Does Democracy Cause Growth? A Meta-Analysis (of 2000 Regressions)

Marco Colagrossi[a], Domenico Rossignoli[b,*], Mario A. Maggioni[b]

[a] *CSCC, Università Cattolica del Sacro Cuore, Milano*
[b] *DISEIS and CSCC, School of Political and Social Science, Università Cattolica del Sacro Cuore, Milano*

Abstract

The relationship between democracy and economic growth has been widely debated in the social sciences with contrasting results. We apply a meta-analytical framework surveying 188 studies (2047 models) covering 36 years of research in the field. We also compare the effect of democracy on growth with the effect of human capital on growth in a sub-sample of 111 studies (875 models). Our findings suggest that democracy has a positive and direct effect on economic growth beyond the reach of publication bias, albeit weaker (about one third) of that of human capital. Further, the growth effect of democracy appears to be stronger in more recent papers not surveyed in Doucouliagos & Ulubaşoğlu (2008). Finally, we show that the heterogeneity in the reported results is mainly driven by spatial and temporal differences in the samples, indicating that the democracy and growth nexus is not homogeneous across world regions and decades.

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*Corresponding author: domenico.rossignoli@unicatt.it

1. Introduction

The relationship between democracy and economic growth has been the subject of a vast literature in the social sciences with contrasting results. Researchers adopting a variety of identification strategies, estimation techniques and different samples of countries and periods have claimed either a positive (e.g. Acemoglu et al., 2019; Gründler & Krieger, 2016; Madsen et al., 2015) or a negative (e.g. Przeworski, 2000; Gerring et al., 2005) or a non-significant relationship (e.g. Baum & Lake, 2003; Murtin & Wacziarg, 2014).

Early empirical investigations of the institutional determinants of economic growth (e.g. Barro, 1991; Barro & Sala-i-Martin, 1992) already showed mixed findings. However, this is not surprising: as Sala-i-Martin (1997) noted, economic growth theories are usually not explicit in stating which are the factors that matter most for a country to prosper. Therefore, despite the accumulation of empirical evidence, the consensus among scholars on this issue was far from being reached. As Sirowy & Inkeles stated "many of the central questions pertaining to the developmental consequences of political democracy remain, by and large, unresolved"; furthermore, "the relevant quantitative, cross-national research continues to be plagued by conflicting findings" (Sirowy & Inkeles, 1990, p. 127). A few years later, similar conclusions were reached by Przeworski & Limongi: when it comes to the nexus between democratic institutions and economic development "social scientists know surprisingly little" (Przeworski & Limongi, 1993, p. 51).

In an effort to solve this puzzle, further attempts moved their focus mostly on identification strategies, proposing alternative solutions to the embedded endogeneity of institutions (e.g. Acemoglu et al., 2001). This led to a further diversification of model specifications, estimation techniques and even measures of democracy. Such

process led to a tentative consensus for a positive effect of democracy on growth among economists (Acemoglu et al., 2019). However, despite the democracy and growth *conundrum* benefited from renewed attention – and from the introduction of novel econometric techniques, machine learning algorithms for pattern recognition and new measures of democracy – the key question remained somehow unaddressed (Gerring et al., 2005; Knutsen, 2012). Finally, the recent increase in empirical evidence in economics supporting the causal link from democracy to economic growth is yet contrasted by a few papers claiming that democracy follows the increase in income (e.g. Gundlach & Paldam, 2009; Murtin & Wacziarg, 2014).

Doucouliagos & Ulubaşoğlu (2008) delved into the debate by performing the first meta-analysis on the issue based on a sample of 483 point-estimates included in 84 studies. They concluded that "democracy does not have a direct impact on economic growth. However, it has robust, significant and positive indirect effects through higher human capital, lower inflation, lower political instability and higher economic freedom" (Doucouliagos & Ulubaşoğlu, 2008, p. 61). This conclusion supported earlier evidence provided by Tavares & Wacziarg (2001) and spurred further research (such as, for instance, Gründler & Krieger, 2016; Dahlum & Knutsen, 2017; Acemoglu et al., 2019).

Our contribution to this debate follows Doucouliagos & Ulubaşoğlu (2008) and takes advantage of the increased production of quantitative scientific papers on the topic as well as advances in meta-analytical techniques. We collect all point estimates available in both published and unpublished studies and find no evidence of publication bias in this literature.[1] We then address the effect sizes' hierarchical dependence (Stevens & Taylor, 2009) – through multilevel modelling and clustering techniques

[1]Please refer to Table A.1 for a detailed classification of Published and Unpublished works.

– and assess the robustness of our findings against a variety of specifications and estimators.

Finally, we collect all point estimates relating to human capital included in our sample of studies. Human capital is a widely accepted key factor in the process of economic growth and "a significant amount of research has been devoted to the education-growth nexus" (Benos & Zotou, 2014, p. 669) in both the neoclassical and the endogenous growth literature; furthermore, several attempts investigating a causal mechanism of transmission of democracy on growth focus on human capital (e.g. Saint-Paul & Verdier, 1993; Tavares & Wacziarg, 2001; Dahlum & Knutsen, 2017). By comparing the strength of the association between democracy and growth with the magnitude of the effect of human capital on growth, we provide a direct comparison to support the interpretation of the results of our meta-analysis.[2]

In brief, the novel contribution of this paper is threefold. First, we collect the largest and most up-to-date sample of studies investigating the democracy and growth nexus, consisting of 188 papers and 2047 effect sizes; second, we provide a comparison between the estimated effect of democracy on economic growth with the effect, on growth, of human capital; third, we show that the growth effect of democracy appears to be stronger in more recent papers not surveyed in Doucouliagos & Ulubaşoğlu (2008).

The rest of the paper is organised as follows: Section 2 provides a survey of the main issues in the *democracy and growth* literature; Section 3 outlines the procedures followed to collect the sample of studies providing descriptive evidence and discusses the methodology; Section 4 provides results and findings of both meta-analysis and

[2]It shall be acknowledged that, while the estimation of the effect of human capital on growth is comparable with that of democracy on growth, our result can not be interpreted as a meta-analysis on the education-growth nexus. For the latter, see Benos & Zotou (2014).

meta-regression analysis as well as predicted values from our preferred specification of the effect of democracy on growth. Further, it discusses the issue of publication bias; finally, Section 5 concludes the paper.

2. The democracy and growth *conundrum*

Despite an initial fierce debate on the role of institutions in determining individual economic behaviour and aggregate performance, starting in the 1990s, economists widely acknowledged that "institutions matter" for long-run growth (North, 1994).

Institutions can be defined as "humanly devised constraints that structure political, economic and social interactions" (North, 1990, p. 97) or as "systems of established and embedded social rules that structure social interactions" (Hodgson, 2006, p. 13). Therefore, institutions may influence the incentive structure by affecting the underlying economic context, potentially fostering or curbing the dynamics of economic activity.

Much of the existing empirical literature on this issue implemented the analysis of the impact of democracy on economic growth through the adoption of indices of political regimes. Such tradition dates back to the seminal comparative study of Lipset (1959). Notwithstanding the vast amount of empirical research spurred on the topic, results were still contrasting and inconclusive.[3] One of the main empirical challenges concerned how to *quantify* the degree of democracy in a country. Over the years, several approaches have been proposed: interval-level or dichotomous variables, both based on experts' panels, procedural algorithms and, more recently, machine-

[3] As an example, Przeworski (2000) shows that though the direct relationship is quite inconclusive, dictatorships tend to allocate capital more efficiently, while democracies (in high-income countries) produce more output per capita. Studies focusing on levels of democracy (rather than regime transitions) identified either negative but not significant (Helliwell, 1994) or negative and slightly significant (Barro, 1996) or inverse-U shaped relationships with low or no statistical significance (Barro, 2003).

learning techniques.

The meta-analysis by Doucouliagos & Ulubaşoğlu (2008) documented a positive and significant coefficient of democracy in 27% of the cases, while in 37% it was positive but not significant and in 36% it was either negative or negative and not significant (Doucouliagos & Ulubaşoğlu, 2008, p. 62). In the same study, the authors suggested that other factors (e.g. human capital, inflation, political instability, etc.) possibly act as channels of transmission between democracy and growth.

Przeworski & Limongi (1993) and Knutsen (2011) focused on democratic institutions as a means to guarantee property rights, while Barro (1991), Przeworski & Limongi (1993) and Olson (1993) considered the ability of democratic institutions to assist production and maximise the total output by guaranteeing private activity or stimulating it by directly supplying inputs. Minier (1998) explored the possibility of a productivity-enhancing role of democracy, driven by a more efficient allocation of production factors compared to autocratic regimes. Rodrik & Wacziarg (2005) found that the process of democratisation exerts a positive effect on growth, whose heterogeneity depends on the consolidation of democracy itself. Klomp & de Haan (2009) stressed that *good* political institutions are expected to favour growth by limiting volatility. Gerring et al. (2005) emphasised the role played by *political capital*, as a result of the stock of democratic experiences accumulated by a country.

Conversely, other scholars perceived the relationship between development and political democracy as conflicting or even incompatible: voters' interest "generally leads parties to give the expansion of personal consumption a higher priority vis-à-vis investment than it would receive in a nondemocratic system." (Huntington & Dominguez, 1975, p. 60). Democracy and economic growth are considered to be competing concerns, as Sirowy notes that "successful and rapid economic growth requires an authoritarian regime" (Sirowy & Inkeles, 1990, p. 129). Further, Olson (1982) pos-

tulated that in democratic regimes special-interest groups' actions, aiming at rents, ultimately lead to an *institutional sclerosis* of the political and economic system, generating stagnation and fostering political instability. Following Przeworski & Limongi (1993), the essential dynamics through which democracy is believed to hamper growth refer to political pressures for immediate consumption, reducing investments. Furthermore, whereas there is agreement on the benefits of securing property rights, it is controversial whether autocracies can better secure these rights (Przeworski & Limongi, 1993). Finally, authoritarian regimes can be more effective in timely implementing the kinds of policies reputed necessary to boost growth while "democratic regimes are largely unable to implement effectively the kinds of policies considered necessary to facilitate rapid growth" (Sirowy & Inkeles, 1990, p. 129).

The abundance of different and contrasting results about the democracy-growth nexus can be explained by a number of alternative reasons. Firstly, since democracy is a multidimensional concept that cannot be directly observed and uniquely quantified, its definition as well as the measurement of its components (and how they are aggregated) are crucial in determining the sign and significance of its coefficient(s). Secondly, studies aimed at testing the causal effect of democracy on growth, are based on a large set of model specifications and estimation techniques that can affect the outcome of the analysis (see Gründler & Krieger, 2016, for a detailed discussion on both issues.) Overall, the presence of a large number of alternative hypotheses, specifications and contrasting results allows for applying a meta-analytical framework in which the effect of these features on the estimated relationship can be controlled and accounted for.

3. The meta-analytic framework

3.1. Procedures

The validity of a meta-analysis highly depends on the search conducted to retrieve the articles that form the sample of studies from which inference will be drawn (Hopewell et al., 2005). Our last search was conducted on April 2019 and involved a four-step approach. First, we run the query "democracy AND growth" over five academic databases – Econlit, Jstor, RePEc, ScienceDirect and SSRN.[4] We then investigated nine qualitative literature reviews on the topic of democracy and growth.[5] Then, we moved towards a forward snowballing sampling approach. We identified four among the most cited papers investigating the democracy and growth nexus in the last four decades (Weede, 1983; Barro, 1996; Acemoglu et al., 2008, 2019) and searched, through the Google Scholar citation system, for articles quoting them. Finally, we integrated our sample of papers with those contained in the meta-analysis by Doucouliagos & Ulubaşoğlu (2008).

To be included in our sample, studies must contain a coefficient of democracy and a measure of its dispersion (typically the t-statistic or the standard error) in a regression framework where a proxy of economic growth is the dependent variable.[6] To compare the magnitude (and the direction) of the effect of democracy on economic growth with a meaningful benchmark, we also collected (when available) the coefficient of

[4]Precisely, we searched for the words "democracy AND growth" as well as "democracy AND income". The search was not circumscribed to the article title but covered also its keywords and abstracts. Importantly, the databases we employed use search algorithms that diversify the search terms using passive forms, singular, plurals and synonyms of the words used.

[5]Namely Przeworski & Limongi (1993); Alesina & Perotti (1994); Brunetti (1997); Heo & Tan (2001); Rivera-Batiz (2002); Gerring et al. (2005); Kong (2007); Hazama (2008); Knutsen (2012).

[6]Importantly, studies investigating the impact of regime transitions on economic growth are not included in our sample, since both their aims and methodologies are not comparable to those of the democracy and growth literature. While the latter try to assess the impact of the level and/or the presence of democracy on economic growth, the former investigate how regime transitions (usually the democratisation process) impact the growth trajectory of countries.

human capital and a measure of its dispersion.

Concerning publication status, Doucouliagos & Ulubaşoğlu (2008) choose not to include working papers and unpublished articles to control for research quality. We instead agree with Stanley, who argues that "differences in quality, data or methods do not provide a valid justification for omitting studies" (Stanley, 2001, p. 135): rather such differences provide the rationale for performing a meta-analysis and a meta-regression analysis (MRA) in the first place. Thus, potential differences arising from different publication status can always be investigated in an MRA setting.

To avoid the *artificial* reduction of the heterogeneity of the collected effect sizes, we did not discriminate between what authors indicate as their "best specification" and other models; instead, we collected all available estimates included in each study. To assess the robustness of our results, we collected information on whether the coefficient was part of a model considered by the author(s) as a sensitivity analysis, robustness test, placebo or falsification strategy and/or was included in the Appendix. We considered everything else as main specifications.

Further, we also included in our sample specifications reporting interaction or quadratic form terms of the independent variable(s) of interest. We do acknowledge, as Gunby et al. (2017) show, that in such specifications the estimated coefficients of democracy (or human capital) might provide biased information about the marginal effect of democracy (human capital) on economic growth. In fact, in a non-linear specification such as $y = \beta_0 + \beta_1 x + \beta_2 x^2$, the marginal effect $\partial y/\partial x$ is equal to $\beta_1 + 2 \times \beta_2 \times x$. Similarly, when the specification includes an interaction term so that $y = \beta_0 + \beta_1 x + \beta_2 x \times z + \beta_3 z$, the marginal effect $\partial y/\partial x$ is equal to $\beta_1 + \beta_2 z$. However, it is always possible to exclude these models in a meta-analysis or to control for the fact that they were collected in a non-linear specification (or in a specification where they were part of an interaction term) in an MRA through dummy variables.

We did exclude studies reporting only Granger causality tests, as they usually do not report, for the same specification, a single estimate of the relationship between democracy and economic growth, but rather several lags of it. Finally, we investigated only articles written in English, the *lingua franca* of the international scientific community, in which data were collected from 1945 onward.

Overall, the process yielded 2047 β_{dem} (democracy) estimates in 188 papers and 875 β_{hc} (human capital) estimates in 111 papers.[7] We then created a reduced sample to investigate the effect of democratic institution on economic growth when human capital is accounted for. It contains 111 papers for a total of 764 effect sizes.[8] Further we created two sub-sample based on publication dates, the threshold being December 2005 (the date of the last search performed by Doucouliagos & Ulubaşoğlu (2008) (henceforth DU). The *pre-DU* sample contains 741 effect sizes clustered around 94 studies, while the *post-DU* sample shows 1306 effect sizes included in 94 studies. Finally, to test the sensitivity of our results to authors' robustness tests, we created a sample (*main specifications* sample) including only the main specifications reported in each article. It includes 180 studies and 1227 effect sizes.

The number of estimates varies widely across studies. In the full sample, it ranges from 1 to 90 with a mean of 10.89 estimates per study. In 17 cases, studies report only 1 estimate matching our criteria, while in 9 cases only we collected more than 50 coefficients. The earliest article in our sample was published in 1983 while the latest in 2019, covering more than 35 years of literature on the topic of democratic institutions and economic growth. Of such articles, 10 have been published in the

[7]References and additional information regarding our sample are provided in Appendix A.

[8]The number of effect sizes diverge from the full sample of human capital estimates as it is common in the literature to include more than one proxy of human capital (e.g. separate enrolment ratios for males and females). Therefore, while there are a total of 875 β_{hc} estimates, there are only 764 democracy-related betas.

80s, 48 in the 90s, 55 from 2000 to 2009 and 75 from 2010 onward. With regard to publication status, 150 studies are published in an academic journal recognised either by the RePEc (Research Papers in Economics) database or by the SCImago Journal & Country Rank portal. 26 are working papers whose series are included in the RePEc WPS (Working Paper Series) database. Finally, 3 are books (or book chapters) and 9 papers either do not report any source or their source is recorded neither in RePEc nor in SCImago.

3.2. Effect sizes and descriptives

The adopted effect size is the partial correlation coefficient, as commonly done in recent meta-analysis in economics (e.g. Iwasaki & Tokunaga, 2014; Dauvin & Guerreiro, 2017; Gunby et al., 2017). It estimates the degree of association between the dependent variable and the independent variable when the other variables included in the model are held constant.[9] It has the benefit of allowing the comparison and the synthesis of the collected estimates when different independent variables, with different scales and definitions, are used.[10] The partial correlation coefficient is then

[9]Seven models do not include independent variables other than the measure of democracy. Therefore, correlations computed from these models are not partial correlations but rather zero-order correlations, which might suffer from severe identification problems. Table B.2 and Table B.10 test the robustness of the findings discussed in Section 4 to the exclusion of these effect sizes. Results are substantially unchanged. We thank an anonymous reviewer for driving our attention to this issue.

[10]The partial correlation coefficient is computed as:

$$r_f = \frac{t_f}{\sqrt{t_f^2 + df}} \tag{1}$$

where t_f is the t statistic of the regression coefficient β_f while df is the degrees of freedom $(n-p-1)$ in which p is the number of regressors and n is the number of observations. Its sample variance is instead given by:

$$var(r_f) = \frac{(1 - r_f^2)^2}{df} \tag{2}$$

normalised using the *Fisher's z-score* transformation.[11]

We begin our analysis documenting the distribution of Fisher's Z scores. Table 1 provides a first outlook to the accumulated evidence on the relationship between democracy, human capital and growth.[12] The majority of the effect sizes recorded in the full sample are non-significant while about 1/3 are positive and significant. On the contrary, in the sample of papers including both measures of democracy and human capital as determinants of growth, the effect of human capital is positive and significant in 2/5 of the cases, while the effect of democracy is positive in 1/4 of the cases and negative in almost 1/5 of the cases.

