BBVA Research

Social Welfare and Government Size

J. Andrés, E. Bandrés, R. Doménech and L. Gadea

48th Symposium of the Spanish Economic Association
Salamanca, December 15, 2023.

Introduction

- There is a large literature that evaluates the empirical effects of government size on GDP per capita growth (see, for example, the Bergh and Henrekson (2011) survey.
- However, the evidence is far from conclusive and varies with model specifications, variable definitions, sample of selected countries, time periods, data quality or estimation methods.
- For advanced economies, the empirical literature points to a negative effect of government size, although this result is not robust enough either.
- Economic prosperity also depends on many public activities, such as the quality of public services and regulations, or the configuration of the institutional framework.
- The literature on the effects of public spending on inequality is also abundant. In general, larger and more effective governments tend to reduce inequality, mainly through spending on education, health and family and child support, and ex-post distributional policies, such as taxes and transfers.

Introduction: main contributions

- In this paper we systematically compare the effects of government size on a more comprehensive measure of social welfare growth with respect to the effects on GDP per capita growth, using different econometric techniques and robustness analysis for the sample of 36 OECD countries in the last six decades.
- We rely on the welfare measure proposed by Jones and Klenow (2016).
- This welfare index can be rigorously derived from the individual preferences used in the economic analysis of welfare and can be expressed as a function of:
  1. private and consumption per capita
  2. leisure (which depends on the number of hours worked)
  3. the distribution of income and life expectancy

Introduction: main results (I)

- Panel data estimates using annual data and cross and time fixed effects, which control for differences in GDP per capita and welfare steady states, show a negative and statistically significant impact of government size.
- In general, these effects are smaller in absolute terms in the case of welfare than for GDP per capita.
- This result is robust to changes in the estimation method, like the Mean Group (Pesaran and Smith, 1995) or the Pooled Mean Group (Pesaran et al., 1999) estimators, to the use of smoothed variables, either the HP filter or ten-year averages, and to the inclusion of dummy variables that control for expansions and recessions.
- When we allow the effect of government size to be time-varying, we find that the estimated coefficients are negative, statistically significant and rather stable until the Great Recession.
- Since the beginning of the financial crisis to the sovereign debt crisis, the negative effect of government size on growth almost doubled.
- Additionally, we find that the effect on welfare is smaller in absolute value than for GDP per capita, during most of the sample period, although the difference is smaller in the last six years.

Introduction: main results (II)

- We have tested the presence of non-linear effects of government size on growth, controlling for government quality.
- The effects on growth can be equally negative when the government is too small, with insufficient provision of critical public services to the economy, or when it is too large, so that high taxes are a drag on the efficiency of the private sector.
- At the same time, the optimal government size may be different for each country depending on the efficiency level of the public sector. Thus, we expect that countries with more efficient public sector will have larger governments.
- Our results show that the effect of government size follows an inverted U-shape, being positive, and greater for WI than for GDP per capita growth, when government size is below 35% to 40% and turn negative beyond this level.
- We also find that the efficiency with which public resources are used matters, so that government quality improvements substantially expands the range of values for which government size has a positive effect on welfare and GDP per capita growth.

Structure of the presentation

- Literature on social welfare and analyze the properties of the welfare measure used in this paper
- Survey on the empirical evidence on the effects of government size on GDP per capita growth and inequality
- Main results of our panel data estimates
  - without fixed effects
  - with fixed effects (cross and time)
  - Mean Group estimates (MG)
  - Pooled Mean Group estimator (PGM)
  - Raw and HP filtered data
- Robustness of these results to
  - non-linear effects over the business cycle
  - alternative smoothing approaches
  - the non-linear effects of government size, taking into account government quality
- Conclusions

Social welfare and GDP per capita

- Although GDP per capita is the standard measure of development, the use of broader measures that include indicators of well-being has become more widespread in recent decades.
- Berik (2020) distinguishes four different approaches to measure welfare:
  - composite indexes, as the UN Human Development Index,
  - subjective evaluation, as the UN World Happiness Report,
  - dashboards, as the OECD Better Life Initiative, and
  - monetary approaches, as the Measure of Economic Welfare developed by Nordhaus and Tobin, 1972, or the more recent variant proposed by Jones and Klenow, 2016.
- The monetary approach is less comprehensive, but it provides a well-grounded theory-based aggregation procedure of different determinants, and it allows cross-country and intertemporal comparability in a way that subjective evaluation approaches cannot do.
- In this paper we use the Jones and Klenow's (2016) measure

Social welfare and GDP per capita: Jones and Klenow (2016) measure

- Jones and Klenow's measure is a function of private and public consumption per capita (C), leisure (ℓ, which depends on the number of hours worked), the distribution of income and life expectancy (which depends on the probability of survival, S, of living beyond certain age, a):

$$U = E \sum_{a=1}^{100} \beta^a u(C_a, \ell_a) S(a) \tag{1}$$

- The comparison of welfare across countries and time is made in terms of the equivalent annual consumption necessary for a person randomly chosen in any country to be indifferent to living in another (e.g., the United States).
- This measure takes into account (the same principle using GDP) the capacity to enjoy the set of goods and services produced in each country.
- Furthermore, this comparison depends on how consumption is distributed among the individuals in an economy.
- So, it includes personal preferences about inequality.
- In practice, we do not have microeconomic data from representative surveys for all OECD countries, so some additional assumptions have to be made to use information from databases with macroeconomic information.
- Jones and Klenow (2016) show that the approximation with macroeconomic data is quite good in the case of the countries for which microeconomic data are available.

