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**ADB Working Paper Series**

**DEMOCRACY AND THE LABOR SHARE  
OF INCOME: A CROSS-COUNTRY ANALYSIS**

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**Abstract**

Summary statistics on the labor share of income show that between-country variation is much greater than within-country variation: functional income distribution is determined by factors which change substantially across countries but are persistent over time. This article attempts to shed some light on the long-run and political economy determinants of the labor income share. We revisit and extend previous empirical research on democratic political institutions and the labor share using a dataset of 112 countries over the period 1970-2015. Our empirical analysis shows that democracy allows workers to appropriate a higher share of national income. The evidence is robust to different indices of democracy and different periods of time, and after performing instrumental variable estimation. These results are particularly relevant today, in light of the recent global decline in the labor income share and current crisis of democracy.

**Keywords:** labor share, factor income distribution, democracy, political economy, institutions

**JEL Classification:** E25, P16, O15

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## 1. INTRODUCTION

Despite a renewed interest in recent years (Acemoglu and Robinson 2015; Autor et al 2017; Karabarbounis and Neiman 2013), empirical literature on the labor income share is still relatively scarce and the evidence, especially on developing countries, ambiguous (Harrison et al 2011). Existing research identifies globalization, financialization, and technological progress (Guscina 2006; Harrison 2002; IMF 2017; Stockhammer 2017) as key drivers of the labor share of income. However, these determinants mainly explain short- and medium-term variation, leaving much of the change in the labor share unexplained. Summary statistics, in fact, show that between-variation in the labor share is much greater than within-variation (Guerriero 2012): functional income distribution, similarly to income inequality (Gradstein and Milanovic 2004; Li et al 1998), appears to be determined by factors which change substantially across countries but are persistent over time.

In recent years, economists have progressively started to take interest in the persistence of inequality and the role of institutional characteristics in affecting not only economic performance but also distributional outcomes (Acemoglu and Robinson 2006; Bentolila and Saint-Paul 2003; Rodrik 1999). Institutions governing political and economic processes are believed to affect both income distribution and its persistence (Bourguignon et al 2007; Chong and Calderón 2000; Chong and Gradstein 2007). However, despite tentative theoretical consensus that a relationship exists between political institutions and the share of labor, few empirical studies test this hypothesis, the notable exception being Rodrik (1999), who uses a cross-country panel dataset to show that democratic institutions are associated with higher wages.

This study intends to re-examine the existing literature on the relationship between democratic political systems and the labor share of income using a significantly expanded dataset covering 112 countries, both developing and developed. Our estimations consist of a set of cross-sectional regressions in which the labor share is regressed on measures of democracy. Contrary to the majority of the empirical research on democracy and factor shares, which focuses mainly on the manufacturing sector and wealthier countries (Palley 2005; Rodrik 1999), we study a large number of countries and their entire economies, to provide a complete picture of the relationship. Additionally, in extension to the existing literature, we use four different measures of democracy – dichotomous, categorical, and continuous, both censored and not – as we recognize that the definition and measurement of political democracy suffers from several problems (Bollen 1990; Schmitter and Karl 1991). Furthermore, we attempt to provide proof of a causal relationship between democracy and the labor income share by employing event-study analysis, instrumental variable estimation, and the use of lagged explanatory variables. Robust evidence shows that democratic political systems favor labor over capital.

The results of this study qualify and extend previous findings on democracy and factor income distribution. Furthermore, they contribute to the general understanding of the causes of income inequality (Daudey and García-Peñalosa 2007) and are particularly relevant for policymakers in developing and emerging countries that are concerned about reducing excessive inequalities while also sustaining employment.

The remainder of this study is organized as follows. Section 2 discusses previous theoretical and empirical literature on the relationship between democracy and the labor share of income. Section 3 explains the econometric methodology and the data used in the analysis. Preliminary results from the analysis of descriptive statistics and bivariate

relationships are presented in Section 4, while Section 5 provides the main econometric results. Concluding remarks are drawn in Section 6.

## **2. POLITICAL INSTITUTIONS AND THE LABOR INCOME SHARE: A LITERATURE REVIEW**

### **2.1 Theoretical Background**

Using two democracy indices and a panel dataset covering the period 1960 to 1994, Rodrik (1999) demonstrates that democratic political institutions are associated with higher wages in the manufacturing sector. The author argues that this happens because of multiple reasons, but in particular because democracies may directly increase the bargaining power of workers by allowing greater freedom of association and collective action in the political sphere, leading to stronger unions and higher reservation wages (Palley 2005; Rodrik 1999). Democracies may provide a political environment conducive to reforms in labor market institutions, where workers use different forms of collective action to influence the creation of labor legislation that is more partial to their interests (Kristal 2010). Consequently, because of institutional wage determination, democracies may display higher labor costs (Fields and Wan 1989; Savoia et al 2010) and potentially higher labor income shares.

This channel is only one of the possible mechanisms via which democratic political institutions may affect wages and the labor share of income. Another possible mechanism is through redistributive platforms. Democracies are indeed believed to increase the demand for redistributive taxation (Acemoglu 2008; Acemoglu and Robinson 2006; Bollen and Jackman 1985). In democracies, political power is widely diffused. Regular, free, and fair elections allow workers to vote for parties that privilege redistributive platforms, since workers represent the majority of the population and – according to the median voter model – are fundamental to determining the tax rate (Acemoglu and Robinson 2006). In particular, this may lead to an increase in producers' taxation, a decline in entrepreneurial investment and the redistribution of income from entrepreneurs to workers, or in other words, from capital to labor. In contrast, government revenues and demand for redistribution are lower in autocracies and military dictatorships (Bates 2008).

A third mechanism can be established from the theoretical literature. Democracies may prevent entry barriers against new entrepreneurs. Entry barriers redistribute income away from labor toward capital by stopping the entry of more productive agents into entrepreneurship, and therefore reducing labor demand and wages (Acemoglu 2008). In oligarchies, the rich elite who capture the majority of the rents also have the resources to lobby for policies which are beneficial to them but harmful to the rest of the society. They may (Li et al 1998) use their economic power, or even direct political control, to erect significant entry barriers to market and protect themselves from expropriation. A democratic society may encourage greater competition, potentially leading to lower mark-ups on profits and higher wages, and therefore an increase in the labor income share.

