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### Research Report Economic growth and the issue of women participation in adult education

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Research Institute for the Economics of Education and Social Affairs

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# Economic growth and the issue of women participation in adult education

Study as part of the project "Economic and regional costs, funding structures and benefits of continuing education" (VoREFFi-WB) Funded by the Federal Ministry of Education and Research.

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#### **Table of Content**

Introc	luction	.4
1	Gender equality, Adult education and Economic growth	.5
1.1	Literature review	. 5
1.2	Data review of Adult education as a basis of Human capital	.6
2	Analysis	.9
2.1	Methodological framework	.9
3	Conclusion	12
4	Bibliography	13
Anne>	ς	16

#### List of Tables

Table 1 Panel data models for Real GDP per capita growth	10
Table 2 Panel data models for HCF females	11
Table 3 Adult education participation rates, Real GDP per capita growth rates, Global Gender Gap	index
data by European regions	18 <u>7</u>

## List of Figures

Figure 1Participation rates in education and training by gender by regions on the basis of data AES-	
2007, AES-2011, AES-2016	7
Figure 2 Mean instruction FTE days spent by participant in education and training by sex and by region	S
based on data AES 2007, AES 2011 and AES 2016	8



## Introduction

The necessity of growth support was embedded into the core message adopted by the European Commission in the Europe 2020 strategy, which recommends a number of structural reforms in order to boost labor utilization and productivity growth (European Commission, 2011). This article presents an indepth appraisal of the theoretical approaches in relation to the link between adult education (human capital in general) disaggregated by gender and macroeconomic growth and a summary of results from the main empirical macro-studies for European countries.

The literature on economic growth is vast and policy-oriented studies, in particular, have flourished in the past decade. Yet, there is little agreement on the exact mechanisms linking policy settings to growth. So far, we have not come across the studies modelling adult education variables into Human capital, and empirical investigations seeking to test its relation to macroeconomic indicators except FiBS/CEDEFOP study in 2012 (CEDEFOP, 2012).

Human capital theory signifies the modern economy focused on the increasing role of human capital in the knowledge-based society. The human resources development is an important part of all development strategies and has recently been embodied in the policy and reports of most important international institutions: the European Commission and other regional policy institutions (Cedefop, 2011, 2016, 2017). The theoretical emphasis on human capital was laid mainly by endogenous growth theory, starting with Becker, who was probably the first ones who emphasized the role of human capital in technology adoption and its impact on economic growth. However the concept of human capital was fully embodied later, mainly in works of Romer (1986) and Lucas (1988) and Barro (1991) (Robert J Barro, 1991; Lucas, 1988; Romer, 1989). Generally, although, education and growth literature is largely based on the endogenous growth models, it is however, neglected human capital accumulation in stage of adult education and differences in gender impact. Needs to mention is that since each different scholar uses varied estimation methods and data, this has led to different conclusions, and therefore economic growth and human capital and gender issues remains a place worthy of study and discussion, which possesses distinct theoretical and practical significance.

The paper deals with three issues: (1) whether gender inequality is present in further education participation (2) whether gender specific human capital and separately taken gender inequality index contributes to economic growth. Accordingly, the paper is structured as follows. The first section shows the review of studies on gender issues and education issues in relation to economic growth, then the second section explains methodological framework of the empirical model and data used. Then results of the empirical results and some policy implications and recommendations for further research are given in section four. We argue that there is a significant social loss if women do not revert to working force. The contribution makes a series of recommendations to rectify the participation gap.



# I Gender equality, Adult education and Economic growth

#### **I.I** Literature review

There are a limited number of papers emphasized gender inequality issues empirically in the economic growth models. Many of arguments are given under umbrella of "smart economics" and pointing to the global gender gap issues in education, income and social protection ("GENDER EQUALITY AND DEVELOPMENT," 2012, "Gender Equality as Smart Economics: A World Bank Group Gender Action Plan (Fiscal years 2007–10)," 2006; King & Hill, 1993; World Bank, 2016).

Initially, many studies of human capital were not gender-specific. One of the first studies separately considering gender impact was in Barro and Lee (1994) study, who included female and male secondary education attainment as independent variables in the growth model of 85 countries. The analysis was done via instrumental variables model with 5-year lagged explanatory variables as instruments to per capita growth rate data in the periods 1965 to 1975 and 1975 to 1985. The result was that male secondary education has a significantly positive, while female education has a negative effect. The authors suggested that this gender significance can be a measurement or omitted variable problem (Robert J. Barro & Lee, 1994). Further Barro and Sala-i-Martin (1995) extended analysis and included separate variables for higher and secondary education attainment by gender and confirmed the results of Barro and Lee (1994) on negative impact of female education and positive significant impact of male education on economic growth (R J Barro & Sala-I-Martin, 1995).