Social welfare and GDP per capita: Jones and Klenow (2016) measure

The relative welfare measure (λ_i) of each OECD country in relation to the US is calculated using the following expression:

$$\begin{aligned}\log \lambda_i = \frac{e_i - e_{us}}{e_{us}} \left(\overline{u} + \log c_i + \nu\left(\ell_i\right) - \frac{1}{2}\sigma_i^2 \right) + \log c_i - \log c_{us} \\ + \nu\left(\ell_i\right) - \nu\left(\ell_{us}\right) - \frac{1}{2}\left(\sigma_i^2 - \sigma_{us}^2\right)\end{aligned} \tag{2}$$

where

- e is life expectancy
- c per capita consumption
- v a function of leisure
- σ the variance of consumption among individuals for country i and the United States (us).

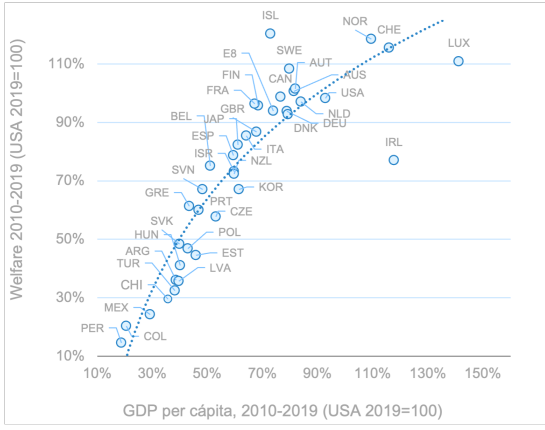
Social welfare and public expenditure

- This welfare measure is particularly suitable to study the economic and social impact of public spending.
- The role of the public sector in an economy is not only to foster productivity growth, through public investment, and the provision of public goods, such as property rights, defense, regulations or justice.
- Public spending affects market activities directly, whose effect on personal well-being is represented by consumption per capita and leisure
- It also influences the distribution of income and hence inequality in a country. Public spending is in particular a key determinant of pre-market inequality (schooling or health) and post-market inequality (taxes and transfers).
- Finally, health care, and other regulations, affect life expectancy.

Social welfare: data and sample

- The welfare measure for OECD countries has been calculated since 1960 or the first available year.
- Life expectancy at birth (e) is obtained from the Gapminder database (2020).
- Consumption per capita (c), GDP per capita (gdp), and the number of hours worked over the working age population are from Penn World Table (PWT 10, Feenstra, Inklaar and Timmer, 2015).
- For inequality of disposable income after taxes and transfers, we use the Gini coefficient from Eurostat (2020) and OECD (2020a). Data from Standardized World Income Inequality Database (SWIID 8.3, Solt, 2020), Atkinson et al. (2017) and Prados de la Escosura (2008), in the case of Spain, are used to extrapolate backwards.
- Data availability allows us to construct an unbalanced or incomplete panel for 36 OECD countries, with observations since 1960 for Australia, Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Japan, Korea, Netherlands, Norway, New Zealand, Portugal, Sweden and United States, since 1970 for Colombia, Mexico and Iceland, since 1980 for Hungary, since 1990 for Estonia, Israel, Lithuania, Slovakia, Slovenia and Turkey, and since 2000 for Luxembourg, Poland and Czech Republic.

Social welfare and GDP per capita in the OECD and selected Latam countries



GDP per capita and Welfare in the OECD and selected Latam countries, 2010-2019.

Social welfare and GDP per capita in the OECD and selected Latam countries

- Social welfare is closely related to GDP per capita, which is able to explain 83 percent of the welfare differences between countries.
- There are interesting differences between these two indicators.
- Ireland: GDP per capita is more than 22 percent higher than in the US, but the welfare index corresponding to Ireland is 21 percent lower. GDP per capita does not translate into a similar relative level of consumption per capita (see Byrne, Conefrey and O'Grady, 2021).
- Something similar happens in the case of Luxembourg and, to a lesser extent, in Switzerland
- Longer life expectancy, a better distribution of income and fewer hours worked partially compensate for the advantage of the United States relative to the European economies in GDP and per capita consumption.