In summary, three different theoretical channels help to explain how democracy may influence functional income distribution: wage-setting policies, redistribution, and regulation of entry into market.

## 2.2 Empirical Evidence

Although research on the labor income share is relatively limited, in the last two decades we have seen a rapid increase in empirical (especially, cross-national) investigations on its determinants (Bentolila and Saint-Paul 2003; Daudey and García-Peñalosa 2007; IMF 2017), including several studies on the role of political institutions (Palley 2005; Rodrik 1999; Young and Lawson 2014). First of all, Rodrik's (1999) article establishes that "democracies pay higher wages" by using cross-section and panel data econometric techniques. As an extension to Rodrik (1999) and using the same dataset, Palley (2005) focuses on the effect of improvements in labor standards on wages and the labor share, concluding that they are associated with better governance and reduced corruption. Finally, a recent empirical study (Young and Lawson 2014) that analyzes the effect of economic institutions (in particular, economic freedom) on the labor income share in a panel of 93 countries, includes political institutions among the control variables in the econometric model. These empirical studies focus prevalently on the manufacturing sector and use measures of labor shares which are not adjusted for self-employment income. Moreover, they use econometric techniques that do not fully address potential endogeneity problems. In addition to the above-mentioned multivariate analyses, Przeworski et al (2000) use cross-country descriptive statistics for the period 1950–1990 to show that both dictatorships and democracies are more likely to fall when labor receives a low share (less than 25% of valued added). Furthermore, Acemoglu and Robinson (2006) find a positive bivariate correlation between the labor income share and democracy in the 1990s.

Along with the literature on democracy and the labor income share, several empirical studies analyze the impact of political institutions on personal income distribution (Chong and Calderón 2000; Chong and Gradstein 2007; Timmons 2010), often considered to be associated with functional income distribution (Atkinson 2009; Daudey and García-Peñalosa 2007).

## 3. ECONOMETRIC METHODOLOGY, EMPIRICAL SPECIFICATION, AND DATA

### 3.1 The Measurement of the Labor Income Share

'Income shares' refer to the shares of national income which reward the different factors of production. The labor income share is the share of national income compensating labor. This study constructs a dataset of the labor income share around the world following the methodologies proposed by Krueger (1999), Glyn (2009) and Gollin (2002), and using data from the UN National Accounts Statistics. The denominator of the labor share is the income aggregate, Gross Value Added at basic prices, net of fixed capital consumption and measured at factor costs. The numerator is the compensation of employees, calculated in current prices and adjusted for self-employment income. The adjustment we suggest uses data on the composition of the workforce (available from the ILO Yearbooks of Labour Statistics) and imputes average employees' compensation to all workers holding self-employment jobs excluding employers, who are assumed to earn only capital income. This avoids the risk of overestimating the labor share using the imputed wage method (Izyumov and Vahaly 2015). The compiled labor share dataset is an unbalanced panel containing 2,771 observations covering 112 countries, both developed and developing, over the period 1970–2015.



### 3.2 Empirical Strategy

Our analysis consists of a set of cross-sectional regressions where the labor income share is regressed on a measure of democracy as well as other controls. We choose to utilize cross-sectional, five-year averages for two main reasons: firstly, to circumvent the problem of missing data (Tebaldi and Mohan 2010); secondly, five-year averages are suitable tools when testing for long-run relationships, especially with variables – such as democracy and the labor share – which present long-term rather than short-term variation (Chong and Calderón 2000; Rodrik 1999). The data is grouped into non-overlapping five-year averages covering 10 sub-periods over the period 1970 to 2015. However, our analysis mainly focuses on the most recent sub-periods (2005–2009 and 2010–2014). Following Rodrik (1999), we adopt the subsequent model specification (see Equation 1):

$$LS_{i(T-1,T)} = \beta_0 + \beta_1 Democracy_{i(T-1,T)} + \sum_k \delta_k X_{ik(T-1,T)} + \varepsilon_{i(T-1,T)} \quad (1)$$

where  $LS_{i(T-1,T)}$  is the average labor income share for country  $i$  between the end of the five-year period,  $T$ , and the beginning of the five-year period,  $T-1$ .  $Democracy_{i(T-1,T)}$  is the average political democracy for country  $i$  between times  $T$  and  $T-1$ .  $X_{ik(T-1,T)}$  is a vector of control variables. Following Rodrik (1999) and Palley (2005), the model controls for the natural logarithm of GDP per capita, as a proxy for structural determinants correlated to the level of economic development and to avoid capturing the effect of economic development in the coefficient of democracy. A dummy variable for oil exporters and a set of geographical/economic dummies (for East Asia, Latin America, Sub-Saharan Africa, socialist countries and OECD member states)<sup>1</sup> are also included. Finally,  $\varepsilon_{i(T-1,T)}$  is the error term.

### 3.3 The Data

The explanatory variable of interest is a measure of political institutions. As there is disagreement among scholars about the proper way to measure democracy (Cheibub et al 2010; Coppedge et al 2008; Elkins 2000; Munck and Verkuilen 2002), we consider four alternative indicators suggested in the existing literature.

**Polity IV:** The first measure of democracy is derived from the Center for Systemic Peace Polity IV dataset (Jagers and Gurr 1995; Marshall and Jagers 2016), which contains annual democracy indicators over the period 1800–2015 for all independent countries with a population greater than 500,000. This variable has been widely used in the literature (Acemoglu et al 2008; Barro 1996; Rodrik 1999). The Polity IV index measures a country's constraints on executive power and is subjectively coded by the authors on the basis of: intensity of political competition, regulation of political participation, competitiveness of executive recruitment, openness of executive recruitment, and constraints placed on the chief executive. Specifically, the authors construct two measures: a democracy indicator (*democ*) and an autocracy indicator (*autoc*). The combined polity score is then computed by subtracting the *autoc* score from the *democ* score and it ranges from +10 (strongly democratic) to -10 (strongly autocratic). The revised combined polity score (*polity2*), which is used in this analysis, is a modified version introduced to facilitate time series analysis. We rescale the *polity2* index to range from 0 to 1.

