor market outcomes. Thus, we can infer that our results would be underestimated

Table 3. Background characteristics surveyed pupils and dropouts

	Baseline and follow-up	Baseline survey dropouts	T-Test/Chi-Square Difference
Female (%)	0.19	0.16	not sign.
Number of points for secondary school			not sign.
60-69 points	0.28	0.21	
70-79 points	0.29	0.31	
80 or more points	0.23	0.25	
Position of enrolled school on wish list			not sign.
First	0.63	0.59	
Second	0.17	0.18	
Third or higher	0.20	0.23	
Mother's education			*
At most primary school	0.16	0.13	
3 or 4 years secondary school	0.73	0.71	
College or higher	0.11	0.16	
Number of pupils	723	532	

Note: Difference: significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. Not sign. denotes not significant. T-test for Female and Chi-Square test for Points for secondary school, Position of enrolled school on wish list and Mother's education.

Source: Author's calculations from survey administered in the project

5. RESULTS

This section reports and analyses the available characteristics of pupils such as mother's education and their other characteristics at the end of primary school such as gender, number of points for secondary school enrolment and position of enrolled school on wish list. This analysis is required to understand to which extent the pupils in treated and comparison profiles are similar.

Table 4 compares the available background characteristics between treated and comparison profiles. In the columns (1) to (4), we report the characteristics for each of the four groups. The last column *Diff-in-Diff* reports the difference-

due to the bias resulting from having pupils with lower education of the mother in the subsample than in the overall sample.

in-difference estimator from a regression[8] and this number reports the difference between the treated group and the comparison groups in the difference-in-difference setting. A statistically significant number in column *Diff-in-Diff* implies that the characteristics of the treated group is statistically different from the comparison groups. This structure of the columns will be used for all tables in the paper that analyse the effect of the program on the treated group.

A comparison of available background characteristics of pupils in treated and comparison profiles reveals that treated pupils were of somewhat lower quality than comparison pupils and they were less likely to enrol their first choice profile compared to comparison pupils. The other available characteristics capturing gender and educational background of the mother do not show up to be statistically significant between the treated and comparison profiles. Despite these small differences, it can be concluded that the quality of pupils in treated and comparison profiles is similar and that they are comparable.

Table 4. Background characteristics of treated and comparison pupils

School	**Treated**		**Comparison**		**Diff-In-Diff**
Profile	**T**	**C1**	**C2**	**C3**	
	(1)	**(2)**	**(3)**	**(4)**	**[(1)-(2)]-[(3)-(4)]**
Female (%)	**0.04**	**0.24**	**0.03**	**0.24**	**not sign.**
Number of points for secondary school					*
59 or less points	0.41	0.10	0.58	0.12	
60-69 points	0.45	0.25	0.25	0.25	
70-79 points	0.13	0.39	0.14	0.28	
80 or more points	0.01	0.26	0.03	0.36	
Position of enrolled school on wish list					**
First	0.58	0.54	0.60	0.74	
Second	0.19	0.20	0.18	0.12	
Third or higher	0.23	0.25	0.22	0.15	
Mother's education					not sign.
At most primary school	0.28	0.12	0.28	0.10	

[8] We do not include control varialbes in the regressions due to a small number of observations and many missing values in the controls.

School	Treated		Comparison		Diff-In-Diff
Profile	**T**	**C1**	**C2**	**C3**	
	(1)	**(2)**	**(3)**	**(4)**	**[(1)-(2)]-[(3)-(4)]**
Secondary school (3 or 4 years)	0.68	0.75	0.69	0.75	
College or higher	0.04	0.13	0.03	0.15	
Number of pupils	115	287	72	249	
Total	723				

Note: significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. Not sign. denotes not significant. The impact estimates and confidence intervals are obtained by a linear regression model for Female and ordered logit for other outcome variables.

Source: Author's calculations from survey administered in the project

Quality of educational profiles

In a first step, we would like to assess whether the profiles that are used as comparison are objectively and subjectively of the same quality. It is expected that the modernisation of profiles raised their quality and thus it is expected that the higher quality is captured by at least some of the available measures.

Pupils were asked a series of questions on their opinion of the quality of the education, such as: what was the overall quality, how were the school and the company equipped, whether they felt prepared for work after finishing secondary school and if they would choose the same educational profile again. These questions are expected to reflect the subjective opinion of pupils on the quality of education. The results are reported in Table 5. In the columns (1) to (4), we report the characteristics for each of the four groups and the last column *Diff-in-Diff* reports the difference-in-difference estimator from a simple regression.

The findings reveal that all pupils in treated and comparison profiles finished the last grade by the time of the survey. This is not surprising as most dropouts in secondary school happen in the first grade. Among the interviewed students, the grade average in the third grade was somewhat smaller than 4 on a scale from 1 (worst) to 5 (best). Compared to control peers, treated pupils were less likely to respond that they plan to continue with their education within the next two years. The *Overall quality of secondary education* was rated higher by treated pupils. On the other hand, the other outcomes *School: Equipment and*

conditions, Company: Equipment and conditions, *Readiness for work* and *Likelihood of choosing again the same profiles* were not significantly different between the treated and comparison group. Both treated and comparison pupils said they would choose again the same educational profile if they were offered this choice.

Table 5. Subjective and objective measures of quality of education

School	**Treated**		**Comparison**		**Diff-In-Diff**
Profile	**T**	**C1**	**C2**	**C3**	
	(1)	**(2)**	**(3)**	**(4)**	**[(1)-(2)]-[(3)-(4)]**
Completed last grade	1.00	1.00	1.00	1.00	0.00
Grade average	3.77	3.91	3.71	3.99	13.39
Started education after finishing school	0.11	0.48	0.14	0.54	0.04
Plans to continue with education	0.32	0.48	0.48	0.40	-0.23**
Overall quality of secondary education	0.85	0.73	0.71	0.83	0.24**
Equipment and conditions of the school	0.73	0.63	0.60	0.56	0.07
Equipment and conditions of the company	0.92	0.82	0.92	0.82	-0.01
Readiness for work	0.86	0.68	0.74	0.63	0.07
Choose again same educational profile	0.82	0.75	0.78	0.78	0.06
Number of pupils	115	287	72	249	
Total number of pupils	723				

Note: significant at 10%, ** significant at 5%, *** significant at 1%. All scales are from 1 (worst) to 5 (best).

Source: Author's calculations from survey administered in the project

The difference-in-difference estimates from the last column in Table 5 are presented graphically in Figure 2. Overall, we find a statistically significant positive impact on treated pupils with respect to quality of their secondary education, treated pupils were 24 percentage points more likely to say that their education was good or very good. Other measures of school quality were higher for treated pupils, but they do not reach statistical significance. The other statistically significant difference is found for the outcome *Plans to continue with education*. Treated pupils were 23 percentage points less likely to express

an interest to continue with their education in the future. We believe that the reason for this response among treated pupils is that they felt better prepared for work and that there were better job opportunities available to them in their field of study.

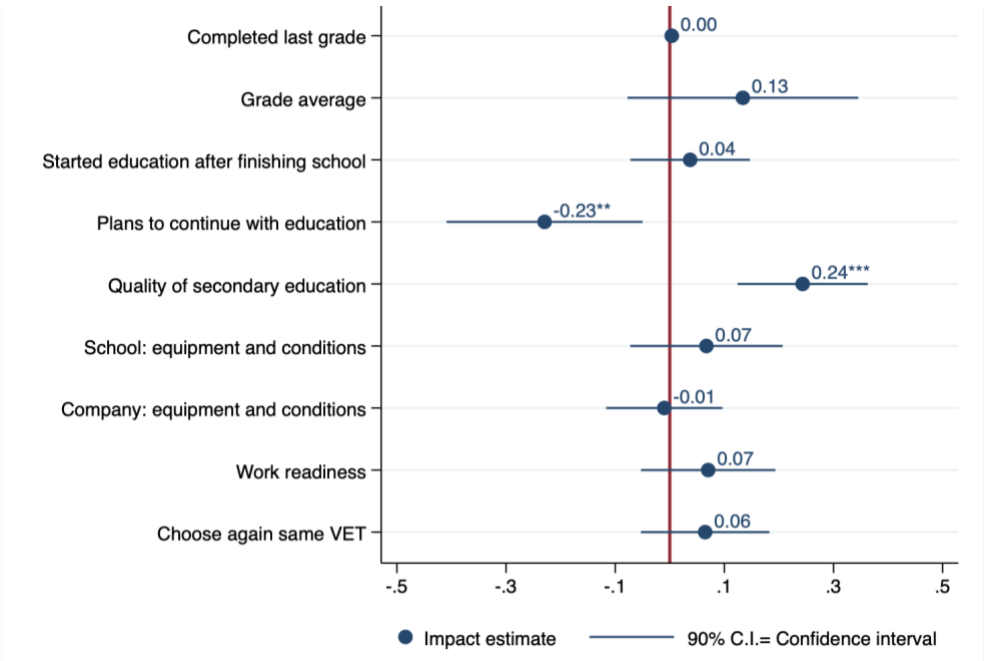

Figure 2. Impact estimates: Measures of quality of education

Notes: significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. The impact estimate refers to the Diff-In-Diff column from Table 5.

Source: Author's calculations from survey administered in the project

Employment status and job search

We now assess the employment status in the sixth month after graduation. Table 6 shows whether pupils ever held a job and whether they are currently employed. We can see that among treated pupils 77% ever held a job and 65% are currently employed. We can also observe that the employment rates of the *Treated group* is similar to the *Comparison group 2*, while *Comparison group 1* and *Comparison group 3* pupils have lower rates of employment because these pupils attended four-year profiles and many of them continued their educational path. Both treated and comparison group pupils work, on average, somewhat more than the statutory working hours (40-hours week).

Table 6. Employment status

School	Treated		Comparison		Diff-In-Diff
Profile	**T**	**C1**	**C2**	**C3**	
	(1)	**(2)**	**(3)**	**(4)**	**[(1)-(2)]-[(3)-(4)]**
Ever employed	0.77	0.52	0.74	0.50	0.01
Currently employed	0.65	0.38	0.57	0.34	0.03
Number of hours worked	44.09	42.80	42.73	42.64	1.19
Number of pupils	115	287	72	249	
Total number of pupils	723				

Note: significant at 10%, ** significant at 5%, *** significant at 1%.

Source: Author's calculations from survey administered in the project

We compare characteristics of the employed individuals in both treated and comparison profiles and analyse whether job characteristics differ in Table 7. Most pupils in all groups are still employed in their first job. Almost half of all treated pupils (48%) got their first job in the company where the training took place, whereas this share is much lower in the comparison groups. Almost two thirds of treated pupils (64%) said that their job is work related, the numbers in the comparison groups are lower. Similarly, treated pupils gave higher scores than comparison group pupils for the usefulness of their VET education in their current job. In terms of salary, we observe that half of all treated pupils have a salary higher than 45.000 RSD while this share is lower for the comparison groups. We further observe that the *Treated group* has a similar distribution of net salaries to the *Comparison group 2* pupils, while *Comparison group 1* and *Comparison group 3* have larger shares in the lowest salary category (approximately one third of all employed). Most pupils do have a written fixed term contract. Finally, all four groups of pupils report high levels of satisfaction with their jobs.

Table 7. Job characteristics of employed

School	Treated		Comparison		Diff-In-Diff
Profile	T	C1	C2	C3	
	(1)	(2)	(3)	(4)	[(1)-(2)]-[(3)-(4)]
Still in first job after finishing secondary school	0.77	0.80	0.73	0.70	-0.06
First job in company where training took place	0.48	0.05	0.14	0.06	0.35**
Current work VET related	0.64	0.23	0.55	0.31	0.18
Current work VET use(ful?)	0.60	0.24	0.43	0.25	0.18
Monthly net salary					not sign.
Less than 35,000 RSD	0.21	0.35	0.14	0.34	
Between 35,000 RSD and 45,000 RSD	0.52	0.38	0.43	0.24	
More than 45,000 RSD	0.91	0.73	0.73	0.79	0.23**
Written contract (%)	0.26	0.12	0.21	0.19	0.12
Unlimited duration contract (%)	4.45	4.21	4.50	4.22	-0.04
Satisfied with job	0.21	0.35	0.14	0.34	
Number of pupils	74	110	41	84	
Total number of pupils	309				

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. All scales are from 1 (worst) to 5 (best).

Source: Author's calculations from survey administered in the project

We now turn to presenting the impact estimates (last column in Table 7) in a graphical form and discussing them. Figure 3 displays the estimated impact for job conditions related to VET education. Compared to the comparison pupils, treated pupils were 35 percentage points more likely to find their first job in the company where they had their training during secondary school. They also reported a higher score than comparison pupils in terms of relatedness and usefulness of their VET education for their current job, but these numbers do not reach statistical significance.

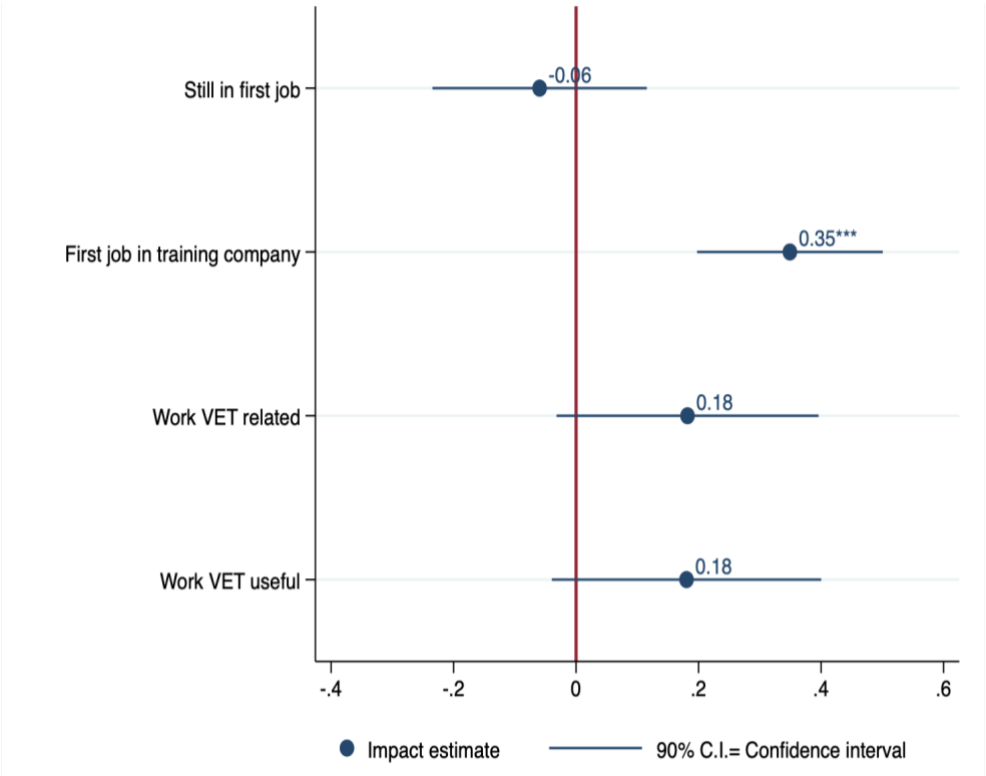

Figure 3. Impact estimates: Job conditions

Note: * significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. The impact estimate refers to the Diff-In-Diff column from Table 7.

Source: Author's calculations from survey administered in the project

In Figure 4 we present the differences between the different wage categories and we confirm graphically that wages are not different between the treated and comparison pupils.

We consider the contract conditions and job satisfaction in Figure 5. Treated pupils are 23 percentage points more likely to hold a written contract than comparison pupils. In terms of contract duration, we see that treated pupils are 12 percentage points more likely to have an unlimited contract, but this impact is not significant. Finally, treated and comparison pupils do not differ in terms of job satisfaction.

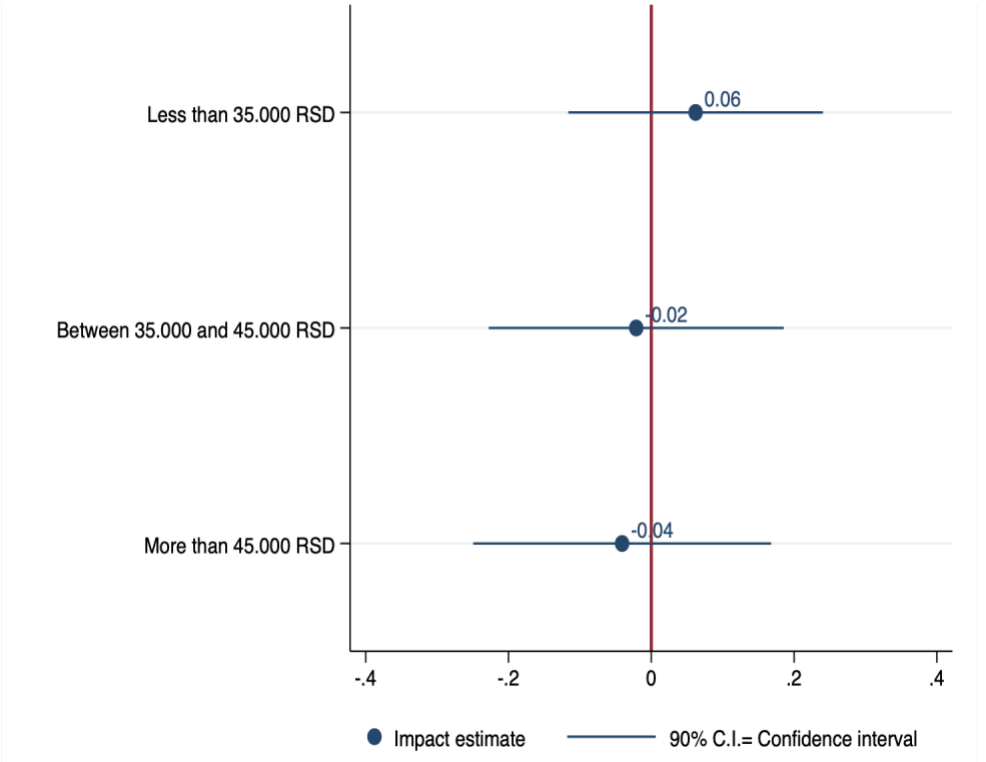

Figure 4. Impact estimate: Monthly wage

Note: significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. The impact estimate refers to the diff-in-diff column from Table 7.

Source: Author's calculations from survey administered in the project

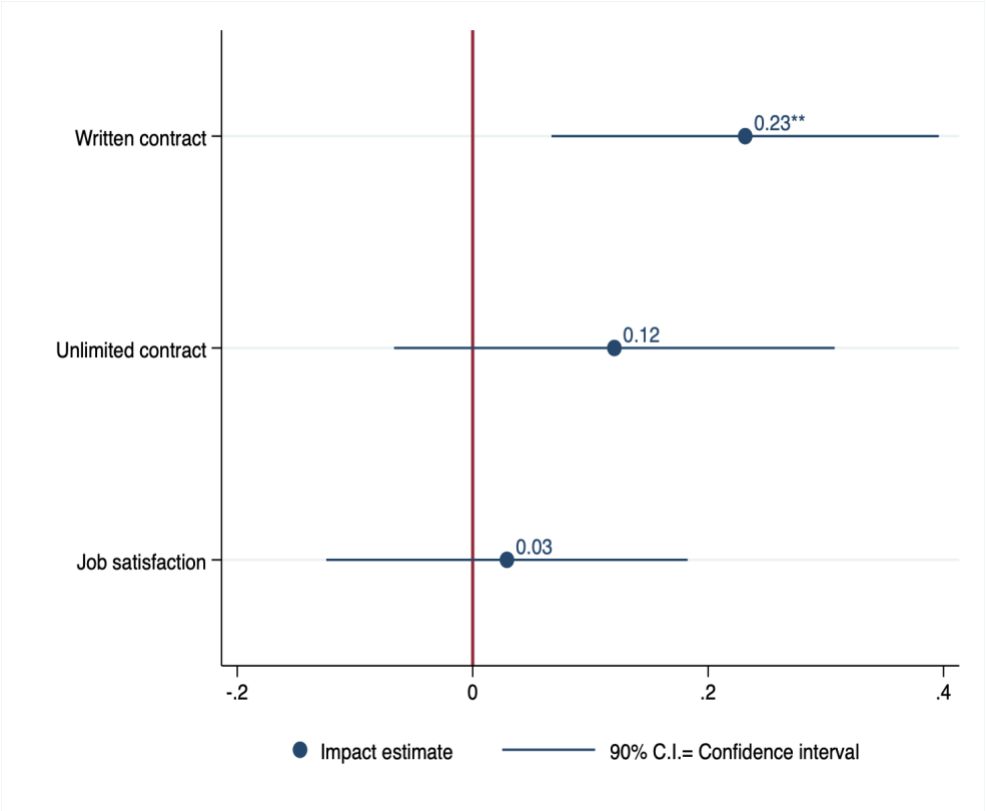

Figure 5. Impact estimates: Job conditions (contract and satisfaction)

Note: * significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. The impact estimate refers to the Diff-In-Diff column from Table 7.

Source: Author's calculations from survey administered in the project

Table 8 provides an insight into the share of the employed and unemployed/inactive searching for a job. Generally, graduates could be searching for a (better) job irrespective of their current labor market status. We do not find statistically significant differences in terms of the share of pupils searching for jobs between treated and comparison pupils. Among the 297 pupils not searching for a job, the two main reasons why they were not searching for a job are: (1) they are still in education or doing a practical training (65.32%), (2) they plan to start looking for a job at some later point of time (13.13%) and (3) they plan to start education or training (8.42%).

Table 8. Job search by employment status

School	Treated		Comparison		Diff-In-
Profile	Treated	C1	C2	C3	Diff
	(1)	(2)	(3)	(4)	[(1)-(2)]-[(3)-(4)]
Searches for job - Employed	0.36	0.32	0.43	0.41	-0.07
Searches for job - Unemployed / Inactive	0.79	0.40	0.63	0.30	0.00
Number of pupils	115	287	72	249	
Total number of pupils	723				

Note: significant at 10%, ** significant at 5%, *** significant at 1%.

Source: Author's calculations from survey administered in the project

6. CONCLUSION AND DISCUSSION OF FINDINGS

This paper evaluates the impact of the introduction of modernised vocational profiles on pupils completing secondary school in Serbia. The analysis is based on originally collected survey data from the third cohort of the program.

The empirical analysis examines the effect of the modernisation of profiles on quality of educational outcomes, employment status and quality of jobs of the employed. We employ a rigorous difference-in-difference methodology that compares pupils of modernised profiles to comparable pupils within and across schools. Two main results follow from the analysis:

First, with respect to subjective measures of quality of education, we find that treated pupils were 24 percentage points more likely to give a good or very good grade for their secondary education, other important outcomes such as *School: Equipment and conditions*, *Readiness for work*, and *Likelihood of choosing again same educational profile* are larger for treated pupils, but the impact estimates do not reach statistical significance. Interestingly, treated pupils were 23 percentage points less likely to say that they plan to continue their education, presumably because they perceive they have the required skills for the labor market and/or they are happy with their current work.

Second, we do not find differences on employment rates between treated and comparison pupils. However, the bond between secondary school and thus pupils and the companies is stronger for treated pupils. This is reflected by the fact that treated pupils are 35 percentage points more likely to get employment

at the company where they did their practical training during school. Treated pupils are also 23 percentage points more likely to have a written contract and thus they are more likely to be formally employed. While the outcome of having an unlimited contract does not reach statistical significance, this outcome is larger for treated pupils. The relatedness and usefulness of their current work with respect to their educational background was graded higher by treated pupils, but these outcomes do not reach statistical significance. We do not find that the modernization of profiles affected the wages of treated pupils and their levels of satisfaction with the job. We do not find differences with respect to job search behavior between treated and comparison pupils

Overall, the rigorous analysis shows that treated pupils judged the quality of their education somewhat better. While the employment rate was not affected by the program, the jobs that they got were of higher quality than the jobs of their similar peers. The positive impacts from the evaluation of the second cohort are confirmed also for the third cohort.

The literature emphasises that evaluations of vocational education should also take a long-term perspective. The education should provide strong basic skills and practical training in vocational education should not be increased at the cost of general education. This is especially important as previous research has shown that vocational skills depreciate at a faster rate than general skills.

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ENTREPRENEURIAL INTENTIONS OF STUDENTS IN SERBIA: EVIDENCE FROM DIFFERENT FIELDS OF STUDY

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Abstract: *This paper aims to examine entrepreneurial intentions to anticipate future entrepreneurial behavior of undergraduate students enrolled in two different fields of study at the same university. Following the theory of planned behavior, empirical relationships between entrepreneurial intention and its determinants are established. The data were collected using an especially tailored survey questionnaire, while students of business economics and electrical engineering were attending their courses. Three antecedents were tested in relation to entrepreneurial intentions. Correlation analysis confirmed that attitudes toward entrepreneurship, perceived behavioral control, and subjective norms form positive and statistically significant associations with entrepreneurial intentions. However, certain differences between these two groups of students' stances related to the items that describe the determinants of entrepreneurial intentions are confirmed. This requires additional attention and remains for future research.*

Keywords*: entrepreneurship, entrepreneurial intention, students of economics and electrical engineering, Serbia.*

JEL Classification: *I25, I31, L26*

1. INTRODUCTION

This paper aims to study entrepreneurial intentions (EIs) to anticipate future entrepreneurial behavior of undergraduate students enrolled in two different fields of study at the same university. Furthermore, we are trying to argue that EIs are different from the adults and among the students themselves. In this paper, EIs of business economics students compare with the entrepreneurial intentions of electrical engineering students. Based on previous empirical findings (Lüthje and Franke, 2003; van Gelderen, et al., 2008), and theoretical constructs (Ajzen, 1991) the main objective of this paper is defined:

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- to examine the effects of three groups of EI determinants to explain why some individuals (i.e., undergraduate students) have more entrepreneurial spirits than others, and
- to explain the main differences between the two groups of students with different previous knowledge about entrepreneurship.

Following theoretical models constructed on Ajzens' theory of planned behavior (Ajzen, 1991), the empirical relationship between EIs and their determinants was established using the data collected through a tailored survey questionnaire. As the theory of planned behavior (TPB) suggests the intention is the most immediate predictor of an individual's actual behavior. Translated to the field of entrepreneurial behavior, in this paper, three antecedents of EIs are studied:

- Attitudes toward entrepreneurship,
- Perceived behavioral control,
- Subjective norms.

As explained in Ajzen's (1991) seminal paper, attitudes toward entrepreneurship reflects one's awareness of the result of concreate behavior, perceived behavioral control reflects belief or sentiment that this behavior is under one's control. In contrast, subjective norms represent beliefs about significant others who may influence one's intent to perform the behavior. According to some previous empirical studies, these three determinants explain up to 45% of the variation in EIs (see, for example, van Gelderen, et al., 2008). Besides these three core antecedents of EIs, summaries of the most studied determinants of EIs are provided, for example, in Schlaegel and Koenig (2014), Liñán and Fayolle (2015), etc.

So far, entrepreneurship has been studied from different perspectives in Serbia. One strand of recent research focuses on the institutional support to the development of entrepreneurship and entrepreneurs, with special emphasis on entrepreneurship from necessity. They include social entrepreneurship analyses and grants assessments provided through active labor market policy schemes (Obradović and Ivanović, 2021). The other strand of literature includes only a few papers on entrepreneurial values and decisions of young people (i.e., undergraduate students) to choose entrepreneurship as a professional call (Stanković, Dedjanski and Vojteški-Kljenak, 2015; Papić, Garabinović and Jovičić, 2019). Several other studies have been focused on the comparative perspective, where entrepreneurial intentions of individuals have

been explored in several countries of the region, including Serbia, Bosnia and Herzegovina, Croatia and Macedonia (Rajh, et al., 2018; Petković, et al., 2018).

This paper is organized into several sections. In the following section, a review of the most recent literature about the determinants of EIs is presented. This section focuses not only on theory but also provides empirical findings. The research methodology is presented in a separate section, followed by a discussion of the main results, while the last section provides conclusions of the paper.

2. LITERATURE REVIEW

The literature review in researching entrepreneurial intentions suggests that various sets of determinants can be those which may predict one's behavior. However, most of them rely on the TPB, claiming that intentions are a substantial predictor of planned behavior. This section will provide a comprehensive summary of recent academic literature on this topic. Entrepreneurship development has become one of the essential strategies for boosting economic growth and solving aggregated issues in the labor market (Vasić, Tancioni and Ognjenović, 2011). An increasing number of studies in post-transition economies are dealing with this topic (Turulja, et al., 2020; Turuk, Horvatinović and Sudarić, 2020; Pejić Bach, Aleksić and Merkač Skok, 2018; Rajh, et al., 2018).

Most regional studies employ the TPB as a theoretical background for empirical research. Starting with a most recent study published by Turuk, Horvatinović and Sudarić (2020), who surveyed Croatian economics students, tested the theoretical model, and the empirical results show that attitudes toward entrepreneurship and perceived behavioral control form a positive relationship with EIs. Their results also confirmed that subjective norms significantly but negatively impact EIs; gender moderates this effect. Pejić Bach, Aleksić and Merkač Skok (2018) found, on the other hand, empirical support for all the determinants of the TPB in their research. The authors conduct this research among Slovenian undergraduate and master studies students in business economics. In addition, their research confirmed that innovative cognitive style has a significant effect in creating an entrepreneurial intent.

Turulja, et al. (2020) investigated an extended set of determinants on EIs of business economics students in Bosnia and Herzegovina. Their results pointed to the positive influence of subjective norms on EIs, examined through the

support of family and close friends, while fear of failure has a negative impact on EIs. The impact of subjective norms moderates this negative association between fear of failure and EIs. They also show that entrepreneurial capacity may positively predict entrepreneurial behavior. This additionally supports the idea of the importance of entrepreneurship education, which is a predictor of entrepreneurial behavior omitted from most empirical studies (Schlaegel and Koenig, 2014).

Petković, et al. (2018) conducted an empirical research on a sample of undergraduate students in Bosnia and Herzegovina, Croatia and Serbia. They examined the differences in students' willingness to choose entrepreneurship or managerial jobs as a professional call. Students in Croatia and Serbia did not find the impact of society or cultural context as favorable for creating an entrepreneurial intent. In contrast, students in Bosnia and Herzegovina see attitudes toward entrepreneurship as an essential predictor of EIs. Rajh, et al. (2018) employ the TPB in their research which is extended by additional determinants of EIs. They surveyed undergraduate business economics students in Bosnia and Herzegovina, Croatia, Macedonia, and Serbia. They obtained somewhat different results between the countries. Three fundamental antecedents of EIs have a positive and significant influence on the entrepreneurial intent of students in Bosnia and Herzegovina, and Croatia, while Macedonian and Serbian students did not find subjective norms a considerable predictor of EIs. They did not find a significant correlation between additional contextual variables and EIs. Gender has an important but diminishing effect showing that female students are less prone to entrepreneurial behavior.

