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New Evidence on the Historical Growth of Government in Europe: The Role of Labor Costs

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Abstract

We document a robust positive correlation between the size of government and the labor share of income in data from European countries covering the period 1869-1975. Following Facchini et al (2017), we interpret this correlation as evidence that labor costs drive public spending. The long-term increase in the labor share observed over this period explains half of the overall growth of central government. The relationship holds when the labor share is instrumented with movements in technological change at the frontier. When decomposing public spending, transfers, not intensive in labor, are the only component not associated with the labor share.

Keywords: Labor share, Public Spending, 20th Century Europe.

JEL: N4; J3; E25.

Declaration of interest: none.

1 Introduction

The long-run stability of the shares of national income received by labor and capital was ordained as "stylized fact" by Kaldor (1961). However the global decline in the labor share documented since the 1980s (for example discussed in Karabarbounis and Neiman 2014) has severely undermined this precept, perhaps confirming earlier doubts (Kravis 1962; Kuznets and Murphy 1966). Moreover, recent studies provide evidence of an upward trend in the labor share of income from the late 19th Century up until the 1970s in Western countries (Atkinson and Piketty 2007; Roine and Waldenström 2015; Bengtsson and Waldenström 2015).

In a recent paper Facchini, Melki and Pickering (2017) (henceforth FMP) make the case that the recent declines in the labor share contributed to the slowdown in the growth of the size of government in OECD countries since the 1980s, through declining labor costs. In the present paper we take this hypothesis to data for Western European countries from the late 19th Century up until the 1970s. The early and mid 20th Century witnessed substantial state building across Western Europe. Tanzi and Schuknecht (2000) document that average government spending as a share of GDP around 1870 was 10.3%. By 1970 this had risen to 39% in the 11 countries analyzed in this paper - not much less than that observed in the present day.[1]

Insert Figure 1

Figure 1 depicts the upward trend in both the labor share and public spending for central and general (total) government spending as a share of GDP for historical periods up to 1975 for our sample of countries. Notwithstanding the two world wars, for most countries there is a clear correspondence between the two series. In contrast with FMP the present paper therefore covers a period of time with much greater variation in the dependent variable, and covers the substantive period of government growth. It therefore represents an important examination of the hypothesis that the

[1] Tanzi and Schuknecht (2000), Table I.1, pp. 6-7. The labor share data used by FMP begins for most countries in their analysis in 1970.

labor share substantially affects the size of government. Moreover, the idea that the labor share plays a first-order role in determining the size of government can be tested against other prominent theories explaining the growth of government in the 20th Century.

Previous literature predominantly attributes the long-term growth of government in the 20th Century to demand-side factors, such as economic development (Durevall and Henreckson 2011) in accord with 'Wagner's law', democratisation and the extension of the voting franchise (Aidt et al. 2006), rising income inequality (Meltzer and Richard 1983) or voters' ideology (Pickering and Rockey 2011; Facchini and Melki 2014). On the supply side, a literature emphasises the role of efficient tax innovations such as the adoption of personal income taxation in the growth of the government's revenues (Becker and Mulligan 2003; Aidt and Jensen 2009). The present paper instead asks whether supply side factors affecting the costs of providing public services also played a part in the dramatic growth in government spending over the period prior to 1975.

We find that the observed increase in the labor share through the period from 1869 to 1975 in countries such as Germany or the UK explains up to half of the total growth of central government spending and around one sixth of the total growth of general government spending, the latter being relatively less labor intensive due to the inclusion of social security composed of transfers. The empirical analysis uses a panel of 11 Western European countries, augmenting the analysis of Aidt et al. (2006) including the labor share as an additional explanatory variable. The labor share is measured as the share of compensation going to dependent employees in total income, using the database provided by Flora (1983). This database provides continuous and comparable annual data and extends the time span by several decades in comparison with existing cross-national datasets starting from the 1970s, thereby covering the period of growth in both the labor share and public spending through the earlier parts of the 20th Century as depicted in Figure 1.

The size of government is consistently found to be positively associated with the labor share of income. This relationship is robust across a wide set of differ-

ent econometric specifications, using both general and central government spending as the dependent variable, alternative measures of the labor share taking into account long-term structural changes in the economies and controlling for a number of further factors affecting both the labor share and public spending. In particular, the result holds up when the data are averaged across 5-year intervals to eliminate cyclical variation, a potential source of endogeneity as both the labor share and government size plausibly move with the cycle.[2] In addition to the quantitatively sizeable estimate of the importance of the labor share, our analysis reveals that it is the only determinant of public spending that is robust across specifications, reinforcing the hypothesis that the labor share played a first-order role in the growth of government in the 20th Century.

As discussed below, there are other potential mechanisms linking government spending and the labor share: there may be reverse causality, as well as exogenous forces driving both. In order to address this we take two approaches. Firstly, and also in order to address measurement error in the labor share as well as the endogeneity issue, the analysis employs an instrumental variable strategy based on the established view that technological change, whether capital- or labor-augmenting, is one of the main drivers of the labor share (Acemoglu 2002; Karabarbounis and Neiman 2014). Movements in the technological leader's labor share reflect exogenous technological change at the frontier. As in Acemoglu et al (2006), the United States is considered as the technological leader from 1945 onwards. Individual (non-leader) country labor shares are then linked to the leader's labor share via technological catch-up. In particular technological change at the frontier is assumed to heterogeneously affect the individual countries' labor shares, depending on their distance to the technological frontier. Following a shift in the leader's labor share, countries that are closer to the frontier, i.e. with small development gaps, are more likely to

[2]Theoretically the cyclical relationship between government size and the labor share may be positive or negative depending on the macroeconomic model. Plausibly government size is anti-cyclical as the denominator (GDP) shrinks in recession, whilst 'automatic stabilizers' might increase the numerator. On the other hand the labor share could be procyclical or anticyclical depending on how real wages move with the cycle. Real Business Cycle theory posits a procyclical relationship, whilst Keynesian theory posits that real wages increase in recession (if nominal wages are 'sticky' and prices fall).

experience subsequent shifts in their own labor share, whilst countries with larger development gaps will be less affected. Hence we use the interaction of the labor share of the leader with the development gap between individual countries and the leader to instrument for the country-level labor share. The instrumental variable regression results further support the hypothesis of this paper.

The second strategy addresses reverse causality in particular, reflecting the likely presence of lags in the alternative mechanisms, and implements Granger-causality tests proposed by Angrist and Pischke (2009, ch. 5). The results support the hypothesis that the labor share Granger-causes the size of government, but not vice-versa.

A further test of the central hypothesis is provided by disaggregating total public expenditure between security spending (including defence, justice, police), long-term public services (including transport and communication), collective goods (including health, public housing and education) and social transfers. The main argument of the paper applies to labor-intensive sectors of government. However, an increasing portion of total government expenditure in our sample has consisted of transfers, reaching up to around half of total spending in some countries in 1975. As underlined by FMP, these expenditures (generally) do not require labor inputs to the same extent as produced public services. We find that social transfers as a share of GDP is the only component of government spending to be not statistically associated with the labor share. This again supports the hypothesis that the link between government size and the labor share is due to labor costs.

The next section develops a theoretical discussion of how the labor share affects government spending. Section 3 presents the data. Section 4 discusses the empirical strategy and Section 5 presents the regression results. Section 6 offers concluding remarks.

2 Theoretical Mechanisms

The literature distinguishes between demand- and supply-side explanations for the growth of government. The seminal supply-side explanation is Baumol's (1967) cost disease: costs are pushed up over time because of rising wages and stagnant productivity in the (public) service sector. Given inelastic demand for labor-intensive public services the relative size of government grows. FMP showed that an implication of these premises is that the size of government depends positively on the labor share because of increased costs in the (labor-intensive) public sector.

The theoretical model presented by FMP is of a two-sector economy (a la Baumol, 1967) where the private sector enjoys exogenous Solow-style technological progress and the labor-intensive public sector does not. Individuals derive utility from goods from both sectors and again following Baumol (1967) the demand function requires that public sector output must grow so as to match private sector output that is growing due to technological progress. Expenditure on the public sector depends very straightforwardly on labor costs and if the private sector labor share increases then these rise due to wage parity across the two sectors. The size of the public sector thus rises and falls with the labor share. FMP find that data from the OECD since 1970 cohere with this hypothesis.

Nonetheless as FMP acknowledge there are myriad potential mechanisms linking the size of government to the labor share. One important possibility is that it is policy itself (represented by the size of government) which affects the labor share. For instance a large public sector might raise the outside option of a private-sector employee. Given this option the worker might be able to bargain a more generous wage from her employee and hence drive up the labor share. This mechanism requires some degree of imperfect competition in the labor market: were the labor market competitive then it is marginal productivity rather than bargaining which determines the wage and hence the labor share.

In the empirical work below the possibility that large government itself affects the labor share is investigated in the Granger-causality sense. The bargaining pro-

cess is likely to involve lags given wage rigidities. For example suppose the size of government increases and the outside option improves. Here it seems plausible there would be a lag before the realization of the higher wage. The hypothesis is therefore that lags of the size of government affect the labor share.