There are no sizeable differences if we consider either *main specifications* or the full sample. On the contrary, differences arise once comparing the *pre-DU* and *post-DU* samples. The positive effect sizes increase from 1/4 to 2/5 from the *pre-DU* to the *post-DU* sub-sample. Further, there is a 10 percentage points reduction in the non-significant estimates after December 2005. Whether these results are due to the advancement in econometric techniques or to the use of better measures of democracy cannot be discerned due to limited data availability.[13]

We now move to the visual investigation of our samples. The forest plot of the

[11]The *Fisher's z-score* transformation is equal to:

$$z = \frac{1}{2} ln \left(\frac{1 + r_f}{1 - r_f} \right) \tag{3}$$

with a sampling variance of:

$$var(z) = \frac{1}{n - 3} \tag{4}$$

[12]The density plots showing the distribution of the t-statistics for both samples can be found in Appendix C, Figures C.1a and C.1b. Table C.1 shows that the results of Table 1 are robust to the adoption of the t-statistics.

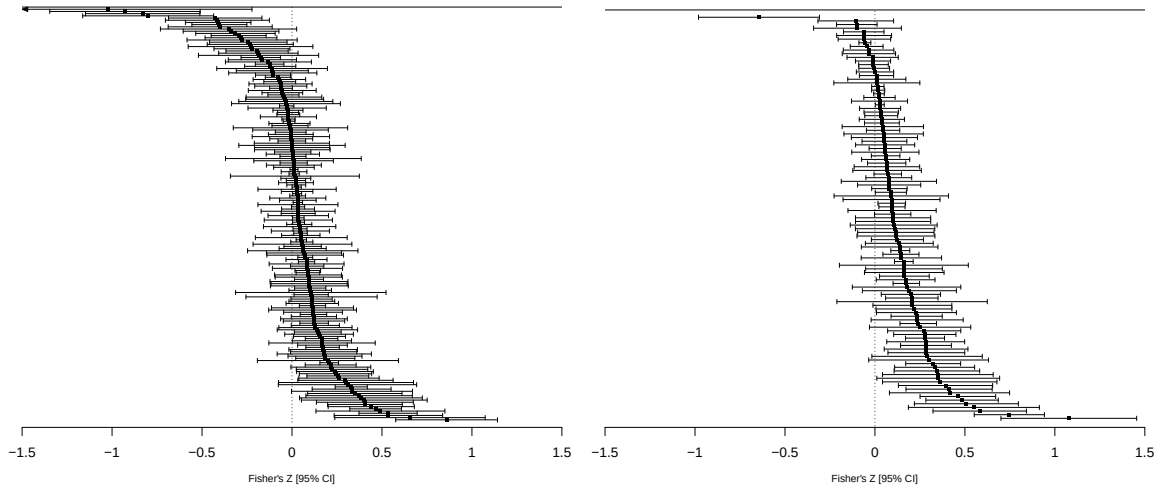
[13]Indeed (at least) two new measures of democracy have been released over the last few years, namely the Support Vector Machine Democracy Index (Gründler & Krieger, 2016, 2018) and the set of democracy indicators provided by the V-Dem project (see `https://www.v-dem.net/`), but their use, although rapidly increasing, is still limited in the literature to allow for a further investigation.

Table 1: Democracy, human capital, and growth: Fisher's Z score

		Positive	Negative	Non-significant	Total
Democracy					
	effect sizes	711	242	1094	2047
		34.73%	11.82%	53.44%	
	studies	48	20	120	188
		25.53%	10.64%	63.83%	
Human Capital					
	effect sizes	352	29	494	875
		40.23%	3.31%	56.46%	
	studies	39	2	70	111
		35.14%	1.80%	63.06%	
Democracy (Reduced)					
	effect sizes	197	152	415	764
		25.79%	19.90%	54.32%	
	studies	21	14	76	111
		18.92%	12.61%	68.47%	
Democracy (Main specifications)					
	effect sizes	393	157	677	1227
		32.03%	12.80%	55.18%	
	studies	47	20	113	180
		26.11%	11.11%	62.78%	
Democracy (Pre-DU)					
	effect sizes	181	114	446	741
		24.43%	15.38%	60.19%	
	study	21	8	65	94
		22.34%	8.51%	69.15%	
Democracy (Post-DU)					
	effect sizes	530	128	648	1306
		40.58%	9.80%	49.62%	
	studies	27	12	55	94
		28.72%	12.77%	58.51%	

Notes: The significance level is $p < 0.05$. The *Reduced* sample contains only estimates of democracy collected from a specification in which a proxy of human capital was included. The *pre-DU* sample contains only estimates collected from studies published before December 2005 - the date in which the search for studies by Doucouliagos & Ulubaşoğlu (2008) ended. The *post-DU* sample contains instead only estimates collected from studies published after December 2005. The *main specifications* sample contains only estimates collected from specifications included in the body of the article (i.e. appendixes are excluded) and not labelled as robustness tests, sensitivity analyses or falsification and/or placebo strategies.

Figure 1: Forest plots: average effect size (Fisher's Z) per study and 95% confidence interval.



(a) Democracy and economic growth

(b) Human capital and economic growth

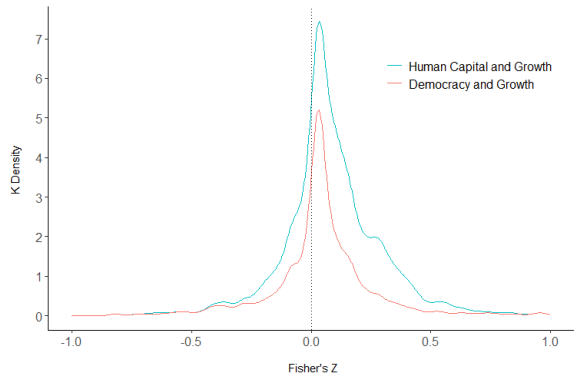
Note: in Figure 1a, axis are limited to the $[-1.5/1.5]$ interval.

relationship between democracy and economic growth (Figure 1a) shows that most of the studies report (on average) null effect-sizes (not significantly different from 0); it is interesting to note how the strictly positive effects and the strictly negative effects almost counterbalance. Instead, the collected effect sizes of the impact of human capital on growth (Figure 1b) exhibit a rather different pattern. The majority of them cross the line of null effect similarly to the democracy-growth estimates; however, their distribution appears to be more skewed towards the positive region of the plot.

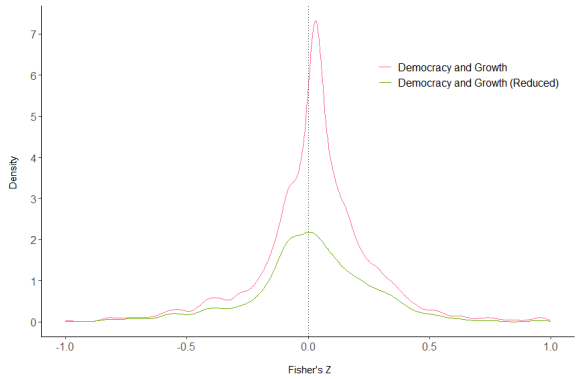
These preliminary findings are corroborated by the analysis of the kernel density estimates of the relationship between democracy and growth and human capital and growth (Figure 2a). The peak of the distribution of human capital and growth lies, similarly to that of democracy and growth, in the positive area of the plot. However, the former shows a much higher density of positive effect sizes.

Finally, Figure 2b shows the kernel density estimates of the democracy and growth effect sizes based on the full sample (2047 observations) and the reduced sample (764

Figure 2: K-density plots: comparison of different samples



(a) Democracy, human capital and economic growth: kernel density comparison



(b) Democracy and economic growth: kernel density comparison between the full sample and the reduced sample

estimates). Overall, the full sample shows a higher kurtosis and a peak just right of the line of the null effect. Conversely, the limited sample exhibits a lower kurtosis and a peak around the zero.

3.3. Models

Meta-analysis models can be divided between *fixed effect* and *random effect(s)* models. The main intuition behind fixed effect models is that the difference in the effect sizes is given by sampling variation. In other words, if the sample in each primary analysis converges towards infinity, each study will document the same effect size. Analytically, being $i = 1, \ldots, n$ the effect sizes in the meta-analytic sample, the fixed effect model can be written as:

$$y_i = \theta + \varepsilon_i, \quad \varepsilon_i \sim N(0, v_i^2) \tag{5}$$

where y_i is the effect size measure (the Fisher's Z score in our case), θ is the underlying (true) effect and ε_i is the error term that is assumed to be normally distributed with mean 0 and variance v_i^2 – the (above mentioned) sampling variance. Such a model is then usually fitted by weighted least square with weights w_i equal to

$1/v_i^2$.

The choice between the fixed and random effect(s) models should not be based on the estimated heterogeneity (or the lack of thereof) of the sample as sometimes assumed, but rather on the inference required by the model itself (Hedges & Vevea, 1998; Borenstein et al., 2010; Viechtbauer, 2010). When the interest lies in summarising the results of the i effect sizes included in the sample (i.e. *restricted inference*) fixed effect models are to be preferred. This can be particularly useful in the analysis of sub-samples, such as our sample of human capital coefficients or the pre- and post-DU samples, where the sample of i effect sizes is, by construction, not random with respect to study characteristics.

In contrast, random effect(s) models are recommended when the interest lies in drawing more general conclusions regarding an empirical relationship not restricted to the i effect sizes included in the meta-analysis (i.e. *unrestricted inference*). However, unrestricted inference rests on the assumption that the effect sizes included in the meta-analysis are a random sample of all the effect sizes available or, in other words, that the selected studies are a random sample of the population of studies on the topic.[14]

Analytically, with $i = 1, \ldots, n$ being the effect sizes in the sample, the random effect model is given by:

$$y_i = \theta + \eta_i + \varepsilon_i, \quad \eta_i \sim N(0, \tau^2), \quad \varepsilon_i \sim N(0, v_i^2) \tag{6}$$

[14]The random sampling assumption plays a crucial role. If the sample of studies is not random with respect to study characteristics – e.g. a sub-sample based on the publication date, which is highly correlated, for example, with estimation techniques and time-span investigated – random effects model might be biased. In these cases, a better inference can be obtained by adopting fixed effect models.

where y_i is the effect size measure; θ is the underlying true effect; η_i is the random effect introduced to model the variability among true effects and its variance (τ^2) indicates the amount of heterogeneity among them; and ε_i is the variance component that is assumed to be normally distributed with mean 0 and variance v_i^2 (the sampling variance).

Random effect models are estimated using an iterative procedure. First, the heterogeneity τ^2 is estimated through one of the (many) estimators proposed in the literature.[15] Then θ is estimated through weighted least square with weights w_i equal to $1/(v_i^2 + \tau^2)$.

Equations 5 and 6 implicitly assume that the effect sizes are independent from each other. However, this assumption is unlikely to hold when studies contain multiple effect sizes, an issue sometimes known as "hierarchical dependence" (Stevens & Taylor, 2009). Both the random and fixed effect model can accommodate for such a hierarchical data-structure via clustered standard errors, which however assumes within-cluster homogeneity. Hierarchical dependence can also be addressed through multilevel modelling, which allows to model without restrictive assumptions both the within-study and the between-studies heterogeneity and to measure them.[16]

Assuming $i = 1, \ldots, n$ effect sizes and $j = 1, \ldots, k$ studies, the multilevel (random

[15] Among the available estimators, our choice falls on the restricted maximum likelihood estimator, which "strikes a good balance between unbiasedness and efficiency" (Viechtbauer, 2005, p. 291).

[16] The I^2 statistic (Higgins et al., 2003) measures the between-studies consistency in a meta-analysis as:

$$I^2 = \left(\frac{Q - df}{Q} \right) \times 100$$

where Q is the *Cochran's Q* of the model (i.e. its χ^2 statistics) and df are the degrees of freedom.

effects) model can be written as:

$$\begin{aligned} y_{ij} &= \theta + \lambda_j + \eta_{ij} + \varepsilon_{ij} \\ \lambda_j \sim N(0, \sigma_B^2), \quad \eta_{ij} &\sim N(0, \sigma_W^2), \quad \varepsilon_{ij} \sim N(0, v_{ij}^2) \end{aligned} \tag{7}$$

where θ is the average true outcome; λ_j is the random effect that allows for heterogeneity between studies and σ_B^2 the corresponding between-studies variance; η_{ij} is the random effect that allows for heterogeneity within studies and σ_W^2 is the between-observations within-study variance; and ε_{ij} is the sampling error and v_{ij}^2 its variance.

3.3.1. Meta-regression analysis

Meta-regression analysis involves the regression of the observed effect sizes on one or multiple study characteristics. It can be used to address what Stanley & Jarrell call the "problem of specification": the fact that different specifications, data-sets and statistical methods make it difficult to achieve consensus on a topic (Stanley & Jarrell, 1989; Stanley, 2001).

All models shown in Section 3.3 can be easily adapted to include covariates to investigate the determinants behind the between- and within-study heterogeneity. As an example, it is possible to add q predictors at the third level (the between-studies level) of the hierarchical (random effects) model and rewrite equation 7 as:

$$\begin{aligned} y_{ij} &= \theta_0 + \theta_1 X_{1ij} + \ldots + \theta_q X_{qij} + \lambda_j + \eta_{ij} + \varepsilon_{ij} \\ \lambda_j \sim N(0, \sigma_R^2), \quad \eta_{ij} &\sim N(0, \sigma_W^2), \quad \varepsilon_{ij} \sim N(0, v_{ij}^2) \end{aligned} \tag{8}$$

where $X_{1ij}, \ldots, X_{qij}$ are study-level predictors and $\theta_1, \ldots, \theta_q$ their coefficients. The variance of λ_j is now written as σ_R^2, since it indicates the residual between-studies variance (Konstantopoulos, 2011).

Recently, Stanley & Doucouliagos (2015, 2017) challenged the conventional meta (regression) models – fixed and random effect(s) – by proposing a third alternative: the unconditional weighted least square meta-regression analysis (henceforth UWLS-MRA). Conventional meta-analytic models assume that the sampling variances are known. Conversely, the UWLS-MRA assumes that the sampling variances are known only up to a proportionality constant σ_e^2, which is "automatically estimated by the mean squared error, MS_E" (Stanley & Doucouliagos, 2017, p.22).[17] Assuming again q predictors to explain between-studies difference, the UWLS-MRA can be written as:

$$y_i = \theta_0 + \theta_1 X_{1i} + \ldots + \theta_q X_{qi} + \varepsilon_i, \quad \varepsilon_i \sim N(0, \sigma_e^2 v_i^2) \tag{9}$$

where $X_{1i}, \ldots, X_{qi}$ are study-level predictors and $\theta_1, \ldots, \theta_q$ their coefficients. The model is then fitted via weighted least squares with weights w_i equal to $1/(\sigma_e^2 v_i^2)$. Therefore, while in random effect(s) meta-analysis unrestricted inferences is obtained through an additive factor (i.e. τ^2), the UWLS-MRA addresses excess heterogeneity via a multiplicative factor. There is little or no rationale for such a multiplicative factor.[18] However, the simulations reported by Stanley & Doucouliagos (2015, 2017) show that there is little difference between random effects models and the UWLS-MRA, which appears to be even superior when there is a sizeable publication bias. We will therefore present, for the meta-regression analysis, also the results of Equation 9. As with the random and fixed effect model, to account for the hierarchical dependence in our data, we will cluster the standard errors at study level.[19]

[17] Standard meta-analytic models instead suppose that $\sigma_e^2 = 1$.

[18] "[T]he idea that the variance of the estimated effect within each study should be multiplied by some constant has little intuitive appeal, [...] we do not recommend them in practice"(Thompson & Sharp, 1999, p. 2705).

[19] It is not clear whether Equation 9 can account for the effect sizes' hierarchical dependence in a

4. Results

4.1. Meta-Analysis

The findings of our meta-analysis are summarised in Table 2. Alternative meta-analytic estimators are presented across columns while alternative samples are reported across rows. Standard errors, in parentheses, are shown below coefficients.

The first row provides the estimated effect of democracy on economic growth in the full sample: it is positive and strongly significant ($p < 0.01$) in all meta-analytic models. Both total and between-studies heterogeneity (I^2) display large values, thus supporting the appropriateness of a MRA (see Section 4.2).[20]

Table 2: Meta-analysis, full sample

	RE ML (s.e.)	**FE** (clustered s.e.)	**RE** (clustered s.e.)	**Total $\hat{I2}$** [**Between $\hat{I2}$**]	**ICC**	**Studies** [**Effect sizes**]
Democracy	0.0440**	0.0338***	0.0464**	97.96%	0.892	188
	(0.0138)	(0.0041)	(0.0152)	[87.34%]		[2047]
Human capital	0.1348***	0.0750***	0.1183***	90.62%	0.798	111
	(0.0156)	(0.0134)	(0.0126)	[72.33%]		[875]
Democracy	0.0151	0.0203	0.0127	92.35%	0.718	111
(Reduced sample)	(0.0166)	(0.0168)	(0.0169)	[66.31%]		[764]
Democracy	0.0430**	0.0363***	0.0494***	96.93%	0.821	180
(Main specifications)	(0.0141)	(0.0055)	(0.0131)	[79.6%]		[1227]

Notes: Standard errors in round parentheses, as indicated in columns' headers.
Significance levels *** 0.001 ** 0.01 * 0.05

Results are substantially unaffected when the sample includes only main specifications, as shown in the fourth row of Table 2. The growth impact of democracy remains positive and significant ($p < 0.01$). Overall, our findings show that there is a

multilevel setting. Stanley & Doucouliagos (2017) suggest that meta-regressions can adopt multilevel methods to account for the fact that "estimates within the same study are likely to be dependent on each other". However, applying the unconditional weighted least square method to a multilevel model implies adopting additive and multiplicative variance components simultaneously. Such a possibility does not have any theoretical rationale and, to the best of our knowledge, has not yet been either discussed or tested.

[20] In Appendix B we present the results of Table 2 after excluding non-linear specifications (Table B.1). Results hold.

direct effect of democracy on economic growth, supporting the claim that "democracy does cause growth" (Acemoglu et al., 2019).

The second row reports, as a comparison, the estimated growth effect of human capital. There is indeed a shared consensus (e.g. Barro, 2001; Cohen & Soto, 2007; Ciccone & Papaioannou, 2009) that human capital is positively linked to economic growth. Our analysis shows that human capital has a sizeable and statistically significant impact on economic growth and its magnitude is two to three times larger than the impact of democracy on growth once the effect of human capital is accounted for. However, it is important to acknowledge that these results should not be taken as a meta-analytical estimate of the direct effect of human capital on growth. Our sample contains only estimates of human capital at constant levels of democracy and does not aim at representing of the whole population of studies on human capital and growth. In a meta-analysis on the topic based on a rather different set of papers, Benos & Zotou show that there appears to be a substantial publication bias toward positive growth effects of human capital and "the growth impact of education after taking into account publication bias hinges upon the specific features of each study" (Benos & Zotou, 2014, p. 687).