On this line of research, Caselli, Esquivel, and Lefort (1996) used a generalized method of moments estimator to eliminate the problems of correlated individual effects and endogenous explanatory variables and re-estimated a variety of cross- country growth regressions. When they re-estimated the model of Barro and Lee (1994) with their own specifications, they found a reversal in the signs of male and female education and other variables, and they pointed to several inconsistent estimation procedures of Barro and Lee (1994) (Caselli, Esquivel, & Lefort, 1996).

Further Busse and Spielmann (2006) studied relation of types of gender inequality – wage, education and labor market activity to country's comparative advantage in Trade (computed as the ratio of laborintensive exports to total exports). Under Education they weighted both 50% - total literacy rates and total gross secondary school enrollment. Under Labor inequality they took gender inequality in labor market participation rates. They used cross-sectional and the panel analysis regressions with time series data for 1975, 1980, 1985, 1990, 1995, and 2000 for 40 countries, namely 17 developed and 23 developing countries. According to their results, there is a statistically significant link between female/male educational attainment and comparative advantage and in labor-intensive goods, i.e. less gender inequality in labor market participation rates is associated with a stronger comparative advantage, taking other country characteristics into account. Their findings confirm their theoretically expected outcome - a higher female labor force will enhance the labor endowment and, thus, comparative advantage in labor-intensive commodities (Busse & Spielmann, 2006).

In contrast, some economists, including the influential studies of Stephanie Seguino, stated that gender wage gaps contributed to economic growth in semi-industrialized economies in export-oriented manufacturing sectors, where the lower female wages increase export competitiveness and subsequent growth (Blecker & Seguino, 2002; Seguino, 2010; Seguino & Grown, 2006; Seguino & Heintz, 2012). However, it is indicated what type of inequality is matters for a county. The type of inequality based on wage discrimination has systematic positive effects for growth because of lower cost of labor, however the type of inequality based on access to education and other productive resources create inefficiencies because lower female education lowers labor productivity and contributes children's access to resources, and therefore constrains the future labor supply and economy-wide productivity. A country

can benefit when women's greater education combined with lack the bargaining power to translate that productivity into higher wages (Seguino & Braunstein, 2012; Seguino & Grown, 2006).

Important point in the studies is that there are variety of indicators used to measure gender inequality and its impact to economic growth. As educational – ratios of total years of schooling (S. Klasen, 2002; Stephan Klasen & Lamanna, 2009), average years of schooling (Forbes, 2000; Knowles, 2002), ratio of enrollment rates (M. Baliamoune-Lutz & McGillivray, 2009; Mina Baliamoune-Lutz, 2007; Esteve-Volart, 2002), educational attainment (Dollar & Gatti, 1999), literacy rates (Mina Baliamoune-Lutz, 2007) and other combined effect of the gender gaps in labor force participation and education (Bandara, 2015) were taken. As employment inequality – ratio of female male workers (Esteve-Volart, 2004), labor force participation (Heintz, 2006; Kapsos, 2005), etc. In the literature other forms of inequality measures are also present in relation to economic growth- violence (Duvvury, Callan, Carney, & Raghavendra, 2013), fertility (Day, 2012) and other well-being indicators (Forsythe, Korzeniewicz, & Durrant, 2000). However, most studies were concerned with wage and earnings differences in relation to economic growth (A. B. Atkinson, 2015; Blecker & Seguino, 2002; Oostendorp, 2009; Schober & Winter-Ebmer, 2009; Seguino, 2010; Seguino & Braunstein, 2012; Seguino & Grown, 2006; Stockhammer & Onaran, 2012).

Mostly studies researching the relationship between gender, education and economic growth are present on aggregated cross-country level, but there are some analysis done on regional country level. The issue of comparing these findings poses challenges both in methodological - because of differences in countries included, covered time periods, and conceptual – definitions of gender equality and the impacting ways to economic growth. Additionally, due to different focuses the control variables included also vary which changes the comparability and generalizability of results. There are other issues – statistical collection issues of the relevant data, and complex composite nature of the data on economic growth, as well as econometrics issues of modelling causality and methodological issues of regression analysis.

#### 1.2 Data review of Adult education as a basis of Human capital

Any discussion on the measurement of human capital can be seen from various perspectives due to definitional diversity and the issues of validity. In our paper we propose to include adult education as a basis of human capital and further in this part we will try to justify the rationale of that.