Similar findings are obtained by Shinnar, et al. (2018) on a sample of US management students. The authors find a significant relationship between antecedents and EIs as suggested by the TPB, and a moderated effect of gender. Not all empirical studies give the same results when it comes to testing the relationship between EIs and their determinants. Giacomin, et al. (2011), on the other hand, found that cultural background plays a significant role in explaining differences in EIs among American, Asian and European students. It is also an unavoidable factor to consider when creating entrepreneurship education programs, whose influence on EIs is less represented in empirical studies. Several other studies provide results for European students of business economics. On a sample of Dutch undergraduate business administration students, van Gelderen, et al. (2008) tested the TPB and show that the most important predictors of EIs are entrepreneurial alertness and financial security.

In most of recent academic literature about EIs students of business economics are examined, while, for example, students of technical faculties are less represented in similar research. Lüthje and Franke (2003) conducted their research among US engineering students and found that personality traits variables, such as attitudes toward entrepreneurship, have a significant positive relationship with EIs. While contextual variables, represented by perceived barriers and perceived support factors, have significant but diverse effects on students' EIs.

3. METHODOLOGY

To test the main research hypothesis, an empirical model is constructed. Following the theoretical construct derived from Ajzen's approach (1991), three antecedents of EIs are selected, and their association with the entrepreneurial intention is examined. Although entrepreneurial behavior had studied among different subpopulations (Bruton, Ahlstrom and Obloj, 2008), in this paper, the primary sampling units are undergraduate students, mostly of final years of studies, as, for example, in works of Lüthje and Franke (2003) and van Gelderen, et al. (2008). Sometimes this approach is considered the main limitation of the research into the behavior-intent relationship (Vuorio, Puumalainen and Fellnhofer, 2018), but, on the other hand, it may explain most of our understanding of the entrepreneurial process that begins in the educational system (Giacomin, et al., 2011).

The design of the methodology and data collection process, which is employed in this paper, was previously developed by Rajh, et al. (2018). The survey questionnaire includes several sections about the determinants of EIs and EIs themselves. The pen-and-paper personal interviews (PAPI) were conducted, while students were in their classrooms. The students of two fields of study at the University of Belgrade were selected, including those from the Faculty of Economics (FE) and the Faculty of Electrical Engineering (FEE). Thus, the survey was conducted only in Belgrade, which represents the most developed part of the country, introducing innovative study programs and attracting the most significant number of inhabitants (including students) from the rest of the country. The data were collected during the 2016/2017 schooling year, i.e., at the beginning of the summer semester at FE and the beginning of the winter semester at FEE. The data collection process was finalized within one week in both cases. The response rates were over 100% because our planned sample counted 300 undergraduate students at each of the faculties.

The realized sample includes 309 (FE) and 307 (FEE) completed questionnaires used in the data processing phase. Three groups of EI antecedents were analyzed using statistical tests to test the differences in means between the responses provided by these two groups of students. In addition, a pairwise correlation analysis is conducted to identify the magnitude and statistical significance of the associations between EIs and its determinants.

In Table 1 some descriptive statistics, including gender, age, and year of study for students from two faculties, are reported.

Table 1. Differences in personal characteristics of students

Descriptive statistics	Study group	
	Students of Economics	Students of Electrical Engineering
Gender (in %)		
Male	23.30	63.84
Female	76.67	36.16
Age (in years)		
Mean	21.63	21.89
Std. dev.	1.21	1.17
Year of study (in %)		
1st	0.33	0.00
2nd	33.00	7.49
3rd	47.25	46.91
4th	19.42	45.60
No. of observations	309	307

Source: Self-administered survey.

The main difference between the two groups reflects in the gender of students. While most students of FE are young women, the opposite is true when the FEE students are observed. Female students constitute 76.67% of the sample of FE respondents, while male students make 63.84% of the FEE sample. As far as age is concerned there is no significant difference among the students. In both cases, most sampled students are those of the 3rd and 4th year of study, except for the FE sample, which includes almost one-third of students enrolled in the second year of study. This appears due to both common subjects that students attend in the same classroom or that they have already chosen their field of study, for example, major in business economics.

4. RESULTS AND DISCUSSION

This section contains the key results of the empirical analysis conducted to show whether EIs for the two groups of students can be explained by selected antecedents as suggested by the theory and tested in other empirical studies. The research hypotheses have been formulated and empirically tested to show that 'Attitude toward entrepreneurship', 'Perceived behavioral control', and 'Subjective norm' form a positive and statistically significant association with EIs.

Reliability of data

All responses in the survey questionnaire are measured using a 5-point Likert scale, ranging from 1-strongly disagrees to 5-strongly agree, where three means neither agree nor disagree. The number of items within a group of related questions is relatively uniform.

Table 2. Reliability statistics by an item group

Variable content	Study group	
	Students of Economics	Students of Electrical Engineering
IG1; Entrepreneurial intention		
No. of items	6	6
Scale	5-point Likert	5-point Likert
Cronbach's alpha	0.896	0.907
IG2: Attitude toward entrepreneurship		
No. of items	4	4
Scale	5-point Likert	5-point Likert
Cronbach's alpha	0.788	0.815
IG3: Perceived behavioral control		
No. of items	4	4
Scale	5-point Likert	5-point Likert
Cronbach's alpha	0.857	0.842
IG4: Subjective norm		
No. of items	3	3
Scale	5-point Likert	5-point Likert
Cronbach's alpha	0.954	0.957

Source: Self-administered survey.

The *Cronbach's* alpha, i.e., the coefficient of reliability for the six items for the entrepreneurial intention's set of questions for both groups of students, is

relatively high, exhibiting the values of 0.896 and 0.907, respectively (Table 2). These values of the alpha coefficients suggest relatively high internal consistency of items for both groups of students, considering a threshold of 0.70 or higher as an acceptable measure of internal reliability.

As depicted in Table 2, the same conclusions can be drawn for all other items representing EI antecedents. In general, the items' lowest, but still acceptable, internal consistency is provided for the group 'Attitudes toward entrepreneurship' and the highest for the group 'Subjective norm'. This finding is not surprising since the alpha coefficient value increases with the increase of the average inter-item correlation, regardless of the number of items. In the former case, the number of items is four, while in the latter only three.

Testing statistical differences in EI antecedents between two groups of students

In order to examine the differences in EI antecedents between the two groups of students, we applied Welch's t-test statistics (Welch, 1938). Under the null hypotheses, the difference between the population means for the two independent samples is assumed to be equal to zero (H_0: $M_1 - M_2 = 0$). Under the assumption about unequal population variances ($\Sigma_1 \neq \Sigma_2$), appropriate test statistics is given in the form:

$$t' = \frac{\mu_1 - \mu_2 - (M_1 - M_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}. \quad (1)$$

If H_0 is true (i.e., $M_1 - M_2 = 0$), the t' test statistics can be approximated by Student's t distribution. Then, the degrees of freedom are calculated according to the Welch-Satterthwaite correction formula (Welch, 1938).

Table 3 contains the results of testing the hypotheses about the differences in attitude toward entrepreneurship between business economics and electrical engineering students. This group of antecedents of EIs is represented by four explanatory factors, showing that all the items exhibit significant differences in explaining EIs. Only exception is the claim 'If I had the opportunity and resources, I'd like to start a firm' which doesn't differ between the two groups of students. In other words, both groups of students rated this question with a similar average score, 4.02 (FE) and 3.89 (FEE), so the difference of 0.127 is not statistically significant [t=1.417 p=0.16]. On a Likert scale up to 5, high average estimates exhibit a firm attitude toward the intention to create a new venture. This statement is evident in its sense, implying that if the opportunity is here and resources are available young people will probably not hesitate to start

their own business. Pejić Bach, Aleksić and Merkač Skok (2018) found antecedents of entrepreneurial behavior highly statistically correlated with Slovenian students' intentions to start their own business. Additionally, they also found the gender of the students as a significant explanatory factor of EIs. Some recent studies for Serbia, for example, show that gender itself doesn't provide clear conclusions when financial performances of companies are observed as a measure of business success (Stevanović and Simović, 2017). The authors concluded that the influence of gender on the financial performances of medium-sized companies in the manufacturing sector is somewhat inconclusive regarding the variety of factors that may moderate gender effects.

It also can be noticed that undergraduate business economics students give on average higher scores to all the items explaining one's attitude toward entrepreneurship than students of electrical engineering. This is expected and can be explained by the role of entrepreneurship education, which is much closer to business economics students. This part of education is even more critical because some empirical studies show that the companies do not find training provided at the workplace necessary for improving business performances in the short term (Ognjenović, 2015).

Table 3. Differences in 'Attitude toward entrepreneurship'

Item	Mean (μ_1, μ_2)	Std. dev. (σ_1, σ_2)	Diff. (μ_1- μ_2)	t-test, $\alpha = 0.05$
I11: Being an entrepreneur implies more advantages than disadvantages				
Faculty 1	3.82	0.84	0.125	1.706 p=0.09
Faculty 2	3.69	0.97		
I12: A career as an entrepreneur is attractive for me				
Faculty 1	3.64	1.08	0.318	3.389 p=0.00
Faculty 2	3.32	1.25		
I13: If I had the opportunity and resources, I'd like to start a firm				
Faculty 1	4.02	1.07	0.127	1.417 p=0.16
Faculty 2	3.89	1.15		
I14: Being an entrepreneur would entail great satisfaction for me				
Faculty 1	3.74	1.14	0.337	3.610 p=0.00
Faculty 2	3.41	1.17		

Note: Faculty 1 and Faculty 2 stand for students of Faculty of Economics and Faculty of Electrical Engineering, respectively.
Source: Self-administered survey.

A set of determinants explaining how perceived behavioral control influences EIs has obtained the lowest score among the students of both study groups. Students perceive the knowledge of all necessary practical details about starting a firm or developing an entrepreneurial project as insufficient. This implies that a lack of practical knowledge about starting own firm may distance young graduates from realizing a business idea. No statistical differences were found in students' responses, suggesting that students of business economics don't perceive 'the control of the creation process of a new firm' or 'expected probability of succeeding' differently from students of electrical engineering.

Students' views about the statement 'I know the necessary practical details to start a firm' should be carefully analyzed. Both scores are based on an attitude that students disagree with such a claim on average. As depicted in Table 4, average scores are 2.62 (FE) and 2.27 (FEE), indicating a significant difference in students' responses [t=4.471 p=0.00]. Students have lower expectations for controlling the process of starting a business venture, knowing that this process may be accompanied by something beyond their control. So, entrepreneurial education is important, and some other unobserved factors would raise students' confidence in the success of their endeavor.

Table 4. Differences in 'Perceived behavioral control'

Item	**Mean (μ_1, μ_2)**	**Std. dev. (σ_1, σ_2)**	**Diff. (μ_1- μ_2)**	**t-test, $\alpha = 0.05$**
I21: I can control the creation process of a new firm				
Faculty 1	3.10	1.00	0.084	1.011 p=0.31
Faculty 2	3.02	1.06		
I22: I know the necessary practical details to start a firm				
Faculty 1	2.62	0.93	0.357	4.471 p=0.00
Faculty 2	2.27	1.05		
I23: I know how to develop an entrepreneurial project				
Faculty 1	2.74	0.96	0.350	4.111 p=0.00
Faculty 2	2.39	1.14		
I24: If I tried to start a firm, I would have a high probability of succeeding				
Faculty 1	3.34	0.89	0.069	0.923 p=0.36
Faculty 2	3.27	0.98		

Note: Faculty 1 and Faculty 2 stand for students of Faculty of Economics and Faculty of Electrical Engineering, respectively.
Source: Self-administered survey.

Electrical engineering students perceive the subjective norm as a better antecedent of EIs than business economics students. The most significant difference in their attitudes can be seen in the claim that 'If I decided to create a firm, my colleagues would approve it'. However, this difference (-0.081) is not statistically significant [t=-1.093 p=0.28], neither is any other difference that would show 'important others' as supporters of students' business ideas (Table 5). In other words, both groups of students expect high support from their families, friends, or colleagues if they decide to realize a business venture.

Table 5. Differences in 'Subjective norm'

Item	Mean (μ_1, μ_2)	Std. dev. (σ_1, σ_2)	Diff. (μ_1- μ_2)	t-test, $\alpha = 0.05$
I31: If I decided to create a firm, my close family would approve it				
Faculty 1	4.15	0.95	-0.027	-0.372 p=0.71
Faculty 2	4.18	0.85		
I32: If I decided to create a firm, my friends would approve it				
Faculty 1	4.13	0.89	-0.050	-0.717 p=0.47
Faculty 2	4.18	0.84		
I33: If I decided to create a firm, my colleagues would approve it				
Faculty 1	3.94	0.95	-0.081	-1.093 p=0.28
Faculty 2	4.02	0.89		

Note: Faculty 1 and Faculty 2 stand for students of Faculty of Economics and Faculty of Electrical Engineering, respectively.

Source: Self-administered survey.

Testing statistical differences in EIs between two groups of students

Claims explaining one's entrepreneurial intentions, which represent a dependent variable, are reported in Table 6. Both groups of students find some differences in proposed explanations. The only two claims where students have similar opinions are those represented by 'I am determined to create a firm in the future' [t=1.515 p=0.13] and 'I have very seriously thought of starting a firm' [t=1.534 p=0.13].

Table 6. Differences in 'Entrepreneurial intention'

Item	Mean (μ_1, μ_2)	Std. dev. (σ_1, σ_2)	Diff. (μ_1- μ_2)	t-test, $\alpha = 0.05$
I01: I am ready to do anything to be an entrepreneur				
Faculty 1	2.86	1.06	0.297	3.348 p=0.00
Faculty 2	2.57	1.14		
I02: My professional goal is to become an entrepreneur				
Faculty 1	2.89	1.10	0.281	3.015 p=0.00
Faculty 2	2.61	1.21		
I03: I will make every effort to start and run my own firm				
Faculty 1	2.88	1.09	0.405	4.470 p=0.00
Faculty 2	2.48	1.16		
I04: I am determined to create a firm in the future				
Faculty 1	3.00	1.13	0.143	1.515 p=0.13
Faculty 2	2.86	1.22		
I05: I have very seriously thought of starting a firm				
Faculty 1	2.91	1.18	0.150	1.534 p=0.13
Faculty 2	2.76	1.26		
I06: I have the firm intention to start a firm someday				
Faculty 1	3.00	1.18	0.166	1.677 p=0.09
Faculty 2	2.83	1.28		

Note: Faculty 1 and Faculty 2 stand for students of Faculty of Economics and Faculty of Electrical Engineering, respectively.

Source: Self-administered survey.

Though the claim 'My professional goal is to become an entrepreneur' represents an entrepreneurial intention, most honestly, average student responses don't lead to a high level of commitment that would indicate that they will realize their business idea soon. The average scores of 2.89 (FE) and 2.61 (FEE) are well below the threshold 'neither agree nor disagree' that indicates an indifferent opinion of students about their willingness to become entrepreneurs.

The results in Table 6 show that neither business economics nor electrical engineering students exhibit a clear intention to start their business venture after graduation. This conclusion can be derived regardless of the statistically

significant differences obtained from their responses. These differences were tested and confirmed at low average scores. This conclusion may be further supported by Rajh, et al. (2018), who found that attitude toward entrepreneurship and perceived behavioral control form a positive and statistically significant relationship with EIs, while subjective norms have no impact on EIs. Their results are confirmed on a sample of Serbian students of business economics. Similar results were found by Turuk, Horvatinović and Sudarić (2020) for Croatian students of business economics who took entrepreneurship as a compulsory course. Their results show that attitudes toward entrepreneurship and perceived behavioral control positively impact, while subjective norms negatively impact EIs.

Correlation analysis

Table 7 and Table 8 present correlation matrixes with pairwise associations between each set of determinants and EIs. Both the coefficients of correlation and significance levels are reported in the matrix. This part of the analysis should confirm the alliance between EIs and their antecedents. As previously shown, they form hypotheses to be tested.

All determinants that describe one's attitude towards entrepreneurship form a positive and statistically significant relationship with EIs. However, the associations between an entrepreneurial career choice and opportunities and resources with EIs are more pronounced. For example, the correlation coefficients between these two attitudes described as 'A career as an entrepreneur is attractive for me' and 'If I had the opportunity and resources, I'd like to start a firm' and an intention 'My professional goal is to become an entrepreneur' are 0.69 ($p<0.001$) and 0.61 ($p<0.001$), respectively.

Table 7. Correlation matrix - variables for study group Economics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I01																
I02	.71[1]															
I03	.72[1]	.80[1]														
I04	.67[1]	.79[1]	.86[1]													
I05	.65[1]	.77[1]	.81[1]	.88[1]												
I06	.64[1]	.75[1]	.80[1]	.88[1]	.89[1]											
I11	.43[1]	.44[1]	.33[1]	.38[1]	.37[1]	.16[1]										
I12	.62[1]	.69[1]	.60[1]	.64[1]	.59[1]	.60[1]	.59[1]									
I13	.57[1]	.61[1]	.57[1]	.61[1]	.59[1]	.61[1]	.52[1]	.78[1]								
I14	.57[1]	.61[1]	.56[1]	.58[1]	.54[1]	.58[1]	.52[1]	.80[1]	.84[1]							
I21	.44[1]	.45[1]	.43[1]	.44[1]	.46[1]	.43[1]	.33[1]	.44[1]	.44[1]	.43[1]						

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I22	.34[1]	.36[1]	.31[1]	.35[1]	.33[1]	.30[1]	.27[1]	.29[1]	.15[2]	.19[1]	.45[1]					
I23	.42[1]	.38[1]	.38[1]	.41[1]	.40[1]	.34[1]	.17[2]	.28[1]	.19[1]	.19[1]	.46[1]	.67[1]				
I24	.45[1]	.39[1]	.42[1]	.43[1]	.41[1]	.40[1]	.25[1]	.39[1]	.35[1]	.34[1]	.57[1]	.33[1]	.41[1]			
I31	.21[1]	.23[1]	.19[1]	.29[1]	.23[1]	.23[1]	.25[1]	.30[1]	.26[1]	.24[1]	.24[1]	.19[1]	.14[2]	.25[1]		
I32	.21[1]	.17[1]	.18[1]	.25[1]	.18[1]	.15[2]	.18[1]	.27[1]	.21[1]	.22[1]	.19[1]	.20[1]	.15[2]	.23[1]	.72[1]	
I33	.17[1]	.13[2]	.15[1]	.20[1]	.16[2]	.13[2]	.17[2]	.23[1]	.18[1]	.22[1]	.20[1]	.16[2]	.11[3]	.25[1]	.55[1]	.74[1]

Note: ([1]), ([2]), ([3]) stand for the 1%, 5% and 10% level of significance, respectively.
Source: Self-administered survey.

Perceptions about controlling factors such as 'I can control the creation process of a new firm' and the intentions described as 'My professional goal is to become an entrepreneur' or 'I have very seriously thought of starting a firm' are less pronounced among FE students. Estimated correlation coefficients are 0.45 ($p<0.001$) and 0.46 ($p<0.001$), which confirms strong associations.

Even though FE students perceive the subjective norms as EI antecedents as most important, potential relationships they form with an entrepreneurial intent are moderate. The correlation coefficient between a family as a supporter 'If I decided to create a firm, my close family, would approve it' and an intent 'I am determined to create a firm in the future' is estimated at 0.29 ($p<0.001$). Colleagues are perceived as less necessary in the students' intention to start own business than family members or close friends. Turulja, et al. (2020) also found the support of family and close friends highly significantly associated with EIs of students in Bosnia and Herzegovina.

As described by several antecedents, attitude toward entrepreneurship is also highly correlated with FEE students' intentions. The claim 'A career as an entrepreneur is attractive for me' that reveals one's potential professional choice is strongly associated with EIs as reported in Table 8. Correlational analysis reveals high and statistically significant relationships between attitudes and EIs.

Table 8. Correlation matrix – variables for study group Electrical Engineering

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I01																
I02	.77[1]															
I03	.79[1]	.79[1]														
I04	.74[1]	.82[1]	.79[1]													
I05	.72[1]	.79[1]	.75[1]	.84[1]												
I06	.74[1]	.81[1]	.77[1]	.86[1]	.85[1]											
I11	.43[1]	.47[1]	.44[1]	.46[1]	.47[1]	.51[1]										
I12	.64[1]	.69[1]	.64[1]	.67[1]	.69[1]	.66[1]	.66[1]									
I13	.51[1]	.56[1]	.54[1]	.63[1]	.60[1]	.61[1]	.56[1]	.76[1]								
I14	.60[1]	.67[1]	.61[1]	.68[1]	.65[1]	.67[1]	.61[1]	.81[1]	.83[1]							
I21	.51[1]	.49[1]	.50[1]	.51[1]	.51[1]	.46[1]	.38[1]	.52[1]	.47[1]	.50[1]						
I22	.45[1]	.41[1]	.45[1]	.42[1]	.40[1]	.39[1]	.24[1]	.36[1]	.23[1]	.31[1]	.52[1]					
I23	.52[1]	.49[1]	.51[1]	.47[1]	.50[1]	.45[1]	.27[4]	.44[1]	.31[1]	.35[1]	.57[1]	.72[1]				
I24	.48[1]	.42[1]	.45[1]	.44[1]	.44[1]	.42[1]	.19[1]	.34[1]	.31[1]	.33[1]	.48[1]	.38[1]	.46[1]			
I31	.12[2]	.17[2]	.20[1]	.19[1]	.16[2]	.24[1]	.26[1]	.20[1]	.24[1]	.24[1]	.19[1]	.11[2]	.16[2]	.26[1]		
I32	.19[1]	.23[1]	.23[1]	.22[1]	.23[1]	.30[1]	.33[1]	.23[1]	.26[1]	.26[1]	.29[1]	.20[1]	.25[1]	.28[1]	.69[1]	
I33	.27[1]	.27[1]	.30[1]	.30[1]	.30[1]	.35[1]	.28[1]	.27[1]	.27[1]	.27[1]	.26[1]	.22[1]	.30[1]	.37[1]	.53[1]	.71[1]

Note: ([1]), ([2]), ([3]) stand for the 1%, 5% and 10% level of significance, respectively.
Source: Self-administered survey.

Perceived control over the process of creating a potential firm, as described with a claim 'I know how to develop an entrepreneurial project', is more strongly associated with FEE student's intentions, given as 'I am ready to do anything to be an entrepreneur', than with those revealed in the sample of FE students. The estimated correlation coefficient is 0.51 ($p<0.001$). However, unlike FE students, who see family members as supporting in their intention to engage in entrepreneurship, FEE students put their colleagues first. This conclusion is strongly related to their perception of entrepreneurship as an idea that starts with a project.

5. CONCLUSION

This paper employs the TPB (Ajzen, 1991) to explain the intent-behavior relationship among young entrepreneurs to be in Serbia. The empirical research relies on the data collected by a survey conducted among business economics and electrical engineering students at the University of Belgrade. The data were collected using a PAPI method through two independent samples, while economics and electrical engineering students attended their classes. The data collection process took one week in the 2016/2017 schooling year. Thus, only students who attended the class filled the survey questionnaire. Their answers form the database which was explored in the empirical research.

Three fundamental antecedents of entrepreneurial intentions were empirically examined: attitudes toward entrepreneurship, perceived behavioral control, and subjective norms. They are selected as most studied predictors of entrepreneurial intentions in the peer-reviewed academic literature over the last ten years (Bruton, Ahlstrom and Obloj, 2008; Schlaegel and Koenig, 2014; Liñán and Fayolle, 2015). The empirical strategy is based on testing the differences in explanatory factors of students' entrepreneurial intentions using Welch's approximation of t-test statistics (Welch, 1938). In addition, correlation analysis was conducted to confirm the magnitude and significance of the associations between entrepreneurial intentions and their antecedents.

Correlation analysis, which was conducted at both samples of students independently, confirmed that attitudes toward entrepreneurship, perceived behavioral control, and subjective norms form positive and statistically significant associations with entrepreneurial intentions. Similar results are confirmed by previous empirical studies conducted for Serbia and other countries of the region, including Bosnia and Herzegovina, Croatia, Macedonia. and Slovenia. These countries share common economic history (see, for example, Pejić Bach, Aleksić and Merkač Skok, 2018, Rajh, et al., 2018; Turuk, Horvatinović and Sudarić, 2020; Turulja, et al, 2020). These studies also confirm a moderated effect of gender when it is included in the entrepreneurial intention model as a controlling factor.

However, specific differences between the attitudes of business economics and electrical engineering students related to the items that describe determinants of entrepreneurial intentions are further revealed. These differences are mostly related to their understanding of the significant others in creating alliances between subjective norms and entrepreneurial intentions. Some previous studies for Serbia, conducted on a sample of economics students, did not find subjective norms as a significant supporting factor for one's entrepreneurial intent (Rajh, et al., 2018). Sometimes, gender is a factor that moderates the effects of subjective norms (Horvatinović and Sudarić, 2020). This requires additional attention and remains for future research.

Although this research was conducted among undergraduate students who are determined to receive tertiary education, the contribution of this paper is at least twofold. Firstly, the paper seeks to reveal potential sources of the entrepreneurial population in Serbia. Secondly, the article explains the main determinants of entrepreneurial intentions among young people enrolled in two different fields of study at the same university.

This research paper fills the existing gap in studies of entrepreneurial intentions in Serbia. It contributes to the academic literature in the field of (i) youth entrepreneurship, (ii) youth wellbeing, (iii) the influence of entrepreneurship education on the decision process of undergraduate students who are enrolled in different study programs, and (iv) exploring the determinants of the professional status of future entrants to the Serbian labor market. The implications from this paper may help understand the entrepreneurial propensities of undergraduate students and address the potential gap in entrepreneurship education programs.

ACKNOWLEDGEMENT

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THE ASSESSMENT OF WAGE PENALTY FOR OVER-AND UNDER-EDUCATION IN THE CASE OF SERBIA

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Abstract: *The subject of the paper is education mismatch analysis in the labour market of Serbia. The aim of the paper is to examine the extent of overschooling and underschooling effects on earnings in Serbia. The paper seeks to determine the impact of overschooling and underschooling on wages in Serbia and to what extent do the effects differ depending on occupation. The paper follows the methodology developed by Verdugo and Verdugo (1989), so the extended Mincerian equation was assessed using LFS data in 2019. The basic model results showed that on average in Serbia overeducated workers earn about 5% more, and undereducated workers earn about 1.5% less, regardless of the occupation. The second model specification indicated that after inclusion of the worker's occupation on average the overeducation effects decrease by 1 pp, while undereducation effects increase by 0.5 pp. The final specification included the interaction between over/undereducation and occupation, and the results indicate that both overeducated and undereducated high-skilled workers earn less than properly educated high-skilled workers in Serbian labour market.*

Keywords*: education mismatch, over/underschooling effects, Serbian labour market.*

JEL Classification*: J01, I26*

1. INTRODUCTION

In recent period there has been significant increase of educational attainment which has attracted attention in the literature by numerous scholars. The problem of overeducation and undereducation is widespread, especially in the USA and Europe. For example, at the end of the previous century Sloane et al.

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(1999) showed that about 30 percent of workers in the UK are overeducated, while the numbers in the USA range from about 10 percent (Verdugo & Verdugo, 1989) to over 50 percent (Tsang et al., 1991), depending on various factors such as the data set, time considered and definition of required schooling. Concerns with overeducation were firstly expressed during the 1970s in the USA when the supply of educated workers surpassed its demand in the labor market, which resulted in a great reduction in the rate of returns on investment to education. The reduction suggested that supply overtook demand in education market, which attracted great concerns by education policy makers about overinvestment - especially in high education. In the book titled *The Overeducated American*, Freeman (1976) predicted that the excess of supply of college graduates in education market will probably become more and more pronounced over time. The book attracted much attention of researchers in the field of economics of education. Since then, a substantial increase in the educational attainment in the coming decades has been noticed, and at the same time considerable growth in the demand for highly educated workers has occurred. A various studies tried to investigate this problem to determine the economic effects of overeducation in labour market (e.g., Duncan & Hoffman, 1981; Groot & van den Brink, 2000; Sicherman, 1991; Verdugo &Verdugo, 1989; Hartog, 2000; Tsai, 2010).

The examination of this topic is important because overeducation can be costly for individuals, organizations, and economies. At the individual level, some research showed that overeducated tend to earn less compared to properly educated workers whose jobs match their qualifications, leading to a conclusion that probably some proportion of the investment in education is underutilized and unproductive (McGuinness & Sloane, 2011). Also, a few studies have shown that the problem of overeducation may lead to decrease of motivation since overeducated workers may have lower levels of job-satisfaction (e.g., Tsang et al., 1991; Battu et al., 1999). Additionally, less-qualified workers can be replaced by over-educated workers, particularly in slack labour markets, resulting with the rise of unemployment for such workers, as over-educated workers are moving into their occupations (Battu & Sloane, 2002). At the level of the organizations, it has been found that the problem of overeducation is linked with lower level of productivity (Tsang, 1987) and higher level of labour turnover, which leads in turn to lost investments in recruitment and training (Tsang et al., 1991). At the level of an economy, excessive education can lead to waste of investment in education, and the national output is potentially lower than it could be if the skills of over-educated workers were used appropriately (Davia et al., 2016).

Investigating the extent of overinvestment in education is important from a public policy perspective - especially in the case of Europe where education is largely subsidized. In the context of public policy decision making, the problem of overinvestment at the national level may be solved through the reduction of government subsidies to education or setting limits to some educational institutions. In this regard, it is crucial to determine the profitability of such education investments. The important indicator for measuring the profitability of overinvestment in education, which was proposed by Freeman (1976) is the rate of return to college degree, or the high-education premium. It should be noted that Freeman's view is within the neoclassical framework, so the high-education premium decrease as the supply of highly educated workers increases. The reasons for that are twofold. First, firms are adjusting the technology to take the advantage of relatively less-costly production input - highly educated workers. Second, highly educated workers are competing in a labour market where the number of skilled jobs is limited, which decreases the wage level.

In almost all Central and Eastern European (CEE) countries the educational level of the labour force has increased over the last decades as the result of transitional period. During the transition process in the countries of the CEE region, economic and political institutions have changed significantly since 1989. Starting from a social policy that emphasized fairness among workers, wages were determined by plan, not market, so wage profiles were compressed compared to capitalist countries. Therefore, with the transition from planned to market economic regulation, the structure of wages has changed, so with greater wage dispersion it is important to examine the extent to which the impact of education on wages in the pre-transition and post-transition period differs (Svejnar, 1999). Moreover, in the CEE countries, the influence of two factors could have largely resulted in changes in the distribution of education and the distribution of wages. First, the transition abolished the former wage structure that minimized the income gap between low-skilled and high-skilled workers in the former socialist countries. Consequently, the transition from a planned to a market system eliminated implicit transfers from more to less productive workers, which had to be reflected in the premium on education. Second, the transition has increased the demand for specific skills - such as managerial skills, which are especially valued in capitalist countries. According to human capital theory, investing in such skills is most valuable during periods of labor market imbalances in terms of skills required. So, the increase in the education level in the labour market was followed by higher-than-average growth rates of jobs for high-skilled workers. However, as the increase in the supply of those workers outran the increase of demand for them, the

overeducation was the result of these changes. But, the effect of these two factors differs between the CEE countries, and this difference could be reflected in the differences in the rate of return on investment in education. Namely, due to variations in the success of the implementation of transitional reforms among the countries of the CEE region, which is reflected in the different levels of economic development, the intensity of changes in the impact of education on earnings was certainly different. Serbia, for example, later embarked on transitional reforms, which was reflected in the efficient establishment of the capitalist institutional framework (Laporšek et al., 2021).