In the third row, we consider only those models in which Fisher's Z scores of the partial correlation between democracy and growth are at constant levels of human capital (Reduced sample). All three estimation techniques show that the effect of democracy on economic growth is now not significant. Human capital and democracy are most likely highly correlated. While part of the literature (Tavares & Wacziarg, 2001) claims that the effect of democracy is mostly channelled through human capital (a claim confirmed by Doucouliagos & Ulubaşoğlu, 2008), from our analysis we cannot exclude that the effect goes in the opposite direction: democracy might be a channel for the effect of education on growth.

Table 3: Meta-Analysis: A comparison before and after Doucouliagos & Ulubaşoğlu (2008)

	Pre-DU	**Post-DU**
	FE (clustered s.e.)	**FE (clustered s.e.)**
Democracy	0.0287	0.0343 ∗ ∗∗
	(0.0202)	(0.0042)
Studies	94	94
Eff. Sizes	741	1306

Notes: Fixed effect models (equation 5). Clustered standard errors in parentheses. The *pre-DU* sample contains only estimates collected from studies published before December 2005 - the date in which the search for studies by Doucouliagos & Ulubaşoğlu (2008) ended. The *post-DU* sample contains instead only estimates collected from studies published after December 2005.
Significance levels *** 0.001 ** 0.01 * 0.05

Finally, in Table 3 we show the differences between the sub-sample of studies that have been published before (pre-DU) and after (post-DU) the meta-analysis by Doucouliagos & Ulubaşoğlu (2008).[21]

Results show that studies published before December 2005 failed to find a direct growth effect of democracy. Also (Doucouliagos & Ulubaşoğlu, 2008) does not find any direct effect of democracy on economic growth. However, the picture changes after 2005: newer studies show that democracy has a positive effect on growth.

4.2. Meta-Regression Analysis

Table 4 provides a description of all the potential sources of heterogeneity investigated in the MRA.[22] We account for the high values of I^2 found in Table 2 by considering: the different data structure underlying each model specification; the

[21] These sub-samples are obtained through a non-random pattern in the selection of studies. Therefore, unrestricted inference (i.e. random effect models) can not be applied, since its underlying assumptions are violated (see Section 3).

[22] It is worth noticing that the total heterogeneity is substantially large and in line with the levels found in many other meta-analyses (see Ioannidis et al., 2017).

estimation strategies and research designs adopted by the scholars in the field; the extent of non-linearities in the modelling of democracy; the different proxies chosen for both democracy and economic growth; the (several) control variables adopted; the geographical and time composition of the sample(s) of countries.

Table 4: Description of meta-regression variables

Variable name	Variable description
Data structure	
Panel	= 1 if the model uses panel data (yearly observations). Omitted reference category
Cross-section	= 1 if the model uses cross-sectional data
Time-series	= 1 if the model adopts time-series analysis techniques
Panel (avg)	= 1 if the model uses panel data averaging observations within regular sub-periods
Estimation techniques	
OLS	= 1 if coefficients are estimated through Ordinary Least Square. Omitted reference category
FE	= 1 if the model controls for unaccounted time-invariant variables
DPD	= 1 if the model is estimated through dynamic panel data (DPD) model
Other techniques	= 1 if the model is estimated through estimation techniques not listed above
Non-linear specifications	
Non-linearity	= 1 if the specification includes a quadratic term of democracy
Interaction	= 1 if democracy is also included in an interaction term
Multiple	= 1 if the specification includes more than one proxy of democracy
Dependent variable	
Level	= 1 if the dependent variable is expressed in levels of GDP/GNP and no lagged value of the dependent variable is included in the right-hand side
Democracy	
FH	= 1 if Freedom House is the proxy of democracy. Omitted reference category
Polity	= 1 if Polity Index is the proxy of democracy
Dichotomous	= 1 if a dichotomous variable is the proxy of democracy
Other proxies	= 1 if none of the above is a proxy of democracy
Control variables	
Convergence	= 1 if the specification includes a proxy for convergence
Investment	= 1 if the specification includes a proxy for investment a/o physical capital
Govern size	= 1 if the specification includes a proxy for government size
Human capital	= 1 if the specification includes a proxy for human capital
Corruption	= 1 if the specification includes a proxy for corruption
Ethnicity	= 1 if the specification includes a proxy for ethnicity
Religion	= 1 if the specification includes a proxy for religion
Econ freedom	= 1 if the specification includes a proxy for economic freedom
Rule of law	= 1 if the specification includes a proxy for rule of law a/o property rights
State capacity	= 1 if the specification includes a proxy for state capacity

Table 4 continued from previous page

Variable name	Variable description
Openness	= 1 if the specification includes a proxy for financial and economic openness
Population	= 1 if the specification includes a proxy for population growth and/or level
World regions	
Africa	= 1 if the sample includes at least two countries from Sub-Saharan Africa
East Asia	= 1 if the sample includes at least two countries from East Asia
East Europe	= 1 if the sample includes at least two countries from East Europe
Latin America	= 1 if the sample includes at least two countries from Latin America
Middle East	= 1 if the sample includes at least two countries from Middle East and North Africa
South Asia	= 1 if the sample includes at least two countries from South Asia
High-income	= 1 if the sample includes at least two countries from high-income countries
Region dummies	= 1 if the study includes regional dummies
Time periods	
1940s	= 1 if at least one observations is dated 1940-1949
1950s	= 1 if at least one observations is dated 1950-1959
1960s	= 1 if at least one observations is dated 1960-1969
1970s	= 1 if at least one observations is dated 1970-1979
1980s	= 1 if at least one observations is dated 1980-1989
1990s	= 1 if at least one observations is dated 1990-1999
2000s	= 1 if at least one observations is dated 2000-2009
2010s	= 1 if at least one observations is dated 2010-2017

Table 5 presents the main results of our MRA.[23] It compares the estimated effect of each covariate on the relationship between democracy and growth according to the four alternative estimators detailed in Section 3.3. During the discussion of our findings, we will mainly focus on the results obtained in our preferred model, the multilevel (random effects) model (RE ML). Importantly, the other models considered show no case of conflicting results.

[23]In Appendix B we test the robustness of our MRA by: testing multicollinearity issues by estimating each set of covariates separately (Table B.3); adopting *raw* partial correlations as effect sizes (Table B.4); including only effect sizes collected from main specifications (Table B.5); including a set of additional control variables accounting for publication-quality and other publication-related characteristics (tables B.6 and B.7). Results are unchanged.

Table 5: Meta-regression, full sample, alternative estimators

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
Data structure					
Cross-section	0.0413	0.0448	0.0448	0.0470	81
	(0.0217)	(0.0287)	(0.0256)	(0.0314)	[603]
Time-series	0.1168	0.2961	0.2961	0.4220∗	11
	(0.0697)	(0.3073)	(0.2743)	(0.1887)	[100]
Panel (avg)	0.0299 ∗ ∗	0.0166	0.0166	0.0456∗	63
	(0.0106)	(0.0155)	(0.0138)	(0.0227)	[663]
Estimation techniques					
FE	−0.0171	−0.0125	−0.0125	−0.0488	67
	(0.0137)	(0.0166)	(0.0148)	(0.031)	[777]
DPD	0.0038	−0.0331	−0.0331	−0.1026∗	20
	(0.0175)	(0.0229)	(0.0205)	(0.0435)	[233]
Other techniques	−0.0027	0.0114	0.0114	−0.0195	54
	(0.0143)	(0.0203)	(0.0181)	(0.031)	[370]
Non-linear specifications					
Non-linearity	−0.0864 ∗ ∗∗	−0.0275	−0.0275	−0.0959 ∗ ∗	25
	(0.0163)	(0.0214)	(0.0191)	(0.0362)	[248]
Interaction	−0.0120	−0.0023	−0.0023	−0.0024	40
	(0.0090)	(0.0089)	(0.0079)	(0.0218)	[403]
Multiple	−0.1061 ∗ ∗∗	−0.0302	−0.0302	−0.0371	10
	(0.0313)	(0.0226)	(0.0202)	(0.0317)	[68]
Dependent variable					
Level	0.0384	−0.0297	−0.0297	−0.0275	13
	(0.0255)	(0.0236)	(0.0211)	(0.0797)	[54]
Democracy					
Polity	0.0010	−0.0103	−0.0103	−0.0129	80
	(0.0086)	(0.0127)	(0.0113)	(0.0183)	[771]
Dichotomous	−0.0156	0.0023	0.0023	0.0232	39
	(0.0109)	(0.0112)	(0.0100)	(0.0221)	[361]
Other proxies	0.0003	−0.0137	−0.0137	0.0035	28
	(0.0084)	(0.0096)	(0.0085)	(0.0237)	[323]
Control variables					
Convergence	0.0310∗	0.0043	0.0043	0.0195	152
	(0.0123)	(0.0142)	(0.0127)	(0.0302)	[1748]
Investment	0.0064	−0.024	−0.0240∗	−0.0576 ∗ ∗	120
	(0.0109)	(0.0136)	(0.0122)	(0.0206)	[920]
Govern size	0.0114	0.0024	0.0024	0.0231	69
	(0.0104)	(0.0113)	(0.0101)	(0.0216)	[550]
Human capital	−0.0083	−0.0073	−0.0073	−0.0193	120
	(0.0100)	(0.0101)	(0.0091)	(0.0196)	[991]
Corruption	0.0164	0.0135	0.0135	0.0273	20
	(0.0344)	(0.0207)	(0.0185)	(0.0352)	[158]
Ethnicity	0.0006	−0.0248	−0.0248∗	−0.0562∗	18

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Table 5 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0163)	(0.013)	(0.0116)	(0.0257)	[122]
Religion	−0.0152	0.015	0.0150	0.0783	7
	(0.0229)	(0.0254)	(0.0227)	(0.0547)	[35]
Econ freedom	−0.0180	−0.028	−0.0280∗	−0.0274	26
	(0.0172)	(0.0146)	(0.013)	(0.034)	[115]
Rule of law	−0.0066	−0.022	−0.022	0.0113	26
	(0.021)	(0.0255)	(0.0228)	(0.0299)	[239]
State capacity	0.0558∗	0.0424 ∗ ∗	0.0424 ∗ ∗	0.0513	3
	(0.0220)	(0.0146)	(0.013)	(0.0459)	[31]
Openness	−0.0079	0.0004	0.0004	0.0273	86
	(0.0095)	(0.0124)	(0.0111)	(0.0213)	[902]
Population	−0.0239∗	−0.0043	−0.0043	−0.0098	79
	(0.0104)	(0.0115)	(0.0102)	(0.0204)	[849]
World regions					
Africa	0.1757 ∗ ∗∗	0.0755	0.0755∗	0.1742∗	161
	(0.0148)	(0.0414)	(0.037)	(0.0814)	[1773]
East Asia	−0.0289	0.0283	0.0283	0.0783	150
	(0.0431)	(0.0787)	(0.0702)	(0.1033)	[1657]
East Europe	0.0148	−0.0096	−0.0096	0.0267	125
	(0.0187)	(0.0189)	(0.0169)	(0.0333)	[1388]
Latin America	−0.0120	0.0093	0.0093	0.0467	152
	(0.0193)	(0.0249)	(0.0222)	(0.0492)	[1682]
Middle East	0.0310	0.0189	0.0189	0.0296	155
	(0.0182)	(0.0214)	(0.0191)	(0.0499)	[1561]
South Asia	−0.1117 ∗ ∗	−0.0699	−0.0699	−0.2547 ∗ ∗	146
	(0.0412)	(0.0823)	(0.0735)	(0.0942)	[1642]
High-income	0.0241∗	−0.0082	−0.0082	0.003	129
	(0.0094)	(0.0104)	(0.0093)	(0.0217)	[1299]
Region dummies	−0.0062	0.0076	0.0076	0.0177	33
	(0.0102)	(0.0066)	(0.0059)	(0.02)	[211]
Time periods					
1940s	0.0382	−0.0581∗	−0.0581∗	−0.225	3
	(0.033)	(0.0284)	(0.0254)	(0.1598)	[34]
1950s	−0.0050	0.0193∗	0.0193∗	0.0525	16
	(0.0206)	(0.0096)	(0.0085)	(0.0284)	[106]
1960s	−0.0605 ∗ ∗∗	−0.0206	−0.0206	−0.0398	95
	(0.0148)	(0.0142)	(0.0127)	(0.0251)	[990]
1970s	−0.0424 ∗ ∗	−0.0356	−0.0356	−0.0193	140
	(0.0144)	(0.0206)	(0.0184)	(0.0294)	[1525]
1980s	0.0863 ∗ ∗∗	0.0689∗	0.0689 ∗ ∗	0.0655	157
	(0.0164)	(0.0276)	(0.0247)	(0.0367)	[1763]
1990s	0.0136	0.0177	0.0177	0.0185	108
	(0.0187)	(0.0216)	(0.0193)	(0.0266)	[1458]
2000s	−0.0409∗	−0.0058	−0.0058	−0.0273	70

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Table 5 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0185)	(0.0158)	(0.0141)	(0.0274)	[1019]
2010s	0.0170	0.0408∗	0.0408 ∗ ∗	0.1035 ∗ ∗	22
	(0.0383)	(0.0171)	(0.0152)	(0.0395)	[281]
Constant term	−0.0674	−0.0343	−0.0343	−0.0753	188
	(0.0366)	(0.0507)	(0.0453)	(0.0693)	[2047]

Notes: Standard errors in round parentheses as indicated in column headers. The sample is composed by 2047 observations (188 studies).
Significance levels *** 0.001 ** 0.01 * 0.05

Data structure. The first block of three rows in Table 5 illustrates that the way data are structured impacts the estimated growth effect of democracy. Averaging observations over sub-periods (usually 5 or 10 years) in panel data positively affects the outcome of the partial correlation. Averaging observations attenuates the effect of economic cycles, hence capturing longer-term trends. The coefficients of alternative data structures are not statistically different from 0 when compared to the reference (omitted) category, which is Panel – panel data with yearly observations.

Estimation techniques. Different estimation techniques do not systematically affect the partial correlation between democracy and growth when compared with the omitted reference category (OLS). Rather than the estimator *per se*, the core issue seems to be related to the modelling of endogeneity, as shown by the robustness checks reported in Table B.8. Here the set of dummies related to the estimation techniques are replaced with a single dummy identifying whether a specification explicitly models endogeneity: the coefficient of Endogeneity is positive and significant.[24] Overall, our finding seems to justify the large attention that the literature paid to the endogeneity of the relationship between democratic institutions and growth (e.g. Lipset, 1959;

[24]In the case of IV models, the recent literature has shown that IV estimates are often much higher than OLS estimates (see Jiang, 2017). We thank an anonymous reviewer for this suggestion.

Barro, 1999).

Non-linear specifications. The inclusion of a quadratic term of democracy in the model specification is associated with a downward bias of the effect size. Unfortunately, we can not provide further interpretation of these results as studies do not report the covariance between the linear and quadratic forms of the proxy of democracy used. Similarly, including multiple proxies of democracy exerts a significant negative effect on the estimated effect size.[25] This result may simply suggest a mechanical relation occurring in the estimation procedures, likely driven by the introduction of collinearity in the model.

Dependent variable. Some scholars adopt levels rather than growth rates to investigate the effect of democracy on economic activity. When there is a lagged value of the level of economic growth on the right-hand side of the equation it is easy to show that models using levels produce "identical coefficient estimates and standard errors for the other explanatory variables as a specification with growth as the dependent variable and lagged income included as an explanatory variable" (Gunby et al., 2017, p. 253). However, when the dependent variable is expressed in levels of GDP/GNP and there is no lagged value of the dependent variable in the right-hand side, the model is informing about production levels rather than economic growth. Therefore, we control through the dummy variable Level when effect sizes are collected from specifications of the latter type. Table 5 shows that this variable is never statistically significant. Further, our results are robust to the exclusion of these effect sizes (see Table B.11).

[25]This features is mostly adopted by earlier studies including in the same model both the *Political Rights Freedom* and the *Civil Liberties Freedom* measures provided by Freedom House.

Democracy. The definition and measurement of democracy is a key issue in the literature. Therefore, we carefully collected all the alternative indicators adopted in our sample of studies. Since the distribution of alternative indicators is uneven, with some of them that are very popular in the literature and other that are less used, we distinctly identified only the most frequently used proxies, consistently aggregating the remaining. According to our MRA, the choice among the most common proxies of democracy affects neither the strength nor the direction of the estimated effect. To further investigate these results, we provide an alternative MRA specification including a more disaggregated classification of democracy indicators (see Table B.9 in the Appendix). The only positive statistically significant dummy relates to the Vanhanen index that has been shown to inflate the growth impact of democracy (Gründler & Krieger, 2016). Once we exclude the very small sub-sample of studies relying on this indicator, in the last column of Table B.9, we find again that the use of alternative indicators does not impact the estimated growth effect of democracy.

Control variables. The largest block of rows in Table 5 reports the results relating to most of the control variables that scholars have used over the years to model the relationship between democracy and growth. The fact that almost all these coefficients are not significant is one of the main contributions of our analysis: different specifications of the augmented production function do not matter. Such outcome is remarkable, considering the extended attention that researchers have dedicated at growth regressions' covariates over the last decades. As a partial exception, controlling for Convergence positively affects the estimated effect of democracy on growth. Controlling instead for the growth rate of population decreases the value of the partial correlation between democracy and growth. Further, introducing a control for State Capacity – i.e. accounting for state capabilities in extracting rents, controlling their

territory and providing public goods – increases the likelihood of finding a positive growth effect of democracy, although this covariate only appears in 3 studies and 31 models.

Geographical characteristics. The set of rows headlined as *Geographical characteristics* refers to the group of countries included in the primary studies and provides key insights on the growth effect of democracy: the sample of countries included in the analysis largely matter in predicting the direction and magnitude of the democracy-growth nexus. Following the regional classification used by the *World Bank*, we discover that democratic institutions have a strong and positive impact on economic growth in Sub-Saharan Africa ($p < 0.001$ and the largest coefficient of our MRA) and a slightly weaker impact ($p < 0.05$) in High-income countries. If such regions are included within the samples, scholars are more likely to report the *bright side* of democracy. It is likely that in these countries democratic institutions intertwine with other institutional settings that support total output generation (Barro, 1991; Przeworski & Limongi, 1993)

The opposite is true for South Asia ($p < 0.01$, the second-largest coefficient of Table 5), where democracy has a detrimental effect on growth. In this region, the theories of Huntington (1968) and Huntington & Dominguez (1975) seem to prevail. Democracy, through increased demand for current consumption, reduces investment and hinders growth (Alesina et al., 1992; Persson & Tabellini, 2003): here, authoritarian regimes can overcome such issue and help countries to reach their growth potential.

Our findings are mostly consistent with the theoretical and empirical literature on the subject. In South Asia, the lobbying power of some labour and industrial groups can lead to an inefficient investment allocation in democratic regimes promot-

ing rent-seeking behaviours and, consequently, economic inefficiencies at the aggregate level. Against this background, authoritarian political elites can have the autonomy needed to promote economic growth without being restrained by rent-seekers' pressures (Krieckhaus, 2006).