In general, education is positively associated with a range of other individual and societal benefits such as healthier life-styles, active political involvement, lower propensity to commit crime, richer social networks, etc. From economic efficiency view, the spending toward adult education may have short term outcome in comparison with primary and secondary education spending, that in turn gives viable results and raises the accountability issue of decision makers. In our analysis we go into simplification of Human capital and taking under this term distinctly adult education, while it is important to point that early stages of education – primary and secondary, and subsequent higher education is viable part of human capital in a broader sense. Also these early stages of education can underpin the further participation in education, as higher educated people tend to get into skills-intensive jobs in knowledge-intensive sectors, where they are given opportunities to acquire skills continuously and participate more in training possibilities. This is widely confirmed via collected surveys that higher educated people tend to participate more in adult education. In European countries training programs remain asystematic. Moreover, there is no national training systems to classify, and central database does not exist.

Adult education can influence economic growth in various ways. Accumulated knowledge and skills through adult education can impact directly to employability, better match to work and is converted in increased labor productivity, facilitation of the technological progress and innovation. Moreover, especially adult learners can in turn initiate changes in the wider sense by affecting the home/family, work, and community contexts they engage in (Schuller & Desjardins, 2010).

However the trigger of participation in adult education still under many studies, where participation is treated as the result of a complex chain of responses such as – personal attitudes (Cross, 1981), monetary

and non-monetary expectations, etc. (Baert, De Rick, & Van Valckenborgh, 2006). The participation reasons in adult education also varies. Motivation specialists have tried to link adult motivation and attitude with participation of adults in training (early researchers are – Houle, 1961; Boschier, 1971; Bourgess, 1971; Morstain and Smart, 1974; recent researchers -(Gorges, Maehler, Koch, & Offerhaus, n.d.)). Others have related this with the social psychology theory (Boshier, 1973; Cross, 1981; Darkenwald and Merriam, 1982; recent researchers - (Gorges & Kandler, n.d.; Rammstedt, Danner, & Clemens, 2017). Thus, measuring general adult motivation seems quite fruitful to understanding the processes of why they participate in further education. Some recent studies have come to other combined factors influencing adults in their decision to undertake training –combination of several factors for specific target groups (Dohmen, 2016).

There are variety sources of information on adult education participation – AES, LFS, CVTS which tries to measure the phenomena from different forms and types (For overview see (D Dohmen, 2018)). In our analysis we will use Adult education Survey database as this survey constitutes the core survey on adult education and play a key role in the European System of Statistics on Lifelong Learning. The AES is a self-contained survey referring to "all learning activity (i.e. intentional learning) undertaken throughout life, with the aim of improving knowledge, skills and competences, within a personal, civic, social, and employment related perspectives" (Eurostat, 2014). This includes formal and non-formal activities, while informal learning activities, such as self-learning, are not considered. Learning activities are covered within the last twelve months prior to the conduction of the survey, that allows to cover broad range of activities.

Before proceeding to regression analysis, we want to provide country review of participation rates is adult education. From Figure 1 we see that by regional breakdown over the survey years we can see that overall participation rates are increasing. Western and Northern European countries are the regions of high participation rates in adult education. In these regions, there is a prevalence toward female participation. The other regions show variations that seems to be not stable over the years.



Figure 1: Participation rates in education and training by gender by regions on the basis of data AES-2007, AES-2011, AES-2016.

*Source: Eurostat, Participation rate in education and training by sex [trng\_aes\_100]. EU-average is calculated for the current composition of countries* 



# Figure 2 Mean instruction FTE days spent by participant in education and training by sex and by regions based on data AES 2007, AES 2011 and AES 2016

*Source: Eurostat, Mean instruction hours spent by participant in education and training by sex [trng\_aes\_151] \*EU-average is calculated for the current composition of countries* 

In the Figure 2 we present average number of days spent by participant in education and training. Mean instruction FTE days spent by participant in education and training is calculated on the basis of AES data on Mean instruction hours by dividing to eight hours of full equivalent working hours. Regarding that data, we can see that on average EU countries spend 15 days by female participant and 14 days by male. Looking at the data, we see that within regions there are variations.





## 2 Analysis

There are different econometric models used so far, mainly constituting as OLS. And with the availability of more datasets on cross sectional and time series basis some author attempted to use panel data analysis or apply instrumental variables. Empirical studies of economic growth often produce contradictory results due to the weak data itself (Anthony B Atkinson & Brandolini, 2001; de la Fuente & Doménech, 2000), or inclusion of different set of variables. Regarding the extension of the variables to economic growth, Durlauf et al.(2004) presented review where almost 145 different variables have been found to be statistically significant in at least one study (Durlauf, Johnson, & Temple, 2004). Therefore it is not possible to model with all the variables at once. While in the pursuit of endogenous growth literature frame, we will include the most robust variables and model human capital by gender, and also include gender gap index variable.