As Serbia represents a developing country, public financial management occupies an important place in the agenda of policy makers, and it is important to examine the profitability of these investments in education. According to Eurostat data, while among European union countries overqualification rate is stable around 20% in period 2016-2019, overqualification rate in Serbia in this period increased from about 24% in 2016 to near 27% in 2019. So, not only that overqualification rate in Serbia is few percentage points higher than in European union, but the problem of overeducation is becoming more pronounced. With such a prominent problem of overeducation, the allocation of skills over jobs in Serbia seems less than optimal, which can greatly call into question the intensity of state intervention in the field of education.

The subject of the paper is education mismatch analysis in the labour market of Serbia. The aim of the paper is to investigate the extent of overschooling and underschooling on earnings in Serbia. The paper seeks to determine how overschooling and underschooling affects wages in Serbia and to what extent do the effects differ depending on workers' occupation. The main motivation to study this topic regards the educational inflation expressed in the form of increased demand for formal qualifications, and the devaluation of these qualifications. No similar research was Serbia has been conducted. The structure of the paper is as follows. After the introduction, the second part of the paper gives the insight in education and labour market outcomes in Serbia. The third part of this paper describes the mismatch in the labour market in Serbia. The data and model used to investigate the research questions are represented in the fourth part, followed with the estimation results. The final part of the paper gives some concluding remarks.

2. LITERATURE REVIEW: EDUCATION AND LABOUR MARKET OUTCOMES IN SERBIA

The idea that education has different benefits, both monetary and non-monetary, is not recent. However, the use of terms such as human capital and human wealth in depicting the economic effects of education began only through the coherent research program of several economists in the late 1950s. Before World War II, most economists traditionally viewed the benefits of education primarily at the political and moral level and ignored the role of education in economic terms. Despite important conclusions about the importance of education for individuals and society for political and moral purposes, education in that period was still a peripheral role from the point of view of the analysis of economic phenomena, especially in the field of labor economics. This led to the formulation of the human capital theory, within which the profitability of investment in education was measured by estimation of degree premium. These estimations differ greatly depending on the data, assumptions, and assessment methods used (Vuksanovic & Aleksic, 2017a). The developed theoretical and methodological framework for the analysis of human capital had positive implications for the educational policies of many countries. Namely, the methodological framework emphasizing the importance of investing in education to increase the human capital fund due to the positive effects on the country's economic development. So, the possibility of increasing the productivity of the nation by education investments drew the attention of public policy makers. As the result, all countries began to promote education as a means of economic progress at both individual and national level (Vuksanovic et al., 2018).

In recent period as the result of increased supply on the education market, the effects of over- and under-education were investigated by numerous researchers. The researchers estimated these effects usually at the country level and to focused on measurement of the wage effects of education-job mismatch in the labour market. Also, the estimated wage effect of over/undereducation varies significantly between countries. So, the researchers tried to identify the determinants of these international differences (Davia, et al., 2016). Groot and van den Brink (2000) examined the impact of over-education on earnings, using the meta-analysis. Hartog (2000) showed that the increase of supply in education market in many countries was higher than the increase of demand, which resulted in significant drop of college premium. Humburg and van der Velden (2015) analyzed nearly 20 countries in Europe and showed that both field of study and the supply and demand

relationship in education market are important determinants of wage, and that the problem of overeducation is not so prominent in some specific field of education market - showing that this protective effect is higher in those occupations where excess of high-skilled workers is less expressed. Verheast and van der Velden (2010) performed a multi-level analysis for a sample of graduates in several countries in Europe and found the evidence of existence of imbalances in education market, which are structural in nature, since both the number of college graduates and quality of study programs determine the size of overeducation wage effects.

Education is probably the single most important variable that determines labour market outcomes. In his pioneering work, Becker (1964) emphasized the positive correlation between education, productivity, and labour market outcomes. Becker's human capital theory laid the foundation for future research on the linkage between schooling and labour market outcomes. The empirical works that followed found that better-educated people have a higher probability of employment, higher employment rates, higher wages, shorter unemployment spells etc. Serbia almost perfectly fits this pattern. As can be seen from the following Table, education is a key feature that determines outcomes in the labour market in Serbia. The basic labour market indicators are positively correlated with the level of human capital so that better-educated people record higher activity and employment rates. The only exception is the unemployment rate, where the monotonic relationship is undermined by the fact that the unemployment rate of people with secondary education is slightly higher than that of people with low levels of education.

Table 1. Labour market indicators by the level of education (15-64), 2020

Indicator	Education	2020
Activity rate	Low	31.0%
	Medium	59.8%
	High	70.4%
Employment rate	Low	28.3%
	Medium	54.1%
	High	64.8%
Unemployment rate	Low	8.6%
	Medium	9.6%
	High	7.9%

Source: LFS, SORS.

Although the unemployment rate for those with medium level education is higher than for low educated workers, the average unemployment spells for low educated workers are longer. Long-term unemployment, which refers to people who have been unemployed for 12 months or more, provides good evidence. While more than a half among low educated unemployed workers search for a job longer than 12 months, around 45% of medium educated can be considered as long-term unemployed[1]. This result is in line with Devine and Kiefer (1991), who found that education reduces the duration of unemployment spells. Moreover, a recent study that analysed the employment probability for youth in Serbia (Aleksic & Vuksanovic, 2019) found that medium educated persons have about 13 percentage points higher probability of finding a job than those with lower education. The spike in probability was more pronounced among young men - 18 pp, compared to the whole working population.

Besides better quantitative indicators, well-educated workers are also characterized by higher employment quality. In contrast, the low educated workers are more exposed to precarious work, have a higher chance to work on fixed-term contracts, part-time jobs, temporary employment etc. One study found that the employment rate for temporary employees between 2014 and 2016 in Serbia for low educated workers was more than twice as high (35% vs 15%) as for the highly educated workers (Kovacevic et al., 2017). Nevertheless, the most noticed and for our research the most relevant indicator of the quality of employment are wages.

As in many other countries, wages in Serbia are predominantly determined by the level of education. The Figure 1 suggests that relative wages vary significantly depending on the level of education[2]. The net relative wages ranged from 60% of the national average wage for workers with primary and less than primary education to 150% for workers with a master's degree and higher. Although workers with secondary education make up the majority of

[1] LFS, Eurostat.

[2] Level 1 - Less than primary and primary; Level 2 – vocational training or non-formal education; Level 3 – vocational secondary education of 3 years or non-formal education; Level 4 – secondary education of 4 years - vocational, artistic, secondary school; Level 5 – masterly and specialist education, 3+2 or 4+1 year; Level 6 – sub-level 6.1 (BAS or BAS, 180 ECTS) + sub-level 6.2 (BAS or SVS, 240 ECTS); Level 7 and 8 encompass: Level 7, sub-levels 7.1 (IAS, max. 360 ECTS; MAS, 300 ECTS; MVS, 120 ECTS) + sub-level 7.2 (SAS, 60 ECTS) + Level 8 (PhD, +180 ECTS). ECTS – European Credit Transfer System.

the labour force in Serbia, the above-average wage is reserved for workers that at least have Level 5 of education - one year of schooling more than secondary education. It is a strong sign of pronounced right-skewed wage distribution which is characterized by a long right tail and the mean greater than the median. The median wage was about 77% of the national average wage and this implies that half of the employees in 2020 had earnings that were lower than 77% of the national average wage.

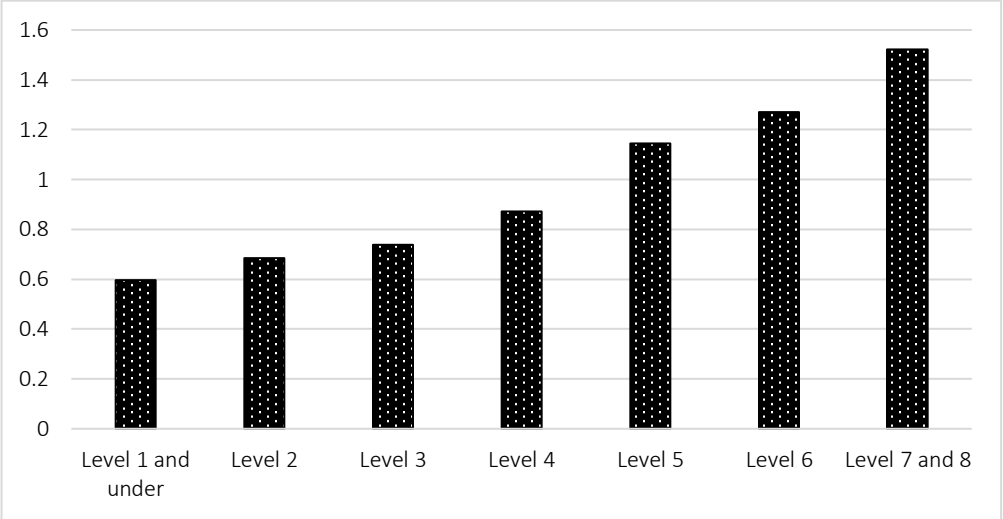

Figure 1. Net relative wages by the level of education, 2020

Note: See footnote 2 for explanation on level of education.

Source: SORS.

Not only does better education provide higher average earnings, but it also provides effective shelter from low-paid work. Based on the standard OECD methodology, which defines a low wage earner as a person that earns 2/3 of the national median wage or less, the Structure of Earnings Survey (SES) measures the incidence of low wage earners by different characteristics. According to the last available data from 2018 only 4.9% of those with tertiary education were low wage earners. In contrast, 21.5% and 35.3% of workers with primary and secondary education earned less than 2/3 of the national mean, respectively [3].

[3] SES, Eurostat.

3. MISMATCH IN THE LABOUR MARKET IN SERBIA

In the previous section, we showed some of the advantages that well-educated people in Serbia have. Although at first glance it seems that education is an efficient shield against unemployment, bad jobs, and low wages, this may not be universally true. Namely, if there is a mismatch between knowledge and skills between demand and supply of labour, higher education does not necessarily lead to more favourable outcomes in the labour market. Therefore, the marginal revenue of workers whose skills do not meet the job requirement will vary from the marginal revenue of properly matched workers. Consequently, inadequately matched workers will have relatively lower earnings and worse performance on the labour market. Examination of this topic in recent years has gained in importance because different studies indicated the problem of skills mismatch in the labour market of Serbia through different indicators (Vuksanovic & Aleksic, 2017b).

Even though the skills mismatch is a complex phenomenon, in general, there are two main types of skills mismatches - by the field of education and by the level of education. A person may have a sufficient level of skills, but the type or field of qualification does not adequately match. It is a so-called horizontal mismatch. On the other hand, vertical mismatch implies that the level of education of a person is not matched to jobs requirement. In the case of vertical mismatch, a person may have the right skills for occupation, but he or she could be overqualified or underqualified. Since we are trying to estimate the impact of overschooling and underschooling on earnings in Serbia, the latter mismatch is more important for our research.

There are several ways for measuring over/under qualification/education rates. The difference in approaches will be tackled in the following section. In this section, we will assess the magnitude of vertical mismatch in Serbia according to the available data. One source for the internationally comparable data on over-qualification is the Eurostat. The methodology is based on the correspondence between occupations and level of education as proposed by the International Labour Organization (ILO) in the International Standard Classification of Occupations. Technically, the over-qualification rate is calculated as the ratio of employed persons with tertiary education that works in occupations for which tertiary education is not required and the number of employed with tertiary education.

Insight into internationally comparable data provided us with a double motivation to deal with the assessment of overschooling and underschooling

earnings in Serbia. First, the over-qualification of workers in Serbia in 2019 was 5 percentage points higher than the EU average. Second, in addition to the relatively high vertical mismatch in the labour market in Serbia, the over-qualification rate has constantly increased in recent years. According to the first available data for Serbia (2013), the over-qualification rate was "only" 20.3% and was even lower than the EU average (21%). However, while the over-qualification rate in the EU has stagnated, it has been constantly growing in Serbia by more than one percentage point per year. As a result, the rate has risen to almost 27% in 2019.

Additionally, the over-qualification rate varies considerably depending on the sector of economic activity. As can be seen from the Figure 2, in the worst position were employees in Wholesale and Transport, where about half of the workers had a higher level of education than required. On the other hand, the highest compliance was observed in Education and Health, where the over-qualification rate is lower even than the corresponding EU average. These findings give us justification to include the dummy variable for the sector when estimating the impact of overschooling and underschooling on earnings.

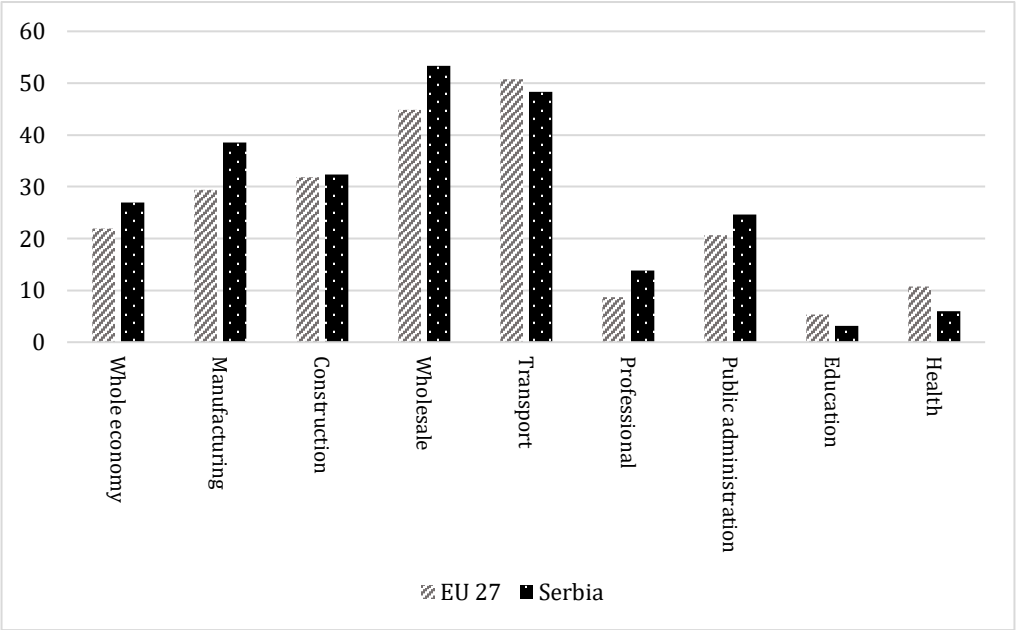

Figure 2. Over-qualification rate in Serbia and EU27, 2019 (% of people aged 20-64 with tertiary education and working in ISCO 4-9)

Source: Eurostat.

In addition to the available data relating to different sectors of the economy, a recent study addressed the vertical mismatch for different occupations (ETF, 2019). Instead of using the International Standard Classification of Occupations, it was based on the empirical approach. It used statistical techniques to classify all employees in one of three groups - over-educated, under-educated and properly matched. The study found that under-education is less frequent than over-education in Serbia. This indicates that there were no workforce shortages due to which companies would have to employ insufficiently skilled workers in jobs that require a higher level of education. On the other hand, the largest share of over-education was found among service and sales workers, followed by the skilled agricultural workers and elementary occupations. The following Figure consists of over- and under- education rates obtained for the main one-digit ISCO-08 occupation levels.

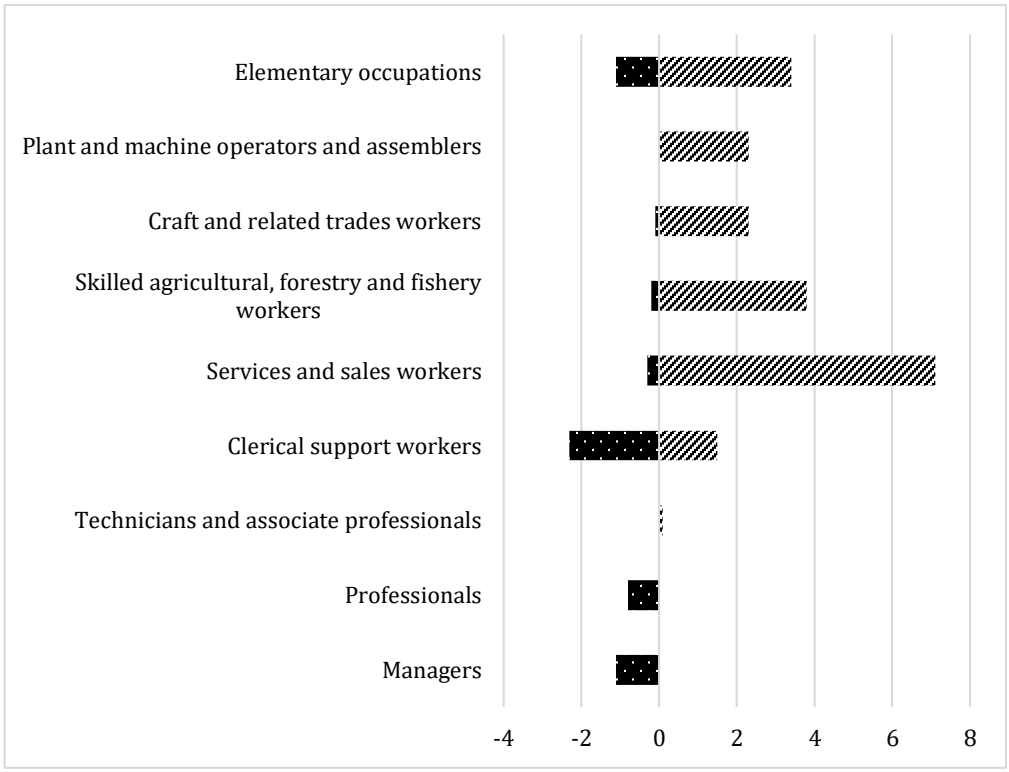

Figure 3. Over/under education by occupation in Serbia, 2016
Source: ETF (2019).

4. METHODOLOGY: DATA AND MODEL

As the main goal of the paper is to determine whether and to what extent the rates of return to education differ depending on how well workers and jobs are matched in terms of the required level of education, it was necessary to divide all workers into three groups: overschooled, underschooled and properly matched. Therefore, a person is overschooled (underschooled) if his/her completed level of schooling is higher (lower) than the level of schooling required for the job. In any other case, a worker and a job are properly matched. The literature highlights three approaches to measuring the required level of schooling. The first method relies on the self-assessment of employees. It requires data from a comprehensive survey in which employees provide answers on what level of education is necessary for the job they perform, as well as whether they consider that they have a higher or lower level of education than required. The second method is based on the standardized classification of job requirements. To identify whether an employee has the required level of schooling for a job, his/her level of schooling is contrasted with the International Standard Classification of Occupations (ISCO). The third method is also known as the empirical method that relies on statistical techniques. It considers the distribution of schooling of current workers in each occupation. This leads to the typical level of schooling required for a worker in a particular occupation. Depending on whether the level of education of the observed worker differs from the "typical" worker within an occupation, one of the three statuses is attributed to the worker - over, under or proper. Although each of these methods has its advantages and disadvantages, in the paper the third method was used. This method was chosen primarily because of the data availability. Although the self-assessment can be done based on data from the School to Work Transition survey conducted by the ILO in 2015, it is only possible for young people and, more importantly, only for a relatively distant period. As shown in Section 3, the over-qualification rate has rapidly increased in the last five years. The second method cannot be used because the standard job classification is not applicable to the available data. Therefore, with current data, we have the last method at our disposal - the empirical approach.

The paper follows the line of research which uses the methodology developed by Verdugo and Verdugo (1981). Even though the basic model in the overeducation literature is the extended version of the Mincerian wage equation introduced initially by Duncan and Hoffman (1981), Verdugo and Verdugo (1989) have made some changes to this model and significantly contributed to the research of this topic. The authors estimated the returns to overschooling and underschooling effects using a specification that differed in

several ways from the specification used by Duncan and Hoffman. First, they measured required schooling through the mean method. Second, instead of including years of over/underschooling, they included dummies for being over/underschooled. And third, instead of required years of schooling they control for completed years of schooling in the regression. Having in mind the nature of the data used in the research this methodology seems to be appropriate. The following equation was assessed

$$\ln w_i = \delta_p D_i^p + \delta_o D_i^o + \delta_u D_i^u + \beta X_i + \varepsilon_i \quad (1)$$

where wages (hourly earnings) are regressed on set of dummies regarding whether worker is educated properly, overeducated, or undereducated (D_i^p, D_i^o, D_i^u) and set of control variables (X_i). We used, beside the level of education (13 educational levels aggregated in 3 internationally standardized categories - low, medium, and high) as the main independent variable, the following categorical variables to control for the differences between employees - sex (male/female), region according to NUTS 2 (Beograd, Vojvodina, Central and West Serbia, and South and East Serbia), property (private/state), sector of activity (21 sectors according to the NACE Rev. 2 classification). In addition to the categorical variables, work experience and work experience squared as continuous explanatory variables were also included in the model. The equation is estimated using Weighted Least Square method.

The dependent variable in the model is employees' earnings. To consider working hours, we decided to use hourly earnings. Hourly earnings were obtained through the following procedure. In addition to continuous data on earnings (the exact amount of earnings), in Serbia there is a possibility that respondents, if they do not want to give and/or do not know the exact amount of earnings, express it in the predetermined intervals. To analyse as many observations as possible, we decided to consider both continuous and interval data on earnings. To translate interval earnings into continuous earnings, we apply the method that is widely used in the literature - interval averages are used as proxies for continuous earnings. The only exceptions are the first and last intervals that are open and whose distribution was simulated based on the empirical distribution of continuous data. Thus obtained, the monthly modal wage in the first case is 15,000 RSD and 250,000 RSD in the second. We then divided the combined (interval and continuous) data on monthly net earnings by the product of usual weekly working hours and a factor of 4.32, which is the average number of weeks in a month. Although the respondents, in addition to

the usual weekly working hours, also state the actual working hours in the previous week, the first category is more often used in the literature, because it avoids potential fluctuations in hours worked due to the redistribution of working hours.

Instead of using broad levels of education (low, middle, and high), we have decided to measure the level of schooling by the number of completed years of education. To determine the required number of years of schooling by occupation, we used well-developed practice from previous research based on the average years of schooling for a given occupation (Clogg & Shockey, 1984; Shockey, 1989; Verdugo & Verdugo, 1989). In the following step, we categorized employees as overschooled or underschooled if their completed years of schooling deviate at least one standard deviation from the mean in their occupation. Employees whose completed years of schooling are within the occupational mean are considered to have the appropriate level of schooling. Occupations are defined by (ISCO) and we observed them on a four-digit level. In the research, we use the micro data from the Labor Force Survey (LFS) in 2019, which is an internationally comparable household questionnaire consisting of important information on the socio-economic characteristics of workers that are necessary for our analysis. Among the most important information are wages and the calendar year in which the highest level of education was acquired. The number of completed years of schooling for each worker was obtained as the difference between the year in which the current education was acquired and the year of birth augmented by seven (which represents the time before entering the education process). Since the sample of the LFS is made up of the entire population, it is necessary to make a few restrictions to obtain appropriate input for modelling. We have followed the international practice defining people aged 20 to 64 as the reference group. The trend of increasing education has raised the lower limit of the working age population from the usual 15 to 20 years, which is best evidenced by the fact that the Europe 2020 goals are defined for the age cohort 20-64. In the following step, we kept only those who have jobs and who gave information on their monthly earnings. Finally, we have decided to base the research exclusively on one category of workers - salaried workers (wage employees), for which there are methodological and economic reasons. The remaining two categories of workers are unpaid family workers (supporting household members) and the self-employed. The former, by definition, have no earnings, while the latter do not report their income in the Serbian LFS. Therefore, any other workers except wage employees must be excluded from the methodological standpoint. Even if data on the income of the self-employed are available, there are economic reasons why this group of workers should not be included in the analysis. First,

great inaccuracy of data on income from self-employment was observed when they were based on self-reporting, instead of administrative sources. Second, great volatility of the income from self-employment was observed. The volatility depends on the labour taxation system and, in connection with that, distorted tax incentives that artificially affect the portion of earnings that self-employed reports as personal earnings or as income from self-employment. Also, since we analyse occupations at the lowest level (a four-digit level), because of sample restrictions, it is quite expected that certain occupations will have a small number of workers who provided data on earnings. In that case, the number of completed years of schooling of a particular worker can deviate significantly from the average for a given occupation. Therefore, to increase the reliability of the estimates, we excluded occupations in which there is a small number of workers. In this regard, all occupations with 30 or fewer respondents were excluded from the analysis.[4] The following table gives the descriptive statistics.

Table 2. Descriptive statistics

Variable	Mean	Std. dev.	Min.	Max.	Number of obs.
LogHourlyWage	5.299	0.3987	0.843	7.974	19,504
Overeducated	0.290	0.453	0	1	19,504
Undereducated	0.384	0.486	0	1	19,504
Propereducated	0.324	0.468			19,504
Experience	18.472	11.349	0	49	19,504
Experience2	470.037	457.358	0	2401	19,504
Male	0.520	0.499	0	1	19,504
Female	0.479	0.499	0	1	19,504
Married	0.628	0.483	0	1	19,504
NotMarried	0.371	0.483	0	1	19,504
PublicFirm	0.373	0.483	0	1	19,504
PrivateFirm	0.626	0.483	0	1	19,504
Belgrade	0.192	0.394	0	1	19,504
Vojvodina	0.225	0.418	0	1	19,504
CentralAndWestSerbia	0.282	0.450	0	1	19,504
SouthAndEastSerbia	0.298	0.457	0	1	19,504

Source: Authors' calculation based on LFS data.

[4] As the result of that the number of observations decreased by about 2,800.

5. RESULTS

Starting from the presented methodological framework, three different model specifications were assessed. The first model estimates the rate of return on overschooling or underschooling, regardless of the occupation. The basic specification indicates that on average in Serbia overeducated workers earn about 5% more, and undereducated workers earn about 1.5% less, compared to properly educated workers. This result is consistent with the results of other studies. In general, Leuven and Oosterbeek (2011) summarized results from numerous studies and showed than in Europe and Asia the rate of return for overschooling is around 4% and 5%, while the rate of return for underschooling is -3.5% and -4%, respectively. Most of the control variables are statistically significant with the expected sign. For example, male worker on average earns about 10% more compared to the female worker, and worker employed at public firm earns about 20% more than worker employed at private firm.

Table 3. First model estimation

LogHourlyWage	Coefficient	Robust std. errors
Overeducated	0.054*	(0.008)
Undereducated	-0.015**	(0.007)
Experience	0.006*	(0.001)
Experience2	-0.001*	(0.000)
Male	0.108*	(0.006)
Married	0.014*	(0.007)
PublicFirm	0.231*	(0.006)
Region		
Belgrade	0.197*	(0.010)
Vojvodina	0.094*	(0.009)
CentralAndWestSerbia	0.000	(0.008)
Cons	5.035*	(0.012)
R2	0.141	
Number of observations	19,504	

Notes: * statistically significant at 1%; ** statistically significant at 5%; *** statistically significant at 10%; the reference category is SouthAndEastSerbia.

Source: Authors' calculation based on LFS data.

In order to test how the effects change in terms of occupation the dummy variable that refers to whether the worker is 'gold collar' or not was defined. 'Gold collars' are highly-skilled and in high-demand workers employed in sector of information and communication, financial and insurance sector, real estate sector, or sector of scientific and technical activities. Psacharopoulos and

Patrinos (2018) in a decennial review of the global literature concluded that occupation in recent period with the advancement of technology occupation is one of main determinants of the rate of the return to education. According to the second specification model on average in Serbia the overeducation effects decrease by 1 pp, while undereducation effects increase by 0.5 pp. On average 'gold collars' earn about 20% more than 'non-gold collars'.

Table 4. Second model estimation

LogHourlyWage	Coefficient	Robust std. errors
Overeducated	0.047*	(0.008)
Undereducated	-0.020*	(0.007)
Experience	0.006*	(0.001)
Experience2	-0.001*	(0.000)
Male	0.111*	(0.006)
Married	0.016	(0.007)
PublicFirm	0.237*	(0.006)
Region		
Belgrade	0.179*	(0.010)
Vojvodina	0.093*	(0.009)
CentralAndWestSerbia	-0.000	(0.008)
GoldCollar	0.210*	(0.021)
Cons	5.020*	(0.011)
R2	0.155	
Number of observations	19,504	

Notes: * statistically significant at 1%; ** statistically significant at 5%; *** statistically significant at 10%; the reference category is SouthAndEastSerbia.

Source: Authors' calculation based on LFS data.

The third specification includes the interaction between over/undereducation and occupation. The results indicate that 'properly educated gold collars earn on average more than 'overeducated gold collars' and 'undereducated gold collars'. 'Properly educated gold collars' earn nearly 40% more, while 'overeducated and undereducated gold collars' earn, respectively, 22% and 14% more than 'properly educated non-gold collars'.[5] This result shows that rate of return for properly educated high-skilled workers is about 20pp and 25pp higher compared to the overeducated and undereducated high-skilled workers in the labour market in Serbia - whereby the reference category represents the properly educated non-gold collars. So, the inclusion of this interaction was justified. This result is consistent with the results of some other

[5] The difference according to standard t-test is statistically significant.

studies. For example, Groot (1996) showed that overeducated high-skilled workers earn less, while undereducated high-skilled workers earn more than properly educated workers in the UK labour market.

One possible explanation for this situation on Serbian labour market may be provided by signalling theory. Namely, according to this theory, if an individual has been educated for a longer or shorter period than required, this may indicate that the individual is less productive – or has lower ability and should earn less accordingly. For example, if two individuals obtained a college degree, but one of them studied longer, then that fact will be a signal to employers about the lower ability of that individual. This can be especially true among 'gold collars', where almost everyone has high education.

Table 5. Third model estimation

LogHourlyWage	Coefficient	Robust std. errors
OvereducatedGoldCollar	0.224*	(0.034)
UndereducatedGoldCollar	0.144*	(0.025)
ProperеducatedGoldCollar	0.383*	(0.051)
OvereducatedNonGoldCollar	0.057*	(0.008)
UndereducatedNonGoldCollar	-0.011***	(0.007)
Experience	0.007*	(0.001)
Experience2	-0.000*	(0.000)
Male	0.110*	(0.006)
Married	0.016**	(0.007)
PublicFirm	0.236*	(0.006)
Region		
Belgrade	0.178*	(0.010)
Vojvodina	0.092*	(0.009)
CentralAndWestSerbia	-0.001*	(0.008)
Cons	5.014*	(0.011)
R2	0.158	
Number of observations	19,504	

Notes: * statistically significant at 1%; ** statistically significant at 5%; *** statistically significant at 10%; the reference category is SouthAndEastSerbia.

Source: Authors' calculation based on LFS data.

6. CONCLUSION

The subject of the paper was education mismatch analysis in the labour market of Serbia. The aim of the paper was to examine the extent of overschooling and underschooling effects on earnings in Serbia. The paper aimed to determine

how overschooling and underschooling affects wages in Serbia and to what extent do the effects differ depending on occupation. According to Eurostat data, the over-qualification rate in Serbia was 5 pp higher than the EU average in 2019. In addition to the relatively high vertical mismatch in the labour market in Serbia, the constant increase in the over-qualification rate can be noticed. While the rate in the EU did not change significantly, in Serbia it was constantly growing by more than 1 pp per year. Furthermore, the distribution of vertical mismatch by sectors is very diverse. In the worst position are employees in wholesale and transport, where about half of the workers have a higher level of education than required. On the other hand, the highest education match is characterized for education and health, where the over-qualification rate is lower even than the EU average. These facts are main motivating factors for addressing the research questions.