Government size, growth and inequality: Review of the evidence

There is no empirical evidence on the effects of public expenditure on welfare, in contrast to the large literature on their effects on economic growth and income inequality (see, for example, Awaworyi Churchill et al, 2017)

1. Economic growth
   - Landau (1983): negative effect of public consumption on growth, but mainly advanced economies.
   - Grier and Tullock (1989) also obtained significant results on the negative influence, but much lower in less developed countries.
   - In advanced countries, different econometric methodologies show very consistent and robust negative effects (Saunders, 1985, Hansson and Henrekson, 1994, Pevcin, 2004, or Bergh and Henrekson, 2011 and 2015)
   - Composition of public expenditure matters: Gemmell, Kneller and Sanz (2016) found that reallocating spending towards productive expenditure, such as infrastructure and education, has positive effects on growth.
2. Inequality
   - The literature on the effects of public spending on inequality is also abundant, and it finds that size, composition and government efficiency matter (Fournier and Johansson 2016, Johansson, 2016)
   - Positive distributional effect of education, public health, social spending and labor market policies (e.g., Afonso, Schuknecht and Tanzi, 2010).
   - In a meta-regression analysis applied to over 900 regression results in 84 different studies, Anderson et al. (2017) confirm a moderate negative effect of public spending on inequality.

Main results: sample and data

- Extending previous findings in the empirical literature, we systematically compare the effects of government size on welfare growth with respect to GDP per capita growth.
- Our results are based on data of the welfare index (*WI*), previously described, *GDP* per capita and total public spending (*PS*) in relation to GDP.
- GDP and population have been taken from the Penn World Table 10.0
- Total public spending over GDP has been taken from the OECD Economic Outlook and it has been extrapolated backwards, until 1960 whenever it was necessary, using the Mauro et al. (2015) database.
- Lower case variables $gdp_{i,t}$, $wi_{i,t}$, and $ps_{i,t}$ represent logarithms, $i=1;...,N$, where N is the number of countries and $t=1,...,T$ the time period from 1960 to 2019, although the sample is not complete for all countries.
- Two types of panels:
  1. an unbalanced panel with 36 countries with some data from 1960 to 2019,
  2. a balanced panel with the 22 countries that have data for the full period 1960-2019.

▸ Data

Main results: econometric specifications

- We begin our analysis performing a panel data estimation using annual data, with and without fixed effects:

$$\Delta y_{it} = \beta ps_{it} + \rho y_{it-1} + \delta_t + \alpha_i + \epsilon_{it} \tag{3}$$

- we estimate a second specification similar to the Mean Group (MG) estimator (Pesaran and Smith, 1995), which allows for country specific effects of government size on GDP per capita and welfare (β_i),

$$\Delta y_{it} = \beta_i ps_{it} + \rho y_{it-1} + \delta_t + \alpha_i + \epsilon_{it} \tag{4}$$

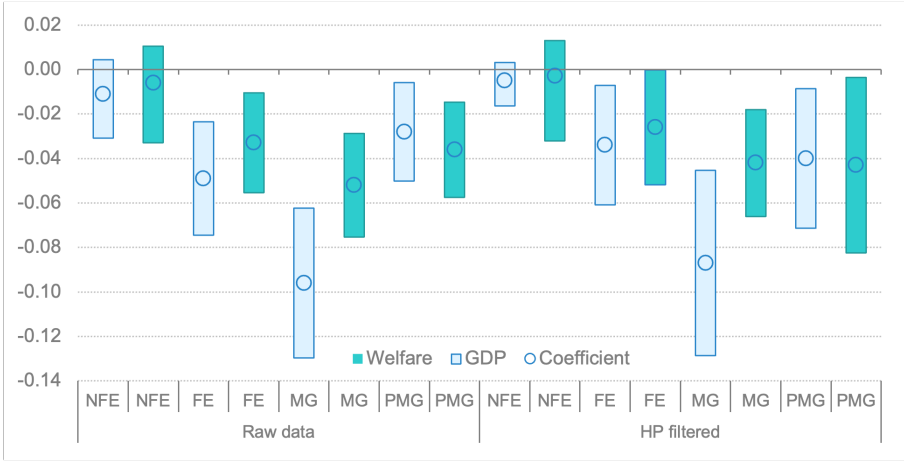
  Then we define the Mean Group estimate of β as:

$$\widehat{\beta}_{MG} = N^{-1} \sum_{i=1}^{N} \widehat{\beta}_i \tag{5}$$

- The third approach is the Pooled Mean Group (PGM) estimator (Pesaran et al., 1999). We allow α_i and β_i to differ across countries, but we constrain the error correction and the short-run dynamics coefficients and the time dummies to be the same across countries:

