

**Report on Gender Equality
and Economic Growth in BSR and EAP countries.
Qualitative and Quantitative Approach**

EUSBSR FORUM FOR GENDER EQUALITY
& ECONOMIC GROWTH, 3.0
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Content of the Report

1. Introduction.....	3
2. Literature Review on Effects of Gender Factors on Economic Growth.....	6
3. The Augmented Solow Model Including Human Capital	9
4. Empirical study of the relation between economic growth and gender equality	11
4.1. Correlation analysis	13
4.2. Econometric analysis	22
5. Methodology of the Qualitative study	26
5.1. Qualitative study – Estonia	27
5.2. Qualitative study – Sweden	30
5.3. Qualitative study – Poland.....	32
6. Discussion.....	36
6.1. Quantitative Analysis.....	36
6.2. Qualitative Analysis.....	36
7. Conclusions.....	41
8. References.....	43

1. Introduction

Studies which aim at quantifying the relationship between economic growth and gender equality show a strong and positive correlation between the two dimensions (Lofstrom 2009, Klasen and Lamanna 2009). However, the way the GDP is calculated is subject to serious criticism pointing out that, among others, it ignores goods and services which are provided outside the market, such as household production and work, and misses and/or miscalculates some costs, such as environmental pollution, or treating speculative bubbles (like those on financial and real estate markets) as the GDP increase. New measures of progress are still under discussion but clearly the thinking is along the concept of the HDI – Human Development Index, introduced by the UNDP, which incorporates not only the GDP per capita but also life expectancy and the level of education (Klasen and Lamanna 2009).

The results of studies on the relation between the economic growth and gender equality have made the authors believe that it is necessary to take a broader view on the subject of their interest and to include the category of Sustainability, Entrepreneurship and Innovation into their considerations as it is the area that meets social, economic and environmental needs of present and future generations.

There are few publications dealing with the relationship between development and gender equality and the discussion is usually limited to the micro-level, whereas the macroeconomic issues have not been tackled until recently. What is more, the developing and the developed countries cannot be compared in terms of both development and time allocation (Stocky 2006).

The relation under this study is described as a ‘two-way street’ since economic development has a considerable effect on gender equality, and gender equality affects growth (Seguino 2009).

This opinion has been a starting point for considerations about the nature of this connection. In the reference literature authors mention its three types: casual connections, intentional connections and the connections of coexistence. The term ‘two-way street’ and the empirical analyses of the examined relationship that ignore time delay indicate that we are dealing with the connection of coexistence. Thereby the reason for this particular shape of the relation should be searched for somewhere else.

The global crisis in the years 2008-2012 apparently worsened the economic situation in the European countries which saw decrease in production volume, salaries, employment, income,

consumption and investment. The GDP growth rate went lower in wealthy countries that in the worse off countries after economic transformation. Despite the fact that the growth rates quickly recovered to its pre-crisis values, the quality of life of some population groups in Europe has evidently deteriorated (Stiglitz et al 2010). The quantitative analyses in this field, with a special focus on gross value added, were made by Lis (2010).

In many regions women's economic situation is hard, due to their disadvantageous position on the labour market, lower salaries and incomes as well as their stronger dependence on social protection. At the time of crisis, the situation gets even harder – therefore women's position on the labour market is often described as “last in – first out”. This means that they are less likely than men to find a good job and more likely to lose it (Izdes 2007). Similar situation was seen in the countries of Central and Eastern Europe during the transition process of the 1990s when sharp decline in the GDP took place resulting in job losses and cuts in social protection.

Research on links between gender, economic growth and development has proven that power of the mutual impact of these categories can differ significantly depending on the type of growth and key driving factors such as exports (Seguino et al. 2009).

In the majority of the European countries the necessity to increase female participation rate in employment is strongly emphasized by both economists and politicians. It is generally believed that it is the best way to reduce a growing gap in labour force due to ageing (except migration). Increased women's market activity means more effective allocation of human resources as well as better use of people's talents - both women and men, the consequence of which is a positive effect on economic growth. Gender equality has been thus described as ‘smart economics’ (Ruminska-Zimny 2009).

When it comes to the literature about the time allocation, it has to be admitted that it often relates to equality issues (Antonopoulos and Hirway 2010). A significant part of housework are activities performed on behalf of other adults in the family. These chores have their economic value, even though they are not taken into consideration in central national accounts. There have been attempts to change this approach by promoting the concept of satellite accounts (Stiglitz et al. 2010), the latter being complementary to the central accounts that focus on a “certain field or aspects of economic and social life e.g. unpaid household work in the context of national accounts” (OECD 2008).

In order to reach the desired level of men's and women's participation in economy their market and non-market activity must be balanced - their paid and unpaid work in particular. "3R" rule was proposed in that context: Rethink the concept of paid and unpaid work; Register the quantity of paid and unpaid work time; and Reallocate the unpaid work into paid one in the markets. This will surely help to design more effective policies addressing the crisis and boosting sustainable growth in the BSR (Hozer-Kocmiel, Zimoch 2010).

Despite public debate about the sustainability of development, gender issues are hardly ever discussed in this context. Research shows that women live in a more sustainable way than men and that their market activity is generally more environmentally friendly. What is more, some authors claim that gender equality is a prerequisite for sustainable development (Johnsson-Latham 2007).

It is necessary to conduct various kinds of studies based on interdisciplinary and multidisciplinary approaches to understand the reality of gender and its socio-economic relations. Therefore WCE® at the University of Szczecin conducted a qualitative and quantitative study as a part of the European Baltic Sea Region Forum for Gender Equality and Growth, 3.0 project.

Marta Hozer-Koćmiel, Małgorzata Guzowska and Anna Gdakowicz contributed to the quantitative study. Sandra Misiak-Kwit, Małgorzata Wiścicka-Fernando, and Shihan Fernando dealt with the qualitative analysis. The qualitative research was conducted by focusing on real-world scenarios from Poland, Sweden and Estonia. Britt-Marie Torstensson, Gertrud Åström, Sirje Vällmann, and Virve Transtok were responsible for the field survey and the questionnaire development process.

The first section of the report consists of a description of a qualitative study made in order to understand the relation between Gender Equality and Economic Growth in Baltic Sea Region (BSR) and Eastern Partnership (EAP) countries. The second section contains the summaries of the completed qualitative studies based on Estonia, Poland and Sweden.

2. Literature Review on Effects of Gender Factors on Economic Growth

The study of gender equality and its impact on social, political, and economic aspects is a constant theme in the literature, due to the efforts in the social and political arenas to incorporate women in different decision-making areas under conditions of equality with men. Inclusive economic growth means that the effort to advance a country's growth and development should be produced with the contribution of all citizens without excluding an important group of the society, more specifically, women. Considering the assessment that "gender equality brings about economic growth, but economic growth does not necessarily bring about gender equality" (Brashaw et al. 2013), most of the authors focused on the gender factors that trigger an increase in and stimulate economic growth in a country, for both low and high-income countries, and thus result in inclusive economic growth.

Based on the review by the Cabeza-García, Del Brio, and Oscanoa-Victorio (Cabeza-García et al. 2018), we can define the four most pervasive hypotheses about the relationship between economic growth and gender equality.

- Hypothesis 1 (H1). With a higher educational level of women, greater economic growth is expected.
- Hypothesis 2 (H2). With a higher participation of women in the labour market, greater economic growth is expected.
- Hypothesis 3 (H3). With higher fertility and fecundity, lower economic growth is expected.
- Hypothesis 4 (H4). With the greater participation of women in the democratic system, greater economic increase is expected.

The expansions of the above hypotheses are presented in table 1 (see next page).

Table 1. Expansion of four hypotheses about the relationship between economic growth and gender equality

Hypothesis 1 (H1) With a higher educational level of women, greater economic growth is expected	
<ul style="list-style-type: none"> • The relationship between the education levels of women and economic growth has been previously studied, with contradictory results since evidence exists for both a negative and positive relationship. 	(King and Hill 1993) (Knowles et al. 2002)
<ul style="list-style-type: none"> • The education gender gap was found to block economic growth and significantly reduce GDP, when modelled theoretically. 	(Licumba et al. 2015) (Cuberes and Teignier 2012) (Qureshi et al. 2011)
<ul style="list-style-type: none"> • Most of the researchers used the access of women to primary education measured by the number of girls in school, or the access of women to secondary education. Few studies measured the access of women to university, although a positive relationship between economic growth and university studies were identified. 	(Barro and Lee 1994) (Klasen and Lamanna 2009) (Barro and Lee 1996) (Barro and Sala-i-Martin 2003)
<ul style="list-style-type: none"> • Studies indicated that gender inequality in education reduces the average amount of human capital in a society and, therefore, harms economic growth. 	(Hakura et al. 2016) (Knowles et al. 2002) (Dollar and Gatti 1999) (Forbes 2000) (Klasen 2002) (King and Hill 1995)
Hypothesis 2 (H2) With a higher participation of women in the labour market, greater economic growth is expected	
<ul style="list-style-type: none"> • Most authors, with few exceptions, have found a positive relationship between the greater access of women to employment and economic growth. 	(Cuberes and Teignier 2012) (Moghadam 2003) (Baliamoune-Lutz and McGillivray 2007) (Elborgh-Woytek et al. 2013)
<ul style="list-style-type: none"> • Two measures of inequality have been used in analysed papers: the proportion of women participating in the overall labour force, and the proportion of the female population of working age in formal employment. 	(Klasen and Lamanna 2009) (Klasen 1999)

Hypothesis 3 (H3) With higher fertility and fecundity, lower economic growth is expected	
<ul style="list-style-type: none"> The changes in fertility and the age structure can affect the rates of national savings and investment and increase productivity by improving the health and education of each child. 	(Bloom et al. 2012) (Deaton and Paxson 1997) (Lee et al. 2001) (Goldin 2014) (Angelov et al. 2016) (Kleven and Landais 2017)
<ul style="list-style-type: none"> Lower fertility can induce higher rates of business activity or employment for women especially in low-income countries. It has been confirmed that fertility has a negative and significant effect on the rate of GDP growth, whereas fertility and the income per capita have been shown to be positively associated in the majority of high-income OECD countries. This relationship is also produced when salaries increase, the salary gap persists (Hartman 2010), and the results of fertility are translated into higher salaries for women (Kumara 2013). The necessity of good social planning so that fertility significantly raises the production per capita has been demonstrated. 	(Bloom et al. 2009) (Hartmann 2010) (Day 2012) (Komura 2013) (Razin and Sadka 1995) (Golosov et al. 2007) (Kleven 2019)
Hypothesis 4 (H4) With the greater participation of women in the democratic system, greater economic increase is expected	
<ul style="list-style-type: none"> Early research on the relationship between economic growth and democracy underscored a positive relationship between the two variables. The greater proportion of women with legislative power would help introduce new policies for social and economic development that also empower women. These policies include establishing gender quotas, redirecting the distribution of wealth, and eliminating discrimination against women, since women politicians know the many difficulties, they have faced to dedicate themselves to politics. 	(Lipset 1959) (Bolleen 1979) (Kabeer and Natali 2013) (Ramanayake and Ghosh 2017) (Gerring et al. 2005)

Source: own study.