The paper followed the line of research encouraged by Verdugo and Verdugo (1981). The extended version of the Mincerian wage equation was assessed - wages (hourly earnings) were regressed R a set of dummies regarding whether worker is educated properly, overeducated, or undereducated, and set of control variables. In the research the micro data from the Labor Force Survey in 2019 was used. Three different model specifications were assessed using Weighted Least Squares method. The first model estimated the rate of return on overschooling or underschooling, regardless of the occupation, and results showed that on average in Serbia overeducated workers earn about 5% more, and undereducated workers earn about 1.5% less. The second model specification indicated that after inclusion of the worker's occupation on average in Serbia the overeducation effects decreased by 1 pp, while undereducation effects increased by 0.5 pp. The final specification included the interaction between over/undereducation and occupation, and results showed that in Serbia both overeducated and undereducated high-skilled workers earn less than properly educated high-skilled workers.

The future research may be focused to the investigation of the existence of the difference between under/overschooling effects on earnings regarding the worker's sector of activity. It can be important to determine whether and to what extend the problem of overeducation is present in various sectors of Serbian economy, indicating more clearly the mismatch labour market situation.

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DETERIORATED SLEEP QUALITY DOES NOT EXPLAIN THE NEGATIVE IMPACT OF SMARTPHONE USE ON ACADEMIC PERFORMANCE

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Abstract: *University students' smartphone use has recently been shown to negatively affect their academic performance. Surprisingly, research testing the empirical validity of potential mechanisms underlying this relationship is very limited. In particular, indirect effects of negative health consequences due to heavy smartphone use have never been investigated. To fill this gap, we investigate, for the first time, whether deteriorated sleep quality drives the negative impact on academic performance. To this end, we examine longitudinal data on 1,635 students at two major Belgian universities. Based on a combination of a random effects approach and seemingly unrelated regression, we find no statistically significant mediating effect of sleep quality in the relationship between smartphone use and academic performance.*

Keywords*: smartphone use, academic performance, sleep quality, mediation analysis.*

JEL Classification: *I21, I23, J24*

1. INTRODUCTION

By 2019, the amount of smartphone users worldwide has risen up to 3.3 billion (Newzoo, 2020). This strong penetration of the technology indicates that smartphones are in general perceived as rather helpful. Nevertheless,

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smartphone use has extensively been associated with negative consequences (Busch & McCarthy, 2021) concerning (i) mental health (Chen, Yan, Tang, Yang, Xie & He, 2016; Rozgonjuk, Levine, Hall, & Elhai, 2018), (ii) physical health (Haripriya, Samuel, & Megha, 2019; Kim, Kim, & Yee, 2015), (iii) social behaviour (Choi, Choi, & Kim, 2017; Hawi & Samaha, 2017), and (iv) professional performance (Roberts & David, 2020).

A negative effect of smartphone use on academic performance (Nayak, 2018) can be considered as part of the latter group of consequences. A growing body of empirical studies examined a potential negative impact of smartphone use on academic performance. Based on a systematic literature review, Amez and Baert (2020) find a dominance of empirical studies supporting a negative association between students' smartphone use and academic performance. Nevertheless, they identify two major gaps in the empirical literature: (i) a lack of studies drawing causal interpretations, and (ii) very limited empirical research on the mechanisms underlying this association.

These limitations are substantial, from a policy point of view. First, a negative association between smartphone use and academic performance might not be problematic in itself when it only manifests variation in other unobserved characteristics. To the best of our knowledge, three empirical studies aimed to draw causal inferences, and all report a negative causal effect of smartphone use on university students' performance. Baert et al. (2020) analysed cross-sectional data by means of instrumental variable estimation techniques and found a strong negative impact of smartphone use on academic performance. Alternatively, Amez, Vujić, De Marez and Baert (2021) followed students for three consecutive years to be able to take unobserved individual heterogeneity into account. They report that an increase of one standard deviation in smartphone use yields a decrease of more than a third of a point (out of 20) on students' exam scores. Finally, Bjerre-Nielsen, Andersen, Minor, and Lassen (2020) monitored the actual smartphone use of Danish university students and found – based on a fixed effects approach – a negative relationship with their exam scores. However, they state that the magnitude of the effect strongly decreases when taking individual fixed effects into account.

Second, if a negative impact of smartphone use on academic performance is affirmed, it is essential to reveal the underlying mechanisms driving this relationship to create and implement effective smartphone policies. Multiple

theoretical mechanisms have been discussed in the literature to date.[1] As such, multitasking or task-switching might lead to a cognitive overload (Junco, 2012). This multitasking behaviour might be induced by auditive or visual notifications (Junco & Cotten, 2012). Alternatively, this might be the result of a desire not to miss out on anything happening online (Chen & Yan, 2016) or destructive addictive behaviour (Vitak, Crouse, & LaRose, 2011). Next, students may perceive their smartphones as providing an easy and tempting escape from academic tasks (Hawi & Samaha, 2016). Moreover, there might be a time trade-off à la Becker (1965) whereby every minute spent on the smartphone cannot be used productively.

Surprisingly, indirect effects through negative health consequences caused by smartphone use have received little attention. In particular, students' sleep quality might mediate the impact of smartphone use on academic performance. On the one hand, proper sleep quality has shown to be crucial for performing well academically (Baert, Omey, Verhaest, & Vermeir, 2015; Hysing, Harvey, Linton, Askeland, & Sivertsen, 2016). Smartphone use, on the other hand, has recently been associated with deteriorated sleep quality (Amez, Vujić, Soffers, & Baert, 2020; Exelmans & Van den Bulck, 2016; Li, Lepp, & Barkley, 2015). Therefore, we hypothesise that the relationship between students' smartphone use and academic performance might be (partly) mediated by a negative effect of smartphone use on their sleep quality. To test this hypothesis, we run a state-of the-art mediation analysis on longitudinal data containing rich information on university students' smartphone use, sleep quality, exam scores and a wide range of control variables.

2. METHOD

2.1. Research population

For three successive years, students from eleven separate study programmes at two representative Belgian universities, i.e. University of Antwerp and Ghent University, were recruited to participate. During the first year of data collection, 2016, all freshmen students enrolled for the included study programmes, were approached by the main researcher at the start of a main course during the last week of the first semester. All attending students were requested to fill-in a paper-and-pen questionnaire. At the end of the questionnaire, students were

[1] A more thorough description of these theoretical mechanisms can be found in Amez and Baert (2020).

asked for active consent to combine their answers on the questionnaire with their exam scores from the following examination period. For all students who consented, an independent third party received (i) students' exam scores from the faculty administration and (ii) the survey answers from the main researcher. Next, this independent third party linked the information and provided the anonymised dataset to the researchers. The next two years, i.e. 2017 and 2018, this data collection procedure was repeated targeting both freshmen students and all students who had participated the previous year(s). At Ghent University, no additional data collection was organised in 2018.[2]

Next, all filled-in questionnaires were evaluated based on three major exclusion criteria. First, all students for whom the faculty administration was not able to provide exam results were excluded. This might have been because students (i) dropped out before the examination period or (ii) switched to a different study programme which was not included in the targeted population. In other cases, exams were excluded because successful matching was impossible, due to small errors in the unique student identifiers needed to obtain the respective exam scores. Second, all students who did not participate (earlier) as a first-year student were dropped, leaving a homogenous group of students. Third, the remaining questionnaires were checked for missing values with respect to the main variables. This procedure resulted in a final sample of 1,883 questionnaires filled-in by 1,635 unique individuals.[3]

2.2. Measures

As discussed above, the main source of data was the paper-and-pen questionnaire completed by the participating students. The questionnaire consisted of three main parts. The first section asked students more about their smartphone use. Next, the second section contained questions concerning their sleep quality. The final part of the survey inquired the participating students with respect to a broad range of control variables.

[2] The current data collection was organised simultaneously with the data gathering process of Amez et al. (2021).

[3] After applying all three exclusion criteria on the initial sample 1,884 observations remained. However, we needed to exclude one additional observation to successfully run the Stata-command (see infra). We have no reason to believe that the main findings of our analyses would have changed drastically by dropping one single observation from a relatively large sample.

The first section of the questionnaire started with the question 'Do you own a smartphone (i.e. a mobile phone which enables more computer capabilities than sending text messages and making calls)?' to assess whether the student qualified to participate (Baert et al., 2020). Next, overall smartphone use was measured by means of the Smartphone Usage Subscale of Rosen, Whaling, Carrier, Cheever, and Rokkum (2013). This scale consisted of nine statements concerning nine different activities (e.g. checking the news or read e-mails) whereby students were asked to indicate how frequently they perform these activities on their smartphone. Participating students scored every single activity on a 10-point scale, ranging from 1 (corresponding to 'never') to 10 (corresponding to 'all the time'). Thereafter, these nine separate scores were averaged, resulting in a score between 1 and 10, where a higher score indicates a higher frequency of smartphone use. The average score on the Smartphone Usage Subscale, henceforth referred to as *overall smartphone use*, was 5.744 as can be seen in Panel A of Table 1.[4]

Table 1. Summary Statistics

	(1)	(2)
	Average	**Standard deviation**
A. Smartphone use		
Overall smartphone use	5.744	0.903
B. Mediator variable		
PSQI Subjective sleep subscale	1.912	0.658
C. Time invariant control variables		
Female	0.537	-
Foreign origin	0.169	-
Dutch is not the main language at home	0.090	-
Highest diploma father: no tertiary education	0.372	-
Highest diploma father: tertiary education outside college	0.292	-
Highest diploma father: tertiary education in college	0.336	-
Number of siblings: none	0.105	-
Number of siblings: one	0.508	-
Number of siblings: two	0.275	-
Number of siblings: more than two	0.112	-

[4] For ease of presentation, we present the summary statistics in Table 1 on the year-student observation level. Summary statistics on the individual student level are available upon request.

	(1)	(2)
	Average	**Standard deviation**
Programme in secondary education: Economics—Languages	0.133	-
Programme in secondary education: Economics—Maths	0.191	-
Programme in secondary education: Ancient Languages	0.147	-
Programme in secondary education: Exact sciences—Maths	0.146	-
Programme in secondary education: Other	0.384	-
General end marks secondary education: less than 70%	0.339	-
General end marks secondary education: between 70% & 80%	0.536	-
General end marks secondary education: more than 80%	0.125	-
D. Predetermined time varying control variables		
At least one parent passed away	0.030	-
Divorced parents	0.216	-
Living in a student room	0.340	-
Number of ECTS-credits in programme	22.765	5.780
Programme: University of Antwerp	0.473	-
Programme: Ghent University, Business and Economics	0.223	-
Programme: Ghent University, Commercial Sciences	0.247	-
Programme: Ghent University, Public Administration and Management	0.057	-
Programme: University of Antwerp, Business Economics	0.191	-
Programme: University of Antwerp, Economic Policy	0.025	-
Programme: University of Antwerp, Business Engineering	0.088	-
Programme: University of Antwerp, Management Information Systems	0.029	-
Programme: University of Antwerp, Communication Studies	0.032	-
Programme: University of Antwerp, Political Science	0.013	-
Programme: University of Antwerp, Social and Economic Sciences	0.065	-
Programme: University of Antwerp, Sociology	0.022	-
Programme: Other	0.008	-
E. Time varying control variables		

	(1)	(2)
	Average	**Standard deviation**
Academic motivation scale	4.972	0.607
General health: (fairly) bad	0.043	-
General health: fairly good	0.579	-
General health: very good	0.378	-
In a relationship	0.350	-
F. Academic performance		
Average exam score	10.987	3.160
Number of observations	1,883	

Note: See Section 2 for a description of the data. No standard deviation is provided for binary variables.

Source: Authors' calculations from survey data

Subsequently, section 2 of the survey queried students about their sleep quality. This was assessed by means of a subscale of the well-validated Pittsburgh Sleep Quality Index (PSQI) of Buysse et al.(1989). Concretely, students' sleep quality was measured by the PSQI subjective sleep subscale which consists of the question 'During the past month, how would you rate your overall sleep quality?'. Four potential answers were presented: (i) 'very bad'; (ii) 'fairly bad'; (iii) 'fairly good', (iv), 'very good'. Next, students' answers were scored – in contrast with the original PSQI subjective sleep quality subscale – such that higher scores indicate better sleep quality. Specifically, the answer 'very bad' corresponds with the score 0 while the score 3 indicates a 'very good' sleep quality. Panel B of Table 1 shows an average score of 1.912 which is very close to a 'fairly good' sleep quality.

The final part of the questionnaire consisted of questions concerning a wide variety of control variables. As can be seen in Table 1, we divided control variables in three categories depending on how they change over time: (i) time invariant control variables (Panel C), (ii) predetermined time varying control variables (Panel D), and (iii) time varying control variables (Panel E). First, we collected information with respect to control variables that do not change over time but are likely to be correlated with students' academic performance. As education research typically reports a female advantage in school performance (Voyer, & Voyer, 2014), students' gender was included in our empirical analyses. Next, we captured whether students had a migration background (Dockery, Koshy, & Li, 2020) by way of two related questions. Participants were asked (i) about their origin and (ii) whether Dutch was the main language

spoken at home. This was followed by questions about parental education. However, we only included the information concerning the fathers' highest diploma since this was highly correlated with the academic achievement of the students' mothers. Household composition was assessed by asking students how many siblings they had at the time of the data collection. As earlier educational performance has shown to be a strong predictor of academic performance (Galla et al., 2019; Westrick et al., 2015), students were asked about (a) their study programme in high school and (b) their general end marks in high school. Panel C of Table 1 presents the summary statistics for these time invariant control variables. To summarise, a slight majority (53.7%) of our finale sample consisted of female participants while only less than a fifth (16.9%) of the participating students had a foreign origin.

Furthermore, students were surveyed on predetermined time varying control variables. These are variables that might change over time but are – in principle – determined at the beginning of the academic year. With respect to household composition, we constructed two dummy variables indicating whether (i) at least one of the student's parents passed away and whether (ii) his/her parents are divorced. Next, we also included a dummy variable which has the value 1 when the student lives in a student room as students' residence status has shown to be associated with academic performance (Schudde, 2011; Simpson, & Burnett, 2019). To assess each student's course load, we calculated the total number of ECTS-credits the student aims to obtain in the observed semester (Amez et al., 2020). Lastly, we also constructed dummy variables for all eleven study programmes, assigning a value of 1 if the student is enrolled for the respective programme. As can be seen in Panel D of Table 1, slightly more than a third (34.0%) of the students lived in a student room. Moreover, the final sample of participants contained almost as many students enrolled at the University of Antwerp (47.3%) as at Ghent University.

Additionally, we collected information on time varying control variables that are not determined at the start of the semester. First, students' academic motivation was evaluated by means of the College Version of the Academic Motivation Scale of Vallerand et al. (1992). This well-established scale instrument has 28 items that have to be evaluated on a 7-point Likert scale. Subsequently, all items were scored such that higher scores demonstrate higher academic motivation and are then averaged. As can be seen in Panel E of Table 1, the average score for academic motivation was close to 5 (4.972). Next, students were asked about their current perceived health status. Based on the three answer possibilities, we constructed three dummy variables, through which each student indicated her/his health to be either (i) very good, (ii) fairly

good, or (iii) (fairly) bad. Lastly, students had to indicate whether they were in a romantic relationship at the time of completing the questionnaire.

Finally, our outcome of interest, academic performance, was assessed by the actual exam scores that were provided by the faculty administration to an independent third party (see supra). This variable was operationalised by taking the average exam score of all the exams the participant took in the next examination period. In Belgium, exams at university are typically graded on a scale of 20 points.[5] As shown in Panel F of Table 1, the participating students on average passed their exams with a score of almost 11 (10.987) out of 20 points.

2.3. Statistical approach

To test whether sleep quality mediates the relationship between smartphone use and academic performance, we needed to estimate two separate equations. On the one hand, we had to regress students' average exam scores on their overall smartphone use and a broad set of control variables. On the other hand, we had to estimate the association between their sleep quality and smartphone use, while holding other drivers of sleep quality constant. However, it is expected that the error terms across the two equations are correlated for a given student. Therefore, we applied a set of seemingly unrelated regressions instead to allow for this cross-equation correlation. Moreover, exploiting this correlation improved the efficiency of our estimator (Cameron & Trivedi, 2010).

As described in Subsection 2.1., we collected data on students' smartphone use, sleep quality and academic performance for three consecutive years. Compared to cross-sectional observational data, we were able to take (unobserved) individual heterogeneity into account (Verbeek, 2012). Moreover, the longitudinal character of the data allowed us to explore both between-student and within-student variation (Bell, Fairbrother, & Jones, 2019) which further increased the efficiency of our estimations. As such, we combined a random individual effects approach with seemingly unrelated regressions by means of the custom-made *xtsur*-command in Stata by Nguyen (2008).

The estimates of our random effects approach might be interpreted in a causal way under two main assumptions. First, all factors that affect students' exam scores that have not been included in our analyses were identically and

[5] Analyses which include exams that students did not take yield very similar results and are available upon reasonable request.

independently distributed over all students (Amez et al., 2020). Therefore, all those unobserved factors can be summarised by a random error term. Second, our main independent variable, i.e. overall smartphone use is uncorrelated with the individual specific effect and is strictly exogenous (Verbeek, 2012).

3. RESULTS

Our mediation model, which is visualised in Figure 1, shows that overall smartphone use is linked with students' average exam scores in two ways: (i) a direct way and (ii) an indirect way via the included mediator, i.e. the PSQI subjective sleep quality subscale. This model consisting of a system of two related regressions was estimated by the statistical approach described in Subsection 2.3. The estimation results are presented in Figure 1 and Table 2.

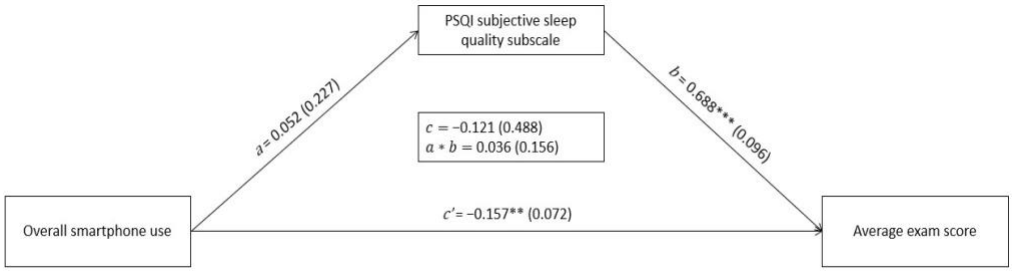

Figure 1. Mediation model

Notes: The presented statistics are coefficient estimates and standard errors. Standard errors are in parentheses. *** (**) ((*)) indicates significance at the 1% (5%) ((10%)) significance level. c stands for the total association, c' for the direct association; and a*b for the indirect association between overall smartphone use and exam score.

Source: Authors' calculations from survey data.

Most interestingly with respect to our main research goal is the estimated mediating effect of sleep quality. This effect is the product of (i) the effect of overall smartphone use on the PSQI subjective sleep quality subscale (*a* in Figure 1), and (ii) the effect of students' sleep quality on their average exam scores (*b* in Figure 1). In contrast with earlier (cross-sectional) findings of – amongst others – Amez et al. (2020) we find no significant association between students' overall smartphone use and their score on the PSQI subjective sleep quality subscale (b = 0.052, p = 0.819). In contrast, the association of sleep quality with students' average exam scores is statistically significant and completely in line with Baert et al. (2015) and Hysing et al. (2016) – as

discussed in the Introduction section (a = 0.688, p = 0.000). However, multiplying both estimated coefficients does not yield a statistically significant mediation effect of sleep quality ($a*b$ = 0.036, p = 0.819), implying that deteriorated sleep quality does not drive the negative impact of students' overall smartphone use on academic performance.

In line with the theoretical reasoning in the Introduction section and the recent empirical literature (Amez et al., in press; Baert et al., 2020; Bjerre-Nielsen et al., 2020), we find a significant direct effect of students' overall smartphone use on their average exam scores (c' = −0.157, p = 0.029).

Table 2. Estimation Results: Benchmark Analysis

Dependent variable	**Exam score**	**PSQI subjective sleep subscale**
Overall smartphone use	−0.157** (0.072)	0.052 (0.227)
PSQI subjective sleep quality	0.688*** (0.096)	-
Program: University of Antwerp	2.152** (1.061)	−0.114 (2.187)
Female	0.029 (0.115)	−0.009 (0.335)
Foreign origin	−0.923*** (0.200)	−0.043 (0.744)
Dutch is not main language at home	−0.740*** (0.252)	−0.052 (0.853)
Highest diploma father: tertiary education outside college	0.678*** (0.151)	0.028 (0.415)
Highest diploma father: tertiary education in college	0.785*** (0.165)	−0.043 (0.455)
Number of siblings: one	0.772*** (0.246)	0.070 (0.746)
Number of siblings: two	0.660** (0.279)	0.005 (0.858)
Number of siblings: more than two	0.492* (0.271)	−0.055 (0.894)
Programme in secondary education: Economics—Languages	−0.002 (0.201)	-
Programme in secondary education: Economics—Maths	0.948*** (0.182)	-

Dependent variable	Exam score	PSQI subjective sleep subscale
Programme in secondary education: Ancient Languages	1.518*** (0.161)	-
Programme in secondary education: Exact sciences—Maths	0.999*** (0.208)	-
General end marks secondary education: between 70% & 80%	1.692*** (0.120)	-
General end marks secondary education: more than 80%	2.861*** (0.244)	-
At least one parent passed away	1.200*** (0.301)	0.021 (0.880)
Divorced parents	0.099 (0.134)	0.000 (0.428)
Living in a student room	0.174 (0.152)	0.035 (0.467)
Number of ECTS-credits in programme	0.191*** (0.041)	-
Academic motivation scale	0.013 (0.091)	0.182 (0.324)
General health: fairly good	1.691*** (0.219)	0.564 (0.739)
General health: very good	1.508*** (0.230)	0.915 (0.766)
In a relationship	−0.096 (0.129)	0.087 (0.355)
Academic program controls	Yes	No
Number of observations	1,883	

Notes: See Section 2.3 for a description of the mediation model. The presented results are coefficient estimates, with standard errors in parentheses. *** (**) ((*)) indicates significance at the 1% (5%) ((10%)) significance level.

Source: Authors' calculations from survey data

Before concluding, we briefly discuss some secondary results with respect to other determinants of academic achievement. The coefficient estimates for these determinants are presented in the first column of Table 2. In line with earlier educational research we find that students who perform well are those that (i) do not have a migration background, (ii) have a highly educated father, (iii) performed well in secondary education, and (iv) are in good health. However, we do not replicate the well-documented gender gap in academic

performance. We do not find a statistically significant association of student's gender with exam scores (p = 0.804).

4. CONCLUSION

With the current study, we contributed to the empirical literature on the relationship between smartphone use and academic performance in two major ways. First, we explored – for the first time worldwide – the empirical validity of the theoretical mechanisms postulating that a negative impact of smartphone use on academic performance can be (partly) explained by negative health consequences and in particular students' sleep quality. Second, we applied our mediation analysis on longitudinal data which allowed us to give a causal interpretation to the estimated associations between smartphone use, sleep quality and exam results under weaker assumptions than in earlier literature.

We found no statistically significant mediating effect of students' sleep quality in the relationship between smartphone use and academic performance. This implies that the negative impact of smartphone use on academic performance that we confirmed based on our longitudinal data cannot be explained by worse sleep quality due to smartphone use. Based on this finding, the negative relationship between smartphone use and academic performance should not be treated by smartphone policies targeting a negative impact through students' sleep quality. To be able to accurately tackle this negative impact, future studies must test the empirical validity of other theoretical mechanisms discussed in the literature.

We end this manuscript by acknowledging its main limitations and relate them with directions for future research. First, although we used a well-established scale instrument to measure overall smartphone use, research has shown that the correlation between self-reported smartphone use and actual use is smaller than expected (Araujo, Wonneberger, Neijens, & de Vreese, 2017; Uzun & Kilis, 2019). Therefore, we encourage studies to replicate the current study based on objectively logged smartphone use.

Second, the number of students we observed multiple times is rather limited. As a consequence, fixed effects estimations were imprecise. Nevertheless, we believe our benchmark panel model controlling for random effects is still superior to cross-sectional observational studies since it allowed us to control for unobserved heterogeneity being at the same time more efficient than ordinary least squares estimations by considering both within-student and

between-student variation (Bell, Fairbrother, & Jones, 2019). Nevertheless, future research might aim to expand the number of students observed multiple times and use fixed-effects estimators to replicate the current findings.

Third, we focus on measuring students' smartphone use only. In particular, we ignore the fact that students might (simultaneously) use other mobile technology such as laptops or tablet computers (Hale & Guan, 2015). Although the focus of the current study was on identifying potential mediation of sleep quality in the relationship between smartphone use and academic performance, further studies might expand this focus to include other mobile devices.

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HYBRID ORGANIZATIONS AND SOCIAL INNOVATION IN EUROPE: AN ENABLING ECOSYSTEM

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***Abstract**: The goal of the present work is to explore characteristics of hybrid organizations that have developed across 11 European countries and contribute to the understanding of the features of an enabling ecosystem for this kind of organizations. To answer our research question on the main features of an enabling ecosystem for hybrid organizations in Europe we opted for a mixed methodology. We recurred to a convergent parallel mixed methods design, which entails the integrated collection of quantitative and qualitative data and enables researchers to offset the weaknesses of both quantitative and qualitative research by capitalizing on the strengths of both. In the light of our research aim, we believe the combination of qualitative case studies and a quantitative survey was the most suitable approach for investigating the complexities of the organizations under study. This is especially true if we consider that 837 social entrepreneurs from 11 European countries (in alphabetical order: Albania, Austria, Denmark, England, France, Germany, Italy, Poland, Serbia, Scotland and The Netherlands) have been involved in our research activities. Among the potential factors we examined, scarce funding opportunities, troublesome relations with national bureaucracies, and poor marketing skills emerged in all included countries as crucial factors constraining the development of SEs (Social enterprises). Moreover, other factors, such as inadequate*

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managerial skills or insufficient stakeholder involvement, can represent important hindering elements. In the dynamic sense, as from our research, hybrid organizations face numerous challenges, but their relative importance changes through their life cycle. Our research provides an insight into the complex experiences of European social entrepreneurship, and it may represent a starting point for reasoning on the main steps, in terms of management and policies, that national and European stakeholders should take to define a flourishing inclusive ecosystem for social enterprises and other bottom-up entrepreneurial activities.

Keywords: *hybrid organizations, social enterprises, disruption, social economy, Europe*

JEL Classification*: L31, M14, O35*

1. INTRODUCTION

Organizations pursuing business venture today face a tremendous pallet of economical, technological, environmental, geopolitical, and social challenges such as income inequality and closely linked political issues, the earthquake of technology change and digitalization, environmental disruptions and the climate change - to name just a few. The EU and most European countries face serious issues, particularly long-term unemployment, political instability and the refugee crisis, which have a profound impact on the European welfare system. As a consequence, an uncertain socio-economic context in Europe and a renewed pressure to find new solutions has created several opportunities for SEs across Europe. The global economic crisis resulted in widespread public discontent with the way the global economy functions and it fueled interest from many perspectives into more inclusive economic systems.

These challenges ask for organisations that can recognize and respond to both economic and social tasks, attract capital and generate income in non-traditional ways, and develop organizational designs that will enable and support these dualities (Eldar, 2017; Haigh, Walker, Bacq and Kickul, 2015). Relevant theory often refers to these organizations as “social enterprises” including a wide range of very different organizations such as microfinance institutions, firms that sell fair trade products, work integration social enterprises (WISEs), and low-cost sellers, incubators or accelerators for social business or social innovation, “social hybrid ventures”, “benefit corporations” or “hybrid organizations”. Social enterprises (SEs) are often perceived as hybrid

organizations being able to satisfy the growing need for social services in a context of decreased public spending while also creating greater employment opportunities, especially for people who have been excluded from the labour market (Di Domenico, Tracey and Haugh, 2009; Defourny and Nyssen, 2008; Borzaga, Depedri and Tortia, 2009).

Hybrid organizations are increasingly attracting the interest of both academia and practice (Mair, Mayer and Lutz, 2015). While practitioners are recognizing this type of organizations as necessary as able to meet the needs of contemporary social and environmental complexity, academics are appreciating them for their orientation towards innovative problem-solving (Monzon and Chaves, 2012; Leadbeater, 1997), new models in delivering public and social services (Defourny and Nyssens, 2010) and the ability to produce small changes in the short term that reverberate through existing systems to catalyze large changes in the longer term (Alvord, Brown Letts, 2004). Hybrid organizations are defined as "enterprises that design their business models based on the alleviation of a particular social or environmental issue." Hybrids generate income and attract capital in ways that may be consistent with for-profit models, non-profit models, or both (Haigh, Walker, Bacq and Kickul, 2015).

Hybrid organizations are developing in the arena where balancing between gaining social impact and generating sources for economic sustainability becomes an imperative. This simultaneous search for more effective solutions that meet emerging social needs together with the exploration of the ways to operate with higher efficiency is becoming their dominant feature, which gives them a quality to be named as hybrid (Baglioni et al., 2018 Klingemann and Fuchs, 1998; Putnam, 2000; Wuthnow, 1998). Santos et. (2015) al explain that "*…while social business hybrid models can be traced back to the 19th century, with legal forms such as cooperatives or mutual companies, they have grown in number and visibility in the last decades due to the blurring of boundaries between social and commercial sectors. … Social business hybrid organizations have developed valuable experience in combining financial and societal value since they need to be effective in both kinds of activities in order to grow and fulfil their mission."*

Hybrid organizations have been increasingly under the spotlight in Europe after the Social Business Initiative (SBI) was launched by the EU Commission in 2011. The SBI aimed at creating a favourable financial, administrative and legal environment for social enterprises as exclusive organizations, so as to

make it possible for them to operate on an equal footing with other types of enterprises in the same sector.

Institutional recognition of hybrid forms of organization in the European social economy began in the 1980s, culminating in 1989 with the Communication of the Commission on "Businesses in the social economy sector - Europe's frontier-free market" (European Commission, 1989). This communication suggested providing cooperatives, structured associations, mutual societies and other hybrid organizations with legal recognition through the creation of a specific statute. The positive understanding of the SEs presence in a society has increased in the policy discourse also because of the 2009 economic crisis (Testi, Bellucci, Franchi and Biggeri, 2017). The creation of the Social Economy Unit by the Directorate-General XXIII of the European Commission is also evidence of a strong attitude to promote the role of hybrid organizations in the social economy sector (Baglioni et al., 2018). Furthermore, during the 1980s, two institutions—the European Parliament and the European Economic and Social Committee (EESC)—published a multitude of reports, proposals, and resolutions highlighting the social value brought about by various actors in the social economy (Baglioni et al., 2018).