Conversely in the mechanism proposed by FMP, it is the private sector labor share which exogenously moves first. This is in accord with Karabarbounis and Neiman (2014) who find that the main determinant of the labor share is the state of technology. Given that incumbent public sector workers very likely bargain their wage (and in the public sector the link between wages and productivity is arguably weaker) then the lag this time works in the other direction - lags of the labor share affect the size of government.

3 Data

3.1 Public Spending

We use two measures of government size: central government spending as a share of GDP and general (total) government spending as a share of GDP, with the latter including not only all levels of government (central, local, and where relevant, regional) but also social insurance spending. We employ data from Flora (1983), which is available for the 11 countries of our analysis between 1869, at the earliest, and 1975. The two spending measures are complementary. On the one hand, data for general government spending alleviate the problems of cross-country comparison due to variations in national accountancies, institutional frameworks or government decentralization. For the overlapping years between 1960 and 1975, the Flora (1983) data can be compared with the OECD Economic Outlook database. The correlation coefficient between Flora's data on general government spending and the comparable OECD data is 0.87. On the other hand, central spending data are available for more countries and years. General government spending data are not available for France and the Netherlands and only from 1968 for Italy.[3]

[3]The historical data on central government cannot easily be compared with the modern data from the International Financial Statistics as there is little overlap across the two series.

In addition, because the hypothesis of this paper is that the labor share of income should affect expenditure on public services that are especially intensive in labor, we also disaggregate central government spending following Aidt et al (2006). The separate items are (1) security (defence, general administration, the judiciary and the police), (2) long-term public services (economic services, transport and communication), (3) collective goods (health, public housing and education) and (4) social security as a proxy for social transfers. The different items are measured in current domestic prices as a proportion of nominal GDP (or NNP if GDP numbers are not available). While security and public services data are available for the 11 sample countries, collective goods and transfers spending are available for just 5 countries (Scandinavia, Belgium, UK) from 1930 at the earliest. Nonetheless transfers are quantitatively important. Social transfers represented less than 10% of total spending in 1930 (with a minimum of 5% in Norway), and dramatically increased to represent up to nearly half of total spending in 1975 (with a maximum of 48% in Denmark).

Table 1 reports the data on general and central government spending as a share of GDP for selected years between 1870 and 1975. Since 1869, both central and total government spending has increased considerably in all the sample countries although this increase has not been constant over time. As noted by Tanzi and Schucknecht (2000) for industrialized countries, most of the increase occurred in the wake of the two World Wars and during the period from 1960 to 1980. During the pre-World War I period from 1869 to 1913, public spending was fairly stable and indeed minimal. The differences between countries are in part due to the varying scope of government activities across countries. For example, although the first social security system was introduced in Germany in the 1880s, it remained a minor component of public spending. Increased military spending is evident at particular instances, in particular the Franco-Prussian War of 1870-1871 and the arming of Germany, France and the UK in anticipation of WWI. This is reflected in higher total public spending in these countries, while total public expenditure barely reached 10% of GDP in Denmark, Norway and Sweden.

Insert Table 1

The First World War itself brought about a considerable increase in average government spending. The interwar period from 1919 to 1938 was marked by much volatility in public spending though roughly followed a 'U-shaped' curve in many countries, as evident in Figure 1. The resumption of spending in the 1930s partially came from growing military spending in response to the renewed threat of war, but also stemmed from the enlargement of government activities. Indeed, by the late 1920s many European countries had introduced rudimentary social security systems and the Depression resulted in the adoption of social programs in the 1930s.

The post-World War II period up to 1960 was marked by post-war adjustment. Between 1930 and 1950, average public spending in our sample substantially increased by around 6.5% points for both central government (from 13.9% to 20.5%) and general government (19.8% to 26.2%). Conversely, the post-war period up to 1960 was marked by a modest increase by only 1% point for central government and around 5% points for general government, partially reflecting the growth of social transfers during this period. A closer look at this period reveals a short cut in spending immediately after the war and then a moderate increase in the 1950s for both central and total public spending. During this period, many European countries accepted welfare rights as constitutional rights.

In contrast, the period from 1960 to 1975 presents a clear picture of rapid and steady growth. Average general spending increased from 29.58% to 48.21% of GDP. General government spending at least doubled in Denmark, Belgium, Sweden, Switzerland, in several instances exceeding 50% of GDP. Certainly the role of government was transformed, with creation of the modern welfare state (Tanzi and Schuknecht 2000). Nonetheless, our argument is that the expansion of the remit of the public sector is not the only candidate for explaining why public expenditure grew so much through the century.

3.2 The Labor Share

Using data from Flora (1983), we derive a measure of the labor share of income using total compensation of dependent employees as a share of national income. Data are available annually for all countries of our sample going back to at least 1950 and in the cases of Germany and the United Kingdom to the late 19th Century. Figure 1 depicts the evolution of these data along with the public spending data, and Table 2 reports the labor share data for selected years for each country. Regarding Germany and the UK, for which data are available from 1870, the labor share as measured by Flora increased from 42.7% to 72.8% for Germany and from 47.9% to 80.2% for the UK over the 105 years covered in the sample. A similar upward trend is present in the other countries. Indeed, in the 5 countries for which data is available from 1930, the average labor share increased from 58.36% in 1930 to 77.80% in 1975. Regarding the 11 sample countries, the average labor share increased from 56.53% to 74.75% between 1950 and 1975.

Insert Table 2

As discussed below, one concern with these data is that they include only the labor income of dependent employees. Hence the data potentially underestimate the actual labor share at the beginning of our observation period, thus overestimating the long-term growth in the labor share. However, the upward trend in the labor share in Western countries over the 20th Century has also been documented with other data and calculation methods (Atkinson and Piketty 2007; Roine and Waldenström 2015; Bengtsson and Waldenström 2015). Moreover, as emphasized by Gollin (2002), aggregate labor share measures are influenced by the methods used to separate the labor and capital income earned by entrepreneurs, sole proprietors, and unincorporated businesses. The labor share of dependant employees is not subject to changes in these imputations.

Regarding the pre-WWI period, the labor share modestly increased by around 5% points in Germany and UK, echoing the modest growth of general government in these countries during this period. Also in line with the dramatic growth of

government spending consecutive to WWI, the labor share significantly increased from 1913 to 1930, by around 9% points in both countries. There then followed a period of relative stability in the labor share as between 1930 and 1950, the average labor share for our sample of 5 countries increased by only 1% point. The pattern for post-WWII again follows the evolution of public spending with a modest increase in the labor share during the 1950s followed by rapid growth until the end of the observation period.

This historical measure of the labor share raises some issues. First our hypothesis is that it is wages costs in the private sector that drive the expenditure share of government in the economy. Thus ideally we should use a measure of the labor share of private sector of income as in FMP. The historical measure used here aggregates the labor of both the private and the public sectors. However we are confident that the historical data mainly capture the variations of the private sector labor share, especially in the earlier periods when the public sector was small and public employment was relatively limited. Further corroboration of the data is provided by the within-country correlation between our historical labor share measure and the private sector labor share taken from the OECD for the overlapping five years between 1970 and 1975. Table A.1 in the Appendix reports the correlations for each country for which private labor share data are available from 1970. The correlations are very high, with the only exception of Sweden.

A further issue is the measurement of the labor income of the self-employed, not taken into account in Flora's data. Relatedly Kravis (1962) pointed out the major role of structural changes in the long-term increase in the share of wages in total income. In particular, the shift of labor away from agriculture implied that the proportion of self-employed and small entrepreneurs declined over time and the long-term employment reallocation was associated with increased workers' compensation. Thus, the long-term growth in our labor share data including only dependent employees' compensation may partly come from the increasing share of dependent employees in the labor force, due to the secular decline in self-employment. To account for these biases, Flora (1983) proposes alternative measures of the labor share

taking the growing proportion of employees over time into account. The first of these is the standardized adjusted labor share, calculated by dividing the share of the compensation of dependent employees in national income (i.e. the labor share data) by the share of the dependent labor force in the total labor force. The second is a hypothetical adjusted labor share calculated by multiplying the labor share data by the share of the dependent labor force in the labor force of a reference year (here 1970). This captures movements in the labor share under the premise of a constant proportion of employees in the labor force. These alternative measures are both highly correlated with our main measure (the correlation coefficient is 0.84 for the standardized adjusted labor share and 0.91 for the hypothetical adjusted labor share) and also reveal an upward trend.

As a further alternative we use Bengtsson and Waldenström's (2015) data on factor shares which are adjusted for the incomes of the self-employed by allocating some of it to labor income and the rest to capital. This is done by imputing a wage for each self-employed person equivalent to the average wage in the sector or economy, and counting the rest of self-employed incomes as capital income (Bengtsson and Waldenström 2015).[4] These data are available from at least the 1920s for all the sample countries except for Italy for which data is not available.[5] On the other hand, compared to Flora, the data availability is reduced for the post-WWI period for Norway and Belgium and for the pre-WWI period for Germany and UK. The correlation between the two labor share data is 0.38, which is statistically significant, but also low enough to indicate that the treatment of the self-employed does matter when measuring the labor share of income. Nonetheless, as discussed by Bengtsson and Waldenström, these data again confirm the long-term upward trend in the labor share observed in Flora's data.

