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Power, policy, and top income shares

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Abstract

The rise of the super-rich has attracted much political and academic attention in recent years. However, there have been few attempts to explain the cross-national along with the temporal variation in the rise of top incomes. Drawing on the World Wealth and Income Database, we study the income share of the top 1% in current postindustrial democracies from 1960 to 2012. We find that extreme income concentration at the top is a predominantly political phenomenon, not the result of increasing marginal productivity of top managers in markets of increasing size. Top income shares are largely unrelated to economic growth, increased knowledge-intensive production, export competitiveness, financialization and wealth accumulation, though they are related to stock market capitalization. Instead, they are closely associated with political and policy changes such as union density and centralization, secular-right governments, top marginal tax rates and investment in public tertiary education.

Key words: income distribution; inequality

JEL classification: J51, N30

1. Introduction

The growth of inequality, particularly the growth of incomes at the very top, has attracted much political and academic attention in recent years. In academics, the debate was fueled by the monumental data collection efforts of Thomas Piketty and his colleagues, who assembled a huge comparative and historical database on the top income shares in almost all current post-industrial democracies as well as a number of other countries (Piketty, 2001, 2003; Atkinson, 2005; Atkinson and Piketty, 2007, 2010; Alvaredo *et al.*, 2015).

Despite the academic and political attention to the growth of inequality at the top end and the availability of the *World Wealth and Income Database* (Alvaredo *et al.*, 2015; hereafter WWID), there have been few attempts to date to explore political along with economic determinants of the cross-national variation in the rise in top incomes in the past half

century. Atkinson *et al.* (2011) note that the rise in top incomes is primarily an Anglo-American phenomenon, a view that receives support from Figure 1 which groups countries in geographical/historical clusters that roughly correspond to different types of political economies. There is some increase in a number of other countries, so a complete account will explain these modest increases as well as the sharp increase in the Anglo-American countries. To our knowledge, there are only five pooled time series analyses of the determinants of the top income shares and two of these focus on the variation in top income shares over a century (Roine *et al.*, 2009; Scheve and Stasavage, 2009) and thus exclude many hypothesized causes of the recent rise in top income shares. The other three, Dünhaupt (2014), Flaherty (2015) and Godechot (2016) are primarily studies of the impact of financialization, and test a limited number of other explanations. Moreover, Flaherty covers only 14 countries and a short time period (1990–2010), and Dünhaupt only 13 countries over the period 1980–2010. We define the scope conditions of our explanation as covering the past half century that saw the tremendous increase in top income shares in the context of globalization and transition to the knowledge economy. We are not proposing a general theory of capitalism but a theory of the political economy of advanced capitalist countries in the period of globalization and growth of the knowledge economy, transformations that figure prominently in economic explanations of the rise of the top 1% share.

We build on the literature on inequality in advanced industrial democracies, keeping in mind that the share of the top 1% is a special case that may not have determinants identical to those of Gini coefficients, poverty or wage ratios (e.g. Wallerstein, 1999; Pontusson *et al.*, 2002; Bradley *et al.*, 2003; Brady and Leicht, 2008; Brady, 2009; Huber and Stephens, 2014).[1] Nevertheless, political power distributions and institutions that have been shown to shape household income distribution and wage dispersion can be expected also to shape the top 1% share.

An analysis of the composition of the top 1% of income earners in the USA by Bakija *et al.* (2012, pp. 35, 41) shows that some 60% of known occupations are in business, and some two-thirds of all income (excluding capital gains) is generated by people in these occupations, such as managers, entrepreneurs, skilled sales people, etc., not by highly paid professionals like doctors and lawyers or by sports and entertainment personalities. For this reason, our analytical framework also focuses mainly on the corporate world. In addition, we do present some economic hypotheses (e.g. see the discussion below on skills, credentials and networks) which also apply to highly paid professions, such as doctors and lawyers, who make up 24% of the top 1% in the USA (Bakija *et al.*, 2012, p. 35).

We agree with Soskice (2014, p. 661) who argues that an account of the rise of the top income shares has to begin with an account of why the Anglo-American countries stand out in terms of the enormous rise there. Thus, we begin with an examination of the liberal market economies of the Anglo-American in comparison with the coordinated market economies of the Nordic and Continental countries. These liberal market economies have undergone particularly steep declines in union density, have labor market institutions that do not extend contracts to non-union members, and have neglected investment in public education.

1 Specifically, we would not expect demographic variables like proportion of single mother households or labor market variables like unemployment that have an impact on Gini coefficients to influence the share of the top 1%.

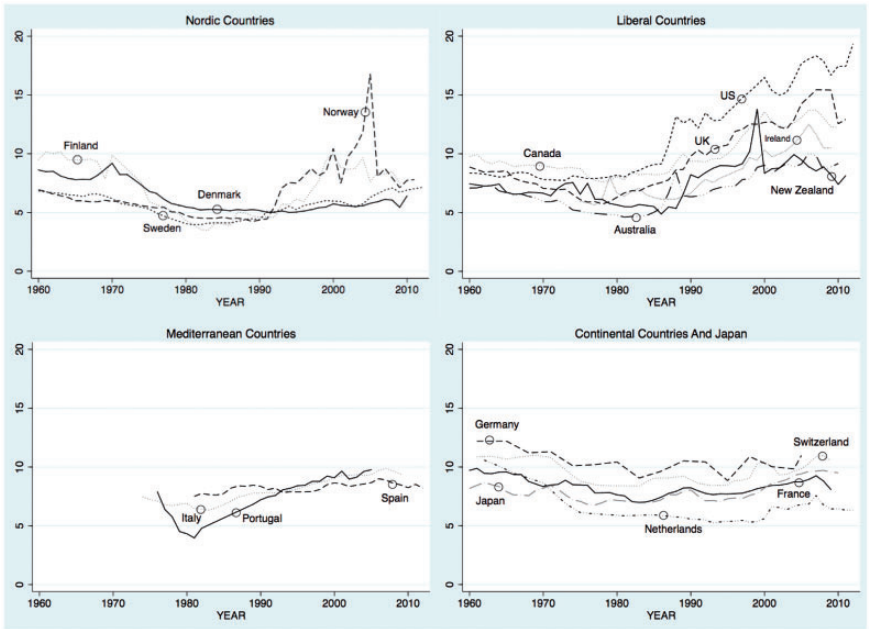

Figure 1. Top 1% income share by production regime and country.