The European Commission launched the Social Business Initiative in 2011 (European Commission, 2011) as a means of encouraging the growth of SEs by expanding their access to funding. To this aim, the Commission established an Expert Group on Social Entrepreneurship (GECES) in February 2012 that consisted of one representative from each member state and 43 representatives from the social economy sector, the banking sector, and academia. A subgroup in charge of social impact measurement was set up a few months later to develop a methodology that could measure the socioeconomic impact of SEs (Bellucci et al., 2019), while the Commission outlined new mechanisms—most notably the European Structural Fund—to improve financing opportunities (Baglioni et al., 2018).

Social entrepreneurship is now considered to be one of the pillars of the Europe 2020 initiative, a project that aims to promote full employment, economic growth, and a sustainable and more inclusive economy. Across Europe there is a growing interest in youth entrepreneurship, social innovation, corporate social responsibility, sustainable technologies and inclusive business. Developments in Europe have been reproduced in other parts of the world and the United Nations indicated that social entrepreneurship was of vital importance in ensuring sustainable economic development (Masquelin, 2014). Given the increasing relevance of these topics in the context of our evolving

societies, there is the need of a better understanding of the features of an enabling ecosystem for hybrid organizations in the European social economy sector (Biggeri et al., 2017).

2. METHODOLOGY

The goal of the present work is to explore characteristics of hybrid organizations that have developed across 11 European countries and contribute to the understanding of the features of an enabling ecosystem for this kind of organizations. This paper is structured as follows. Firstly, we will explore the role of hybrid organizations in the evolving social and institutional context in Europe. Secondly, we will outline the methodology that guided the complex multi-method field research, which resulted in more than 1,500 social entrepreneurs, stakeholders and policy makers have been involved in the research activities during 2014-2016, 837 hybrid organizations being included in the questionnaire and 55 in-depth case studies from 11 European countries. We searched to understand the key factors that influence the development of hybrid organizations and, consequently, identify the characteristics of enabling eco-systems, and used both quantitative and qualitative data to enlighten the complexity of the factors of key influence. In order to understand the dynamics of these influences, we further searched into organisations' past, present and future perception about relative importance of factors that challenge their development. We conclude by providing some practical and managerial implication on the features of an enabling ecosystem capable of fostering social inclusion through bottom-up social entrepreneurship activities.

Hybrids, in this paper, are not necessarily a new organizational form, but rather a product of the current internal development of several entities, including voluntary organizations, cooperatives and mutual-aid organizations. As Doherty, Haugh and Lyon (2014, p. 421) note, a key factor in this transformation is the "marketization of the non-profit sector".

In order to answer our research question on the main features of an enabling ecosystem for hybrid organizations in Europe we opted for a mixed methodology. Mixed methods research combines quantitative and qualitative methods within a single study (Bryman, 2016) and has become an increasingly popular approach to conducting social research (Tashakkori and Teddlie, 2010; Bryman, 2016). In particular, we recurred to a convergent parallel mixed methods design, which entails the integrated collection of quantitative and qualitative data (Bryman, 2016) and enables researchers to offset the

weaknesses of both quantitative and qualitative research by capitalizing on the strengths of both. In light of our research aim, we believe the combination of qualitative case studies and a quantitative survey was the most suitable approach for investigating the complexities of the organizations under study. This is especially true if we consider that 837 social entrepreneurs from 11 European countries (in alphabetical order: Albania, Austria, Denmark, England, France, Germany, Italy, Poland, Serbia, Scotland and The Netherlands) have been involved in our research activities.

The qualitative part of the research is based on case studies. The case study is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt, 1989). For this study, we realized 55 in-depth case studies – five case studies per each of the above-listed eleven countries. Multiple-case studies are generally used to contribute to our knowledge of individual, group, organizational, social and political phenomena and are now a common research strategy in social sciences (Yin, 2013). Multiple cases provide varied empirical evidence where constructs and relationships are precisely delineated (Eisenhardt and Graebner, 2007). Following the breakdown suggested by Thomas (2011), we chose to focus on "multiple" case studies carried out "in parallel" and with a "diachronic" approach that aids in identifying the lifecycle of each organization. Exploratory case studies can serve as a point of interest to the researcher in order to open the way to further investigation (Yin, 1993). Among the various possible selection criteria, we opted for the maximum variation sampling method (Flyvbjerg, 2001), which makes it possible to maximize the differences between the cases on one or more levels (including country, field of operation, forms of governance, legal form, and revenue capacity). Each case study was carried out applying a multi-disciplinary methodology encompassing organizational life histories, narrative methods, in-deep individual and collective interviews, focus groups as well as participatory exercises and desk analysis (cf. Yin, 2013). Data gathering also included a period of participant observation within the selected enterprises. Methodological solutions and technics of data collection were tailored according to the specific characteristics of each enterprise, with the aim of describing and analysing not only the enterprise in itself but also the social, institutional and economic eco-system in which it operates. The case studies allow the social entrepreneurship evolutionary pathway to be traced mapping new experiences, context of intervention, organizational identities, business models, resilience and coping mechanisms, driving forces, needs and competencies, all of which may or may not differ from more traditional and formalized experiences of social enterprise.

The quantitative part of the research is based on data collected through a web survey which was administered to representatives of 837 SEs operating in the same eleven European countries. Web surveys are increasingly popular because they offer several advantages compared to postal questionnaire or structured interviews in terms of data entry and analysis (Bryman, 2016). A set of 1,100 SEs have been sampled from national lists of SEs in Albania, Austria, England, France, Germany, Italy, Poland, Scotland, Serbia, Sweden, and The Netherlands. In countries where no official lists of social enterprises were available, snowballing techniques involving different stakeholders were used instead of random sampling. Survey data collection and analysis were completed in July 2016. The survey has been designed in order to provide insights into the features and background of SEs as well as the enabling and constraining factors they face. In particular, in order to determine potential limiting factors for the growth as perceived by SEs in our research, we asked the respondents to rate factors accordingly: 1) Definitely not a constraint; 2) Not a significant constraint; 3) Neither yes nor no; 4) A constraint; and 5) Definitely a constraint. Mean rate greater than 3 indicates that the factor tested is a potential restriction to growth, while a mean rate of less than 3 indicates that the tested factor does not constitute a growth restriction. In order to determine whether the investigated factors were equally limiting for all eleven observed European countries, we applied analysis of variance (ANOVA). Namely, we tested the hypothesis that the means among different countries are equal. The results of this analysis are presented in Table 3 and 4 in the Appendix.

3. RESULTS

Respondents rated on scale from 1 to 5 (as previously explained) the extent to which outlined factors represent a constraint to the growth of organizational hybrids. Those factors were: funds availability, market size, internal skills, interaction with organization's stakeholders (e.g. members, employees, investors, etc.), interest/relations from/with the local community, interest/relations from/with the local authority, bureaucracy, empathy and understanding of what the organization wants to do, marketing and public relations and knowledge on how to get funds (grants, etc.). The average score was computed for these potential factors and shown in Table 1.

Table 1. Possible factors that can be constraint to the growth of the organization.

Factors	Mean[a]	Std. Deviation	N[b]	Constraint[c]
Lack of funds	3.8544	1.20330	666	Yes
The market is too small	2.6607	1.23685	666	No
Lack of internal skills	2.5826	1.17490	666	No
Lack of interaction with organisation's stakeholders (e.g. members, employees, investors etc.)	2.4339	1.20625	666	No
Low interest/relations from/with the local community	2.4339	1.23823	666	No
Low interest/relations from/with the local authority	2.9880	1.33990	666	Neutral
Bureaucracy	3.4535	1.22938	666	Yes
Lack of empathy and understanding of what the organisation wants to do	2.7958	1.47731	612	No
Poor marketing and public relations	3.6161	1.17365	620	Yes
Lack of knowledge on how to get funds (grants etc.)	3.4304	1.23466	625	Yes

[a] Possible answers were: 1-Definitely not a constraint; 2-Not a significant constraint; 3-Neither yes nor no; 4-A constraint; 5-Definitely a constraint.

[b] Sample size were 837

[c] Results of one-sample t-test (H_0: $\mu=3$; H_1: $\mu\neq3$)

Lack of funds, Bureaucracy, Lack of knowledge on how to get resources and Poor marketing skills, emerged as the most important factors that constrain the development and growth of the hybrid form. Other factors are rated with an average score of less than 3.00 indicating that they do not present a limitation for the further growth of social enterprise. We presented these average scores in Figure 1 on radar chart which is usually used to compare multiple quantitative variables because it is easy to see which variables have high or low values. The dotted line represent neutral point (average score equal to 3.00). All factors that represents constraint to the growth (scored with an average score greater than 3.00) are marked on the graph outside the dotted line and all factors that not represent constraint to the growth (scored with an average score lower then 3.00) are marked on the graph inside the dotted line. All points for all factors are tied with a line named "Total" because represent the score for all SE.

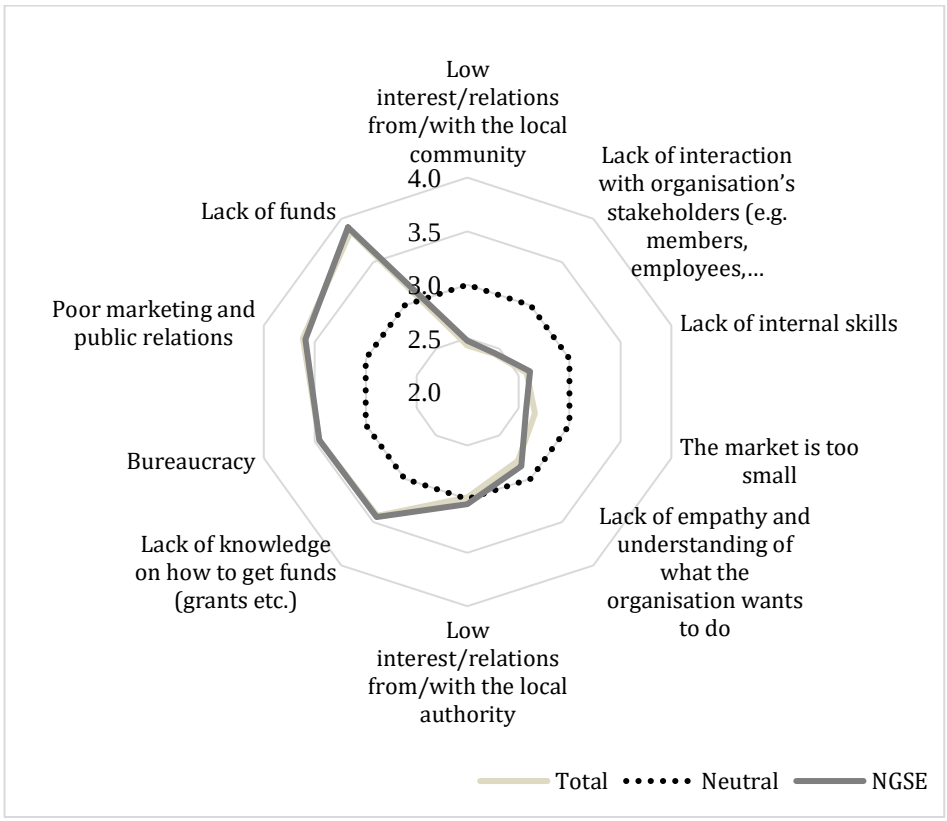

Figure 1. Average extent to which factors represent a constraint to the growth of organizations.

In order to capture for the differences, we analysed if the organisations established after 2006 responded differently compared to the sample in total. Their responses are represented with a grey line titled NGSE (new generation social enterprises) and showed that NGSE share completely the pattern shown by the whole sample with regard to enabling/disabling factors (see Figure 1).

Dominant disabling factors

Finance. Finance reported to be disabling factor for organizational growth in two forms: firstly, in terms of the Lack of funds, which is related to the lack of financing sources and a range of financial options, and secondly, as the Lack of knowledge entrepreneur or employees have on how to obtain funds for financing the venture (see Table 1, Lack of funds mean = 3.85; Lack of knowledge of how to get funds Mean = 3.45). In order to gain a better insight

into whether finance is a limiting factor for growth in all observed countries, a more detailed statistical analysis was conducted - ANOVA was conducted to determine whether there are statistically significant differences in the attitude of the respondents about the limiting factors between the countries observed. The results of this analysis are presented below (see Table 3 and 4 in Appendix). As far as Lack of funds is concerned, analysis reports that there are no statistically significant differences between the countries observed. When it comes to the Lack of knowledge to raise funds as a constraint factor for growth, a detailed statistical analysis shows that there is no statistically significant difference between the countries observed.

Table 2. Ranked main challenges faced at each stage of organisation's development.

Initial phase (0-6 months)	Current experience	Future
1. Bureaucracy 2. Lack of government funding 3. Limited public awareness of your organisation 4. Difficulties recruiting employees 5. Low skills and experience of employees	1. Lack of government funding 2. Bureaucracy 3. Difficulties getting funds from private sources 4. Lack of favourable tax treatment 5. Low pay of employees	1. Lack of government funding 2. Bureaucracy 3. Competition with for-profit business 4. Difficulties participating in public tenders 5. Difficulties getting funds from private sources

Based on the Table 3 and 4 in Appendix we may conclude that:

- Regardless of the range of options offered, financing the venture which balances social and profit goals and funding hybrid organizations seems to be universal problem across 11 European countries we investigated (Figure 2)
- Financing venture occurs as a limitation in the initial stage of development (Table 2) as well as in the current period.
- Government funding is more limiting than private sources at the initial stage of development (Table 5 in Appendix)
- The same is with the current state, and for the perceived future (Table 5 in Appendix).

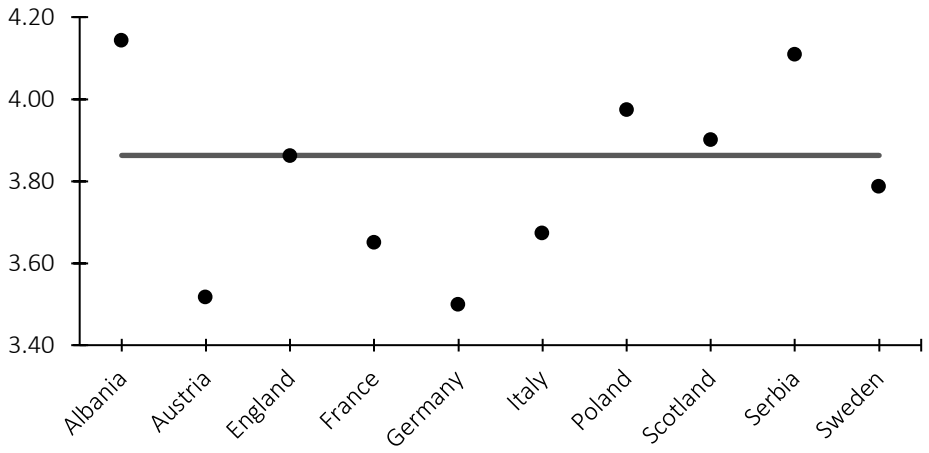

Figure 2. Average extent to which lack of funds represent a constraint to the growth of organization by country.

> *"It has been very difficult for us to find sustainable partnerships between the private and the public sector. Social enterprises like SWE 1 thus need better support, especially since they often find themselves in a grey area of profit on the one hand and charity on the other. What we need is courageous officials and politicians who dare to break existing norms in society by thinking outside of the box. We need to open people's eyes and make them see the great potential in what we do. We have had a lot of help from courageous people before. However, we do need more people to get behind our cause" (Administrative staff member, SWE 1).*

Poor access to finance, misfit between demand for finance and financial products that are offered to SEs in different developmental stages, limited start-up financing and inadequate knowledge about finance management, are some of the chronic problems that affect SEs across Europe. Even if the funding landscape in the specific country is very elaborate, it is not always very helpful for the SEs because none of the funding schemes are suited to them.

As from the experience from one of investigated countries:

> *"A big problem for social entrepreneurs is the constant search for funding. It is often difficult to receive money from the private and the public sector. Private investors are usually not willing to invest their money in social businesses because of low profits. On the other hand, asking for help from the public sector they will tell you that they cannot favour a commercial*

> *enterprise due to the law on competition. On this basis, I decided to change SWE 2´s legal form by combining the characteristics of a joint-stock company and a foundation, mainly to bridge this gap. Doing so has thus enabled the company to seek funding simultaneously on two parallel fronts" (SWE 2, Sweden)*

Another challenging element found in most of the cases under examination is their dependence on external resources, often project-based and short-term. Many of these hybrid ventures report that they are disadvantaged by a shortage of reliable and long-term income sources.

For instance, participant s on our focus groups in Serbia agreed that

> *"…banks show a very conservative attitude towards entrepreneurial companies, including the companies that have a social mission. Social enterprises have difficulties to access financial resources because there are no adequate options of micro - financing, while a credit union or similar forms of financial cooperatives are not allowed. Thus, access to financial resources in a large number of social enterprises linked to project financing, which is time-limited and inconvenient for funding long-term initiatives."*

Further supported by Austrian entrepreneur:

> *"I don't understand why companies get money from juries for the most profitable business model. But if you have an impactful idea to solve social or ecological problems you get recognition and a handshake […]. There is a misunderstanding in our society that beliefs that solving social problems is not profitable. In Austria the main attitude is: you should not contaminate social or ecological issues with money".*

Poor marketing and PR are perceived as one of the constraints (see Figure 3 and Table 3 to 4 in the Appendix).

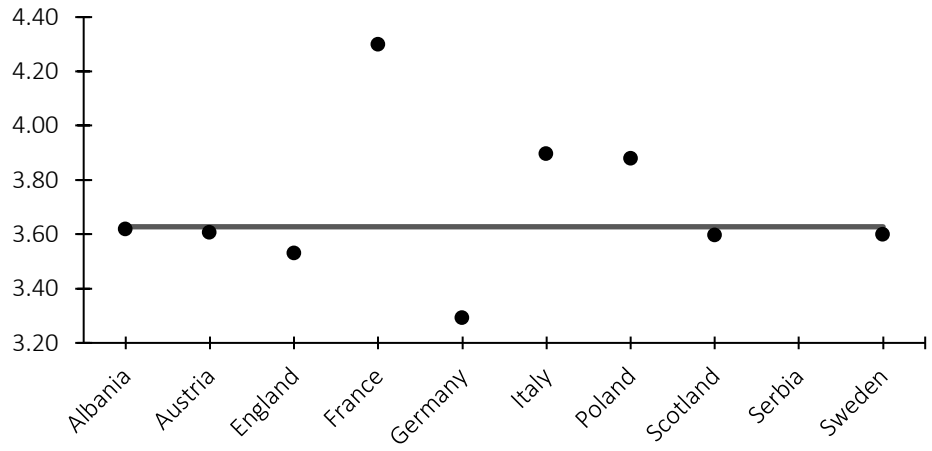

Figure 3. Average extent to which poor PR and marketing represent a constraint to the growth of organization by country.

Obtaining different skills to run the business gets particularly hard for explored hybrids. As one of our interviewee's states:

> *"It is really not my thing. It would be great to have someone else involved with different skills, but hire more workforce is impossible since I cannot cover the costs. And volunteers is not something you can choose and select, like an employee. You depend on willingness to help from others, and cannot ask much" (NLD 1, the Netherlands)*

Or, as stated by another stakeholder in UK, the strong motivation is not supported with the right skills:

> *"The biggest issue in the sector is, the founders are often motivated by the social motivation of what they want to do and the social change but they don't have the skills or the experience to run a business. And because they're really nice people with some great ideas, people give them money and then they mess it up. We've had a queue of mentees around our kitchen table…there's a huge community of people that are living on grants and they don't have viable business models. Not that they can't have, they just don't have. I'm completely convinced that for social enterprise to get to scale you need the combination, it's a bit like having all men or all women boards. ..The state of the sector worries me, the legacy of a whole raft of social entrepreneurs that don't have the business skills" (ENG 1, England).*

Bureaucracy. Hybrid organizations are reluctant to bureaucracy (in terms of external regulations, rules, procedures and officials) and organizational characteristics (high formalization, mechanic design, procedures etc) associated with it, both in terms of external condition of doing business and the characteristic of internal organization (see Figure 4 and Table 3 to 4 in the Appendix).

"There is a lot of bureaucracy. It is different in every town. It is unbelievable. Every city, every official in charge is different. Every school is different. Job centres, employment offices, municipalities – everybody interferes. There is no red line" (DEU 1, Germany).

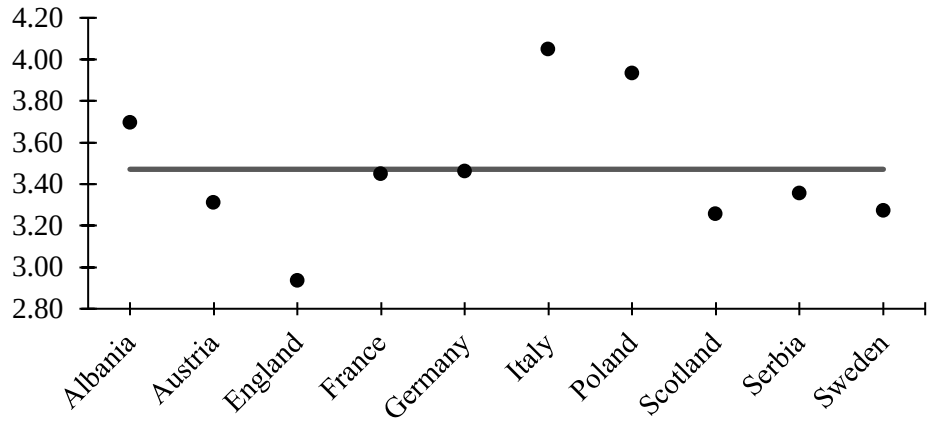

Figure 4. Average extent to which bureaucracy represent a constraint to the growth of organization by country.

This difficult relation with bureaucracy goes from the cuddle to the grave of each organization:

> *"The whole process of choosing the right legal form took several months. The bureaucracy was just absurd. Another problem was learning how the legal framework surrounding the sector works, especially since an overarching framework is non-existent from our perspective. We just want to play theatre not spending all of our time filling out blankets. We have therefore become quite allergic towards all the bureaucracy surrounding our business sector" (SWE 3, Sweden).*

Also

> *"In Austria you have to decide if you are an NGO – then you have to be charitable without a profit, or become a company with the aim of maximizing profit […]. This separation of legal structure without alternatives is annoying, because in the meantime many companies have social and economic goals, but they are treaded like organisations that seek to maximize profit permanently" (AUT 1, Austria).*

Also

> *"The lack of an overarching legal framework often puts us in a difficult position as we are constantly affected by two different systems. As a result, we always have to adapt by finding new ways of conducting our business. The legal framework could thus be much more distinct to facilitate our daily work. Our business position itself is on the borderline between profit on the one hand and non-profit on the other, meaning that sometimes it is more beneficial to be a foundation rathr than a joint-stock company while sometimes it is the other way around. In terms of conducting business in the legal form of a joint-stock company, the biggest problem is to receive public funding, especially since public authorities are not allowed to support profitable businesses. However, all our profit is reinvested in the company, which makes us an exception from these rules. Consequently, we constantly need to emphasize this in order to legitimize our cause. Taking all this into account points to the fact that general knowledge about social business needs to be improved" (SWE 4, Sweden).*

As one field report reflects:

> *"The big welfare associations have wonderful structures for expansion but they lack innovation. They are big, inert tankships and we are small effective motorboats. And right now we are seeking cooperation with these welfare associations. Ideally, our innovative concept is spread with the help of these beautiful big associations which, however, tend to have a lethargic momentum" (DEU 2, Germany).*

In many contexts there is a lack of laws (lack of bureaucracy) specifically designed to promote social mission together with the economic one, especially the new evolving experimental business models, or else they are not adequately recognized in practice.

> *"This year, state institutions undertook an action against informality and undeclared work. During this action, the controlling structures firmly considered every person engaged in the activities of the Center as employed in black. The status of volunteers wasn't taken into*

> *consideration during these controls. In one of these controls, Axa and Max, volunteer managers of the Center were given a fine of 500,000 ALL each, as undeclared persons. The case was appealed and the decision of the relevant structures is expected. This situation has impeded the normal functioning of the Center. "We don't intend to use stable volunteers, because the continuous tax audits have hindered us. The tax audit action is very problematic" (ALB 1, Albania).*

However, beyond the way rules are drafted, it is mainly the actual openness and willingness displayed by state institutions (from local to national agencies) that is left up to discretion and chance.

As a matter of fact, it is rare that social enterprises or other hybrid forms are positioned within a public "plan" that fully values the role they play. Some countries such as Scotland and Germany may represent exceptions; indeed, none of the examined cases in these countries reported particular restrictions or difficulties from a regulatory point of view, probably due to the fact that the legislation is more mature and the institutions are more thoroughly committed.

Beneath the Surface: Further Constrains

Out of the ten factors examined in quantitative research, the four above explained proved to have disabling impact on the organizational growth in hybrid forms we examined, while others have been rated as not being a constraint (see Table 1). These are the results of the analysis in which the country of origin of the company was not considered. A more detailed statistical analysis (using analysis of variance) showed that the attitudes differ significantly across countries (see Table 2 and Table 3 to 4 in the Appendix). It has been shown that the market size (see Figure 5 and Table 3 to 4 in the Appendix) and interest / relations from / to the local authority (see Figure 6 and Table 3 to 4 in the Appendix). are perceived differently depending on the country of origin, which will be discussed further below.

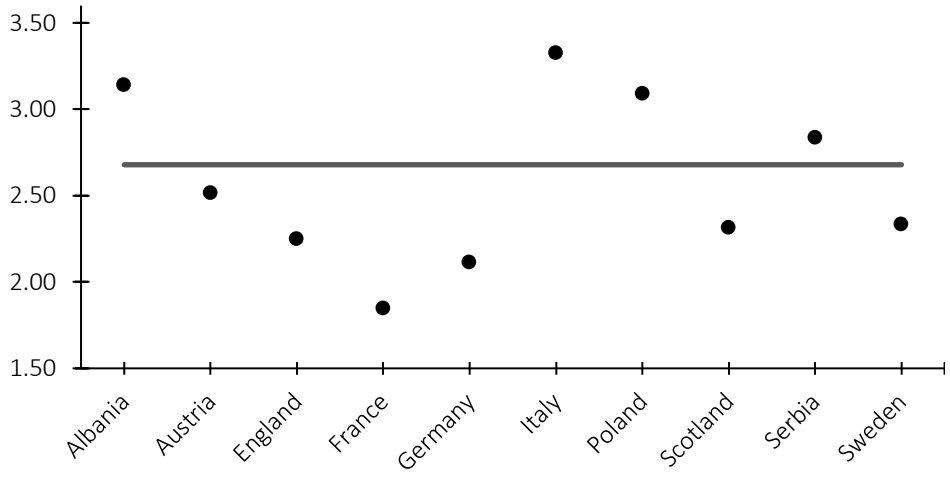

Figure 5. Average extent to which small market represent a constraint to the growth of organization by country.

Market size. Small market is seen as a constraint depending on the country of origin (see Table 3 and 4 in the Appendix). While SEs coming from EU countries like (England, France, Germany, Scotland, Sweden, Netherlands) do not perceive small market size as a significant constraint, other European countries do not have either positive or negative evaluation of this factor as a constraint (see Figure 5). That is important in relation to EU market accession, as stated by an interview from Poland:

> *"After the Polish transition to capitalism and democracy in 1989 the previously nationalized farms, covering one third of Polish land, that had become inefficient and had lacked investment, were either sold or closed down, leaving thousands of people without work. After more than 25 years of democracy, the rate of unemployment in this region is still higher than in other parts of Poland. The unemployed have little or no access to retraining programs, and find themselves discouraged, hopeless and unable to compete in job markets. This self-conception is durable and passes from generation to generation. The feeling of fatigue, frustration, powerlessness and a lack of agency – 'why should anyone do anything when nothing depends on us?'" – is pervasive (POL 1, Poland).*

Interest from local authorities. Social entrepreneurship all over Europe is mainly a local phenomenon in the sense that its activities are usually performed at the local level and aim to solve local problems. Social Entrepreneurship is

thus embedded in the local context through relations with consumers/producers, with the local financial sector, local support services, local policy makers etc. An analysis of the case studies also shows that the problems faced by SEs are often not legislative and administrative but more explicitly political, associated with a lack of institutional support. In many European countries, in fact, the political culture still seems averse to grant full citizenship to activities by private organizations aimed at producing a positive social impact. As quoted from the field:

> *"After the speech of the King, when he said that 'participation society' would grow in importance, Municipalities started to show interest in NDL 1. Municipalities were stimulated to invest in tools for a more participatory society and social cohesion. In this way, neighbourhood network systems became more important" (NDL 1, the Netherlands).*

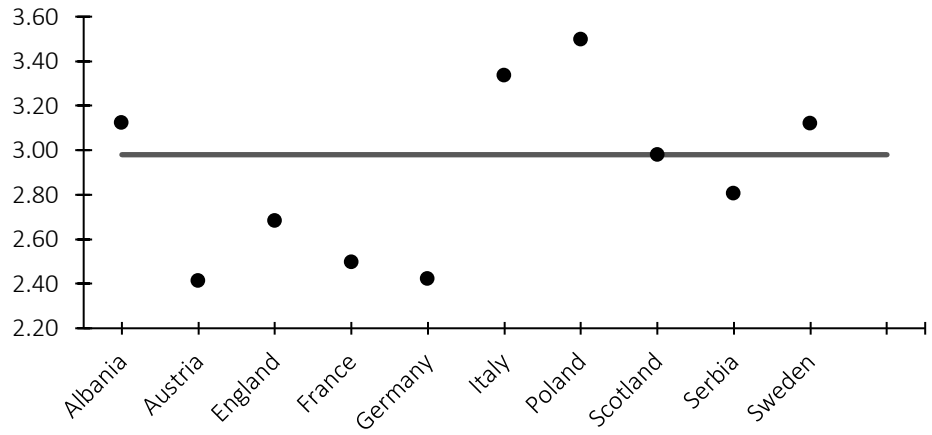

Figure 6. Average extent to which low interest/relations from/with the local authority represent a constraint to the growth of organization by country.

Main challenges through life-cycle.

Regardless of the legal form they adopt to navigate in the transitional space, hybrid organizations often struggle in their aspiration to achieve relative economic independence from the public sector, instead obtaining their revenues from the end users of their services. Even the organizations that reached this transition space after having been dependent on government subsidies seek to diversify their financial structures as to achieve greater autonomy, sometimes at the cost of giving up the political ideological vocation that distinguished their activity in the past. These cases involve new needs,

which often require the organization to renew its human resources to bring in profiles better suited to responding effectively to market logics. On the other hand, it should be noted that the SEs generally continue to privilege a positive social impact over profit or budget lines, with the result that these latter elements are often neglected, especially when companies are young, fragile, weak and not yet sufficiently consolidated. This may force SEs to work without a clear model of financial sustainability, or to apply fundraising strategies ranging from self-promotion and marketing to searching for sponsors or pursuing illuminated patrons and shareholders, a phenomenon that is more typical of the world of start-ups.

Hybrid organizations, thrown into this transitional space face numerous challenges, but their relative importance changes through their life cycle.

