I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12389

Voting Up? The Effects of Democracy and Franchise Extension on Human Stature

Alberto Batinti
Joan Costa-Font
Timothy J. Hatton

MAY 2019

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12389

Voting Up? The Effects of Democracy and Franchise Extension on Human Stature

Alberto Batinti
Xi'an Jiaotong-Liverpool University

Joan Costa-Font
LSE, IZA and CESIfo

Timothy J. Hatton
University of Essex, Australian National University, CEPR and IZA

MAY 2019

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Voting Up? The Effects of Democracy and Franchise Extension on Human Stature[1]

We study the health effects of the spread of democratic institutions and the extension of voting rights in 15 European countries since the middle of the nineteenth century. We employ both cross country and cohort variation in heights and employ a new instrument for democracy and the extension of the franchise, the effect of decolonisation on democracy in the colonising country's democratisation to identify the causal effect of democracy on heights. We find robust evidence of a link between democratic quality and human stature. The results indicate that the transition to democracy increased average male heights by 0.7 to 1 cm, equivalent to a one-decade average increase in stature across cohorts. Including the extension of the franchise to women increases the effect on average stature to about 1.7cm. The effect is driven by both political participation and contestation in reducing inequality and expanding health insurance coverage.

JEL Classification: H1, J18

Keywords: height, democracy, transition, voting rights expansions, franchise

Corresponding author:
Alberto Batinti
Xi'an Jiaotong-Liverpool University
Wuzhong, Suzhou, 215125
China

E-mail: albertobatinti@yahoo.com

[1] We are grateful to the participants at: the 2018 European Public Choice Society in Rome; the 2018 Workshop on the Economic Analysis of Institutions in Xiamen; the 1st GEP-China Workshop on Advances in Economic Research University of Nottingham Ningbo China (UNNC). We also thank Simon Appleton, Sonia Bhalotra, Berkay Ozcan, Ricardo Pagan, Luca Colombo, Paolo Epifani, David Greenway, and Chee-Ruey Hsieh for their comments. We are solely responsible for any remaining errors.

1 Introduction

Rising living standards and increasing access to health and social services can improve wellbeing and human stature (Steckel, 1995). However, this effect is underpinned in part by reforms that result from deeper political and institutional transitions which in turn influence collective decision-making, such as the advent of a democracy. Ordinary citizens in a democracy can challenge powerful and privileged elites to bring about permanent change (Acemoglu and Robinson, 2006), and in Western Europe this was a precondition for social reform. Democratisation can give rise to a range of socio-economic outcomes by affecting the formation of societal preferences, embracing a wider range interests, and improving state capacity to implement collective choices. By improving political contestability and accountability through the extension of voting rights, democratisation may advance social reforms that otherwise would not garner sufficient support. The latter include the expansion of basic social servicies such as health and education, redistribution and social safety nets and better access to information. Our goal is to assess the overall effect on one key indicator of physical wellbeing over more than a century of European history.

A range of mechanisms underpin the link between democratisation and human wellbeing. Some studies find that democracy strengthens the institutions of accountability and representation, making welfare reforms more likely (Besley and Kudamatsu, 2006; Norris, 2012), and shaping fiscal policies (Aidt et al., 2006). Gradstain and Milanovic (2000) conclude that restrictions on the voting franchise gives rise to economic inequality and that democratization, in the form of franchise expansion, give rise to greater redistribution. Democracies produce fewer famines and less deprivation (Siegal et al., 2004) which some interpret as a process of 'fit through democracy' (Sen, 1999). Democracy also enhances the

feeling of having choice and control over one's life (Inglehart et al., 2008; Frey and Stutzer, 2008).

However, democracy might not necessarily address the health needs of the poorest (Krueger et al., 2015), as institutions may be captured by a dominant elite (Acemoglu et al., 2015; Powell-Jackson et al., 2011), with clientilistic support from the middle class. Hence, the effect of democracy on health may depend on the precise structure of any increase in democratic accountability and the level of government involved (Chapman, 2018). Our focus is on the average effect of the advance of democracy at the national level over a long sweep of history. So far, the evidence has been mixed and inconclusive. Even when a positive association is found, the causal evidence of the effect of democracy on wellbeing is often problematic. A recent review of the literature (Acemoglu et al., 2015) argues that diversity in the existing findings can be related to failure to control consistently for country fixed effects, which undermines the causal interpretation of the link between democratic transitions and health outcomes.

This paper examines the effect of democratization on one retrospective measure of physical health, namely male average stature. We exploit unique evidence from a quasi-natural experiment by examining the expansion of democracy and voting rights using a panel of adult male heights in 15 European countries from 1860 to 1980. We exploit the exogenous variation from the process of decolonisation on the democratic quality of coloniser countries, drawing on evidence of 'push effects' of colonialism on democracy in coloniser countries (Coppedge et al., 2015). We contribute to the literature on the welfare effects of democracy in the following ways.

First, we study an important retrospective marker of individual well-being among those that survive childhood, which is sensitive to environmental changes, namely the average height of adult males. Stature is influenced positively by nutrition and negatively by the disease environment during childhood, as well as by a variety of socioeconomic conditions that create

safer and more stable environments (Silventionen et al., 2003; Steckel, 1995; 2009).[2] Height is correlated with a number of health outcomes later in life[3] and is positively associated with employment, earnings and occupational attainment (Black et al., 2007; Case and Paxson, 2010; Currie, 2009; Persico et al. 2004; Weil, 2007, 2014). However, we know very little about how institutional and political changes trigger environmental stimuli during childhood (especially early childhood) that influence human stature. Our outcome measure has several advantages compared with others. It is an absolute measure that is not subject to changing definitions over time and it provides a straightforward interpretation of the quality and quantity of health gain implied by democratic transitions. We use *cohort* data of male populations, reporting heights measured at an age of around 21, an age where final height is achieved. Because height is determined during childhood, and especially early childhood, the timing is clearer than it would be for measures such as life expectancy where the health gains may depend on conditions at different stages of the life cycle.[4]

Second, we adopt an empirical strategy that addresses critique of previous studies by Acemoglu et al. (2015). Specifically, we provide evidence of a causal mechanism by using both the joint identification power from using country and year fixed effects and by augmenting the baseline model with an instrumental variable strategy, allowing us to control for unobserved and time-varying heterogeneity, which could bias our baseline results[5]. A fundamental challenge to identification is that unobserved variables influencing democratisation might also explain

[2] About 20 percent of the variation across individuals is accounted for by 'environmental' factors, both adverse and beneficial (Silventoinen et al., 2000). By focusing on group means we average away the hereditary differences between individuals.

[3] These include physical and mental health, life expectancy, reduced incidence of chronic disease and physical disability as well as with improved cognitive function and educational attainment

[4] For example, in the nineteenth and early twentieth centuries the increase in life expectancy is driven largely by falling mortality in infancy and early childhood; in later decades it is influenced more by reductions in mortality at mature ages. Hence, over time, life expectancy at birth is influenced by conditions at different life-cycle stages. Height is determined during early childhood but we also present tests for exposure in later childhood.

[5] Later we discuss the validity our IV strategy and in doing so we find that our baselines and a number of robustness checks jointly deliver convincing evidence of a sizable and significant effect on heights and thus health.

changes in heights. This could bias our estimates even though such omitted channels (e.g., cultural norms, generalised trust, tolerance etc.) are likely to produce attenuation bias in the coefficient of interest. Consistent with the recent literature on the effect of democracy on income (Persson and Tabellini, 2009; Madsen et al., 2015; Acemoglu et al., 2019), we allow for endogenous democratization. However, in contrast with previous studies, this is achieved by using a novel instrumental variable strategy that rests on the differential timing of decolonisation processes among European coloniser countries. We build on Coppedge et al., (2015) who document that decolonisation can exert both a 'resource effect' (that accelerated the modernization and progress toward liberal democracy in colonizer countries) and an 'ideational effect' (whereby the increasing information on the horrors of colonial rule stiffened a move in colonizer countries to deepen their own freedoms and advance the quality of their democracy). Furthermore, large effects are found when using a more demanding measure of democratization, one which includes electoral suffrage extended to at least half of the adult female population as an additional requirement to define a democratic transition.

Third, our empirical setting is Europe from the 1860s to the 1970s, a period over which the average height of adult males increased by 11cm (Hatton, 2014) and there were significant advances in democracy. It also allows us to disentangle the contribution of institutions influencing collective decision making from the role of voting rights extension, which adds weight to the preferences of previously neglected groups such as women and poorer individuals (Chattopadhyay and Duflo, 2004; Bhalotra and Clots-Figueras, 2014). In general, the extension of the franchise to women is a key feature in the advance of democracy and is typically associated with a range of civil rights improvements (Wang et al., 2017). Female enfranchisement is associated with expanding the size of government (Lott et al., 1999) and particularly the welfare state (Abrams and Settle, 1999), with important implications for the welfare of children. Our

baseline results establish robust evidence over more than a century of an effect on height of key dimensions of democracy, and specifically the extension of female voting rights. We find that the formal inclusion of female populations in the process of collective decision-making in Europe delivered substantial health gains. Our research thus speaks to a growing body of research on the positive health and welfare effects of women's inclusion in politics.

Finally, we explore potential mechanisms that explain the association between democracy and heights. There are many possible channels of influence and our main results capture all of these as a reduced form effect. Even though the historical data is limited, we can nevertheless examine several potentially important channels through which the democracy effect might be expected to operate and on which previous research has speculated. We find convincing results for some of them and lack of support for others.