3. The Augmented Solow Model Including Human Capital

Solow (1956) developed a model from the neoclassical production function and assumed diminishing marginal returns to capital, exogenous population growth and savings rate, no depreciation and technological progress. The model predicts how the steady-state level of income per capita depends on the savings rate and the population growth rate, which leads to the view of convergence. In testing the Solow model, Mankiw, Romer and Weil (1992) presented the augmented Solow growth model which yielded up with an equation that includes both physical and human capital as the fundamental determinant of growth. It sees output growth as an element of physical capital, human capital, exogenous labour growth rate and technological improvement.

Hence the researchers derived the augmented Solow growth model containing the variable for human capital (Mankiw et al. 1992):

$$Y = Af(K, H, L) \quad (1)$$

where:

Y – output

A – technology level

K – physical capital

H – human capital

L – inputs of labour

By arranging this model into a Cobb-Douglas production function one gets:

$$Y(t) = K(t)^\alpha H(t)^\beta (A(t)L(t))^{1-\alpha-\beta} \quad \alpha + \beta < 1 \quad (2)$$

The parameters a and b are the output elasticities with respect to physical and human capital (shares of physical and human capital in total income), respectively. Mankiw, Romer and Weil (1992) extended the Solow dynamics of physical capital accumulation to human capital. Thus, the dynamics of growth takes the form:

$$\dot{K}(t) = s_k Y(t) - \delta K(t) \quad (3)$$

$$\dot{L}(t) = nL(t) \quad (4)$$

$$\dot{A}(t) = gA(t) \quad (5)$$

$$\dot{H}(t) = s_h Y(t) - \delta H(t) \quad (6)$$

Where s_k and s_h denote the fraction of output devoted, respectively, to physical and human capital accumulation, n is the rate of growth of labour, g is technological progress, and d is the rate of depreciation. A dot over a variable indicates the derivative with respect to time. Assuming the existence of a steady state with $\alpha + \beta < 1$, Mankiw, Romer and Weil (1992) obtained the following steady-state estimable version of the model:

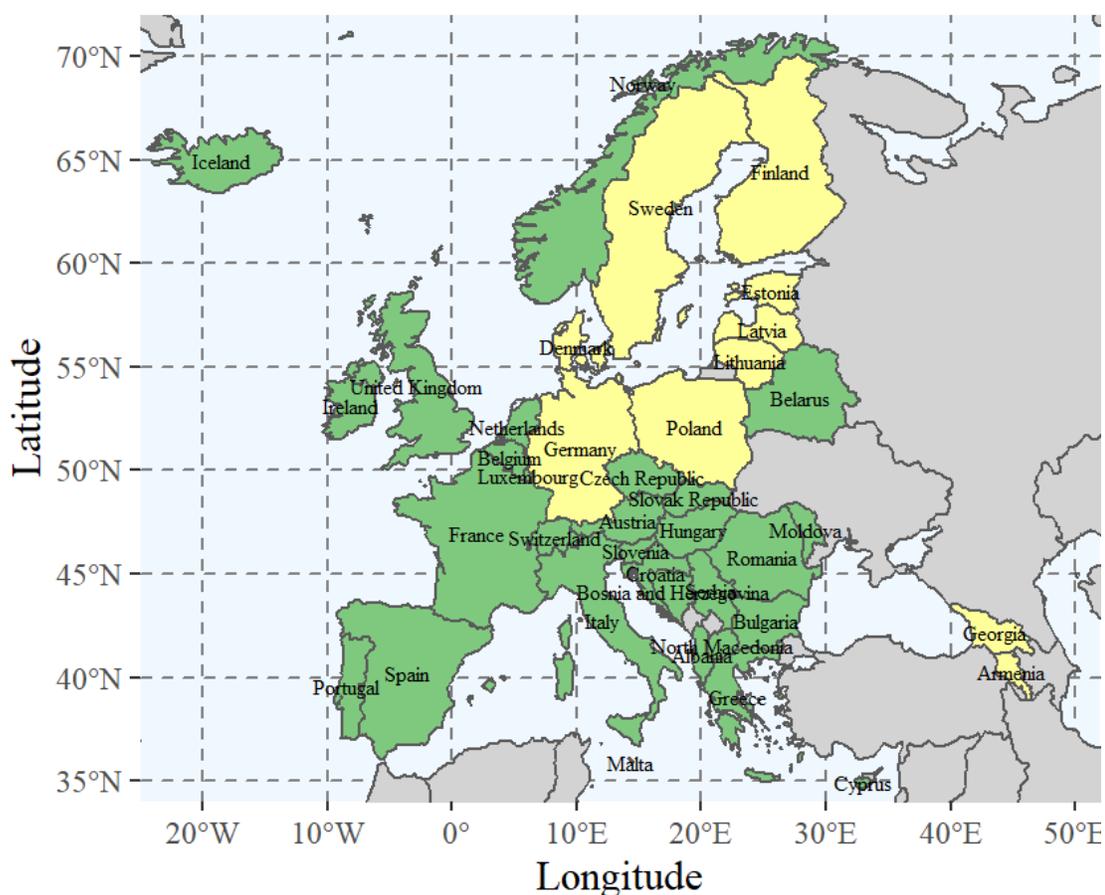
$$\ln \frac{Y_t}{L_t} = \ln A(0) + gt + \frac{\alpha}{1 - \alpha - \beta} \ln(s_k) + \frac{\beta}{1 - \alpha - \beta} \ln(s_h) - \frac{\alpha + \beta}{1 - \alpha - \beta} \ln(n + g + \delta) \quad (7)$$

Equation (7) provides the basic framework for testing the augmented Solow model. The model predicts that the steady-state level of income per capita is positively affected by investment in both physical and human capital and negatively affected by population growth, depreciation, and exogenous technological progress, and requires that they coefficients sum to zero.

4. Empirical study of the relation between economic growth and gender equality

Initially, the study was planned to cover all European countries. However, the completeness of data was not at an acceptable level, so we selected 37 countries (marked in green and yellow on the map). In addition, we placed emphasis on countries associated with the Winnet: Baltic Sea Region (BSR) and Eastern Partnership (EAP) countries (marked in yellow), so the group of European countries was expanded to include two countries outside the Europe – Georgia and Armenia. Ultimately, we analysed 39 countries (figure 1).

Figure 1. The countries under analysis



Source: own study.

Solow's augmented growth model that includes the impact of gender has been proposed:

$$Y_i = Af(X_{1i}, X_{2i}, X_{3fi}, X_{3mi}, X_{4fi}, X_{4mi}, X_{5fi}, X_{5mi}, u_i) \quad (8)$$

where:

Y_i – GDP per capita (PPP),

X_{1i} – Capital stock (PPP),

X_{2i} – Population,

X_{3fi} – Female net enrolment rate (%),

X_{3mi} – Male net enrolment rate (%),

X_{4fi} – Female labour participation rate (%),

X_{4mi} – Male labour participation rate (%),

X_{5fi} – Mean nominal monthly earnings of female employees (PPP),

X_{5mi} – Mean nominal monthly earnings of male employees (PPP),

u_i – random component.

All variables that are presented in money units have been converted to PPP¹. According to the theory of growth models, we proposed the following variables:

Y_i – GDP per capita – this is the dependent variable. The variable is stated in current PPP.

The next variable, represents **the capital** impact – K:

X_{1i} – This explanatory variable is the country's level of capital stock. The variable was calculated from the gross capital formation given in % of GDP (from the WDI) and multiplied with GDP for each year to find the actual gross capital formation. This variable should have a positive impact on GDP since capital is related to investment. A higher level of capital generates higher level of capital per worker, all else equal, hence higher level of production output.

Human capital is defined by the next three variables – H:

X_{2i} – This explanatory variable is the country's total population. The variable is assumed to have a positive impact on GDP, all else equal, since a larger share of population increase production.

¹ Purchasing power parities (PPPs) are the rates of currency conversion that try to equalize the purchasing power of different currencies, by eliminating the differences in price levels between countries. The basket of goods and services priced is a sample of all those that are part of final expenditures: final consumption of households and government, fixed capital formation, and net exports. This indicator is measured in terms of national currency per US dollar.

X_{3fi} – Female net enrolment rate or female primary school completion rate. This explanatory variable denotes the percentage of female students completing last year of primary school stated as a share of all females in the relevant age group. An increased level of females completing last grade of primary school is expected to have a positive impact on GDP.

X_{3mi} – Male net enrolment rate (%) – the same variable for men, and also expected positive impact. Our variables refer to school completion at the elementary level².

The last variables represent the inputs of **labour** – L:

X_{4fi} , X_{5fi} – Female and male labour participation rate (%) – This explanatory variable show the proportion females (and males) in the labour force as a share of all females (males) in the age over 15 which are economically active, i.e. all people supplying the labour force in the production of goods and services. This variable is expected to influence GDP positively since when more females (males) enter the labour force the output of production is expected to increase and hence also the level of GDP.

The last two dependent variables (X_{5fi} i X_{5mi}) refer to the average nominal monthly earnings of women and men employees, respectively. These variables are expected to have a positive impact on GDP because when workers earn more, so they get richer, GDP also increases.