> *In previous times everything would have been great; we would have laughed together and now suddenly we have working meetings, agreed goals and receive formal notices if certain things don't work out." (DEU 1, Germany)*

As from our research, initial phase of the development (0-6 months) is mostly weighted by the bureaucracy, lack of government funding, limited public awareness of your organization, difficulties recruiting employees and low skills and experience of employees. Interestingly, SEs evolve during the time under the influence of the actors carrying their own values and generational challenges:

> *"This first generation of activists, always present inside FRA 1, has been joined today by a number of second generation activists, who are less interested in proper political action because they are often suspicious of it. At the same time, this generation is sensitive to the development of equitable trade and energy economies. As FRA 1 is growing, its sociological profile is also evolving. People with less political and militant experience continue to be interested in this organization, because they think of an ecology by itself and not an ecology to accomplish political goal" (FRA 1, France).*

Thinking about the future, SEs across 11 European countries anticipate lack of government funding, bureaucracy, competition with for-profit business, difficulties participating in public tenders and difficulties getting funds from private sources as the most important factors influencing their business. Make people aware about the mission of SEs is considered one of the issues:

> *"For me it's important not to act like some beggars, but to emphasize that we take on a certain social responsibility. When our society decides that we don't want poverty, that we don't want violence, that we don't want*

> *to have this and that, the necessary financing power has to emerge from civil society somehow, otherwise it won't work. I'm not the one begging for money, I have a social product to sell" (DEU 3, Germany).*

At the same time, constraints can be internal, in the continuous struggle to be able to joggle with challenges and opportunities:

> *"The constraints at the moment are me being able to… me. The constraint's me. How do I delegate, how do I structure this, how do I get more people around me? So the constraints are really about how quickly I can do it, that's it. The business is there to be picked up" (SCO 1, Scotland).*

This internal constraint can be also related with the ultimate motivation of the actors involved hybrid themselves:

> *"After 1,5 years, Jonta [one of the three co-founders of the organization] lost interest. She liked the first phase, idealizing and going through the challenge of getting things together. When NLD 3 went into the development phase, she got bored and left. NLD 3 would not have started without Jonta, but it never have continued without me!" (NLD 3, Netherlands).*

These different factors are systematized by rank in the Table 2.

4. CONCLUSIONS

The present study aims at contributing to the understanding the external and internal actors influencing the development of social enterprises and other forms of hybrid organizations that combine profit-seeking with social objectives across eleven European countries. Though challenged with disrupt changes in the world economy, technology and social issues, we cannot unequivocally claim that hybrid organizations functioning in the European space represent a "new generation", different and independent from the previous ones that have been developed under past circumstances. Instead, our empirical evidence gives us grounds to recognize a hybrid space, a space that hosts many heterogeneous entities and brings together new and old actors who adopt approaches, languages, work styles and tools which (considered all together) attest to a significant renewal in ways of doing social enterprise. For social enterprises, this new-generation space thus serves as an area of "transition" and "crossing", rather than a space of birth or rebirth. It is a space in which different trajectories intersect: some more focused on approaching

longstanding issues in a new way, especially employment-related issues and the social inclusion of marginalized groups (according to the WISE approach); others more specifically dedicated to addressing emerging problems, especially environmental and ecological ones (according to the model we have defined as protosocial). At any rate, these entities are usually capable of syncretizing, hybridizing and renewing themselves over the course of their development in a climate of increasing economic uncertainty and progressive decline of welfare state's public expenditures to support social services as a whole.

Among the potential factors we examined, scarce funding opportunities, troublesome relations with national bureaucracies, and poor marketing skills emerged in all included countries as crucial factors constraining the development of SEs. Moreover, other factors, such as inadequate managerial skills or insufficient stakeholder involvement, can represent important hindering elements at the national level, as illustrated in the previous section.

By exploring the factors that hamper the development of hybrid organizations in Europe, our study provides some practical and managerial implication on the features of an enabling ecosystem capable of fostering social inclusion through bottom-up social entrepreneurship activities. In the first place, an enabling ecosystem should be capable of providing access to diverse kinds of funding and financial resources (Bellucci et al., 2018). Every hybrid organization has its own peculiar features, many of which are linked to the context in which it is operating, its specific social aim, and the shape of its business model. Like in traditional enterprises, a coherent and comprehensive set of available resources at the local level is necessary to foster the development of SEs. For example, an ecosystem where only traditional bank credit is available may not create adequate conditions in which smaller but innovative hybrid organizations can get funding; in order to start engaging in innovative activities, SEs require access to grants, traditional bank credit, and micro-credit (cf. Biggeri et al., 2017).

In the second place, diverse managerial skills are also important because they encourage a more efficient use of the resources available in the ecosystem, enhance the innovation capacities of hybrid organizations by augmenting the possibilities at their disposal, and increase the variety within organizations operating in the ecosystem in terms of business models. European SEs in our sample reported a low level of marketing skills that hampers their capacity to increase their turnover, enlarge their workforce, and augment their social impact. As hybrid organizations which aim to be self-sustainable trough the selling of good or services, SEs cannot neglect professionalization, skills

updating and marketing. Especially in times of change, evolving consumers' behavior, and social disruption, an enabling ecosystem should provide opportunity for managerial and relational skills improvement, with the final aim of improving the positive impact of SEs on communities.

In the third place, national institutions should recognize that European hybrid organizations feel that bureaucracy is often not supporting them. Hybrid organizations like SEs can represent a powerful bottom-up tool for reducing social disruption and promoting social inclusion (Dey, Schneider and Maier, 2016), but institutions should follow-up by providing more straightforward process for creating, managing and supporting socially-driven organizations.

Our research provides an insight into the complex experiences of European social entrepreneurship, and it may represent a starting point for reasoning on the main steps, in terms of management and policies, that national and European stakeholders should take in order to define a flourishing inclusive ecosystem for social enterprises and other bottom-up entrepreneurial activities.

In the dynamic sense, as from our research, hybrid organisations face numerous challenges, but their relative importance changes through their life cycle. Initial phase of the development (0-6 months) is mostly weighted by the bureaucracy, lack of government funding, limited public awareness of your organization, difficulties recruiting employees and low skills and experience of employees. Thinking about the future, across 11 European countries hybrid organisations anticipate lack of government funding, bureaucracy, competition with for-profit business, difficulties participating in public tenders and difficulties getting funds from private sources as the most important factors influencing their business.

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APPENDIX

Table 3. Test of homogenity of variance.

	Levene Statistic	Degree of freedom 1	Degree of freedom 2	Significance
Lack of funds	1.076	10	655	.378
The market is too small	1.109	10	655	.352
Lack of internal skills	3.205	10	655	.000
Lack of interaction with organisation's stakeholders (e.g. members, employees, investors etc.)	4.392	10	655	.000
Low interest/relations from/with the local community	7.012	10	655	.000
Low interest/relations from/with the local authority	1.308	10	655	.222
Bureaucracy	1.545	10	655	.120
Lack of empathy and understanding of what the organisation wants to do	1.649	10	601	.089
Poor marketing and public relations	1.276	10	609	.241
Lack of knowledge on how to get funds (grants etc.)	3.422	10	614	.000

Table 4. Results of analysis of variance.

		Sum of Squares	Degree of freedom	Mean Square	F	Significance
Lack of funds	Between Groups	22.833	10	2.283	1.591	.105
	Within Groups	940.039	655	1.435		
	Total	962.872	665			
The market is too small	Between Groups	138.358	10	13.836	10.311	.000
	Within Groups	878.951	655	1.342		
	Total	1017.309	665			
Lack of internal skills	Between Groups	18.608	10	1.861	1.355	.197
	Within Groups	899.350	655	1.373		
	Total	917.958	665			
Lack of interaction with organisation's stakeholders (e.g. members, employees, investors etc.)	Between Groups	56.660	10	5.666	4.074	.000
	Within Groups	910.933	655	1.391		
	Total	967.593	665			
Low interest/relations from/with the local community	Between Groups	204.773	10	20.477	16.461	.000
	Within Groups	814.820	655	1.244		
	Total	1019.593	665			
Low interest/relations from/with the local authority	Between Groups	71.752	10	7.175	4.188	.000
	Within Groups	1122.152	655	1.713		
	Total	1193.904	665			
Bureaucracy	Between Groups	102.097	10	10.210	7.406	.000
	Within Groups	902.960	655	1.379		
	Total	1005.057	665			
Lack of empathy and understanding of what the organisation wants to do	Between Groups	87.181	10	8.718	4.204	.000
	Within Groups	1246.288	601	2.074		
	Total	1333.469	611			
Poor marketing and public relations	Between Groups	40.942	10	4.094	3.072	.001
	Within Groups	811.697	609	1.333		
	Total	852.639	619			
	Between Groups	19.293	10	1.929	1.271	.243

Lack of knowledge on how to get funds (grants etc.)	Within Groups	931.929	614	1.518		
	Total	951.222	624			

Note: Shadowed rows represent the factors for which the analysis of variance showed that there is a statistically significant difference in respondents' responses from different countries.

Table 5. Ranked main challenges faced at each stage of organisation's development.

	Initial phase (0-6 months)			Current experience			Future		
	Count	%	Rank	Count	%	Rank	Count	%	Rank
Bureaucracy	129	15.41	1	140	16.73	2	106	12.66	2
Lack of government funding	123	14.70	2	166	19.83	1	148	17.68	1
Limited public awareness of your organisation	118	14.10	3	72	8.60	9	36	4.30	14
Difficulties recruiting employees	92	10.99	4	68	8.12	10	52	6.21	9
Low skills and experience of employees	85	10.16	5	38	4.54	19	26	3.11	20
Low pay of employees	77	9.20	6	91	10.87	5	47	5.62	10
Difficulties getting funds from private sources	71	8.48	7	100	11.95	3	78	9.32	5
Difficulties participating in public tenders	65	7.77	8	88	10.51	7	83	9.92	4
Difficulties building strategic partnerships	53	6.33	9	51	6.09	11	43	5.14	11
Difficulties finding/affording a physical space to work	47	5.62	10	47	5.62	13	39	4.66	12
Difficult accessing capital markets	44	5.26	11	43	5.14	15	29	3.46	18
Lack of favourable tax treatment	44	5.26	12	94	11.23	4	77	9.20	6
Competition with for-profit business	44	5.26	13	90	10.75	6	105	12.54	3

	Initial phase (0-6 months)			Current experience			Future		
	Count	%	Rank	Count	%	Rank	Count	%	Rank
Lack of clear legal status (e.g. registering your organisation)	42	5.02	14	21	2.51	23	11	1.31	23
Difficulties recruiting volunteers	40	4.78	15	42	5.02	17	30	3.58	17
Difficulties drafting a business plan	40	4.78	16	15	1.79	24	10	1.19	24
Difficulties communicating social value to stakeholders	37	4.42	17	43	5.14	16	35	4.18	16
Low motivation of employees	35	4.18	18	36	4.30	21	26	3.11	21
Lack of support organisations	34	4.06	19	37	4.42	20	27	3.23	19
Lack of trust in your organisation	34	4.06	20	9	1.08	25	9	1.08	25
Difficulties selling products in the non-private market	32	3.82	21	48	5.73	12	36	4.30	15
Small market	28	3.35	22	41	4.90	18	39	4.66	13
Decreasing profit margins from business activity	24	2.87	23	81	9.68	8	65	7.77	7
Competition with other third sector organisations	24	2.87	24	45	5.38	14	64	7.65	8
Difficulties getting equity investment	18	2.15	25	35	4.18	22	25	2.99	22

CHILD POVERTY IN FORMER YUGOSLAV COUNTRIES

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Abstract: *Paper analyses child poverty determinants in four former Yugoslav republics: Slovenia, Croatia, Serbia and Montenegro. We show how child benefits have been transformed in the period following the dissolution of the country and how that might have impacted current varying levels of child poverty rates. Comparing poverty reduction due to social transfers, we see that pensions play more important role than other social transfers in Serbia and Montenegro. In Slovenia social transfers other than pensions have the highest capacity to reduce child poverty among the four countries. Labour market status of parents, their educational level and household composition as poverty determinants are also addressed. Single parent households are mostly exposed to the poverty in Slovenia and Croatia whereas in Montenegro and Serbia those having three or more children. Paper concludes with policy proposals that could reverse the trend especially in Serbia which faces one of the highest child poverty rates in Europe.*

Keywords: *child poverty, welfare state, social transfers, ex-Yugoslavia*

JEL classification: *C35, I32, J13*

1. INTRODUCTION

Poverty in a childhood has not only current, but long-term negative effects, and it is important obstacle for child development. There is transmission of poverty through generations, therefore poverty during childhood considerably increases the risk of poverty through the rest of the life. Parents raised in poverty have high probability to raise their children in poverty too. For this reason, it is important to focus on solving the problem of high child poverty.

Although COVID-19 epidemic is not yet over, there are clear signs that the economic crisis generated by this epidemic threatens to hit children and

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families the hardest (UNICEF, 2020). When parents lose their jobs and source of income it is important to assess what happens to children living in poor families. Research in March 2021 in UK found that over a quarter of UK families (27%) are living on a reduced income as a direct result of a pandemic-related loss of earnings, compared with 17% of households without children. Disproportionally more families with children compared to those without are struggling to buy food and other essentials, to pay the bills, have to borrow the money for essentials and have no money in savings. Not all families with children are equally exposed to crisis. Single parents, those on lower incomes, those living in rented homes and those that have to take care of a child with serious health condition or disability are bearing the brunt of the crisis.[1]

This article aims to address a problem of child poverty in several former Yugoslav countries: Croatia, Montenegro, Serbia and Slovenia. They once shared same social protection institutions but transition paths were different during the last three decades which affected the capacity of the social welfare system to protect against poverty. We choose Slovenia as it has one of the lowest child poverty rates in Europe, Croatia that is at the EU average level of child poverty and Serbia and Montenegro with one of the highest child poverty rates in Europe.

Article proceeds with short literature overview dealing with the determinants of child poverty in different sets of countries. It also provides a summary of the most important reforms to the child allowance system in the four countries since the breakup of the Yugoslavia. The role of social transfers, parents' education and the labour market status is analysed in the empirical part of the paper. Final section concludes with several policy proposals especially for Serbia that has very high child poverty rate and has done the least among the four countries to reform its system of child poverty reduction.

2. LITERATURE REVIEW

2.1. Determinants of child poverty

Literature dealing with the determinants of child poverty rates usually focus on parental employment and the education level, the role of family structure and the social transfers system.

[1] https://www.standardlifefoundation.org.uk/en/media-centre/media-centre-news-article/bearing-the-brunt-2

In their analysis of the OECD countries Whiteford and Adema (2007) found that countries with very low child poverty rates (less than 5%) combine low levels of family joblessness and effective redistribution policies supports. More nuanced results are provided by Chen and Corak (2008) who address changes in child poverty rates in 12 OECD countries during the 1990s. They found that higher labour market participation of mothers leads to lower child poverty rates, while drop in employment and earnings of fathers increases poverty rates. Reforms of social transfers aimed at boosting labour supply have ambiguous effects as in some cases child poverty is reduced and in others not.

Assessing the effectiveness of child benefits on the reduction of child poverty between 2008 and 2013 shows that while in Western Europe non-pension transfers (typically child benefits) contribute more to reducing child poverty, in CEE countries pension systems play a relatively large role in the reduction of child poverty (Bradshaw and Kenichi, 2016). Slovenia is found among the group of European countries where social transfers (pensions excluded) have the greatest impact (at least 50%). The same research by Gabos (2013) puts Slovenia in group of EU countries that have the best child poverty outcomes, highest labour market participation of both parents and the greatest effectiveness of government intervention, measured by the poverty-reduction effect of social transfers (excluding pensions). For Croatia Stubbs *et al.* (2017) showed that in that households with a larger number of children, with a lower number of employed members and households with a lower level of parents' education face the highest risks of child poverty. Clavet *et al.* (2019) show that benefit strategy (more efficient social transfers) is by far the more cost-effective option for reducing child poverty in Serbia than an employment strategy that aims to raise the work incentives for parents.

2.2. Reforms of the child benefits programs

Child benefit has been transformed more than other social benefits since Slovenia gained independence. It is a mean tested benefit intended for families with children below the age of 18 whose income per family member is below a certain threshold. There were proposals to make the child allowance universal, but rejected for fiscal reasons in the period following the 2008 economic crisis and means testing was preserved (Guardiancich, 2011). However, over the years, coverage has been gradually increased and the benefit design changed in order to direct it more to the lower income groups. By 1999 the child allowance became an instrument of population policy, as more births were financially encouraged. At the moment, coverage is very large and makes the benefit near universal as 86% of the children are receiving the allowance.

Social policy reforms in Croatia were a product of the complex relationship between nation state-building coupled with responses to the consequences of war during the 1990s and delayed Europeanization in comparison with the countries of Central and Eastern Europe (Stubbs and Zrincak, 2009). Social Programme of the 1993 was mainly oriented towards the war victims and their children with no new measures directed to others that fell into poverty. The welfare system remained largely unchanged until 2000s when new social democratic government took office (Stubbs and Zrincak, 2009).

Child allowance is similarly designed as in Slovenia. Also, similar to Slovenia there is a pronatality supplement, a substantial top-up given to households with three and four or more children. Income test is not applied in case of children in the family if they belong to people died in the latest civil war. Over the last twenty years Croatia experienced a large drop in child allowance beneficiaries due to several factors. First, due to natural population decline and migrations, the total number of children dropped by 18% in 2018 compared to 2002. In the same period, the number of recipients of the child benefit decreased by over 40% which was the result of the increase in the average net wage so those with income above the threshold ceased to receive the benefit. The number of children receiving the benefit would have been even smaller had the government not adjusted the upper means-test threshold in 2007 and 2018 (Urban and Pezer, 2019). Currently 40% of children are covered by the benefit.

The number of households receiving child allowance in Serbia dropped significantly after the reform in 2002. It decreased by 31% and it continued to fall in the years ahead (Matković and Mijatović, 2012). Child allowance was a quasi-universal benefit prior to these reforms. Only for the first two children the income test was applied, whereas the children of higher order were entitled to the benefit. The reform abolished the universal feature of the benefit and introduced more stringent eligibility criteria, means test instead of income test. Additionally, pro-natality role was abandoned, and child allowance became poverty alleviating program. Only 26% of the children up to 19 years of age in Serbia are covered by the benefit which is a reduction from the previous 30% of the covered children a decade ago. Given that law provisions regarding the benefit have not been changed in the last two decades, the reason behind this reduction lies probably in the decrease in the number of children. As the Statistical office showed, the number of first born babies is being reduced in Serbia which is a consequence of the emigration (SORS, 2020). For that reason, in 2018 government decided to reform parental allowance, a benefit that is of universal character and given to parents after the child is born. Benefit amounts have been increased for the first, second, third and fourth born children and

instead of two years period benefit is now received until a child reaches 10 years of age in case of the third and fourth child. In essence, despite very high child poverty rates reforms to the child benefits system have not been motivated to reduce the poverty but to increase the number of children due to unfavorable demographic trends. Additional problem is that any subsequent child after fourth one is not covered by neither child benefit nor parental allowance, although those families are mostly exposed to poverty. Official reason for excluding children of higher order than forth is unconvincing. It is explained as being dangerous for mothers' health, therefore non-receiving additional benefits may discourage mothers to have more than four children (Anić and Žarković Rakić, 2019). Higher number of children reduces probability of mothers' activity by 8.2%, controlling for other characteristics based on SILC 2013–2016 data (Anić, 2019). Therefore, reforms should tackle both problems casing high child poverty, high inactivity of mothers on one side, and on the other side to increase both coverage and amounts of benefits for families with children.

Like Serbia Montenegro also has very strict means test targeting rules that result in large exclusion errors so child allowance covers only 23% of the children in Montenegro. Montenegro's Law on Social and Child protection stipulates that all those that are eligible for monetary social assistance (main minimum income scheme) are also eligible for child allowance. Given that income thresholds are very low and receiving social assistance is not compatible with any work (as it would automatically abolish the eligibility for the benefit) that means that the benefit is targeted to families with children where adults are not work-capable. Alternatively, given the high employment in the informal sector beneficiaries of the child allowance could also be families in the most vulnerable type of employment, those in the informal sector. Thirty years after the break up of Yugoslavia first reforms of the child benefit system happened in 2021 in Montenegro. The new government proposed introduction of the universal child allowance for children up to six years of age in the amount of €30. For other child allowance beneficiaries the government proposed increase in the benefit amounts (allowance going from 44 to 60 Euros). Introducing the benefit for all the children until 6 years of age would increase total expenditures for 18 million € on a yearly basis, or almost four times the current spending. Implementation of the reform started in October 2021 and effects are still to be seen but it is expected that child poverty rate will be reduced.

3. DATA AND METHODOLOGY

We use Survey of Income and Living Conditions (SILC) data to investigate at-risk-of-poverty rates for children in Serbia, Slovenia, Croatia and Montenegro in 2018. SILC is main data source for investigating poverty and inequality in EU countries and EU candidate countries. We use descriptive statistics and present several poverty and social exclusion indicators in order to compare poverty profile of children between the four countries. This section presents definition of indicators analysed.[2]

At-risk-of-poverty or social exclusion is main EU-SILC indicator that shows the share of children (persons) exposed to either at-risk-of-poverty or sever material deprivation or living in households with very low work intensity. Children are in poverty risk if they are living in households whose income per adult equivalent is below 60% of median national income per adult equivalent. Low work intensity households are those households where all the adults worked less than 20% of their potential in previous year, excluding students. Someone is severely material deprived if it cannot afford four or more deprivation items.[3] Children being in at-risk-of-poverty in three out of four consecutive years are persistently poor. Poverty gap is the difference between median income of children below poverty line and the poverty line in percent of poverty line.

Since housing costs represent significant share of household income and also housing costs are needs which are firstly covered, it is important to see relative distribution of equivalized income when housing cost are deducted. At-risk-of-poverty rate is also calculated for disposable income excluding housing costs. Those are costs of living in accommodation and costs of utilities.

To see whether being in first income quintile of equivalized household income necessarily means being exposed to the risk-of-poverty or social exclusion we analyse distribution of at-risk-of-poverty or social exclusion by income quintiles.

[2] All definitions of indicators could be found in Eurostat webpage or EU-SILC methodological guidelines. https://socijalnoukljucivanje.gov.rs/wp-content/uploads/2015/08/Description%20of%20Income%20and%20Living%20conditions%20dataset.pdf

[3] To afford one-week holiday during a year, to have meat or vegetarian meal every second day, adequate heating, washing machine, TV, telephone, car, being unable to pay unexpected expenses, be delayed with paying bills.

Since children whose parents have higher education level tend to be less exposed to poverty, we compare child-at-risk-of-poverty rates depending on education level of parents.

Lastly, our analysis is based on the at-risk-of-poverty indicators before and after social transfers. Difference in the capacity of welfare state to reduce poverty is observed by comparing both in absolute and relative terms poverty reduction due to social transfers.

4. RESULTS

This section presents main results. We compare different at-risk-of-poverty indicators in the countries analysed. From Table 3 it can be observed that there is almost no difference between at-risk-of poverty rate between adults and children in Croatia. In Serbia, at-risk-of poverty rate for children is 5.5 percentage points (pp) higher than adults' one. Higher child at-risk-of-poverty rate is even more pronounced in Montenegro with 11.4 pp difference in the rates for children and the adults.

Contrary to Serbia and Montenegro, Slovenia has slightly lower at-risk-of poverty rate for children than for adults. In Croatia, Slovenia and Serbia, the share of adults severely materially deprived is higher than the respective share of children, whereas in Montenegro severe material deprivation is more observed by children than adults.

Table 3. At-risk-of-poverty rate or social exclusion, for adults and children

	Croatia		Slovenia		Montenegro		Serbia	
	A	C	A	C	A	C	A	C
At-risk-of-poverty rate	19.2	19.7	13.6	11.7	21.0	32.4	23.3	28.8
Very low work intensity	11.9	9.0	6.5	2.2	22.4	25.2	18.6	16.1
Severely materially deprived	8.8	7.6	4.0	2.2	11.3	17.7	16.0	15.3
At-risk-of poverty or social exclusion	25.0	23.7	16.9	13.1	28.7	39.4	34.0	35.9

Note: Children are defined as age less than 18, adults are defined as 18 years and over, except for very low work intensity, where adults are aged 18–59.

Source: Eurostat database

Similar situation is with share of adults and children living in households with very low work intensity. Share of children living in households with very low work intensity is lower than the share for adults in Croatia (for 2.9 pp), Serbia (for 2.5 pp) and Slovenia (for 2.5 pp), but higher in Montenegro (for 2.8 pp). At-risk-of-poverty or social exclusion is lower for children than for adults in Croatia and Slovenia but higher in Serbia and Montenegro. The difference is most pronounced in Montenegro, where at-risk-of-poverty or social exclusion is 10.7 pp higher for children than for adults.

We are also interested in the share of children facing any two vulnerabilities or even all three vulnerabilities. At-risk-of-poverty rate or social exclusion captures children that face at least one of the three components (at-risk-of-poverty, very low work intensity or severe material deprivation), but it is also important to see how many children (out of total number of children) are in the intersection of all three risks. As can be seen from Table 4 the share of children being at all three risks of social exclusion is higher in Croatia, Serbia and Montenegro, but lower in Slovenia compared with the respective share of adults. Slovenia has low share of children facing all three risks, only 0.3%, while the share is higher in Croatia (2.9%) and is especially high in Serbia (6.6%) and Montenegro (12.8%). Therefore, one out of eight children in Montenegro are exposed to all three social exclusion risks. In Slovenia, out of 100 children only three children are exposed to all three risks. The share of children living in households with very low work intensity and being at-risk-of-poverty is extremely high in Montenegro where one out of five children are in that situation.

Table 4. Intersection of at-risk-of-poverty, low work intensity and severe material deprivation of adults and children

	Croatia		Slovenia		Montenegro		Serbia	
	A	C	A	C	A	C	A	C
At-risk-of-poverty, low work intensity and severely materially deprived	1.8	2.9	0.8	0.3	6.1	12.8	3.5	6.6
At-risk-of-poverty and low work intensity	5.3	7.7	2.8	1.6	10.5	19.2	8.5	14.4
Low work intensity and severely materially deprived	2.0	3.1	1.0	0.6	6.6	13.1	4.0	6.7
At-risk-of-poverty and severely materially deprived	5.2	4.6	2.2	1.1	9.9	16.3	8.5	9.8

Note: Children are defined as age less than 18, adults are defined as 18 years and over, except for very low work intensity, where adults are aged 18–59.
Source: Eurostat database

A large percent of children in Serbia and Montenegro are not only in at-risk-of-poverty in a current year but in three out of four years, 23.4% and 21.8%, respectively. In both countries persistent poverty rate is lower for total population than for children. In Croatia, the rate for children is slightly lower than the rate for total population, whereas in Slovenia children are less persistently exposed to poverty than total population by 4.6 pp. Similarly, relative poverty gap is lower for children than adults in Croatia and Slovenia, whereas the opposite is for Montenegro and Serbia.

Table 5. Persistent at-risk-of-poverty rate and relative poverty gap

	Croatia		Slovenia		Montenegro		Serbia	
	T/A	C	T/A	C	T/A	C	T/A	C
Persistent at-risk-of-poverty rate	14.8	13.8	7.7	3.1	14.7	21.8	19.6	23.4
Relative poverty gap	30.2	29.5	19.1	13.3	34.6	40.9	39.8	42.4

Note: Persistent at-risk-of-poverty rate is for total population (T). Relative poverty gap is for persons aged 18–64 (A). C stands for children.

Source: Eurostat database

Having in mind determinants of the child poverty from the literature overview, we first investigate the reduction of child poverty due to social transfers. Social transfers consist of transfers at the individual and household level. Those are unemployment benefits, sickness benefits, disability benefits, education related allowance, old age and survivor's benefits, i.e. pensions (at the individual level) and family/children related allowance, housing allowance and social exclusion not elsewhere classified (at the household level). Table 6 presents at risk of poverty rate before and after social transfers. We investigate poverty rates without social transfers when pensions are included in social transfers and when pensions are excluded.

Poverty reduction due to social transfers other than pensions is the highest in Slovenia, 12.5 pp, whereas in Serbia is the lowest amounting to 5.5 pp. In Serbia and Montenegro, the reduction in poverty is twofold higher if pensions are included in social transfers (13.1 and 11.8 pp, respectively) then when they are excluded (6.3 and 5.5 pp).

Table 6. At-risk-of-poverty rate before and after social transfers

	ARPT	ARPT before transfers (pensions income)	ARPT before transfers (pensions transfers)	ST reduction without pensions in pp	ST reduction with pensions in pp	ST reduction without pensions in %	ST reduction with pensions in %
CRO	19.7	28.4	32.2	8.7	12.5	44%	63%
SLO	11.7	24.2	25.9	12.5	14.2	107%	121%
MNE	32.4	38.7	45.5	6.3	13.1	19%	40%
SRB	28.8	34.3	40.6	5.5	11.8	19%	41%

Note: ARPT stands for at-risk-of-poverty, ST stands for social transfers.

Source: Eurostat database

In Slovenia, difference between child poverty reduction is only slightly higher when pensions are included in social transfers (14.2 pp) than excluded from social transfers (12.5 pp). Expressing reduction relative to child-at-risk-of-poverty we see that reduction in Slovenia is more than 100%, i.e. poverty reduces from 25.9% and 24.2% (social transfers with and without pensions, respectively) to 11.7%. In Croatia, poverty reduction due to all social transfers including pensions is 63% and 44% excluding pensions (relative to the poverty rate). In Serbia and Montenegro, reduction in relative terms amounts approximately 20% when pensions are excluded from social transfers and 40% when pensions are included in social transfers. Therefore, the capacity of welfare state to reduce child poverty is significantly lower in Serbia and Montenegro comparing with the other two countries. The difference is especially stark when contrasted with Slovenia.

We further look at the poverty reduction due to social transfers other than pensions by different households' type (Annex, Figure A1–Figure A4). As we can see, highest poverty reduction due to social transfers is observed for Slovenia for single parent households, 20.9 percentage points. For the same household types in Croatia poverty reduction due to social transfers system amounts to 12.1 pp, in Montenegro 11.5 pp, and in Serbia only 5.1 pp.

Differences between countries are especially stark for households with two adults and three or more children. In Slovenia, every third household is exposed to poverty before social transfers, but after social transfers approximately every sixth household is facing poverty risk, i.e. poverty rate for two adults with three or more children amounts to 31.1% and is being reduced to 15.8% due to transfers. Poverty reduction capacity of the transfers system in Croatia is lower than in Slovenia, poverty for this household type reduces by 12.7 pp. In Serbia

and Montenegro poverty is reduced by 7.9 pp and 5.7 pp, respectively. Even after social transfers poverty rate for two adults with three or more children remains high in Serbia, since more than half of them stay in poverty.

Given that the literature also finds work intensity to be an important determinant of poverty status we investigate poverty rates by across this indicator as well. Table 5 presents poverty rates of people aged 0–59 by work intensity and living in households with one or more dependent children. The share of persons being at-risk-of-poverty is the lowest if household has very high work intensity, and the poverty rate increases as the work intensity reduces. More than 80% of persons (in household with at least one dependent child) face poverty risk if living in the household with very low work intensity in Croatia and Serbia, whereas around 70% in Slovenia and Montenegro. Difference between poverty rates if person is living in a household with very low and not in very low work intensity is the highest in Croatia, 70 pp, and lowest in Montenegro 57 pp.

