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TESTING THE EFFECT OF POPULATION AGEING ON NATIONAL SAVING RATES: PANEL DATA EVIDENCE FROM EUROPE

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Testing the effect of population ageing on national saving rates: panel data evidence from Europe

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ABSTRACT

The objective of this study is to test the relationships between population ageing and gross saving rates in European countries. We use panel data techniques to explore the possible non-linearity between it. We show that the dependency ratio, when is significant, negatively affects gross saving rates. Besides, life expectancy has non-linear effects on saving rates and rising longevity is a main factor to explain saving rates at national levels. European countries are concerned about the delivery of benefits and services and financial sustainability of their welfare state and increase gross national savings rates can help to fill this gap.

Keywords: population ageing, gross saving rates, old-age dependency ratio, life expectancy, longevity, European countries.

JEL Classification: J11, E21

1. INTRODUCTION

Over the last half century there have been strong indications of a worldwide fertility decline and life expectancy at birth has been the primary determinant of population ageing. These past trends in fertility and mortality mainly affect developed countries, which already have completed their demographic transition. This dramatic growth has been driven largely by population projections like United Nations (2017) projections which shows that in 2030 the European old-age dependency ratio is expected to be 37,4%. Hence, ageing is only one of the determinants of savings rates although this effect has not been correctly measured (Wong and Ki Tang, 2013).

From a theoretical perspective, the problem of income distribution between savings and consumption was proposed by Modigliani (1986) in his "life cycle hypothesis" because individuals save during their work life to finance their consumption during the retirement years. Thus, individuals save more because they expect to live longer, increasing the savings rate.

Nowadays, some authors (Serres and Pelgrin, 2003; De Nardi et al., 2009) use panel data methods considering the social impact of aging populations and explain the increase in life expectancy because of the longest-lived groups are the people with more economic resources that is fundamental in savings rates. This matches with the "life cycle hypothesis" which increases the savings due to the uncertainty generated by higher life expectancy encouraging savings even after retirement. Hence, population aging is leading many countries to solve pension system, for example, extending the retirement age or by a reduction in payments although an increase in longevity is associated with greater individual savings (Ehrlich and Lui, 1991; Bloom, 2003; Kinugasa and Mason, 2007).

Most saving models are influenced by demographic factors and it has implications for capital formation and economic growth (Li et al., 2007). Moreover, Sterk and Rayn (2017) focus on the last recession over the US and demonstrate that job uncertainly reduces goods and services demand because of the rising in the precautionary savings.

Another factor that many studies consider for studying saving rates is the private savings for retirement. Metzger (2015) concludes that the individual income increases the probability of saving for old-age people but a negative effect over the individual savings appears when is included a control variable for the household income. Thus, being employed increases the probability of saving and self-employed persons are more likely to save more for retirement.

The contribution of this paper is to focus on the homogeneity of the sample in order to disentangle how the dependency ratio negatively affects the Gross saving rates and analyzing the evolution of saving rates due to life expectancy and increasing longevity.

The paper is organized as follows. Firstly, we show the representative sample that we are going to use, and we discuss the criteria used for selecting some European countries. Next, we analyze the descriptive statistics checking temporal series and sample homogeneity. Thirdly, we test our research hypothesis in order to present the empirical results. Finally, the main conclusions and policy implications of our research are showed.

2. DATA AND METHODS

The information has been used from the database of the World Bank, World Development Indicators (WDI). For selecting the sample, we have used geographical selection criteria, and we have restricted it only for the most populous countries, considering robustness tests for testing the homogeneity of our selected sample. The WDI provides useful information for the period 1960-2015, which is the last year with data availability. The selected variables are defined in Table 1.

Table 1: Description of variables.