Conversely, democracy enhances growth opportunities in Africa, where clientelism has historically been regarded as the region's main political economy feature (Wantchekon, 2003; Vicente & Wantchekon, 2009) and the first cause behind the continent economic fragilities (Sandbrook & Barker, 1985). Indeed, authoritarian regimes, which protect clientelistic interests and are less exposed to whistle-blowers arising from the civil society, are more likely to allow for corrupted politicians to plunder economic gains (Krieckhaus, 2006).

Finally, we find that including East Asian countries in the sample is not likely to affect the estimated relationship between democracy and growth. This is partially in contrast with the literature focusing on the positive impact of autocratic institutions on economic growth in East Asia (Krieckhaus, 2006). Accordingly to such literature, political elites, without the restraints imposed by democratic institutions, can commit to promoting rapid industrialisation over all other social objectives, hence fostering GDP growth (Cumings, 1984).

Overall, our results indicate that the strength of the nexus between democracy and growth is not ubiquitous. The impact of democratic institutions on economic growth is largely driven by regional-specific aspects, suggesting that, while democratic institutions are, on average, beneficial for economic growth, the effect depends on the countries considered in the analysis.

Time periods. The last set of rows reports a further important result of our analysis: not only *space* but also *time matters*. The coefficients of the dichotomous variables in-

cluded in the bottom panel of Table 5 highlight that the period covered by the studies does matter for the sign of the relationship between democracy and growth. In particular, including the 1960s, 1970s or 2000s highly increases the probability of observing a negative relationship. This result is consistent with the fact that during the 1960s and part of the 1970s a relevant subset of democratising countries was experiencing the decolonisation phase. Thus, despite a formal increase in their democracy levels, they were also experiencing economic turmoils, hence low (or even negative) growth rates. The 2000s crises, as well the economic booming of autocratic China, drive instead the negative and significant coefficient of this dummy. Conversely, including the 1980s largely increases the probability of obtaining a positive relationship. The gradual stabilisation of the decolonisation processes, and the begin of the downturn of the Soviet block, could be interpreted as a golden age of the democracy and growth relationship.

Overall, the finding that the effect of democracy on growth is largely dependent on space and time characteristics of the underlying sample is consistent with the evidence on control variables: while convergence and population growth proxy the socio-economic development of a country, state capacity can be considered a measure of its overall political development. To better gauge the growth effect of democracy, time and space are essential components of the puzzle.

4.2.1. Predicted values

Based on our main model, reported in column (1) of Table 5, we provide some insights on the predicted effect of democracy on growth for a set of *preferred* study's characteristics. Predictions are based on our main model by setting equal to 1 only the value of the covariates we consider within our *preferred* set of study features.

Our preferred specifications include panels averaged over sub-periods (panel avg) estimated through dynamic panel data techniques (DPD). We base our predictions on the most common measure of democracy within our sample (Polity) and include as control variables Convergence, Population, State capacity and Human capital. We separately consider each world region in alternative time spans: all available decades, all complete decades (1950-2009) and a set of time intervals that exclude earlier decades. The resulting predictions are shown in Table 6.

Table 6: Democracy and growth, predicted values for selected regions and periods

	All regions	*Africa*	*East Asia*	*East Europe*	*Latin America*	*Middle East*	*South Asia*	*High-income*
All periods	0.1212*	0.2039***	-0.0007	0.0430	0.0162	0.0592	-0.0835	0.0523
	(0.0558)	(0.0582)	(0.0719)	(0.0626)	(0.0607)	(0.0606)	(0.0721)	(0.0583)
1950-2009	0.0660	0.1487***	-0.0559	-0.0122	-0.0390	0.0040	-0.1387*	-0.0029
	(0.0403)	(0.0440)	(0.0591)	(0.0492)	(0.0470)	(0.0478)	(0.0629)	(0.0439)
1960-2009	0.0710	0.1537***	-0.0509	-0.0072	-0.0340	0.0090	-0.1337*	0.0021
	(0.0367)	(0.0407)	(0.0577)	(0.0466)	(0.0440)	(0.0449)	(0.0599)	(0.0409)
1970-2009	0.1315***	0.2143***	0.0096	0.0533	0.0265	0.0695	-0.0732	0.0626
	(0.0377)	(0.0415)	(-0.0583)	(0.0474)	(0.0448)	(0.0457)	(0.0605)	(0.0417)
1980-2009	0.1739***	0.2566***	0.0520	0.0957	0.0689	0.1119*	-0.0308	0.1050
	0.0354	0.0394	(0.0567)	(0.0454)	(0.0428)	(0.0436)	(0.0590)	(0.0395)

Notes: Predicted values based on column (1) Tab. 5. The following variables are set equal to 1: Panel (avg), DPD, Polity, Convergence, Population, State capacity, Human capital. Standard errors in parentheses.
Significance levels *** 0.001 ** 0.01 * 0.05

This analysis confirms that the effect of democracy on growth is positive and statistically significant. Yet, the economic significance of such effect is rather small (see the guidelines for interpreting meta-analytical coefficients proposed by Doucouliagos, 2011, p. 11). The predicted effect is larger when the 1950s and 1960s are excluded from the sample. The effect of democracy and growth is not homogeneous across regions nor periods. For analyses including Africa, the strength of the association between democracy and growth is positive and moderate in size. A positive effect is also found for the Middle East, albeit only in the most recent time interval (1980-2009) and smaller in magnitude. Conversely, for analyses including South Asia, the effect is negative and small when the 1950s and 1960s are also investigated. In the remaining regions, no coefficient is statistically significant at 5% level. Overall, Table

6 confirms a very large variability in the predicted values across regions and decades. Therefore, the overall small effect might be driven by region-specific and time-specific effects working in opposing directions.

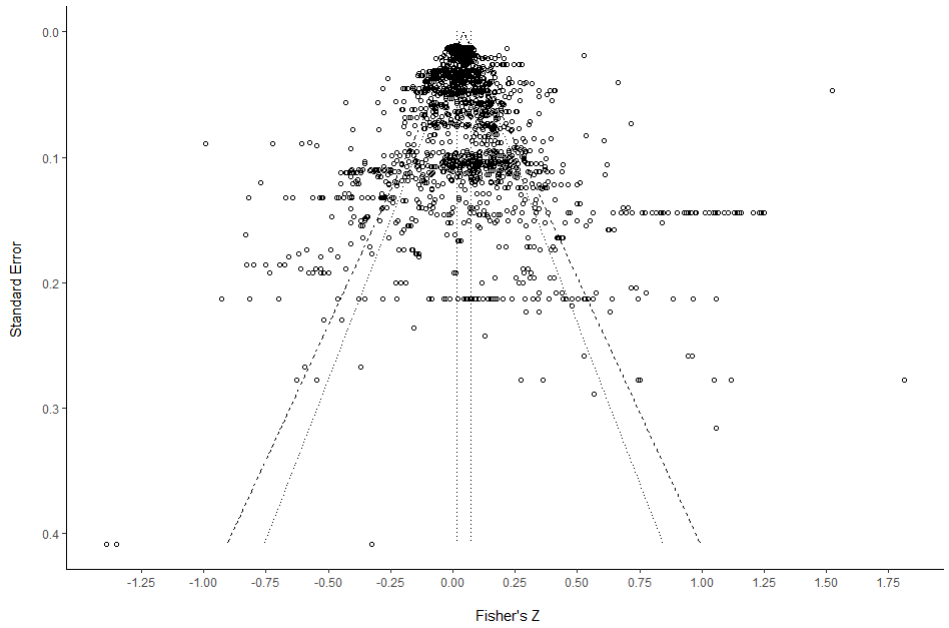
4.3. Publication Bias

Since the seminal contribution of De Long & Lang (1992), publication bias has been recognised as another threat to empirical economics (Stanley, 2005). When articles failing to report statistically significant results are kept in the file drawer (Rosenthal, 1979) or routinely rejected by editors and referees, the distribution of effect sizes available on a given relationship would be distorted. As a result, meta-analytical estimates might over- or under-estimate the *true* effect, which might result in reporting a statistically significant relationship when there is none.

To address this issue, researchers have developed statistical techniques to identify and, if necessary, correct, for publication bias (see Rothstein et al., 2006; Stanley, 2008). Among these, the most common tool is the visual inspection of funnel plots, which show the effect size estimates from individual studies against an inverted measure of study size or precision (standard errors in Figure 3). In the absence of publication bias, the graph should resemble an inverted funnel; low-sample studies would scatter more widely at the bottom, while large-sample studies would converge towards the *true* effect.

Yet, the visual investigation of the funnel plot might be subjective (Terrin et al., 2005) and, as in Figure 3, complex to interpret when the meta-analytical sample is large. Therefore, to formally investigate funnel plots asymmetry, researchers usually test $H_0 : \beta_1 = 0$ in a regression of the effect size on a constant term and the standard error of the effect size (i.e. $y_i = \beta_0 + \beta_1 SE_i$) where the error structure might be either additive or multiplicative (Sterne & Egger, 2006). If there is a relationship between

Figure 3: Democracy and growth: funnel plot



The outer dashed (dotted) diagonal lines represent the 99% (95%) confidence interval region. The inner vertical lines represents the 95% confidence interval region of the RE ML estimate of the effect of democracy on growth (Table 2).

the observed outcomes and the chosen measure of study size or precision, this might imply asymmetry in the funnel plot. Therefore, when the null hypothesis of the funnel asymmetry test (FAT) is rejected, the estimates might suffer from publication bias (Egger et al., 1997; Stanley, 2005). This does not appear to be the case in the democracy and growth literature. Panel A of Table 7 shows that the null hypothesis of no publication bias ($\hat{\beta}_1 = 0$) is not rejected in all three FAT tests.

Stanley (2008) shows that testing $H_0 : \beta_0 = 0$ can provide information on whether there exists a genuine empirical effect beyond the reach of selective reporting bias (Precision Effect Test, PET). Intuitively, the intercept of a regression of the effect sizes on their standard errors should provide the effect size of a perfect study (with standard errors equal zero) once the potential publication bias is accounted for. However, Stanley & Doucouliagos (2014) show that $\hat{\beta}_0$, as estimated by the PET test,

Table 7: Publication bias: tests

(a) Panel A: FAT tests, no additional covariates

	RE ML (s.e.)	**RE (clustered s.e.)**	**UWLS (clustered s.e.)**
	FAT-PET	FAT-PET	FAT-PET
β_0	0.0278^{+}	0.0230	0.0273***
	(0.0174)	(0.0177)	(0.0061)
β_1	0.1851	0.3823	0.3140
	(0.1282)	(0.4617)	(0.3062)

(b) Panel B: PEESE tests

	RE ML (s.e.)	**RE (clustered s.e.)**	**UWLS (clustered s.e.)**
	PEESE	PEESE	PEESE
β_0	0.0394**	-	0.0321***
	(0.0149)	-	(0.0041)
β_1	0.4825	-	2.2063
	(0.5762)	-	(2.328)

(c) Panel C: FAT tests, additional covariates (not reported) as in Table 5

	RE ML (s.e.)	**RE (clustered s.e.)**	**UWLS (clustered s.e.)**
	FAT	FAT	FAT
β_0	-0.1067*	-0.0724	-0.0661
	(0.0427)	(0.0964)	(0.0600)
β_1	0.4077^{+}	-0.0273	0.3980
	(0.2265)	(0.6475)	(0.4129)

Notes: Standard errors in parentheses, as indicated in columns' headers. The sample is composed by 2047 observations (188 studies). The first column reports the estimate of the Random Effects (Multi-Level) estimation (RE ML); the second column of the Random Effect model (RE); and the third column of the UWLS estimates.
Significance levels *** 0.001 ** 0.01 * 0.05 $^{+}$ 0.10. The latter is reported as recommended by Stanley (2017).

tends to under-estimate the *true* effect. Replacing the effect size's standard error with its variance (v_i^2) reduces the bias in the intercept, a test known as Precision Effect Estimate with Standard Error (PEESE). Therefore, when there is evidence of a genuine effect, PEESE should be used; otherwise, the corrected effect is best estimated by FAT tests. To choose whether employing the FAT or the PEESE test, Stanley (2017) recommends testing for $H_0 : \beta_0 \leq 0$ at the 10% significance level.

The results of the PEESE estimates are reported in Panel B of Table 7. Overall, except for the random effect model, the three-steps FAT-PET-PEESE procedure, which has become the cornerstone of publication bias analysis in economics (see Alinaghi & Reed, 2018, for a list of references), shows that there exist a relationship between democracy and growth over and beyond publication bias. Importantly, the PEESE estimates are not statistically different from any of the estimates of our meta-analysis (Table 2).

Finally, Panel C of Table 7 shows that there is no strong evidence of differential publication bias associated with other moderator variables (our covariates). It replicates the FAT procedure (Table 7, Panel A) with the addition of the same covariates (not reported) included in the meta-regression analysis (Table 5). Such a model addresses "possible interaction of funnel plot asymmetry and moderator variables by simultaneously fitting a meta-regression and a publication bias model" (Stanley & Doucouliagos, 2014, p. 75) and confirms that there is no prejudice against the null hypothesis in the democracy and growth literature.[26]

[26] When additional covariates are included, the intercept no longer provides information on whether there exists an effect beyond publication bias. Therefore, the PET-PEESE procedure is not estimated when additional covariates are included.

5. Conclusion

The relationship between democracy and economic growth has long been investigated in the political science and the economic literature both from a theoretical and empirical perspective. Starting in the early 1990s, regression analysis has been increasingly applied to the empirical investigations of institutional determinants of economic growth. The findings of this early literature have been, at best, mixed. Further attempts moved their focus mostly on identification strategies, proposing alternative solutions to the embedded endogeneity of institutions (e.g. Acemoglu et al., 2001). This led to a further diversification of model specifications, estimation techniques and measures of democracy. Overall, such process led to increasing evidence of a positive effect of democracy on growth at least among economists, but a definitive consensus was far from being reached.

By adopting a meta-analytical framework, we try to shed lights on this relationship. Based on a hierarchical sample of 188 studies containing 2047 observations (the largest sample of effect sizes dealing with such an issue), our analysis suggests that democracy positively correlates to economic growth over and beyond publication bias. We then compare the magnitude with the observed correlation between human capital and growth in the appropriate sub-sample of studies. Our analysis suggests the growth effect of democracy is about one-third of the comparable effect of human capital.

Further, our results also suggest that findings from more recent papers, not surveyed in Doucouliagos & Ulubaşoğlu (2008), uncover a stronger democracy-growth nexus.

Our meta-analyses also document a high degree of between-studies heterogeneity – in line with analogous applications in the economic literature (see Ioannidis et al.,

2017) – that we investigated by adopting meta-regression techniques. Effect sizes are mostly driven by spatial and time differences in the sample, indicating that the democracy and growth nexus is largely dependent on the world's regions and periods considered.

We find that the adoption of alternative measures of democracy does not substantially affect the outcome of the analysis. Further, most of the control variables included in the papers to account for potential confounding effects, do not impact the reported point estimates, except for Population, Convergence and State Capacity. The use of averages in a panel data setting positively impacts the uncovered growth effect of democracy, while the inclusion of non-linear terms negatively affects it. Overall, estimation techniques other than OLS do not systematically affect the outcome of the uncovered relation between democracy and growth.

Finally, predicted values from our preferred specification support our findings: the effect of democracy on growth, which is small in the full sample, varies across world regions and time intervals, being larger once periods beyond 1970s are included. In particular, the predicted effect size is positive and moderate for Africa; negative and small for South Asia.

Overall, after digging into more than 2000 regressions within almost 200 papers, we show that democracy does affect growth, even if the effect is small and not ubiquitous across space and time, thus confirming, at least from an economic perspective, the famous quote by Winston Churchill, "[m]any forms of Government have been tried and will be tried in this world of sin and woe. No one pretends that democracy is perfect or all-wise. Indeed, it has been said that democracy is the worst form of government except for all those other forms that have been tried from time to time".[27]

[27]W. Churchill, Speech in the House of Commons (11 November 1947), published in The Official Report, House of Commons (5th Series), 11 November 1947, vol. 444.

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Appendix A. The meta-sample

Table A.1: The meta-analytical sample: additional information

Study	Coefficients	Mean Z	SD Z	Period	Countries	Includes HC	Publication type
Abdelkader (2015)	3	0.3830	0.0306	1972-2013	1	Yes	working paper
Abida et al. (2015)	3	-0.1096	0.0000	1980-2012	3	No	journal article
Acemoglu et al. (2008)	2	0.0885	0.0123	1960-2000	134	No	journal article
Acemoglu et al. (2019)	90	0.0329	0.0173	1960-2010	175	No	journal article
Adams & Klobodu (2016)	3	0.0108	0.0928	1970-2011	33	Yes	journal article
Adom (2016)	44	0.8592	0.2684	1962-2012	1	No	working paper
Aghion et al. (2007)	9	0.0806	0.0688	1980-2000	148	No	working paper
Ahmad & Hall (2017)	8	0.0237	0.0301	1984-2007	58	Yes	journal article
Aisen & Veiga (2013)	4	-0.0476	0.0526	1960-2004	113	Yes	journal article
Albornoz-Crespo & Dutta (2007)	8	-0.0637	0.4098	1960-2000	18	Yes	working paper
Alesina & Rodrik (1994)	2	-0.0085	0.0239	1970-1985	41	Yes	journal article
Alesina et al. (1996)	1	0.0424	NA	1960-1985	98	Yes	working paper
Ali & Crain (2001a)	8	0.0088	0.1158	1975-1994	91	Yes	unpubllished
Ali & Crain (2001b)	2	-0.0007	0.0202	1975-1989	91	Yes	journal article
Ali (1997)	2	0.0007	0.0202	1975-1990	91	Yes	journal article
Ali (2003)	16	-0.0344	0.2358	1975-1994	91	Yes	journal article
Almeida & Ferreira (2002)	3	-0.0141	0.0537	1970-1990	138	Yes	journal article
Alpalhão (2019)	72	0.0350	0.0145	1961-2016	148	No	unpubllished
Amir-ud Din & Khan (2017)	10	0.0582	0.3556	1963-2016	1	No	journal article
Antič (2004)	2	-0.0197	0.0251	1951-1990	141	Yes	journal article
Arfaoui et al. (2016)	2	-0.2305	0.1324	1980-2014	1	No	journal article
Assane & Pourgerami (1994)	8	0.0489	0.0349	1980-1989	33	No	journal article
Assiotis & Sylwester (2014)	29	0.0808	0.0888	1984-2007	155	No	journal article
Assiotis & Sylwester (2015)	37	0.1643	0.1105	1986-2010	118	Yes	journal article
Aziz & Ahmad (2018)	12	-0.1941	0.2080	2000-2009	126	Yes	working paper
Baklouti & Boujelbene (2015)	1	-0.2966	NA	1998-2011	12	Yes	journal article
Baklouti & Boujelbene (2018)	1	-0.4036	NA	1998-2011	12	Yes	journal article
Barro & Lee (1993)	2	0.0048	0.2858	1965-1985	89	Yes	working paper
Barro (1996)	9	0.2149	0.0755	1965-1990	90	Yes	working paper
Barro (1996b)	3	-0.0068	0.1166	1960-1990	84	Yes	journal article
Barro (2000)	2	0.1127	0.0078	1965-1995	97	Yes	journal article
Bataka (2019)	12	0.2068	0.0390	1980-2015	40	Yes	journal article
Baum & Lake (2003)	2	-0.0073	0.0150	1967-1997	128	Yes	journal article
Bhalla (1997)	17	0.2971	0.0556	1973-1990	86	Yes	book
Bleaney & Nishiyama (2002)	4	0.4405	0.0545	1965-1990	70	Yes	journal article
Bluedorn (2001)	4	-0.1210	0.0448	1960-1990	78	Yes	journal article
Boko (2002)	2	0.2418	0.0135	1971-1999	20	No	journal article
Bornscheir & Scholtz (2002)	5	0.1430	0.1369	1968-1991	102	Yes	unpubllished
Bougharriou et al. (2019)	2	0.1224	0.0636	2002-2013	16	No	journal article
Brueckner et al. (2018)	11	-0.0225	0.0602	1970-2010	126	Yes	working paper
Butkiewicz & Yanikkaya (2006)	52	0.0891	0.0830	1970-1999	114	Yes	journal article
Butkiewicz & Yanikkaya (2007)	7	-0.0626	0.0432	1970-1999	106	Yes	journal article
Cavallo & Cavallo (2010)	32	-0.0111	0.0435	1970-2004	78	Yes	journal article
Chan et al. (2017)	1	-0.0292	NA	1984-2014	113	No	journal article
Chatterji (1998)	5	0.2159	0.0326	1960-1985	81	Yes	journal article
Chen (2003)	4	0.5358	0.1926	1970-1992	54	Yes	journal article
Chen et al. (2019)	6	0.0472	0.0045	1987-2009	147	No	unpubllished
Chousa et al. (2006)	1	0.1700	NA	1994-2002	55	No	working paper
Collier (1999)	1	0.1834	NA	1960-1990	94	No	unpubllished
Collier (2000)	13	0.0950	0.0737	1960-1990	94	Yes	journal article
Combes et al. (2019)	15	0.1086	0.0274	1980-2012	70	Yes	journal article
Comeau (2003)	11	-0.3143	0.1980	1972-1989	82	Yes	journal article
Corujo & Simões (2012)	1	-0.8299	NA	1960-2001	1	Yes	journal article
Dasgupta et al. (2013)	2	0.0075	0.0077	1980-2010	1	Yes	working paper
Dawson (1998)	2	0.0944	0.0141	1975-1990	85	Yes	journal article