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<sup>1</sup> The OECD sample is composed of today's OECD member countries.

**Freedom House:** The *Freedom in the World* survey provides annual evaluations of the state of freedom in 195 countries and 14 territories for the period 1972–2015. The dataset has been extensively used in existing empirical work on the relationship between democracy and economic growth (Acemoglu et al 2008; Barro 1996; Helliwell 1994). Derived from the work of Gastil and his followers (Freedom House 2017), it represents a subjective classification of freedom as experienced by individuals. It is measured according to two broad categories: political rights (*prights*, the rights which enable people to participate freely in the political process) and civil liberties (*civlib*, the rights which allow for freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy). Each country is assigned a numerical rating – on a scale from 1 to 7, where higher values signify lower freedom. Following Helliwell (1994) and Rodrik (1999), we combine the two ratings into a single index that varies from 0 to 1 (with higher values indicating greater freedom) using the transformation  $[14 - \text{civlib} - \text{prights}]/12$ .

**Vanhanen's Index of Democratization:** As noted in Benhabib et al (2013), a feature of the Polity IV and the Freedom House indices is that their data are bounded: a substantial share of countries in the sample are designated as full democracies, and a large group of full democracies remain so throughout the entire time period considered in this study.<sup>2</sup> In order to address this concern, we consider a measure of democracy which, unlike the two previous indices, is not censored on the right-hand side (Benhabib et al 2013). Compiled by Tatu Vanhanen (Vanhanen 2000; Vanhanen 2003; Vanhanen 2016), the Index of Democratization covers 195 countries over the period 1810–2014. Countries which were considered democracies decades ago can still show gains in recent years.<sup>3</sup> The indicator is a composite measure of two theoretical dimensions of democracy: intensity of public contestation (*competition*, measured by the smaller parties' share of votes cast in the elections) and voter's participation rights (*participation*, measured by the percentage of the population which voted in the same elections); these are combined together into an overall Index of Democratization (ID), which we then rescale to range from 0 to 1.

**Democracy and Dictatorship (D/D) Revisited:** One of the concerns in the debate on the measurement of democracy is related to whether democracy should be treated as a dichotomous, ordinal, or continuous variable. Bollen (1990), for example, describes the intensity of democracy as continuous by nature and regards a dichotomous index as a crude pooling of heterogeneous political regimes into a single category. On the other hand, Przeworski et al (2000) reject the notion of a continuum and claim that a country is either democratic or not. To accommodate for the latter point of view, the fourth democracy indicator considered in this study is a dichotomous regime classification, which was first introduced in Alvarez et al (1996) and Przeworski et al (2000), and later revisited and extended in Cheibub et al (2010). A regime is classified as a democracy if it meets all of the following requirements: the chief executive is chosen by popular election or by a popularly elected body, the legislature is popularly elected, there is more than one political party competing in the elections, an alternation in power under electoral rules must have taken place.

Among the control variables, data on natural logarithm of GDP per capita have been collected from the Penn World Tables 9.0 (Feenstra et al 2015; Summers and Heston 1988). The regional dummy variables have been constructed using the geographical classification of the UN Statistics Division. Dummy variables for OECD member countries

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<sup>2</sup> For example, the Polity IV score for Switzerland is equal to its maximum since 1848.

<sup>3</sup> For example, Switzerland's score ranges from a value of 23.04 to a value of 43.4 in the period 1970–2015.

and oil exporters (OPEC members) have been created by looking at the list of members of both organizations and the dummy for socialist countries by analyzing the political history of the individual countries.

## 4. SOME STYLIZED FACTS

### 4.1 Overview of the Data

Table 1 contains summary statistics for all variables utilized in this study<sup>4</sup> for the entire period 1970–2015. The labor share measure has been rescaled ranging from 0 to 100.

**Table 1: Overview of the Data: Summary Statistics**

Variable		Mean	St. Deviation	Min	Max	Observations
Year	Overall	1992.5	13.277	1970	2015	$N = 6,486$ , $n = 141$ , $\bar{T} = 46$
Measures of labor share:						
Unadjusted (%)	Overall	48.155	16.938	3.5103	84.5974	$N = 3372$
	Between		16.659	12.665	76.6105	$n = 141$
	Within		5.0522	15.495	70.3157	$\bar{T} = 23.915$
Adjusted (%)	Overall	65.899	15.627	7.3938	99.7760	$N = 2771$
	Between		15.164	23.576	91.3094	$n = 112$
	Within		6.8434	35.497	95.7221	$\bar{T} = 24.741$
Explanatory variables:						
Polity IV	Overall	0.6090	0.3675	0.0000	1.0000	$N = 5,358$ , $n = 126$
Freedom House	Overall	0.5894	0.3335	0.0000	1.0000	$N = 5,534$ , $n = 141$
Vanhanen	Overall	0.3017	0.2791	0.0000	1.0000	$N = 5,372$ , $n = 129$
D/D	Overall	0.4945	0.5000	0.0000	1.0000	$N = 4,646$ , $n = 130$
GDP per capita	Overall	14,779.0	19,830.6	408.02	245,077.8	$N = 5,471$ , $n = 130$
Instruments:						
Legal origin_uk	Overall	0.2774	0.4477	0.0000	1.0000	$N = 6,302$ , $n = 136$
Legal origin_fr	Overall	0.5328	0.4990	0.0000	1.0000	$N = 6,302$ , $n = 136$
Legal origin_ge	Overall	0.1460	0.3531	0.0000	1.0000	$N = 6,302$ , $n = 136$
Legal origin_sc	Overall	0.0365	0.1875	0.0000	1.0000	$N = 6,302$ , $n = 136$
Legal_origin_so	Overall	0.0073	0.0851	0.0000	1.0000	$N = 6,302$ , $n = 136$
Latitude	Overall	22.476	26.306	– 41.814	67.470	$N = 5,566$ , $n = 121$
Coastland	Overall	0.3519	0.3512	0.0000	1.0000	$N = 5,566$ , $n = 121$
Malaria	Overall	0.5745	0.4245	0.0000	1.0000	$N = 5,704$ , $n = 124$
Fractio.	Overall	0.4424	0.2463	0.0040	1.0000	$N = 5,520$ , $n = 120$
Nat. resources	Overall	6.6162	10.509	0.0000	89.596	$N = 5,720$ , $n = 141$
Dummy variables:						
OECD members	Overall	0.2482	0.4320	0.0000	1.0000	$N = 6,486$ , $n = 141$
OPEC members	Overall	0.0922	0.2893	0.0000	1.0000	$N = 6,486$ , $n = 141$
Social. countries	Overall	0.0967	0.2955	0.0000	1.0000	$N = 6,486$ , $n = 141$
Latin America	Overall	0.1206	0.3256	0.0000	1.0000	$N = 6,486$ , $n = 141$
Sub-Sah. Africa	Overall	0.2199	0.4142	0.0000	1.0000	$N = 6,486$ , $n = 141$