Type of indicator	Variable	Definition
WEALTH, INCOME OR WELFARE	GDP per capita (constant $ US in 2010)	Division of GDP among the inhabitants of a country (constant dollars at prices of 2010)
DEMOGRAPHIC	Old-age Dependency Ratio (% of working-age population)	Proportion of the population over 65 years of age over the working age population (as %)
WEALTH, INCOME OR WELFARE	Gross domestic savings (% of GDP)	Gross national income minus total consumption (it is the sum of public and private savings) as a % over GDP.
WELLNESS AND HEALTH	Life expectancy at birth (males and females)	Average number of years at birth for both sexes.
DEMOGRAPHIC	Fertility rate	Average number of children born per woman if all women lived until the end of their fertile years (number of children per woman, according to the fertility rates by age).
DEMOGRAPHIC	Total population	Total number of inhabitants who legally have the nationality of a country (units of inhabitants).

Source: Author´s elaboration with data from World Bank (2018) and WDI database.

In order to get a representative sample, the first selection criteria is geographical. In this case, European countries that could be considered developed, with population ageing problems and demographic transition are included. The second selection criteria is the population size. We omit from the analysis the small countries (with a population of less than 5 million inhabitants) because it distort estimations and our representative sample is reduced to 23 countries (Austria, Belgium, Denmark, France, Finland, Greece, Germany, Hungary, Italy, Ireland, Czech Republic, Netherlands, Norway, Romania, Portugal, Poland, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom and Belarus). The highest annual national savings as a percentage of

GDP is from Ireland (53,40%) in 2015 and the lowest is Greece (2,07%) in 1966 even with negative value in 1968, being the variable that has got the greatest volatility among the selected ones (see Annex).

We have made two groups of countries to test if they are homogeneous or some countries should be removed. When the heterogeneity of the slopes in cross-sectional data is ignored, in this case, different degrees of development, it can lead to lose some information. Even if it is estimated by fixed effects where unobserved heterogeneity is controlled there could be differences, so we would have observed heterogeneity in our results.

Based on descriptive statistics, our sample countries have low fertility rates and a high old-age dependency ratio but there are differences in other variables between the Eastern Europe countries and Central and Western Europe ones. To test it, we estimate linear and nonlinear models in both groups of countries (Table 2).

Table 2: Linear and non-linear models.

	Western and Central Europe [1]		Eastern Europe[2]	
	Linear model	Non-linear model	Linear model	Non-linear model
$Constant$	−48.429 *** (6.155)	−27.719 (149.106)	−36.564 ** (15.576)	734.28 *** (207.618)
$Old\ Age\ Dependency_{i,t}$	−0.678 *** (0.052)	−0.868 ** (0.385)	-0.405 (0.292)	−5.849 *** (1.934)
$Life\ Expectancy_{i,t}$	1.132 *** (0.089)	0.647 (3.775)	0.945 *** (0.277)	0.138 *** (0.039)
$PercapitIncomeGrowth_{i,t-1}$	0.001 *** (0.001)	0.001 *** (0.001)	−0.001 *** (0.001)	0.001 (0.001)
$Old\ Age\ Dependency^2_{i,t}$		0.003 (0.006)		0.114 *** (0.043)
$Life\ Expectancy^2_{i,t}$		0.003 (0.023)		0.138 *** (0.039)
R^2			0.5963	

[1] Western and Central European countries (384 observations): Austria, Belgium, Denmark, France, Finland, Greece, Germany, Italy, Ireland, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

[2] Eastern European countries (168 observations): Hungary, Czech Republic, Romania, Poland, Slovak Republic and Belarus.

	0.9352	0.9352		0.6385

Notes: ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

In Western and Central Europe countries, the variables are significant and R-square is high in both models, so the model fit is good. Meanwhile, in the Eastern Europe countries the R-square is smaller. The differences in the estimated coefficients between the two groups show that population characteristics and economic structure are relevant. That is why we have decided to remove the seven Eastern European countries from the sample. Hence, the sample of countries which we are going to pool together in order to perform the analysis is as follows: Austria, Belgium, Denmark, France, Finland, Greece, Germany, Italy, Ireland, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and UK.