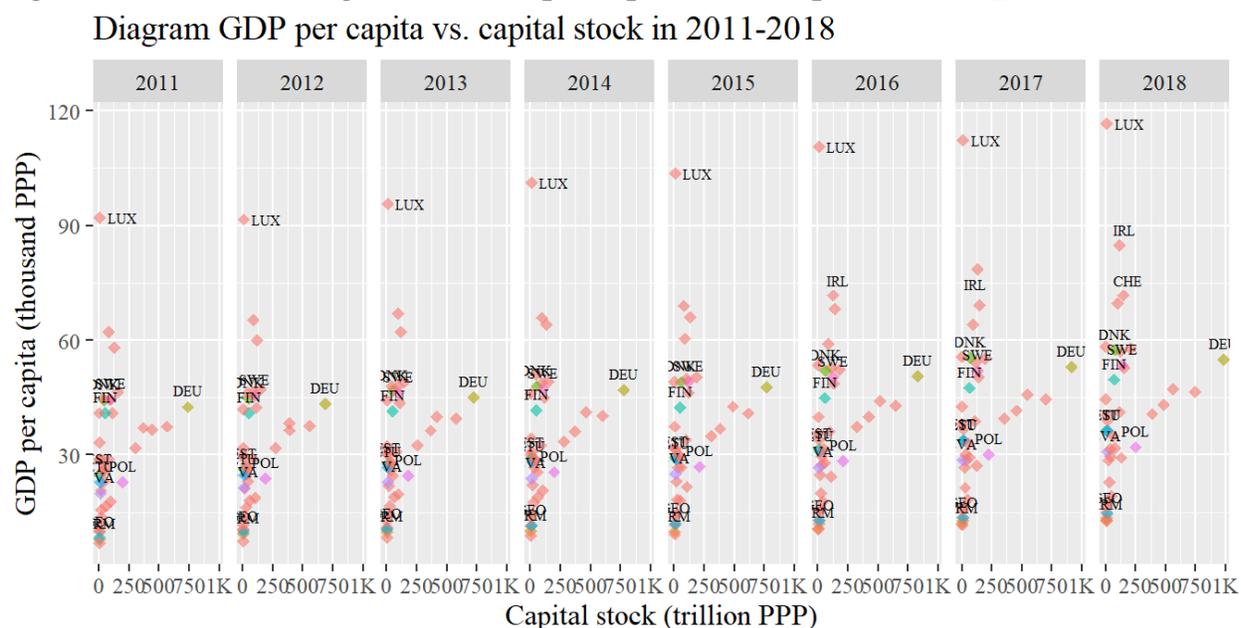
All data were obtained from WDI – World Bank’s data base and international labour organization – ILO. Data were collected for the years 2011-2018.

4.1. Correlation analysis

We examined the correlation between each explanatory variable X_i and the dependent variable Y_i – GDP per capita in the following years. The results are presented in the figures 2-9. Baltic Sea Region (BSR) and Eastern Partnership (EAP) countries are marked as coloured dots and described by the abbreviation. In addition, we marked countries where GDP per capita was higher than 70 thousand PPP (Luxemburg, Ireland and in 2018 Switzerland).

² We considered the enrolment rate at secondary level, but unfortunately the data gaps were so great that we abandoned this idea.

Figure 2. Correlation diagrams of GDP per capita versus capital stock (X_{1i}) in 2011-2018



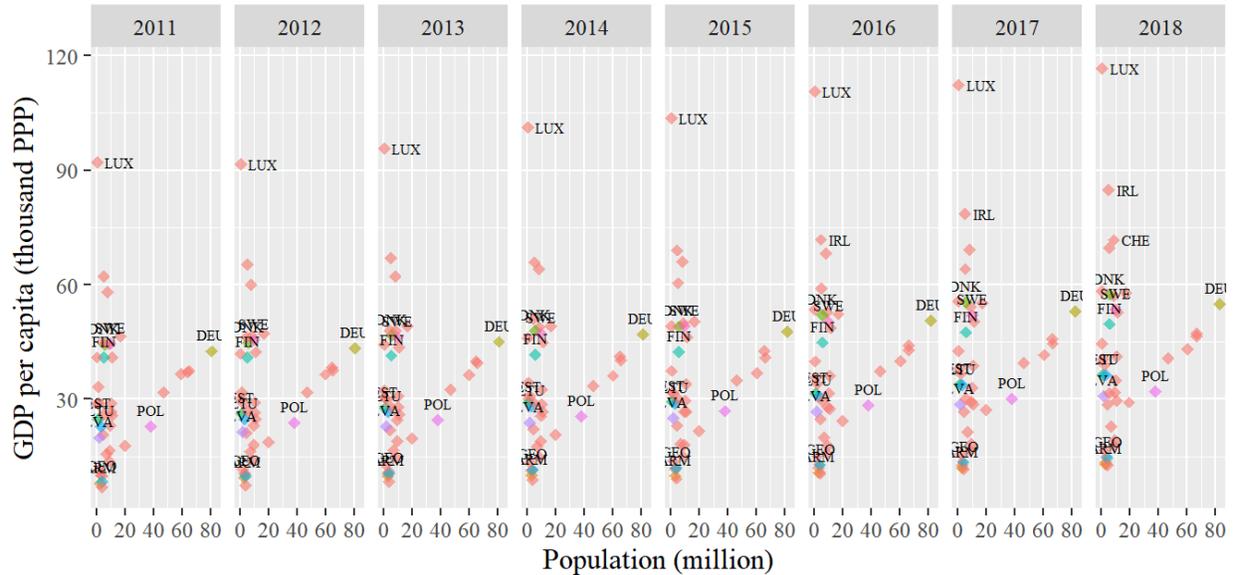
Source: own study.

BSR and EAP countries, based on GDP per capita, form three clusters: the first one – the richest countries: Scandinavian countries and Germany (GDP over 40 thousand PPP per capita), the second cluster – post soviet countries: Estonia, Lithuania, Poland and Latvia (GDP: 23-29 thousand PPP per capita), and the third cluster – two Asian countries – Georgia and Armenia (about 11 thousand PPP per capita). The lowest GDP was seen in Moldova.

A positive trend is the GDP growth in all BSR and EAP countries in the analysed years. The highest level of capital stock was in Germany at over 740 trillion PPP (740 in 2011 – 980 w 2018), then Poland – about 200 trillion PPP, the Scandinavian countries – 40-50 trillion PPP. The lowest level in 2011 was seen in Estonia, Armenia and Georgia – about 7 trillion PPP. Only Armenia remained below 10 trillion PPP in 2018 .

Correlation between variables in the following years was weak and not statistically significant – 0,237.

Figure 3. Correlation diagrams of GDP per capita versus population (X_{2i}) in 2011-2018
 Diagram GDP per capita vs. population in 2011-2018



Source: own study.

The country with the largest population was Germany with over 80 million inhabitants, followed by Poland with about 38 million inhabitants. The least populated countries covered by the analysis were: Armenia, Lithuania and Latvia – with populations below 3 million people.

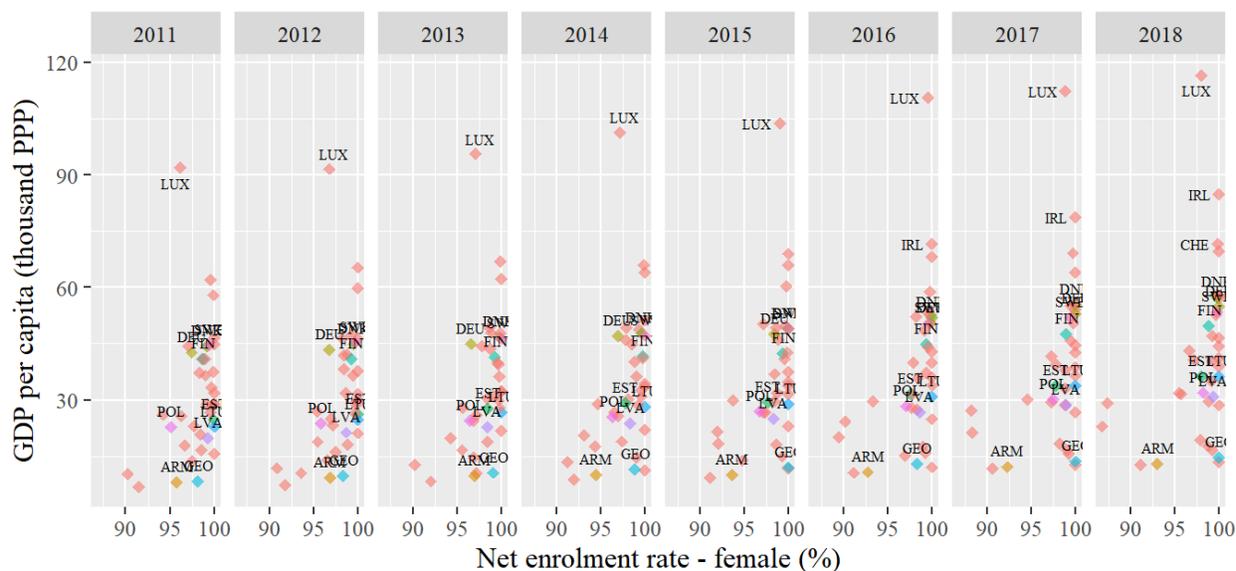
In some countries the number of inhabitants increased in 2018 compared to 2011. This was the case of Germany, Sweden, Denmark, Finland and Armenia. In other countries, the figure decreased: from 0.3% in Estonia to more than 9% in Lithuania.

No correlation was observed between GDP per capita and country population³.

³ We also considered only working-age population, or the growth of their number, but the time range of the study resulted in very low variation in these variables, and thus the variables had an insignificant impact on GDP.