One central assumption in Baumol, as well as in FMP is parity between public

[4]The series are compiled and homogenized from previous studies - especially Piketty's (2014) long-run data for France, Britain, Germany and the United States - but also from different countries' official historical national accounts.

[5]Bengtsson and Waldenström's data are available from 1900 instead of 1951 in Flora for Finland, 1910 instead of 1930 for Norway, 1920 instead of 1953 for Belgium, 1900 instead of 1953 for France, 1923 instead of 1950 for Netherlands, 1875 instead of 1930 for Sweden.

and private sector wages. The literature in general finds a public sector premium, for example discussed in Disney (2007). However, as long as this premium (such as it exists) is stable, then the central cost-push argument will still go through. Historical data from France (Bayet 1997) are consistent with this assumption: the ratio of the lowest paid public sector workers to private sector worker is around 1 and stable throughout the period 1880-1950.

4 Empirical Strategy

4.1 Specification

The analysis employs panel data drawing on the specification used in Aidt et al (2006). They analyze government spending in the panel of Western European countries over the pre-World War II period. Our study augments their specification with the labor share data described above and extends the observation period to 1975. Thus we estimate the baseline regression equation:

$$g_{i,t} = \beta_0 + \beta_1 s_{i,t} + \beta_K X_{i,t} + \psi_i + \zeta_t + \epsilon_{i,t} \tag{1}$$

where $g_{i,t}$ is the natural log of government spending as a share of GDP in country i in year t, either general government spending, central government spending or a component of central government spending; $s_{i,t}$ is the labor share of income; $X_{i,t}$ is the vector of controls used as standard by Aidt et al (2006) including a dummy for the extension of the economic franchise, a dummy for the female franchise, a dummy for proportional rule electoral systems, the polity IV democracy measure, the share of people aged over 65, the urbanization rate, log GDP per capita, log total population, and a dummy coded 1 when a country is at war.[6] In all regressions, we allow for country-specific fixed effects ψ_i and common time effects ζ_t to control for otherwise unobserved factors that are respectively country-specific and stable over time, and common to all countries at a given point in time. Furthermore, we allow the error term $\epsilon_{i,t}$ to have different variances across the countries with

[6]See Aidt et al (2006) for the source of the data

the reported standard errors of the parameter estimates clustered by country. The main parameter of interest is β_1, which is hypothesized to be positive as the labor share of income ($s_{i,t}$) is predicted to increase the share of labor-intensive government spending in the economy.

While the fixed effects control for constant unobserved country-level heterogeneity and the time-varying heterogeneity common to all countries, they do not account for unobserved country-specific time-varying variables that could be correlated with the labor share of income. To address this possibility, we modify our baseline model to include country-specific time trends.[7] Moreover, in addition to the equilibrium model corresponding to equation (1), we report the partial adjustment model including the lagged dependent variable $g_{i,t-1}$. This addresses autocorrelation and the persistence of government spending and also enables a quantification of the short- and long-run relationship between government spending and the labor share. The presence of a lagged dependent variable among the regressors may imply that the within group fixed effect estimator is biased. However, this bias decreases with the panel's time dimension and can be considered as negligible in our panel (Nickell 1981).

The key econometric concern is that the labor share of income has its own driving forces, which problematically also may independently drive public spending. The analysis goes some distance towards addressing this by controlling for the main candidate explanations for the historical labor share in Western Europe. For example Kuznets and Murphy (1966) emphasised the role of demographic change and urbanization. Our baseline specifications takes these factors into account controlling for the population size, the urbanization rate and the share of people over 65. Other mechanisms are discussed in the robustness checks.

To directly address the endogeneity issue, we implement an Instrumental Variable strategy described in the next subsection, as well as the Granger-style causality test proposed by Angrist and Pischke (2009, ch. 5).

[7] Country-specific time trends also help account for the potential non-stationarity of the labor share, since these data trend upwards over time.

4.2 Instrumental Variable Strategy

The literature establishes technological change as a principal driver of the labor share of income (Acemoglu 2002; Karabarbounis and Neiman 2014). For example it is often argued that, since the early 1980s, technological change has become capital-augmenting, rather than labor-augmenting (as it was in the post-war era) (Bentolila and Saint-Paul 2003; Guerriero and Sen 2012). Conversely, the labor-augmenting nature of technological change before the 1980s is likely to have been a primary factor responsible for the upward trend in the labor share during our sample period up to 1975.[8] Through the middle of the 20th Century education levels and labor force productivity were principal and positive drivers of the labor share (Guerriero and Sen 2012).

We build on this literature to develop an Instrumental Variable strategy isolating exogenous movements in the labor share of each of the countries in the sample. We assume that the country's labor share is affected to an important extent by worldwide technological change common to all countries. The state of worldwide technology is proxied using the labor share observed in the technological leader ($s_{l,t}$), which since 1945 unambiguously has been the United States. Hence if the labor share in the leader increases, then due to technological 'catch up', the labor share in follower countries is assumed to increase as well.

However technological change heterogeneously affects individual countries' labor shares, depending on their distance to the technology frontier. The distance to the technology frontier is measured as the ratio of the country's GDP per capita ($y_{i,t}$) to the GDP per capita in the leader nation ($y_{l,t}$), as in Acemoglu et al (2006). The argument is that countries which are close to the frontier will be more strongly affected by changes in the leader labor share, whilst those which are distant less so.

Hence the instrument is defined as:

$$z_{i,t} = s_{l,t}(y_{i,t}/y_{l,t}). \tag{2}$$

[8] Indeed, if the marginal productivity of labor increases, then wages go up.

As the leader's labor share movements (induced by exogenous technological change) likely affects the labor share of other countries with a lag, our instruments are measured as the lags of the leader's labor share from t-1 to t-5, thus providing five instrumental variables. Figure 2 plots the distance to the technological frontier for every country from 1945 to 1975. This instrument has the advantage of providing both cross-sectional and temporal variation.

Insert Figure 2

Note that the exclusion restriction could be violated if the technological changes captured in the instrument also drive GDP - which in turn represents the central mechanism in explaining government growth according to the Wagner's law. However our analysis includes a measure of GDP per capita, as well as the considerable battery of fixed effects and country-specific trends, to account for this mechanism.

5 Results

5.1 Baseline Estimations

Table 3 displays the baseline estimation results in a regression specification extending that used in Aidt et al (2006), using annual data between 1869 and 1975. This includes fixed effects and a number of control variables together with the labor share data. Whether using general government spending (column 1) or central government spending (column 4) as dependent variables, the estimated coefficient for the labor share is positive, and is significant at the 1% level.[9]

Insert Table 3

Columns (2) and (5) report the estimation results of the partial adjustment models including the lagged dependent variable. Given the presence of the lagged dependent variable, the parameter estimates reflect current-period (or short-run)

[9]The high R2 in the regressions mainly comes from the inclusion of the year fixed effects, capturing a significant part of the trend in public spending. In a regression of general government spending or central government spending on the time fixed effects and a constant, the R2 already reaches 0.938 and 0.865, respectively.

correlations. Columns (3) and (6) present the corresponding long-run parameter estimates for the impact of the labor share and the other explanatory variables on the long-run steady-state level of government size, which we denote $g*$.[10] The estimated long-run coefficients for the labor share are still significant at 1%, and the estimated effect is sizeable: A sustained one standard deviation (8.46%) increase in the labor share is associated with an eventual increase in the size of spending by 17% for general government and 33% for central government. Notably the estimated coefficient for the labor share doubles in the central government regression compared to the general government regression. This is likely to be due to the fact that central government spending are more intensive in labor as general government also includes social insurance spending, mainly composed of transfers not intensive in labor.

In the case of Germany and UK, the increase in the labor share by around 30% points over the century between 1870 and 1975 is associated with growth of general government by 60% and growth of central government by 118%. Given that general government spending increased by 473% in UK and by 384% in Germany during this period, this implies that the growth of the labor share respectively explains 13% to 16% of the total growth of general government. Regarding central government, given that spending increased by 228% in UK and by 275% in Germany during this period, the growth of the labor share is estimated to explain 43% to 52% of the total observed growth.

Moreover the labor share is the only robust and consistent determinant across specifications. Among the few statistically significant determinants, the extension of the female franchise is found to have a negative impact on central government, which is consistent with Aidt et al (2006). Both the adoption of proportional rules and a democratic regime are negatively associated with general government spending but rather positively with with central government government where the estimated coefficients reach significance. Finally Wagner's law, predicting a positive association between economic development, as measured by GDP per capita, and government

[10] Given the regression $g_t = \alpha g_{t-1} + \beta s_t + \gamma X_t + ...$, the long-run level of g is taken as: $g* = \frac{\beta}{1-\alpha} s_t + \frac{\gamma}{1-\alpha} X_t + ... = \delta s_t + \eta X_t + ...$ The standard errors of the long-run parameters, δ and η are estimated using the delta method.

spending, received empirical support only for central government spending.