Overall, our results show that the transition from autocracy to democracy increases adult height of about 0.7 centimetres, which is 6.4% percent of the total increase in height over the century from 1860 to 1980. Importantly, when we include voting right extensions to women, we consistently find larger effects on heights, up to 1.7 centimetres or about 11% of the total increase. We devise several tests to discriminate between different potential mechanisms driving our results, and we provide evidence of the robustness of our results across different specifications. The results indicate that the main mechanisms through which democracy affects height are reducing inequality and expanding health care coverage.

The rest of the paper proceeds as follows. In the next section we summarise the literature on democracy and health-related wellbeing and emphasise the advantage of using measures of height. We identify our contribution and explain the originality and distinctiveness of our analysis. Next, we describe the dataset and set out our estimating framework. We then report

OLS and IV results using different measures of democracy and exploring the channels of influence. We summarise our results and draw implications in the concluding section.

2 Democracy and wellbeing

2.1 Democracy and Health Outcomes

The relationship between democracy and health has been documented in a number of empririal studies. Democracies entail distinct mechanisms of collective decision-making which relate socioeconomic outcomes to public preferences. A range of empirical studies examines the impact of differences in democratic quality on wellbeing[6]. A literature review by Muntaner et al. (2011) identifies 21 studies that reported a positive association between democracy and some measure of health, mostly relying on cross-sectional data and examining infant/child mortality and life expectancy as measures of health[7]. For example, Besley and Kudamatsu (2006) find a positive association between life expectancy and democracy across countries from the 1960s to the 2000s. However, life expectancy is sensitive to the history of the health environment, which raises issues of the timing of such effects. To address such concerns, Lin et al. (2012) focus on the dynamic effects of democracy on life expectancy in annual panel data for 119 less developed countries for 1970 to 2004. Controlling for GDP per capita, the literacy rate and food deficiency, they found the impact effect of democracy to be small, although it increases in size and becomes more significant over the full life-cycle. Such results point to the importance of examining early life influences where changes in the social environment are likely to have the greatest influence.

[6] This is in part because some of the aspects that make a better democracy such as political participation requires some investment in skills and resources that are more likely to be made available in a democracy (Brady et al, 1995).
[7] Other studies that focus on life expectancy include Franco et al. (2004), Safai (2006) and Wigley and Akkoyunlu-Wigley (2011), while Klomp and de Haan (2009) use a composite health indicator.

Evidence of the effects of democracy on early-life health are far from consistent. While, Zweifel and Navia (2000) found a strong association between democracy and infant mortality, other research reports that health is determined by specific interventions rather than directly by democracy (Burroway, 2016). Furthermore, examining transitions to democracy, Ross (2006) found that the effects are sensitive to the selection of countries and are undermined by the inclusion included country fixed effects. In contrast, Kudamatsu (2012) found that transitions to democracy reduced infant deaths, even when comparing siblings born before and after democratic transitions. Previous studies have also found that female empowerment improves health outcomes for children. Examining a panel of US states from 1900 to 1936, Miller (2008) found that female enfranchisement led to immediate increases in state and local expenditure on health and social services and it substantially reduced the mortality rates of young children. Other studies also find that female political empowerment has significant positive effects on child health (Chattopadhyay and Duflo, 2004; Bhalotra and Clots-Figueras, 2014; Swiss et al., 2012; Varkey et al., 2010).

2.3 Environmental Effects on Height

With few exceptions, the literature has not explored the effect of political correlates on human heights. Unlike infant or child mortality, which reflect acute conditions, height reflects the childhood circumstances on those that survive; hence it captures a wider spectrum of conditions operating through multiple channels that are affected by democratization.[8] Thus, Komlos and Kriwy (2003) found convergence in male heights between East and West Germany following reunification, and Costa-Font and Gil (2008) found that the heights gap in Spain

[8] Changes in the health environment during childhood could have two opposing effects on height: selection and scarring (see Bozzoli et al. 2009). The selection effect is where improved conditions increase the survival rates of more vulnerable and possibly shorter individuals. The scarring effect is where improved conditions enhance growth during childhood. For Europe scarring effects seem to dominate (Hatton, 2011; 2014). Here we estimate the net effect.

narrowed after its transition to democracy. However, to our knowledge, there have been no comprehensive studies that evaluate the effect on height of the historical transition to democracy in developed countries. We exploit a long-run time series (1860-1980) for heights and democracy in order to assess the effects of past transitions to democracy in a set of developed countries.

An important contribution is to identify the mechanisms underlying the height - democracy association. Transitions to democracy may involve overthrowing the pre-existing elite and abolishing extractive institutions (Acemoglu et al., 2008), which may influence health (Krueger et al., 2015; Powell-Jackson et al., 2011). But the threat of revolution may induce more incremental change (Aidt and Jensen, 2014). As democracy takes root, and as the franchise widens, voting rights typically percolate down the hierarchy of social class and income. This might lead to redistributive policies, either because the position of the median voter changes (Meltzer and Richard, 1981), or because democracies are better at mobilising the demand for private transfers and social services (Keefer and Khemani, 2005). Redistribution alone could increase physical well-being overall and not just for the poor at the expense of the rich.[9] But whether or not democracy-induced redistribution improves the health of the average citizen is an empirical question.

2.4 Other Mechanisms

Development and Infrastructure. There is overwhelming evidence that higher incomes and better health infrastructure, such as sanitation, clean water and access to improved medical services, had substantial effects on health (Cutler and Miller, 2008; Kesztenbaum and Rosenthal, 2017; Chapman, 2019). It is important to recognise that if democracy affects health and height

[9] If the health production function is concave as is often suggested (Preston, 1975; Steckel, 1995, p.1914; Easterlin, 1999, p. 259) then redistribution from rich to poor (with no change in average income) should improve average health outcomes.

only through income and infrastructure then, in empirical applications, the effect of democracy may disappear once such effects are accounted for, and specifically when GDP per capita is included. The studies that reject the idea that democracy affects health often include controls for (some of) these variables. So, what they are finding is that there is no additional effect of democracy over and above those that run through improvements in living standards and better health facilities. In practical terms, the observed effect of democracy is likely to depend on the degree to which such indirect effects are controlled for.[10] Thus, it is important to compare conditional and unconditional effects of democracy on health as this provides evidence of the mechanisms through which democracy affects health. Conditioning on GDP per capita may be important as some studies, following Lipset (1959), have found a positive correlation between income per capita and democracy, although more nuanced approaches fail to find evidence that income influences transitions to democracy (Przeworski et al., 2000).

Health Information. It is difficult to account for the myriad of ways in which widening democratic accountability facilitates access to better nutrition and an improved disease environment, particularly among the poor. One example would be that greater accountability improves the quality and the targeting of health-related infrastructure and not only the quantity of, or expenditure on, health services (Lake and Baum, 2001). The health environment may also be improved by greater transparency and a free flow of information via the press (Ruger 2005). As noted by Sen (1999), this is often a corollary of the advance of democracy. In the nineteenth century, and more recently in developing countries, such information could be as basic as rudimentary knowledge of nutrition and hygiene.

[10] For example, one study of 153 countries from 1972 to 2000 finds that the positive effect of democracy is halved in the presence of controls for health expenditure, education and calorie consumption (Wigley and Akkoyunlu-Wigley, 2011).

Stability. It is possible that democracy improves health by altering behaviours not only through access to information but also by shaping incentives. This could arise through reducing uncertainty arising from corruption and arbitrary exaction as well as by providing a social safety net. Longer time horizons and greater opportunity could affect fertility decisions, fostering a transition towards reduced family size and greater investment in child quality. Even beyond this there may be effects on health due to psychological and psychosocial processes that affect health individually as well as through the accumulation of social capital (Kristenson et al., 2004). This would be consistent with, Sen's (1999) notion of a constructive role of democracy in generating self-esteem and self-determination as well as in the formation of pro-social values, and with the idea that autonomy can improve wellbeing (Frey and Stutzer, 2008).

3 Empirical Strategy

3.1 Endogeneity of Democratic Rights Extension

Country-level studies often treat democracy as an exogenous determinant of health. But as recognised by Lipset (1959) and many others since, the inception of democracy is influenced by a number of other variables. Income per capita or education are associated with the advent of democracy although these effects are contentious (Bobba and Coviello, 2007; Moral-Benito and Bartolucci, 2012; Acemoglu et al., 2008).

In order to help in identifying the causal effect of interest, we use two-way fixed effects (2WFE). By including country fixed effects we control for time invariant heterogeneity which might lead to dependence between the assignment of the treatment (various measures of democratization) and the determination of the outcome (height). And by also including period fixed effects, the 2WFE strategy controls for common cross-sectional factors which, if omitted, could also create bias. However, 2WFE would not control for time-varying omitted variables

correlated both with treatment assignment and outcome determination, which can bias our OLS estimates. Existing studies of democracy and health often fail to take this into account, and focus instead on expanding the potential list of controls in order to reduce the problem of omitted variable bias. However, this risks including variables that are influenced by democracy, which would attenuate its effect. In order to obtain unbiased estimates of democracy and voting rights extensions on wellbeing, we need an emprirical strategy that exploits some form of exogenous variation in measures of democracy. In what follows (sub-section 3.3), we will address this problem by using an instrumental variable (IV) approach, based on using a strong and valid instrument, to estimate the impact of democracy on heights. This allows us to produce causal estimates that can be interpreted as the local average treatment effect (LATE) of democracy on heights.