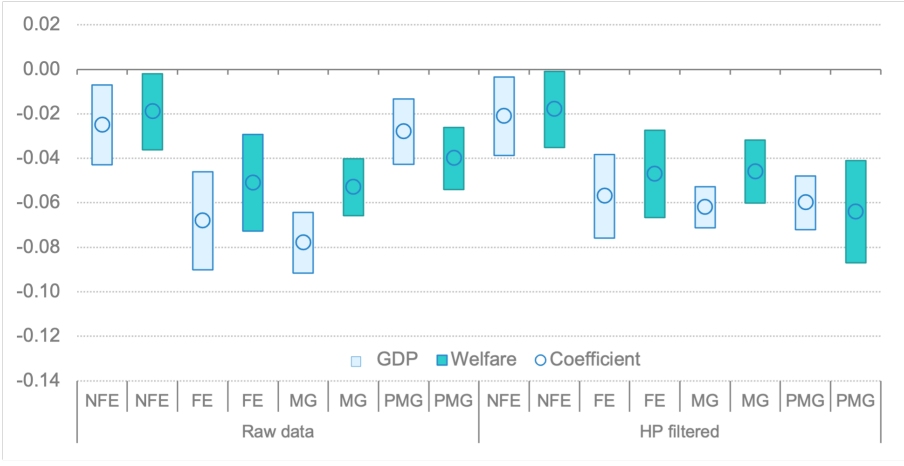
$$\Delta\Delta y_{i,t} = \theta(\Delta y_{i,t-1} - \alpha_i - \rho y_{i,t-2} - \beta_i ps_{i,t-1} - \delta_t) + \sum_{p=1}^{P} \lambda_p \Delta\Delta y_{i,t-p} + \sum_{q=1}^{Q} \gamma_q \Delta ps_{i,t-q} + \epsilon_{it} \tag{6}$$

Main results: panel estimates, unbalanced sample, 36 countries



Coefficients of government size with different methods and 95% confidence intervals.

Main results: panel estimates, balanced sample, 22 countries

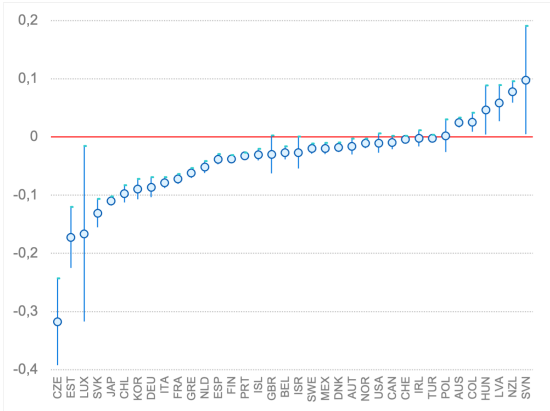


Coefficients of government size with different methods and 95% confidence intervals.

Main results: comments

- The main result is that, regardless of the estimation method, we find a negative and significant effect of the size of the public sector on the growth of GDP per capita and of the welfare index, once fixed effects are taken into account.
- The absolute value of β_i is smaller for welfare than for GDP growth.
- Although we include time effects, the negative sign of the government size coefficient may be the consequence of the business cycle: as growth is negative in recessions, GDP falls and government expenditure over GDP increases, even in the case of a neutral fiscal policy. As a result, *PS* may be countercyclical.
- As a first attempt to correct for this potential bias, we replicate the previous estimations but now using the trend component obtained after smoothing the logs of GDP per capita, welfare and government expenditures over GDP with the Hodrick and Prescott filter.
- The effect with filtered variables is still negative and statistically significant in all specifications in which country fixed effects are included.

Main results: country effects in welfare regressions



Coefficients of government size for each country in welfare regressions, based on MGE with data filtered by business cycle (vertical lines represent 95% confidence intervals).

Results by country: comments

- Although the average of coefficients is negative (-0.042),there is a lot of heterogeneity across countries.
- In five countries the coeffcients are smaller than -0.10: CZE, EST, LUX, SVK and JAP.
- In seven countries are positives: POL, AUS, COL, HUN, LVA, NZL and SVN.
- The estimated coefficient of *ps* ranges from -0.317 for Czech Republic to 0.098 for Slovenia.
- In most of the countries, the coefficients are estimated with a small standard error, so the confidence intervals are quite small.

▸ Country analysis

Main results: country effects welfare vs GDP per capita regressions

Coefficients of government size for each country in welfare and GDP per capita regressions, based on MGE.

Results by country: comments

- The average value of the government coefficient for welfare is half the value (-0.042) of th average for GDP per capita (-0.087).
- The correlation is positive, by quite low (0.28).
- In the case of GDP per capita, the coefficient of *ps* is positive only in two countries (Colombia and Turkey).
- At the other extreme, the negative coefficient for Luxembourg (-0.72) is very large and atypical with respect to the estimated coefficients for other countries.

Empirical evidence: summary

So far, all the empirical evidence can be summarized as follows:

1. When we replace *GDP* with a more inclusive measure such as the welfare index (*WI*), the negative effect is reduced in most specifications.
2. There is strong cross-country heterogeneity in the results; taking into account unobserved differences across countries is very relevant.