Figure 4. Correlation diagrams of GDP per capita versus net enrolment female rate (X_{3fi}) in 2011-2018

Diagram GDP per capita vs. NER_f in 2011-2018



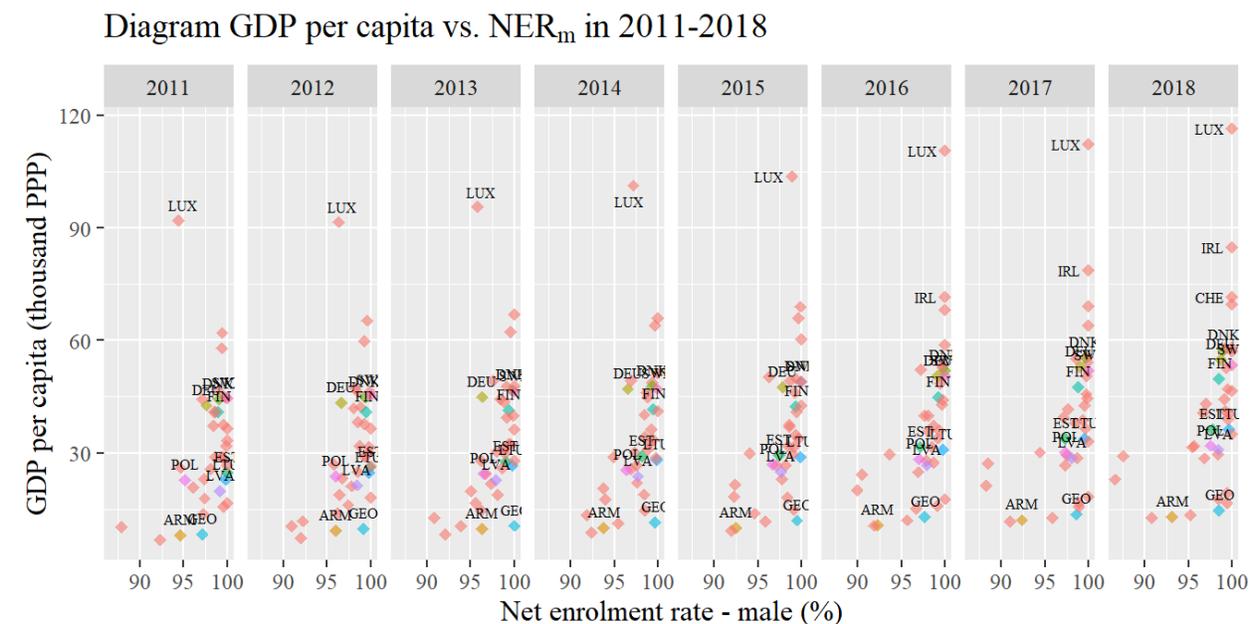
Source: own study.

The net enrolment rate is an indicator that relates to primary education, and we would expect 100% of girls (and boys) to complete elementary school without delay.

In 2011, only in Lithuania did 100% of girls complete elementary school. In Denmark, Estonia, Latvia, Sweden girls were also in a good situation – the rate was over 99%. In 2018, the rate of over 99% was reported in the following countries: Germany, Denmark, Georgia, Lithuania, Latvia, and Sweden. In most cases the indicator has improved. The exceptions were Armenia with the rate falling from 96% to 93% and Estonia with the decrease from 100% to 98%.

Also this indicator was not significantly correlated with GDP.

Figure 5. Correlation diagrams of GDP per capita versus net enrolment male rate (X_{3mi}) in 2011-2018



Source: own study.

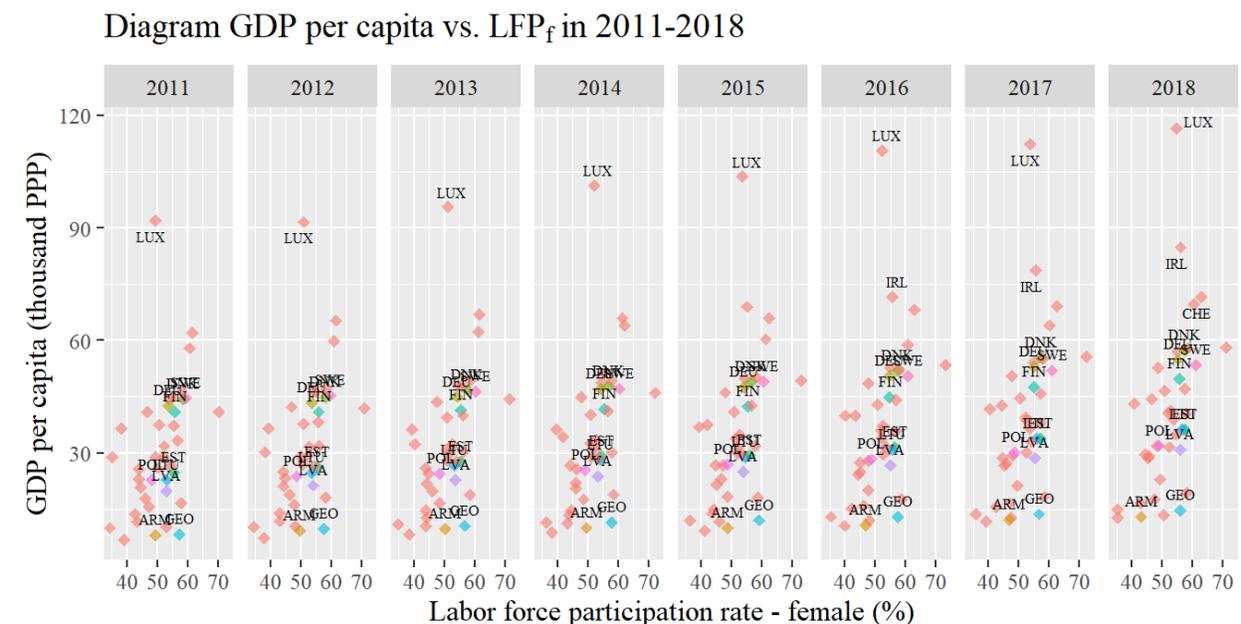
More girls than boys complete primary education on time, but the differences are very small, on the order of 1 percent, which means that completing primary school on time is not a gender issue, and the problem rather lies in the education system.

Half of the countries (5) reported a lower rate in 2018 compared to 2011 (Armenia, Estonia, Finland, Lithuania, Latvia). The largest decreases were in Estonia 2.3% and Armenia (reduction from 94.6% to 93%).

The lowest rate in 2018 was in Bulgaria and Romania (86%).

Also this indicator was not significantly correlated with GDP.

Figure 6. Correlation diagrams of GDP per capita versus female labour force participation rate (X_{4f}) in 2011-2018



Source: own study.

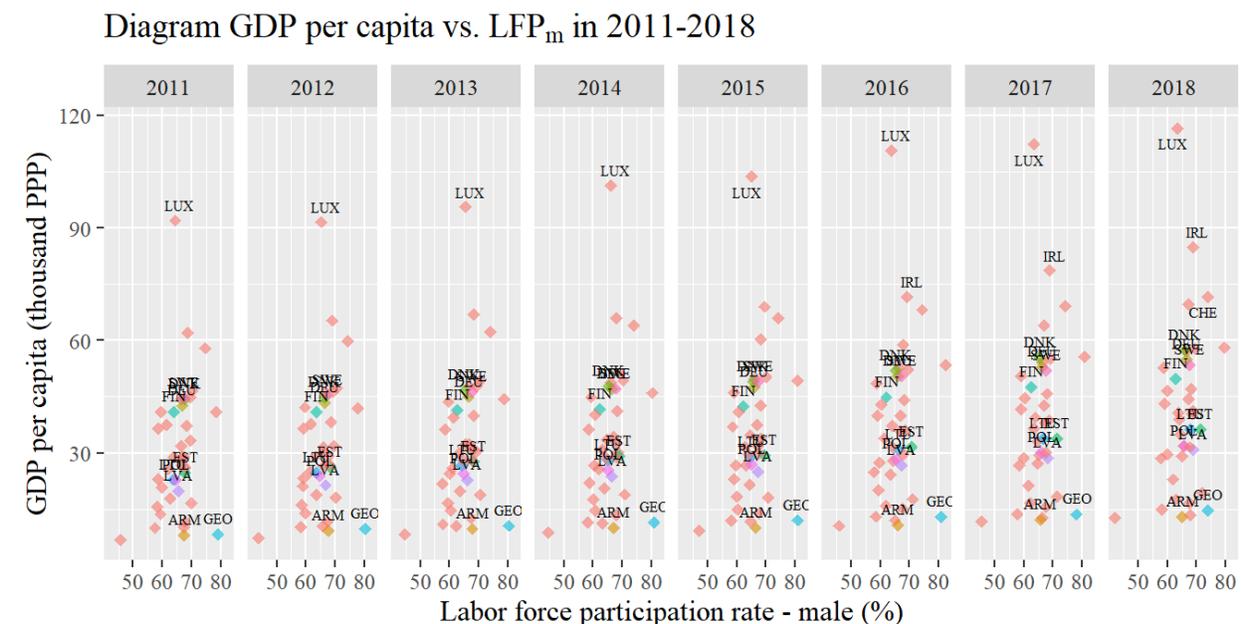
For all the countries surveyed, the average rate was 51%. This means that on average in these countries every second woman of working age is employed.

In BSR and EAP countries the highest percentage of employed women was in Sweden – about 60% and in Denmark with about 57-58%, depending on the year. The lowest number of women worked in Poland (48-49%) and Armenia (43-49%).

In 2018, as compared to 2011, the female labour force rate decreased in 4 countries. But while in Denmark, Finland, and Georgia the decrease was at about 1 percentage point, in Armenia it reached 6 percentage points, which is a very high number.

In this case, a positive significant correlation was seen between female labour force and GDP, higher percentage of women working and higher GDP per capita.

Figure 7. Correlation diagrams of GDP per capita versus male labour force participation rate (X_{4mi}) in 2011-2018



Source: own study.