5.2 Robustness

5.2.1 Sample Adjustments

We report a number of robustness checks for both the equilibrium model for each dependent variable in Table A.2 in the Appendix . First of all, our baseline estimation results include all available data including the war years for the countries for which the data are available. However, war years and especially the two World Wars are known to have idiosyncratic effects on both government spending and indeed factor income shares. Thus columns (1) and (5) of Table A.2 reports estimation results excluding all war years. The estimated effect of the labor share is virtually unchanged.

Second, as our baseline panel is unbalanced with considerable heterogeneity in the observation periods across countries, columns (2) and (6) re-estimate the model for a balanced panel from 1953 to 1975 for which labor share data are available for all sample countries. An additional interest of this exercice is to focus on a relatively more recent period for which the growth of public spending is driven, to an important extent (though not exclusively), by the rise of social expenditures and transfers as described above. Table A.2 shows that the relationship between the labor share and government spending is still robust over this subperiod.[11]

One important endogeneity problem arises from spurious correlation over the business cycle: both the labor share and government size plausibly move with the cycle. Columns (3) and (7) report estimation results using averages of the data over 5-year periods, which substantially removes this problem. The fact that the relationship holds in spite of the reduced sample size due to the use of averages is reassuring.

Columns (4) and (8) augment the baseline specification with country specific

[11] We also reestimated the partial adjustment model and calculated that the long-term coefficient of the labor share on central government spending is about half that compared to the estimation for the total period. This is consistent with the fact that the labor share played a less important role in the growth of government when transfers became a growing function of the government.

time trends, thus controlling for potentially omitted time-varying factors correlated with the labor share in particular countries. The results are again robust to this specification.

5.2.2 Additional Controls

Tables A.3 augments the baseline specifications with further control variables potentially correlated with both the labor share and government spending. In columns (1) and (5), we follow Aidt and Jensen (2013) and include the seat share of leftwing parties in the lower chamber of parliament in order to capture at least partially the rise of socialism. Indeed, leftwing government could have both implemented policies in favor of the workers, thus increasing wages and the labor share, as well as increasing public spending. The estimated coefficient found for this variable is negative and insignificant whilst the labor share maintains its statistical significance.

A further potential co-variate with both government size and the labor share is economic openness. The compensation hypothesis predicts that the size of the government size is affected by openness to compensate the losers of globaliation (Rodrik 1998) whilst globalization has also been found to affect the labor share (Guerriero and Sen 2012). Columns (2) and (6) present the results when the baseline specification is augmented with openness data and again the inference is unaltered.

Columns (3) and (7) control for female participation in the labor force, which potentially decreased the costs of tax collection (Winer et al. 2008), and which also substantially increased the (formal) labor force through the course of the 20th Century, thereby potentially impacting the repartition of income between labor and capital (Kuznets and Murphy 1966). Nonetheless the statistical relationship of the size of government with this variable is quite weak, whilst the statistical significance of the labor share is sustained.

Finally the labor share is likely to be correlated with income inequality, a well-known determinant of public spending according to the median voter model. In the absence of appropriate historical measures, in columns (4) and (8) we control for the equality of land distribution, taken from Vanhanen (2003). Once again the inference

is unaltered.

5.2.3 Alternative Labor Share Measures

The discussion of the labor share data provided above noted that its upward trend partly derives from the growing portion of employees in the labor force over time. Thus we replicate our baseline estimation instead using the alternative labor share measures described in the introduction. Columns (1), (2), (4) and (5) of Table 4 use data from Flora (1983) weighting the labor share by the proportion of employees in the labor force. Columns (3) and (6) account for the labor income of the self-employed using data from Bengtsson and Waldenström (2015). The regression results reveal that our main result is robust. Using the coefficient estimates of columns (3) and (6) based on Bengtsson and Waldenström's labor share data, we find that a one standard deviation (6.87%) increase in the labor share is associated with an increase in the size of spending by 8.3% for general government and 8.5% for central government, against 17% and 33% respectively when using Flora's labor share data. This suggests that, while the magnitude of the effect is probably overestimated using the data in Flora (1983), the effect remains quantitatively sizeable with a proper treatment of the self-employed.

Insert Table 4

5.2.4 Independent Workers and Public Sector Employees

As noted above, another issue with our main measure of the labor share from Flora is that it covers dependent employees only. This likely underestimates the actual labor share at the beginning of our observation period and thus produces an 'artificial' upward trend in the data. Using alternative measures of labor share taking the self-employed into account, as done in Table 4, was a first way of addressing this concern. A second way is to directly control for the relative share of "dependent" and "independent" workers in the labor force in order to isolate the cost effect independently of the effect of the growing portion of employees. Thus columns (1) and

(4) of Table 5 control for independent workers (defined in Flora as employers and the self-employed) as a share of the labor force, using data from Flora. We notice that this variable does not reach statistical significance and the effect of the labor share is robust, supporting the wage effect.

Insert Table 5

In the absence of historical data on the labor's share of non-government income, which would be the ideal variable to test our hypothesis, our analysis uses the country's overall labor's share of income. A second issue with our measure is that the overall labour income also includes labor in the labor-intensive government sector. In order to separate out increases in government spending due to increasing wages (as predicted in this paper) and increases due to the growing number of public employees, we augment our baseline specification with data on total public sector employees (employed in general government), from Flora (1983).[12]

Table 5 reports the regression results controlling for the total number of public sector employees in columns (2) and (5) and as a share of the total labor force in columns (3) and (6). Surprisingly these variables have a negative coefficient, albeit not statistically significant. But, more importantly, the effect of the labor share survives, which makes us confident that our main results is not driven by the growing public labor force over time, included in the overall labor share measure.

5.2.5 Income Taxes

Finally, we control for an alternative and independent mechanism through which the labor share could increase public spending. As the income share of dependent workers increases, it could become easier for the government to collect income taxes. For instance it could be easier to get information from firms on the wages of workers as compared to self-employed workers on farms. Thus another mechanism running through increased income tax revenue rather than direct costs could explain our result. To investigate this possibility, we look at whether an increased labor share

[12]The data are interpolated when needed.

is associated with higher levels of income tax revenue by regressing the share of (personal) income tax in total tax revenues, with data coming from Flora (1983), against the labor share of income along with our set of controls and fixed effects. Surprisingly we observe in Table A.4 a significant and negative correlation. While it is beyond the scope of the paper to explain the observed negative relationship, the absence of a positive correlation suggests that our main results cannot be explained by this alternative mechanism, thus supporting the mechanism proposed in this paper.

5.3 Error Correction Model and Granger Causality

In any time series data, nonstationarity may be a concern. Pesaran et al (1999) offer a technique to estimate potentially nonstationary dynamic panels in which the parameters are heterogeneous across groups: the pooled mean-group (PMG) estimator. The PMG estimator relies on a combination of pooling and averaging of coefficients. This estimator allows the intercept, short-run coefficients, and error variances to differ across the groups but constrains the long-run coefficients to be equal across groups (as is also the csae with the FE estimator). Assuming that the variables are $I(1)$, the error correction model of the first order ARDL dynamic panel is:

$$\Delta g_{i,t} = \phi_i(g_{i,t-1} - \theta_{0,i} - \theta_{1,i}s_{i,t} - \theta_{K,i}X_{i,t}) + \delta_{11,i}\Delta s_{i,t} + \delta_{2K,i}\Delta X_{i,t} + \epsilon_{i,t} \qquad (3)$$

with, as in equation (1), $g_{i,t}$ government spending as a share of GDP; $s_{i,t}$ the labor share of income; $X_{i,t}$ the vector of controls used in Aidt et al (2006); ϕ_i the error-correction speed of adjustment parameter; $\theta_{1,i}$ and $\theta_{K,i}$ the long-run coefficients; $\delta_{11,i}$ and $\delta_{2K,i}$ the short-run coefficients. With the inclusion of $\theta_{0,i}$, a nonzero mean of the cointegrating relationship is allowed. One would expect ϕ_i to be negative if the variables exhibit a return to long-run equilibrium.

Table 6 provides the estimation of the error correction model and of the short-term model for both measures of government size. We observe that the estimated

long-run effect of labor share is significantly positive in the error correction models of columns (1) and (3). Regarding the short-term models, the error-correcting speed of adjustment term, ϕ_i, is significantly negative for both dependent variables, showing a long-run cointegration relationship between the variables. This model also provides the averaged short-run parameter estimates, which are significantly positive for the labor share (columns (2) and (4)).[13]

Insert Table 6

The analysis so far establishes a robust and statistically significant contemporaneous relationship between government spending and the labor share. As a check for reverse causation, we follow Dincecco and Katz (2014) and implement the procedure proposed by Angrist and Pischke (2009, ch. 5) in the spirit of Granger. According to the Angrist and Pischke (2009) procedure, Granger causality testing means a check on whether, conditional on country and year effects, past labor share, $s_{i,t}$, predicts government size, $g_{i,t}$, while future $s_{i,t}$ does not. If $s_{i,t}$ causes $g_{i,t}$ but not vice versa, then lags should be significant in the below equation (4) but leads should not matter in the below equation (5):

$$g_{i,t} = \beta_0 + \sum_{\tau=0}^{5} \gamma_{-\tau} s_{i,t-\tau} + \beta_K X_{i,t} + \psi_i + \zeta_t + \epsilon_{i,t} \tag{4}$$

$$g_{i,t} = \beta_0 + \sum_{\tau=0}^{5} \gamma_{+\tau} s_{i,t+\tau} + \beta_K X_{i,t} + \psi_i + \zeta_t + \epsilon_{i,t} \tag{5}$$

We allow for 5 lags in equation (4) and for 5 leads in equation (5). The notation is the same as for equation (3) except that we now also allow for country-specific time trends.