Study	Coefficients	Mean Z	SD Z	Period	Countries	Includes HC	Publication type
De Haan & Siermann (1995)	13	0.0667	0.1044	1973-1988	96	No	journal article
De Haan & Siermann (1996a)	2	0.0351	0.0317	1961-1992	110	No	journal article
De Haan & Siermann (1996b)	10	0.1085	0.3463	1963-1988	97	No	journal article
De la Croix & Delavallade (2011)	7	-0.0536	0.0159	1994-2004	62	No	journal article
De Luca et al. (2015)	2	0.1012	0.0191	1960-2003	129	No	journal article
Deana & Gamba (2008)	2	-0.0163	0.0220	1955-2000	183	No	working paper
Decker & Lim (2008)	52	0.0346	0.0681	1995-2002	128	No	journal article
Dias & Tebaldi (2012)	11	0.0343	0.0175	1965-2005	61	Yes	journal article
Diebolt et al. (2013)	5	-0.2835	0.0975	1990-2000	85	No	journal article
Doucouliagos & Ulubasoglu (2006)	2	0.0039	0.0450	1970-1999	82	Yes	journal article
Drury et al. (2006)	3	-0.0216	0.0293	1982-1997	94	No	journal article
Durham (1999)	18	0.0465	0.1087	1960-1989	105	Yes	journal article
Emara & Jhonsa (2014)	2	0.4648	0.3566	2009-2009	189	No	working paper
Fedderke & Klitgaard (1998)	7	0.0931	0.1817	1960-1985	113	Yes	journal article
Feng (1995)	12	0.0966	0.1713	1982-1988	19	No	journal article
Feng (1996)	6	0.3731	0.1375	1960-1992	40	Yes	journal article
Feng (1997)	5	-0.2225	0.0823	1960-1980	96	Yes	journal article
Fidrmuc (2003)	42	0.1045	0.3125	1996-2000	25	Yes	journal article
Flachaire et al. (2014)	4	0.0221	0.0756	1975-2005	79	Yes	journal article
Fosu (2008)	15	-0.2428	0.1495	1975-2004	30	No	journal article
Ganau (2017)	7	-0.0610	0.0258	1981-2001	50	No	journal article
Gasiorowski (2000)	3	-0.0768	0.0241	1968-1991	49	Yes	journal article
Gerring et al. (2005)	25	0.0738	0.0629	1965-2000	187	Yes	journal article
Gerring et al. (2013)	32	0.0120	0.0165	1965-2005	198	No	unpubllished
Ghosh et al. (2013)	12	-0.0009	0.1103	1960-2009	15	Yes	working paper
Glaeser et al. (2004)	12	0.1140	0.1356	1990-2000	102	Yes	journal article
Goldsmith (1995)	2	0.3493	0.0863	1988-1993	59	No	journal article
Gounder (2002)	5	0.3085	0.0981	1968-1996	1	No	journal article
Green (2018)	6	0.1230	0.0502	1961-2014	45	No	journal article
Grier & Tullock (1989)	6	0.1503	0.1199	1961-1980	43	No	journal article
Gründler & Krieger (2016)	38	0.0877	0.1094	1981-2011	164	Yes	journal article
Gründler & Krieger (2018)	57	0.0287	0.0107	1960-2014	170	Yes	working paper
Gupta (1988)	2	0.1996	0.1172	1950-1977	28	No	journal article
Gupta et al. (1998)	1	0.0590	NA	1965-1986	120	Yes	journal article
Gwartney et al. (1999)	3	-0.1870	0.1706	1980-1995	82	Yes	journal article
Haggard & Tiede (2011)	11	-0.0083	0.0446	1985-2004	98	Yes	journal article
Heckelman & Wilson (2019)	4	0.0844	0.0642	1975-2014	132	Yes	journal article
Heckelman (2010)	6	0.6557	0.5178	2000-2004	25	No	journal article
Helliwell (1994a)	3	-1.0227	0.6046	1960-1985	9	No	working paper
Helliwell (1994b)	3	-0.0446	0.0960	1960-1985	90	Yes	journal article
Henisz (2000)	7	0.1760	0.0869	1965-1990	84	Yes	journal article
Heshmati & Kim (2017)	6	0.0518	0.0155	1980-2014	144	No	working paper
Iqbal et al. (2012)	4	0.3334	0.0483	1972-2010	1	Yes	journal article
Jacob & Osang (2018)	71	-0.0205	0.0466	1961-2010	169	No	journal article
Jalles (2010)	12	0.1103	0.0671	1975-2005	86	Yes	journal article
Jamali et al. (2007)	2	0.1192	0.0568	1990-1999	92	Yes	journal article
Jaunky (2013)	1	0.0214	NA	1980-2005	28	No	journal article
Jetter (2014)	11	0.0219	0.0375	1961-2010	90	No	journal article
Kagochi et al. (2007)	3	0.3005	0.0139	1970-2000	1	No	journal article
Kang et al. (2013)	3	-0.1737	0.0695	1996-2010	27	No	unpubllished
Ken Farr et al. (1998)	2	0.0339	0.2132	1976-1990	78	No	journal article
Khanna (2017)	6	0.0591	0.0287	1984-2005	19	Yes	journal article
Kim & Lee (2016)	20	0.0284	0.0864	1976-2001	154	Yes	journal article
Knack & Keefer (1995)	4	0.0515	0.0582	1974-1989	97	No	journal article
Knutsen (2013)	45	0.1138	0.0708	1990-2004	153	No	journal article
Knutsen et al. (2016)	6	0.0337	0.0168	1960-2014	149	No	unpubllished
Korhonen (2004)	15	0.1303	0.1502	1970-2001	106	Yes	working paper
Kormendi & Meguire (1985)	2	0.1669	0.1443	1950-1977	47	No	journal article
Krieckhaus (2004)	57	-0.0407	0.2323	1990-1999	112	Yes	journal article
Krieckhaus (2006)	55	0.0160	0.6179	1980-2000	85	Yes	journal article
Kurzman et al. (2002)	4	-0.0700	0.0267	1951-1980	107	Yes	journal article
Landau (1986)	20	-0.1244	0.0556	1960-1980	65	Yes	journal article

Study	Coefficients	Mean Z	SD Z	Period	Countries	Includes HC	Publication type
Leblang (1996)	3	0.1169	0.0287	1960-1990	50	Yes	journal article
Leblang (1997)	9	0.1694	0.0443	1970-1989	92	Yes	journal article
Leschke (2000)	2	0.2610	0.4955	1997-1997	80	No	journal article
Levine & Renelt (1992)	3	0.0282	0.1863	1960-1989	86	Yes	journal article
Li & Zou (1998)	10	-0.1310	0.2092	1960-1994	46	Yes	journal article
Lopes & de Jesus (2015)	6	0.1297	0.1679	1990-2010	77	Yes	journal article
Lundberg & Squire (2003)	1	-0.4103	NA	1960-1992	38	Yes	journal article
Ma & Ouyang (2016)	3	0.0323	0.0865	1960-2010	48	Yes	journal article
Madsen et al. (2015)	1	0.0942	NA	1950-2000	141	No	journal article
Malikane & Chitambara (2017)	4	0.4049	0.1177	1989-2014	8	Yes	journal article
Marsh (1988)	6	0.0000	0.1631	1970-1984	47	No	journal article
Masaki & Van de Walle (2014)	10	0.0546	0.0233	1982-2012	43	No	working paper
Mazurek (2017)	1	-0.7993	NA	2005-2015	32	Yes	journal article
Mbaku & Kimenyi (1997)	10	0.4915	0.2005	1950-1985	46	No	journal article
Mbaku (1994)	12	0.0597	0.1862	1970-1991	117	No	journal article
Mehanna (2006)	2	0.1412	0.0067	1982-1999	80	Yes	journal article
Miguel et al. (2004)	1	0.0054	NA	1981-1999	41	No	journal article
Minier (1998)	4	0.1661	0.1248	1970-1989	96	Yes	journal article
Minier (2003)	4	0.1731	0.1497	1970-1990	73	Yes	journal article
Mira & Hammadache (2017)	12	0.0104	0.1136	1996-2001	45	No	working paper
Mo (2000)	16	-0.2319	0.0900	1970-1985	83	Yes	journal article
Mo (2001)	9	-0.2773	0.0969	1970-1985	46	Yes	journal article
Mo (2015)	14	-0.0271	0.1812	1970-1985	105	Yes	journal article
Mobarak (2005)	13	-0.0199	0.0933	1960-1990	77	Yes	journal article
Murtin & Wacziarg (2014)	3	-0.0043	0.1142	1960-2000	69	No	journal article
Nelson & Singh (1998)	6	0.1529	0.0128	1970-1989	67	No	journal article
Oliva & Rivera Batiz (2002)	11	0.1851	0.0587	1970-1994	120	Yes	journal article
Parada & Garçia (2008)	10	0.1065	0.1507	1984-1999	17	Yes	working paper
Perotti (1996)	2	-0.1070	0.0299	1960-1985	67	Yes	journal article
Persson & Tabellini (1992)	3	-0.1105	0.2709	1960-1985	50	Yes	journal article
Persson & Tabellini (1994)	1	-0.3991	NA	1960-1985	49	Yes	journal article
Pettersson (2004)	44	-0.0681	0.0415	1982-2000	129	Yes	working paper
Piatek (2016)	1	-0.9284	NA	2007-2010	25	No	journal article
Pinho & Madaleno (2009)	15	0.0403	0.0263	1960-2000	170	Yes	unpubllished
Pitlik (2002)	4	0.1144	0.0287	1975-1995	73	Yes	journal article
Plümper & Martin (2003)	9	0.3313	0.1323	1975-1997	83	Yes	journal article
Polterovich & Popov (2007)	2	-0.0336	0.1914	1975-1999	45	No	working paper
Pourgerami & Assane (1992)	8	0.4017	0.2595	1950-1977	47	No	journal article
Pourgerami (1988)	3	0.4055	0.2351	1965-1984	92	No	journal article
Pourgerami (1992)	7	0.0861	0.0872	1958-1986	104	Yes	journal article
Quinn & Woolley (2001)	2	0.0736	0.1092	1974-1989	92	Yes	journal article
Qureshi & Ahmed (2012)	5	0.0338	0.1497	1987-2002	73	Yes	working paper
Rivera-Batiz (2002)	2	0.1794	0.2207	1960-1990	59	Yes	journal article
Rodrik (1997)	1	0.0016	NA	1970-1989	90	No	working paper
Rodrik (1999)	2	0.2225	0.0108	1960-1989	104	No	journal article
Rossignoli (2014)	6	0.0113	0.0197	1961-2010	169	No	book
Sakyi & Adams (2012)	4	-0.4147	0.0823	1960-2008	1	No	journal article
Salahodjaev (2015)	12	0.2389	0.0983	1990-2013	120	Yes	journal article
Sala-i-Martin (1997)	2	0.2546	0.0000	1960-1992	133	No	journal article
Scully (1988)	4	0.1222	0.2177	1960-1980	115	No	journal article
Siermann (1998)	42	0.0810	0.0864	1973-1992	110	No	book
Svensson (1999)	16	-0.0543	0.1492	1970-1989	68	Yes	journal article
Sylwester (2015)	16	0.0260	0.0077	1950-2007	180	Yes	journal article
Tang & Tang (2018)	77	0.0446	0.0298	1970-2010	112	No	journal article
Vorhies & Glahe (1988)	1	0.5340	NA	1986-1986	150	No	journal article
Weede (1983)	10	-0.3388	0.1943	1960-1979	94	Yes	journal article
Weede (1984)	11	-0.3527	0.1778	1960-1979	75	Yes	journal article
Weede (1993)	6	0.0329	0.0737	1987-1987	96	Yes	journal article
Weede (1996)	5	-0.0063	0.1594	1980-1987	93	Yes	journal article
Weede (1997)	9	-0.1860	0.0677	1960-1985	48	Yes	journal article
Williams (2017)	29	0.1014	0.0780	1982-2011	78	No	journal article
Williams (2018)	6	0.3292	0.6027	1970-2014	81	No	journal article

Study	Coefficients	Mean Z	SD Z	Period	Countries	Includes HC	Publication type
Wu & Davis (1999)	6	0.0093	0.0141	1975-1990	92	No	journal article
Wu (2012)	18	0.0315	0.0539	1960-2001	111	No	journal article
Xi (2017)	2	0.0111	0.0059	1950-2010	167	No	journal article
Yanıkkaya & Turan (2019)	9	-0.1052	0.0566	1960-2009	122	Yes	journal article
Yanovskiy & Ginker (2017)	5	0.0365	0.0067	1970-2012	124	Yes	journal article
Zakaria & Fida (2009)	22	-0.4268	0.1558	1947-2006	1	Yes	journal article
Zallé (2018)	2	0.0326	0.2471	2000-2015	29	Yes	journal article
Zaouali (2014)	4	0.1217	0.1066	2000-2011	40	Yes	working paper
Zouhaier & Karim (2012)	2	-0.1647	0.0861	2000-2009	11	No	journal article

Notes: Coefficients indicates the number of effect sizes included in the manuscript. *Mean Z* and *SD Z* are, respectively, the mean value of the Fisher's Z and its standard deviation. *SD Z* is equal to NA if only one coefficient is available in the manuscript. *Period* describes the longest time-span investigated in the manuscript and *Countries* the largest sample of countries analyzed. *Includes HC* indicates whether in at least one of the specifications collected from the manuscript there is a proxy of human capital. *Publication type* is: "journal article" if the manuscript venue is among those included in the IDEAS/RePEc H-Index journals list; "working paper" if the manuscript venue is among those included in the IDEAS/RePEc H-Index working papers list; "book" if the manuscript is a book or a contribution in a book; "unpublished" if neither "journal article" nor "working paper" nor "book" apply.