We build on Power Resources Theory (PRT) (Stephens, 1979; Korpi, 1983) to develop our explanations. PRT tells us that wealth is both an economic and a political power resource, but that organization of those without wealth can be a counterweight in the power balance in society. The more unified such organizations are, the easier they can overcome collective action problems and act strategically in the pursuit of their interests. In democracies, organization also works as a counterweight to wealth in influencing election outcomes, and election outcomes are crucial because partisan composition of government heavily shapes policies, which set the parameters for the distribution of income and wealth. Accordingly, strong and centralized unions constitute a check on the rise of the 1% share. In contrast, center-right governments pass policies that support income concentration at the top, such as low marginal tax rates.

Traditionally, PRT has focused on organized labor and left parties to explain welfare state development, labor market policies and income distribution. This is entirely appropriate because they are the main actors actively promoting policies that favor labor and lower income households. Here, we remain within the power resources framework but focus on the main actors actively promoting opposite agendas. We focus on organized labor as protector of income of workers and on center-right governments as active promoters of policies that weaken labor and favor their business and high-income core constituency.

The role of union density and union and bargaining centralization in shaping top 1% shares may appear surprising, given that top incomes are not subject to collective bargaining. However, we argue that they shape the magnitude of CEO pay and thus, along with partisan composition of government and policies like marginal tax rates, are the crucial determinants of the top 1% share. The distribution of income is an inherently political issue.

Explanations based on economic laws like supply and demand determining the price, or in this case the supply and demand of talent shaping the top 1% share (e.g. see Kaplan and Rauh, 2013), ignore the fact that supply is politically determined and that price is also potentially subject to political constraints.

2. Literature and hypotheses

2.1 Power, politics and policies

Power relations in domestic society and polity

Social science has generated some solid findings on the impact of power distributions on the distribution and redistribution of income that should be applicable to top income shares. Key determinants of pre-tax and transfer income distributions are unions and labor market institutions, along with policies and therefore partisan incumbency (Wallerstein, 1999; Pontusson *et al.*, 2002; Kenworthy and Pontusson, 2005; Brady and Leicht, 2008; Brady *et al.*, 2013). Unions have a dual role; they are not only wage bargainers but also political actors.

To begin with the liberal market economies, analyses of the steep rise of the top 1% share in the USA highlight political determinants. Volscho and Kelly (2012) find that rightward shifts in Congress, declines in union power, and reductions in marginal income and capital gains taxes all helped fuel the recent rise of the super-rich in the USA. Enns *et al.* (2014), Hacker and Pierson (2010), and Bartels (2008) highlight how political institutions and partisan politics have contributed to income concentration. Kristal (2013) and Kenworthy (2010) emphasize the decline in union bargaining power, changing corporate practices and the rise in stock values as contributors to rising top income shares.

In contrast to these studies with a focus on the USA, Scheve and Stasavage (2009) in their study of 13 countries over the period 1916–2000 argue that partisan politics and labor market institutions have had little influence on the evolution of income inequality, when viewed from a century-long perspective. Instead, the authors suggest that income inequality has been driven by underlying economic forces such as the race between technology and education, among others, but they do not test these hypothesized alternatives explicitly. Directly focusing on the postwar era where globalization or increasing returns to technology could have been the most obvious explanation for the rise of the top 1%, our article nevertheless shows that political and institutional factors such as union decline and rightwing partisan incumbency play an important role in determining top income concentration.

An institutional factor that facilitates a strong role for unions is the presence of works councils. Therefore, we include works councils among our power resources variables. Many countries do not have legally sanctioned works councils, and in the countries where they exist, their powers vary widely, from a simple right to information through consultation all the way to codetermination. Works councils with more extensive rights can be expected to restrain the income of top executives. Even where they only have a right to consultation, their presence works as implicit regulation, as we shall discuss below.

Our model will test effects of power resources alone and in combination with specific policies and competing explanations. Of course, besides the specific policy mechanisms we measure, there will be various other mechanisms through which power resources affect top incomes. These mechanisms can be conceptualized on the basis of a variety of studies, which we turn to next. Some of these mechanisms cannot be directly tested because they cannot be

directly observed, such as norms. Others cannot be tested because of data limitations. However, we do cite empirical evidence for these additional mechanisms from the existing literature.

Conceptualizing union effects on top income shares[2]

Linking declining union density to top 1% income shares is not straight-forward. For the top 1%, it is not a plausible assumption that their compensation is determined directly through the collective bargaining process, unlike the traditional wage dispersion literature that focuses on wage and salary earners below the 90th percentile (Wallerstein, 1999; Pontusson *et al.*, 2002). In our dataset, in only two country years does contract coverage exceed 95%, so the compensation for the top 1% is not directly subject to union wage bargaining. For this reason, we highlight some more subtle mechanisms through which union strength shapes top income shares.

Implicit regulation: Analyzing 1049 corporations and 1688 CEOs from 1974 to 1986, Jensen and Murphy (1990) find that instead of being pegged strictly to performance, CEO pay leaves considerable room for rent bargaining between managers and their shareholders. Because CEO pay is by law public information, third parties such as labor unions or journalists play an important role in constraining executive pay, which the authors refer to as 'implicit regulation'. When unions actively publicize information on 'what the boss makes' (Jensen and Murphy 1990, p. 254), they influence worker demand for their own pay as well as worker morale.

Several other scholars echo Jensen and Murphy's 'implicit regulation' thesis. For example, citing Joskow *et al.* (1993, 1996)'s finding that CEO pay is lower in more regulated industries, DiNardo *et al.* (2000) suggest that union presence is 'akin to regulation' (p. 4), safeguarding the welfare of those company 'stakeholders' outside the circle of shareholders and executives. As Gomez and Tzioumis (2006) point out, unions push especially hard to restrict stock options compensation, by far the largest component of CEO pay.