#### 2.1 Methodological framework

Econometric modelling is by no means easy to answer as it depends both on the theoretical specification used and on the empirical problems encountered in growth studies. In order to avoid spurious regressions: and errant behavior, we carried out the unit root test for each variable first. For that reason, we tested our variables by Augmented Dickey-Fuller (ADF) test. Other econometric pitfalls are – autocorrelation, multicollinearity issues, heteroskedasticity should be also avoided and we tested our model accordingly.

On the basis of literature of growth models, the following augmented growth model is estimated as the following. The choice of variables are discussed in previous part of the paper. As a dependent variable we take real GPD per capita growth. That variable gives control over the nominal changes, as well as population and comparable over a country changes. In the panel dataset we have 2007, 2011, 2016 years according the waves of AES. So, Human capital is defined by participation rates in AE by gender. The other variables were taken accordingly to these years. We include the all inclusive gender inequality measure published by World Economic Forum as a separate independent variable. The report's Gender Gap Index ranks countries according to calculated gender gap between women and men in four key areas: health, education, economy and politics to gauge the state of gender equality in a country.

Panel data analysis accounts for country heterogeneity and allows to control for variables like difference in organization of work and FE practices across countries. Additionally there are estimated advantages of panel data analysis as this method gives control over unobserved heterogeneity – any omitted variables will not bias the estimates (Durlauf et al., 2004; Islam, 1995; Temple, 2000). In our context of interest, the framework condition variables GDP per capita, the share of tertiary educated people, R&D expenditure, PISA numeracy scores are crucial for consideration. We take log values of PISA, GDP per capita values to have comparable values and this also done in the logic of modelling the growth accounting models.

 $Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + u_{it} + \varepsilon_{it}$ 

 $Y_{it}$  = Real GDP per capita growth rate for a country, where i=country, t=time

*X*<sub>2*it*</sub> = Human capital formation (male)

 $X_{3it}$  = Human capital formation (female)

X<sub>4it</sub> = Gender inequality index

 $X_{5it}$  = GPD per capita per country

 $u_{it}$  = between-country error;

 $\varepsilon_{it}$  = within-country error;

 $\beta$  = coefficient for the variables



Most measures were adapted from the extant literature. The data used in this research are secondary data, collected through European surveys and statistical office of the European Union. The key to our methodology is to minimize the extrapolations and keep the data as close as possible to those directly available from European surveys. In terms of understanding the determinants of economic growth, the international data have several advantages. Firstly, all sources come from standardized European surveys which makes sources comparable and reliable cross-country data in time series. Secondly, these survey data provide systematic heterogeneity across countries. However, aggregate data are poorly suited to deal with question of causality: does human capital cause economic growth or the reverse can be also true. The ability of reverse causality to explain this empirical relationship is also investigated in this paper.

As regards the geographical scope for the study, this is the 27 European countries (see the list of countries in the Appendix. The model described in the equation is estimated on a sample of up to 27 European countries and up to three five-year periods between 2007,2011 and 2016, giving a possible 81 observations. For the empirical analysis much of the data is taken from the AES, Eurostat and World Economic Forum reports

	(Mode	l 1)		(Model 2)			(Model 3)		
VARIABLES	Real	GDP	per	Real	GDP	per	Real GDP	per	
	capita growth			capita growth			capita growth		
HCF - Males	-0.0356			-0.0415			-0.0441		
HCF - Females	0.136**			0.146**			0.153**		
GGGI	-14.21	*		-11.80			-10.51		
ln_GDP per capita	-2.240***			-2.174***			-2.085***		
Share of adults with tertiary				-0.0347		-0.0396			
education									
R&D expenditure as % of GDP							-0.196		
Constant	14.83***			13.65***			12.73**		
Observations	77			77			77		
Number of Countries	27			27			27		
R-square	0,70			0,71			0,74		
*** p<0.01, ** p<0.05, * p<0.1									

Table 1 Panel data models for Real GDP per capita growth

The base model - Model 1 explains 70% of the variation shown in R-square value. Here, HCF female is positive and significant, while GDP per capita and Gender inequality index are significant and negatively correlated. Further we can see in the Model 2 we added to control share of adults with tertiary education and the variables used explain 71% of the variation of Real GDP per capita growth. However the only significant ones remain HCF female (positive) and GDP per capita (negative). In the Model 3 we include R&D expenditure and explanatory power of R-square increases to 74%, and the significance of HCF female and GDP per capita remain while other variables show no significance.