Appendix A.1. The meta-sample: references

Meta-sample

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Appendix B. Robustness checks

Table B.1: Meta-analysis, linear specifications only

	RE ML (s.e.)	**FE (clustered s.e.)**	**RE (clustered s.e.)**	**Total $\hat{I2}$ [Between $\hat{I2}$]**	**ICC**	**Studies [Effect sizes]**
Democracy	0.0565***	0.0317***	0.0453***	97.85%	0.972	151
	(0.0156)	(0.0049)	(0.0125)	[95.15%]		[1364]
Human capital	0.1480***	0.0749***	0.1277***	90.98%	0.866	96
	(0.0173)	(0.0165)	(0.0146)	[78.82%]		[639]
Democracy	0.0237	0.0315	0.0253	93.12%	0.525	86
(Reduced sample)	(0.0179)	(0.0196)	(0.0201)	[48.87%]		[516]
Democracy	0.0539***	0.0344***	0.0556***	96.76%	0.995	144
(Main specifications)	(0.0165)	(0.0066)	(0.0138)	[96.23%]		[895]

Notes: Standard errors in round parentheses, as indicated in columns' headers. Model specifications including quadratic or interacted terms of democracy are excluded from the sample.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.2: Meta-analysis, excluding zero-order correlations

	RE ML (s.e.)	**FE (clustered s.e.)**	**RE (clustered s.e.)**	**Total $\hat{I2}$ [Between $\hat{I2}$]**	**ICC**	**Studies [Effect sizes]**
Democracy	0.0415**	0.0336***	0.0456**	97.77%	0.883	185
	(0.0133)	(0.0041)	(0.0151)	[86.35%]		[2040]

Notes: Standard errors in round parentheses, as indicated in columns' headers. The sample excludes zero-order correlations. Significance levels *** 0.001 ** 0.01 * 0.05

Table B.3: Meta-regression, full sample, individual blocks of covariates

	(1) **RE ML (s.e.)**	(2) **RE ML (s.e.)**	(3) **RE ML (s.e.)**	(4) **RE ML (s.e.)**	(5) **RE ML (s.e.)**	(6) **RE ML (s.e.)**	(7) **RE ML (s.e.)**	(8) **RE ML (s.e.)**	**Studies [Eff. sizes]**
Data structure									
Cross-section	0.0247								81
	(0.0174)								[603]
Time-series	0.0412								11
	(0.0635)								[100]
Panel (avg)	0.0237∗								63
	(0.0104)								[663]
Estimation techniques									
FE		−0.0139							67
		(0.0101)							[777]
DPD		0.0065							20
		(0.0144)							[233]
Other techniques		−0.0010							54
		(0.0132)							[370]
Endogeneity									
Endogeneity			0.0194 ∗ ∗						71
			(0.0069)						[688]
Non-linear specifications									
Non-linearity				−0.0862 ∗ ∗∗					25
				(0.0164)					[248]
Interaction				−0.0125					40
				(0.0088)					[403]
Multiple				−0.0773∗					10
				(0.0303)					[68]
Democracy									
Polity					0.0008				80
					(0.0089)				[771]
Dichotomous					−0.0217∗				39

Continued on next page

Table B.3 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **RE ML (s.e.)**	(3) **RE ML (s.e.)**	(4) **RE ML (s.e.)**	(5) **RE ML (s.e.)**	(6) **RE ML (s.e.)**	(7) **RE ML (s.e.)**	(8) **RE ML (s.e.)**	**Studies [Eff. sizes]**
					(0.0109)				[361]
Other proxies					0.0007				28
					(0.0087)				[323]
Dependent variable									
Level						0.0358			13
						(0.0235)			[54]
Control variables									
Convergence						0.0269*			152
						(0.0118)			[1748]
Investment						0.0054			120
						(0.0110)			[920]
Govern size						0.0082			69
						(0.0105)			[550]
Human capital						−0.0128			120
						(0.0100)			[991]
Corruption						0.046			20
						(0.0335)			[158]
Ethnicity						0.0115			18
						(0.0139)			[122]
Religion						−0.0065			7
						(0.0229)			[35]
Econ freedom						−0.0102			26
						(0.0172)			[115]
Rule of law						0.0099			26
						(0.0210)			[239]
State capacity						0.0189			3
						(0.0197)			[31]
Openness						−0.0048			86
						(0.0095)			[902]

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Table B.3 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **RE ML (s.e.)**	(3) **RE ML (s.e.)**	(4) **RE ML (s.e.)**	(5) **RE ML (s.e.)**	(6) **RE ML (s.e.)**	(7) **RE ML (s.e.)**	(8) **RE ML (s.e.)**	**Studies [Eff. sizes]**
Population						−0.0206∗			79
						(0.0101)			[849]
World regions									
Africa							0.1739 ∗ ∗		161
							(0.0149)		[1773]
East Asia							−0.0366		150
							(0.0422)		[1657]
East Europe							0.0158		125
							(0.0189)		[1388]
Latin America							−0.0098		152
							(0.0196)		[1682]
Middle East							0.0289		155
							(0.0185)		[1561]
South Asia							−0.0990∗		146
							(0.0400)		[1642]
High-income							0.0275 ∗ ∗		129
							(0.0095)		[1299]
Region dummies							−0.0014		33
							(0.0091)		[211]
Time periods									
1940s								0.0267	3
								(0.0322)	[34]
1950s								−0.0164	16
								(0.0195)	[106]
1960s								−0.0584 ∗ ∗	95
								(0.0141)	[990]
1970s								−0.0465 ∗ ∗	140
								(0.0135)	[1525]
1980s								0.0764 ∗ ∗	157

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Table B.3 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **RE ML (s.e.)**	(3) **RE ML (s.e.)**	(4) **RE ML (s.e.)**	(5) **RE ML (s.e.)**	(6) **RE ML (s.e.)**	(7) **RE ML (s.e.)**	(8) **RE ML (s.e.)**	**Studies [Eff. sizes]**
								(0.0152)	[1763]
1990s								0.0102	108
								(0.0180)	[1458]
2000s								$-0.0504**$	70
								(0.0169)	[1019]
2010s								0.0267	22
								(0.0374)	[281]
Constant term	0.0258	$0.0480**$	$0.0383**$	$0.0577***$	$0.0471***$	0.0277	$-0.0433*$	$0.0526*$	188
	(0.0163)	(0.0150)	(0.0140)	(0.0141)	(0.0143)	(0.0187)	(0.0200)	(0.0231)	[2047]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. The sample is composed by 2047 observations (188 studies). Significance levels *** 0.001 ** 0.01 * 0.05

Table B.4: Meta-regression, full sample, uncorrected partial correlations

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
Data structure					
Cross-section	0.0708 * **	0.0874*	0.0874*	0.0524	81
	(0.0213)	(0.0390)	(0.0348)	(0.0314)	[603]
Time-series	0.1218	0.4801 * *	0.4801 * *	0.394 * *	11
	(0.0717)	(0.1729)	(0.1543)	(0.1278)	[100]
Panel (avg)	0.0266*	0.0350	0.035	0.0465*	63
	(0.0108)	(0.0239)	(0.0213)	(0.0228)	[663]
Estimation techniques					
FE	−0.0092	−0.0019	−0.0019	−0.0493	67
	(0.0138)	(0.0222)	(0.0198)	(0.0317)	[777]
DPD	0.0108	−0.0232	−0.0232	−0.1058*	20
	(0.0178)	(0.0279)	(0.0249)	(0.0439)	[233]
Other techniques	0.0034	0.0194	0.0194	−0.0218	54
	(0.0144)	(0.0239)	(0.0214)	(0.0312)	[370]
Non-linear specifications					
Non-linearity	−0.0745 * **	−0.0661	−0.0661.	−0.0957 * *	25
	(0.0162)	(0.0391)	(0.0349)	(0.0362)	[248]
Interaction	−0.0107	0.0023	0.0023	−0.0084	40
	(0.0089)	(0.0121)	(0.0108)	(0.0217)	[403]
Multiple	−0.1128 * **	−0.0571	−0.0571.	−0.0391	10
	(0.0326)	(0.0346)	(0.0309)	(0.0314)	[68]
Dependent variable					
Level	0.0298	−0.0217	−0.0217	−0.0273	13
	(0.026)	(0.0295)	(0.0263)	(0.0835)	[54]
Democracy					
Polity	−0.0003	0.0024	0.0024	−0.0132	80
	(0.0088)	(0.0200)	(0.0178)	(0.0178)	[771]
Dichotomous	−0.0169	0.0119	0.0119	0.0228	39
	(0.0112)	(0.0158)	(0.0141)	(0.0219)	[361]
Other proxies	0.0003	−0.0125	−0.0125	0.0033	28
	(0.0086)	(0.0116)	(0.0104)	(0.0233)	[323]
Control variables					
Convergence	0.0341 * *	0.0198	0.0198	0.0288	152
	(0.0128)	(0.0197)	(0.0176)	(0.0326)	[1748]
Investment	0.0018	−0.0570*	−0.057*	−0.0577 * *	120
	(0.0104)	(0.0285)	(0.0255)	(0.0206)	[920]
Govern size	0.0185	0.0165	0.0165	0.0243	69
	(0.0106)	(0.0195)	(0.0174)	(0.0216)	[550]
Human capital	−0.0059	−0.0015	−0.0015	−0.0218	120
	(0.0102)	(0.0166)	(0.0148)	(0.0205)	[991]
Corruption	0.0133	0.0307	0.0307	0.0341	20
	(0.0354)	(0.0244)	(0.0218)	(0.0345)	[158]
Ethnicity	0.004	−0.0399	−0.0399.	−0.0544*	18

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Table B.4 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0165)	(0.0236)	(0.0211)	(0.0256)	[122]
Religion	−0.0137	0.0311	0.0311	0.0776	7
	(0.0233)	(0.0335)	(0.0299)	(0.0549)	[35]
Econ freedom	−0.0199	−0.0352∗	−0.0352∗	−0.0264	26
	(0.0177)	(0.0170)	(0.0152)	(0.0346)	[115]
Rule of law	−0.0118	−0.0321	−0.0321	0.0153	26
	(0.0216)	(0.0290)	(0.0258)	(0.0298)	[239]
State capacity	0.0637 ∗ ∗	0.0395∗	0.0395 ∗ ∗	0.047	3
	(0.0222)	(0.0167)	(0.0149)	(0.0495)	[31]
Openness	−0.0043	0.0112	0.0112	0.0282	86
	(0.0097)	(0.0167)	(0.0149)	(0.0211)	[902]
Population	−0.0269∗	0.0046	0.0046	−0.0125	79
	(0.0108)	(0.0175)	(0.0156)	(0.0203)	[849]
World regions					
Africa	0.2155 ∗ ∗∗	0.1212	0.1212∗	0.19∗	161
	(0.0148)	(0.0634)	(0.0566)	(0.0823)	[1773]
East Asia	−0.0582	0.0752	0.0752	0.0435	150
	(0.0446)	(0.1069)	(0.0954)	(0.1023)	[1657]
East Europe	0.0181	−0.0499	−0.0499	0.0311	125
	(0.0191)	(0.0540)	(0.0482)	(0.0364)	[1388]
Latin America	−0.0172	0.0254	0.0254	0.0601	152
	(0.0199)	(0.0366)	(0.0327)	(0.054)	[1682]
Middle East	0.0449∗	0.0807	0.0807	0.0340	155
	(0.0187)	(0.0672)	(0.06)	(0.0515)	[1561]
South Asia	−0.1258 ∗ ∗	−0.1503	−0.1503	−0.2527 ∗ ∗	146
	(0.0427)	(0.1062)	(0.0948)	(0.0822)	[1642]
High-income	0.0309 ∗ ∗	−0.0140	−0.014	0.0017	129
	(0.0096)	(0.0154)	(0.0138)	(0.0226)	[1299]
Region dummies	−0.0056	0.0065	0.0065	0.0189	33
	(0.0104)	(0.0086)	(0.0077)	(0.0205)	[211]
Time periods					
1940s	0.0434	−0.0792	−0.0792∗	−0.2258	3
	(0.0337)	(0.0439)	(0.0392)	(0.1471)	[34]
1950s	−0.002	0.0314∗	0.0314 ∗ ∗	0.0609	16
	(0.0211)	(0.0136)	(0.0121)	(0.0313)	[106]
1960s	−0.0751 ∗ ∗∗	−0.0337	−0.0337.	−0.0430	95
	(0.0148)	(0.0210)	(0.0188)	(0.0254)	[990]
1970s	−0.0494 ∗ ∗∗	−0.0223	−0.0223	−0.0176	140
	(0.0146)	(0.0292)	(0.0261)	(0.0297)	[1525]
1980s	0.0904 ∗ ∗∗	0.0728∗	0.0728∗	0.0618	157
	(0.0164)	(0.0360)	(0.0321)	(0.0382)	[1763]
1990s	0.0148	0.0254	0.0254	0.0184	108
	(0.0187)	(0.0252)	(0.0224)	(0.0280)	[1458]
2000s	−0.0386∗	−0.0098	−0.0098	−0.0225	70

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Table B.4 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0189)	(0.0189)	(0.0169)	(0.0300)	[1019]
2010s	0.0003	0.0756∗	0.0756∗	0.0994∗	22
	(0.0397)	(0.0380)	(0.0339)	(0.0392)	[281]
Constant term	−0.0928∗	−0.1264	−0.1264	−0.0853	188
	(0.0374)	(0.0906)	(0.0809)	(0.0754)	[2047]

Notes: Standard errors in round parentheses as indicated in column headers. The sample is composed by 2047 observations (188 studies). The dependent variable is the *raw* partial correlation.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.5: Meta-regression, main specifications only

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
Data Structure					
Cross-section	0.0755∗	0.0671	0.0671∗	0.0718∗	77
	(0.0320)	(0.0342)	(0.0305)	(0.0355)	[460]
Time-series	0.1224	0.1451	0.1451	0.2704	11
	(0.0762)	(0.2234)	(0.1995)	(0.1679)	[58]
Panel (avg)	0.0465	0.0324	0.0324	0.069∗	56
	(0.0324)	(0.0203)	(0.0182)	(0.0288)	[396]
Estimation techniques					
FE	−0.0004	−0.0146	−0.0146	−0.0628	61
	(0.0213)	(0.02)	(0.0178)	(0.0353)	[357]
DPD	0.0549	−0.0428	−0.0428	−0.0844	16
	(0.0343)	(0.0341)	(0.0304)	(0.0558)	[88]
Other techniques	0.0086	0.0309	0.0309	−0.0325	47
	(0.0207)	(0.0234)	(0.0209)	(0.0347)	[265]
Non-linear specifications					
Non-linearity	−0.0675 ∗ ∗	−0.0288	−0.0288	−0.0926∗	24
	(0.0223)	(0.0234)	(0.0209)	(0.0421)	[120]
Interaction term	−0.0325	−0.0013	−0.0013	−0.0305	36
	(0.0180)	(0.0114)	(0.0102)	(0.0314)	[173]
Multiple Dem	−0.1293 ∗ ∗	−0.0408	−0.0408	−0.0651	10
	(0.0396)	(0.026)	(0.0232)	(0.0384)	[68]
Dependent variable					
Level	0.0143	−0.0173	−0.0173	−0.0482	11
	(0.0394)	(0.0351)	(0.0314)	(0.0892)	[37]
Democracy					
Polity	−0.008	−0.007	−0.007	−0.0213	73
	(0.0151)	(0.0179)	(0.016)	(0.0243)	[446]
Dichotomous	−0.0015	0.0085	0.0085	0.0334	33
	(0.0216)	(0.0177)	(0.0158)	(0.0272)	[205]
Other proxies	−0.0078	−0.012	−0.012	0.0141	22
	(0.0223)	(0.0152)	(0.0136)	(0.0327)	[122]
Control variables					
Convergence	0.0181	0.0001	0.0001	−0.001	146
	(0.0208)	(0.0152)	(0.0136)	(0.031)	[1025]
Investment	−0.0142	−0.0327	−0.0327	−0.0615∗	110
	(0.0173)	(0.0195)	(0.0174)	(0.0263)	[636]
Govern size	0.0098	0.0009	0.0009	0.0264	63
	(0.0184)	(0.0151)	(0.0135)	(0.023)	[341]
Human capital	−0.0087	−0.0022	−0.0022	−0.0243	110
	(0.0194)	(0.017)	(0.0152)	(0.0231)	[722]
Corruption	0.0360	−0.0069	−0.0069	0.0274	19
	(0.0404)	(0.0292)	(0.0261)	(0.0462)	[102]
Ethnicity	0.0168	−0.0297	−0.0297	−0.0379	16

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Table B.5 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0254)	(0.0209)	(0.0187)	(0.031)	[65]
Religion	0.0010	0.0267	0.0267	0.1054	5
	(0.0444)	(0.0324)	(0.0289)	(0.0576)	[21]
Econ freedom	0.0299	−0.0115	−0.0115	0.0153	22
	(0.0337)	(0.0219)	(0.0196)	(0.0296)	[87]
Rule of law	0.0188	−0.0076	−0.0076	0.013	24
	(0.0279)	(0.0298)	(0.0266)	(0.0354)	[139]
State capacity	0.0131	0.0399	0.0399	0.0316	3
	(0.0418)	(0.0247)	(0.0221)	(0.0852)	[16]
Openness	0.0143	0.0067	0.0067	0.0512∗	76
	(0.0196)	(0.0198)	(0.0177)	(0.0248)	[489]
Population	−0.0271	−0.0163	−0.0163	−0.0199	74
	(0.0181)	(0.0141)	(0.0126)	(0.0237)	[497]
World regions					
Africa	0.1595 ∗ ∗	0.0462	0.0462	0.1372	153
	(0.0214)	(0.0293)	(0.0262)	(0.0717)	[997]
East Asia	0.0093	0.0081	0.0081	0.0482	144
	(0.0501)	(0.0601)	(0.0536)	(0.0892)	[947]
East Europe	0.0255	−0.0091	−0.0091	0.0267	120
	(0.0246)	(0.0186)	(0.0166)	(0.0339)	[768]
Latin America	0.0167	−0.0052	−0.0052	0.0529	145
	(0.027)	(0.0254)	(0.0227)	(0.0511)	[962]
Middle East	0.0131	0.0226	0.0226	0.0217	148
	(0.0251)	(0.0199)	(0.0178)	(0.0527)	[907]
South Asia	−0.1262 ∗ ∗	−0.0332	−0.0332	−0.2037∗	141
	(0.0461)	(0.0616)	(0.055)	(0.0825)	[926]
High-income	0.0215	−0.0122	−0.0122	0.0023	124
	(0.0161)	(0.0153)	(0.0137)	(0.0256)	[710]
Region dummies	−0.0225	0.0127	0.0127	0.0165	23
	(0.027)	(0.0162)	(0.0145)	(0.0261)	[143]
Time periods					
1940s	0.1734	−0.1681	−0.1681	−0.204	2
	(0.0961)	(0.1876)	(0.1675)	(0.1968)	[16]
1950s	0.0346	0.0143	0.0143	0.0766∗	15
	(0.0367)	(0.0156)	(0.014)	(0.0359)	[78]
1960s	−0.0400∗	−0.0158	−0.0158	−0.0384	89
	(0.0201)	(0.0176)	(0.0157)	(0.0255)	[517]
1970s	−0.0378	−0.0289	−0.0289	−0.0224	134
	(0.0232)	(0.0215)	(0.0192)	(0.0313)	[906]
1980s	0.0852 ∗ ∗	0.0613∗	0.0613∗	0.051	149
	(0.0268)	(0.0291)	(0.026)	(0.0394)	[1012]
1990s	0.013	0.0149	0.0149	0.0204	101
	(0.0229)	(0.0227)	(0.0202)	(0.028)	[756]
2000s	−0.0606	0.0015	0.0015	−0.0181	67

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Table B.5 – continued from previous page

	(1) **RE ML (s.e.)**	(2) **FE (clus. s.e.)**	(3) **UWLS (clus. s.e.)**	(4) **RE (clus. s.e.)**	**Studies [Eff. sizes]**
	(0.0334)	(0.0192)	(0.0171)	(0.0317)	[441]
2010s	0.0742	0.0458	0.0458∗	0.1101∗	22
	(0.0442)	(0.0239)	(0.0214)	(0.0452)	[124]
Constant term	−0.1189∗	−0.0123	−0.0123	−0.0396	180
	(0.0516)	(0.0518)	(0.0463)	(0.0657)	[1227]

Notes: Standard errors in round parentheses as indicated in column headers. The sample is composed by 1227 observations (180 studies). All models relating to robustness checks, falsification tests, placebo or appendix have been omitted. Only the *main specifications* of the studies are included in the sample.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.6: Meta-regression, publication related issues