In order to check the robustness of our results when these group of countries are included, we test the stationary variables considering the Dickey-Fuller unit roots test and an autoregressive process of order 1, AR (1), with constant term (random walk with drift):

Model with drift: $Y_t = \delta + \beta Y_{t-1} + u_t$ (1)

Where $u_t \sim iid(0, \sigma_u^2)$ and t = 1,2,…, n

With the contrast hypothesis: $H_0: \beta = 1$; $H_1: \beta < 1$. Thus, we cannot use the value of a traditional t-Student because the distribution of statistic $\hat{\beta}$ does not follow a normal one. We have to subtract a delay on both sides of the equation of the AR (1) model:

$$\nabla Y_t = \delta + (\beta - 1)Y_{t-1} + u_t \quad (2)$$

Where $u_t \sim iid(0, \sigma_u^2)$ and t = 1,2,…, n

With the contrast hypothesis: $H_0: \beta - 1 = 0$; $H_1: \beta - 1 \neq 0$. Under the null hypothesis, the AR (1) process is non-stationary and β = 1, that is, the AR (1) process has a unit root and under the non-zero hypothesis is the AR process (1) a stationary process that it has a unit root greater than one being the contrast statistic now as follows:

$$t_\beta = \frac{\widehat{\beta}-1}{se(\widehat{\beta}-1)} \tag{3}$$

Thus, the condition of rejection or acceptance of H_0, is “reject H_0" si $|t_\beta|>|t_c|$.

Tables 3 and 4 shows that Gross saving rates and GDP growth are not stationary variables but logarithm of per capita income, life expectancy, old age dependence ratio and fertility rate are mostly stationary. We also see that for some countries the main variables are non-stationary.

Table 3: Critical Values for Dickey-Fuller Contrast.

T	WITH CONSTANT			
Signification value	0.010	0.025	0.050	0.100
25	-3.75	-3.33	-3.00	-2.63

Table 4: Summary of Dickey-Fuller results.

Variable	**Results**	**Variable**	**Results**
Per Capita Income Growth	Non Stationary	Life expectancy	Stationary (except two countries)
Gross Savings Rate	Non Stationary	Old-age Dependency Ratio	Stationary (except five countries)
Log GDP pc	Stationary (except seven countries)	Fertility Rate	Stationary (except one country)

We investigated the effect of several socioeconomic variables over Gross Saving rated and in order to specify the models we follow the basic guidelines of Li et al. (2007) and Wong and Ki Tang (2013). Nevertheless, the remaining models will be based on additional variables or squares of these variables. In this regard, the basic linear model without trend is as follows:

$$GrossSavings\ Rate_{i,t} = \beta_0 + \beta_1 LifeExpectancy_{i,t} + \beta_2 OldAgeDependency_{i,t} + \beta_3 PcIncomeGrowth_{i,t-1} + u_i + v_t + \varepsilon_{i,t} \quad (4)$$

Moreover, it is possible to include over model (4) the fertility rate and the logarithm of GDP per capita delayed:

$$GrossSavings\ Rate_{i,t} = \beta_0 + \beta_1 LifeExpectancy_{i,t} + \beta_2 OldAgeDependency_{i,t} + \beta_3 FertilityRate_{i,t-1} + \beta_4\ Log(GDP\ pc)_{i,t-1} + u_i + v_t + \varepsilon_{i,t} \quad (5)$$

The sum of the three errors in both linear models (associated to the country, time period and randomness) will be the unobserved heterogeneity of the model. Besides, the basic linear model with trend includes a time variable in which the parameter λ_i indicates the time period change:

$$GrossSavings\ Rate_{i,t} = \beta_0 + \beta_1 LifeExpectancy_{i,t} + \beta_2 OldAgeDependency_{i,t} + \beta_3 PcIncomeGrowth_{i,t-1} + \lambda_i t + u_i + v_t + \varepsilon_{i,t} \quad (6)$$

3. RESULTS

Based on our theoretical assumptions, we have estimated panel data models using fixed effects. We show that the inclusion of longevity as an explanatory variable leads to greater savings, increasing investment and capital accumulation per worker and higher production per worker. Moreover, the expected effects of the old-age dependency ratio and the first difference of the fertility rate will be negative on the national gross saving rates.