To conclude, we say that HCF female is significant predictor of GDP per capita growth as it is correlated positively. The presented models have high explanatory power and included control variables, and according to it we can say that the results stay consistent with the base model. The negative correlation was revealed by GDP per capita, which can be interpreted as a percentage increase in GDP per capita has a marginal decreasing impact of real GDP per capita growth. Gender inequality index demonstrated

negative significant effect in our base model, while in other model still show negative impact but not significant one.

Further in our analysis, we want to make reverse modelling and see whether growth drives more gender equality. This reverse relationship is not well investigated in the literature due to its theoretical complexity and not direct linkages to investigate. Looking at descriptive statistics from data in *Table 1*, we see that there is no straight correlation of these two datasets. Many authors mentioned open questions of the way of transmission of increased growth toward benefiting women (Braunstein, 2012). In our analysis of Economic growth and Adult education participation, we also do not find significant reverse relationship of impact of economic growth to adult education participation, which leads to conclusion that economic growth does not drive participation in further education.

	(Model 1)	(Model 2)
VARIABLES	<b>HCF</b> Females	HCF Females
Real GDP per capita growth	1.410***	1.422***
GGGI	145.1***	109.3***
In_GDP per capita	9.521***	8.726***
Share of adults with tertiary education		0.345*
Constant	-93.27***	-74.48***
Observations	77	77
Number of Countries	27	27
R-square	0,74	0,77
*** p<0.01, ** p<0.05, * p<0.1		

Table 2 Panel data models for HCF females

According to the results of the panel data analysis, we see that included variables – Real GDP per capita growth, Gender inequality and GDP per capita are significant and positive. Surprisingly that gender inequality increase might lead to more participation in further education of females. When in the second model included the share of adults with tertiary education we see that it is also significant and positive, that means high formal educated people positively contribute to female participation in adult education. The explanatory power of the models are very high, however the positive significant of inequality index can be the result of measurement error or omitted variable error and needs more in-depth analysis further.

# **3** Conclusion

Human capital (adult education) is considered today as the most important element generating value for companies and economy, therefore the tendency in research to include it in relation to GPD growth is manifested more strongly. The quality aspects of human capital - skills and competencies - enhanced by further education contribute more and more to the improvement of growth potential, especially when with the means of further education more female are brought into labor force and given favorable climate to increase labor productivity. Governments may stand to reap the greatest economic benefits from the release of further education and advancements to female.

The topic of inequality, human capital and economic growth presents interest to both academia and policy. In this paper we analyzed the relationship of participation in adult education (human capital) disaggregated by gender, gender inequality index and study their relation to economic growth from a macroeconomic perspective of European countries. The purpose of this paper was to take some steps in filling this lacuna by discussing current theories and findings on adult education and gender inequality, and their impact to economic growth.

Our paper attempted to close the gap and provided a theoretical framework as well as an empirical basis for an improved understanding of the wider macroeconomic benefits of female adult education. In this paper we investigate the causality relationship between female and male adult education and economic growth in European countries for 2007-2016 time period. We used a panel data Random Effect model to analyze the long run relationship between education and economic growth. We used panel data analysis that allows for differences in the aggregate production function across countries. The choice of the type of panel analysis was based on specification tests. Our results showed that female adult education has positive effect on economic growth and gender inequality index turned to be negatively impacting to economic growth. We argue that it is difficult or even almost impossible to estimate precisely the determinants of economic growth for a country as there are many factors in play. However we argue that variables of adult education measured into human capital are on important positions under given estimation procedure with the possible dataset to measure, and while holding the other most favorably treated factors such as educational attainment levels, R&D.

# 4 Bibliography

Atkinson, A. B. (2015). Inequality: what can be done?