Figures 3 and 4 display the results of these regressions with general government and central government spending as dependent variables, respectively. The left part of the figures plot the coefficient of the lags and the right part the leads of $s_{i,t}$. For both dependent variables, only the lags and the contemporaneous value of $s_{i,t}$ turn

[13]Some variables, such as ln(income per cap.) and ln(population), do not enter the short-term model as it was not possible to estimate the model when including these variables.

out to be significant, with consistently positive coefficients, while the leads never reach significance. More precisely, in Figure 3, γ_{-1} and γ_0 are significant at 5% and γ_{-5} at 10%. In Figure 3, γ_0 is significant at 5% and γ_{-2} at 10%. Moreover, the coefficients of the lags tend to increase over time until t and then essentially disappears after the first lead, becoming even negative albeit not significant. Overall, the results of these tests provide evidence that reverse causation does not drive the relationship between government spending and the labor share.

Insert Figures 3 and 4

5.4 IV Estimation Results

So far the empirical analysis demonstrates a clear positive association between government size and the labor share, and also that the dynamics of the relationship support the hypothesis that labor share movements pre-empt movements in government size. As a further means of addressing the endogeneity issue, Table 7 contains results instrumenting the labor share with the lagged interactions of the US labor share with the country's distance to the technological frontier. With the objective of isolating exogenous movements in the labor share, the instrument aims to capture the part of movement in the labor share driven by exogenous technological change - which plausibly affects countries differently depending on their distance from the frontier. The observation period is limited to the post-1945 period since the US became the uncontested technological leader following WWII.

Insert Table 7

The first stage regressions are reported in the lower part of the Table. We observe that the second, third and intermittently the fourth lag of our instrument reach statistical significance. While the coefficient estimates intermittently exhibit negative signs, the long-run cumulative impact of the lags is estimated to be positive, as expected. In column (1) using the small sample of 9 countries (excluding France and Netherlands) for which general spending data are available, the standard F-statistic

for weak instruments strongly rejects the null hypothesis, hence the instruments are found to have strong explanatory power. However, in column (2) exploiting the large sample of 11 countries for which central spending data are available, the weak instrument F statistic of 4.29 is lower than the standard baseline value of 10. Thus the regression of column (2) is replicated for the small sample of 9 countries excluding France and Netherlands in column (3) and for the large sample excluding only France in column (4). The F-statistic exceeds 10 when excluding France (column 4), which reveals that France is the country weakening the strength of the instrument in the large sample.[14]

As opposed to the other countries, the French labor share seems to be independent of the technological changes that affected the US labor share. It is remarkable that France is the only country of our sample for which the labor share decreased between 1950 and 1960. Bengtsson and Waldenström (2015) already observed the peculiar historical evolution of the factor shares in France, contrasting with other countries. This could be explained by a tradition of wages planning in France. Indeed prices and wages have been subject to substantial state control since 1939, until the adoption of the guaranteed minimum wage in 1950 (Gautié 2018).

In the second stage, the estimated effect of the labor share on the size of government continues to be positive and significant and its magnitude almost doubles compared to the OLS case.

5.5 Spending Composition

The central idea proposed in this paper is that the labor share of income affects public sector expenditure by raising its production costs. However, government activities and therefore the embodied production technologies are diverse. In particular, transfer payments in principle involve very little in the way of production and labor. Such payments have represented an increasing fraction of total government spending over our observation period. If such expenditures are not labor-intensive

[14]We also replicated the regression by excluding only Netherlands from the large sample. The weak instrument F-statistic ir relatively unchanged, suggesting that Netherlands is not the country weakening the instrument.

there should not be a link with the labor share, whilst for the labor-intensive components of public spending a link should exist.

In order to investigate this we disaggregate central government spending following Aidt et al (2006). The items are (1) security (defence, general administration, the judiciary and the police), (2) long-term public services (economic services, transport and communication), (3) "collective goods" (health, public housing and education) and (4) social security as a proxy for social transfers. Table 8 contains regression results using OLS for the four categories. In both the equilibrium and partial adjustment models, we find evidence of a significant and positive association between the labor share and every component except for social transfers. This supports the hypothesis that only the activities intensive in labor are affected by labor costs.

Insert Table 8

6 Conclusion

The growth of government was one of the most important social phenomena of the 20th Century in Western Europe. This process has intrigued researchers for well over 100 years. Previous explanations have predominantly focussed on demand-side explanations, beginning with Wagner's law, but also encompassing ideology, demographics and the distribution of income. In contrast FMP argued that the declining labor share of income observed in OECD countries in the last two decades of the 20th Century and the early part of the 21st Century, played an important role in explaining the arrest of the growth of government observed in that period. The present paper takes the same hypothesis to historical data, taking inspiration from recent studies documenting an upward trend in the labor share of income from the late 19th Century in Western countries, mirroring observed concurrent increases in the size of the government.

The positive and statistically significant association between the size of government and the labor share of income is robust across a wide range of econometric specifications and also holds when the labor share is instrumented with a variable

encapsulating exogenous movements in technological change at the frontier. The data support the hypothesis that causality runs from the labor share to the size of government. In contrast, transfer spending, which is likely not intensive in labor, exhibits no relationship with the labor share.

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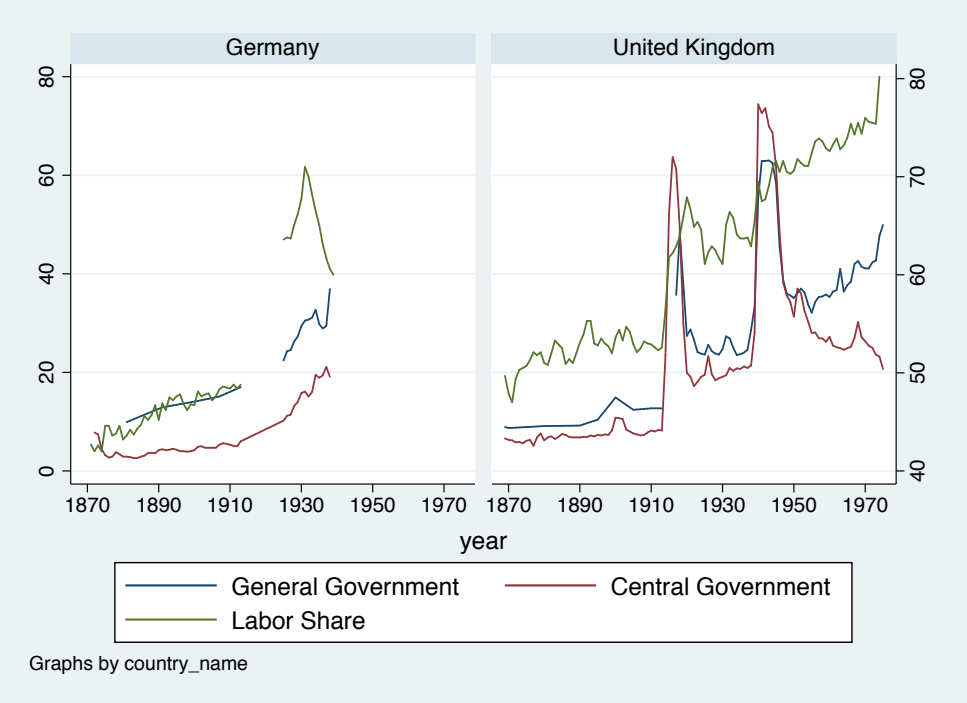

Figure 1. Labor Share of Income and the Size of the Government.

Notes: Left-hand vertical axis for General Government and Central Government (percentage of GDP), right-hand vertical axis for Labor Share (percentage of GDP). Data from Flora (1983).