	H-Index		Institutions		Published only	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Publication						
H-index	0.0001	176	0.0003	176		
	(0.0002)	[1834]	(0.0003)	[1834]		
US-UK institution			0.0711*	103		
			(0.0355)	[1121]		
Feedback			0.0318	31		
			(0.0599)	[375]		
US-UK inst. × H-Index			-0.0007	103		
			(0.0005)	[1121]		
Data structure						
Cross-section	0.0230	76	0.0256	76	0.0423	70
	(0.0250)	[533]	(0.0249)	[533]	(0.0266)	[563]
Time-series	0.1054	11	0.1351	11	-0.098	8
	(0.0757)	[100]	(0.0762)	[100]	(0.0863)	[51]
Panel (avg)	0.0308*	60	0.0303*	60	0.0338**	53
	(0.0124)	[640]	(0.0124)	[640]	(0.0128)	[554]
Estimation techniques						
FE	-0.0178	59	-0.0183	59	-0.033*	47
	(0.0156)	[640]	(0.0156)	[640]	(0.0166)	[472]
DPD	0.0063	20	0.0067	20	0.0124	18
	(0.0200)	[233]	(0.0200)	[233]	(0.0206)	[226]
Other techniques	-0.0024	50	-0.0034	50	-0.0085	42
	(0.0163)	[351]	(0.0163)	[351]	(0.0168)	[293]
Non-linear specifications						
Non-linearity	-0.0925***	23	-0.0926***	23	-0.1111***	18
	(0.0182)	[172]	(0.0182)	[172]	(0.0217)	[110]
Interaction	-0.0106	40	-0.0101	40	-0.0126	34
	(0.0101)	[403]	(0.0101)	[403]	(0.0106)	[355]
Multiple	-0.1098**	9	-0.1128**	9	-0.1725***	7
	(0.0348)	[60]	(0.0348)	[60]	(0.0403)	[54]
Dependent variable						
Level	0.0356	12	0.0362	12	0.1018*	6
	(0.0287)	[51]	(0.0287)	[51]	(0.0463)	[30]
Democracy						
Polity	0.0035	75	0.0039	75	0.0037	63
	(0.0105)	[717]	(0.0105)	[717]	(0.0108)	[594]
Dichotomous	-0.0144	35	-0.014	35	-0.0227	32
	(0.0136)	[307]	(0.0136)	[307]	(0.0134)	[325]
Other proxies	0.0014	24	0.0023	24	-0.0038	19
	(0.0123)	[268]	(0.0123)	[268]	(0.0123)	[168]
Control variables						
Convergence	0.0300*	141	0.0293*	141	0.0227	126
	(0.0139)	[1538]	(0.0139)	[1538]	(0.0148)	[1406]

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Table B.6 – continued from previous page

	H-Index		Institutions		Published only	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Investment	0.0141	114	0.0145	114	0.0037	101
	(0.0127)	[848]	(0.0127)	[848]	(0.0136)	[721]
Govern size	0.0092	66	0.0087	66	0.0066	58
	(0.0121)	[533]	(0.0121)	[533]	(0.0124)	[457]
Human capital	-0.0107	114	-0.0107	114	-0.0079	101
	(0.0114)	[910]	(0.0114)	[910]	(0.0126)	[838]
Corruption	0.0136	19	0.0133	19	-0.0529	13
	(0.0374)	[155]	(0.0375)	[155]	(0.0498)	[112]
Ethnicity	0.0027	17	0.0015	17	-0.0103	14
	(0.0186)	[121]	(0.0186)	[121]	(0.0197)	[105]
Religion	-0.0221	6	-0.0202	6	-0.0094	7
	(0.0270)	[22]	(0.0270)	[22]	(0.0259)	[35]
Econ freedom	-0.0307	23	-0.0312	23	-0.006	22
	(0.0200)	[86]	(0.0200)	[86]	(0.0204)	[100]
Rule of law	-0.0099	25	-0.0143	25	0.0123	20
	(0.0228)	[236]	(0.0228)	[236]	(0.0268)	[208]
State capacity	0.0633*	3	0.0627*	3	0.0966***	2
	(0.0247)	[31]	(0.0247)	[31]	(0.0257)	[29]
Openness	-0.0057	81	-0.0054	81	-0.0009	72
	(0.0111)	[792]	(0.0111)	[792]	(0.0114)	[630]
Population	-0.0223.	72	-0.0207	72	-0.0154	65
	(0.0130)	[741]	(0.0130)	[741]	(0.0132)	[628]
World regions						
Africa	0.1879***	150	0.1872***	150	0.2035***	133
	(0.0163)	[1563]	(0.0163)	[1563]	(0.0176)	[1392]
East Asia	-0.0341	139	-0.039	139	-0.0483	123
	(0.0462)	[1450]	(0.0462)	[1450]	(0.0578)	[1332]
East Europe	0.0171	114	0.0169	114	0.0386	100
	(0.0217)	[1223]	(0.0216)	[1223]	(0.0244)	[1074]
Latin America	-0.0136	141	-0.0157	141	-0.0456	124
	(0.0211)	[1475]	(0.0211)	[1475]	(0.026)	[1340]
Middle East	0.0310	144	0.0325	144	0.0175	127
	(0.0205)	[1354]	(0.0204)	[1354]	(0.0251)	[1227]
South Asia	-0.1219**	135	-0.1171**	135	-0.1264*	118
	(0.0441)	[1435]	(0.0441)	[1435]	(0.0528)	[1317]
High-income	0.0262*	118	0.0267*	118	0.026*	104
	(0.0119)	[1128]	(0.0119)	[1128]	(0.0115)	[980]
Region dummies	-0.0053	31	-0.0056	31	-0.0128	28
	(0.0117)	[207]	(0.0117)	[207]	(0.0136)	[196]
Time periods						
1940s	0.2177*	2	0.2082*	2	0.2741**	2
	(0.0919)	[28]	(0.0917)	[28]	(0.0929)	[28]
1950s	0.0140	15	0.0166	15	0.0176	13
	(0.0262)	[98]	(0.0262)	[98]	(0.0284)	[92]

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Table B.6 – continued from previous page

	H-Index		Institutions		Published only	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
1960s	-0.0902***	86	-0.0929***	86	-0.08***	78
	(0.018)	[831]	(0.0180)	[831]	(0.0177)	[680]
1970s	-0.0374*	130	-0.0387*	130	-0.0304	116
	(0.0158)	[1321]	(0.0158)	[1321]	(0.0168)	[1162]
1980s	0.0891***	146	0.0866***	146	0.1122***	128
	(0.0177)	[1553]	(0.0177)	[1553]	(0.0182)	[1362]
1990s	0.0244	99	0.0307	99	0.0095	83
	(0.0231)	[1305]	(0.0232)	[1305]	(0.0225)	[1069]
2000s	-0.0886**	64	-0.0817**	64	-0.0627	52
	(0.0309)	[904]	(0.0312)	[904]	(0.035)	[741]
2010s	0.0273	20	0.0376	20	-0.0042	15
	(0.0446)	[203]	(0.0446)	[203]	(0.0479)	[83]
Constant term	-0.0570	176	-0.1092*	176	-0.0435	153
	(0.0443)	[1834]	(0.0496)	[1834]	(0.0440)	[1612]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. H-Index: RePEc H-Index (10 years) of the journal in which the study has been published; US-UK Institution: = 1 if at least one of the author is affiliated to a US/UK/Canadian/Australia academic institution; Feedback: = 1 if the authors acknowledged any feedback from other scholars that already published a study about democracy and growth. The last column refers to a subsample of studies that exclude unpublished works. Significance levels *** 0.001 ** 0.01 * 0.05

Table B.7: Meta-regression, publication year

	Full model	**No periods**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Publication year	−0.0028	−0.0013	188
	(0.0020)	(0.0017)	[2047]
Data structure			
Cross-section	0.0365	0.0290	81
	(0.022)	(0.021)	[603]
Time-series	0.1205	0.1320	11
	(0.0695)	(0.0684)	[100]
Panel (avg)	0.0300**	0.0287**	63
	(0.0106)	(0.0106)	[663]
Estimation techniques			
FE	−0.0154	−0.0166	67
	(0.0137)	(0.0138)	[777]
DPD	0.0055	0.0082	20
	(0.0175)	(0.0176)	[233]
Other techniques	−0.0010	−0.0045	54
	(0.0144)	(0.0143)	[370]
Non-linear specifications			
Non-linearity	−0.0866***	−0.0899***	25
	(0.0163)	(0.0164)	[248]
Interaction	−0.0113	−0.0103	40
	(0.009)	(0.0091)	[403]
Multiple	−0.1048***	−0.1024**	10
	(0.0313)	(0.0315)	[68]
Dependent variable			
Level	0.0431	0.0255	13
	(0.0258)	(0.0253)	[54]
Democracy			
Polity	0.0017	−0.0004	80
	(0.0086)	(0.0087)	[771]
Dichotomous	−0.0163	−0.0182	39
	(0.0109)	(0.0107)	[361]
Other proxies	0.0009	−0.0007	28
	(0.0085)	(0.0085)	[323]
Control variables			
Convergence	0.0302*	0.0283*	152
	(0.0123)	(0.0124)	[1748]
Investment	0.0059	0.0055	120
	(0.0109)	(0.0108)	[920]
Govern size	0.0112	0.0081	69
	(0.0104)	(0.0105)	[550]
Human capital	−0.0089	−0.01	120
	(0.01)	(0.0101)	[991]
Corruption	0.0182	0.0512	20

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Table B.7 – continued from previous page

	Full model	**No periods**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0344)	(0.0332)	[158]
Ethnicity	0.0012	−0.0013	18
	(0.0163)	(0.0164)	[122]
Religion	−0.0141	−0.0131	7
	(0.0229)	(0.0229)	[35]
Econ freedom	−0.0187	−0.0044	26
	(0.0172)	(0.0171)	[115]
Rule of law	−0.0072	0.0107	26
	(0.021)	(0.0208)	[239]
State capacity	0.0538∗	0.0561∗∗	3
	(0.022)	(0.0205)	[31]
Openness	−0.0074	−0.0074	86
	(0.0096)	(0.0096)	[902]
Population	−0.0226∗	−0.0167	79
	(0.0105)	(0.0104)	[849]
World regions			
Africa	0.1758∗∗∗	0.1791∗∗∗	161
	(0.0148)	(0.0149)	[1773]
East Asia	−0.033	−0.0370	150
	(0.0432)	(0.0431)	[1657]
East Europe	0.0165	0.0171	125
	(0.0187)	(0.0188)	[1388]
Latin America	−0.0123	−0.0093	152
	(0.0194)	(0.0195)	[1682]
Middle East	0.0300	0.0284	155
	(0.0182)	(0.0183)	[1561]
South Asia	−0.1084∗∗	−0.1059∗	146
	(0.0412)	(0.0411)	[1642]
High-income	0.0244∗∗	0.0245∗∗	129
	(0.0094)	(0.0095)	[1299]
Region dummies	−0.0057	−0.0048	33
	(0.0102)	(0.0103)	[211]
Time dummies			
1940s	0.035	−0.0013	3
	(0.0331)		[34]
1950s	−0.0023		16
	(0.0207)		[106]
1960s	−0.0623∗∗∗		95
	(0.0149)		[990]
1970s	−0.0442∗∗		140
	(0.0145)		[1525]
1980s	0.0843∗∗∗		157
	(0.0164)		[1763]
1990s	0.0207		108

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Table B.7 – continued from previous page

	Full model	**No periods**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0194)		[1458]
2000s	−0.0323		70
	(0.0196)		[1019]
2010s	0.0322		22
	(0.0397)		[281]
Constant term	5.5056	2.4532	188
	(4.0311)	(3.3723)	[2047]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses as indicated in column headers. The sample is composed by 2047 observations (188 studies). Both model specifications include the publication year of the study as a control variable.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.8: Meta-regression, full sample, effect of controlling for endogeneity

	Col (1) Table 5	**Endogeneity**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Data structure			
Cross-section	0.0413	0.0462∗	81
	(0.0217)	(0.0208)	[603]
Time-series	0.1168	0.125	11
	(0.0697)	(0.0694)	[100]
Panel (avg)	0.0299 ∗ ∗	0.0285 ∗ ∗	63
	(0.0106)	(0.0105)	[663]
Estimation techniques			
FE	−0.0171		67
	(0.0137)		[777]
DPD	0.0038		20
	(0.0175)		[233]
Other techniques	−0.0027		54
	(0.0143)		[370]
Endogeneity		0.0166∗	72
		(0.007)	[691]
Non-linear specifications			
Non-linearity	−0.0864 ∗ ∗∗	−0.0834 ∗ ∗∗	25
	(0.0163)	(0.0162)	[248]
Interaction	−0.0120	−0.0132	40
	(0.0090)	(0.0089)	[403]
Multiple	−0.1061 ∗ ∗∗	−0.1041 ∗ ∗∗	10
	(0.0313)	(0.031)	[68]
Dependent variable			
Level	0.0384	0.0372	13
	(0.0255)	(0.0254)	[54]
Democracy			
Polity	0.001	0.0006	80
	(0.0086)	(0.0086)	[771]
Dichotomous	−0.0156	−0.0152	39
	(0.0109)	(0.0109)	[361]
Other proxies	0.0003	0.0005	28
	(0.0084)	(0.0084)	[323]
Control variables			
Convergence	0.0310∗	0.0320 ∗ ∗	152
	(0.0123)	(0.012)	[1748]
Investment	0.0064	0.0063	120
	(0.0109)	(0.0108)	[920]
Govern size	0.0114	0.0120	69
	(0.0104)	(0.0103)	[550]
Human capital	−0.0083	−0.0062	120
	(0.0100)	(0.0100)	[991]
Corruption	0.0164	0.0162	20

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Table B.8 – continued from previous page

	Col (1) Table 5	Endogeneity	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0344)	(0.0345)	[158]
Ethnicity	0.0006	0.0103	18
	(0.0163)	(0.0145)	[122]
Religion	−0.0152	−0.0081	7
	(0.0229)	(0.0228)	[35]
Econ freedom	−0.0180	−0.0201	26
	(0.0172)	(0.0170)	[115]
Rule of law	−0.0066	−0.0060	26
	(0.021)	(0.0209)	[239]
State capacity	0.0558∗	0.0544∗	3
	(0.0220)	(0.0219)	[31]
Openness	−0.0079	−0.0120	86
	(0.0095)	(0.0095)	[902]
Population	−0.0239∗	−0.0248∗	79
	(0.0104)	(0.0102)	[849]
World regions			
Africa	0.1757 ∗ ∗∗	0.1754 ∗ ∗∗	161
	(0.0148)	(0.0148)	[1773]
East Asia	−0.0289	−0.0260	150
	(0.0431)	(0.0432)	[1657]
East Europe	0.0148	0.0152	125
	(0.0187)	(0.0187)	[1388]
Latin America	−0.0120	−0.0115	152
	(0.0193)	(0.0193)	[1682]
Middle East	0.0310	0.0308	155
	(0.0182)	(0.0182)	[1561]
South Asia	−0.1117 ∗ ∗	−0.1135 ∗ ∗	146
	(0.0412)	(0.0413)	[1642]
High-income	0.0241∗	0.0248 ∗ ∗	129
	(0.0094)	(0.0094)	[1299]
Region dummies	−0.0062	−0.0028	33
	(0.0102)	(0.0099)	[211]
Time periods			
1940s	0.0382	0.0386	3
	(0.033)	(0.0329)	[34]
1950s	−0.0050	−0.0073	16
	(0.0206)	(0.0206)	[106]
1960s	−0.0605 ∗ ∗∗	−0.0612 ∗ ∗∗	95
	(0.0148)	(0.0148)	[990]
1970s	−0.0424 ∗ ∗	−0.0430 ∗ ∗	140
	(0.0144)	(0.0144)	[1525]
1980s	0.0863 ∗ ∗∗	0.0856 ∗ ∗∗	157
	(0.0164)	(0.0163)	[1763]
1990s	0.0136	0.0124	108

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Table B.8 – continued from previous page

	Col (1) Table 5	**Endogeneity**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0187)	(0.0187)	[1458]
2000s	−0.0409∗	−0.0442∗	70
	(0.0185)	(0.0182)	[1019]
2010s	0.0170	0.0146	22
	(0.0383)	(0.0384)	[281]
Constant term	−0.0674	−0.0786∗	188
	(0.0366)	(0.0353)	[2047]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. The sample is composed by 2047 observations (188 studies). Endogeneity = 1 if the study account for potential endogeneity.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.9: Meta-regression, full sample, alternative measures of democracy

	Col (1) Tab 5 Alt. Dem. Indices			**Excl. Vanhanen**	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Data structure					
Cross-section	0.0413	0.0401	81	0.0410	81
	(0.0217)	(0.0216)	[603]	(0.0212)	[603]
Time-series	0.1168	0.1138	11	0.1142	11
	(0.0697)	(0.0698)	[100]	(0.0696)	[100]
Panel (avg)	0.0299**	0.0297**	63	0.0292**	63
	(0.0106)	(0.0105)	[663]	(0.0100)	[659]
Estimation techniques					
FE	−0.0171	−0.0175	67	-0.0176	67
	(0.0137)	(0.0135)	[777]	(0.0131)	[774]
DPD	0.0038	0.0098	20	0.0098	20
	(0.0175)	(0.0175)	[233]	(0.0168)	[231]
Other techniques	−0.0027	−0.0017	54	-0.0019	54
	(0.0143)	(0.0142)	[370]	(0.0138)	[370]
Non-linear specifications					
Non-linearity	−0.0864***	−0.083***	25	-0.0809***	25
	(0.0163)	(0.0163)	[248]	(0.0158)	[248]
Interaction	−0.0120	−0.0117	40	-0.0117	40
	(0.0090)	(0.0089)	[403]	(0.0085)	[403]
Multiple	−0.1061***	−0.1108***	10	-0.1104***	10
	(0.0313)	(0.0311)	[68]	(0.0303)	[68]
Dependent variable					
Level	0.0384	0.0379	13	0.0374	13
	(0.0255)	(0.0254)	[54]	(0.0247)	[54]
Democracy					
Polity	0.001	−0.0016	80	0.0011	80
	(0.0086)	(0.0091)	[771]	(0.0083)	[771]
Dichotomous (incl. Acemoglu)	−0.0156		39	-0.0141	39

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Table B.9 – continued from previous page

	Col (1) Tab 5	Alt. Dem. Indices		Excl. Vanhanen	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0109)		[361]	(0.0105)	[361]
Dichotomous (excl. Acemoglu)		−0.0149	35		
		(0.0111)	[257]		
Vanhanen		0.1353***	3		
		(0.0324)	[5]		
Acemoglu		−0.0276	4		
		(0.0485)	[104]		
Bollen		−0.0021	9		
		(0.0303)	[66]		
SVMDI		−0.0275	3		
		(0.0244)	[86]		
Unified		0.0107	5		
		(0.0153)	[77]		
Other proxies	0.0003	−0.0074	28	-0.0019	28
	(0.0084)	(0.0119)	[323]	(0.0081)	[318]
Control variables					
Convergence	0.0310*	0.0310*	152	0.0307**	152
	(0.0123)	(0.0122)	[1748]	(0.0118)	[1743]
Investment	0.0064	0.0056	120	0.0055	120
	(0.0109)	(0.0108)	[920]	(0.0105)	[918]
Govern size	0.0114	0.0122	69	0.0113	69
	(0.0104)	(0.0103)	[550]	(0.01)	[548]
Human capital	−0.0083	−0.0101	120	-0.0098	120
	(0.0100)	(0.0099)	[991]	(0.0096)	[989]
Corruption	0.0164	0.0163	20	0.0167	20
	(0.0344)	(0.0343)	[158]	(0.0339)	[158]
Ethnicity	0.0006	0.0010	18	0.0013	18
	(0.0163)	(0.0161)	[122]	(0.0155)	[122]
Religion	−0.0152	−0.0156	7	-0.0171	7