3.2 Two-Way Fixed Effects and Instrumental Variable estimates

The basic model that we estimate can be expressed as follows:

$$H_{it} = \beta_1 + \beta_2 D_{it} + \boldsymbol{\beta_3'} \boldsymbol{X_{it}} + \pi_i + \tau_t + \varepsilon_{it} \quad (1)$$

Here, H_{it} is the average adult height in country i for individuals born in period t. The explanatory variables are aligned with the cohort birth period. D_{it} refers to different measures of democracy for country i at time t and its coefficient, β_2, measures the treatment effect. $\boldsymbol{X_{it}}$ is a vector comprising the three controls: (i) the infant mortality rate, with coefficient β_{31} (ii) the log of GDP per capita (β_{32}), and (iii) average years of education of the parents' generation (β_{33}). These variables are widely used in the literature and are intended to capture, respectively: the overall disease environment, access to basic needs and nutrition, and child-rearing capabilities. More detail on the sources and measurement of these variables will be given in Section 4. π_i is a country fixed effect and τ_t is a period fixed effect. As already noted, this aids identification by controlling for non-varying factors both between countries and over time, which might affect

jointly the assignment of the treatment and the determination of the outcome. Finally, ε_{it} is the unobserved random error.

First, we explore the association between heights and democracy using ordinary least squares estimates of equation (1) to identify any association and to see if it is robust. We estimate the coefficient β_2 with and without $\boldsymbol{X_{it}}$ included. As a second step, and to overcome the endogeneity problem, we employ an instrumental variable (IV) strategy, estimating at the first stage the following equation for the index of democracy:

$$D_{it} = a_1 + a_2 Inst_{it} + \boldsymbol{a_3}'\boldsymbol{X_{it}} + \theta_i + \delta_t + \mu_{it} \quad (2)$$

Where $Inst_{it}$ refers to a time varying instrument for democracy in country i at time t, and θ_i and δ_t are country and time fixed effects. We note that, by having a time-varying instrument, we can exploit the joint identification power of the FE and IV approaches. We also estimate the reduced form:

$$H_{it} = \gamma_1 + \gamma_2 Inst_{it} + \gamma_3 \sum_{k=1}^{2} \kappa_k Inst_{it+k} + \boldsymbol{\gamma_4}'\boldsymbol{X_{it}} + \rho_i + \sigma_t + \epsilon_{it} \quad (3)$$

Where $\gamma_2 = \alpha_2\beta_2$ and $\gamma_{4j} = \beta_{3j}(1 + \alpha_{3j})$, and where $j = 1,2,3$ represents the three control variables used throughout. The term $\sum_{k=1}^{2} \kappa_k Inst_{it+k}$ adds forward values of the instrument, which will be included in the regressions to test the robustness of the reduced form transmission effect γ_2. As shown, this measures the composite effect of the first-stage selection into treatment, α_2, and the second-stage, main causal effect of interest, β_2. As placebos, we would expect these leading indicators not to account for the transmission channel and to be insignificant. We limit these to two forward values both because we use five-year averages, so capturing up to 10 years forward, and for reasons of sample size.

Although our focus is on these specifications, we enrich the analysis in three ways. One is to explore different indices of democracy, including measures of the voting franchise. Another is to assess the effects of democracy in the presence of other variables (gross versus net effects). Third, we examine possible channels of influence or mediating factors through which democracy affects height.

3.3 Validity of the Instrumental Variable Strategy

Our instrumental variable (IV) strategy takes advantage of the plausibly exogenous effect of the change in the country's colonial territory on voting rights extensions and democratization more generally. This is, we claim, a political factor that should not influence heights directly, especially in the presence of other controls.

Limiting political self-determination and sovereignty of the occupied territories was a constraint on the extension of similar rights in the coloniser's country, and the progressive decolonization process unleashed the political influence of movements pushing for democratic reforms at home. Extending the same political rights that reformers were advocating in European countries to the colonies would not have been financially viable under colonial rule. Thus, the exploitation of overseas territories-imposed constraints on the extension of political rights to the home population, sometimes by force, with the result of undermining support for democratic reforms. Indeed, the evidence suggests that democracy advanced more slowly in colonisers than in rich countries without colonies (Coppedge at al., 2015). But decolonization allowed the colonizer to disclaim responsibility for the colonized (Galbraith, 1994) and this explains the close association between progressive movements' political clout and decolonisation.[11] The latter became all the more urgent as colonies became progressively more

[11] The First Constituent Assembly 1945 in France constituted a progressive majority, which abolished forced labor in France's colonies, and passed the Lamine Gueye Act, which made citizens of France's colonial subjects. Nonetheless, the new parliament in June 1946, halted its progress and implementation (Nesbitt, 2007).

complex and expensive to maintain due to irredentist movements, geopolitical rivalries and international conflicts (Cooper, 1997). Hence, the end of the colonial rule was a first hurdle to a more fundamental and lasting transformation of the socio-political order.[12]

It seems unlikely that losing territories abroad would have any direct effect on health and heights in colonisers' countries, but only an indirect impact via the coloniser's political system or regime. But a possible consequence of decolonization could have been to affect capita GDP which then influenced the demand for democratization in European countries. However, concerns about endogeneity on this account can be dispelled because we are able to control for this backdoor effect directly in the second stage regression. In any case, the evidence suggests that the liberation of colonies caused little economic loss to the colonizers as the economic advantages associated with trade remained largely intact after decolonisation.[13] While there could be an effect through other omitted variables, we will also provide an independence test (see Table 3 below), showing a very weak correlation between the instrument and the controls, and which covers a range of alternative channels.

Finally, it is possible that democracy at home might have contributed to decolonization but Gartzke and Rohner (2011) find no empirical support for that argument.[14] Hence, differences in exposure to colonialism appear as a reasonable quasi-experiment to exploit. Another question concerning the validity of an instrumental variable strategy is that of statistical monotonicity, in particular, the extent to which there are non-complier countries in our data. Given that we exploit a substantially larger number of 'compliers' than 'defiers', the estimated

[12] Decolonization also spurred the growth in importance of international organizations such as the United Nations, and the emergence of a regime of international human rights (Klose, 2014).
[13] While there was some cost to loss of control over trade, decolonization delivered savings on direct administration and defense. Colonial relationships were often replaced by less formal arrangements, most notably the British Commonwealth, which most newly independent states joined. Hopkins (2006) and Tomlinson (2003) examine the role of the Commonwealth in the years prior to Britain's accession to the European Union in 1973.
[14] Consequently, the paper also supports the alternative idea and explanation that European decolonization was mainly supported by the joint emergence of the two international superpowers (URSS and USA) after the IIWW, and by the organization of political and social movements in the colonies pushing for independence.

effect can then be interpreted as a Local Average Treatment Effect (LATE) (de Chaisemartin, 2017). In addition, we run a battery of robustness tests that fail to reject the validity assumption.

4 Data

4.1 Dependent variable

The dependent variable used throughout the paper is a five-year average of heights, measured in centimetres, of cohorts of men aged around 21, where heights are aligned with the years of birth. These data are from Hatton and Bray (2010) [HB10] and provide an unbalanced panel of 15 European countries for birth cohorts from 1856-60 to 1976-80. The data show that, between the birth cohorts of 1871-5 and 1976-80, average height increased by 11 centimetres, or about 1 centimetre per decade. More detail on heights and the other control variables used in this paper can be found in Hatton (2014) [H14]. Figure 1 shows heights trends for countries aggregated into main groups: (i) southern, (ii) central, and (iii) northern European countries.

[Insert Figure 1 about here]

4.2 Measures of Democracy

Several measures of democracy have been proposed in the literature, and there is debate over the extent to which they capture the complex and multi-dimensional aspects of democracy. The main divide is between sources producing (i) continuous/multi-category index values measuring how much a country is democratic, and (ii) dichotomous measures classifying a country as democratic or not. Sources within the first type include the polity score from the Polity4 dataset, while within the second we can count Boix, Miller and Rosato (2013) [BMR13], Alvarez et al. (1996), Golder (2005), and Cheibub et al. (2010). BMR13, has the advantage of covering the longest time span, of improving on the definitions used in the other papers, and of

adding a minimal suffrage requirement (50% of the male population).[15] Another important feature for our purpose is that the data sources need to go far enough back in time.[16] As our data on heights are for the period from 1856-60 to 1976-80, this restricts our options to two main data sources, Polity4 and BMR13.

Making the two democracy variables comparable implies dichotomizing the polity score. This has been recently proposed by Acemoglu et al. (2019) where the polity score is reduced to a dummy variable by choosing zero as the threshold value of the polychotomous index to discriminate between autocratic and democratic regimes. To illustrate, Figure 2 shows the correlation between heights measures averaged by polity values, where the latter are five-year averages of the polity value score.

[Insert Figure 2 about here]

To improve the quality and reduce the noise of the measure, they propose a method which considers the consistency of classifications through multiple sources and produces a customized dummy variable. Details of the exact steps we followed to construct the BCFH democratic dummy are given in Appendix I, section AI3. By following this approach, we created a dummy variable (BCFH), which is constructed by combining the two sources. We are thus quite conservative in classifying a country as a democracy. Our methodology bears the risk of considering as non-democratic a country that could have been democratic, while strongly limiting the misclassification in the opposite direction. Overall, this way of attributing the democratic status in the presence of a possible measurement bias should be more vulnerable to

[15] The latest version of this index (produced in March 2018) for the years from 1800 to 2018, includes more than 200 countries and provides the new democratization measure that includes female enfranchisement. For a detailed list of the sources, see Boix, Miller and Rosato (2013), Table 1.