- Atkinson, A. B., & Brandolini, A. (2001). Promise and Pitfalls in the Use of "Secondary" Data-Sets: Income Inequality in OECD Countries as a Case Study. Journal of Economic Literature, 39(3), 771–799. https://doi.org/10.1257/jel.39.3.771
- Baert, H., De Rick, K., & Van Valckenborgh, K. (2006). Towards the conceptualization of learning climate. Adult Education: New Routes in a New Landscape, (January 2016), 87–111.
- Baliamoune-Lutz, M. (2007). Globalisation and gender inequality: Is Africa different? Journal of African Economies, 16(2), 301–348. https://doi.org/10.1093/jae/ejl037
- Baliamoune-Lutz, M., & McGillivray, M. (2009). Does Gender Inequality Reduce Growth in Sub-Saharan African and Arab Countries? African Development Review, 21(2), 224–242. https://doi.org/10.1111/j.1467-8268.2009.00209.x
- Bandara, A. (2015). The Economic Cost of Gender Gaps in Effective Labor: Africa's Missing Growth Reserve. Feminist Economics, 21(2), 162–186. https://doi.org/10.1080/13545701.2014.986153
- Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. The Quarterly Journal of Economics,106(2),407–443.Retrievedfromhttp://links.jstor.org/sici?sici=0033-5533%28199105%29106%3A2%3C407%3AEGIACS%3E2.0.C0%3B2-C
- Barro, R. J., & Lee, J.-W. (1994). Sources of economic growth. Carnegie-Rochester Conference Series on Public Policy, 40(1), 1–46. Retrieved from https://ideas.repec.org/a/eee/crcspp/v40y1994ip1-46.html
- Barro, R. J., & Sala-I-Martin, X. (1995). Economic Growth. European psychiatry the journal of the Association of European Psychiatrists (Vol. 25). https://doi.org/10.1016/j.eurpsy.2009.07.013
- Blecker, R. A., & Seguino, S. (2002). Macroeconomic Effects of Reducing Gender Wage Inequality in an Export-Oriented, Semi- Industrialized Economy. Review of Development Economics, 6(1), 103–119. Retrieved from https://www.uvm.edu/gioo/pubpdfc/Blocker. 2002. Review.ed. Development. Econ.pdf

https://www.uvm.edu/giee/pubpdfs/Blecker\_2002\_Review\_of\_Development\_Econ.pdf

- Braunstein, E. (2012). Neoliberal Development Macroeconomics A Consideration of its Gendered Employment Effects. UNRISD Research Paper. Retrieved from http://www.unrisd.org/ 80256B3C005BCCF9/(httpAuxPages)/F95D244010CF453DC12579AD0049AB47/\$file/Braunstein.pdf
- Busse, M., & Spielmann, C. (2006). Gender inequality and trade. Review of International Economics, 14(3), 362–379. https://doi.org/10.1111/j.1467-9396.2006.00589.x
- Caselli, F., Esquivel, G., & Lefort, F. (1996). Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics. Journal of Economic Growth. Retrieved from https://personal.lse.ac.uk/casellif/papers/reopeni4.pdf
- Cedefop. (2011). The benefits of vocational education and training. Director (Vol. VI). https://doi.org/10.2801/43027
- Cedefop. (2016). Future skill needs in Europe: critical labour force trends. Luxembourg: Publications Office of the European Union, 59. https://doi.org/10.2801/56396
- Cedefop. (2017). On the way to 2020: data for vocational education and training policies. Luxembourg: Publications Office of the European Union. https://doi.org/10.2801/414017
- CEDEFOP. (2012). Learning and innovation in enterprises. Cedefop Research Papers. https://doi.org/10.2801/94281
- Cross, K. P. (1981). Adults as Learners. Increasing Participation and Facilitating Learning. Jossey-Bass, Inc. Retrieved from https://eric.ed.gov/?id=ED200099

- Day, C. (2012). Economic Growth, Gender Wage Gap and Fertility Rebound. The Economic Record, 88, 88– 99. https://doi.org/10.1111/j.1475-4932.2012.00799.x
- de la Fuente, A., & Doménech, R. (2000). Human Capital In Growth Regressions: How Much Difference Does Data Quality Make? - ProQuest. IDEAS Working Paper Series from RePEc. Retrieved from https://search-proquest-com.proxy-