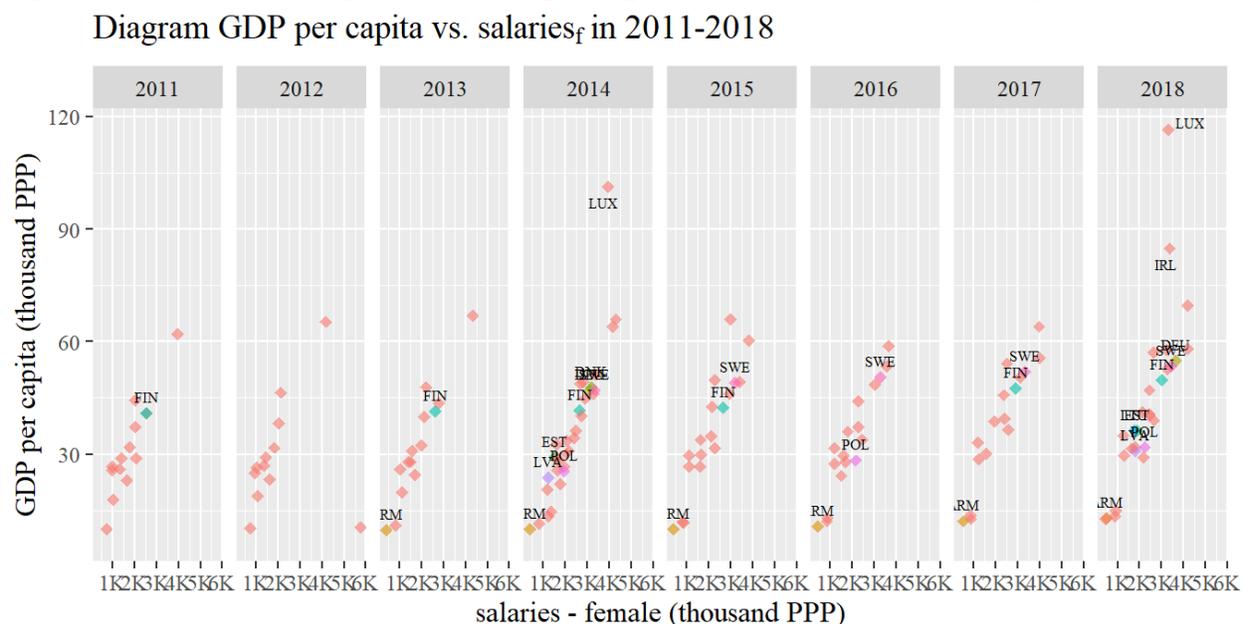
The average percentage of working-age men in employment between 2011 and 2018 in all the studied countries was 65%, which was significantly more than women. In 2018, the range of the indicator ranged from 42% (Moldova) to 79.5% (Iceland).

In BSR and EAP countries the largest proportion of men worked in Georgia (79-74%). In Armenia, Denmark, Estonia and Sweden it exceeded 67%, while in Finland, and Lithuania the rate was the lowest at about 64%. In 2018, 6 countries saw decrease in male labour force compared to 2011. The biggest decrease was recorded in Georgia (from 79% to 74%, but still maintaining high male labour force participation) and in Armenia (from 67.6% to 65%). The largest increase in the male employment rate was reported in Estonia, Lithuania, and Latvia – more than 3 percentage points.

No significant correlation was observed between male labour force rate and GDP.

The last (but not least) indicators are mean nominal monthly earnings of female and male employees. Information on these variables is scarce because not every country reports average monthly earnings. Most reported data concerned 2014 and 2018.

Figure 8. Correlation diagrams of GDP per capita versus female salaries (X_{5fi}) in 2011-2018



Source: own study.

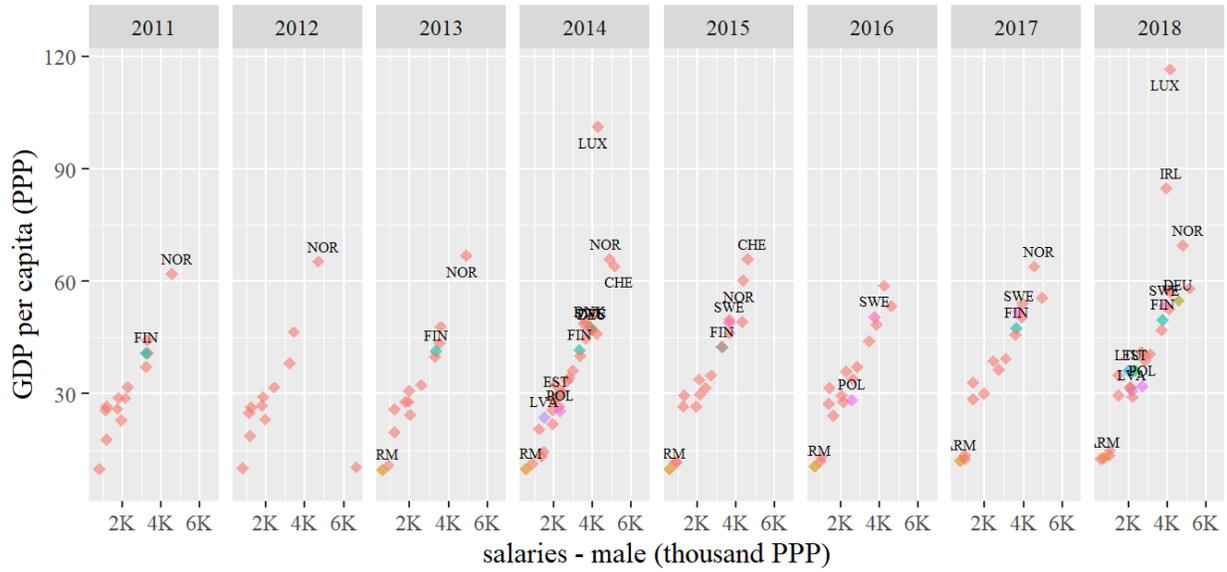
In 2014 the average female salary exceeded 2.3 thousand PPP.

Women in richer countries earned more in: Sweden, Denmark, and Germany – over 3,000 PPP, while the lowest salary of 390 PPP was earned in Armenia.

The good news is that women's salaries in every country have been increasing year by year.

Average female wages were very strongly, significantly positively correlated with GDP per capita. It means that the higher the wage, the higher the GDP.

Figure 9. Correlation diagrams of GDP per capita versus male salaries (X_{5mi}) in 2011-2018
 Diagram GDP per capita vs. salaries_m in 2011-2018



Source: own study.

In 2014, the average salary of men was 2,800 PPP and was 21% higher than the average salary of women. That year, men in Germany, Denmark, and Sweden earned the best – around 4,000 PPP. The lowest paid men were in Armenia – 600 PPP.

Men also earned more every year.

The salary gap in 2014 varied from 17% in Sweden to as high as 53% in Armenia.

Also this variable was very strongly positively correlated with GDP per capita.

4.2. Econometric analysis

As we noted in point 3, it is possible to estimate a Solow growth model that includes the impact of gender. The accepted hypothesis (formula 8) leads to the following econometric model:

$$\begin{aligned} \ln Y_{1i} = & \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_3 \ln X_{3f,i} + \beta_4 \ln X_{3m,i} + \beta_5 \ln X_{4f,i} + \beta_6 \ln X_{4m,i} \\ & + \beta_7 \ln X_{5f,i} + \beta_8 \ln X_{5m,i} + u_i \end{aligned} \quad (9)$$

where: all symbols are the same as in formula 8.

Unfortunately, we were able to estimate this figure only for 2014, due to missing data.

In the next step of the research, for each year we would like to estimate such 6 models (formulas 10-15). In each of these models, the explanatory variables are always capital stock (X_{1i}) and population (X_{2i}), and one of the gender variables:

$$\ln Y_{2i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_3 \ln X_{3f,i} + u_i \quad (10)$$

$$\ln Y_{3i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_4 \ln X_{3m,i} + u_i \quad (11)$$

$$\ln Y_{4i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_5 \ln X_{4f,i} + u_i \quad (12)$$

$$\ln Y_{5i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_6 \ln X_{4m,i} + u_i \quad (13)$$

$$\ln Y_{6i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_7 \ln X_{5f,i} + u_i \quad (14)$$

$$\ln Y_{7i} = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_8 \ln X_{5m,i} + u_i \quad (15)$$

where: all symbols are the same as in formula 8.

All seven models were estimated only in 2014, while in the other years the first model (formula 9) did not include the X_{5f} and X_{5m} variables, and the sixth (formula 14) and seventh models (formula 15) were not estimated.

In table 2 we summarized the estimated parameters of models $\ln Y_{1i}/\ln Y_{7i}$ (formulas 10-15) for 2014 year.

Table 2. Estimation results for Solow's augmented growth models $\ln Y_{1i} \ln Y_{7i}$ in 2014

Variables	$\ln Y_{1i}$	$\ln Y_{2i}$	$\ln Y_{3i}$	$\ln Y_{4i}$	$\ln Y_{5i}$	$\ln Y_{6i}$	$\ln Y_{7i}$
Constant	-2.823	-13.946	-18.233	1.170	2.646	-1.509	-2.054
$\ln X_{1i}$	0.366	0.789	0.762	0.828	0.867	0.405	0.355
$\ln X_{2i}$	-0.396	-0.792	-0.769	-0.827	-0.872	-0.422	-0.376
$\ln X_{3fi}$	0.373	3.472					
$\ln X_{3mi}$	0.178		4.421				
$\ln X_{4fi}$	0.124			0.182			
$\ln X_{4mi}$	-0.481				-0.196		
$\ln X_{5fi}$	-0.082					0.558	
$\ln X_{5mi}$	0.675						0.626
R^2	0.918	0.838	0.844	0.832	0.831	0.930	0.940
F-statistics	43.190	65.017	67.848	63.582	63.365	137.580	162.480

Notes: marked in red are significant parameters at the 0.05 level.

Source: own study.

All models were fairly well fitted to the real data – R^2 was over 83%. F -statistic confirms that the regression model, as a whole, was statistically significant.

In the first model $\ln Y_{1i}$, only the capital and population variables were statistically significant. Whereas in the next models, apart from variables $\ln X_{1i}$ and $\ln X_{2i}$, variables $\ln X_{3i}$ – enrolment rate and $\ln X_{5i}$ – monthly salary were also significant (both for men and women).

The models that best explain the formation of GDP were the last two models – $\ln Y_{6i}$ and $\ln Y_{7i}$ (the highest level of R^2).

Sample interpretation of the results obtained:

For model $\ln Y_{6i}$ – an increase in capital stock ($\ln X_{1i}$) by 1% will increase GDP by 0.405%. An increase in population ($\ln X_{2i}$) by 1% will cause GDP to decrease by 0.422%, a 1% increase in female wages ($\ln X_{5fi}$) will cause GDP to increase by 0.558% (assuming other variables are constant).

In table 2 we summarized the parameters of the estimated models $\ln Y_{1i} \ln Y_{5i}$ (formulas 9-13) (without X_{5i} variables) in 2018. Models $\ln Y_{1i} \ln Y_{5i}$ were estimated in each year of analysis, but in table 3 we present detailed results for models estimated in the last year of analysis (for the most recent and available data).