[16] As an example, the widely used Freedom House (FH) index is available only from 1972. The Polity and FH indexes differ somewhat in emphasis and coverage, but they are highly correlated (Högström, 2013).

the erroneous inclusion of democracies in the control group, which is likely to bias *downwards* the postulated (positive) effect in Sen's conjecture about the existence of a health dividend from democratization.

To evaluate if there is a *height premium* from shifting to minimal requirements for democracy to higher standards of democratic quality, we extend our analysis by using a more "demanding" measure of democracy, specifically one that includes female suffrage. This dummy variable is available in the most recent version (3.0) of the BMR data (March 2018). This is a definition of democracy that requires also that at least half of adult women have the right to vote. Also, in this case we use the original dummy, call it BMR_F, and its harmonized version BMR_F_A5, calculated by following the same steps for creating the 5-year average of our BCFH measure of democracy.

4.4 Other Independent Variables

Additional controls, taken from H14, include: (i) the log of real per capita GDP (PC_GDP), (ii) the infant mortality rate (IMO), and (iii) average years of education of the parents' generation, (PARENT_EDUC). Their definitions can be found in Appendix I, AI3.

4.5 Instrumental variable: colonial power

As described above, we exploit as an instrument the decisive change in colonial status experienced by European countries in the period covered in our sample. This period captures the bulk of the historical decolonization process experienced by these countries during the twentieth century. Colonial relationships in dyadic form are taken from Wimmer and Min (2006) [WM06], and we use them to calculate our key instrumental variable as the average from time *t-9* to time *t* of the log of the colonial territory originally expressed in square kilometres colonized by each country (AREA_COLONY_A10). This average, covering a period which is on average 5 years antecedent the treatment variables of interest, allows us to estimate more precisely the

selection into treatment by removing the simultaneity concerns that can arise when using contemporaneous variables.[17] This variable scores zero when the country has no colonial territory as defined. To sharpen the design, we also create a dummy variable for colonial status = 1, otherwise 0 when the country has no colonial territory (COLONIAL_STATUS).

Collective decision-making in democratic regimes is more complex and encompasses a larger set of veto points. Hence, decisions tend to result from overcoming a larger number of hurdles before a collective decision is made. Colonialism encompasses already complex structures that would only become more complex with the inception of democratic institutions and structures. Hence, limiting democratic rights and delaying the creation of democratic institutions would have reduced the costs of running an empire. We will show that this instrument is strong when using the dummy-based democratic variables (BCFH and BMR_F). More detail about the underlying assumptions motivating the exclusion restriction for our instrument will be provided later in section 5.2, when discussing the IV estimates.

5 Results

5.1 Baseline Results

Our baseline estimates exploit the staggered distribution of the democratic transitions for the countries in the sample and they include country and year fixed-effects. The coefficients are displayed in Table 1 with robust standard errors in parentheses. To ease the interpretation of our results we focus on two measures of democracy, namely BCFH and the BMR definitions, on the shortest sample with and without controls. This allows us to account for the possibility that the differences in the coefficient estimates might not be induced by the different definitions, but by varying sample sizes.

[17] We tried also the five-year average measure from *t-4* to *t*. The results do not change appreciably. These results are available on request.

[Insert Table 1 about here]

The upper panel (A) reports regression results without controls (columns 1 to 4), while the lower panel (panel B, columns 5 to 8) shows the results obtained when including the three additional control variables (PC_GDP, IMO, and PARENT_EDUC). The estimates in column (1) of panel A indicate that a democratic transition from 0 to 1 of the BCFH dummy is associated with an increase of about 0.73 cm in height, a little less than the average decadal increase in heights. The coefficient is significant at the 1% level. In column (2), where we use the 5-year average dummy (BCFH_A5), we find a slightly larger and significant coefficient of around 0.79. Columns (3) and (4) show the results obtained from BMR (V3), when using the more demanding definition of democracy. When we focus on the enfranchisement of women, as in BMR_F, this reduces the number of observations, and also reduces the number of cases where a country can be considered a democracy because it does not have at least half of the female population with the right to vote. The results suggest evidence of a "quality premium"; as women are included in the democracy definition, the effect rises from 0.73 to 1.15 from column (1) to column (3) and the increasing effect, though smaller, is present also when using the averaged dummy variables, with the transition effect increasing from 0.79 (column 2) to 0.98 (column 4). In both cases, our results indicate a meaningful increase in the size of the coefficients when democratic reforms involve female enfranchisement. However, the larger effect must be interpreted carefully; it is not the effect on women's heights, but rather, the effect of women's enfranchisement on the adult heights of their (male) children.

Panel B of Table 1 includes a set of controls for per capita income (PC_GDP), infant mortality (IMO) and parental education (PARENT_EDU). As expected, GDP per capita and years of parental education both exhibit a positive association with heights, but they are overshadowed by the effect of democracy. By contrast, the coefficient on infant mortality is

negative and highly significant, implying that a reduction in infant mortality has a positive effect on height. This result underlines the importance of the disease environment as an influence on growth during early childhood, which has been the focus of previous studies of average height (Hatton 2011, 2014). As expected, the inclusion of these variables reduces the size of the coefficient on democracy, indicating that some of the effect of democracy comes through its influence on the more proximate determinants of height. However, the democracy effect remains uniformly statistically significant, economically relevant, and positive in sign, as predicted by our hypothesis. Given that both per capita GDP and parental education are not significant, our estimates exhibit a downward bias through the over-specification of the model. Finally, the finding of a health dividend from democratization is a result consistent with micro-level studies that stress the importance of female empowerment for health and heights (Bhalotra and Clots-Figueras, 2014).

5.2 Colonial Rule Extension as an Instrumental Variable

Least squares estimates are likely to be affected by potential unobservables, as well as by confounding effects that influence democracy such as improvement in education, or historical events influencing the persistence of non-democracies. Hence, in this section we consider possible endogeneity, which has often been neglected in this context. First, we provide evidence of exogenous changes in colonial area on European democratic transitions. As noted above, the colonial area is a theoretically relevant instrument for democracy insofar as maintaining a colonial empire often requires limiting domestic political rights given the added challenges that democracy entails when running a colonial empire.

To document our identification strategy, Figure 3 shows the declining trends in colonization as measured by the average number of colonies annually from 1860 to 1980.

[Insert Figure 3 about here]

The blue dots show the total number of colonized countries while the green and red lines show, respectively, the yearly decolonization and colonization flows. We can clearly detect three major events where the most famous colonial empires suffered complete or very large decolonization processes. These are the Austrian and German in 1918, followed by the one involving Great Britain in 1947 and the French one in 1960.

However, as noted previously, we use the *area colonized* in place of countries, because the former considers the complexity and gradualism of the decolonization phenomenon we are trying to capture, and this is mainly because colonies were very heterogeneous in size and because we do not have sufficiently reliable measures of population. The inverse relationship over time between the unweighted yearly average of the polity index and the colonized area is shown in Figure 4.

[Insert Figure 4 about here]

We first examine and document the presence of a robust and significant correlation in the reduced form by regressing heights on the continuous version of decolonization and by adding all the control variables used in the baseline regressions (Table 2). These differ only in the number of observations that were associated with the different measures of democracy. They are estimates of equation (3), which include controls and two-way fixed effects, and test for the presence of the reduced form relationship between the dependent variable and the instrument when leaving out the democratic treatment variables. We then check the robustness of this relationship by adding forward values of the IV measures, as illustrated in equation (3). Overall, for each of the three samples involving the BCFH, BCFH_A5 and BMR_F variables, we

estimate the baseline least square regression (i) without controls (columns 1, 4 and 7); (ii) with controls (columns 2, 5 and 8), and (iii) an extended model including forward values (two leads) of the instrumental variable (columns 3, 6 and 9). We have attempted alternative specifications such as an averaged version of the variable BMR_F, which delivers results comparable to those reported in Table 2.

[Insert Table 2 about here]

The coefficient estimates in Table 2, for different samples, indicate that the reduced form tests support the presence of a statistically robust (negative) and significant (always below the 1% level) effect of the combined first and second stage coefficients that we will show in Table 4. They also illustrate that, in contrast to panel B of Table 1 the coefficients on log PC_GDP and PARENT_EDUC become significantly positive. This suggests that democracy is partly a function of these variables as often suggested, following Lipset (1959). Furthermore, Table 3 reports a series of instrument independence tests. These reveal that the correlation between the instrument and the rest of the control variables used is quite weak and disappears once controlling for lagged values of the instrument.

[Insert Table 3 about here]

Our instrument does not appear to be a function of those variables, and it is not likely to be correlated with omitted factors that are associated with the control variables used. Thus, especially when examining the specifications in columns (5) and (6) and (7) of Table 3, we find that the colonised area AREA_COLONY_A10, used as instrument, is persistent as reflected by the coefficients on the lagged dependent variable.

We then turn to the IV estimates in Table 4, which provides direct comparisons with the OLS estimates in Table 1.

[Insert Table 4 about here]

Table 4, reports both first-stage F tests and first-stage coefficients. The negative and significant first-stage coefficient measuring the impact of colonial possessions on democracy is, as expected from the reduced forms estimates, consistently negative across all the eight specifications, and significant at the 1% level throughout. These results indicate that decolonization had a positive impact on the democratization process of the countries, because as the colonized area decreases democratization takes place. The first stage coefficient is reported in the bottom rows of the table. We also include the F-statistic obtained by squaring the t-statistics of the first-stage coefficient on the instrumental variable. In all cases the F-statistics are well above the value of 20, providing evidence of a strong instrument.