<sup>4</sup> Some of the variables presented in this table are discussed in Section 5.

East Asia	Overall	0.0780	0.2682	0.0000	1.0000	$N = 6,486, n = 141$
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Source: Author's calculations.

As previously mentioned, between-variation in the labor share is much larger than within-variation, suggesting that the labor share of income changes considerably across countries but is relatively persistent over time. Political institutions, which are also rather persistent, could represent a plausible explanatory factor of income distribution. For example, if we consider the binary variable of democracy/dictatorship, there are only 11 countries<sup>5</sup> that experience a transition from autocracy to democracy for which we possess continuous yearly data on the adjusted labor share for the period when the switch occurred.

## 4.2 Democracy and the Labor Income Share: A Preliminary Analysis

Table 2 presents a preliminary evaluation of the relationship between democracy and the adjusted labor share of income. It shows pair-wise correlation coefficients between the labor share, the four variables of democracy, and the other regressors in the benchmark model, for the entire period.

**Table 2: Overview of the Data: Pair-wise Correlation Matrix**

	Adjusted LS	Polity IV	Fr. House	Vanhanen	D/D	Ln(GDP)	Oil Export.
Adjusted LS	1.000						
Polity IV	0.4900*	1.0000					
Fr. House	0.4793*	0.8924*	1.0000				
Vanhanen	0.4589*	0.8258*	0.8322*	1.0000			
D/D	0.4235*	0.8543*	0.8267*	0.7919*	1.0000		
Ln(GDP)	-0.0540*	0.3867*	0.5163*	0.5875*	0.4188*	1.000	
Oil export.	-0.4130*	-0.3168*	-0.3159*	-0.2705*	-0.2359*	0.1118*	1.000

Source: Author's calculations. Please note: \*  $p < 0.05$ .

Firstly, the four indicators of democracy are significantly and highly correlated with each other (their correlation coefficients being always greater than 0.79). Secondly, there is a significant and positive pair-wise correlation between democracy and the labor share of national income. This correlation is relatively large (greater than 0.42) for all four variables of democracy. Thirdly, there is a positive and significant correlation (greater than 0.38) between each of the democracy indices and the control variable, natural logarithm of GDP per capita. Several studies have indeed suggested that democracy may be associated with greater economic development (Acemoglu et al 2001; Barro 1996; Przeworski et al 2000). This correlation needs to be taken into careful consideration as it may increase the risk of collinearity between the explanatory variables in our model.

<sup>5</sup> Bolivia, Chile, Ecuador, Georgia, the Kyrgyz Republic, Mexico, Peru, Senegal, the Republic of Korea, Sri Lanka, and Thailand.

**Figure 1: Bivariate Scatters: Democracy and the Labor Share, 2005–2014**



Source: Author's calculations.

Figure 1 presents ten-year averaged bivariate scatters of the three continuous democracy indices and the labor share for the most recent 10-year period (2005–2014). Consistent with the correlation coefficients presented above, the relationship with the labor share is positive for all three democracy indicators.<sup>6</sup>

**Table 3: Adjusted Labor Share Averages in Democracies and Dictatorships**

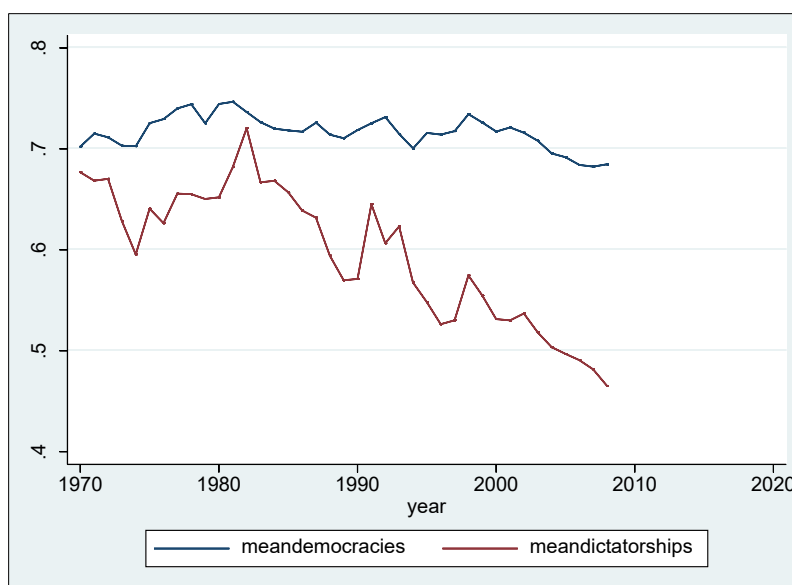
	Dictatorship	Democracy
1970–2008	57.4704	71.3392
1970s	64.4864	72.0245
1980s	64.8542	72.4788
1990s	56.8297	71.9457
2000s	50.6231	69.9678

Source: Author's calculations.