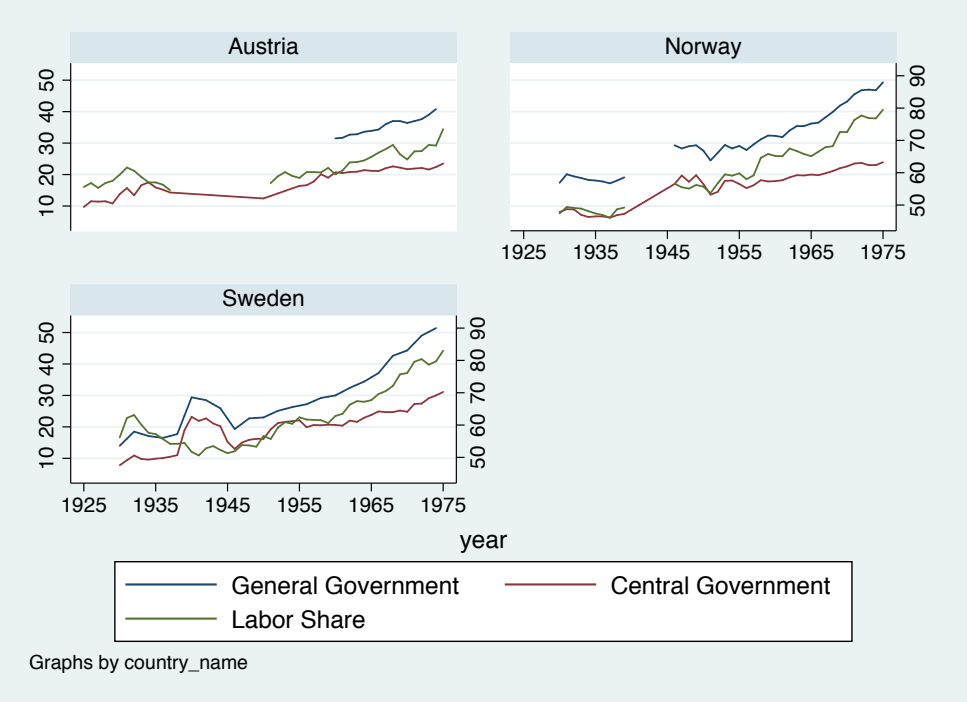

Figure 1 (cont'd). Labor share of Income and the Size of the Government.

Notes: Left-hand vertical axis for General Government and Central Government (percentage of GDP), right-hand vertical axis for Labor Share (percentage of GDP). Data from Flora (1983).

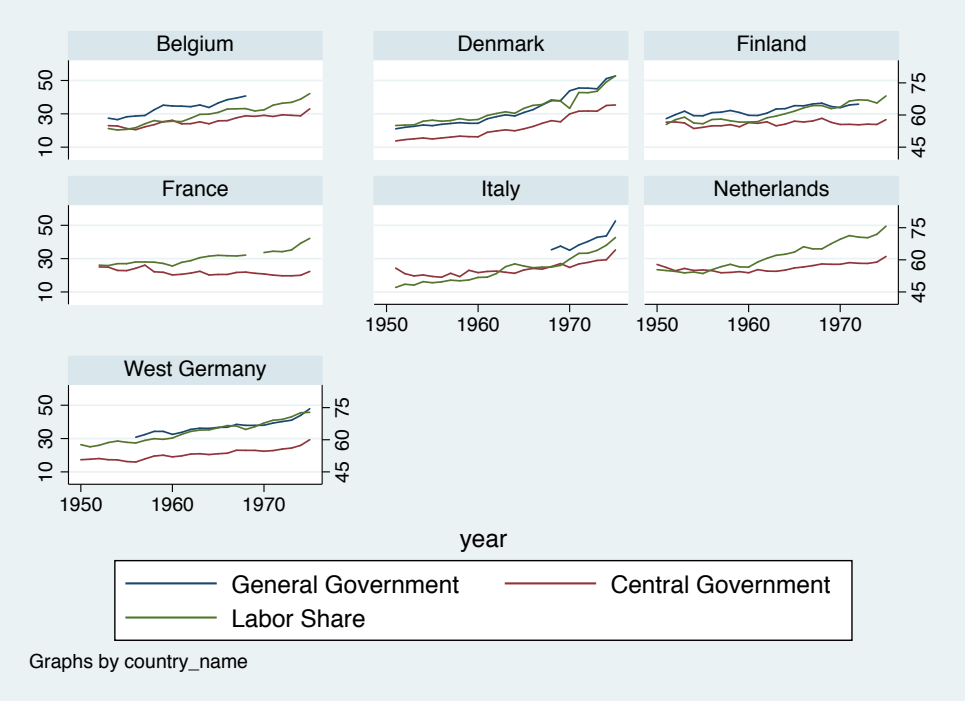

Figure 1 (cont'd). Labor share of Income and the Size of the Government.

Notes: Left-hand vertical axis for General Government and Central Government (percentage of GDP), right-hand vertical axis for Labor Share (percentage of GDP). Data from Flora (1983).

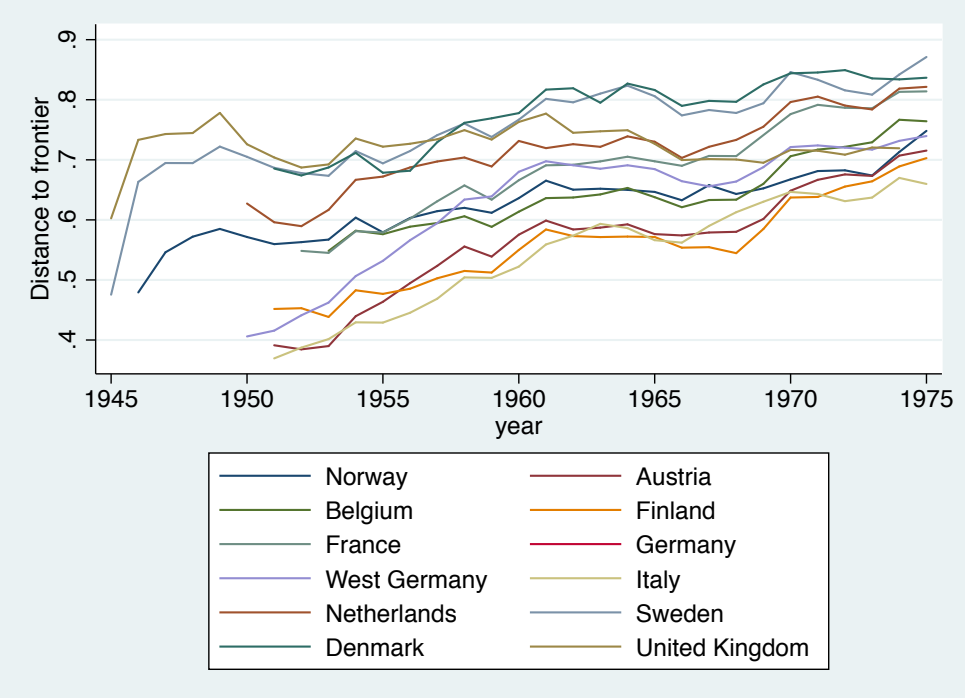

Figure 2. Distance to the Technological Frontier, 1945-1975.

Notes: The distance to the technological frontier is measure as the ratio of the country's GDP per capita to the U.S. GDP per capita.

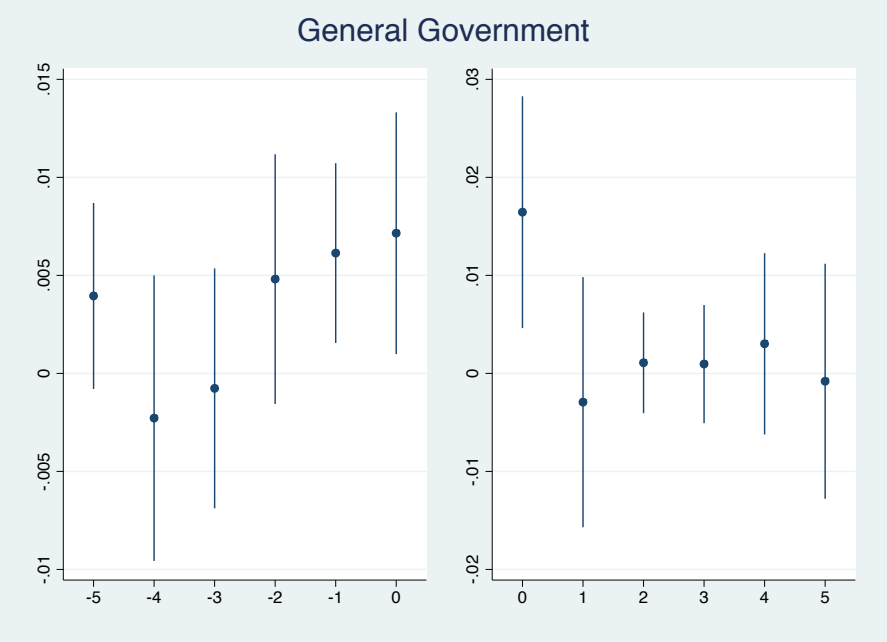

Figure 3. Granger Causality Tests for General Government Spending

Notes: This figure displays the coefficient estimates of the lags of the labor share measured from t-5 to t (left-hand side) and of the leads of the labor share from t to t+5 (right-hand side), obtained from a regression of general government spending on the lags/leads of labor share, time-varying controls, fixed effects and country-specific time trends.