Based on robustness test, we have considered the Western and Central European countries, that is, with 16 cross-section units (countries) observed during 25-time periods. Estimates fully controlled for socioeconomic factors are reported in Table 5. The signs of the linear models that we have proposed are in line with our theoretical approaches and the main explanatory variables of models are significant. The linear models with the higher R-squares are the ones which consider as explanatory variable the delayed per capita income growth. For these models either the delayed of the fertility rate or the trend are individually significance and Model 1 is the one with the best fit to the data.

But considering the logarithm of per capita GDP when the trend or delayed fertility rate are included provide better results, and more explanatory variables are significant. Then, with the logarithm of the per capita GDP the models that best fit the data are Models 4 and 6.

Table 6 shows the main results for basic non-linear models. The global significance of the explanatory variables is similar to linear models. The non-linear models with the higher R-squares when the main factor is the per capita income growth delayed. Moreover the squared old age dependency ratio seems to be individually significantly only in models with the logarithm if the per capita GDP is an explanatory variable and the squared life expectancy in any non-linear model is significant.

Table 5: Results for linear models. Dependent variable: Gross Saving rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	−48.429 *** (6.155)	−77.159 *** (9.233)	−48.156 *** (6.210)	−81.684 *** (9.070)	−43.983 *** (16.638)	−114.74 *** (21.080)	−41.902 ** (17.311)	−103.31 *** (20.836)
$Old\ Age\ Dependenc$	−0.678 *** (0.052)	−0.545 *** (0.057)	−0.680 *** (0.053)	−0.551 *** (0.056)	−0.680 *** (0.053)	−0.522 *** (0.058)	−0.682 *** (0.053)	−0.537 *** (0.057)
$Life\ Expectancy_{i,t}$	1.132 *** (0.088)	0.259 * (0.133)	1.139 *** (0.091)	0.319 ** (0.131)	1.073 *** (0.220)	0.630 *** (0.229)	1.060 *** (0.223)	0.532 ** (0.226)
$Pc\ Income\ Growth_{i,t-}$	0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)	
$Log\ (GDPpc)_{i,t-1}$		8.991 *** (1.369)		9.874 *** (1.351)		9.850 *** (1.430)		10.326 *** (1.406)
$Fertility\ Rate_{i,t-1}$			−0.501 (1.403)	−5.875 *** (1.339)			−0.639 (1.449)	−5.554 *** (1.367)
Trend					0.015 (0.052)	−0.112 ** (0.056)	0.021 (0.054)	−0.065 (0.056)
R^2	0.9352	0.9304	0.9352	0.9339	0.9352	0.9311	0.9352	0.9341

Table 6: Result for basic non-linear models. Dependent variable: Gross Saving rates

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−47.899 *** (6.253)	−80.272 *** (9.352)	−27.359 (148.950)	158.679 (160.342)	−27.719 (149.106)	170.838 (159.856)
$Old\ Age\ Dependency_{i,t}$	−0.868 ** (0.384)	0.157 (0.381)	−0.680 *** (0.053)	−0.550 *** (0.057)	−0.868 ** (0.385)	0.181 (0.381)
$Life\ Expectancy_{i,t}$	1.158 *** (0.104)	0.172 (0.141)	0.598 (3.770)	−5.857 (4.153)	0.647 (3.775)	−6.347 (4.145)
$Pc\ Income\ Growth_{i,t-1}$	0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)	
$Log\ (GDPpc)_{i,t-1}$		9.004 *** (1.3645)		9.722 *** (1.454)		9.783 *** (1.448)
$Life\ Expectancy^2_{i,t}$	0.003 (0.006)		0.003 (0.023)	0.038 (0.026)	0.003 (0.023)	0.040 (0.026)
$Old\ Age\ Dependency^2_{i,t}$		−0.012 * (0.006)			0.003 (0.006)	−0.012 * (0.006)
R^2	0.9352	0.9311	0.9352	0.9308	0.9352	0.9315

Notes: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

To check whether the trend should be included, we include in Table 7 and estimate the following models. Our findings show that the trend should be included in the models that have the logarithm of the per capita GDP delayed and otherwise the trend should not be included.