<sup>6</sup> Similar relationships are found with year-by-year scatter plots.

Moreover, as can be seen from Table 3 and Figure 2, it appears that the difference between democracies and dictatorships is increasing over time, as the labor share remains almost constant on average in democracies, while it declines very rapidly in dictatorships. This preliminary result could indicate that the global decline in the labor share may be explained, at least in part, by economic changes within autocratic regimes, or by a decrease in democracy levels around the world. This latter hypothesis is supported by the findings of Freedom House (2017), according to which the number of ‘free’ countries in the world has been declining over the last decade. Finally, Figure 2 seems to also suggest that the labor income share is more stable in democracies and more volatile in dictatorships.

**Figure 2: Adjusted Labor Share Averages in Democracies and Dictatorships**



Source: Author's calculations.

In conclusion, a preliminary analysis of the data shows that the labor share of income is higher and more stable in democracies than in autocracies. This is consistent with the results in Rodrik (1999), which showed that democracies pay higher wages. The results are similar across all four indicators of democracy. Nonetheless, simple correlations do not allow us to infer any causal relationship. A more robust multivariate analysis needs to be carried out in order to appropriately answer our research questions.

## 5. ECONOMETRIC RESULTS

### 5.1 Benchmark Estimation

Table 4 displays cross-sectional regression results for all four democracy indicators for the sub-period 2005–2009, and the three continuous indices for the most recent period (2010–2014).<sup>7</sup> The models presented in the table differ according to the variables used to measure democracy. The natural logarithm of GDP per capita, a dummy variable for oil exporters, regional dummies for East Asia, Sub-Saharan Africa, and Latin America,

<sup>7</sup> No data is available for the dichotomous variable for the period 2010–2014.

as well as dummies for socialist countries and OECD members have been introduced as controls across all specifications.<sup>8</sup> Heteroskedasticity robust standard errors have been utilized throughout the analysis, in order to correct for the possible presence of arbitrary heteroskedasticity of the residuals, leading to incorrect standard errors.

The first four columns show the results for the sub-period 2005–2009. Column 1 presents the results for the Polity IV index, column 2 the Freedom House index, column 3 the Vanhanen's index and column 4 the dichotomous variable of democracy/dictatorship. All coefficients on democracy are positive and strongly significant. As hypothesized, democracy has a positive and significant effect on the labor share of national income. Non-democratic regimes, where the majority of the population are disenfranchised, may be harmful for labor outcomes. The magnitudes of the coefficients vary across the four columns, indicating that a transition from an absolute dictatorship to an absolute democracy in the sub-period 2005–2009 would have corresponded to an increase of approximately 14 to 34 percentage points in the labor share. These effects are quantitatively comparable to those presented in Rodrik (1999).<sup>9</sup>

Columns 5, 6, and 7 present data for the sub-period 2010–2014 (for Polity IV, Freedom House, and Vanhanen's index, respectively). The coefficient estimates are very similar to those in columns 1, 2, and 3, in terms of sign and significance, suggesting that the effect of democracy on the labor income share has not changed in the last two sub-periods. The magnitude has increased slightly. In summary, democracy exerts a statistically significant impact on the labor share in the sample studied.

**Table 4: Cross-Sectional Results using 5-year Averaged Data for 2005–2009 and 2010–2014**

Dep. Var.:	2005–2009				2010–2014		
Adjusted LS (%)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Polity IV	25.40*** (7.287)				29.80*** (8.639)		
Freedom House		25.51*** (7.475)				32.30*** (8.643)	
Vanhanen's Index			33.89*** (7.374)				35.27*** (13.27)
D/D				13.82*** (4.952)			
Ln(GDP)	-5.944** (2.327)	-	-	-4.684* (2.420)	-4.917* (2.907)	-	-6.857** (2.854)
Oil exporters	-6.673 (4.992)	-8.389 (5.375)	-9.960** (4.427)	-	-3.749 (7.361)	-0.149 (6.589)	-8.417 (6.522)
_cons	100.4*** (24.65)	123.2*** (20.08)	119.7*** (21.76)	97.62*** (23.91)	91.37*** (30.26)	141.0*** (26.33)	116.2*** (29.53)
N	95	101	97	98	63	68	63
R <sup>2</sup>	0.494	0.473	0.505	0.470	0.3597	0.3936	0.3302

<sup>8</sup> Only the results for oil exporters and the natural logarithm of GDP per capita are presented in the table.

<sup>9</sup> Rodrik's (1999) article mainly focuses on wages and not the share of labor. However, among the various estimations, the author includes a panel data regression of the impact of democracy on the labor share. His estimated coefficients range from 11 to 41.

Please note: Heteroskedasticity robust standard errors in parentheses. Regressions include dummies for East Asia, Latin America, Sub-Saharan Africa, socialist countries and OECD members (coefficient estimates not shown). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Author's calculations.

With respect to the control variables, the labor share is unsurprisingly lower in oil-producing countries, their incomes being less dependent on labor wages and more dependent on land rents. However, this result is not significant across all specifications.

GDP per capita displays a negative and significant relationship with the share of labor in national income. This result contradicts the existing literature (Palley 2005; Rodrik 1999; Young and Lawson 2014) and it can be explained by the fact that previous empirical studies use unadjusted measures of labor share, which do not account for mixed income and tend to be positively correlated to economic development because of the higher share of self-employed in poorer economies (Gollin 2002). Therefore, the unadjusted labor share is more likely to be lower in countries with lower per capita income. After appropriately adjusting for self-employment income (Bernanke and Gürkaynak 2001; Gollin 2002), the relationship between labor income share and economic development is no longer straightforward. When performing the above estimations with the unadjusted labor share,<sup>10</sup> the results are broadly consistent for all coefficients apart from the coefficient on economic development, displaying a positive relationship.