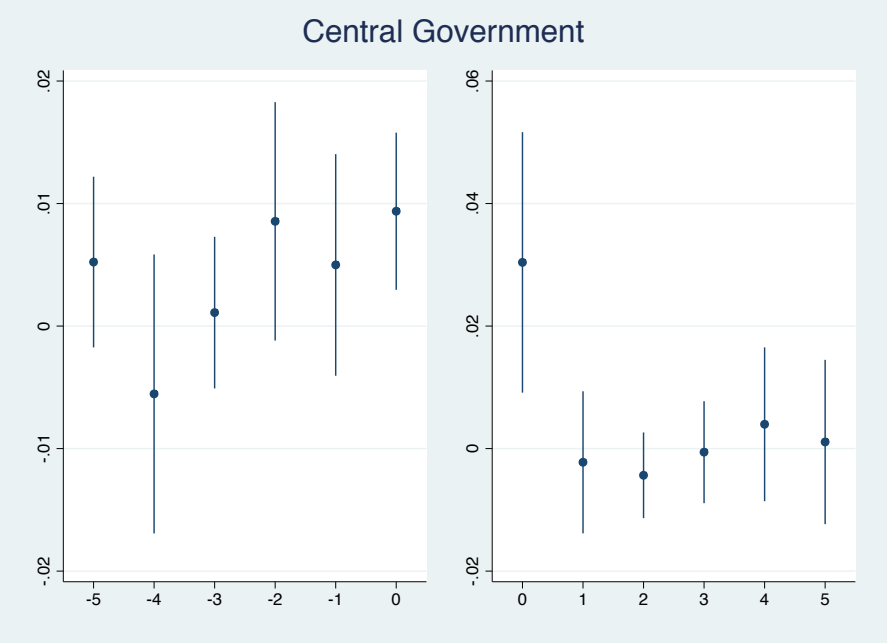

Figure 4. Granger Causality Tests for Central Government Spending

Notes: This figure displays the coefficient estimates of the lags of the labor share measured from t-5 to t (left-hand side) and of the leads of the labor share from t to t+5 (right-hand side), obtained from a regression of central government spending on the lags/leads of labor share, time-varying controls, fixed effects and country-specific time trends.

	1870[a]	**1913**	**1930**	**1950**	**1960**	**1975**[b]
Norway	3.6	7.3	8.1	17	17.9	23.9
	[5.9]	[10.35]	[17.4]	[27.6]	[32.3]	[49.3]
Austria			13.8	12.4	20.7	23.5
					[31.5]	[40.8]
Belgium		13.9	21.47	21.6	26.1	33
				[22.6]	[34.7]	[40.7]
Finland		7.4	12.9	26.2	24.7	26.5
				[28.6]	[29.1]	[35.8]
France	13.2	10.2	16.1	19.1	20.2	22.3
	-	-	-	-	-	-
(West) Germany	7.8	6	15.8	17.3	19	29.3
	[9.9]	[17]	[29.4]		[32.5]	[47.9]
Italy	13.7	14.4	19.8	25.6	21.6	35.2
						[52.6]
Netherlands		8.3	11.8	26.5	21.5	31.3
		-	-	-	-	-
Sweden	5.65	6.9	7.8	16.2	20.6	31.1
		[10.4]	[14]	[23]	[30]	[51.4]
Denmark	6.2	5.4	6.6	12	16.2	35.3
	[9.2]	[10.4]	[13.5]	[19]	[24.3]	[52.7]
UK	6.3	8.2	19.1	31.3	27.3	20.7
	[8.7]	[12.7]	[24.7]	[35.1]	[35.3]	[49.9]
Average[c]		8.8	13.9	20.5	21.4	28.4
		[12.2]	[19.8]	[26.2]	[30.9]	[50.2]

Table 1. The Size of Government

Notes: For each country, the above figure is for central government spending as a share of GDP and the below figure in brackets is for general government spending as a share of GDP. [a] 1881 for general government in Germany; [b] 1968 for general government in Belgium, 1972 for government spending in 1972; [c] The average share of central government spending is calculated for Norway, Belgium, Finland, France, Germany, Italy, Netherlands, Sweden, Denmark, UK. The average share of general government spending is calculated for Norway, Germany, Sweden, Denmark, UK.

	1870	1913	1930	1950[a]	1960	1975
Norway			47.4	55.7	65.2	79.5
Austria			59.4	56.8	59.5	73.5
Belgium				53.7	57.1	70
Finland				55.6	56.7	68.9
France				57.5	57.1	70
Germany	42.7	48.8	67.7	57.7	60.8	72.8
Italy				47.1	51.8	70.4
Netherlands				55.4	56.6	75.7
Sweden			56.2	56.6	62.8	83
Denmark				55.1	57.9	78.3
UK	47.9	52.6	61.1	70.6	72.6	80.2
US		86.9	75.8	83.8	87.5	84.3
Average (11)[b]				56.53	59.83	74.75
Average (5)[c]			58.36	59.48	64.18	77.80

Table 2. Labor Share of Income

Notes: The table presents the labor share of income. [a] 1953 for Belgium, 1952 for France. [b] *Average (11)* = The average labor share is calculated for the 11 countries of our sample. [c] *Average (5)* = The average labor share is calculated for the 5 countries for which data are available from 1930.

	ln(General Spending/GDP)			ln(Central Spending/GDP)		
	(1)	(2)	(3)	(4)	(5)	(6)
Labor share	0.0164***	0.00492***	0.0201***	0.0321***	0.0111***	0.0393***
	(0.00457)	(0.000970)	(0.00394)	(0.00457)	(0.00231)	(0.00758)
Lagged dep. var.		0.755***			0.719***	
		(0.0707)			(0.0711)	
Economic Franchise	-0.00309	0.000539	0.00220	0.00337	-0.000778	-0.00277
	(0.00181)	(0.000737)	(0.00341)	(0.00284)	(0.00148)	(0.00561)
Female Franchise	-0.0727*	0.0190	0.0774	-0.329***	-0.106***	-0.376***
	(0.0389)	(0.0156)	(0.0795)	(0.0668)	(0.0300)	(0.0747)
Proportional rules	-0.428***	-0.0642	-0.262**	0.153*	0.0347	0.123
	(0.0764)	(0.0367)	(0.0986)	(0.0777)	(0.0499)	(0.179)
Polity IV	-0.0883**	-0.0578***	-0.236**	0.0935*	0.00625	0.0222
	(0.0382)	(0.0112)	(0.0726)	(0.0513)	(0.0316)	(0.111)
Old	-0.0271	-0.00479	-0.0196	0.00372	-0.00417	-0.0148
	(0.0208)	(0.00445)	(0.0201)	(0.0266)	(0.0136)	(0.0493)
Urbanization	0.00459	-0.00242	-0.00988	-0.00104	-0.000311	-0.00111
	(0.0104)	(0.00259)	(0.0122)	(0.00360)	(0.00112)	(0.00397)
ln(income per cap.)	-0.0475	0.0492	0.201	0.750**	0.245*	0.872**
	(0.186)	(0.102)	(0.432)	(0.304)	(0.130)	(0.292)
ln(population)	0.902	0.315	1.284	0.369	-0.114	-0.407
	(0.948)	(0.207)	(0.799)	(0.553)	(0.185)	(0.722)
Country FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	333	320	320	440	429	429
Countries	10	10	10	12	12	10
R^2	0.984	0.995	0.995	0.959	0.986	0.986

Table 3. Labor Share and the Size of Government, 1869-1975

Notes: Dependent variables: Annual general government spending as a share of GDP (in ln) in columns 1 to 3 and annual central government spending as a share of GDP (in ln) in columns 4 to 6. Independent variables: *Labor share* = Annual labor's share, in%. Regressions include country and year fixed effects and annual controls used in Aidt et al (2016). Columns 3 and 6 include the lagged dependent variable. Robust standard errors clustered at the country level in parentheses. Columns 3 and 6 contain 'long-run' parameter estimates, with standard errors estimated by the delta method. *** p<0.01, ** p<0.05, * p<0.1

Labor share data:	ln(General Spending/GDP)			ln(Central Spending/GDP)		
	Flora standardized	Flora 1970	B&W	Flora standardized	Flora 1970	B&W
	(1)	(2)	(3)	(4)	(5)	(6)
Labor share	0.0158***	0.0178***	0.0121**	0.0211***	0.0244***	0.0124***
	(0.00371)	(0.00414)	(0.00406)	(0.00585)	(0.00591)	(0.00388)
Controls	X	X	X	X	X	X
Observations	315	315	372	422	420	605
Countries	10	10	9	12	12	11
R^2	0.981	0.980	0.975	0.937	0.937	0.884

Table 4. Alternative Labor share measures

Notes: Table 4 replicates Table 3 with alternative labor share measures. Independent variables: *Flora standardized* = Adjusted labor's share-standardized, in%. This index is calculated by dividing the share of the compensation of employees in national income (the so-called labour's share) by the share of the dependent labor force in the total labor force. *Flora 1970* = Annual adjusted labor's share-hypothetical (1970 = 100). This index is calculated by multiplying the 'standard labor's share' by the share of the dependent labor force in the labor force of a common reference year (here 1970). B&W = Annual labor share of income including the labor income of self-employed from Bengtsson and Waldenström (2015). *** p<0.01, ** p<0.05, * p<0.1.

	ln(General Spending/GDP)			ln(Central Spending/GDP)		
	(1)	(2)	(3)	(4)	(5)	(6)
Labor share	0.0151***	0.0159**	0.0126**	0.0284***	0.0314***	0.0291***
	(0.00462)	(0.00505)	(0.00430)	(0.00354)	(0.00467)	(0.00354)
Independent workers %	-0.00397			-0.0181		
	(0.0157)			(0.0151)		
Public sector employees		-6.55e-08			-9.76e-08*	
		(3.87e-08)			(4.94e-08)	
Public sector employees %			-0.00319			-0.0123
			(0.0131)			(0.0169)
Controls	X	X	X	X	X	X
Observations	344	344	344	451	451	451
Countries	10	10	10	12	12	12
R^2	0.986	0.986	0.986	0.962	0.961	0.964

Table 5. Robustness: Independent Workers and Public Sector Employees

Notes: This Table replicates columns 1 and 4 of Table 3 for the 1869-1975 period with additional controls: *Independent workers %* = independent workers (employers and self-employed) as a share of the labor force, from Flora (1983); *Public sector employees* = Total number for public sector (general government) employees, from Flora (1983); *Public sector employees %* = Public sector (general government) employees as a share of the labor force.*** p<0.01, ** p<0.05, * p<0.1.