Robustness analysis: Business cycle chronology

- The panel data model is now re-estimated with an additional variable *bc* that takes value 1 in times of recession and 0 in times of expansion.

$$\Delta y_{i,t} = \beta ps_{i,t} + \rho y_{i,t-1} + \alpha_i + \theta bc_{i,t} + \delta_t + \epsilon_{i,t} \quad (7)$$

- We estimate the specific business cycle turning point chronologies by applying a yearly adaptation (Inklaar, 2003)) of the non-parametric dating procedure that was introduced by Bry and Boschan (1971) at the monthly frequency and reformulated by Harding and Pagan (2002) for quarterly data.
- In the case of *GDP* growth, the business cycle is, as expected, clearly significant and reduces slightly the negative effect of the size of the public sector on growth, both in the full and reduced sample panel.
- Compared to the results of the fixed-effect model, after including *bc* in the full sample β is now -0.036 for GDP per capita growth (-0.049 in column (3), Table 2), and -0.024 for welfare growth (-0.033 in column (4), Table 2).

▸ Business cycle chronology

Robustness analysis: Business cycle chronology

Panel estimation with a business cycle dummy

	Full sample		Balanced sample	
	$\Delta gdp_{i,t}$	$\Delta wi_{i,t}$		
$ps_{i,t}$	−0.036	−0.024	−0.055	−0.043
	(−3.335)	(−2.505)	(−6.372)	(−5.060)
$gdp_{i,0}$	−0.016		−0.013	
	(−2.204)		(−1.579)	
$wi_{i,0}$		−0.015		−0.010
		(−2.137)		(−1.347)
$bc_{i,t}$	−0.042	−0.028	−0.037	−0.023
	(−12.641)	(−7.770)	(−12.954)	(−6.137)

Robustness analysis: Averaging the sample every 10 years

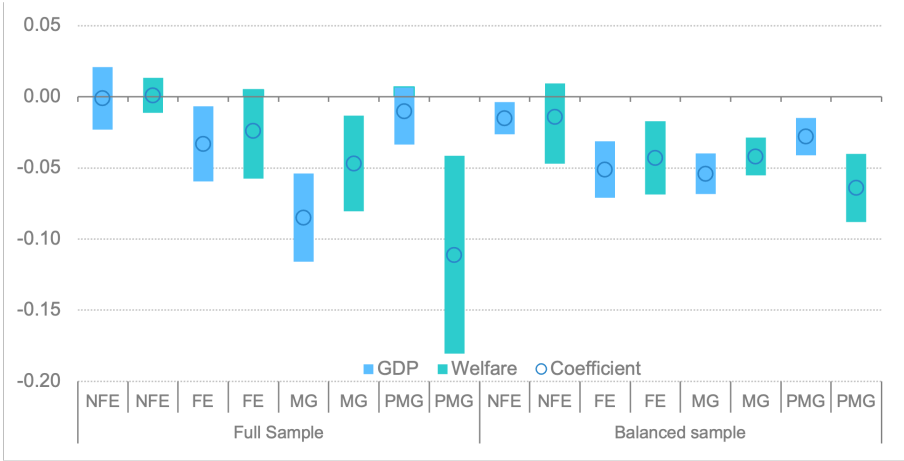
- An alternative way to eliminate the influence of the economic cycle is averaging the sample every 10 years:

$$\frac{y_{it} - y_{it-10}}{10} = \beta \overline{ps}_{it}^{10} + \rho y_{it-10} + \delta_t + \alpha_i + \epsilon_{it} \tag{8}$$

- The estimated values of β are again negative and statistically significant when fixed effects are included.
- we observe that, in general, this coefficient in smaller in absolute value for welfare than for GDP per capita, except for the PMG estimate.
- We have re-estimated equation (8) allowing the effect of government size to be time-varying, but with no variation across countries, that is:

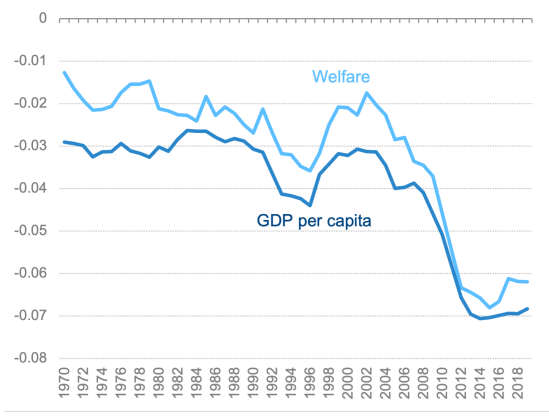
$$\frac{y_{it} - y_{it-10}}{10} = \beta_t \overline{ps}_{it}^{10} + \rho y_{it-10} + \delta_t + \alpha_i + \epsilon_{it} \tag{9}$$

Robustness analysis: Averaging the sample every 10 years



Results of panel estimates with 10-year averages.Coefficients of government size and 95% confidence intervals.