Table 7: Results of non-linear models with trend. Dependent variable: Gross Saving rates

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−31.104 (149.810)	255.772 (163.211)	−43.184 ** (16.730)	−119.01 *** (21.118)	−31.729 (149.970)	272.478 * (162.652)
$Old\ Age\ Dependency_{i,t}$	−0.681 *** (0.054)	−0.521 *** (0.058)	−0.873 ** (0.385)	0.203 (0.380)	−0.873 ** (0.386)	0.261 (0.378)
$Life\ Expectancy_{i,t}$	0.744 (3.815)	−9.226 ** (4.312)	1.097 *** (0.226)	0.550 ** (0.232)	0.804 (3.821)	−9.879 ** (4.303)
$Pc\ Income\ Growth_{i,t-1}$	0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)	
$Log\ (GDPpc)_{i,t-1}$		11.398 *** (1.575)		9.888 *** (1.425)		11.528 *** (1.569)
$Life\ Expectancy^2_{i,t}$	0.002 (0.024)	0.062 ** (0.027)			0.001 (0.024)	0.066 ** (0.027)
$Old\ Age\ Dependency^2_{i,t}$			0.003 (0.006)	−0.012 * (0.006)	0.003 (0.006)	−0.013 ** (0.006)
Trend	0.014 (0.053)	−0.158 *** (0.060)	0.016 (0.052)	−0.115 ** (0.056)	0.015 (0.053)	−0.165 *** (0.059)
R^2	0.9352	0.9321	0.9352	0.9318	0.9352	0.9329

Notes: ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Nevertheless, to check whether the fertility rate delayed should be included in our analysis we estimate the following models (Table 8).

Table 8: Results of non-linear models with fertility rates. Dependent variable: Gross Saving rates

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−10.875 (154.520)	469.079 *** (165.122)	−47.717 *** (6.292)	−85.037 *** (9.181)	−13.814 (154.836)	488.905 *** (164.413)
$Old\ Age\ Dependency_{i,t}$	−0.682 *** (0.054)	−0.564 *** (0.055)	−0.853 ** (0.388)	0.194 (0.372)	−0.851 ** (0.388)	0.260 (0.366)
$Life\ Expectancy_{i,t}$	0.197 (3.901)	−13.981 *** (4.283)	1.162 *** (0.105)	0.227 (0.138)	0.305 (3.913)	−14.694 *** (4.270)
$Pc\ Income\ Growth_{i,t-1}$	0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)	
$Log\ (GDPpc)_{i,t-1}$		11.839 *** (1.456)		9.899 *** (1.345)		11.950 *** (1.449)
$Life\ Expectancy^2_{i,t}$	0.006 (0.024)	0.089 *** (0.026)			0.005 (0.024)	0.093 *** (0.026)
$Old\ Age\ Dependency^2_{i,t}$			0.003 (0.006)	−0.012 ** (0.006)	0.002 (0.006)	−0.014 ** (0.006)
$Fertility\ Rate_{i,t-1}$	−0.591 (1.453)	−7.566 *** (1.414)	−0.413 (1.418)	−5.945 *** (1.334)	−0.498 (1.471)	−7.715 *** (1.408)
R^2	0.9352	0.9359	0.9352	0.9346	0.9352	0.9368

Notes: ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

In this regard, the fertility rate should be included in the models that consider the logarithm of the per capita GDP delayed and if not the trend should not be included.

Finally, we estimate non-linear models (Table 9) with fertility rate and trend. Fertility rate delayed and trend should be included if we consider the logarithm of per capita GDP delayed and if not the trend should not be included.