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Table B.9 – continued from previous page

	Col (1) Tab 5 Alt. Dem. Indices			Excl. Vanhanen	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0229)	(0.0226)	[35]	(0.0218)	[35]
Econ freedom	−0.0180	−0.0157	26	-0.0156	26
	(0.0172)	(0.017)	[115]	(0.0165)	[115]
Rule of law	−0.0066	−0.0076	26	-0.0081	26
	(0.021)	(0.0208)	[239]	(0.0204)	[239]
State capacity	0.0558∗	0.0551∗	3	0.0531*	3
	(0.0220)	(0.0217)	[31]	(0.0209)	[31]
Openness	−0.0079	−0.0099	86	-0.0103	86
	(0.0095)	(0.0095)	[902]	(0.0092)	[898]
Population	−0.0239∗	−0.0269∗∗	79	-0.0269**	79
	(0.0104)	(0.0104)	[849]	(0.01)	[847]
World regions					
Africa	0.1757∗∗∗	0.1746∗∗∗	161	0.1713***	161
	(0.0148)	(0.0147)	[1773]	(0.0143)	[1768]
East Asia	−0.0289	−0.0281	150	-0.0281	150
	(0.0431)	(0.0430)	[1657]	(0.0424)	[1652]
East Europe	0.0148	0.0145	125	0.0130	125
	(0.0187)	(0.0185)	[1388]	(0.0180)	[1383]
Latin America	−0.0120	−0.0120	152	-0.0120	152
	(0.0193)	(0.0192)	[1682]	(0.0187)	[1677]
Middle East	0.0310	0.0309	155	0.0311	155
	(0.0182)	(0.0181)	[1561]	(0.0176)	[1556]
South Asia	−0.1117∗∗	−0.1113∗∗	146	-0.1073**	146
	(0.0412)	(0.0411)	[1642]	(0.0406)	[1637]
High-income	0.0241∗	0.0235∗	129	0.0226*	129
	(0.0094)	(0.0093)	[1299]	(0.0090)	[1294]
Region dummies	−0.0062	−0.0054	33	-0.0053	33
	(0.0102)	(0.0101)	[211]	(0.0097)	[211]
Time periods					

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Table B.9 – continued from previous page

	Col (1) Tab 5 Alt. Dem. Indices			Excl. Vanhanen	
	RE ML (s.e.)	**RE ML (s.e.)**	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
1940s	0.0382	0.0408	3	0.0395	3
	(0.033)	(0.0327)	[34]	(0.0313)	[34]
1950s	−0.0050	−0.0074	16	-0.0104	16
	(0.0206)	(0.0204)	[106]	(0.0197)	[106]
1960s	−0.0605***	−0.06***	95	-0.0594***	95
	(0.0148)	(0.0148)	[990]	(0.0146)	[987]
1970s	−0.0424**	−0.0434**	140	-0.0449**	140
	(0.0144)	(0.0143)	[1525]	(0.0140)	[1522]
1980s	0.0863***	0.0857***	157	0.0841***	157
	(0.0164)	(0.0163)	[1763]	(0.0160)	[1758]
1990s	0.0136	0.0151	108	0.0144	108
	(0.0187)	(0.0187)	[1458]	(0.0184)	[1453]
2000s	−0.0409*	−0.0470*	70	-0.0418*	70
	(0.0185)	(0.0185)	[1019]	(0.0179)	[1014]
2010s	0.0170	0.0189	22	0.0108	22
	(0.0383)	(0.0381)	[281]	(0.0375)	[281]
Constant term	−0.0674	−0.0598	188	-0.0587	188
	(0.0366)	(0.0366)	[2047]	(0.0358)	[2042]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. The sample is composed by 2047 observations (188 studies). The proxies of democracies identified are the following: the Polity score of democracy (Marshall & Jaggers, 2002); binary measures of democracy (Dichotomous) both including and excluding in this definition the measure provided by Acemoglu et al. (2019) (Acemoglu); the Polyarchy score of democracy provided by Vanhanen (2000); the Political Democracy score (Bollen) provided by Bollen (1998); the Support Vector Machine Democracy Index (SVMDI) provided by Gründler & Krieger (2016); the Unified Score of Democracy (Unified) provided by Pemstein et al. (2010). All indicators not mentioned above have been included as Other proxies.
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.10: Meta-regression, excluding zero-order correlations

	Col. (1) Tab. 5		**Excl. 0 order corr.**	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Data structure				
Cross-section	0.0413	81	0.0443*	78
	(0.0217)	[603]	(0.0214)	[598]
Time-series	0.1168	11	0.1178	11
	(0.0697)	[100]	(0.0676)	[100]
Panel (avg)	0.0299**	63	0.0305**	63
	(0.0106)	[663]	(0.0105)	[661]
Estimation techniques				
FE	-0.0171	67	-0.0144	67
	(0.0137)	[777]	(0.0136)	[777]
DPD	0.0038	20	0.0067	20
	(0.0175)	[233]	(0.0174)	[233]
Other techniques	-0.0027	54	0.003	52
	(0.0143)	[370]	(0.0144)	[367]
Non-linear specifications				
Non-linearity	-0.0864***	25	-0.086***	25
	(0.0163)	[248]	(0.0162)	[248]
Interaction	-0.0120	40	-0.0119	40
	(0.0090)	[403]	(0.0089)	[403]
Multiple	-0.1061***	10	-0.1042***	10
	(0.0313)	[68]	(0.031)	[68]
Dependent variable				
Level	0.0384	13	0.0257	11
	(0.0255)	[54]	(0.0256)	[51]
Democracy				
Polity	0.001	80	0.0007	80
	(0.0086)	[771]	(0.0086)	[769]
Dichotomous	-0.0156	39	-0.0154	39
	(0.0109)	[361]	(0.0108)	[361]
Other proxies	0.0003	28	-0.0006	27
	(0.0084)	[323]	(0.0084)	[320]
Control variables				
Convergence	0.0310*	152	0.0302*	152
	(0.0123)	[1748]	(0.0123)	[1748]
Investment	0.0064	120	0.0052	120
	(0.0109)	[920]	(0.0108)	[919]
Govern size	0.0114	69	0.0117	69

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Table B.10 – continued from previous page

	Col. (1) Tab. 5		Excl. 0 order corr.	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0104)	[550]	(0.0103)	[550]
Human capital	-0.0083	120	-0.0078	120
	(0.0100)	[991]	(0.0099)	[991]
Corruption	0.0164	20	0.018	20
	(0.0344)	[158]	(0.0339)	[158]
Ethnicity	0.0006	18	0.0019	18
	(0.0163)	[122]	(0.0162)	[122]
Religion	-0.0152	7	-0.0149	7
	(0.0229)	[35]	(0.0227)	[35]
Econ freedom	-0.0180	26	-0.0177	26
	(0.0172)	[115]	(0.017)	[115]
Rule of law	-0.0066	26	-0.005	26
	(0.021)	[239]	(0.0208)	[239]
State capacity	0.0558*	3	0.0562*	3
	(0.0220)	[31]	(0.0218)	[31]
Openness	-0.0079	86	-0.0078	86
	(0.0095)	[902]	(0.0095)	[902]
Population	-0.0239*	79	-0.0233*	79
	(0.0104)	[849]	(0.0103)	[849]
World regions				
Africa	0.1757***	161	0.1723***	159
	(0.0148)	[1773]	(0.0147)	[1767]
East Asia	-0.0289	150	-0.0247	148
	(0.0431)	[1657]	(0.0424)	[1653]
East Europe	0.0148	125	0.0189	122
	(0.0187)	[1388]	(0.0185)	[1384]
Latin America	-0.0120	152	-0.0123	150
	(0.0193)	[1682]	(0.0192)	[1678]
Middle East	0.0310	155	0.0282	153
	(0.0182)	[1561]	(0.0181)	[1557]
South Asia	-0.1117**	146	-0.1164**	144
	(0.0412)	[1642]	(0.0405)	[1638]
High-income	0.0241*	129	0.0227*	127
	(0.0094)	[1299]	(0.0094)	[1295]
Region dummies	-0.0062	33	-0.0059	33
	(0.0102)	[211]	(0.0101)	[211]
Time periods				
1940s	0.0382	3	0.0353	3
	(0.033)	[34]	(0.0327)	[34]
1950s	-0.0050	16	-0.004	16
	(0.0206)	[106]	(0.0204)	[106]
1960s	-0.0605***	95	-0.0592***	95

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Table B.10 – continued from previous page

	Col. (1) Tab. 5		Excl. 0 order corr.	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
	(0.0148)	[990]	(0.0147)	[987]
1970s	-0.0424**	140	-0.0409**	140
	(0.0144)	[1525]	(0.0144)	[1522]
1980s	0.0863***	157	0.0838***	156
	(0.0164)	[1763]	(0.0163)	[1759]
1990s	0.0136	108	0.0154	108
	(0.0187)	[1458]	(0.0185)	[1456]
2000s	-0.0409*	70	-0.0409*	68
	(0.0185)	[1019]	(0.0184)	[1014]
2010s	0.0170	22	0.0228	22
	(0.0383)	[281]	(0.0373)	[279]
Constant term	-0.0674	188	-0.0696	185
	(0.0366)	[2047]	(0.0363)	[2040]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. The analysis excludes all models based on zero-order correlations between democracy and growth. The sample is composed by 2040 observations (185 studies).
Significance levels *** 0.001 ** 0.01 * 0.05

Table B.11: Meta-regression, excluding models with Level GDP as dependent variable

	Col. (1) Tab. 5		**Excluding Level ==1**	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Data structure				
Cross-section	0.0413	81	0.0426	70
	(0.0217)	[603]	(0.0233)	[603]
Time-series	0.1168	11	0.1800*	8
	(0.0697)	[100]	(0.0710)	[100]
Panel (avg)	0.0299**	63	0.0313**	53
	(0.0106)	[663]	(0.0106)	[663]
Estimation techniques				
FE	-0.0171	67	-0.0160	47
	(0.0137)	[777]	(0.0138)	[777]
DPD	0.0038	20	0.0104	18
	(0.0175)	[233]	(0.0175)	[233]
Other est. tech.	-0.0027	54	-0.0010	42
	(0.0143)	[370]	(0.0147)	[370]
Non-linear specifications				
Non-linearity	-0.0864***	25	-0.0852***	18
	(0.0163)	[248]	(0.0163)	[248]
Interaction	-0.0120	40	-0.0112	34
	(0.0090)	[403]	(0.0091)	[403]
Multiple	-0.1061***	10	-0.1054***	7
	(0.0313)	[68]	(0.0311)	[68]
Democracy				
Polity	0.001	80	0.0007	63
	(0.0086)	[771]	(0.0086)	[771]
Dichotomous	-0.0156	39	-0.0166	32
	(0.0109)	[361]	(0.0109)	[361]
Other	0.0003	28	-0.0004	19
	(0.0084)	[323]	(0.0084)	[323]
Control variables				
Convergence	0.0310*	152	0.0309*	126
	(0.0123)	[1748]	(0.0125)	[1748]
Investment	0.0064	120	0.0061	101
	(0.0109)	[920]	(0.0109)	[920]
Govern size	0.0114	69	0.0123	58
	(0.0104)	[550]	(0.0104)	[550]
Human capital	-0.0083	120	-0.0077	101
	(0.0100)	[991]	(0.0100)	[991]
Corruption	0.0164	20	0.0352	13
	(0.0344)	[158]	(0.0345)	[158]
Ethnicity	0.0006	18	-0.0016	14
	(0.0163)	[122]	(0.0163)	[122]
Religion	-0.0152	7	-0.0132	7
	(0.0229)	[35]	(0.0234)	[35]

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Table B.11 – continued from previous page

	Col. (1) Tab. 5		Excluding Level ==1	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Econ freedom	-0.0180	26	-0.0193	22
	(0.0172)	[115]	(0.0171)	[115]
Rule of law	-0.0066	26	-0.0056	20
	(0.021)	[239]	(0.0209)	[239]
State capacity	0.0558*	3	0.0651**	2
	(0.0220)	[31]	(0.0219)	[31]
Openness	-0.0079	86	-0.0090	72
	(0.0095)	[902]	(0.0096)	[902]
Population	-0.0239*	79	-0.0210*	65
	(0.0104)	[849]	(0.0104)	[849]
World regions				
Africa	0.1757***	161	0.1753***	133
	(0.0148)	[1773]	(0.0149)	[1773]
East Asia	-0.0289	150	-0.0274	123
	(0.0431)	[1657]	(0.0427)	[1657]
East Europe	0.0148	125	0.0085	100
	(0.0187)	[1388]	(0.0188)	[1388]
Latin America	-0.0120	152	-0.0123	124
	(0.0193)	[1682]	(0.0199)	[1682]
Middle East	0.0310	155	0.046*	127
	(0.0182)	[1561]	(0.0187)	[1561]
South Asia	-0.1117**	146	-0.1277**	118
	(0.0412)	[1642]	(0.0406)	[1642]
High-income	0.0241*	129	0.0228*	104
	(0.0094)	[1299]	(0.0094)	[1299]
Region dummies	-0.0062	33	-0.0046	28
	(0.0102)	[211]	(0.0102)	[211]
Time periods				
1940s	0.0382	3	0.0336	2
	(0.033)	[34]	(0.0328)	[34]
1950s	-0.0050	16	-0.0016	13
	(0.0206)	[106]	(0.0205)	[106]
1960s	-0.0605***	95	-0.0549***	78
	(0.0148)	[990]	(0.0147)	[990]
1970s	-0.0424**	140	-0.0381**	116
	(0.0144)	[1525]	(0.0144)	[1525]
1980s	0.0863***	157	0.1034***	128
	(0.0164)	[1763]	(0.0171)	[1763]
1990s	0.0136	108	0.0069	83
	(0.0187)	[1458]	(0.0189)	[1458]
2000s	-0.0409*	70	-0.0200	52
	(0.0185)	[1019]	(0.0195)	[1019]
2010s	0.0170	22	0.0118	15
	(0.0383)	[281]	(0.0381)	[281]

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Table B.11 – continued from previous page

	Col. (1) Tab. 5		Excluding Level ==1	
	RE ML (s.e.)	**Studies [Eff. sizes]**	**RE ML (s.e.)**	**Studies [Eff. sizes]**
Constant term	-0.0674	188	-0.0949*	181
	(0.0366)	[2047]	(0.0369)	[1993]

Notes: Random Effects (MultiLevel) MRA. Standard errors in round parentheses. The sample is composed by 2047 observations (188 studies) for the main model; 1993 observations (181 studies) for the model excluding Level ==1.
Significance levels *** 0.001 ** 0.01 * 0.05

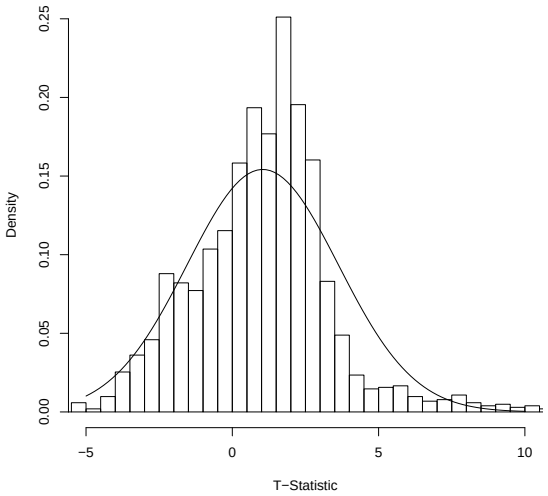
Appendix C. Further descriptives

Table C.1: Democracy, human capital, and growth: t-statistics

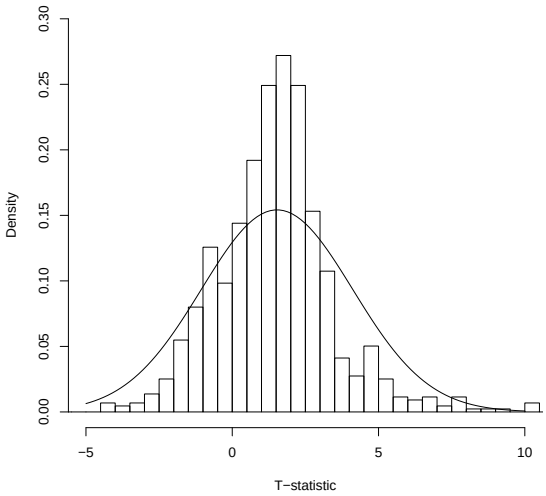
		Positive	Negative	Non-significant	Total
Democracy					
	effect sizes	669	232	1146	2047
		32.68%	11.33%	55.98%	
	study	45	19	124	188
		23.94%	10.11%	65.96%	
Human Capital					
	effect sizes	333	26	516	875
		38.06%	2.97%	58.97%	
	study	38	2	71	111
		34.23%	1.80%	63.96%	
Democracy (Reduced)					
	effect sizes	180	144	440	764
		23.56%	18.85%	57.59%	
	study	19	13	79	111
		17.12%	11.71%	71.17%	
Democracy (Main specifications)					
	effect sizes	367	150	710	1227
		29.91%	12.22%	57.86%	
	study	44	19	117	180
		24.44%	10.56%	65.00%	
Democracy (Pre-DU)					
	effect sizes	172	111	458	741
		23.21%	14.98%	61.81%	
	study	21	8	65	94
		22.34%	8.51%	69.15%	
Democracy (Post-DU)					
	effect sizes	497	121	688	1306
		38.06%	9.26%	52.68%	
	study	24	11	59	94
		25.53%	11.70%	62.77%	

Notes: The significance level is $p < 0.05$. The *Reduced* sample contains only estimates of democracy collected from a specification in which a proxy of human capital was included. The *pre-DU* sample contains only estimates collected from studies published before December 2005 - the date in which the search for studies by Doucouliagos & Ulubaşoğlu (2008) ended. The *post-DU* sample contains instead only estimates collected from studies published after December 2005. The *main specifications* sample contains only estimates collected from specifications included in the body of the article (i.e. appendixes are excluded) and not labelled as robustness tests, sensitivity analyses or falsification and/or placebo strategies.

Figure C.1: Democracy, human capital and economic growth: T-statistic distributions comparison



(a) Democracy and economic growth



(b) Human capital and economic growth

Figure C.2: Democracy and economic growth: raw partial correlation and Fisher z-transformation comparison