Robustness analysis: Rolling estimates averaging the sample every 10 years



Coefficients of government size across time in welfare and GDP per capita regressions

Rolling estimates averaging the sample every 10 years: comments

- The estimated government size coefficients are negative, statistically significant, and fairly stable until the Great Recession.
- Since the beginning of the financial crisis to the sovereign debt crisis, the negative effect of $\overline{ps}_{it}^{10}$ almost doubled.
- However, in principle, we cannot reject the hypothesis of reverse causation.
- That is, if the financial crisis reduced potential growth of GDP and welfare but countries maintained the rate of growth of public spending during the next decade, then $\overline{ps}_{it}^{10}$ increased, reinforcing the effect estimated from government size to growth and welfare estimated in previous decades.
- There is some evidence that this could have been the case in some countries in the sample.
- The negative effect of government size on welfare is smaller in absolute value than for GDP per capita, during most of the sample period, although the difference almost disappeared in the final part of the sample.

Robustness analysis: Cross-country estimates

- The traditional approach of growth equations has used averages for the whole sample period and has estimated cross-country specification. In columns (1) and (2) of Table 4 we present the estimation results of the following equation:

$$\Delta y_{i,\bar{t}} = \theta y_{i,0} + \beta ps_{i,\bar{t}} + \alpha + \epsilon_i \tag{10}$$

- Columns (1) and (2) of Table 4 show now a surprising positive and significant effect for both *gdp* and welfare.
- We have recovered the estimated country fixed effects (α_i) in columns (3) and (4) of Table 3, and we have included them as an additional control in the following cross-section equation:

$$\Delta y_{i,\bar{t}} = \theta y_{i,0} + \beta ps_{i,\bar{t}} + \gamma \alpha_i + \alpha + \epsilon_i \tag{11}$$

- The results in columns (3) and (4) in Table 4 show that the inclusion of α_i makes again the coefficient of government size negative and statistically significant.

Robustness analysis: Cross-country estimates

Results of the cross-section estimation

	(1)	(2)	(3)	(4)
	$\Delta gdp_{i,\bar{t}}$	$\Delta wi_{i,\bar{t}}$	$\Delta gdp_{i,\bar{t}}$	$\Delta wi_{i,\bar{t}}$
Constant	0.094	0.004	0.258	0.099
	(3.34)	(0.20)	(11.7)	(6.69)
$ps_{i,\bar{t}}$	0.012	0.019	-0.043	-0.011
	(2.20)	(3.10)	(5.99)	(2.30)
$gdp_{i,0}$	-0.012		-0.008	
	(4.67)		(5.89)	
$wi_{i,0}$		-0.015		-0.012
		(6.31)		(9.21)
Fixed effects			0.800	0.509
			(8.07)	(6.39)
Countries	36	36	36	36
R^2 *adj.*	0.350	0.660	0.816	0.790

Robustness analysis: Effects of government size on welfare growth components

$$\Delta \widetilde{wi}_{i,t} = \Delta \widetilde{e}_{i,t} + \Delta \widetilde{\log c}_{i,t} + \Delta \widetilde{\nu(\ell)}_{i,t} - \Delta \frac{1}{2} \widetilde{\sigma}^2_{i,t}$$

Panel estimates for welfare components

	(1) $\Delta \widetilde{wi}$	(2) $\Delta \widetilde{e}$	(3) $\Delta \widetilde{\log c}$	(4) $\Delta \widetilde{\nu(\ell)}$	(5) $\Delta \frac{1}{2} \widetilde{\sigma}^2$
$\widetilde{wi}_{i,t-1}$	-0.005	0.002	-0.010	0.003	-0.001
	(2.42)	(2.39)	(5.21)	(8.00)	(2.96)
$\widetilde{ps}_{i,t}$	-0.026	0.001	-0.026	0.002	0.002
	(8.34)	(0.84)	(8.96)	(6.95)	(3.15)
R^2 adj	0.607	0.462	0.575	0.484	0.327
Countries	36	36	36	36	36
Observ.	1775	1775	1775	1775	1775

Government expenditure composition, tax structure and public debt

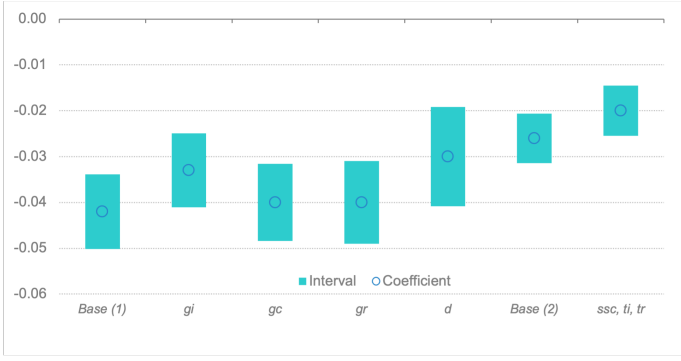
- We also check the robustness of the coefficient of government size in the welfare growth equation (3) when we control for the government expenditure composition, the public debt to GDP ratio, and the tax structure:

$$\Delta \widetilde{wi}_{i,t} = \theta \widetilde{wi}_{i,t-1} + \beta \widetilde{ps}_{i,t} + \phi_x \widetilde{\mathbf{x}}_{i,t} + \delta_t + \alpha_i + \epsilon_{i,t} \tag{12}$$

  where $\widetilde{x}$ stands for:

- The trend components of the three shares of public expenditures (public investment ($\widetilde{gi/ps}$), public consumption ($\widetilde{gc/ps}$), and the rest of expenditures ($\widetilde{gr/ps}$) in total public expenditures),
- The ratio of public debt to GDP ($\widetilde{d/gdp}$),
- The different tax shares considered: the share over total taxes of social security contributions ($\widetilde{ssc/t}$), indirect taxes ($\widetilde{ti/t}$), and other direct taxes ($\widetilde{tr/t}$), different from corporate taxes ($\widetilde{tc/t}$), which are not included since the sum of the different shares adds up to 1.