Table 5. At-risk-of-poverty rate of households with at least one dependent child by work intensity

	Croatia	Slovenia	Montenegro	Serbia
Very high work intensity (0.85-1)	1.7	3.0	2.6	4.3
High work intensity (0.55-0.85)	7.0	9.1	5.3	9.5
Medium work intensity (0.45-0.55)	27.1	34.6	27.8	27.1
Low work intensity (0.2-0.45)	42.0	51.0	31.7	49.2
Very low work intensity (0-0.2)	80.8	69.4	72.2	84.3
Not very low work intensity (0.2-1)	11.4	8.8	15.3	17.2
Difference between very low and not very low in pp	69.4	60.6	56.9	67.1

Note: The work intensity is defined in the third section.

Source: Eurostat database

Looking at the connection between household structure and poverty we observe that single parent households have the highest at-risk-of-poverty or social exclusion rates in Croatia and Slovenia, 52% and 28.9% respectively. In Serbia and Montenegro, poverty rates for single parent households are almost 50%, but are slightly lower than poverty rates for households with two adults and three of more dependent children. In Serbia, households with two adults and three of more dependent children have at-risk-of-poverty or social exclusion rate of almost 60% (Table 6).

Table 6. People at risk of poverty or social exclusion by income quintile and household type

	Single person with dep. children			Two adults with one dep. child			Two adults with two dep. children		
	Total	**Q1**	**Q2**	**Total**	**Q1**	**Q2**	**Total**	**Q1**	**Q2**
Croatia	52.0	100.0	38.4	17.3	97.1	16.2	12.2	100.0	6.7
Slovenia	28.9	65.8	12.2	9.9	67.6	7.3	9.9	57.1	0.4
Montenegro	49.4	100.0	49.0	22.4	100.0	40.8	25.9	100.0	42.1
Serbia	48.6	100.0	46.0	31.6	100.0	41.6	25.9	100.0	26.5
	Two adults with three or more dep. children			**Three or more adults with dep. children**			**Households with dep. children**		
	Total	**Q1**	**Q2**	**Total**	**Q1**	**Q2**	**Total**	**Q1**	**Q2**
Croatia	35.2	95.3	11.7	21.1	97.0	11.8	21.2	97.2	12.2
Slovenia	17.1	71.7	3.0	9.5	65.0	3.4	11.9	63.7	3.8
Montenegro	51.0	100.0	45.8	34.3	100.0	30.7	34.9	100.0	37.6
Serbia	58.4	100.0	36.1	34.0	100.0	39.7	34.1	100.0	36.6

Source: Eurostat database

We further analyse at-risk-of-poverty or social exclusion rate by household type and income quintile. Single parent households from the first quintile are all in at-risk-of-poverty or social exclusion in Croatia, Serbia and Montenegro, but not in Slovenia. Situation is similar for households with two adults and one, two or three or more dependent children. Those households in the first quintile are almost all at-risk-of-poverty or social exclusion in Serbia, Croatia and Montenegro. In Slovenia, being in the first income quintile does not mean that the household necessarily face poverty or social exclusion risks, although the share is high, between 57% and 72% depending on the household type. In the second income quintile situation is improved in terms of being at-risk-of-poverty or social exclusion reduces significantly in all four countries. Especially low rate of poverty of 0.4% is observed for household with two dependent children in the second income quintile in Slovenia (Table 6).

Since housing cost make significant share of household income, we investigate at risk-of-poverty rate after housing cost are included. We compare the results for adults and children. We see that in all three countries at risk-of-poverty rate when households costs are deducted are higher than when households' costs are included in total disposable household income. Comparing at-risk-of-poverty rates for adults and children when households' costs are deducted, we see similar patterns as for at-risk-of-poverty rate. In Slovenia, the rate is lower for children than adults, in Montenegro it is higher for 11 pp, and in Serbia the

rate is higher for 5 pp. The difference between child at-risk-of-poverty without housing costs is higher than with housing costs around 10 pp for Croatia and Slovenia, whereas the difference in Montenegro and Serbia is 12 pp and 18 pp, respectively (Table 7).

Table 7. At-risk-of-poverty rate and at-risk-of-poverty rate when housing costs are deducted

	Without housing costs		Difference between children and adults without housing costs	With housing costs		Difference between children with and without housing costs
	Children	Adults		Children	Adults	
Croatia	29.4	28.9	0.5	19.7	19.2	9.7
Slovenia	22.2	24.5	-2.3	11.7	13.6	10.5
Montenegro	44.5	33.4	11.1	32.4	21.0	12.1
Serbia	46.7	41.7	5.0	28.8	23.3	17.9

Source: Eurostat database

In case of parents with low levels of education at-risk-of-poverty rate is extremely high in Serbia and Montenegro, more than 80%. The same rates are lower in Croatia and Slovenia, 60% and 44% respectively. This is alarming knowing that among current adults with primary education 80% of them have parents with primary education in Serbia, Croatia and Montenegro. In Slovenia the percentage is lower, 51% have parents with low education.[4] Low educational level of parents does not only influence current child-at-risk-of-poverty but also inter-generational transmission of poverty (Table 8).

[4] https://ec.europa.eu/eurostat/databrowser/view/ILC_IGTP01__custom_1619253/default/table

Table 8. At-risk-of poverty rate for children by educational attainment level of their parents

	Primary	Secondary	Tertiary
Croatia	59.8	23.5	5.0
Slovenia	44.2	15.6	7.4
Montenegro	83.6	31.1	11.6
Serbia	80.8	30.5	7.5

Note: Primary education level is defined as less than primary, primary and lower secondary education (levels 0–2), secondary education level is defined as upper secondary and post-secondary non-tertiary education (levels 3 and 4) and tertiary education is defined as short-cycle tertiary, bachelor, master of doctoral (levels 5–8).

Source: Eurostat database.

5. CONCLUSIONS

This paper presented differences in child poverty and social exclusion indicators in four ex-Yugoslavia countries, Slovenia, Croatia, Serbia and Montenegro. Being once part of the same social welfare system, it is interesting to see how these systems evolved during the last three decades especially when it comes to child related transfers.

Our article shows that eligibility criteria for main child poverty reduction program, child allowance, became quite relaxed in Slovenia compared to other three countries. For that reason, it is no surprise to see that the coverage of children below 19 years of age is the highest in this country. With the recent reforms that made the child allowance universal for children up to 6 years of age Montenegro is expecting to increase the coverage of children with the benefit which was very low prior to reform with only 23% receiving the allowance. Croatia intended to increase the coverage of children with the similar benefit but achieved limited success due to decrease in the number of children because of the emigration and due to increases in net wages. Serbia stayed committed to its strict targeting mechanism that was introduced twenty years ago. Number of children covered by the benefit was reduced from 30% a decade ago to current 23%. Reasons behind this drop in the number of recipients have not been analysed but it is highly likely that emigration is the main factor like in Croatia.

Analysing SILC data we show that Slovenia has the lowest child-at-risk-of-poverty rate among the four countries with poverty and social exclusion

indicators mostly lower for children than for the adults. In Croatia, there is no big difference between indicators for children and adults. In Serbia and Montenegro, child poverty indicators are mostly higher for children than for the adults. The difference is especially stark for Montenegro where child-at-risk-of-poverty is around 10 pp points higher than the rate for the adults.

Given our interest in the reforms to the child benefit system we first compared at-risk-of-poverty rate before and after social transfers. We looked at all social transfers and social transfers excluding pensions, i.e. pensions are in former case threated as social transfers and in the latter as income. In Slovenia poverty reduction is only slightly higher when pensions are included in the definition of social transfers than when pensions are excluded. On the other hand, in Serbia and Montenegro capacity of the social transfers system to reduce poverty is doubled when pensions are included than excluded from the transfers.

Children in Serbia and Montenegro face not only one, but two and even three at-risk-of-poverty or social exclusion components. Around 13% of children are in at-risk-of-poverty and severely material deprived and live in household with very low work intensity in Montenegro, whereas in Slovenia the share of children facing all three risks is 0.3%. Labour market status of parents is important determinant of poverty and Slovenia has the best labour market indicators of parents with children among the four countries. Slovenia is one of the top three EU member states according to employment rate of women with one child and three children or more.

Poverty rates among families where parents are with low educational level are extremely high in Serbia and Montenegro which could be explained by the fact that in those two countries low educated parents are more likely to be out of work. Also, given that child benefits are strictly targeted large exclusion errors means that many poor children would be left uncovered by the benefit system.

With recent reforms of the child allowance in Montenegro percentage of children covered by the benefit will increase and Serbia will then have the lowest number of children receiving the benefit. Given very high child poverty rate in the country it is necessary to revise eligibility conditions of the child allowance which have been in place for the last two decades. So far, the government has been concerned with unfavourable demographic trends and increased the amount of parental allowance. It seems to be that child poverty is not a topic of concern for the policymakers in Serbia. Knowing that children raised out in poverty are more likely to be poor as adults, more attention should be paid to this problem.

Covid crisis has showed to have more adverse effects on vulnerable, especially families with children. Although SILC data for 2020 income year are not yet available some preliminary research show that poverty increased among families with children. Therefore, protecting children is even more important nowadays.

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ANNEX

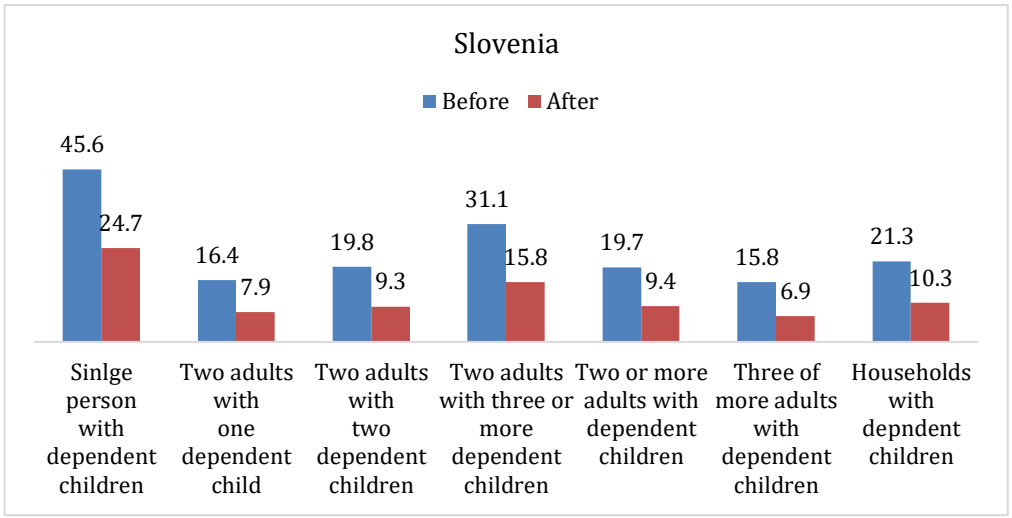

Figure A1. Poverty reduction due to social transfers by households' type, Slovenia

Source: Eurostat database.

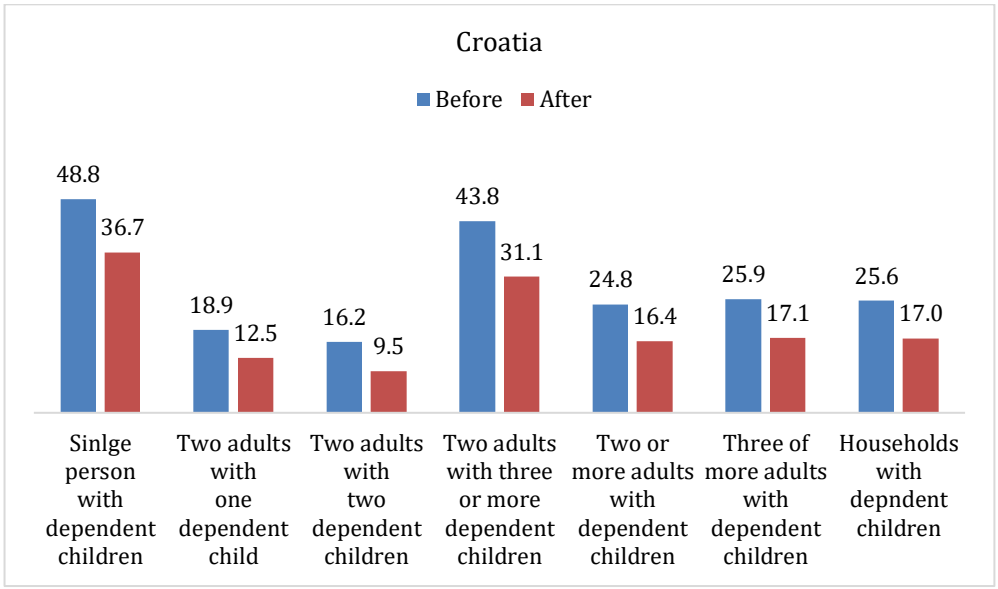

Figure A2. Poverty reduction due to social transfers by households' type, Croatia

Source: Eurostat database.

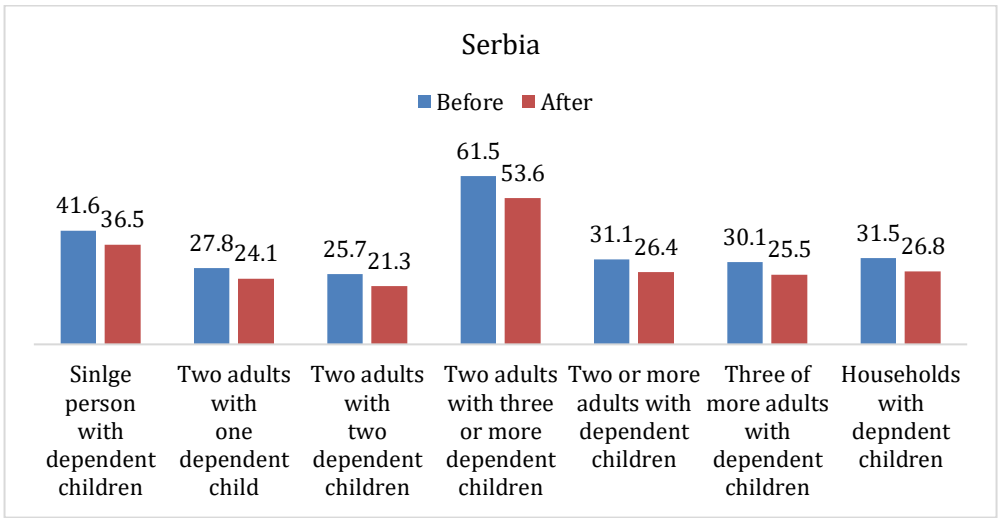

Figure A3. Poverty reduction due to social transfers by households' type, Serbia

Source: Eurostat database.

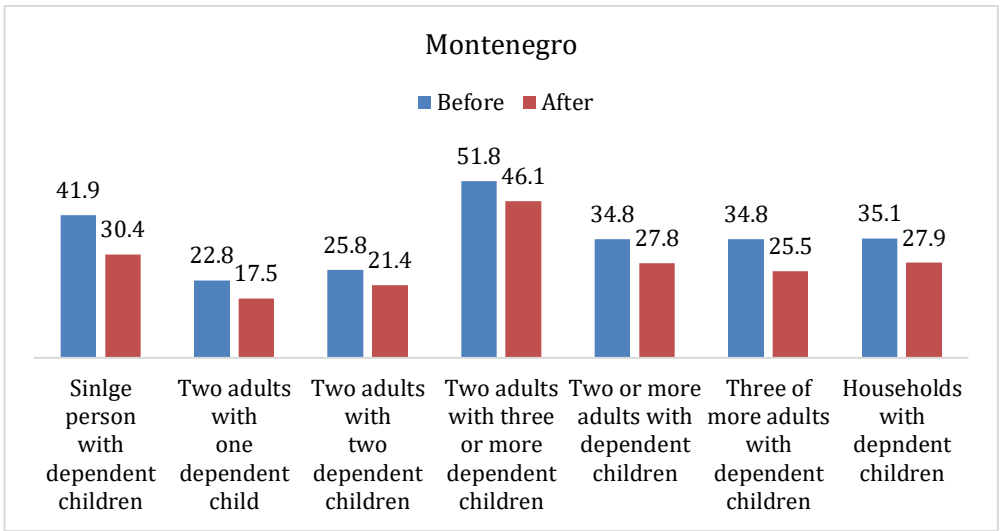

Figure A4. Poverty reduction due to social transfers by households' type, Montenegro

Source: Eurostat database.

SOCIAL EXPENDITURE COMPOSITION AND INEQUALITY IN THE OECD: DO WELFARE STATE REGIMES MATTER?

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Abstract: *Social expenditure has the potential to make the distribution of income less unequal. We employ a fixed effects econometric model with Driscoll–Kraay standard errors to evaluate the response of inequality to changes in the size and composition of social spending. We are interested in mapping the effects across the six welfare state regimes that characterize the 36 OECD countries in our sample over the period 1980-2018. Our findings reveal that the type of social welfare regime adopted by a country affects mostly the strength of the association between the size and composition of social expenditure and inequality. The inequality reducing effect is higher in the Others regime, followed by Central and Eastern European countries, accompanied but at some distance by the Liberal, Mediterranean and Conservative models, respectively. The Nordic model is the only one where inequality is not affected by higher total social expenditure, suggesting that it is used for purposes other than redistribution. In the remaining five regimes the magnitude of the equalising effects implies that health spending and old age pensions are the welfare programs with the higher impacts. These findings have important implications for social policy design that apply also to the COVID-19 crisis period and beyond since the former will likely result in higher income inequality levels worldwide and the need to more effectively curb this trend.*

Keywords*: welfare state regimes, social expenditure composition, income inequality, OECD.*

JEL Classification*: D60, E64, H53, I38, P50*

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1. INTRODUCTION

Nations worldwide and developed countries in particular have witnessed an increase in income inequality since the 1980s (Nolan et al.,2019; Nolan and Valenzuela, 2019). More recently the COVID-19 pandemic threatens to aggravate this trend (Ferreira, 2021; Yonzan et al., 2021). Policy responses, in particular fiscal policy and associated public social expenditure, may play an important role in curbing the former dynamics. Indeed, the redistributive nature of social expenditure leads us to expect a negative effect of higher social spending on disposable income inequality (Esping-Andersen and Myles, 2012). However, different welfare programs and respective implementation through public social expenditure may produce varied impacts on inequality, at least as far the intensity of their influence is concerned, depending on e.g. size, targeted groups, coverage or generosity (Kammer et al., 2012; Claus et al., 2013; Bergh et al., 2020; Cammeraat, 2020; Sauer et al., 2020). Additionally, behavioural effects can result in higher market income inequality that may even compensate the disposable income inequality reducing effects of social expenditure (Niehues, 2010). But an upstream influence from specific welfare state designs corresponding to varied institutions and arrangements may exert an overarching influence and play a mediating role on the link between the size and composition of social expenditure and income inequality (Fuest et al., 2010; Kammer et al., 2012). This begs for the question of whether welfare state regimes make a difference for how social expenditure and respective composition influences income inequality.

This chapter provides an empirical analysis of the relationship between the size and composition of social expenditure and income inequality in 36 OECD countries using data for the period 1980-2018 highlighting the mediating role of welfare state regimes. The empirical model takes as dependent variable a measure of inequality in the distribution of income and as explanatory variables of interest public social expenditure and its composition interacted with dummy variables for the different welfare state regimes. Our work differs and builds upon previous research since our focus is not exclusively on total public social spending, nor on particular components of social spending taken in isolation but instead we take into account all the comparable social policy areas from the OECD Social Expenditure Database (SOCX) (OECD, 2019), plus education. SOCX disaggregates social expenditure according to nine areas of social policy intervention: old age pensions, survivors' pensions, incapacity pensions, health, family support, active labour market policies, unemployment, housing and other areas of social policy. We also align our study with the recommendations of the literature on welfare state regimes and respective

social and economic outcomes that contends that the relationship might be contingent upon differences in arrangements regarding welfare institutions (Fuest et al., 2010; Bergqvist et al., 2013; Toikko and Rantanen, 2017; Tridico,2018). This is especially important following the 2007-08 financial and economic crisis and the sovereign debt crisis that ensued and affected many European countries, implying the need for fiscal consolidation. Given that many OECD countries are not in a position to increase public expenditure due to their high levels of indebtedness, it is important to understand which public social spending components have the greatest impact on inequality, since reallocating social spending may allow for a reduction in income inequality, even if the overall level of public spending remains the same (or even decreases). The more recent world health crisis stemming from the new SARS-CoV-2 virus also raises concerns about future steeper increases in inequality since it is disproportionally affecting the most vulnerable (Brown and Ravallion, 2020; Alves et al., 2021; de França et al., 2021). On the other hand, quick and strong social policy responses have been fundamental in containing the devastating social and economic outcomes of the pandemic (Cook and Ulriksen, 2021; Pereirinha and Pereira, 2021). In addition, a set of control variables composed of potential drivers of inequality selected according to previous literature is also considered. We estimate a fixed effects regression model with Driscoll-Kraay standard errors to account for the possibility of heteroskedasticity and autocorrelation (Driscoll and Kraay, 1998).

In what follows, this chapter first outlines the welfare state typology most often used and discusses briefly previous empirical studies that assess the impact of different social spending programs and welfare state regimes on inequality. It then presents the methodology applied and data used. The chapter next discusses the results on how the interplay between welfare state regimes and types of social spending contribute to income inequality. The chapter concludes with a summary of the main results and respective policy implications.

2. THE WELFARE STATE, SOCIAL EXPENDITURE AND INEQUALITY: TYPOLOGIES AND RELATED LITERATURE

The main hypothesis we want to investigate in this chapter is whether welfare state regimes mediate the relationship between the size and composition of social expenditure and income inequality. For this purpose we use an extension of the well-known welfare state taxonomy proposed by Esping-Andersen (1990) for 18 affluent economies based on data for the 1990s. Our extended classification originates in several critiques to Esping-Andersen's initial

approach that have emerged over recent decades (Ferrera, 1996; Gough et al., 2004; Aspalter et al., 2009; Hay and Wincott, 2012; Toots and Bachmann, 2013; Aspalter, 2019). More specifically, we adapt the classification used by Tridico and Paternesi Meloni (2018) and Hein et al. (2021) given the similarities between our work and the former studies regarding the sample of countries under analysis and time coverage and the concern with the relationship between social expenditure and inequality.

The original classification by Esping-Andersen (1990) identifies three welfare state regimes, based on the varying importance of the state, market, and family as welfare providers, protecting against varied social risks (sickness, unemployment, old age, etc.) (Zambon et al., 2006): liberal (favours private market provision of welfare targeting social assistance by the state to risk groups), conservative-corporatist (state intervention as social welfare provider, protecting against social risks, when the family, or the market, cannot do so), and social democratic (universalist, with the state guaranteeing broad social rights for all). Expanding the number of countries beyond the 18 affluent countries analysed by Esping-Andersen (1990) implied that some countries could not be placed in the original classification, which resulted in the identification of additional welfare state regimes, namely Mediterranean (heavier reliance on the family relative to the conservative model; more recent welfare systems) and post-communist or Central and Eastern European (new welfare system being established following the demise of the communist regime). See also Tridico and Paternesi Meloni (2018) for an overview of the literature on welfare state regime classifications.

Based on Tridico and Paternesi Meloni (2018) and Hein et al. (2021) we group the 36 OECD countries that compose our sample in six welfare state regimes: Nordic, Social-democrat or Scandinavian; Continental, Conservative or Corporative; Liberal or Anglo-Saxon; Mediterranean or Southern European; Central and Eastern European Countries (CEEC); Others. Figure 1 contains the geographical distribution of the 36 OECD countries across the six welfare state regimes. Table 1 details the composition of each group.

Figure 1. Welfare state regimes across the OECD

Source: own elaboration using MapChart.

Table 1. Welfare state regimes typology and countries in our sample

Welfare state regime	**Sample of 36 OECD countries**								
Anglo-Saxon/ Liberal	Australia	Canada	USA	Ireland	New Zealand	UK			
Continental / Conservative/ Corporative	Germany	Austria	Belgium	Korea	France	Netherlands	Japan	Luxembourg	Switzerland
Nordic/ Social-democrat/ Scandinavian	Denmark	Finland	Iceland	Norway	Sweden				
Mediterranean	Spain	Greece	Italy	Portugal					
CEEC	Slovak Rep.	Slovenia	Estonia	Hungary	Latvia	Lithuania	Poland	Check Rep.	
Others	Chile	Israel	Mexico	Turkey					

Source: own elaboration.

In our review of previous empirical studies on the relationship between social expenditure and inequality we limit the discussion to what we believe is a representative sample that can provide an overview of recent developments in this area based on evidence for developed/high-income or OECD countries obtained from econometric models using aggregate data. We do not intend or

attempt to include all the previous studies on the topic under analysis[1]. Another popular approach is social spending incidence analysis that uses microdata for specific countries, see e.g. Kammer et al. (2012), Wang et al. (2014), Caminada et al. (2019). This approach is quite demanding in terms of data requirements regarding personal income distribution, it ignores incentives or behavioural effects that change the distribution of market (before taxes and transfers) income and renders generalisations more difficult. Kammer et al. (2012) is, to the best of our knowledge, the only study that examines the relationship between welfare state policies in the form of different taxes and transfers, the respective distributional outcomes and welfare state typologies. Using microdata for EU-15 countries the authors first apply incidence analysis to assess the redistributive effects of different taxes and social spending instruments. Next, they use hierarchical cluster analysis to determine whether the former results match established welfare state typologies, according to which redistribution is higher in the countries belonging to the Nordic and Continental regimes and lower in the countries that compose the Southern and Anglo-Saxon regimes. The five groups identified using the results from the incidence analysis align well with the former expectations in terms of welfare regimes, except for Belgium and the Netherlands that fall between the Nordic and Continental models.

Tridico (2018) is a recent study that examines the drivers of the increase in income inequality experienced by 25 high-income OECD countries over the period 1990-2013 using aggregate data and applying the feasible general least squares (GLS) estimator. Among the regressors considered in the empirical model is total public social expenditure as a percentage of GDP, found to have an inequality reducing effect that is quantitatively the most important relative to the other determinants of inequality included, financialisation, labour flexibility, employment protection legislation and trade union density. The focus in Bergh et al. (2020) is on the mediating role of overall social spending and health and education spending on the effects of economic globalisation on income inequality. Using a fixed effects model and data for the period 1970–2010 (divided into 5-year intervals) for 140 countries, the authors find that social spending alone is negatively associated with disposable income inequality, but only health spending is strongly and significantly associated with lower inequality, and especially in non-OECD countries. Also, the evidence found does not support the mediating role of social spending. Cammeraat (2020) runs regression models to study the relationship between social

[1] For a recent survey on the inequality effects of government spending see Anderson et al. (2017).

expenditure and the Gini coefficient, among other economic outcomes, with the main aim of disentangling the contribution of different social expenditure schemes, old age and survivors, incapacity, health, family, unemployment and active labour market policies and housing and others. The results from the preferred OLS model with panel corrected standard errors accounting for first order serial correlation and controlling for country and year fixed effects using a panel data set of 32 OECD countries over the period 1990-2015 indicate that total public social expenditure is negatively correlated with inequality and this inequality reducing effect seems to originate in old age and survivors' expenditure, unemployment and ALMPs and family benefits. Finally, Sauer et al. (2020) reappraise the explanations of the inequality trends observed in recent decades (1981-2010) highlighting the heterogeneity of inequality determinants between high- and low-income countries (30 high-income OECD countries plus 43 developing countries). The empirical analysis at the aggregate level using the feasible general least squares (GLS) estimator point to not significantly different from zero inequality effects of public spending on health and social protection and a positive impact of education spending in high-income OECD countries. This brief overview of the literature highlights the lack of studies that deal with the mediating role of welfare state regimes and studies that dig deeper into the inequality effects of the composition of social expenditure. Our work is a first attempt to fill these two gaps.

3. METHODOLOGY AND DATA

Our econometric analysis aims to establish whether and how social expenditure is associated with income inequality based on aggregate data for 36 OECD countries observed over the period 1980-2018. The dependent variable is inequality. The explanatory variable of interest is social expenditure, total and by types of spending. We first focus on overall social expenditure; next we consider different categories of social spending, corresponding to varied welfare programs. To estimate welfare state regime specific social expenditure effects, we group the 36 OECD countries in the six welfare state regimes described in the previous section.

The baseline panel regression specification is:

$$\begin{aligned} INEQ_{i,t} = \alpha + \beta_1 SOCX(x)_{i,t-1} + \beta_2 SOCX_{i,t-1} xLiberal \\ + \beta_3 SOCX_{i,t-1} xCorporatist + \beta_4 SOCX_{i,t-1} xMediterranean \\ + \beta_5 SOCX_{i,t-1} xCEEC + \beta_6 SOCX_{i,t-1} xOthers \\ + Z_{i,t-1}\theta + \eta_t + v_i + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where *INEQ* is income inequality; *SOCX* refers to social expenditure; *Liberal, Corporatist, Mediterranean, CEEC, Others* are the dummy variables for different welfare state regimes; $Z_{i,t-1}$ is a vector of control variables; η_t are the time-fixed effects that control for common business cycle effects; v_i are the country-specific fixed effects that control for time-invariant country-specific characteristics; and $\varepsilon_{i,t}$ is the error term; *i* identifies the country and *t* the year. The variables and respective sources are described in detail in Table 2.

Table 2 Variables and sources

Variable	Description	Source	Unit
Ineq	Gini coefficient of disposable income distribution (scale 0-100).	SWIID	(%)
SOCX(x)	Public social expenditure, % GDP (Total, Old age, Survivors, Incapacity related benefits, Health, Family, Active Labour Market Policies, Unemployment, Housing, Other social policy areas).	OECD SOCX	(%)
SOCX(edu)	Public expenditure on education, % GDP.	World Bank (WDI)	(%)
GDPpc	GDP per capita (expenditure-side) chained PPPs in mil. 2017US$.	Penn World Table 10.0	US$
EcGlob	Index of economic globalisation (scale 0-100).	KOF Institute	(%)
HumCap	Human capital index, based on years of schooling and returns to education	Penn World Table 10.0	index
TechProg	Total factor productivity (TFP) at constant national prices (2017=1)	Penn World Table 10.0	(%)
Unemp	Number of unemployed people as a percentage of the labour force.	OECD STAT	(%)
DepRatio	Ratio of dependents (people younger than 15 or older than 64) to the working-age population (aged 15-64).	World Bank	(%)
EmployProt	Indicator of the strictness of employment protection legislation (scale 0-6).	OECD STAT	index
TaxWeight	Personal income taxes (% GDP)	OECD STAT	(%)

Source: own elaboration.

Although we include several control variables, to address one of the problems that afflict panel data models, omitted-variable bias that can result in endogeneity in the form of potential correlation between the regressors and the error term and thus inconsistent estimates, we use the fixed-effects method to estimate our empirical model described by equation (1), including country-specific characteristics that possibly determine the behaviour of inequality but remain constant over time (v_i). Endogeneity may also exist due reverse causality as social expenditure (and other control variables) may also be influenced by income inequality, Cammeraat (2020). To overcome to some extent this problem we considered the values of the explanatory variables lagged one period. Thus, we assume that inequality in the current period does not influence the explanatory variables in the previous period. Additionally, since considering fixed effects alone cannot correct for cross-sectional and time dependence, essential conditions to minimize the error term and make statistical inference valid, we also apply the correction proposed by Driscoll and Kraay (1998) that consists in recalculating the standard errors assuming the error structure to be heteroskedastic, autocorrelated up to some lag and possibly correlated between groups/panels (Hoechle, 2007).