Panels A and B of Table 4 report, respectively, our estimates with and without controls. Starting from Panel A, we find that the IV coefficients exhibit the expected signs and are significant at the 1 percent level. In columns (1) to (4) we find that the coefficients on democracy are larger than the corresponding OLS estimates in Table 1. The coefficient obtained when using BCFH (column 1) increases from 0.73 to 1.04 (+41%), and the one using BCFH_A5 (column 2) from 0.79 to 1.10 (+39%). We find a similar pattern when using the measures of high-quality democracy. Similarly, the BMR_F dummy, exhibits an increase in the coefficient from 1.15 to 1.65 (+43%). A harmonized measure of high-quality democracy (BMR_F_A5) delivers an even larger increase from 0.98 to 1.69 (+72%).

Panel B presents a similar picture. We find slightly larger IV coefficients with an increase from 0.62 to 0.97 (a 56% increase) when BCFH is used (column 5), from 0.70 to 1.03 (47%

increase) using BCFH_A5 (column 6) as democratic treatment, from 0.94 to 1.58 (68% increase) and from 0.79 to 1.64 (107% increase) when using, respectively the BMR_F variable and the harmonized one, BMR_F_A5 (columns 7 and 8). These estimates confirm a downward bias in the two-way fixed effects models of Table 1, which is larger when including the controls. We also confirm a height dividend from democratization in the IV regressions, indicating an increase in the effect from 1.04 to 1.65 (56% increase) compared to the non-averaged measures (compare with columns 1 and 3 of Table 1) and an increase from 1.10 to 1.69 (39% increase) for the averaged measures (compared with columns 2 and 4 of Table 1). Similar premia can be observed in columns 5 and 7 of panel B exhibiting an increase from 0.97 to 1.58 (62% increase), and in columns 6 and 8 (estimated with averaged dummies) from 1.04 to 1.64 (57% increase).

Part of the substantial increase observed can be attributed to being able to pick up only a local average treatment effect (LATE). This could be because the effect is concentrated in a group of particularly sensitive complier countries, while the rest are non-sensitive to the instrumental selection into treatment. However, it is possible that the instrument is helping also to correct the intentional measurement bias we created when defining our BCFH variables. As documented above, this variable is more likely to classify a democracy as a non-democracy than vice versa. If so, then we are not picking up the whole democratization effect wherever an autocracy that should be a democracy exhibits greater average stature. The IV estimation might, at least in part, correct for this bias and confirm that we are estimating a lower-bound of the democratic effect. Overall, our estimates indicate that the spread of democracy, driven by increasing political participation, especially of women, was an important vehicle for the diffusion of improvement in physical welfare. However, it is important to examine how sensitive our results are to falsification tests, and what are the likely mechanisms involved. On the latter, democracy might have prioritised the implementation of public health and healthcare programs as well as a reduction of inequality and the diffusion of information.

5.3 Residual inclusion and falsification tests

In this section we propose two additional checks of our estimates. The first is a test of residual inclusion, and it aims at supporting the validity of the instrument used. We implement a two-step procedure by first regressing democracy on the instrument. In the second step, we include the original democracy measure and the residuals estimated in the first one by using bootstrapped standard errors. If the instrument is valid, we would expect the correlation between heights and the estimated residual (the part of democracy not explained by the IV) to be weak. The results in Table 5 confirm this expectation.

[Insert Table 5 about here]

The second test is to include forward values of our four measures of democracy. By forward value we mean 20 years forward, (four leads in the 5-year panel) to avoid capturing a possible overlapping effect of the previous cohort. In other words, we expect that after 20 years, height becomes quite stable and cannot be influenced any further. If our inference is valid then we should find that this does not significantly change our key results, and the coefficients on the forward values should be weakly significant or not significant at all. The results are displayed in Table 6.

[Insert Table 6 about here]

Our results confirm the expectation that the forward values are non-significant or weakly significant, except for column (2) where the significance level is 5%. However, the coefficients on the main variables remain large and significant, although about 20% smaller on average than those reported in Table 1. This suggests that it is exposure during early childhood that matters

most. And when using a system-IV the only significance found in column (2) of Table 6 disappears. The exercise conducted for the IV version of our estimates proceeds in the following way. To instrument both the current and forward values of the treatment variables, we used the colonial area for the current value, as in Table 4, and its 20-year forward value for the respective forward values of the treatment variable. The first stage is a system of equations using both instruments for each treatment variable in the first stage, and then using both the instrumented treatment variables in the second stage to estimate their effect on heights. Overall this is a 3-equation system estimated with IV.

The three equations are:

$$H_{it} = \xi_1 + \xi_2 D_{it} + \xi_3 D_{it+20} + \boldsymbol{\xi_4'} \boldsymbol{X_{it}} + \pi_i + \tau_t + \varepsilon_{it} \quad (4.1)$$

$$D_{it} = \alpha_1 + \alpha_2 Inst_{it} + \alpha_3 Inst_{it+20} + \boldsymbol{\alpha_4}' \boldsymbol{X_{it}} + \theta_i + \delta_t + \mu_{it} \quad (4.2)$$

$$D_{it+20} = \eta_1 + \eta_2 Inst_{it} + \eta_3 Inst_{it+20} + \boldsymbol{\eta_4}' \boldsymbol{X_{it}} + \theta_i + \delta_t + \mu_{it} \quad (4.3)$$

In Table 7 we report only the results with controls, also including selected first-stage results in the same table.

[Insert Table 7 about here]

The results for the BCFH variable confirm the results in Table 4, but the coefficients become slightly smaller from 0.97 to 0.96 when using BCFH and from 1.03 to 0.84 for BCFH_A5. The coefficients on the dummies that also include female suffrage (BMR_F and BMR_F_A5) increase, respectively from 1.58 to 2.21, and from 1.64 to 2.00. All the coefficients are significant at 1% (columns 1, 3, and 4) or 5% (column 2). Most importantly, the forward value of the treatment variable is never significant, and the democratic dummies respond consistently to their own-period instruments, revealing the lack of cross-influence of the current/forward

instruments on the forward/current democratic dummies. This supports the existence of a channel of transmission between instrument and democratic status by nesting a set of similar falsification tests in the first stage, but currently testing the robustness of the robust conditional correlation between instrument and treatment variable.

In a separate appendix (Appendix III) we submit our model to a battery of additional tests. These include using a dummy variable version of our instrument (colonies vs no colonies), using different thresholds for the democracy dummy and using versions of the democracy variable derived from alternative sources. These tests all support the finding of a positive and significant effect of democracy on height in both TWFE and IV estimates. We also explore adding trends, using detrended version of the dependent variable, and adding separate war dummies. Finally, although we only have a limited number of observations, we explore possible heterogeneity in the effect. We find that interactions between the democracy variable and interactions with country group variables (north, centre, south) are generally insignificant while the main effect remains robust. Dropping observations country-by-country and period-by period has only modest effects on the democracy coefficient.

6 Mechanisms

In this section, we explore several possible mechanisms through which the democratization variables might affect heights. These are represented by the following variables:

i. UCOV: the development of universal health coverage measured as a discrete variable;
ii. GINI: is the gini coefficient of income;
iii. URB100: percent in urban areas in excess of 100,000, beginning of period;
iv. RWAY: railway miles per 1000 population;
v. WAR: number of years of war in the five-year period divided by 5.

These variables allow us to explore the mediating effect of a set of the intervening factors that form potential links between political systems and health outcomes, and the heterogeneous effect between just being democratic and being an "established" democracy. The methodology used to estimate the various mechanisms when using OLS and IV are described in Appendix I, section AI4. In short, we employ a series of two-step estimation procedures, the first estimating the mechanism explained by the democratic variable, and the second estimating the association between the estimated mechanism and heights. For ease of exposition and to save space, we report only a portion of the full set of mechanisms tested (Table 8 and Table 9): in the main text we report only the estimates using only BCFH_A5 and BMR_F_A5, only the results from the first-step of the procedure, and only for the IV approach (the impact of the instrumented democratic treatment on the mechanism variable).[18] Table 8 does not include controls, while Table 9 includes controls but does not report their coefficients. In both tables we report the F-statistics and coefficients from the first-stage to ease the readability of the tables, although these results are the same as those reported in Table 4.

[Insert Table 8 and Table 9 about here]

The results in Table 8 are obtained by regressing all the five possible mechanisms identified above (UCOV, GINI, URB100, RWAY, and WAR) on the two selected democratic treatments (BCFH_A5 and BMR_F_A5). We first observe that both democratic treatments have a positive, significant, and sizable effect on the probability of transitioning towards a universal healthcare system coverage (UCOV, columns 1 and 2); second (columns 3 and 4) a negative impact on the Gini index, meaning a reduction in income inequality. This is more significant

[18] All the remaining results, those involving also the 2WFE and the second-step effects of the estimated mechanism on height both for the 2WFE and IV estimates, are displayed in Appendix II Tables AII2-AII6.

when using BCFH (5%) than BMR_F (10%), but overall produces comparably sized coefficients (-1.78 in column 3 and -1.98 in column 9). When looking at the impact on the urbanization index the results are less convincing overall (columns 5 and 6) and become insignificant once controls are added in Table 9. In the last two sets of regressions we find instead that the impact on infrastructure building, (columns 7 and 8) is positive, quite significant and sizable (about 1 more mile per 1000 population). There is also a robust negative correlation between the democratic dummies and the average years spent in war (columns 9 and 10). As for the impact, we find a reduction of 0.25 percentage points, which can be also interpreted as a reduction of about 5% of the time spent in war for democracies compared with non-democracies.