Table 9: Results of non-linear models with fertility rate and trend.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−12.988 (154.820)	536.468 *** (166.957)	−41.468 ** (17.357)	−107.649 *** (20.851)	−15.959 (155.138)	560.379 *** (166.182)
$Old\ Age\ Dependency_{i,t}$	−0.684 *** (0.054)	−0.540 *** (0.056)	−0.856 ** (0.388)	0.219 (0.372)	−0.854 ** (0.389)	0.3229 (0.365)
$Life\ Expectancy_{i,t}$	0.324 (3.922)	−16.425 *** (4.397)	1.083 *** (0.229)	0.448 * (0.229)	0.433 (3.934)	−17.285 *** (4.383)
$Pc\ Income\ Growth_{i,t-1}$	0.001 *** (0.001)		0.001 *** (0.001)		0.001 *** (0.001)	
$Log\ (GDPpc)_{i,t-1}$		13.131 *** (1.559)		10.370 *** (1.400)		13.308 *** (1.551)
$Life\ Expectancy^2_{i,t}$	0.004 (0.025)	0.107 *** (0.027)			0.004 (0.025)	0.112 *** (0.027)
$Old\ Age\ Dependency^2_{i,t}$			0.003 (0.006)	−0.012 ** (0.006)	0.002 (0.006)	−0.014 ** (0.006)
$Fertility\ Rate_{i,t-1}$	−0.701 (1.487)	−7.265 *** (1.413)	−0.551 (1.463)	−5.611 *** (1.361)	−0.607 (1.504)	−7.407 *** (1.405)
Trend	0.019 (0.055)	−0.130 ** (0.058)	0.021 (0.054)	−0.068 (0.056)	0.019 (0.055)	−0.136 *** (0.058)
R^2	0.9352	0.9367	0.9352	0.9349	0.9352	0.9377

Dependent variable: Gross Saving rates. *Notes*: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

The findings from our sample confirmed previous results of the economic literature for savings in developed countries where a reverse causality problem exist between savings and dependency ratios for aging or life expectancy, or fertility rate or income. Nevertheless, as Li et al (2007) have proposed it could be useful to consider more explanatory variables such as international trade, infant mortality rates or educational level that reflect the competitiveness and human and / or economic development inside each country. Hence, our research have strengths (a huge time period and sample of main socioeconomic variables for European countries) but limitations, for example, when we estimate using fixed effects we assume that the coefficients are homogeneous among the sample countries. It would be interesting to include dummies variables for each country or to consider decentralization degree although we have to solve a lack of data.

When asking the question about the saving rates in Europe we have to note that greater dynamism of big cities attract more "forever young" population. Meanwhile, rural areas and small towns are losing young inhabitants and only elderly people are living in these rural areas so savings and health care costs in the senior elderly are influenced by proximity to death (United Nations, 2017; Hazra et al., 2018).

Furthermore, European countries are concerned about to achieve sustainable welfare systems for the coming decades. Aging population has important effects over the labor market and pension system and public budgets are strongly restricted after austerity measures. This is strictly related to one of the most common measures that is based on to extend the retirement age or expanding the tax base due to increase in life expectancy. But there are other measures such as special taxes or encouraging savings, whether private or public.

4. CONCLUSIONS

This paper presents empirical evidence on the relationship between population ageing and gross saving rates in European countries. First, we show that the dependency ratio negatively affects the gross saving rate although this effect is not clear when we consider non-linear models. An aging population leads to lower savings because the society is less dynamic. Second, life expectancy has non-linear effects on saving rate because it is observed a first period of accumulation of savings, until reaching a maximum, and then a decrease because in the last years of life of individuals there are some costs related to medical expenses being this behavior modeled by Modigliani's life-cycle theory. Third, the effect of increasing longevity is a main factor in saving rates and nowadays there is no reason to expect that this increase in the near future will slow down. Hence, the increase in "life in good health" makes that savings incentives do not disappear during the retirement period and the savings increase. This effect could be reverse and compensate the negative effect of the rise in the dependency ratio for advanced age.

Therefore, European countries need to stop calling "demographic problem" to something that it is a logical evolution of demographic transition. The success of the Welfare States would be their ability to assimilate changes that come with an aging population understood as new business opportunities, such as those related to active aging or elderly caring.

Despite the progress made over the last few years, there are significant gaps in covering all the different groups of people under European social protection system and aging population makes necessary to implement public policies that increase private and/or public savings, or public revenues, to enhance the financial sustainability of public social budgets.

Last but not least, the key to increase national gross savings rates is to accumulate resources for productive investments that will return through a higher present and future national income generation. This leads to be more precise to fill the gaps between populations and their different saving propensity that it depends on income households when life expectancy is expected to rise.