The dependent variable in our empirical model, $Ineq_{it}$, is measured as the Gini coefficient of income (after taxes and transfers) distribution from the SWIID database (Solt, 2020). SWIID data is taken mostly from UNU-WIDER (2021) but has extended coverage both for countries and years using imputation methods. Extended data coverage is convenient for panel data analysis. Nevertheless, some researchers raise concerns about using this secondary data source, specifically regarding the imputed values for data-poor regions and the fact that it includes non-reported low quality observations from WIID, as pointed out by Ferreira et al. (2015) and Jenkins (2015). These criticisms are however less relevant for our database since we only include OECD countries observed over the period 1980 to 2018 thus fitting the subset of observations with the highest quality on WIID, see Table 1 in Jenkins (2015) for more details.

We study different public social expenditure indicators (as a percentage of GDP), *SOCX(x)*, retrieved from the OECD Social Expenditure Database (OECD SOCX). OECD SOCX provides data on total public social expenditure and also on spending in nine welfare programs: Old age, Survivors, Incapacity-related benefits, Health, Family, Active Labour Market Policies (ALMPs), Unemployment, Housing, and Other social policy areas. Additionally, we use the World Development Indicators (WDI) from the World Bank to retrieve data on public education expenditure as a percentage of GDP, not included in public social expenditure from OECD SOCX.

To estimate welfare regime-specific social spending effects we include in the baseline regression interaction terms between social expenditure and the dummy variables representing the different welfare state regimes: *Liberal* for the Anglo-Saxon or liberal welfare model; *Corporatist* for the continental, conservative or corporatist welfare model; *Mediterranean* for the Mediterranean or Southern European welfare model; *CEEC* for the Central and Eastern European countries welfare model; and *Others* for the others welfare model. The reference group is the Nordic or social-democrat welfare model, thus excluded as an interaction term. The impact of social expenditure in the Nordic regime is given by β_1 while β_2, β_3, β_4, β_5 and β_6 give the effect of globalisation in Liberal, Corporative/Continental, Mediterranean, CEEC and Others welfare state regimes, respectively, relative to the impact in the Nordic welfare model. For each of the former regimes, the association between social expenditure and inequality is measured by the sum of β_1 with the estimated coefficient for the respective interaction term with social expenditure. We follow the approach in e.g. Leibrecht et al. (2011), Onaran and Boesch (2014), Yay and Aksoy (2018) and Santos and Simões (2021) that investigate welfare state-specific impacts of globalisation on social expenditure.

Figures 2 and 3 contain data on average income inequality and total public social expenditure as a percentage of GDP, respectively, across the six welfare regimes over the period 1980-2018. According to the data on the Gini coefficient of disposable income presented in Figure 2, inequality is persistently higher in the Others regime (despite a slight negative trend since the 2000s), followed although at a considerable distance by the Mediterranean and Liberal models. The latter two regimes start with different inequality levels, higher in the Mediterranean regime but the rise in inequality in the Liberal regime up until the late 1990s resulted in similar inequality levels from this period onwards. The Corporative and CEEC regimes also record similar inequality levels from the mid-2000s onwards after an important rise in the CEEC countries from the late 1980s until the mid-2000s. In any case, both groups always record lower inequality levels than the Liberal and Mediterranean regimes. Finally, the Nordic regime is the one with the lowest inequality levels, although it witnessed a rise during the 1990s. As shown in Figure 3, total public social expenditure as a percentage of GDP shows a positive trend towards higher levels at the end of the period in all welfare state regimes, although at different paces and with some fluctuations, more noticeable in the CEEC regime after the transition from the communist influence. In any case, the size of social spending differs considerably across welfare state regimes, quite lower in the Others regime and remaining so for the entire period in spite of some convergence to the higher spending levels of the remaining regimes. At the

other extreme, we have as expected the Nordic and Corporative regimes for which social expenditure starts at similar levels, becomes relatively higher in the Nordic model until the mid-1990s but then decreases to the Corporative regime levels and goes hand-in-hand until the end of the period. Starting with somewhat lower spending we have the Liberal and Mediterranean regimes, but while the former ends the period with higher spending but still at some distance from the Nordic and Corporative regime, the Mediterranean model catches up with the spending levels of the latter. Data for the CEEC regime is available only from 1990s onwards revealing that after some initial fluctuations it catches up with the social expenditure levels of the Liberal model from the mid-2000s onwards.

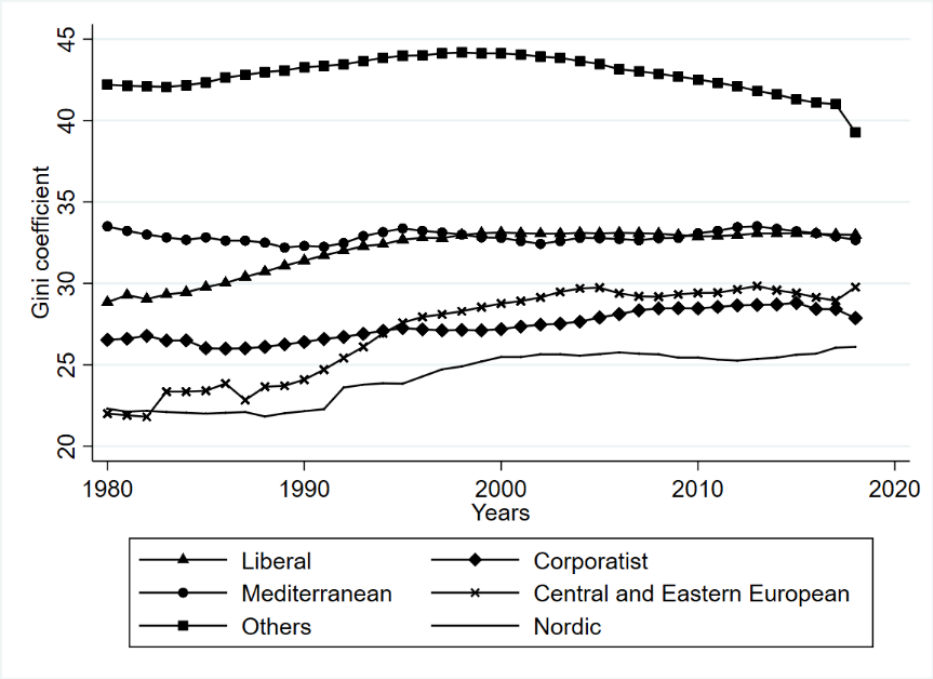

Figure 2. Gini coefficient (disposable income) across the six welfare state regimes, 1980-2018

Source: authors based on data from SWIID.

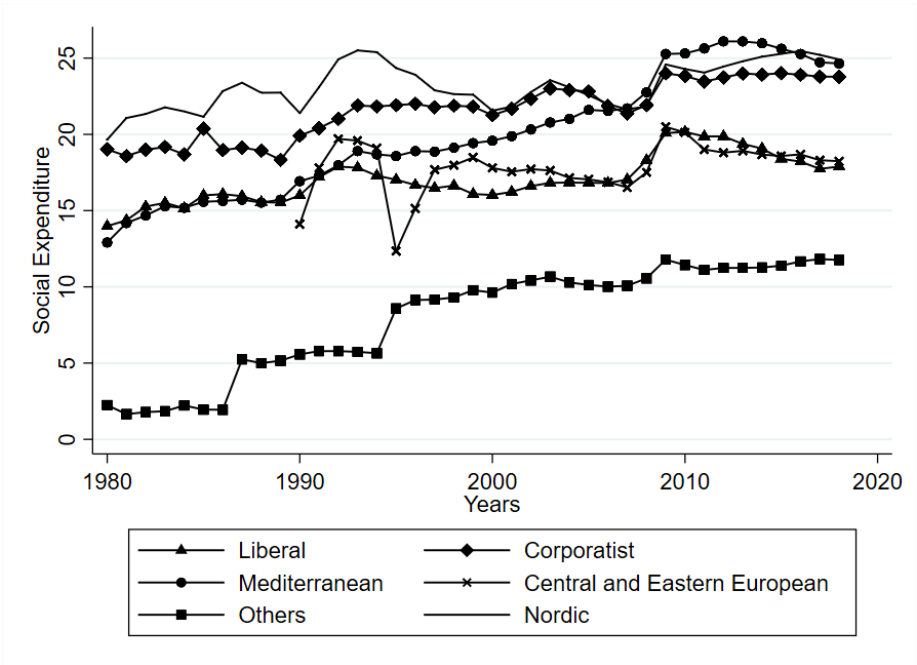

Figure 3. Total public social expenditure (%GDP) across the six welfare state regimes, 1980-2018

Source: authors based on data from OECD SOCX.

The data on inequality and social expenditure presented in Figures 2 and 3 hints at an inverse relationship between social expenditure and income inequality, measured as the Gini coefficient of disposable income, which is confirmed by the negative correlation coefficient presented in Table 3 (-0.61). Digging deeper into the composition of social expenditure leads to some interesting tentative evidence: except for housing expenditure all other types of spending present a negative correlation coefficient with the Gini index but revealing different intensities for this association. Incapacity benefits record the strongest association (-0.65), followed by family benefits (-0.55) and ALMPs (-0.5), while the three largest spending components (see Table 4) come next, education (-0.41), old age pensions (-0.39) and health spending (-0.39). The estimation of equation (1) considering other potential determinants of income inequality will allow us to present more robust evidence on these relationships and identify differences across welfare state regimes.

Table 3. Correlation matrix between inequality and the size and composition of social expenditure (full sample)

Label	A	B	C	D	E	F	G	H	I	J	K	L
A	1.00											
B	-0.61	1.00										
C	-0.50	0.66	1.00									
D	-0.55	0.67	0.51	1.00								
E	0.05	0.15	0.29	0.39	1.00							
F	-0.39	0.75	0.33	0.48	0.26	1.00						
G	-0.65	0.66	0.63	0.66	0.08	0.26	1.00					
H	-0.39	0.83	0.40	0.36	-0.13	0.52	0.40	1.00				
I	-0.11	0.44	0.16	-0.05	-0.30	0.28	0.05	0.50	1.00			
J	-0.31	0.48	0.45	0.17	0.15	0.28	0.31	0.16	0.37	1.00		
K	-0.22	0.16	0.23	0.14	0.23	0.22	0.14	-0.08	-0.26	0.11	1.00	
L	-0.41	0.49	0.41	0.66	0.30	0.36	0.57	0.20	-0.27	0.12	0.45	1.00

Notes: the labels correspond to the following variables: A – Gini index of the distribution of disposable income; B - Total social public expenditure; C - ALMPs; D - Family benefits; E - Housing; F - Health; G - Incapacity; H - Old Age Expenditure; I - Survivors; J - Unemployment benefits; K - Other social policy areas; L - Education. All spending (B to L) is measured as a percentage of GDP.

Source: own elaboration.

A core set of other explanatory variables that previous relevant studies have shown to be associated with inequality are included in vector Z of control variables (Tridico, 2018; Roser and Cuaresma, 2016; Bergh et al., 2020; Cammeraat, 2020; and Sauer and Zagler, 2014). These control variables reflect important drivers of inequality identified in recent decades that are commonly grouped in the following major dimensions: (i) globalisation, (ii) human capital, (iii) technological change, (iv) macroeconomic conditions, (v) demographics and (vi) labour market institutions. To account for (i) we include as explanatory variable economic globalisation (*EcGlob*) proxied by the KOF index of economic globalisation that varies from 0 to 100 with higher values reflecting countries more open to the world markets. This index is computed based on data on trade and financial flows and regulations. Higher economic globalisation is expected to increase inequality in developed economies based on comparative advantages and associated specialisation pattern. Since capital and skilled human capital are relatively more abundant, developed countries export capital- and skill-intensive goods and import low-skilled, labour-intensive goods, which increases the returns to capital owners and skilled workers. To

reflect the impact of (ii), human capital is measured by an index that considers both the quantity (average years of schooling) and the quality (returns to different schooling levels) of education, *HumCap*. An increase in human capital can lead to an increase in inequality if it is concentrated in a small share of the population. However, as increases in human capital become widespread, the associated wage compression effect due to the increase in the supply of more educated workers results in a decrease in inequality. Total factor productivity (*TechProg*) is our proxy for (iii) technological change. Skilled biased technological change is believed to increase income inequality since it increases demand for more skilled workers and the respective wage premium rises. The influence of macroeconomic conditions (iv) on inequality is considered through the introduction of the unemployment rate (*Unemp*). Higher unemployment will result in more inequality if low wage workers witness a reduction in their bargaining power that keeps or even lowers the respective wages. Dimension (v) demographics is accounted for through the age dependency ratio (*DepRatio*), which is expected to increase inequality e.g. because ageing leads to a decline in the labour share. Labour market institutions (vi) are reflected in the variable that measures the strictness of employment protection legislation (*EmployProt*) that goes from 0 (more flexible labour market) to 6 (less flexible labour market). The impact of a more strict employment protection legislation on inequality is ambiguous. On the one hand it can protect workers from wage losses if they are dismissed but it can also lead to segmentation in the labour market increasing unemployment in certain more vulnerable groups, e.g. young workers. In addition to proxies of the former six dimensions of determinants of inequality, we also include the level of real GDP per capita (*GDPpc*, in logs) and its square to test the Kuznets hypothesis, Kuznets (1955), of an inverted U relationship between aggregate income and inequality. The original argument poses that as a country develops and moves from an agricultural based to a manufacturing based economy, inequality increases since productivity and wages are higher in the manufacturing sector. Nevertheless, as most of the workforce is incorporated in the manufacturing sector, and productivity increases in the agricultural sector, inequality starts to decline. However, since we are dealing with a sample of OECD countries where the majority is transitioning from manufacturing to services economies, composed of high productivity modern services with higher wages but also traditional services where the potential for productivity improvements is low, some recent studies identify for more recent periods a U shaped relationship (Lessmann, 2014; Soava et al., 2020). Finally, we also take into consideration the influence of taxes on inequality as an important instrument of welfare state intervention (besides social expenditure), measured as the share of personal income taxes in GDP (*TaxWeight*). A progressive tax structure is expected to decrease inequality and

the opposite applies to regressive taxes. Table 4 contains summary statistics for all the variables used in the estimation of equation (1).

Table 4. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ineq	1,313	30.40	6.23	17.50	50.70
SOCX Total	1,222	18.50	6.22	0	33.70
SOCX ALMP	1,127	0.51	0.44	0	2.68
SOCX Family	1,197	1.84	1.01	0	4.39
SOCX Housing	1,144	0.31	0.32	0	1.72
SOCX Health	1,222	5.01	1.64	0	8.86
SOCX Incapacity	1,197	2.21	1.26	0	6.03
SOCX Old Age	1,197	6.36	2.80	0	14.50
SOCX Survivors	1,185	0.46	0.48	0	3.61
SOCX Unemployment	1,197	0.95	0.77	0	3.36
SOCX Other	1,154	0.92	0.83	0	4.64
SOCX Education	947	5.06	1.24	0	8.56
EcGlob	1,336	67.39	14.03	30.87	92.77
HumCap	1,344	3.05	0.44	1.47	3.85
TechProg	1,320	0.93	0.12	0.52	1.44
GDPpc	1,344	33460.18	15415.71	5451.96	92910.38
Unemp	1,057	7.71	4.01	1.56	27.49
DepRatio	1,404	51.39	6.75	36.21	94.91
EmployProt	884	2.20	0.86	0.09	4.83
TaxWeight	1,238	8.68	4.59	0.87	26.20

Source: own elaboration.

4. RESULTS AND DISCUSSION

In the first part of our empirical analysis we focus on the mediating role of welfare state regimes on the effect of the size of public social expenditure on income inequality. We next investigate whether the distributional effect of different types of public social spending varies across welfare state arrangements. Table 5 reports the results of the estimation of equation (1) considering the alternative measures of public social spending.

Regardless of the social spending instrument considered, the estimated coefficients for most of the control variables are statistically significant. Our findings on the effect of economic globalisation on inequality are consistent with previous evidence, e.g. Roser and Cuaresma (2016), suggesting that as countries open to world markets income inequality increases, although the results are only statistically significant on four out of our total of eleven regressions. The estimated coefficient for the human capital variable is negative and statistically significant in all regressions again in line with Roser and Cuaresma (2016). As suggested by the literature on human capital (education in particular) and income inequality, higher human capital availability implies a more equal income distribution probably due to a 'compression' effect according to which as the average level of education increases and thus the supply of more educated workers, the earnings distribution becomes more equal. On the other hand, the positive estimated coefficients for our measure of technological change confirm the hypothesis that technology is skill-biased in the sense that it raises the demand for high skills resulting in a wage premium for the highly skilled that increases earnings and income inequality. Roser and Cuaresma (2016) also arrive at a positive estimated coefficient for their measure of technological progress although not statistically significant, while Sauer et al. (2020) find that technological change had an equalizing effect in high-income countries but only until the 1990s. The estimated coefficient for the level of real GDP per capita is negative and the estimated coefficient for its square is positive, suggesting the existence of a U-shaped relationship between real GDP per capita and inequality. This result differs from the Kuznets hypothesis that predicts an inverted U relationship. However, Kuznets poses that this happens because countries evolve from agricultural-based to industrial-based economies, while in our sample we have countries undergoing a transition from manufacturing to services economies (tertiarisation and deindustrialisation) (Roser and Cuaresma, 2016). Lessmann (2014) also finds evidence that inequality tends to again increase at very high levels of (regional) economic development and Soava et al. (2020) confirm the U shaped relationship for the older EU member states over the period 2005–2016. We additionally provide support to the hypothesis that a higher unemployment rate increases inequality suggesting that with higher unemployment comes reduced bargaining power for low income workers, which keeps their wages low, thus increasing inequality (Roser and Cuaresma, 2016). The effect of age structure in terms of the impact of the young and old dependency ratio on inequality is positive in line with the results in Bergh et al. (2020). Finally, we find that countries with higher tax burdens have more equal income distributions indicating that taxes accomplish in an efficacious way their redistributive function (Roser and Cuaresma, 2016).

Focusing on the results for our explanatory variables of interest reported in Table 5, we find that increasing total public social expenditure is beneficial for reducing inequality in most welfare state regimes and the magnitude of the reduction is especially high in the CEEC and Others regimes (column 1). The exception is the Nordic regime for which we find no statistically significant impact of total social spending on inequality. For high-income OECD countries considered as a whole (Sauer et al., 2020) associate this finding with progressive and regressive (e.g. because transfers are indexed to income, or due to privileges for certain occupational groups.) effects acting simultaneously and cancelling each other out. Using a different approach known as factor source decomposition, Fuest et al. (2010) conclude for a sample of EU countries that social expenditure plays a negligible or slightly positive role in explaining the behaviour of inequality, while taxes and social contributions lead to a reduction in income inequality. More specifically, they find that the equalizing effect of income taxes is highest in the Nordic countries although social expenditure also plays a (minor) role. The authors argue that this could be due to social expenditure having other goals besides redistribution, such as supporting families with children or older citizens.

However, the former results for the size of public social expenditure hide different effects for different types of social spending across welfare state regimes, as can be seen in Table 5, columns 2-11. In the Nordic regime, old age and health spending (also family and other social policy areas), the two components that represent the highest share of total public social expenditure, lead to an increase in inequality, while the remaining welfare programs produce no impact. These findings suggest that in the countries belonging to the Nordic regime the groups at the top of the income distribution benefit most from old age and health spending, Cammeraat (2020). In the Liberal regime, most types of social spending have an equalising effect; the exception is survivor's pensions, which increases inequality, while the effects of active labour market policies and unemployment benefits are not statistically significant. The results for the latter two types of spending could be a reflection of the small size or regressivity of those transfers. The largest inequality reducing coefficients are found for, respectively, health expenditures, education, old age pensions, family and incapacity benefits and finally housing. In the Corporative regime the statistically significant results, obtained with old age pensions, health, family benefits and other social policy areas (quantitative importance in this order) all correspond to a negative association between spending and inequality indicating that these social spending instruments have wider coverage or are more important in size rather than being targeted at the poor (Kammer et al., 2012; Cammeraat, 2020). Also, relative to the Liberal

regime, the most effective social spending instruments in terms of inequality reduction differ. The former results also apply to the Mediterranean regime, with additionally active labour market policies also having an equalizing effect, although presenting the smallest impact in terms of quantitative importance (and other social policy areas are slightly more effective than family benefits). Also similar are the results for the CEEC regime, except that higher unemployment benefits increase inequality and health spending is the most effective category in terms of inequality reduction. Finally, in the Others regime the diversity of results is higher with a positive impact of housing, survivors' pensions and other social policy areas, no effect from active labour market policies, incapacity and unemployment benefits, and a negative effect from health spending, old age pensions, family benefits and education expenditure, with the respective quantitative importance of the latter in this order. Interestingly, in all the welfare state regimes presenting a statistically significant equalising effect, health spending and old age pensions (in line with the results in Kammer et al. (2012)), the two most important types of spending in terms of GDP share are also in the top two positions as far as effectiveness in inequality reduction is concerned, suggesting that the size and coverage of social spending is the "(…) the most important factor for the redistributive performance of the welfare state." Kammer et al. (2012), p.457. Note also that education spending, another category that involves spending a higher GDP share, only leads to a decrease in inequality in the Liberal and Others welfare state regimes.

Table 5. Size and composition of social expenditure and inequality, conditional on welfare state regimes: estimation results

	Total (1)	**Family (2)**	**Health (3)**	**Old Age (4)**	**Other (5)**
SOCX(x)	1.225	0.662*	2.236**	1.638**	0.913*
	(0.991)	(0.381)	(0.910)	(0.752)	(0.484)
SOCX(x) x Liberal	-5.078***	-1.658***	-5.081***	-3.021**	-0.962***
	(1.176)	(0.556)	(0.772)	(1.118)	(0.311)
SOCX(x) x Corporatist	-2.570**	-2.028***	-2.940***	-2.961***	-1.233**
	(1.181)	(0.468)	(0.917)	(0.816)	(0.516)
SOCX(x) x Mediterranean	-3.990***	-0.949*	-1.785**	-4.188***	-1.074*
	(1.193)	(0.470)	(0.715)	(0.967)	(0.530)
SOCX(x) x CEEC	-5.946***	-2.499***	-4.605**	-4.379***	-0.247
	(1.636)	(0.700)	(2.097)	(1.149)	(0.455)
SOCX(x) x Other	-10.518***	-1.641*	-7.890***	-5.124***	2.250***

	Total (1)	**Family (2)**	**Health (3)**	**Old Age (4)**	**Other (5)**
	(1.987)	(0.959)	(1.699)	(0.890)	(0.714)
EcGlob	0.032*	0.036*	0.022	0.053***	0.039**
	(0.018)	(0.019)	(0.016)	(0.017)	(0.017)
HumCap	-1.388***	-1.449***	-2.834***	-1.378**	-1.225**
	(0.460)	(0.503)	(0.295)	(0.660)	(0.588)
TechProg	2.875***	3.603**	4.594***	3.065***	4.974***
	(0.737)	(1.368)	(1.229)	(0.807)	(1.086)
GDPpc	-13.217***	-13.074***	-14.240***	-11.921***	-11.023***
	(1.890)	(1.431)	(1.584)	(2.401)	(1.148)
GDPpc squared	0.415***	0.394***	0.441***	0.336***	0.289***
	(0.062)	(0.059)	(0.051)	(0.093)	(0.045)
Unemp	0.083***	0.027	0.041**	0.077**	0.027
	(0.023)	(0.021)	(0.020)	(0.032)	(0.024)
DepRatio	0.044	0.077***	0.024	0.040*	0.051*
	(0.027)	(0.021)	(0.017)	(0.024)	(0.028)
EmployProt	0.440*	0.461	0.473*	0.334	0.391
	(0.239)	(0.332)	(0.262)	(0.217)	(0.287)
TaxWeight	-0.047	-0.120***	-0.098***	-0.051	-0.073**
	(0.032)	(0.029)	(0.023)	(0.037)	(0.031)
Observations	754	754	757	754	743
Number of groups	36	36	36	36	36
P-value for joint F-test	0.000	0.000	0.000	0.000	0.000
Within-R squared	0.54	0.49	0.55	0.54	0.49

Table 5. Size and composition of social expenditure and inequality, conditional on welfare state regimes: estimation results (continued)

	ALMP (6)	Housing (7)	Incapacity (8)	Survival (9)	Unemployment (10)	Education (11)
SOCX(x)	0.304	-0.142	0.695	0.009	-0.210	1.688
	(0.249)	(0.350)	(0.680)	(0.395)	(0.148)	(1.976)
SOCX(x) x Liberal	-0.305	-0.862**	-1.348**	1.139**	0.293	-4.530**
	(0.278)	(0.396)	(0.610)	(0.514)	(0.175)	(1.714)
SOCX(x) x Corporatist	-0.314	-0.410	-0.403	0.323	0.652	-2.609
	(0.308)	(0.394)	(1.164)	(0.622)	(0.550)	(1.965)
SOCX(x) x Mediterranean	-0.739*	0.302	0.278	0.095	0.544	-0.897
	(0.369)	(0.324)	(1.517)	(0.495)	(0.393)	(2.467)
SOCX(x) x CEEC	-0.234	-0.038	-0.700	1.388	0.492*	-3.069
	(0.300)	(0.468)	(0.880)	(1.209)	(0.264)	(1.927)
SOCX(x) x Other	0.456	1.354**	0.684	3.372***	0.257	-3.875*
	(0.454)	(0.654)	(0.662)	(0.965)	(0.252)	(2.069)
EcGlob	0.026	0.031	0.024	0.007	0.048***	0.020
	(0.022)	(0.023)	(0.018)	(0.022)	(0.014)	(0.015)
HumCap	-0.812	-3.049***	-0.977*	-1.081**	-1.811***	-2.335***
	(0.544)	(0.634)	(0.533)	(0.515)	(0.565)	(0.761)
TechProg	4.503***	4.192***	5.101***	5.051***	3.643***	5.238***
	(1.032)	(0.581)	(0.902)	(0.812)	(0.794)	(1.068)
GDPpc	-12.875***	-9.266***	-12.372***	-12.784***	-15.636***	-15.975***
	(2.122)	(1.007)	(1.542)	(1.170)	(1.394)	(2.592)
GDPpc squared	0.401***	0.203***	0.385***	0.438***	0.497***	0.503***
	(0.060)	(0.061)	(0.032)	(0.033)	(0.049)	(0.094)
Unemp	0.042*	0.030	0.048**	0.048**	0.021	0.062**
	(0.022)	(0.026)	(0.023)	(0.021)	(0.028)	(0.029)
DepRatio	0.064**	0.073***	0.064**	0.069***	0.026	0.070***
	(0.027)	(0.020)	(0.026)	(0.019)	(0.036)	(0.019)
EmployProt	0.373	0.514	0.277	0.424	0.292	0.230
	(0.314)	(0.357)	(0.312)	(0.265)	(0.313)	(0.309)
TaxWeight	-0.103***	-0.126***	-0.090***	-0.097***	-0.095***	-0.054
	(0.028)	(0.023)	(0.029)	(0.030)	(0.034)	(0.054)
Observations	757	699	754	754	713	579

	ALMP (6)	Housing (7)	Incapacity (8)	Survival (9)	Unemployment (10)	Education (11)
Number of groups	36	35	36	36	35	36
P-value for joint F-test	0.000	0.000	0.000	0.000	0.000	0.000
Within-R squared	0.45	0.48	0.45	0.49	0.46	0.48

Notes: All regressions consider time dummies. Standard errors in parentheses computed using the Driscoll and Kraay (1998) methodology to account for heteroscedasticity and autocorrelation. *, **, ***, statistical significant at the 10%, 5% and 1% levels, respectively.

5. CONCLUSION

One way of addressing the growing level of inequality in income distribution in OECD countries is through public social spending. However, the level of indebtedness of many of these countries is high so that an increase in public expenditure may jeopardize public finances sustainability. Reallocating public social expenditure is a possible solution. This paper investigated whether it is possible to design welfare programs that more effectively reduce inequality by disentangling the contribution of different social policy areas according to welfare state regimes. For this purpose, we use annual data for 36 OECD countries over the period 1980-2018 on different components of social expenditure as a percentage of GDP and the Gini index of income distribution and estimate a fixed effects model with Driscoll-Kraay standard errors with inequality as the dependent variable and highlighting the mediating role of welfare state regimes on the effects upon inequality of ten different categories of social expenditure.

Taking a broad picture, regarding the results for our explanatory variables of interest, social expenditure and its components, it is possible to conclude that the sign of the relevant estimated coefficients varies according to the type of social spending considered, suggesting that a reallocation of social expenditure between different components, while keeping constant the overall value of public social expenditure, might be more effective in reducing inequality. Furthermore, these differences are context specific as far as welfare state regimes are concerned. The results suggest that in the Nordic regime social spending is not effective in reducing inequality and, in a few cases, it even results in more inequality. On the contrary, in the Liberal regime, most types of social spending have an equalising effect (health, education, old age, family,

incapacity, housing, in decreasing order of importance). The Conservative, Mediterranean and CEEC regimes are quite similar often presenting negative associations with inequality for the same categories of spending (old age, health, family), and the same applies to the not statistically significant results. Finally, in the Others regime the diversity of results in terms of sign and statistical significance is higher (inequality reducing effects of health, old age, education and family benefits, in decreasing order of importance).

What course of policy action does the evidence found suggest? Governments in all welfare state regimes (except maybe the Nordic) should pay particular attention to social expenditure on old age and healthcare as the instruments that our evidence suggest as more effective in combating income inequality. Family benefits and other social policy areas are also relevant in many regimes, while ALMPs, incapacity, unemployment benefits, housing and survivors' pensions are significant at most in two out of the six regimes, and in some cases with a positive sign. The former evidence suggests that reallocating spending across these different welfare programs could be an effective way of reducing inequality. This is particularly important if it is not possible to increase public expenditure but also in light of the results obtained for the other drivers of inequality, namely for real GDP per capita, since our findings suggest that as OECD countries become richer there will be a tendency for additional increases in inequality (U-shaped relationship). The most recent wave of technological change associated with automation and artificial intelligence is also expected to increase inequality (Goyal and Aneja (2020) and our results lend support to this hypothesis, evincing also the fundamental role of the welfare state. The evidence found additionally raises concerns on the distributional effects of demographic changes, suggesting that population ageing, an attribute of most OECD countries that is expected to worsen in the near future, will raise inequality. However, more research is needed to fully understand how welfare state configurations shape the impact of social expenditure on inequality in the distribution of income, shedding light on the differences found across regimes based on a more detailed analysis of the characteristics of welfare models, to render social policy a design more effective in reducing income inequality.

In the future, a natural extension of our work would be to compare wider samples of countries from different world regions taking into account 'global welfare regime classifications' as identified by Gough et al. (2004) that adapt and expand the classic welfare state paradigm to 59-65 developing and transitional countries using cluster analysis (se also Roumpakis (2020)). Additionally, expanding the analysis to include the role of the tax structure (e.g. income vs. capital vs. indirect taxes) on income inequality may allow for further

insights on the most effective fiscal policy design. Furthermore, other methods may be applied to address endogeneity issues as it would be premature to interpret our statistical findings as definite evidence of causal effects.

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