	General Spending/GDP (Δ)		Central Spending/GDP (Δ)	
	Error correction model	Short-Run Model	Error correction model	Short-Run Model
	(1)	(2)	(3)	(4)
Error correction term		-0.369***		-0.445***
		(0.0806)		(0.161)
Labor share (Δ)	0.657***	0.303**	0.237***	0.169*
	(0.0671)	(0.150)	(0.0704)	(0.0979)
Old (Δ)	1.344***	6.588	-0.0576	
	(0.327)	(21.78)	(0.181)	
Urbanization (Δ)	0.491***	46,474	-0.0310	-3,593
	(0.143)	(46,470)	(0.0853)	(3,596)
ln(income per cap.)	8.527***		-0.896	
	(2.330)		(2.038)	
ln(population)	-27.81***		2.451	
	(8.634)		(6.025)	
Institution dummies	X	X	X	X
Observations	316	316	316	316

Table 6. Error Correction Model and Short-Term Model

Notes: Using the pooled mean-group (PMG) estimator, columns (1) and (3) provide the estimation of an error correction model and columns (2) and (4) provide the short-term model. Dependent variables: Annual general government spending as a share of GDP in column (1) and in first-difference in Δ in column (2) and annual central government spending as a share of GDP in column 3 and in in Δ in column (4). Independent variables: *Labor share* = Annual labor's share, in%. Regressions include controls used in Aidt et al (2016), including Institution dummies (Economic Franchise, Female Franchise, Proportional rules, Polity IV). *Labor share*, *Old* and *Urbanization* are in Δ in the short-term model in columns (2) and (4). *** p<0.01, ** p<0.05, * p<0.1

	ln(General Spending/GDP)	ln(Central Spending/GDP)		
	small sample	large sample	small sample	exclud. France
	(1)	(2)	(3)	(4)
Labor share	0.0455***	0.0673**	0.0776***	0.0691***
	(0.0142)	(0.0289)	(0.0239)	(0.0245)
Controls	X	X	X	X
Country FE	X	X	X	X
Year FE	X	X	X	X
Observations	178	267	178	244
R^2	0.892	0.705	0.651	0.695
First stage				
Leader labor share x frontier t-1	0.366	0.166	0.366	0.233
	(0.245)	(0.180)	(0.245)	(0.165)
Leader labor share x frontier t-2	0.275**	0.259***	0.275**	0.278***
	(0.120)	(0.0813)	(0.120)	(0.0786)
Leader labor share x frontier t-3	-0.117*	-0.180**	-0.117*	-0.196**
	(0.0671)	(0.0824)	(0.0671)	(0.0906)
Leader labor share x frontier t-4	0.117	0.131*	0.117	0.185***
	(0.123)	(0.0758)	(0.123)	(0.0484)
Leader labor share x frontier t-5	0.232	-0.0376	0.232	-0.0619
	(0.201)	(0.131)	(0.201)	(0.129)
F	39.64	4.29	39.64	33.01

Table 7. 2SLS Estimations, 1946-1975

Notes: Observation period: 1946-1975. Dependent variables: Annual general government spending as a share of GDP (in ln) in column 1 and annual central government spending as a share of GDP (in ln) in columns 2 to 4. Independent variables: *Labor share* = Annual labor's share, in%. Regressions include country and year fixed effects and annual controls used in Aidt et al (2016). IV is estimated by two-stage least squares. The upper part of the Table provides the second stage of the 2SLS estimation and the lower part provides the first stage. The instruments are the lagged interactions between the US labor share and the ratio of the country's GDP to the US GDP from *t-1* to *t-5*. *F* is an F-statistic for the statistical significance of the instruments in the first stage. Columns 1 and 3 use the small sample of 9 countries excluding France and Netherlands; column 2 uses the large sample of 11 countries; column 4 excludes France. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Security		Public services		Collective goods		Social Security	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Labor share	0.255***	0.0752**	0.184**	0.0514**	8.274***	4.228**	0.374	2.515
	(0.0676)	(0.0268)	(0.0712)	(0.0202)	(0.937)	(1.572)	(13.13)	(1.498)
Lagged dep. var.		0.766***		0.730***		0.441**		1.044***
		(0.0488)		(0.0535)		(0.129)		(0.0281)
Controls	X	X	X	X	X	X	X	X
Observations	360	356	360	356	170	168	170	168
Countries	11	11	11	11	6	6	6	6
R^2	0.823	0.938	0.510	0.809	0.929	0.943	0.693	0.968

Table 8. Spending Composition, 1869-1975

Notes: Table 14 replicates Table 4 with alternative dependent variables representing components on total central spending as a proportion of GDP (in ln). *Security* = Defense, general administration, judiciary and police; *Public Services* = Economic services, transport and communication; *Collective goods* = Health, public housing and education; *Social Security* = Social Security spending. *** p<0.01, ** p<0.05, * p<0.1

Online Appendix

Norway	0.73
Belgium	0.93
Finland	0.93
France	0.96
West Germany	0.98
Netherlands	0.67
Sweden	0.15
Denmark	0.75
UK	0.96

Table A.1. Correlation between historical labor share of income from Flora (1983) and business sector labor share of income (from the OECD), 1970-1975

	ln(General Spending/GDP)				ln(Central Spending/GDP)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Labor share	0.0157***	0.0219***	0.0211**	0.0128***	0.0315***	0.0320***	0.0392***	0.0252***
	(0.00432)	(0.00574)	(0.00902)	(0.00324)	(0.00492)	(0.00792)	(0.00996)	(0.00558)
Controls	X	X	X	X	X	X	X	X
Country trend				X				X
Data	exclud. war	1953-1975	5-year	baseline	exclud. war	1953-1975	5-year	baseline
Observations	316	165	58	333	420	247	81	440
Countries	10	9	10	10	12	11	12	12
R^2	0.982	0.915	0.989	0.991	0.946	0.715	0.974	0.976

Table A.2. Robustness Checks: Sample Adjustments

Notes: This Table replicates columns 1 and 4 of Table 3 excluding all war years (WWI, WWII, other wars) in columns 1 and 5, for a balanced panel for the 1952-1975 period in columns 2 and 6, by averaging all the variables over 5 years from t-4 to t in columns 3 and 7, including country specific time trends in columns 4 and 8. *** p<0.01, ** p<0.05, * p<0.1

	ln(General Spending/GDP)				ln(Central Spending/GDP)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Labor share	0.0164***	0.0164**	0.0198***	0.0215***	0.0322***	0.0321***	0.0294***	0.0297***
	(0.00457)	(0.00530)	(0.00566)	(0.00361)	(0.00448)	(0.00623)	(0.00514)	(0.00456)
Left	-0.000376				-0.000937			
	(0.00151)				(0.00185)			
ln(Openness)		-0.00360				-0.000939		
		(0.140)				(0.203)		
Female labor			-0.702**				-0.334	
			(0.224)				(0.208)	
Land equality				0.00769***				-0.00469
				(0.00162)				(0.00440)
Controls	X	X	X	X	X	X	X	X
Observations	333	333	217	333	440	438	273	440
Countries	10	10	9	10	12	12	12	12
R^2	0.984	0.984	0.991	0.985	0.959	0.959	0.977	0.960

Table A.3. Robustness: Additional Controls

Notes: This Table replicates columns 1 and 4 of Table 3 for the 1869-1975 period with additional controls: *Left* = Share of seats won by left-wing parties in elections to the lower chamber of parliament in percentage of all seats, from Flora et. al. (1983) and Caramani (2000); *ln(Openness)* = Economy Openness (in ln) from Mitchell (1998); *Female labor* = Female labour force participation from Mitchell (1998); *Land equality* = Percentage of the total area of cultivated land that is owned by family farmers, from Vanhanen (2003). *** p<0.01, ** p<0.05, * p<0.1.

	Income tax %	
	(1)	(2)
Labor share	-0.832**	-0.335***
	(0.301)	(0.0902)
Lagged dep. var.		0.732***
		(0.0421)
Controls	X	X
Observations	451	451
Countries	12	12
R^2	0.831	0.933

Table A.4. Income Tax and Labor Share, 1869-1975

Notes: Dependent variable: *Income tax %* = Annual (personal) income tax revenues as a share of total government revenues, from Flora et. al. (1983). Independent variables: *Labor share* = Annual labor's share, in%. Regressions include country and year fixed effects and annual controls used in Aidt et al (2016). Column 2 includes the lagged dependent variable. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.