Table 3. Estimation results for Solow's augmented growth models $\ln Y_{1i} \ln Y_{5i}$ in 2018

Variables	$\ln Y_{1i}$	$\ln Y_{2i}$	$\ln Y_{3i}$	$\ln Y_{4i}$	$\ln Y_{5i}$
Constant	0.369	1.463	-1.111	1.512	3.780
$\ln X_{1i}$	0.810	0.874	0.856	0.871	0.916
$\ln X_{2i}$	-0.802	-0.861	-0.841	-0.857	-0.909
$\ln X_{3fi}$	-3.880	0.059			
$\ln X_{3mi}$	4.675		0.629		
$\ln X_{4fi}$	0.646			0.057	
$\ln X_{4mi}$	-1.118				-0.507
R^2	0.897	0.879	0.880	0.887	0.894
F -statistics	54.650	90.262	91.362	100.330	107.919

Notes: in red marked significant parameters at the 0.05 level.

Source: own study.

All models explained GDP well (R^2 over 88%) and the models as a whole – were statistically significant (F -statistics statistically significant).

The best model in 2018 was the first model $\ln Y_{1i}$, although many of the gender variables were statistically insignificant.

Capital stock ($\ln X_{1i}$) had a significant positive effect on GDP, while population ($\ln X_{2i}$) had a significant negative effect, meaning that as population increases, GDP decreases.

The only gender variable that was statistically significant was male labour participation, but the relationship was negative, meaning that a 1% increase in male labour participation ($\ln X_{4mi}$) caused GDP to decrease by 1.118%

In table 4, we summarized the expected (according to theory) effect of each variable on GDP (positive in all variables) and the actual observed effect in all estimated models for all years.

Table 4. Signs and significance of coefficients of Solow's augmented growth models estimated in years 2011-2018

Variables	Theory	2011	2012	2013	2014	2015	2016	2017	2018
X_{1i}	+	+	+	+	+	+	+	+	+
X_{2i}	+	-	-	-	-	-	-	-	-
X_{3fi}	+	+	+	-/+	-/+	-/+	-/+	-/+	-/+
X_{3mi}	+	+	+	+/+	+/+	+	+	+	+
X_{4fi}	+	-	+/-	+	+	+	+	+	+
X_{4mi}	+	-	-	-/+	-	-/-	-/-	-/-	-/-
X_{5fi}	+				-/+				
X_{5mi}	+				+/+				

Notes: marked in red are significant parameters at the 0.05 level.

Source: own study.

In all years we observed a positive impact of capital stock (X_{1i}) on GDP, which means that an increase in capital stock causes an increase in GDP.

In all years we observed a negative impact of population (X_{2i}) on GDP, which means that an increase in population causes a decrease in GDP.

Not in all models was the effect of female enrolment rate (X_{3fi}) on GDP positive, but if it was significant, it was positive.

In all years we observed a positive (but not always significant) impact of male enrolment rate (X_{3mi}) on GDP, which means that an increase in this rate causes an increase in GDP.

Female labour participation (X_{4fi}) had a rather positive effect on GDP, but unfortunately it was not statistically significant.

Male labour participation (X_{4mi}) had a negative (and sometimes statistically significant) effect on GDP. An increase in this rate causes a decrease in GDP. So, we can say that the excessive proportion of employed man does not stimulate the GDP growth.

Wages (X_{5i}) had a positive significant effect on GDP. Wage growth stimulates the GDP growth.

5. Methodology of the Qualitative study

The qualitative study is one of the primary elements of the **European Baltic Sea Region Forum for Gender Equality and Growth, 3.0** project. The completed qualitative study was ran based on a five-step case study method (Rashid et al. 2019). The researchers collected primary data from selected women entrepreneurs from the Republic of Estonia, the Republic of Poland and the Kingdom of Sweden. When selecting them, the researchers chose three qualitative parameters that the selected women entrepreneur should fulfil:

1. The selected woman should own a business venture.
2. She should be a local leader of organizational decision-making.
3. The business model should be innovative.

The structured questionnaire was a main primary data collection tool. The structured questionnaire consisted of open-ended questions. Based on the structured questionnaire, the researchers conducted one-on-one interviews with the selected women entrepreneur. The structured questionnaire covered up four key areas. Firstly, the researcher asked general questions about the interviewee and her company, secondly – questions on entrepreneurship were asked, followed by questions on innovativeness, and finally – on her satisfaction and plans. Researchers recorded all the conducted interviews in electronic media after a written consent from the interviewee. All the interviews were conducted in the interviewee's native language to get the most accurate responses with the optimum understanding of a given question. However, interview answers were translated into English for reporting purposes.

5.1. Qualitative study – Estonia

Ülle Vahtra is a 58-year old zootechnician by profession. She is married with two adult children and three grandchildren. In her free time, she takes care of her grandchildren, family, house, and garden. She is the founder of Lõnga Liisu OÜ, a handicraft company in 2000 in Lääne-Viru County, Estonia.

Ülle believes that the basis of entrepreneurship is running one's own company. At the same time, the entrepreneurial person should take responsibility, make decisions, and fulfil personal needs. She specifically pointed out that an entrepreneurial person could also be a non-entrepreneur. However, they have the same qualities.

As far as Ülle is concerned, she has been doing many things since she was young. She always thinks ahead, so that she has things to do all the time, and plans what she is going to do next and what her goal is. She also focuses on a way how to achieve it. Based on that principle she is in the process of developing her company on a continuous basis. In this case, she is focusing on internal communication in her company and on overall business management. According to her management philosophy, people are different. Thus, we should be positive and tolerant of others.

The opening of Lõnga Liisu OÜ came as a natural thought because Ülle Vahtra would like to look for new challenges. Lõnga Liisu OÜ commenced as a handicraft business because Ülle Vahtra does handicrafts all the time besides her main job. At the very beginning of Lõnga Liisu OÜ's lifecycle, Ülle Vahtra and her business partner worked for another entrepreneur in Tallinn. Then came the breakthrough. One day they thought why to work for somebody else? Can't we try it by ourselves? Even though they did not predict how complicated and difficult these things could be. However, they realized that it was not difficult at all. In the beginning, they were sole proprietors, they worked at home and finally, they could not fit the piles of sweaters that they wanted to sell. They were very interested in a new business approach. Everything was exciting and the offer for current premises appeared in 2000. They registered the company in 2004. They got a legal company name of Lõnga Liisu in 2004. Until 2017, the business was a partnership. Since 2017 Ülle has been running the firm alone. Currently, Lõnga Liisu OÜ has 5 employees.

As regards the procedures to set up a new business in Estonia, according to Ülle's own experience, the establishment process of Lõnga Liisu OÜ was not a hard job. However, her

experience was opposite to other entrepreneurs' general opinion at that time. She specifically pointed out that starting up a new business in Estonia is not a difficult process because many supporters provide help to establish a new business. Lõnga Liisu OÜ was able to utilize the unemployment fund benefits offered by Enterprise Estonia. At the same time, Lõnga Liisu OÜ took advantage of benefits offered by The Agricultural Registers and Information Board (ARIB).

According to Ülle's business philosophy, quality is the most significant factor for any business. It does not mean that a product should not be attractive for the end user. Due to the sustainability concern, Lõnga Liisu OÜ has prohibited to use plastic bags. Lõnga Liisu OÜ's business model is based on the Marketing approach combined with the e-commerce practices. However, more than anything Lõnga Liisu OÜ's employees are a significant asset for its success story.

Ülle Vahtra pointed out that the biggest obstacle for starting up a new business is financial resources. The fact that she is a woman was also a challenge. However, she does not perceive any gender barriers.

Lõnga Liisu OÜ's innovation primarily focused on improving the total productivity of the manufacturing process. The machinery was upgraded to improve the ergonomics and user-friendliness. Lõnga Liisu OÜ stepped onto the cyber marketplace with the concept of an e-shop. Continuous web development with a customer-oriented approach, launching marketing campaigns via social media can be identified as Lõnga Liisu OÜ's grand innovation strategy.

Ülle says that financial resources are the main obstacle to continuous innovation. Especially, when it comes to Information and Communication Technology matters, lack of ICT skills also can be regarded as a barrier. The time factor is also a barrier because Ülle realizes that ICT innovations consume a lot of time.

Ülle highlighted that her business is a small entity in terms of its capacity. However, she is proud of herself because she can contribute to the Estonian economy even though her business output is microscopic. Estonia is a small country. Thus, the role of small businesses is highly significant. She is a taxpayer. She is also able to create jobs via her business. Thus, she feels she is contributing to the economy.

According to Ülle, in Estonia business supportive physical infrastructure is perfect, and the accessibility is also very high. When it comes to social infrastructure, family, and working life, family members' support is important. She regards the Lõnga Liisu OÜ team as a family.

Ülle's opinion is that her business is a successful one. Because of her business strategies, even in Covid 19 conditions, her company is still alive. She has never taken too many risks that she could not manage on her own. She believes that as entrepreneurs, we should be more rational. She always tries to select what is necessary and to avoid what is not necessary. According to her, this principle leads her to move forward as a businesswoman.

Ülle is a satisfied, self-sufficient, entrepreneurial woman. She would love to continue her business, and she would prefer to look beyond the monetary gain. According to her, doing business as a woman in Estonia is not a challenge. However, she pointed out communication and networking as key elements of a women's business success.

More information about the company is given on their website <https://longaliisu.ee/en/>.

5.2. Qualitative study – Sweden

Hanna Bruce is 45 years old, major in Human Resources. She is married and has three children, a dog and a cat. She spends a lot of time in the mountains – snowboarding, skiing and doing excursions. Together with the family they also renovate houses. By a mutual decision Hanna and her husband bought a textile factory Våxbo Lin in 2006. The aim of the company is to expand further on and preserve and renew the flax tradition while contributing to the development of the countryside. What is crucial for the development, they combine tourism and hospitality industry together with flax industry, manufacturing industry. Consequently, a customer may visit not only the factory, but also a factory shop.

An entrepreneurial person, according to Hanna, is not satisfied with just doing his or her own thing, but also envisage himself or herself in a broader way. Entrepreneurship focuses on pushing forward. Hanna also relates entrepreneurship with societal commitment, where helping and developing a society really matters.

Being an owner of a company, Hanna considers herself an entrepreneur. She has capacity for multitasking, energy and naivety. This approach takes naivety as an advantage, because seeing too many obstacles in the beginning enhances the probability to never get started. If a person sets up a business, he or she faces them, overcomes them and solves them.