Government expenditure composition, tax structure and public debt



Coefficients of government size and 95% confidence intervals.

The relevance of government quality

- There are good reasons to think that the effects of government size on welfare and growth may be non-linear.
- As pointed out by theoretical contributions such as Barro (1990), there could be an optimal level of government size that maximizes GDP per capita or welfare so that too small or too large government sizes would be less than optimal, or outright detrimental, in promoting GDP and welfare growth.
- This optimal level may be different for each country depending on the efficiency level of the public sector. We expect that countries with more efficient public sector will have larger governments.
- We have used the Government Quality Indicator from The Quality of Government Institute of the University of Gothenburg.
- This quality indicator is the result of adding three components:
  - the corruption of the political system
  - the impartiality of the judicial system and compliance with the law
  - the quality of public administrations.

The relevance of government quality

- To cincunvent the potential problems of multicollinearity between gq and ps and the stability over time in some countries of gq, we follow an alternative two-stage approach.
- First, we regress ps on gq.
- Second, we include the square of the residuals of this regression $(ps_{i,t} - \widehat{ps}_{i,t})^2$ in our panel equation, as well as the level of government quality ($gq_{i,t}$) and its interaction with government size ($ps_{i,t} * gq_{i,t}$), that is

$$\Delta y_{it} = \beta_1 ps_{it} + \beta_2 (ps_{i,t} - \widehat{ps}_{i,t})^2 + \beta_3 gq_{i,t} + \beta_4 ps_{i,t} * gq_{i,t} + \rho y_{it-1} + \delta_t + \alpha_i + \epsilon_{it} \tag{13}$$

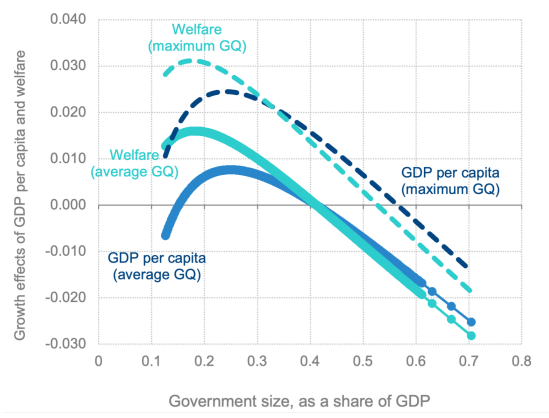
- As expected, we estimate a positive coefficient for government quality. The inclusion of this additional variable introduces a quadratic effect of ps for a given level of government quality.
- The squared residuals $(ps_{i,t} - \widehat{ps}_{i,t})^2$ enter with the expected negative sign. The interpretation of $\beta_2 < 0$ is that the deviation of government size with respect to the level predicted by the quality of government reduces the growth of GDP per capita and welfare.
- To analyse the effects of government size further, we have simulated the joint effects of ps and gq on the growth rates of GDP per capita and welfare, holding constant government quality at two different values: its average and the maximum level of quality.

The relevance of government quality

Panel results with the government efficiency variable

	(1)	(2)	(3)	(4)	(5)	(6)
	Δgdp	Δwi	Δgdp	Δwi	Δgdp	Δwi
$ps_{i,t}$	-0.022	-0.032	-0.030	-0.039	-0.039	-0.046
	(-4.26)	(-7.31)	(-7.46)	(-9.64)	(-8.07)	(-10.2)
$(ps_{i,t} - \widehat{ps}_{i,t})^2$			-0.030	-0.024	-0.033	-0.026
			(-4.04)	(-2.93)	(-4.64)	(-3.38)
$gq_{i,t}$					0.072	0.061
					(1.92)	(1.94)
$ps_{i,t} * gq_{i,t}$					-0.020	-0.017
					(-1.95)	(-2.02)
$gdp_{i,t-1}$	-0.019		-0.020		-0.022	
	(-6.66)		(-6.91)		(-6.81)	
$wi_{i,t-1}$		-0.003		-0.003		-0.004
		(-1.16)		(-0.96)		(-1.32)
R^2	0.742	0.719	0.751	0.725	0.752	0.726
Countries	36	36	36	36	36	36
Observationss	1157	1157	1157	1157	1157	1157

The relevance of government quality



Effects of government size on growth rates of GDP per capita and welfare for two different values of government quality.