Resource constraint: While the 'implicit regulation' mechanism allows unions to increase a company's political and publicity cost of giving high management pay, unions can also reduce the company's financial resources for high executive compensation. As unions enable workers to improve pay, working conditions and other benefits, more surplus is redistributed to workers at the expense of management (Addison and Hirsch, 1989; Chiles and Stewart, 1993).

Organizational constraint: Finally, union presence may also constrain top executive pay by affecting the firm's organizational strategy, which in turn affects the firm's demand for CEO services. The greater the need for supervision, the more complex the firm's hierarchy and the higher pay for top executives (Garicano, 2000). However, when union activism allows workers to increase their own pay, conditions, and autonomy on the job, monitoring by management becomes less necessary for enforcing high workforce performance (DiNardo *et al.*, 2000; Acemoglu and Newman, 2002). In turn, as Garicano and Rossi-Hansberg (2006) prove formally, higher worker performance leads to a flatter firm hierarchy, where managers comprise a smaller fraction of the workforce, and pay at the top is less steep.

2 A more detailed review of the literature and discussion of these three mechanisms of union influence can be found at Huber *et al.* (2015).

Centralization and implicit regulation: Union and bargaining centralization can not only be seen as a feature of bargaining institutions but can also be conceptualized as a dimension of labor movement strength (Garrett, 1998). Centralization eliminates collective action problems. Centralized unions are able to act in a unified fashion both in wage bargaining and in politics. A good example of 'implicit regulation' by central organizations of unions is the annual report of LO, the Swedish Trade Union Confederation, on the incomes of the 'power elite' of Sweden (LO, 2014), with a special focus on the incomes of the CEOs of the 50 largest Swedish firms. The report is widely covered in the press (e.g. see http://www.dn.se/ekonomi/sa-manga-arbetarloner-gar-det-pa-en-direktorslon/).

Conceptualizing Partisan effect on pre-tax and transfer income

Secular right governments may raise the income share of the top 1% in two main ways, either by (1) increasing the bargaining power of top earners, or by (2) weakening the countervailing power of workers. We directly tap into these two broad partisanship mechanisms through the effect of, respectively, top marginal taxes and union density. The decline of top marginal taxes (favored by secular right governments) increases the bargaining power of top earners, just as the decline of unions (also favored by the right) undermines union power to countervail top management pay. However, right government partisanship continues to have a clear effect in raising the top 1%, even after we parse out the influence of top marginal taxes and union density in the empirical analysis. Here, we outline various additional forms which these partisan mechanisms may take (and for which we do not have sufficient data or space for a systematic comparative analysis).

As noted earlier, workers tend to be especially successful in forcing down CEO pay during the course of collective bargaining, because the firm's stakeholders often agree that managerial sacrifice is a necessary condition for concessions by labor (DeAngelo and DeAngelo, 1991). Various right governments have used labor legislation to directly erode the wage bargaining power of unions. For example, in 1975, President Ford vetoed Democratic legislation which would have legalized common situs picketing. Three later Democratic attempts to amend the National Labor Relations Act (NLRA) (in particular, to ban the hiring of permanent replacement workers during strikes) were defeated by Republicans (Block, 1997). In Britain, the Thatcher Conservative government used similar labor legislation tactics to, among other things, abolish union recognition in the process of collective bargaining, remove statutory immunities for workers involved in industrial action, and to weaken protection against unfair dismissals (Towers, 1989).

According to the 'resource constraint' literature, when pay and conditions for workers improve, more of the firm's surplus is redistributed to workers at the expense of top-paid managers (Addison and Hirsch, 1989; Chiles and Stewart, 1993). In this light, secular right governments have also cemented top income shares by directly reducing workers' wages. For example, the Thatcher government not only restricted the tripartite Wages Councils' ability to set minimum wage rates, but also abolished the statutory provision for workers to lodge pay comparability claims (whereby they could apply for legally enforced awards based on arguments that they were paid less than generally prevailing rates) (Towers, 1989). Similarly, the Reagan and Bush administrations froze the federal minimum wage at $3.35/hour for a decade (1980–1990), triggering the largest and longest continuous fall (by 30%) in the real value of the minimum wage in postwar US history (Morris and Western, 1999, p. 642).

Many of the above policy changes under secular center-right governments also directly enhanced the bargaining power of top earners. For example, industrial deregulation and the decline of unions allowed the shareholder value revolution to take hold in firm management practices (Fligstein and Shin, 2007), which was in turn a key driver behind the recent sharp increases in options-based CEO compensation (Hall and Liebman, 1998; Frydman and Saks, 2010).

Policy

Marginal tax rates are a key instrument for governments to shape income distribution. They influence not only redistribution, but also shape pre-tax income distribution. They figure prominently in Volscho and Kelly (2012)'s study of the USA, Roine *et al.* (2009)'s cross-country study from a century-long perspective, and Atkinson *et al.* (2011)'s overview of findings. We adopt the hypothesis that higher marginal tax rates reduce the pre-tax income share of the top 1%. As to the mechanisms, the literature identifies three options. First, the increased tax rates may stimulate more tax avoidance and evasion, so the tax returns show lower incomes. Second, higher tax rates may do the opposite of what lower tax rates are assumed to do, that is, the opposite of improving work incentives of top managers and thus stimulating entrepreneurial innovation and raising marginal productivity (Feldstein, 1995). Third, they may reduce the incentive for top income earners to bargain aggressively (Alvaredo *et al.*, 2013).

The first of these mechanisms can be observed, for instance, in certain spikes in declared income before announced increases in tax rates. Its extent over the longer run will depend on the quality of the tax code in the form of the absence of opportunities for tax avoidance (Piketty *et al.*, 2014). If the standard work incentives argument was correct, then we would see higher growth in countries with lower top marginal tax rates. In their study of three elasticities, Piketty *et al.* (2014) do not find such a result. However, their evidence is consistent with the third interpretation, the incentive for aggressive bargaining on the part of top income earners.