Buying a Våxbo Lin factory was Hanna's dream since she was 15 years old and had a summer job there. She has been related to manufacturing since childhood. Her grandfather had a furniture factory. Further on, she worked as an HR manager at SCA, a paper mill group of companies. When the opportunity arose, she did not hesitate and bought Våxbo Lin spontaneously. She listened to her instinct, she also believed that it was the appropriate time for changes – to pack, get going and move. The biggest obstacle was financing. No bank agreed to give her a loan, everyone advised against the purchase. Without the help of a business angel and owner of Våxbo Lin – Rolf Åkerlund, she would not be able to buy it. Due to the fact that he wanted her and her husband to be the owners, he decided to give them a loan. She did not see obstacles, just her dreams, having a factory of her own, vision and image of their future life – in the factory. She focused only on the good things. From this point of view it is important to stress not only the naivety, but more importantly courage, taking risk, passion, having a vision and believing in it. After the purchase, work on the company's image began. Hanna had not run a

company before, so she needed to learn a lot of new things, including those related to the administration.

When analysing obstacles, she observes that women are often more responsible for families. As an entrepreneur one needs to vouch for every little thing, so there might be a feeling that family security is jeopardized. To overcome such feeling a woman needs to have a very strong will. Without any certainty that the decision of buying a factory will be a success and the awareness that she will personally take economic responsibility for an economic situation, such life choices are scary, especially if one has children. She knew that this was something she had to handle herself.

According to Hanna's point of view, 99% of ordinary entrepreneurs are not part of innovative world, if one takes into consideration innovativeness related to cutting-edge tech companies. She strongly emphasizes that interpretation on innovation is too narrow. It considers mostly tech industry, where actors are mostly man and most funding goes to them. Nevertheless, it cannot be said that other companies are not innovative. According to Hanna, a company can be considered as innovative when the owner is proud but never satisfied with what is achieved. She, as an innovative entrepreneur, always thinks about how they can improve the way they do things, how can they reach even more customers, how can they get a product to become just a tiny bit smarter. It requires searching for answers to such questions as - can we cut it differently, hem up differently, can we alter materials so that the fabric can absorb liquids better, can we skip the dyed and use undyed warp instead to increase its ability to absorb.

It might be said that the innovation strategy for Våxbo Lin can be formulated as mission: "that we have a drive in the company to make the best of what we have" and it should be considered as a the most important part of innovation. Such mission makes the company develop and continuously go well. The key factor for being successful in the long run is to be innovative every day in your own world to be seen as up to date, hungry and interesting. An example for innovation for Våxbo Lin is the usage of the customer response to make alterations in the factory shop. All the production workers also have contact with the final customer. This is an advantage for the company and Hanna considers it as rather unique to get that kind of feedback on what the customer thinks about the product. A source for innovative ideas are also weekly meetings where employees discuss what has happened during the week. On the top of the agenda is sharing the knowledge about new ideas from customers and all employees.

The barriers for innovation are financial resources, inadequate support and time. An excellent example on how to overcome those is what Bollnäs municipality has done. They hired at the Business Office a person with experience in dealing with applications for business support. The purpose of such an occupation was to get to know all local enterprises, understand what they are doing and provide help i.e. during filling in an application form for Investment Support. Such a solution saves time, provides adequate support and gives opportunity to receive financial support. Moreover, after purchasing the company, whenever Hanna applied for financial support, she received it. Being female entrepreneur and the CEO was definitely an advantage while applying for support.

Due to the fact that her company is located in the countryside, people are rather not satisfied with the infrastructure. Hanna considers it lousy. However, she assessed social infrastructure highly, especially in terms of childcare. It has been stressed that successful business, particularly in the rural area, needs to be built on personal contacts – collaboration, mutual help and benevolence.

Hanna confirms that she achieved success. At the same time she claims that she is proud and happy but not satisfied. The reason for that is the need to move forward. Her strongest driving force is having the full responsibility and full authority to do what she wants. As a successful female entrepreneur she needs a husband who takes more responsibility for home. According to her, if not for him, it would not be possible for her to spend so much time running the company. The purchase of Våxbo Lin gave her and her family not only freedom but also improved their quality of life in all aspects.

More information about the company is given on their website www.vaxbolin.se.

5.3. Qualitative study – Poland

The interview was given by Katarzyna Gielarowska, a 48-year-old *E-sense* marketing agency owner. Katarzyna's company has been operating on the market for 20 years offering its clients services involving advertising as well as drawing up plans and strategies for promotional activities. The agency creates leaflets, catalogues, web sites, online promotional activities, among other things. Katarzyna comes from Zielona Góra and she arrived in Szczecin to study

management and marketing at the University of Szczecin. She decided to stay in Szczecin for good after graduation.

Privately, Katarzyna is a mother, bringing up her 14-year-old son on her own. She comes from an entrepreneurial family, because both her parents used to run their own business. That is why she has always known that she would be operating her own company. However, it was her last employer who forced her to self-employment, making further cooperation with Katarzyna conditional upon her setting up a business. Katarzyna believes that it was the incentive that only accelerated her decision. Katarzyna believes in “*taking matters into her own hands*” and organizing on her own. She values her independence and being a person who is not afraid of a challenge. She treats any problems and failures as an important lesson, which frequently provides her with an impetus to work further.

In her free time she enjoys sports and cooking and meeting friends – spending time together, but her work is also her hobby, since she is passionate about it and it engrosses her to the greatest degree. Yet, before she started working in her field, she had been working for a short while in the cosmetic sector. It gave her an opportunity not only to earn for a living, but also to acquire contacts with clients for marketing services. Within one year she reached the goal she had set – she won over companies to cooperate with and her first commissions for advertising.

For Katarzyna being an entrepreneurial individual means running her own company and taking responsibility for herself and potential employees. Then she recognized that an employee who has the initiative, proposes his or her own goals and seeks solutions to existing problems should also be considered as being entrepreneurial person. According to Katarzyna, the traits of an entrepreneurial individual involve “*courage, ability to make independent decisions, striving to reach a goal*”, but also “*indomitability, not giving up, willingness to learn, seeking new solutions, resourcefulness*”.

Katarzyna deemed herself to be an entrepreneurial person. However, evaluating her own entrepreneurial attitude, Katarzyna pointed out that she needs to work on “*time management*”. She would like to combine all those traits and be able to finish work on time. The incentive for starting her own business was to be “*her own boss*” and to decide about her time schedule and work organization on her own, to be independent. According to Katarzyna, the process of starting up a company is not complicated, it only has a rather formalized form, since the business

activity must be registered with the Social Security Company, the Chief Statistical Office and the City Hall.

When preparing to start up her company, Katarzyna purchased a book on how it ought to be done, but she also took the advice of her entrepreneurial parents, especially her father. The first things she did was having her business cards and leaflets made to be able to contact her clients and having a company logo devised. The company was located in Katarzyna's flat, i.e., one of the rooms was designated to act as the company's seat.

She recognized that the main limitation are financial issues. The hardest of them being the burden of mandatory health and pension contributions (the Social Security Company). It is difficult in the first months of the company's existence since it does not yet bring in any income. When Katarzyna was starting her company there were no programs supporting start-up entrepreneurs, which she recognized as an obstacle. Another obstacle is planning one's actions, because the style of work changes and she should know exactly what she needs to do.

Katarzyna is a person who feels that as a female she had a good start in business or in running her company. She does not feel any pressure or limitations in business contacts with men either.

The innovativeness of *E-sense* company is its basis since the firm has been operating online for 15 years. Other innovations include product-related solutions which must be applied, owing to keen competition and the need for quick order fulfilment. The advertising sector features a high participation of innovative tools, which change from day to day. They appear as an update or a completely new tools, e.g., Facebook, LinkedIn. In turn, when considering the organization of an innovative company, Katarzyna has been operating on the outsourcing principle from the start.

Development of services and search for new solutions are of great importance in this sector. Katarzyna draws her inspiration from conversations with clients, whom she listens to attentively, but she also reads about novel solutions and observes the market. She finds ideas for company growth in conversations with her clients, but she draws the energy and ideas for business expansion from people surrounding her. In expanding her company, she created together with a business partner an internet store offering ladders, scaffolding and lifts.

Katarzyna believes that such forms of support offered by the state as e.g., exemption from Social Security Company contributions may facilitate innovation growth. In her opinion,

complicated and complex law poses a limitation to running one's own company. But to her, as a woman – a single mother – it is the lack of support from the state, the city that constituted the greatest barrier in running and expanding her business. When her child was little, a place at a state-run nursery was not available. Her son had to attend a private kindergarten, which entailed higher costs. Lack of free educational infrastructure for the development of child's abilities and for work with demanding children was an obstacle, too. Katarzyna believes that pregnancy and care over her small baby constituted a strong limitation to her professional activity. For her it was a time of "lost" opportunities and possibilities.

Yet another limitation to business activity is owed to the country's economic problems. Several years ago such problems affected Katarzyna's firm, when during crisis her clients did not pay her on time or failed to pay her altogether.

Despite various difficulties Katarzyna is proud of what she has achieved and how her company has grown, she is proud of the fact that she has been running her company for 20 years on her own. The experience she acquired allows her to skilfully respond to various situations with her clients.

Katarzyna believes that she has achieved that thanks to her hard work, i.e., such indomitability, persistence not to give up, pursuit of her goals, search for solutions. When talking to her clients she does not only think of profits, but also of how she may assist them. Such relationship building can be seen in her long-standing cooperation with clients. She has been cooperating with one of her clients for 18 years. She believes that her commitment and adaptability are key to her success. In her view, it was also the up-bringing she received and her parents' attitude, and her father's attitude in particular, that contributed to her success.

Among the economic barriers to running a business the following aspects can be named: employment and the associated issues related to the labour market, limitations faced by women resulting from motherhood, as well as fiscal obligations.

More information about the company is given on their website <https://e-sense.pl>.

6. Discussion

6.1. Quantitative Analysis

The seminal paper by Mankiw et al. (1992) highlights the cross-country correlation between human capital (measured by educational attainment), income and growth. As a natural follow-up to that analysis, subsequent papers have attempted to separate the effect of male as compared with female educational attainment and to provide evidence on the relationship between gender inequality in schooling and economic growth and the use of Solow's growth model to carry them out.

Selected works in which the Solow model was successfully used to study the influence of gender inequality for economic growth are presented below.

Knowles et al. (2002) is one of the few cross-country studies to estimate theory-based specifications. Following Mankiw et al. (1992), the authors augment the Solow model to incorporate female and male human capital separately and to estimate the effect of these types of human capital and of the gender gap on the steady-state level of income using long averages between 1960 and 1990. Their findings indicate a negative correlation between the size of the gap and income: controlling for male educational attainment, a lower level of female educational attainment is associated with lower steady-state income.