The relevance of government quality

- When government quality is at is average value, the effects of government size are positive on growth rates for values of *ps* below 41.1 per cent of GDP.
- According to our estimates, the maximum positive effects occur when the government size is below 30 per cent of GDP.
- When government quality is at its maximum level, the curves shift upward and to the right.
- The positive effects on growth are greater since β_3 is positive; also, as the quality of government improves, the range of government sizes that have positive effects on growth and welfare expands.

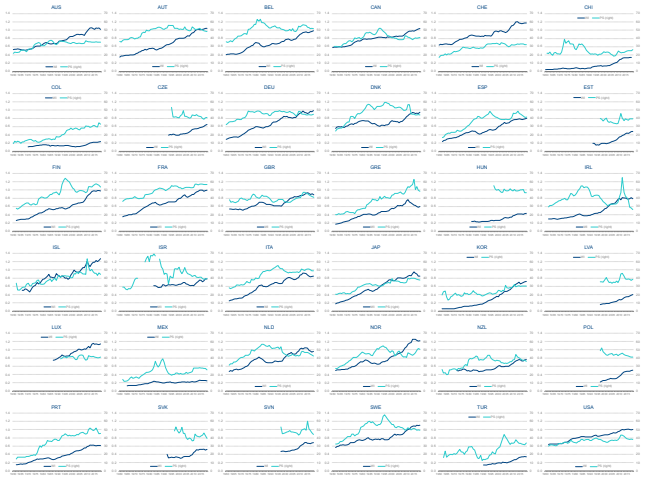
Conclusions

- We have compared systematically the effects of government size on social welfare growth with respect to GDP per capita growth, using different econometric techniques and robustness analysis for the sample of 36 OECD countries in the last six decades.
- Panel data estimates using annual data and fixed effects show negative and statistically significant effects of government size on both GDP per capita and welfare.
- These effects are smaller in absolute terms in the case of welfare than for GDP per capita.
- This result is robust to changes in the estimation method, to the use of smoothed variables, and to the inclusion of dummies variables that control for expansions and recessions over the business cycle.
- When we allow the effect of government size to be time-varying, we find that the estimated coefficients are negative, statistically significant and rather stable until the Great Recession.
- The effect on welfare is smaller in absolute value than for GDP per capita, during most of the sample period.
- Finally, we have found the presence of an inverted U-shape for effects of government size on growth, controlling for government quality. The effects on welfare are positive and greater than for GDP per capita growth when government size is below 35% to 40%. Improvements in government quality can substantially increase government size before having negative effects on growth.

Future research

- Other robustness exercises
  - modifying the Welfare index by giving more weight to inequality
  - analyzing components of public expenditure separately
- Analyse in more detail specific episodes such as the aftermath of financial crises that can act as control cases.
- Relate short-run dynamics to the long-run effect (fiscal multipliers, local projections,...)

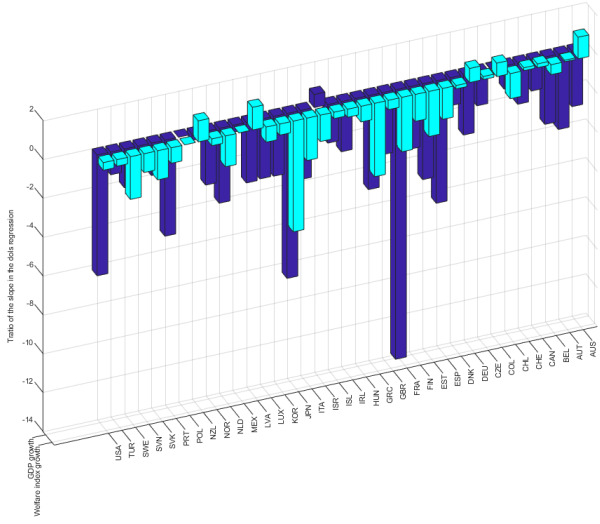
Appendix



Evolution of Welfare Index and Public Spending GDP ratio.

Back

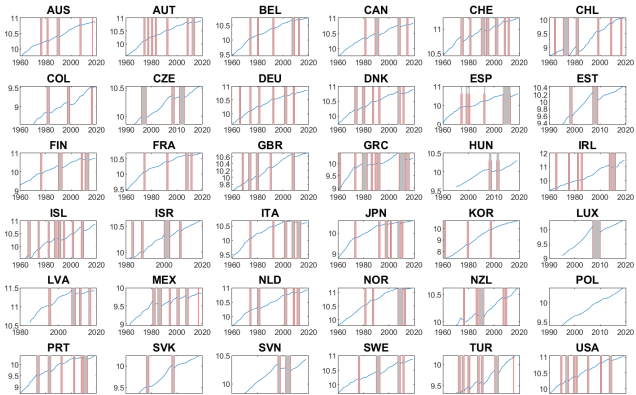
Appendix



Effects of government size on growth rates of GDP per capita and welfare for countries (DOLS estimation, includes initial value and business cycle).

Back

Appendix



Business cycle chronology.

Back