Besides marginal tax rates as a core policy mechanism of government partisanship, we also test the impact of welfare state and education spending as possible additional policies that may affect top income share. Roine *et al.* (2009) test the hypothesis that the size of government affects the top income share. Their hypothesis is that it will have a negative effect on top income shares. They find that the simple correlation between the two variables is negative and significant, but in the multiple regressions it is wrongly signed and insignificant. We test the hypothesis that welfare state expenditures reduce top income shares.

Skill-biased technological change is a common explanation for the postwar increase in inequality. Goldin and Katz (2008), for example, argue that inequality has increased in the USA since 1980 because technological change has increased the demand for high levels of education and the supply has not kept up in this period, in contrast to the first three quarters of the 20th century, when educational expansion exceeded or at least kept up with technological change. They suggest that this might be a factor in rising inequality in other countries. In a pooled time series analysis on market (pretax and transfer) income inequality measured by the Gini of seventeen postindustrial democracies, we tested this hypothesis and found that one reason for the increasing inequality in the Anglo-American countries was the decline in spending on education in most of these countries (Huber and Stephens, 2014). In

the present article, we similarly test the role of public education spending in top income concentration.

Atkinson *et al.* (2011, p. 58) rightly observed that most heads of household not only in the top 1% but also in the top 10% now have college education and thus the 'skill-bias explanation has little to say directly about why the top percentile has increased relative to the top decile'. This ignores variation in skill—and credentials and networks—among those that have tertiary education. It is well known that there is huge variation in the quality of tertiary education in the USA. Prestigious colleges and universities not only arguably impart greater skills but they also carry market value as a credential and make it more likely that the degree holders become embedded in social networks that land them in jobs that carry greater compensation. Kim *et al.*'s (2016) recent study shows that credentials and networks which result from attendance at these colleges and universities are highly consequential for CEO compensation in the USA. For example, they note that 'Harvard has a remarkably high number of graduates who become CEOs of the largest U.S. public corporations; 343 CEOs in our sample graduated from Harvard, out of a total of 2,018 CEOs' (p. 310). One might question whether education at Harvard College and Harvard Business School is so superior to that at elite public and private competitors in actual business skills to merit this level of overrepresentation.

Like the USA, the other liberal countries, along with Japan, are characterized by high levels of private tertiary education spending, which plausibly is related to variations in the quality of tertiary education and the value of credentials. Indeed, the correlation of top income shares with private tertiary education spending as a percentage of total tertiary education spending is moderately high ($r = 0.51$) as is the correlation between private tertiary education spending and secular center and right government ($r = 0.59$). Thus, we hypothesize that the private share of tertiary education spending will be related to the income share of the top 1%.

2.2 Economic determinants

Among economic determinants, the literature identifies the distribution of assets (wealth and skills), economic growth, share of the financial sector, and expansion of scale due to globalization and the ICT revolution. Kaplan and Rauh (2013) and Mankiw (2013) argue that the recent increase in the income share of the top one percent in the USA has been largely a product of the normal operation of competitive markets resulting in compensation in line with the marginal productivity of holders of marketable assets, capital or skill. They defend the high incomes of top managers and entrepreneurs, arguing that globalization and technological change, especially the ICT revolution, enable 'highly talented individuals ... to manage or perform on a larger scale, applying their talent to greater pools of resources and reaching larger numbers of people ... [and thus receiving] higher compensation'. (Kaplan and Rauh, 2013, p. 35).

If the arguments of Kaplan and Rauh (2013) and Mankiw (2013) are correct, one should expect top income shares to be related to measures of globalization; technological success, especially in ICT; economic growth; and export competitiveness. Globalization increases the size of the markets in which these managers can deploy their talents; their greater marginal productivity should promote economic growth and should make their home countries more trade competitive. Similarly, Atkinson *et al.* (2011) identify the expansion of scale associated with globalization and advances in information technology as potentially important determinants of top shares.

An examination of the Nordic model suggests a diametrically opposed set of hypotheses. These economies are highly globalized; they have been highly trade open for a long time and they run trade surpluses. They have also been highly successful in technological innovation in ICT. Yet, they have seen only moderate increases in the top 1% shares, and their levels of the top 1% shares are among the lowest. Accordingly, we adopt non-directional hypotheses for our globalization and technological change variables. The Nordic model does support the hypothesis about the race between technological change and educational investment. In contrast to the Anglo-American countries, the Nordic countries intensified their public investment effort in education over the past half century, which contributed to dampening increases in inequality (Huber and Stephens, 2014).

At its core, Piketty's (2014) explanation for the resurgence in top inequality in the 21st century is increasing wealth in relation to national income: when economic growth slows down, wealth (through savings and hence capital accumulation) increases relative to output, pushing up the income of the very wealthy. His measure of wealth concentration is the ratio of total wealth to national income. Bonnet *et al.* (2014) and Soskice (2014) highlight that Piketty's measure of wealth does not parse out the inflationary effect of housing prices, and may therefore overstate inequality. Therefore, in addition to testing Piketty's total wealth ratio, we also test the wealth ratio with housing wealth subtracted from the numerator. Furthermore, since stock options are a crucial part of the compensation received by top executives, we hypothesize that the value of the stock market shapes the top 1% share. Forbes data for the USA break down CEO compensation into salary and bonus, other compensation, and stock gains, and show that all three categories have increased since the mid-1990s, but stock gains have fluctuated considerably (http://www.forbes.com/lists/2012/12/ceo-compensation-12-historical-pay-chart.html).

Roine et al. (2009) find that periods of high economic growth and a higher share of the banking and stock market sectors in the economy are associated with an increase in the income share of the top 1 percent. Tomaskovic-Devey and Lin (2011) and Lin and Tomaskovic-Devey (2013) argue that in the US financialization in the form of massive income shifts into the financial sector and increasing dependence on financial income have increased top executives' share of compensation. Flaherty (2015) and Godechot (2016) also find that size and profitability of the financial sector are associated with higher top incomes. We also analyze these relationships. In sum, we include independent variables to test competing explanations and to avoid omitted variable bias. We also address omitted variable bias in our estimation techniques through the inclusion of country dummies.