Table 9 confirms the same results when controls are included. However, it also highlights some differences between the effects of BCFH and BMR_F. The positive effect of democratic institutions on the likelihood of developing a universal healthcare system (this must be interpreted as the marginal probability effect in a linear probability model) is much larger when democracies that are also more inclusive of the female electorate are considered (columns 1 and 2). The same difference in strength is also shown when the Gini index is considered, and the effect size is larger for the two measures of democracy considered (columns 3 and 4). Estimates with controls indicate an insignificant effect of democratization on urbanization (columns 5 and 6). Furthermore, we confirm a robust and positive effect of democratization and the development of infrastructures (columns 7 and 8) and a negative effect of democracy on the average number of years spent on war (columns 9 and 10). Finally, the same estimates using infant mortality as the mechanism (columns 11 and 12) yields a negative effect when the female-augmented measure of democratization is used.

7 Conclusion

We have examined the causal effect of the adoption of democratic institutions on human stature as a measure of physical wellbeing in western Europe over more than a century. We explore alternative measures that capture the advance of democracy and especially the extension of the franchise to women. In order to identify the causal effect, we use country and period fixed effects but we also exploit variation in the process of decolonisation in many European countries as an instrument for advances in the democratic quality of coloniser countries. Of course, our results apply only to this setting and we cannot claim that they would apply in the same way to other world regions or other historical eras.

Nevertheless, our results provide robust evidence that an expansion of democracy and, specifically the extension of democratic rights captured by the expansion of female suffrage, has a sizable, significant and positive effect on human heights. We find that the transition from autocracy to democracy increases adult height from about 0.7, which is 6.4% percent of the increase in height in the 120 years from 1860 to 1980. Furthermore, adding voting right extensions to women, increases the overall effect on heights by 1.7 centimetres (11% of the total increase). We interpret these results as showing that democracies enhance the conditions that underlie physical wellbeing during childhood. Our results survive a range tests that include different specifications, the inclusion of controls, and other robustness tests.

Our results are consistent with existing studies that examine evidence the association between democracy and health (Besley and Kudamatsu, 2006) alongside other evidence, that has reported an effect of democracy resulting from female representation (Chattopadhyay and Duflo, 2004; Bhalotra and Clots-Figueras, 2014), as well as with the transition to liberal democracy in Germany (Komlos and Kriwy, 2003) and Spain (Costa-Font and Gil, 2008). The

study of the potential mechanisms driving this effect, is consistent with a narrative suggesting that democratic institutions are more likely prioritise reforms that improve health and wellbeing such as the expansion of health care coverage but there may also be other potential indirect effects such as advances in infrastructure development, reductions in inequality and reduced risk of conflict through exposure to wars.

More widely, these results are suggestive evidence of what seems to be a wellbeing dividend from the establishment of democratic institutions. The advent of democratic institutions gives rise to changes in welfare institutions, including the infrastructure necessary for such institution to deliver welfare services, and potentially reforms that reduce conflict and inequality. Although, democracy can be captured by small elites and is not always sensitive to minorities (Krueger et al., 2015; Powell-Jackson et al. 2011), the net effect is to deliver higher overall wellbeing. These results add to other findings that suggest a causal effect of democracy on growth (recent evidence, for example from Acemoglu et al., 2019) and more generally support an overall welfare effect of government institutions.

References

Abrams, B. A. and Settle, R. F. (1999), "Women's suffrage and the growth of the welfare state" *Public Choice*, 100(3), pp. 289–300.

Acemoglu, D. and Robinson, J. A. (2006), *Economic Origins of Dictatorship and Democracy*, London: Cambridge University Press.

Acemoglu, D., Johnson, S., Robinson, J. A., and Yared, P. (2008), "Income and democracy," *American Economic Review*, 98(3), pp. 808-42.

Acemoglu, D., Naidu, S., Restrepo, P., and Robinson, J. A. (2015), "Democracy, redistribution, and inequality," in *Handbook of Income Distribution* (Vol. 2), Elsevier, pp. 1885-1966.

Acemoglu, D., Naidu, S., Restrepo, P., & Robinson, J. A. (2019). Democracy does cause growth. *Journal of Political Economy*, 127(1), pp. 47-100.

Aidt, T. S., Dutta, J. and Loukoianova, E. (2006), "Democracy comes to Europe: Franchise extension and fiscal outcomes, 1830–1938," *European Economic Review*, 50(2), pp. 249-283.

Aidt, T. S. and Jensen, P. S. (2014), "Workers of the world, unite! Franchise extensions and the threat of revolution in Europe, 1820–1938," *European Economic Review*, 72, pp. 52-75.

Alvarez, M., Cheibub, J. A., Limongi, F. and Przeworski, A. (1996), "Classifying Political Regimes," *Studies in Comparative International Development*, 31(2), pp. 3-36.

Besley, T. and Kudamatsu, M. (2006), "Health and democracy," *American Economic Review*, *Papers and Proceedings*, 96 (2), pp. 313-318.

Bhalotra, S. and Clots-Figueras, I. (2014), "Health and the political agency of women," *American Economic Journal: Economic Policy*, 6(2), pp. 164-97.

Bobba, M. and Coviello, D. (2007), "Weak instruments and weak identification, in estimating the effects of education, on democracy," *Economics Letters*, 96 (3), pp. 301-306.

Boix, C., Miller, M. and Rosato. S. (2013), "A complete data set of political regimes, 1800-2007," *Comparative Political Studies*, 46(12), pp. 1523-1554.

Bozzoli, C., Deaton, A. S. and Quintana-Domeque, C. (2009), "Child mortality, income and adult height," *Demography*, 46(4), pp. 647–69.

Brady, H. E., Verba, S., & Schlozman, K. L. (1995), "Beyond SES: A resource model of political participation,". *American Political Science Review*, 89(2), pp. 271-294.

Burroway, R. (2016), "Democracy and child health in developing countries," *International Journal of Comparative Sociology*, 57 (3), pp. 338 –364.

Case, A. and Paxson, C. (2010), "Causes and consequences of early-life health," *Demography*, 47 (S1), pp. S65-S85.

Chapman, J. (2018), "Democratic reform and opposition to government expenditure: Evidence from nineteenth-century Britain," *Quarterly Journal of Political Science*, 13(4), pp. 363-404.

Chapman, J. (2019), "The contribution of infrastructure investment to Britain's urban mortality decline 1861-1900," *Economic History Review*, 72(1) pp 233-259.

Chattopadhyay, R. and Duflo, E. (2004), "Women and policy makers: Evidence from a randomised policy experiment in India," *Econometrica*, 72 (5), pp. 1409–1443.

Cheibub, J. A., Gandhi, J. and Vreeland, J. R. (2010), "Democracy and dictatorship revisited," *Public Choice,* 143 (1–2), pp. 67–101.

Cooper, F. (1997), "Modernizing bureaucrats, backward Africans, and the development concept, Ch. 3 in F. Cooper and R. Packard (eds.), *International Development and the Social Sciences: Essays on the History and Politics of Knowledge*, Berkeley: University of California Press, pp. 64-92.

Coppedge, M., Tiscornia, L. and Lindberg, S. I. (2015), "Varieties of Democratic Diffusion: Colonial Networks," Göteborgs Universitet. V-Dem Institute, Working paper 2015:2.

Costa-Font, J., and Gil, J. (2008), "Generational effects and gender height dimorphism in contemporary Spain," *Economics and Human Biology*, 6(1), pp. 1-18.

Currie, J. (2009), "Healthy, wealthy and wise: Socioeconomic status, poor health in childhood, and human capital development," *Journal of Economic Literature*, 47 (1), pp. 87-122.

Cutler, D. and Miller, G. (2005), "The role of public health improvements in health advances: The twentieth century United States," *Demography*, 42(1), pp. 1– 22.

De Chaisemartin, C. (2017), "Tolerating defiance? Local average treatment effects without monotonicity," *Quantitative Economics,* 8 (2), pp. 367-396.

Easterlin, R. A. (1999), "How beneficent is the market? A look at the modern history of mortality," *European Review of Economic History*, 3 (3), pp. 257-294.

Franco, A., Álvarez-Dardet, C. and Ruiz, M. T. (2004), "Effect of democracy on health: ecological study," *British Medical Journal*, 329, pp. 1421-1423.

Frey, B. S., and Stutzer, A. (2000), "Happiness prospers in democracy," *Journal of Happiness Studies*, 1(1), pp. 79–102.

Galbraith, J. K. (1994). *A Journey through Economic Time: A Firsthand View*, Boston MA: Houghton Mifflin Harcourt.

Golder, M. (2005), "Democratic electoral systems around the world, 1946–2000," *Electoral Studies,* 24 (1), pp. 103–121.

Gartzke, E. and Rohner, D. (2011) "The Political Economy of Imperialism, Decolonisation and Development," *British Journal of Political Science*, 41, pp. 525-556

Gradstein, M., & Milanovic, B. (2000). Does liberté = egalité? A survey of the empirical evidence on the links between political democracy and income inequality.

Hatton, T. J. (2011), "Infant mortality and the health of survivors: Britain 1910-1950," *Economic History Review*, 64 (3), pp. 951-972.

Hatton, T. J. (2014), "How have Europeans grown so tall?" *Oxford Economic Papers*, 66, pp. 349-372.

Hatton, T. J. and Bray, E. (2010), "Long run trends in the heights of European men, 19th and 20th Centuries," *Economics and Human Biology,* 8 (3), pp. 405-413.

Högström, J. (2013), "Does the choice of democracy measure matter? Comparisons between the two leading democracy indices, Freedom House and Polity IV," *Government and Opposition*, 48 (2), pp 201-221.