oceano.deusto.es/docview/1698221863?rfr\_id=info%3Axri%2Fsid%3Aprimo

- Dohmen, D. (2016). Further Education for Vulnerable Groups: Barriers and the Role of Funding. Dublin: EAN-Conference. Retrieved from http://www.fibs.eu/en/sites/\_wgData/Dohmen\_EAN\_Vulnerable Groups\_160530\_final.pdf
- Dohmen, D. (2018). Adult education state in Europe. FiBS Infobrief.
- Dollar, D., & Gatti, R. (1999). Gender Inequality, Income, and Growth: Are Good Times Good for Women? The World Bank Gender and Development Working Paper Series, (1). Retrieved from http:
- Durlauf, S. N., Johnson, P. A., & Temple, J. R. W. (2004). Growth Econometrics. Retrieved from https://economics.vassar.edu/docs/working-papers/VCEWP61.pdf
- Duvvury, N., Callan, A., Carney, P., & Raghavendra, S. (2013). Intimate partner violence: economic costs and implications for growth and development. World Bank Working Paper, 33(82532), 1–94. Retrieved from https://www.thelookout.org.au/sites/default/files/Duvvury et al. 2013 Intimate Partner Violence. Economic costs and implications for growth and development VAP No.3 Nov 2013.pdf
- Esteve-Volart, B. (2002). Sex Discrimination and Growth. IMF Working Paper.
- Esteve-Volart, B. (2004). Gender Discrimination and Growth: Theory and Evidence from India. LSE STICERD Research Paper, (DEDPS 42), 1–53.
- European Commission. (2011). Europe 2020 Flagship Initiative Innovation Union. Retrieved from https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication-brochure\_en.pdf
- Eurostat. (2014). 2016 AES manual. https://doi.org/10.2903/j.efsa.2015.4206.OJ
- Forbes, K. J. (2000). A Reassessment of the Relationship Between Inequaiity and Growth. The American Economic Review, 90(1995), 869–887. https://doi.org/10.1257/aer.90.4.869
- Forsythe, N., Korzeniewicz, R. P., & Durrant, V. (2000). Gender Inequalities and Economic Growth: A Longitudinal Evaluation. Economic Development and Cultural Change, 48(3), 573–617. https://doi.org/10.1086/452611
- GENDER EQUALITY AND DEVELOPMENT. (2012). World Development Report. Retrieved from https://siteresources.worldbank.org/INTWDR2012/Resources/7778105-1299699968583/7786210-1315936222006/Complete-Report.pdf
- Gender Equality as Smart Economics: A World Bank Group Gender Action Plan (Fiscal years 2007–10).(2006).WoldBankGroup.Retrievedfromhttps://siteresources.worldbank.org/INTGENDER/Resources/GAPNov2.pdf
- Gorges, J., & Kandler, C. (n.d.). Adults' learning motivation: Expectancy of success, value, and the role of affective memories ☆. https://doi.org/10.1016/j.lindif.2011.09.016
- Gorges, J., Maehler, D. B., Koch, T., & Offerhaus, J. (n.d.). Who likes to learn new things: measuring adult motivation to learn with PIAAC data from 21 countries. Large-Scale Assessments in Education. https://doi.org/10.1186/s40536-016-0024-4
- Heintz, J. (2006). Employment Strategy Papers Globalization, economic policy and employment: Poverty and gender implications. ILO Employment Strategy Papers, (3). Retrieved from https://pdfs.semanticscholar.org/f445/50a3dab36caead5f3d6996fe46ca7bcacfe6.pdf



- Islam, N. (1995). Growth Empirics: A Panel Data Approach. The Quarterly Journal of Economics, 110(4), 1127–1170. https://doi.org/10.2307/2946651
- Kapsos, S. (2005). The employment intensity of growth: Trends and macroeconomic determinants. ILO Employment Strategy Papers, (12). Retrieved from http://www.ilo.org/wcmsp5/groups/public/--ed\_emp/---emp\_elm/documents/publication/wcms\_143163.pdf
- King, E. M., & Hill, M. A. (1993). Women's education in developing countries: barriers, benefits, and policies. https://doi.org/10.1016/0738-0593(95)90061-6
- Klasen, S. (2002). Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development. The World Bank Economic Review, 16(3), 345–373. https://doi.org/10.1093/wber/lhf004
- Klasen, S., & Lamanna, F. (2009). The impact of gender inequality in education and employment on economic growth: New evidence for a panel of countries. Feminist Economics, 15(3), 91–132. https://doi.org/10.1080/13545700902893106
- Knowles, S. (2002). Are educational gender gaps a brake on economic development? Some cross-country empirical evidence. Oxford Economic Papers, 54(1), 118–149. https://doi.org/10.1093/oep/54.1.118
- Lucas, R. E. (1988). On the mechanics of economic development. Journal of Monetary Economics, 22(1), 3–42. https://doi.org/10.1016/0304-3932(88)90168-7
- Oostendorp, R. H. (2009). Globalization and the Gender Wage Gap. The World Bank Economic Review, 23(1), 141–161. https://doi.org/10.1093/wber/lhn022
- Rammstedt, B., Danner, D., & Clemens, L. (2017). Personality, competencies, and life outcomes: results from the German PIAAC longitudinal study. Large-Scale Assessments in Education. https://doi.org/10.1186/s40536-017-0035-9
- Romer, P. M. (1989). Endogenous Technological Change. Retrieved from http://www.nber.org/papers/w3210.pdf
- Schober, T., & Winter-Ebmer, R. (2009). Gender Wage Inequality and Economic Growth: Is There Really a Puzzle? IZA Discussion Paper, (4323). Retrieved from http://ftp.iza.org/dp4323.pdf
- Seguino, S. (2010). Gender, Distribution, and Balance of Payments Constrained Growth in Developing Countries. Review of Political Economy, 22(3), 373–404. https://doi.org/10.1080/09538259.2010.491285
- Seguino, S., & Braunstein, E. (2012). The impact of economic policy and structural change on gender employment inequality in Latin America, 1990-2010. Working Paper of University of Vermont, Colorado State. Retrieved from https://mpra.ub.uni-muenchen.de/43261/
- Seguino, S., & Grown, C. (2006). GENDER EQUITY AND GLOBALIZATION: MACROECONOMIC POLICY FOR DEVELOPING COUNTRIES. Journal of International Development. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.882.2513&rep=rep1&type=pdf
- Seguino, S., & Heintz, J. (2012). Monetary tightening and the dynamics of US race and gender stratification. American Journal of Economics and Sociology. Retrieved from https://www.uvm.edu/giee/pubpdfs/Seguino\_2012\_American\_Journal\_of\_Economics\_and\_Socio logy.pdf
- Stockhammer, E., & Onaran, O. (2012). Wage-led growth: Theory, Evidence, Policy. PERI Working Paper Series, (300), 26. Retrieved from http://www.elgaronline.com/abstract/journals/roke/1-1/roke.2013.01.04.xml?print
- Temple, J. (2000). Growth Regressions and What The Textbooks Don't Tell You. Bulletin of Economic Research, 52(3), 181. https://doi.org/10.1111/1467-8586.00103