3. Measurement

Our dependent variable is the share of total national income going to the top 1% of income units—individuals or households, depending on the tax laws of the country and period. Saez and Veall (2007) present evidence for Canada that treating individuals as the unit of taxation increases the level of measured inequality, so we control for the unit of analysis with a methodological dummy variable for individuals. The data come from the WWID (Alvaredo *et al.*, 2015). They are derived from tax returns and capture pre-tax and transfer income. The countries in our analysis are the 18 advanced industrial democracies in the graphs.

With regard to partisan incumbency, our measure is the cumulative share of parliamentary seats of secular center and right parties as a proportion of the seats of all governing parties (Table 1). We use measures for the entire period as well as for the 5 and 10 years

Table 1. Variable definitions and sources

	Definition	Original data source	Hypothesized relation to top income shares
Dependent variable			
Top 1% income shares	Income of the top 1% as a percent of total income	WWID	
Independent variables			
Secular center and right government	Seats of secular right and center parties as proportion of the seats of all governing parties, cumulative from 1945 to date of observation	Brady et al. (2014)	+
Veto points	Index of presidentialism, bicameralism, federalism and refererenda	Brady et al. (2014)	+
Union density	Union membership as a percentage of employed wage and salary earners	Visser (2013)	–
Centralizations of unions and bargaining	Index of bargaining and union centralization	Iversen (1999), Visser (2013)	–
Powers of works councils	Codetermination rights of works councils, 4-point scale	Visser (2013)	–
Top marginal tax rates	Top marginal income tax rates	Roine *et al.* (2009) ,	–
Civilian government employment	Civilian government employment as a percentage of the working age population	Brady et al. (2014)	–
Social security transfers	Social security transfers as a percentage of GDP	OECD	–
Education spending	Education spending, percentage of GDP	WDI	–
Private tertiary education spending	Private tertiary education spending as a percentage of total tertiary eduction spending	OECD	+
Stock market capitalization	Market value of publicly listed stocks as a percentage of GDP	Roine *et al.* (2009), Beck et al.(2009)	+
GDP per capita	GDP per capita in thousands of 2005 US dollars, PPP	Penn World Tables	±
Financial sector size	Value added by the financial intermediation sector as percentage of GDP	EU KLEMS, OECD	+
Outward FDI	Outward foreign direct investment as a percentage of GDP	IMF	±
Capital market openness	Capital market openness	Karcher and Steinberg (2013)	±
Trade openness	Exports plus imports as a percentage of GDP	Penn World Tables	±

continued

Table 1. *Continued*

	Definition	Original data source	Hypothesized relation to top income shares
Trade surplus	Trade surplus (deficit) as a percentage of GDP	Penn World Tables	±
Economic growth	Annual growth in GDP per capita in constant currency	Penn World Tables	±
Knowledge intensive services	Employment in knowledge intensive services as % of the working age population	EU KLEMS	±
Private wealth	Total private wealth divided by GDP	Piketty and Zucman (2014)	+
Non housing private wealth	Total private wealth minus housing wealth divded by GDP	Piketty and Zucman (2014)	+

All variables except stock market capitalization, top marginal tax rates, and private wealth are available in Brady et al. (2014).

preceding the year of observation. The exercise of power is mediated by institutions. Reflecting arguments by Hacker and Pierson (2010) and Enns *et al.* (2014) that institutional veto points may contribute to widening income inequality, we measure constitutional structure veto points with an additive index of presidentialism, bicameralism, federalism and referenda. Union density is measured as net union membership as a percentage of wage salary earners. The union and bargaining centralization index was developed by Iversen (1999, pp. 48–57) and updated by Visser (2013). It combines a measure of the level of bargaining (firm/plant; industry/sector; national) with the concentration of union membership at each level. It is essentially a weighted Herfindahl index. For all these measures, as well as the dependent variable, we cover the period 1960–2012. For the period before 1975, there are five to seven missing observations per year for the dependent variable.

We measure the power of works councils with a four-point scale that ranges from nonexistence of works councils to extensive codetermination rights. The data come from Visser (2013).

Top marginal tax rates are the actual marginal tax rates on the highest income group. Data from Roine *et al.* (2009) were supplemented with data from the OECD Tax Database (Section B1: Personal Income Tax) and the 2014 Economic Freedom Dataset (Gwartney *et al.*, 2014). Piketty *et al.* (2014) use statutory tax rates. The correlation between the statutory and effective tax rates is 0.62, since statutory tax rates 'have been binding to quite varying degrees' (Roine *et al.*, 2009, p. 979). Conceptually, actual tax rates are more appropriate, but we get very similar results with statutory rates.

In measuring the size of government, we depart from Roine *et al.* (2009). In the postwar period, the main variations of the size of government are due to the size of the welfare state. We measure the transfer side of the welfare state with social security transfers as a percent of GDP. We measure the service side of the welfare state with government service employment as a percent of the working age population.

Stock market capitalization is measured as market value of publicly listed stocks as a percentage of GDP. Data from Roine *et al.* (2009) were supplemented with data for recent time points from Beck *et al.* (2009) and Čihák *et al.* (2012). Roine *et al.* (2009) interpolate the data for 1961–1969 and 1971–1974. One might object to this since stock market values fluctuate from year to year. We deal with this problem in the next section.

For financial sector size we took value added from the line 'financial intermediation' from the national accounts from the EU KLEMS database. For country years not in EU KLEMS, we took data from the OECD STAN database. We divided value added by financial intermediation by GDP taken from the OECD, both in national currency units. There are no data for France and New Zealand. For profitability of the financial sector we used gross operating surplus of financial intermediation from EU KLEMS and calculated it as a percentage of GDP, taken from the OECD.

Our globalization variables are outward direct foreign investment as a percentage of GDP, trade openness measured as imports plus exports as a percentage of GDP, and capital controls. Outward direct foreign investment comes from the IMF; trade openness comes from the Penn World Tables; and capital controls come from Karcher and Steinberg (2013).