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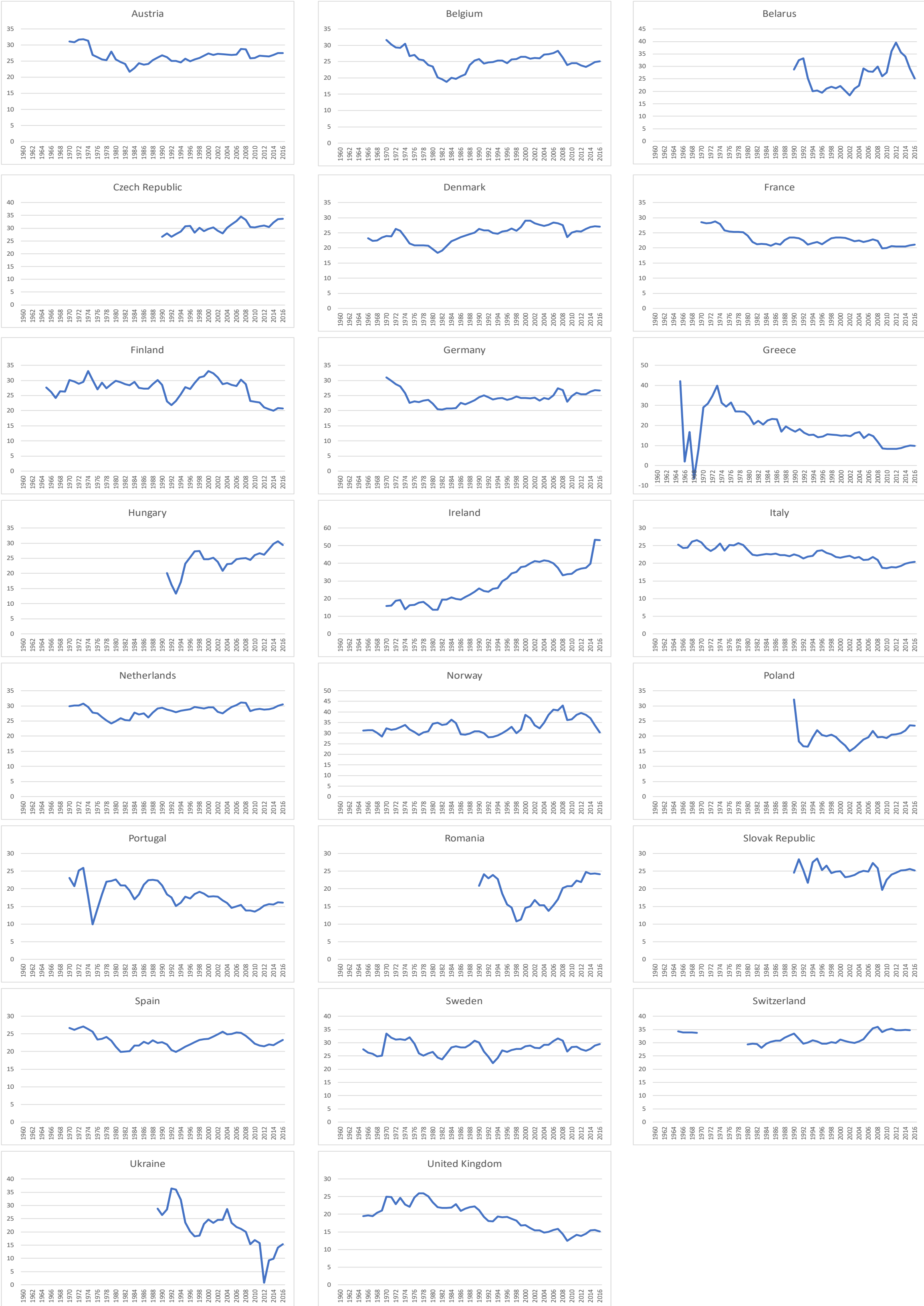
ANNEX. Figure A.1. Gross Savings Rates (full sample).



Source: Author´s elaboration based on data from World Bank Database World Development Indicators (WDI) (2018).