Hopkins, A. G. (2008), "Rethinking Decolonization," *Past and Present*, 200, pp. 211-247.

Inglehart, R., Foa, R., Peterson, C., and Welzel, C. (2008), "Development, freedom, and rising happiness: A global perspective (1981-2007)," *Perspectives on Psychological Science*, 3(4), pp. 264–285.

Keefer, P., and Khemani, S. (2005), "Democracy, public expenditures, and the poor: understanding political incentives for providing public services," *World Bank Research Observer*, 20(1), pp. 1-27.

Kesztenbaum, L. and Rosenthal, J.-L. (2017), "Sewers' diffusion and the decline of mortality: The case of Paris 1880–1914," *Journal of Urban Economics*, 98, pp. 174– 86.

Klomp, J. and de Haan, J. (2009), "Is the political system really related to health?" *Social Science and Medicine*, 69 (1), pp. 36–46.

Klose, F. (2014), "Decolonization and Revolution Decolonization and Revolution," Available at: http://ieg-ego.eu/en/threads/europe-and-the-world/european-overseas-rule/fabian-klose-decolonization-and-revolutions

Komlos, J. and Kriwy, P. (2003), "The biological standard of living in the two Germanies," *German Economic Review*, 4(4), 459-473.

Kristenson, M., Eriksen, H. R., Sluiter, J. K., Starke, D. and Ursin, H. (2004), "Psychobiological mechanisms of socioeconomic differences in health," *Social Science and Medicine*, 58 (8), pp. 1511–1522.

Krueger P. M., Dovel K. and Denney J. T. (2015), "Democracy and self-rated health across 67 countries: A multilevel analysis," *Social Science and Medicine,* 143(3), pp.137-144.

Kudamatsu, M. (2012), "Has democratisation reduced infant mortality in sub-Saharan Africa? Evidence from micro data," *Journal of the European Economic Association*, 10(6), pp. 1294–1317.

Lin, R. T., Chen Y. M., Chien, L. C. and Chan, C. C. (2012), "Political and social determinants of life expectancy in less developed countries: a longitudinal study," *BMC Public Health*, 85(12), pp. 1-8.

Lott, John R., J. and Kenny, L. W. (1999). Did women's suffrage change the size and scope of government? *Journal of Political Economy*, 107(6), 1163–1198.

Lipset, S. M. (1959), "Some social requisites of democracy," *American Political Science Review*, 53(1), pp. 69-105.

Madsen, J. B., Raschky, P. A. and Skali, A. (2015), "Does democracy drive income in the world, 1500–2000?" *European Economic Review*, 78, pp.175–95.

Marshall, M. G., Gurr, T. R., & Jaggers, K. (2014). Polity IV project: Political regime characteristics and transitions, 1800–2013. Center for Systemic Peace..

Meltzer, A. H. and Richard, S. F. (1981), "A rational theory of the size of government," *Journal of Political Economy*, 89 (5), pp. 914-927.

Miller, G. (2008), "Women's suffrage, political responsiveness, and child survival in American history," *Quarterly Journal of Economics*, 123 (3), pp. 1287–1327.

Moral-Benito, E. and Bartolucci, C. (2012), "Income and democracy: Revisiting the evidence," *Economics Letters*, 117(3), pp. 844-847

Muntaner, C, Borrell, C., Ng, E., Chung, H., Espelt, A., Rodriguez-Sanz, M., Benach, J. and O'Campo, P. (2011), "Politics, welfare regimes, and population health: controversies and evidence," *Sociology of Health and Illness*, 33 (6), pp. 946–964.

Nesbitt, N. (2007), "Departmentalization and the logic of decolonization,".*L'Esprit Créateur*, 47(1), pp. 32-43.

Norris, P. (2012), *Making Democratic Governance Work: How Regimes Shape Prosperity, Welfare, and Peace*, New York: Cambridge University Press.

Persico, N., Postlewaite, A., and Silverman, D. (2004), "The effect of adolescent experience on labor market outcomes: The case of height," *Journal of Political Economy*, 112 (5), pp. 1019-1053.

Persson, T., and Tabellini, G. (2009), "Democratic capital: The nexus of political and economic change," *American Economic Journal: Macroeconomics*, 1(2), pp. 88-126.

Powell-Jackson T., Basu S., Balabanova D., McKee M. and Stuckler D. (2011), "Democracy and growth in divided societies: A health-inequality trap?"', *Social Science and Medicine*, 73, pp. 33-41.

Preston, S. H. (1975), "The changing relation between mortality and the level of economic development," *Population Studies*, 29 (2), pp. 231-248.

Przeworski A., Alvarez, M. A., Cheibub, J. A., and Limongi, F. (2000), *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*, Cambridge: Cambridge University Press.

Ross, M. (2006), "Is democracy good for the poor?" *American Journal of Political Science*, 50 (4), pp. 860–874.

Ruger, J. P. (2005), "Democracy and health," *QJM: An International Journal of Medicine*, 98 (4), pp.299–304.

Safaei, J. (2006), "Is democracy good for health?" *International Journal of Health Services*, 36 (4), pp. 767–786.

Sen, A. K. (1999), "Democracy as a universal value," *Journal of Democracy*, 10(3), pp. 3-17.

Silventoinen, K. (2003), "Determinants of variation in adult height," *Journal of Biosocial Science*, 35 (2), pp. 263-285.

Silventoinen, K., Kaprio, J., Lahelma, E. and Koskenvuo, M. (2000), "Relative effect of genetic and environmental factors on body height: Differences across birth cohorts among Finnish men and women," *American Journal of Public Health*, 90(4), pp. 627-630.

Steckel, R. H. (1995), "Stature and the standard of living," *Journal of Economic Literature*, 33(4), 1903-1940.

Steckel, R. H. (2009), "Heights and human welfare: Recent developments and new directions," *Explorations in Economic History*, 46 (1), pp. 1-23.

Swiss, L., Fallon, K. and Burgos, G. (2012), "Reaching a critical mass: Women's political representation and child health in developing countries," *Social Forces*, 91 (2), pp. 531–558.

Tomlinson, J. (2003), "The Decline of the Empire and the Economic 'Decline' of Britain," *Twentieth Century British History*, 14 (3) pp. 201–221,

Varkey, P., Kureshi, S., and Lesnick, T. (2010), "Empowerment of women and its association with the health of the community," *Journal of Women's Health*, 19(1), pp. 71-76.

Wang, Y-T., Lindenfors, P., Sundström, A., Jansson, F. Paxton, P. and Lindberg, S. I. (2017), "Women's rights in democratic transitions: A global sequence analysis, 1900–2012," *European Journal of Political Research*, 56, 735–75.

Weil, D. N. (2007), "Accounting for the effect of health on economic growth," *Quarterly Journal of Economics*, 122 (3), pp. 1265-1306.

Weil, D. N. (2014), "Health and economic growth," *Handbook of Economic Growth*, Vol. 2, Amsterdam: Elsevier, pp. 623-682.

Wigley S. and Akkoyunlu-Wigley A. (2011), "The impact of regime-type on health: Does redistribution explain everything?" *World Politics,* 63(4), pp. 647–677.

Wimmer, A., and Min, B. (2006), "From empire to nation-state: explaining wars in the modern world, 1816–2001," *American Sociological Review*, 71(6), pp. 867-897.

Zweifel, T. D. and Navia, P. (2000), "Democracy, dictatorship and infant mortality," *Journal of Democracy*, 11, pp. 99-114.

Tables and Figures

Table 1. Baseline estimates

(A)	(1)	(2)	(3)	(4)
Treat is	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Democracy:	0.726***	0.794***	1.151***	0.984***
	(0.073)	(0.080)	(0.116)	(0.099)
Observations	256	256	256	256
R-squared	0.974	0.975	0.976	0.975
Country FE	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓
Controls	×	×	×	×

(B)	(5)	(6)	(7)	(8)
Treat is:	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Democracy:	0.623***	0.698***	0.936***	0.788***
	(0.063)	(0.071)	(0.096)	(0.081)
PC_GDP (log)	0.448	0.420	0.396	0.353
	(0.058)	(0.055)	(0.052)	(0.046)
IMO	-0.091***	-0.092***	-0.092***	-0.094***
	(-0.135)	(-0.137)	(-0.136)	(-0.139)
PARENT_EDUC	0.135	0.129	0.067	0.084
	(0.053)	(0.051)	(0.026)	(0.033)
Observations	247	247	247	247
R-squared	0.976	0.976	0.977	0.976
Country FE	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓
Controls	✓	✓	✓	✓

Notes: The dependent variable is five-year averages of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. In panel B we include controls, all drawn from Hatton (2014, H14); please see Table AI1 for details on definitions and original sources. We report, respectively, (a) the estimated coefficient, (b) the robust standard errors in parentheses below (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). All regressions contain both country fixed effects and year dummies.