The negative coefficient on GDP per capita is also interesting since political institutions and economic development are correlated with each other, as can be seen from Table 2 and has often been argued in the political economy literature (Acemoglu et al 2001; Barro 1996; Przeworski et al 2000). Although there is no clear empirical consensus, a number of studies contend that democratic institutions are conducive to economic development when they secure greater stability and create broad-based opportunities for the population; simultaneously, democratic regimes are more likely to be created and consolidated in affluent societies. This correlation could potentially affect our results, leading to collinearity (on the one hand, economic development may influence the labor share through a process of 'democratization'; on the other hand, democracy, which is also growth-enhancing, may have a positive effect on the labor share of income). However, the opposing signs of the two coefficients (of democracy and GDP per capita) indicate the presence of two different mechanisms: once we isolate democracy from economic development, democracy has a positive effect while the impact of economic development is negative.

We conduct several robustness checks on the benchmark estimation: we include a number of control variables, perform the same estimation for different time periods and use alternative measures of labor income share.<sup>11</sup> The econometric results are consistent and confirm our findings that democracy is relevant to functional income distribution.

## 5.2 Empirical Concern: Endogeneity

Endogeneity is an important concern in the empirical analysis of the democracy-labor share nexus. In particular, endogeneity problems may arise from possible double causality between institutional strength and income distribution (Chong and Gradstein 2007). Various scholars have indeed argued that the distribution of income is an important determinant of whether an economy possesses "weak" or "strong" institutions

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<sup>10</sup> Results not presented here.

<sup>11</sup> Results not presented here.



(Young and Lawson 2014). Countries with a large middle class, and consequently relatively high wage levels and a large labor share, may be more likely to make a transition to democracy or to remain one (Rodrik 1999). For example, Easterly (2001) finds that a higher share of income among the middle class is associated with greater levels of democracy and political stability.

Moreover, as we know from the literature, income inequality may be linked to political instability and poor democratic development (Savoia et al 2010). A wide theoretical and empirical literature discusses the possibility of an inverted U-shaped relationship between inequality and the likelihood of transition to democracy (Acemoglu and Robinson 2006; Boix 2003; Midlarski 1999; Przeworski et al 2000). A certain degree of inequality may be required for the initiation of a democratization process, as higher inequality makes revolution – and the egalitarian promises of democracies – more attractive for the citizens. However, the higher the level of inequality, the more unbalanced the access to economic opportunities is, and the more the elites will resist democratization. The richer the elites at the top of the distribution are, the greater the extent to which they would be worse off after a prospective redistribution of political power and economic resources. Because of these reasons, Przeworski et al (2000) discuss the fact that both dictatorships and democracies are more likely to fall when labor receives a low share.<sup>12</sup>

In order to seek proof of causality, we first provide event-study evidence from countries that have experienced a significant transformation in terms of political regime. A before-and-after approach allows us to directly examine the effect of political institutions on the labor share, as it partially accounts for time-invariant and country-specific factors.

**Table 5: Labor Shares and Political Regime Transitions**

Country	Year	Average LS (Polity IV) Pre-transition	Average LS (Polity IV) Post-transition	Democratization Episode. Brief Description
Bolivia	1982	57.26 (–6)	58.70 (+8)	Return to civilian rule. Reconvocation of democratic constitution.
Chile	1990	54.59 (+0.3)	56.70 (+8)	First free and fair presidential elections. End of military rule of A. Pinochet.
Ecuador	1979	50.36 (–5)	51.71 (+9)	First presidential elections. End of military power.
Kyrgyz Republic	2005	72.23 (–3)	67.20 (+3.3)	First Kyrgyz Revolution. End of the rule by authoritarian President A. Akayev.
Senegal	2000	75.09 (–1)	75.58 (+8)	Presidential election. New constitution limiting power of prime minister and length of presidential term.
Republic of Korea	1988	86.58 (–3)	87.40 (+6)	Civilian government replacing military rule.
Thailand	1979	68.34 (–2.3)	77.21 (+2)	Restoration of parliamentary elections.

<sup>12</sup> According to the authors, less than 25% of value added.

Country	Year	Average LS (Polity IV) Pre-coup	Average LS (Polity IV) Post-coup	Episode of Coup D'état. Brief Description
Algeria	1992	65.24 (-2)	63.36 (-7)	Start of the Algerian civil war.
Ecuador	1972	55.84 (0)	50.25 (-5)	Military coup.
Fiji	1987	87.45 (+9)	78.44 (-3)	Two military coups.

Source: Author's calculations.

Table 5 above presents specific instances of change in the labor share following transitions from dictatorship to democracy and coups d'état. Seven instances of transition to democracy have been selected, according to availability of data and the presence of a clear, rapid transition.<sup>13</sup> For each country, the table shows pre- and post-transition levels of the labor share and the Polity IV index (averages of three observations prior to and following the year of transition). In six cases (out of seven), the transition to democracy led to an increase in the labor income share. The only exception is the Kyrgyz Republic. However, according to the Polity IV classification, the Kyrgyz Republic did not experience a full transition in 2005, remaining an anocracy after the revolution.

Three instances of coups d'état are also presented. They have been identified using Przeworski et al's (2013) Political Institutions and Political Events (PIPE) Dataset and availability of data on the labor share. In all cases, the labor income share appears to drop considerably following the coup d'état, suggesting that political stability, and not just the type of political regime, may also have an important effect on the share of labor in national income.

From the event-study evidence, it is possible to see a pattern of causality going from political regime to the labor share. However, in order to better address endogeneity, we utilize instrumental variable (IV) methods and suitable instruments for democracy. Several instrumental variables have indeed been introduced in the empirical literature on political institutions and development (Tebaldi and Mohan 2010).

Firstly, studies suggest that current variation in institutional quality can be explained by geography-related variables and their effect on historical factors (Acemoglu et al 2001; Hall and Jones 1999; McArthur and Sachs 2001). For example, geography played an important role in the creation of early institutions during colonialism, which have then shaped current modern institutions (Denoon 1983). Colonization may have acted in response to certain environmental surroundings: colonies with more favorable geographical conditions or which are geographically closer to the West were better able to replicate European-style settlements and institutions (Acemoglu et al 2001).

Other researchers (LaPorta et al 1999) argue that legal history is relevant to the political regime type. Current political institutions within a country have historical roots in the origin of its legal system.