In line with the cross-country growth regression boom of the 1990s, most studies estimate the relationship between gender inequality in education and the growth rather than the level of income. The first estimates by Barro and Lee (1994) began a heated debate by identifying a positive relationship between gender inequality and economic growth. The authors estimate economic growth equations in a cross-section of 116 countries for the 1965–75 and 1975–85 periods and find that although male secondary-school attainment (defined as the fraction of the over-25 male population for whom some secondary school is the highest level of education) is positively correlated with economic growth, the correlation between female secondary-school attainment and economic growth is negative.

The relationship between gender inequality and economic growth has been subjected to further scrutiny using different samples and theory-based specifications, leading to diverse

findings. Dollar and Gatti (1999) estimate five-year economic growth rates between 1975 and 1990 in a panel of 127 countries. In contrast to Barro and Lee (1994), they find a positive correlation between the growth of per-capita income and the initial level of female secondary school attainment, controlling for male secondary-school attainment.

Andersson (2010) studied the effect of increased gender equality on economic growth in developing countries. The main objective of that work was to investigate whether increasing the level of human capital and reducing gender inequality in the labour market affected the growth rate and welfare of developing countries. The paper used data covering 74 emerging and developing countries for the years 2001 and 2007. The extended Solow growth model was used to estimate how increased primary school completion rates of men and women affected economic growth to see what impact the Development Goal (MDG) effect of universal primary education had on the economy. The thesis shows that an increase in the number of women and men completing primary school has a positive effect on economic growth, as expected.

Ezeh (2020) analysed gender inequality in education and economic growth. The objective of the work (thesis) was to examine the impact of gender inequality in education on economic growth exemplified by Sub-Saharan African countries. Two gender inequality indicators were used: the gap in female to male primary and secondary enrolment. The core of that study was built on the Solow Model but augmented with both human capital and health care expenditure (HCE) Per capita. The empirical analysis was centred on annual data for 40 Sub-Saharan African countries over the period 1990-2018. The method of estimation employed was both the Ordinary Least Squares (OLS) and Fixed effect within-group estimator in a panel data set. The main findings of the paper suggest that there exists a statistically significant negative relationship of gender inequality in education at the primary and secondary level on economic growth and a negative effect of female labour participation on economic growth.

As the above studies indicate, the application of econometric methods based on the Solow Augmented Model in socio-economic analyses carries certain theoretical requirements. The most important ones include: high (satisfactory) variability of explanatory variables (at least at the level of 10%); the relationships between explanatory variables and the dependent variable should be statistically significant; and the relationships between explanatory variables should be statistically insignificant - so as to avoid the collinearity of variables. In addition, as in the

examples cited above, diversity and the economic development of the countries studied play a large role here.

The analysis conducted in this study focused on the European countries as well as on Armenia and Georgia, being countries with good statistical reporting. Therefore, countries where information had been highly insufficient were removed from the analysis (Kosovo and Montenegro). Statistics are well available in countries that are at a good level of economic development.

The similarity in the socio-economic development of the analysed countries was clear while observing variables related to male and female education, as the indicators for all countries were very high in all years under study. Hence, very low variability of these characteristics was seen at about 2.5%. From the point of view of econometric correctness, these variables should have been removed from the model but, as the detailed study showed, in some years they had statistically significant impact on GDP per capita (2013-2015).

The results from the analysis are surprising in two points:

1. the negative, statistically significant impact of population size on GDP per capita,
2. the negative, sometimes statistically significant, impact of male labour participation on GDP per capita.

As for the former, it may be explained by the level of development of the countries under study: when the population increases, it is difficult to achieve a satisfactory growth in GDP per capita, even though the latter indicator also shows an upward trend. The differences in population of the countries studied are greater than the differences in their GDP per capita.

In the latter case, the highest values of the male labour participation rate were seen in countries with the lowest GDP per capita (e.g. Georgia with 80%). In most countries (even those with the highest GDP), this indicator ranged between 60%-70%, which would imply that there is certain norm in the number of employed men. If this figure (70%) is exceeded, the impact on GDP is negative.

The Solow Augmented Model, like any neoclassical growth model, has an equilibrium point to which the solution should aspire, but which may not be reached. The analysis of the study findings indicates that in some countries (Sweden) the equilibrium point has been exceeded and we can witness the effect of ineffective use of resources.

6.2. Qualitative Analysis

The fundamental objective of the discussion is to provide a sufficient understanding of the qualitative data collection tool. The authors believe that if anyone prefers to conduct a similar qualitative research study to investigate the same research problem, then this knowledge will be an added benefit for them.

The authors designed the research questionnaire to collect quantitative data. The first part of the questionnaire focuses on collecting demographic data about the interviewee. The second part of the questionnaire focuses on entrepreneurship, and the third part of the questionnaire focuses on innovativeness. The fourth part of the questionnaire focuses on the interviewee's satisfaction and plans. Below, the authors provide examples of the questions that might be used during the interview.

Examples of the questions used in the first part of the questionnaire:

- I would like to ask you to shortly characterize yourself and your company.
- Examples of the questions used in the second part of the questionnaire:
- What, in your opinion, characterizes an entrepreneurial person? What features should such a person have?
- Which of those features do you have? Which features would you like to work on?
- How did the process of establishing the company look like? How do you evaluate this process in retrospect? Was it easy or difficult?
- What are the obstacles to become an entrepreneur? Are there different obstacles for women and men?

Examples of the questions used in the third part of the questionnaire:

- Would you characterize your company as an innovative one? Why?
- What are the barriers to innovation?
- In your experience, do you find the physical infrastructure, such as transports and digital facilities, sufficient for developing your company?
- Have you had access to a social infrastructure enabling you to combine your family and professional life?

Examples of the questions used in the third part of the questionnaire:

- In your opinion, have your company succeed? Why? What factors contributed to this success?
- What motivates you? What gives you the greatest satisfaction?
- What frustrates you? / What are the disadvantages of running your own business?
- If you were to decide to establish an own company, would you take this step again? Why?
- Did the quality of your life improve thanks to the fact that you run an own company? Or is it the other way around? Please explain this and give examples that characterize the quality of life and changes in this sphere.
- Do you see a bright and prosperous future for your company?

The number of questions depends from many factors, one of them is how detailed information we want to obtain. Types of questions should also be tailored to the aim of the research, local environment etc.

One of the most crucial parts of interview-based data collection is to collect the most accurate and relevant data. The authors used a few techniques to achieve a high-level accuracy and levelness. The number one technique was to make a cordial relationship with the interviewee. The number two technique was to brief about the project. Technique number three was to allow the interviewee to ask questions before starting the actual interview.

The authors made a prior appointment to conduct the interview. All interviews were conducted in a peaceful environment. During the interview, the interviewee was free from other works and tasks. The authors recorded all the discussions after getting the written consent from the interviewee. Moreover, the authors captured pictures of the interviewee, pictures of her workplace, pictures of her products after getting the written consent from the interviewee.

7. Conclusions

The research on links between gender, economic growth and development has proven that power of the mutual impact of these categories can differ significantly depending on the type of growth and key driving factors. In the majority of the European countries the necessity to increase female participation in employment is strongly emphasized by both economists and politicians. It is generally believed that it is the best way to reduce a growing gap in labour force due to ageing (except migration). Increased women's market activity means more effective allocation of human resources, better use of people's talents (both women and men), the consequence of which is a positive impact on economic growth. Gender equality was thus described as "smart economics".

In the quantitative part of the report, the Solow Augmented Model was used to measure the influence of diverse variables (including gender equality ones) on economic growth. According to the theory, all the chosen variables should have positive impact on GDP: X_{1i} – Capital stock (PPP), X_{2i} – Population, X_{3fi} – Female net enrolment rate (%), X_{3mi} – Male net enrolment rate (%), X_{4fi} – Female labour participation rate (%), X_{4mi} – Male labour participation rate (%), X_{5fi} – Mean nominal monthly earnings of female employees (PPP), X_{5mi} – Mean nominal monthly earnings of male employees (PPP). The analysis covered the European countries and the Eastern Partnership countries as well as Armenia and Georgia between 2011 and 2018. Therefore, the set included well or very well-developed countries. The obtained results are not entirely consistent with the theory of the Solow Augmented Model. The reason of that is the choice of countries, the availability of data and the time period of the analysis. The literature confirms that one of the most important elements of the empirical analysis is the choice of appropriately diversified countries (at different economic levels). For the same reason, the years of analysis should be as distant as possible, so that the data can take into account the political, social and economic changes that occurred within the time span. Despite those issues, we have proved that in the European countries under study plus Georgia and Armenia a 1 % increase of female wages will result in GDP per capita rising by 0.56%. Female wages were expressed as mean monthly earnings of female employees in PPP. The relation between GDP per capita and female wages was proved statistically significant.

The qualitative study was based on three selected women entrepreneurs from the Estonia, Poland and Sweden. All interviewees ran an innovative business venture and were also local leaders. The data about the entrepreneurs were collected by means of an original questionnaire consisting of open-ended questions. The main conclusion drawn from the second part of the study is that innovative women entrepreneurs do not perceive any significant gender barriers in the process of running their own companies. And the second issue that emerged in all the three interviews is that the biggest obstacle were financial constraints.

The comparison of the findings of the quantitative and qualitative studies reveals some similarities between the two. First of all in all the constructed models positive influence of capital on economic growth was proved. The same issue was underlined by the surveyed entrepreneurs, that in order to grow they need proper financial means. Without those resources the opening of the company or some investments would not be able to occur. The quantitative analysis showed that gender equality variables, that is X_{3fi} – Female net enrolment rate (%), X_{3mi} – Male net enrolment rate (%), X_{4fi} – Female labour participation rate (%), X_{4mi} – Male labour participation rate (%), X_{5fi} – Mean nominal monthly earnings of female employees (PPP), X_{5mi} – Mean nominal monthly earnings of male employees (PPP) did not have in general statistically significant effect on GDP per capita. The same conclusion was formulated by the entrepreneurs from Sweden, Poland and Estonia: no significant gender barriers were experienced. The reason of the latter statement could be the fact that the interviewees were innovative and successful entrepreneurs, certainly beyond the average.

8. References

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