World Bank. (2016). Gender Equality, Poverty Reduction, and Inclusive Growth.





Annex 1 Adult education participation rates, Real GDP per capita growth rates, Global Gender Gap index data by European regions



Regions	Country	Female AE participation 2016	Lead/Gap to EU by Female AE participation 2016	Trendline (2007, 2011, 2016)	Real GPD per capita growth rate 2015	Lead/Gap to EU by Real GPD per capita growth rate 2015	Trendline (2005, 2010, 2015)	Global Gender Gap index 2015	Lead/Gap to EU by GGGI 2015	Trendline (2005, 2010, 2015)
	BE	46,2	0,03		1,50	-0,20		0,75	0,11	
	LU	48,1	0,06		4,00	0,33		0,74	-0,02	
	UK	53,9	0,15		2,20	-0,06		0,76	0,16	
Western Europe	FR		-0,61		1,10	-0,29		0,76	0,18	
	DE	52,2	0,13		1,70	-0,16		0,78	0,34	
	AT	58,8	0,24		1,00	-0,31		0,73	-0,07	
	NL	63,5	0,31		2,00	-0,10		0,78	0,32	
	RO	7,5	-0,61		3,90	0,31		0,69	-0,43	
	BG	24,7	-0,33		3,60	0,24		0,72	-0,17	
	PL	25,7	-0,31		3,80	0,29		0,72	-0,23	
Central and Eastern Europe	LT	31,9	-0,21		1,80	-0,14		0,74	-0,01	
	EE	50,7	0,10		1,40	-0,23		0,75	0,07	
	SI	48,3	0,06		2,30	-0,03		0,78	0,39	
	CZ	42,6	-0,03		4,50	0,43		0,69	-0,48	
	SK	45,3	0,01		3,80	0,29		0,68	-0,59	
	LV	51,9	0,12		2,70	0,05		0,75	0,10	
	HU	52,7	0,13		3,10	0,14		0,67	-0,62	
	EL	17,5	-0,45		-0,20	-0,57		0,69	-0,50	
	МТ	35,7	-0,15		7,30	1,03		0,67	-0,66	
Southorn Europo	ES	42,9	-0,03		3,20	0,16		0,74	0,01	
Southern Europe	ІТ	39,1	-0,09		0,80	-0,35		0,73	-0,13	
	PT	44,7	0,00		1,60	-0,18		0,73	-0,09	
	СҮ	40,4	-0,07		1,70	-0,16		0,67	-0,63	
	FI	60,2	0,26		0,30	-0,46		0,85	0,98	
	DK		-0,61		1,60	-0,18		0,77	0,24	
Northern Europe	NO	60,4	0,26		1,60	-0,18		0,85	0,98	
	SE	68,2	0,39		4,10	0,35		0,82	0,74	
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EU-average	EU	44,5	N/A	2,46	N/A	0,74	N/A	
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Table 3 Adult education participation rates, Real GDP per capita growth rates, Global Gender Gap index data by European regions Lead and Gap of countries in comparison with EU-average (current composition countries) are identified with normalization scores (0;1).

Sources: Eurostat, Participation rate in education and training by sex [trng\_aes\_100]; Real GDP per capita, chain linked volumes, percentage change on previous period, per capita, code: sdg\_08\_10; World Economic Forum, The Global Gender Gap Report, www.weforum.org



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