Thirdly, it has been argued (Dulleck and Frijters 2004) that natural resources are an important determinant of institutional outcomes. A sizable natural resource sector may be associated with a failure to democratize because of the large incentives of the ruling elites to predate rich resource rents (Bates 2008). Acemoglu et al (2010) showed that greater natural resource rents make military coups more likely – see, for example,

<sup>13</sup> Where both the dichotomous variable switches from 0 to 1 and the Polity IV index exhibits a discontinuous change.

countries like Sudan, Nigeria, and Angola – and they induce more severe political moral hazard.

Finally, another branch of the institutional literature focuses on ethno-linguistic fragmentation (Alesina et al 2003; Easterly and Levine 1997; Posner 2004). Ethnic conflict is an important determinant of the political economy of many nations and it may lead to political instability and poor-quality institutions. Moreover, in ethnically fragmented communities, public goods provision may be less efficient, and participation in social activities and trust may be lower. This is particularly relevant in the developing world, where states are often “artificial” (created by previous colonialists rather than representing underlying ethnic groups), such as for example in the Middle East and in Sub-Saharan Africa, but also in South Asia after the partition of India and Pakistan (Alesina et al 2011).

Empirically, the ideas discussed above suggest that democracy could be modeled as in the following equation:

$$Democracy_{i(T-1,T)} = \gamma_0 + \sum_k \gamma_k I_{ik(T-1,T)} + \eta_{i(T-1,T)} \quad (2)$$

Where  $Democracy_{i(T-1,T)}$  is the average level of democracy for country  $i$  between the end of the five-year period,  $T$ , and the beginning of the five-year period,  $T-1$ .  $I_{ik(T-1,T)}$  is a vector of instruments: geographical variables, measures of legal origin, a measure of natural resource rents and a measure of ethno-linguistic fragmentation.<sup>14</sup> Finally,  $\eta_{i(T-1,T)}$  is the error term.

The geographical variables are taken from Gallup et al’s (1999) Geography Datasets (Center for International Development, Harvard University). We use the absolute value of the latitude of a country centroid, the proportion of a country’s total land area within 100 km of the coastline and an index of malaria prevalence in the country in 1946 to capture the historical effect of geography. Legal legacy is taken from LaPorta et al (2008) and measured by a set of dummy variables that identify the origin of the legal system: English (*legal\_uk*), French (*legal\_fr*), German (*legal\_ge*), Scandinavian (*legal\_sc*) or socialist (*legal\_so*). As a measure of natural resource wealth, we employ total natural resource rents (as a percentage of GDP), derived from the World Bank. Finally, the measure of ethno-linguistic fragmentation is taken from Fearon and Laitin (2003). It consists of an index of fractionalization capturing the probability that two individuals randomly selected from the population of a country belong to two different ethno-linguistic groups (Easterly and Levine 1997).

Because of the characteristics of the variables of democracy, using a simple Two-stage Least Squares (2SLS) method for the instrumental variable estimation, as previous studies have done (Rodrik 1999; Tebaldi and Mohan 2010; Young and Lawson 2014), may lead to incorrect estimates. As previously mentioned (Benhabib et al 2013), both the Polity IV and the Freedom House index are right-censored, with a substantial mass of countries at the boundary. Consequently, we use non-linear estimation methods in the first step:<sup>15</sup> a *tobit* estimation for Polity IV and Freedom House, a logistic estimation for

<sup>14</sup> In addition to the above suggestions, Young and Lawson (2014) instrument democracy with a measure of a country’s checks and balances (Keefer and Stasavage 2002; Keefer and Stasavage 2003). With respect to this measure, we argue that it is not exogenous, as it is itself a manifestation of the presence of democracy. For example, the extent of institutionalized constraints on the exercise of executive power is one of the components of the Polity IV index. As such, it may be correlated with the error term.

<sup>15</sup> Przeworski et al (2000) use probit with the dichotomous variable of Democracy/Dictatorship. Epstein et al (2006) and Benhabib et al (2013) use *tobit* with the Polity IV and the Freedom House indices. Also, Barro (1999) argues that the use of non-linear estimation would improve his approach.

the dichotomous variable of democracy, and a simple OLS estimation for Vanhanen's Index of Democratization, which is neither censored nor dichotomous.

Table 6 below reports the results of the second-stage regressions:<sup>16</sup> columns 1-4 show that, also accounting for endogeneity, democracy is strongly and positively correlated to the labor share of income. All four coefficients on democracy are positive, significant, and larger in size compared to the simple OLS estimations. Among the controls, GDP per capita displays negative coefficients.

**Table 6: Second-stage IV Estimation of the Labor Share on Democracy.  
Five-year Averaged Data (Most Recent Period)**

Dep. Var: LS (%)	First Stage: Tobit 2010–2014	First Stage: Tobit 2010–2014	First Stage: OLS 2010–2014	First Stage: Logit 2005–2009
	(1)	(2)	(3)	(4)
Polity IV	55.24*** (16.56)			
Freedom House		54.95*** (15.03)		
Vanhanen's Index			64.12*** (16.58)	
D/D				34.98*** (9.962)
Ln(GDP)	-3.135 (2.970)	-10.26*** (3.085)	-4.931* (2.743)	-2.551 (2.561)
Oil exporters	2.254 (7.849)	5.036 (6.673)	-8.492 (6.316)	-10.19 (6.907)
_cons	59.96* (33.44)	133.6*** (26.61)	89.51*** (28.18)	68.10*** (23.59)
<i>N</i>	56	57	56	43
<i>R</i> <sup>2</sup>	0.2438	0.3207	0.2523	0.3797

Please note: Heteroskedasticity robust standard errors in parentheses. Regressions include dummies for East Asia, Latin America, Sub-Saharan Africa, socialist countries and OECD members (coefficient estimates not shown). All first-stage regressions are estimated including the following set of variables: absolute latitude, proportion of land within 100km of the seacoast, malaria prevalence in 1946, dummies for the origin of the legal system, ethno-linguistic fragmentation, and natural resource rents. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Instrumented variables: Polity IV, Freedom House index, Vanhanen's Index of Democratization, Democracy/Dictatorship.  
Source: Author's calculations.