Trade surplus is calculated as exports minus imports, as a percentage of GDP, from the Penn World Tables. Economic growth is calculated as annual growth in GDP per capita in constant currency, from the Penn World Tables. Knowledge-intensive service (KIS) employment is calculated as the percentage of the working age population employed in knowledge

intensive services, from the EU KLEMS database. The Brady *et al.* (2014) database contains two measures for KIS employment; we are using the more restrictive measure here. Canada, Norway, New Zealand and Switzerland are not included in the EU KLEMS database.

Education spending is total public spending on education as a percentage of GDP, taken from World Development Indicators. Private tertiary education spending is the share of total tertiary education spending that is private, taken from the OECD Education Statistics online database. The OECD series for private education spending begins in 1995, so there are only 210 country year observations for top 1% income share and private tertiary education. Private wealth is total private wealth divided by GDP, and non-housing private wealth is total private wealth minus housing wealth divided by GDP, both from Piketty and Zucman (2014) There are data for only nine countries, and these countries are Australia, Canada, France, Germany, Italy, Japan, Spain, UK and USA.

4. Statistical estimation

Statistical methodologists (e.g. Hicks, 1994, p. 172; Plümper *et al.*, 2005, p. 329) identify four problems with OLS (ordinary least squares) estimation posed by the non-independence of observations in pooled time series: (1) errors are serially correlated, (2) errors are cross-sectionally heteroskedastic, (3) errors tend to be correlated across units due common shocks and (4) errors tend to be autocorrelated and heteroskedastic at the same time. To deal with these problems, Beck and Katz (1995, 1996) recommend addition of unit and period dummies and a lagged dependent variable to the right-hand side of the equation, calculation of panel corrected standard errors (PCSE), and imposition of a common rho for all cross-sections. Plümper *et al.* (2005) note that this set up, which they call the 'Beck–Katz standard', does effectively deal with all four problems, but, unfortunately, introduces some of its own problems. They argue that the lagged-dependent variable absorbs most of the theoretically interesting time series variance in the data. Indeed, this is true of our data: The lagged-dependent variable alone explains 93% of the variation in the data; the addition of country dummies raises this to 94%; while the introduction of all of the theoretically interesting variables adds nothing to the variation explained.

Our solution is to deal with serial correlation by correcting for first order auto-regressiveness rather than by inclusion of a lagged-dependent variable. Beck and Katz (2004, 2011) have shown that correcting for first-order auto-regressiveness (ar1 corrections) actually does include a lagged dependent variable on the right-hand side of the equation (PCSE and ar1 corrections are known as Prais–Winsten estimations). Thus, it does deal with the problem of serial correlation but without, as our results show, suppressing the power of other independent variables. We hypothesize that most of our causes (except stock market valuation) operate over long periods of time and changes in the dependent variable occur gradually, a case of cumulative causes in Pierson's (2003, p. 198) typology of causes and effects. Moreover, in almost all pooled time series studies of the determinants of inequality, whether wage dispersion, Gini indices of household income, or top income shares, the dependent variable is measured as a level. Thus, it is appropriate to measure the dependent and independent variables as levels.[3] This raises the question of whether the series are

3 For this reason, error correction estimation in which the dependent variable is measured as a first difference is not an appropriate technique to model the hypothesized causal processes.

stationary. For all the key power resource variables involved in the analysis (union density, center-right government partisanship, bargaining centralization and power of works councils) as well as stock market capitalization and the dependent variable, augmented Dickey–Fuller tests reject the joint presence of unit roots across panels ($P = 0.0000$).

We do follow Beck and Katz and include country dummies to deal with omitted variable bias. In addition, in order to control for common economic shocks, such as oil price increases or global economic cycles, we include period dummies. The periods selected are the latter part of the Golden Age of post war growth (1960–1972), oil shocks and stagflation of the seventies (1973–1979), the period of deregulation up to the introduction of the single European market (1980–1992) and the global financial crisis and its aftermath (2008–2012). The reference period is 1993–2007, the transition to the knowledge economy.[4] The problem with country dummies is that they leave us without effects of cross-national variation in one of our independent variables, veto points. Therefore, in the robustness checks in the Supplementary Appendix, we also present Prais–Winsten models without country dummies and Random Effects estimates. As an additional check for robustness, we present fixed effects estimations.

A number of our variables, particularly KIS employment, private tertiary education spending, and the private wealth variables, have many missing observations. As noted, OECD series for private share of tertiary education spending has very few observations. If all variables with the exception of the private tertiary education spending variable are entered in one equation, we are left with only 202 observations. Therefore, we proceed by constructing a baseline model and then entering clusters of related variables or single variables testing particular theoretical arguments. The baseline model contains our power resources variables and control variables. The KIS employment, private tertiary education spending and the private wealth variables are added alone to the baseline model. Model 2 in Table 2 contains all of the policy variables; Model 4 contains all of the economic variables.

As noted above, the stock market data series contains interpolated values for the periods 1961–1969 and 1971–1974. We ran the baseline model with and without the interpolated observations, and the results remained substantially the same. Therefore, we have retained the interpolated data in order not to lose observations with data for the other independent variables.

5. Results

The results of our analyses are displayed in Table 2. The baseline model (Model 1) contains our power resources variables (government partisan composition, union density, centralization of unions and bargaining and powers of works councils), along with three control variables (veto points, stock market capitalization and GDP per capita). In Model 2, we enter our policy variables to the baseline model; in Model 3, we add private share of tertiary education spending; in Model 4, we add value added by the financial sector and the complex of globalization and growth variables; in Model 5, an indicator of the knowledge economy; and in Model 6, Piketty's master variable.