Another possible way to address reverse causality is to employ lagged values of the democracy variable (Rodrik 1999; Young and Lawson 2014), as it would be safe to argue that contemporaneous shocks to the labor share cannot influence prior institutional developments.

The choice of time lags is only motivated by the fact that institutional effects unfold over time. As argued by Gerring et al (2005), political regimes are "historically informed phenomena" rather than "contemporary variables" (p.325) and should be considered as

<sup>16</sup> Relevant post-estimation tests have been performed, but not presented here.

*stocks* instead of *levels*. Democracy and dictatorship may originate from deep legacies, which extend for several years.

In order to both control for endogeneity and for the accumulated effect of ‘historical legacies’, we use two different alternatives: a one-period lag of the democracy variable and the average of democracy for the entire period preceding the relevant sub-period. Table 7 displays cross-sectional regression results for all four democracy indicators. In column 1, we regress the average labor share for the sub-period 2010–2014 on the average of the Polity IV variable in the preceding sub-period (2005–2009) and the other controls. Columns 3, 5, and 7 present the results for the Freedom House index, the Vanhanen’s Index of Democratization and the dichotomous variable of democracy. As expected, the estimated coefficients on democracy are positive and strongly significant. Moreover, they are larger in magnitude compared to the coefficients estimated in Table 4. This means that the lagged effect of democracy on the labor income share is actually larger than the contemporaneous effect. It is indeed plausible that labor contracts and capital structure do not adjust immediately to institutional quality.

Columns 2, 4, 6 and 8 display the results of the ‘historical legacy’ of democracy: the transition from an absolute dictatorship to an absolute democracy in the 40 years prior to 2010 corresponds to an increase of at least 20 percentage points in the labor share in the period 2010–2014. These results are robust to the use of all variables of democracy: all coefficients on lagged democracy are positive, strongly significant, and larger in size compared to the contemporaneous data.

**Table 7: Lagged Democracy and the Labor Share**

Dep. Var: LS (%) (2010–2014)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Polity IV (2005–2009)	33.86*** (8.856)							
Polity IV (1970–2009)		39.97*** (6.424)						
Fr. House (2005–2009)			33.78*** (9.601)					
Fr. House (1970–2009)				44.40*** (8.894)				
Vanhanen (2005–2009)					40.91*** (9.919)			
Vanhanen (1970–2009)						56.50*** (9.773)		
D/D (2005–2009)							16.64*** (5.527)	
D/D (1970–2009)								21.58*** (5.406)
Ln(GDP)	-5.540* (2.882)	-7.437*** (2.655)	-10.11*** (2.714)	-10.54*** (2.587)	-8.244*** (2.845)	-9.016*** (2.809)	-4.999 (3.108)	-6.627** (2.988)
Oil exporters	-0.451 (7.093)	-1.987 (4.896)	-0.419 (6.658)	-0.297 (5.440)	-3.368 (5.877)	-2.204 (5.150)	-7.519 (6.231)	-7.626 (5.602)
_cons	95.79*** (29.88)	114.3*** (27.35)	140.7*** (26.02)	141.5*** (25.06)	128.7*** (28.20)	134.7*** (28.11)	102.7*** (30.36)	118.3*** (29.40)
<i>N</i>	62	64	68	69	63	63	64	64
<i>R</i> <sup>2</sup>	0.3873	0.5030	0.3923	0.4896	0.3817	0.4395	0.3444	0.3925

Please note: Heteroskedasticity robust standard errors in parentheses. Regressions include dummies for East Asia, Latin America, Sub-Saharan Africa, socialist countries and OECD members (coefficient estimates not shown). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Author's calculations.

In summary, these results help us to tackle the reverse causality issue and reinforce the argument that democracy has a positive and significant influence on the labor share of income. Our instrumental variable estimation confirms the results obtained in Table 4. Moreover, democracy also has a positive and significant lagged effect on the labor income share. This effect is larger in size compared to the contemporaneous effect. This result corroborates a vast literature maintaining that there is a considerable time lag between institutional change and its impact.

## 6. CONCLUDING REMARKS

This study investigates the political economy determinants of the labor share of income and, in particular, it studies the association between democratic political regimes and the labor share. Its fundamental aim is to revisit and extend previous evidence on the relationship between democracy and the labor income share with the use of a significantly expanded dataset covering 112 countries, both developing and developed.

Our empirical results find that democratic political systems favor labor over capital. The evidence is robust across different specifications, utilizing different indices of democracy and different periods of time. Moreover, confirmation of the presence of a causal relationship is obtained through event-study evidence, the use of lagged regressors and instrumental variable estimation.

These results support earlier literature on democracy and income distribution. They are particularly relevant today, in light of the recent global decline in the labor income share and current crisis of democracy. According to Freedom House (2017), political rights and civil liberties today are at their lowest level in the last 12 years. Simultaneously, several studies document a decline in the labor income share in recent decades (IMF 2017; Karabarbounis and Neiman 2013; Stockhammer 2017).

Our results are especially insightful for policymakers who are concerned about reducing excessive inequalities while also sustaining employment. On a socio-political level, a low labor share may jeopardize socio-political stability if workers perceive that they are not receiving a 'fair' share of the wealth they produce. On an economic level, it may threaten the sustainability of economic expansion and hamper wage-based household consumption (Atkinson 2009).

As possible avenues of research extending these results, it would be useful to 'disaggregate' democratic and autocratic regimes, in order to analyze how different regimes produce different effects on the labor share. As the literature suggests, differences in the *type* of political regimes may influence a large number of economic outcomes (Wright 2008). Moreover, further investigation could be conducted to test for democracy's channels of influence, to better understand how political institutions influence the labor income share as well as the ways in which political institutions interact with other types of institutions, formal or informal, to generate complex dynamics (Amendola et al 2013). Furthermore, as shown in the event-study evidence, not just the type of political regime, but also its stability seems to influence the labor share – therefore, it would be interesting to further explore this relationship.

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