4 We also ran the models with a full set of country and year dummies, and the results remained essentially the same.

Table 2. Determinants of top 1% income shares (Prais–Winsten regressions)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Unit of Analysis = Individuals	0.494	0.536	−0.666	0.464	1.263***	0.370
Golden Age (1960–1973)	0.896**	0.566		0.536	0.444	0.598
Seventies (1973–1979)	0.288	0.181		0.240	0.238	0.369
Eighties to the Single European Act (1980–1992)	−0.188	−0.055		− 0.161	−0.024	0.150
Financial crisis (2007–2011)	−0.118	−0.085	−0.376**	0.014		0.001
Secular center and right government	0.056**	0.064**	0.062**	0.135***	0.085**	0.055*
Union density	−0.062***	−0.044*	−0.099***	−0.054**	−0.064***	−0.072**
Centralizations of unions and bargaining	−2.763**	−6.000***	1.285	−1.805	−0.768	−3.102*
Powers of works councils	−0.474**	0.015	−0.780**	−0.384^*	−0.089	0.415
Veto points	0.336*	0.142	0.807***	−0.413	0.568*	0.858**
Stock market capitalization	0.007***	0.008***	0.004	0.008***	0.009***	0.011***
GDP per capita	0.034	0.038	0.049*	0.040	0.070**	0.067*
Top marginal tax rates		−2.260**				
Civilian government employment		−0.096				
Social security transfers		−0.023				
Education spending		−0.063				
Private % of total tertiary education spending			0.026***			
Financial sector size				0.052		
Outward FDI				0.019		
Capital market openness				0.008		
Trade openness				−0.014		
Trade surplus				0.004		
Economic growth				0.011		
Knowledge intensive services					−0.094*	
Private wealth						−0.071
Constant	7.687***	10.443***	4.36712**	7.35076***	6.517***	4.439**
Common ρ	0.88	0.87	0.63	0.81	0.94	0.93
Adjusted R^2	0.68	0.71	0.92	0.69	0.72	0.77
Observations	694	562	210	469	422	341

*Significant at 0.05; **significant at 0.01, ***significant at 0.001, ^significant but contrary to directional hypothesis. All models with country fixed effects.

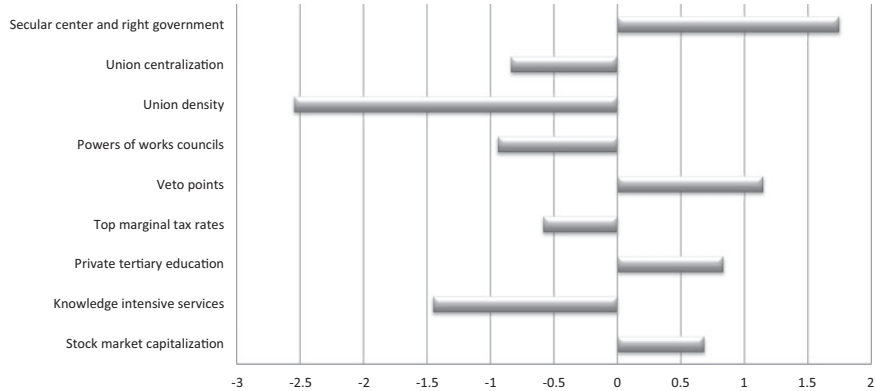

Figure 2. Estimated effect of a two standard deviation change in the independent variables on income share of the top 1% of income earners.

Our most consistently significant variables are government by secular center and right parties, union density, and stock market capitalization. In addition, union and bargaining centralization is significant in three out of six models, including both models with more than 500 observations. Works councils are also significant in three out of six models. The government partisanship variable and union density are not only highly significant but also substantively important.[5] To assess the substantive importance of our independent variables, we calculated the effect of a two standard deviation change in the independent variable on the dependent variable. We calculated this effect on the basis of the coefficients in model 1, our baseline model in which all time periods and all countries are represented.

As Figure 2 shows, a two standard deviation change in secular center and right government increases the share of the top 1% by some 1.75 percentage points and union density reduces the top 1% share by more than 2.5 percentage points.[6] Stock market capitalization is significant in every single model, but its impact is substantively smaller, with a two standard deviation change increasing the share of the top 1% by some 0.7 percentage points. The third strongest substantive effect is that of employment in knowledge intensive services with a two standard deviation change reducing the top 1% share by 1.4 percentage points. A two standard deviation change in union centralization and works council powers is associated with a decrease in the top 1% share, and the same change in private share of tertiary education spending with an increase of between 0.8% and 0.9%, while top marginal tax rates are associated with a reduction in the top 1% share of 0.6 percentage points.

Figures 1 and A1 help in the interpretation of these results. Union density varies both over time and between countries. It declines markedly over time in the liberal countries except for Canada and ends up below 30% (except Ireland; down to 11% in the USA), whereas it rises in the Nordic countries from 1970 to the early 1990s and declines somewhat thereafter, to stabilize at a comparatively very high level of around 70% (except Norway).

5 When we measured partisanship over the previous 5 or 10 years, the effect was not significant, so we are capturing a long-range effect of partisan governments shaping institutions.

6 The Table A1 displays the means and standard deviations of these variables. The appendix tables are in Supplementary Appendix.

These changes parallel the steep rise of the top 1% income shares in the liberal countries and the fall until the early 1990s and moderate rise thereafter of the top 1% shares in the Nordic countries. The share of the top 1% in the Nordic countries remains below 8%, compared to a range of 8–18% in the liberal countries. In the Continental countries, we also see a decline in union density from between 30% and 40% to around 20% (except for France that declined from 20 to below 10%), but union and bargaining centralization remained higher in these coordinated market economies than in the liberal market economies. Accordingly, the top 1% shares in the Continental countries remained relatively stable and at an intermediate range, between about 8% and 12% until 2006 after which Germany climbed to 14%.

Stock market capitalization certainly explains the ups and downs in the top income shares particularly in the liberal market economies. We clearly see the top income shares follow the upswing in the 1990s, the decline in the early 2000s, then the new bubble in the run-up to the 2008 crisis and the decline thereafter. In most of the Continental and Nordic countries with their coordinated market economies, what we see is a trend towards greater reliance on stock markets to finance corporate investment rather than long-term close relations with major banks. This in turn drove up the value of the stock market and supported a trend toward rising top income shares. The trend towards rising top 1% income shares would be much more pronounced if we had data that include capital gains.[7]

The third one of our power distribution variables is union and bargaining centralization. Centralization is significant and statistically negative in the two models with more than 500 observations, and in a third one with fewer observations. Thus, centralized unions and bargaining institutions serve as a break on the increase of top income shares. The substantive importance of union and bargaining centralization is almost twice as strong as that of stock market capitalization. Works councils are also significant in three out of six models, and their substantive effect is very similar to that of union and bargaining centralization (Figure 2).

Our welfare state variables and investment in public education are not significant. Thus, our findings support Atkinson *et al.*'s (2011) hypothesis that the race between technology and education does not apply to the top 1%. However, as we hypothesized, private share of tertiary education in Model 3 is indeed significant and strong, indicating the importance of the stratification of tertiary education in the countries where private financing is important.

Contrary to our expectations, the size of the financial sector has no significant effect on top income shares. The result remains insignificant if we substitute Flaherty's (2015) measure of gross operating surplus in finance, insurance and real estate. If we use gross operating surplus of the financial sector proper, the coefficient becomes marginally significant.[8] Thus, it is not the financialization of the economy per se that drives the growth of the top 1% income shares, but rather the capacity of the sector to extract profits. Our globalization and growth variables do not have significant effects either. These findings contradict the economistic explanation of the rise of top income shares. That rise is not an effect of highly talented managers having a greater reach to display their talents, to make their economies accumulate trade surpluses and to make their economies grow. Nor is the transition to the knowledge economy yielding particular rewards for the top income earners. Employment in

7 The WWID contains data that include capital gains for only six countries.

8 Data not shown. Results available from the authors.

knowledge intensive services is negative and significantly associated with a reduction of the top 1% income shares.

The ratio of private wealth to national income is not significant either. The result is the same with housing assets excluded (data not shown). This may be a result of the fact that the WWID lacks data on capital gains income for a sufficient number of countries.

Our robustness tests (Tables A2–4) show that our main variables of theoretical interest are indeed highly robust to different estimation techniques and different sets of observations created by data availability. Of our six models across the four estimation techniques, union density is significant and correctly signed in all but one. Union and bargaining centralization is significant in 16 models, specifically in every model that includes all countries and time periods. Center-right government is significant in all models in Prais–Winsten with country dummies and in fixed effects estimations and in five random effect models, but not in Prais–Winsten without country dummies, for a total of 17 models. Stock market capitalization, which is in our baseline model, is significant in 18 of 24 models across the four statistical estimation techniques. Works councils are less robust, reaching significance in eight models. Employment in knowledge-intensive services is significant in three estimations but not Prais–Winsten without country dummies. Private share of tertiary education spending is significant in all estimations.

Four of our economic variables become significant in the random effects and two in the fixed effects model. However, financial sector size is negative in the random effects model, as is trade surplus, and trade openness is unstable, positive in the random effects and negative in the fixed effects model. Only economic growth is positive in both the random effects and the fixed effects model. In short, there is only marginal support for the neoliberal interpretation of increasing productivity of top managers in the economic growth variables, and contrary evidence from two other variables.

6. Conclusion

Analyzing top income shares in 18 OECD countries since 1960, we find that the recent rising fortunes of the super-rich are a heavily politically influenced phenomenon, shaped by governments, parties, interest groups and public policies. We find that the rise of the top 1% over the past half century has been driven by a decline in the relative power and resources of labor in the political economy in the form of declining union density and declining union and bargaining centralization and by prolonged incumbency of secular center and right parties. Prolonged incumbency of secular center and right governments produces policies that favor top incomes which we do measure, such as reductions of high top marginal income tax rates and of public spending on tertiary education and in all probability policies we do not measure, such as containment of minimum wages and government regulation of collective bargaining. Moreover, the decline in union density is partly due to deindustrialization and partly due to direct political attacks on unions such as those by Reagan and Thatcher and the Nationals in New Zealand. The difference that can potentially be made by these various political conditions is rather substantial: based on WWID data, in the period 2006–2010 the top 1% in the USA received an average of 17.7% of the nation's income, while the top 1% in Denmark received only 6.0%.

In contrast, we find no support for explanations of income concentration at the top based on increasing marginal productivity of top managerial talent. Top income shares do not rise with the growth in the knowledge economy, trade flows that increase market size,

financialization or even wealth accumulation. The only exception is the stock market, which provides one interface through which the income of the top 1% becomes exposed to macroeconomic cycles. Also, increasing reliance on top executive compensation in the form of stock options accounts for some of the relationship between increasing stock market capitalization and rising top incomes. In the CMEs, the period since 1990 witnessed a trend from bank to stock market financing of business investment and thus significant increases in stock market capitalization, which arguably was associated with an increase in the top 1% shares.

Our findings on the strong impact of union density and union and bargaining centralization in restraining the income of the very top in society provides one interesting perspective through which the role of labor in affluent capitalist democracies can be reevaluated. Given the centrality of wage bargaining to union activities, the comparative political economy literature has long acknowledged the effect of unions on wage inequality through the prism of pay solidarity across workers, which delivers not only wage restraint for higher paid workers, but also protection for lower paid workers. What we have found through this article is that the influence of unions on pay inequality may in fact extend all the way through the firm hierarchy, to the very top of executive compensation, which is well above the range (as captured in the p90/p50 or p90/p10 ratio) over which income inequality data are conventionally collected and studied in the literature on wage dispersion.

Our finding that a strong labor movement can shave income off the very top of society also highlights the contested nature of the relationship between labor and employers in affluent capitalist democracies. While classic PRT (Stephens, 1979; Korpi, 1983) postulates a contested relationship between labor and employers as a reflection of class struggle, the later Varieties of Capitalism literature (Hall and Soskice, 2001) has sought to emphasize cooperation instead: where unions (and left parties) are strong, they cooperate with employers more. Nevertheless, management-labor cooperation on the input side (such as skill training) does not necessarily imply the lack of continuing fundamental conflict on the output side (such as dividing the firm's surplus). Because firm and worker input are complementary (machinery, financial capital and labor), cooperation on the input margin can be rationalized. On the output margin, however, the two sides draw from the same pot of revenue for compensation, so competition is a more normal outcome. Therefore, a strong labor movement may not only cooperate more often with management in production, it may also, as our finding implies, win more often in the contest for the share of the nation's income, which reinforces the central message of classic PRT.

Supplementary material

Supplementary material is available at *SOCECO* online.

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