Table 2. Reduced Form Estimates (including leads of the IV)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample is:	BCFH			BCFH_A5			BMR_F		
Instrument	-0.404***	-0.124***	-0.144**	-0.414***	-0.129***	-0.150**	-0.379***	-0.129***	-0.162***
	(0.036)	(0.020)	(0.062)	(0.037)	(0.021)	(0.061)	(0.034)	(0.019)	(0.058)
IV (1 lead)			0.076			0.096			0.100
			(0.109)			(0.108)			(0.104)
IV (2 leads)			-0.083			-0.101			-0.092
			(0.074)			(0.075)			(0.071)
PC_GDP (log)		2.988***	3.402***		2.987***	3.368***		2.834***	3.257***
		(0.377)	(0.410)		(0.376)	(0.410)		(0.333)	(0.359)
IMO		-0.177***	-0.152***		-0.174***	-0.148***		-0.180***	-0.158***
		(0.032)	(0.032)		(0.031)	(0.031)		(0.032)	(0.032)
PARENT_EDUC		0.675***	0.718***		0.676***	0.717***		0.723***	0.752***
		(0.098)	(0.100)		(0.100)	(0.101)		(0.092)	(0.093)
Obs.	271	263	235	255	247	221	300	291	261
R-squared	0.302	0.871	0.871	0.308	0.875	0.875	0.278	0.872	0.873
Controls	×	✓	✓	×	✓	✓	×	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. All results are obtained by regressing HEI on the set of the three controls used also in the baseline results, and on the preferred instrument. Instrument (IV) is the log of the moving average (*t*-9, *t*) of the total area colonized by country *i* in year *t*, (AREA_COLONY_A10) originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. The reference to the different democracy variables of interest in the column headings refers only to the sample, which is that for the non-missing observations for the three democracy variables, BCFH, BCFH_A5, BMR_F, and which is therefore used to estimate the reduced forms. The democratic variables are *omitted* from the reduced form regression. We report, respectively, (a) the estimated coefficient, (b) the robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1). All regressions contain both country and year dummies.

Table 3. Instrumental Variable Independence Tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PC_GDP (log)	-2.468			-2.829*	0.557	0.277	0.522
	(1.627)			(1.634)	(0.882)	(0.796)	(0.824)
IMO		0.095		0.122	0.011	0.037	0.050
		(0.098)		(0.096)	(0.039)	(0.038)	(0.045)
PARENT_EDUC			-0.199	-0.148	-0.271*	-0.113	-0.148
			(0.294)	(0.286)	(0.147)	(0.121)	(0.124)
Lags of colonial area (MA10)							
Lag 1					0.912***	1.426***	1.526***
					(0.030)	(0.125)	(0.130)
Lag 2						-0.556***	-0.809***
						(0.126)	(0.189)
Lag 3							0.169*
							(0.092)
Obs.	247	247	247	247	242	231	220
R-squared	0.813	0.812	0.811	0.815	0.974	0.980	0.981
Year dummies	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log of the total area colonized by country *i* in year *t*, and originally expressed in km^2 (AREA_COLONY_A10). Colonial relationships in dyadic form are taken from WM06. In this table we also control, progressively, for the 1, 2, and 3rd lagged values of the instrument. Other controls are drawn from Hatton (2014, H14), please see Table AI1 for details on definitions and original sources. We report, respectively, (a) the estimated coefficient, (b) the robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1). All regressions contain both country fixed effects and year dummies.

Table 4. Instrumental Variables 2nd Stage Results

(A)	(1)	(2)	(3)	(4)
Treat is:	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Democracy.	1.035***	1.102***	1.649***	1.688***
	(0.337)	(0.355)	(0.552)	(0.567)
Observations	255	255	255	255
R-squared	0.974	0.974	0.975	0.974
Year dummies	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Controls	×	×	×	×
Min. Eig.	63.34	55.20	28.96	26.18
F-stat	72.25	65.69	31.75	29.25
1st stage coef.	-0.044***	-0.041***	-0.028***	-0.027***
	(0.005)	(0.005)	(0.005)	(0.005)
Durbin pval	0.368	0.404	0.383	0.239
Hausman-Wu pval	0.410	0.445	0.425	0.281
(B)	(5)	(6)	(7)	(8)
Treat is:	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Democracy.	0.967***	1.035***	1.577***	1.640***
	(0.355)	(0.378)	(0.583)	(0.611)
PC_GDP (log)	0.381	0.348	0.278	0.119
	(0.440)	(0.459)	(0.426)	(0.485)
IMO	-0.087***	-0.089***	-0.087***	-0.090***
	(0.027)	(0.026)	(0.026)	(0.026)
PARENT_EDUC	0.137	0.129	0.024	0.033
	(0.087)	(0.085)	(0.097)	(0.096)
Obs.	247	247	247	247
R2	0.976	0.976	0.976	0.975
Year dummies	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Min Eig.	58.49	50.32	26.75	23.29
F-stat	65.30	57.65	28.62	25.62
1st stage coef.	-0.043***	-0.041***	-0.027***	-0.026***
	(0.005)	(0.005)	(0.005)	(0.005)
Durbin pval	0.314	0.362	0.273	0.169
Hausman-Wu pval	0.360	0.408	0.319	0.211

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section
AI3. Controls are drawn from Hatton (2014, H14), see Table A1. Instrument (IV) is the log of the moving average (t-9, t) of the total area colonized by country *i* in year *t* (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. For full 1st stage results, please consult Table AII3. We report, respectively, (a) the estimated coefficient, (b) the robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1). All regressions contain both country fixed effects and year dummies.
Note: the H_0 for Durbin Hausman-Wu (DHW) tests is that the variable is exogenous. P-values cannot reject H_0.

Table 5. Test of 2-stage Residual Inclusion

	(1)	(2)	(3)	(4)
Treat is:	BCFH_A5	BMR_F	BCFH_A5	BMR_F_A5
Bootstrap SE	500reps	500reps	500reps	500reps
Treat's coef.	1.102***	2.201***	1.035**	1.707**
	(0.410)	(0.685)	(0.426)	(0.712)
1st Stage Est. Residual	-0.391	-1.402*	-0.419	-1.048
	(0.466)	(0.751)	(0.487)	(0.785)
Observations	255	300	247	291
R-squared	0.974	0.969	0.976	0.972
Country FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Controls	×	×	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including the stricter condition for being a democracy that at least half of the adult female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. Controls are drawn from Hatton (2014, H14), see Table A1. Instrument (IV) is the log of the moving average (t-9, t) of the total area colonized by country i in year t (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. Estimated first-stage residuals are included in the second-stage regression. The procedure is two stages; the coefficients reported are from the second-stage. We report, respectively, (a) the estimated coefficient, (b) the Robust bootstrapped errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1). All regressions contain both country fixed effects and year dummies.

.

Table 6. Falsification Test: 2WFE

	(1)	(2)	(3)	(4)
Treat is:	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Treat coef.	0.477**	0.655***	0.852***	0.737***
	(0.215)	(0.238)	(0.223)	(0.214)
TreatF (4 leads)	0.187	0.480**	0.271	0.362*
	(0.242)	(0.232)	(0.201)	(0.202)
Observations	250	222	291	291
R-squared	0.973	0.978	0.972	0.972
Country FE	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓
Controls	✓	✓	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. TreatF is the 4-period lead (20 years forward) of the democracy variable. Controls are drawn from Hatton (2014, H14), see Table A1. We report, respectively, (a) the estimated coefficient, (b) the robust bootstrapped errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1). All regressions contain both country fixed effects and year dummies.

Table 7. Falsification Test: System - IV

	(A) Second-stage regression results			
	(1)	(2)	(3)	(4)
Treat is:	BCFH	BCFH_A5	BMR_F	BMR_F_A5
Treat (Democracy)	0.960***	0.840**	2.212***	2.001***
	(0.370)	(0.397)	(0.804)	(0.658)
TreatF(orward) (4 leads ≈ 20 years)	-0.321	0.178	-0.002	-0.003
	(0.507)	(0.541)	(0.742)	(0.657)
	(B) Selected results from the two first-stage regressions			
1st equation: Treat dependent variable	(1.1)	(2.1)	(3.1)	(4.1)
IV on Treat	-0.047***	-0.044***	-0.021***	-0.023***
	(0.005)	(0.006)	(0.005)	(0.005)
IVF (1 cohort forward) On Treat	0.010*	0.016**	0.014**	0.016***
	(0.006)	(0.007)	(0.006)	(0.006)
2nd equation : TreatF dependent variable	(1.2)	(2.2)	(3.2)	(4.2)
IV on TreatF(orward)	-0.008*	-0.011**	-0.005	-0.007
	(0.005)	(0.005)	(0.005)	(0.005)
IVF(1 cohort forward) on TreatF(orward)	-0.037***	-0.034***	-0.023***	-0.025***
	(0.006)	(0.006)	(0.006)	(0.006)
Observations	250	222	291	291
R-squared	0.971	0.978	0.967	0.967
Country FE	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓
Controls	✓	✓	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. Instrument (IV) is the log of the moving average (t-9, t) of the total area colonized by country i in year t (AREA_COLONY_A10), and originally expressed in km2. Colonial relationships in dyadic form are taken from WM06. Controls are drawn from Hatton (2014, H14), see Table A1. Here we run IV-system estimation with two first-stage equations jointly using the colonial area as usual, and its 4-period forward value. The two dependent variables of the first-stage regressions are, respectively, the democracy measures used throughout the paper (Treat), and its 4-period leading value (TreatF). As these are both treated as endogenous, we use two instruments: the IV used throughout the IV-estimations in the paper, and IVF(orward) obtained by consistently advancing the IV value by four periods, which is 20years forward. Panel (A) reports the second-stage results demonstrating robustness to including forward values. Panel (B) reports selected first-stage results coefficients from the two first-stage equations. We report, respectively, (a) the estimated coefficient, (b) the robust bootstrapped errors in parentheses below (*** $p<0.01$, ** $p<0.05$, * $p<0.1$.). All regressions contain both country fixed effects and year dummies and the full set of controls.

Table 8. Mechanisms. IV regressions with no controls

Treat is:	(1) BCFH_A5 on UCOV	(2) BMR_F_A5 on UCOV	(3) BCFH_A5 on GINI	(4) BMR_F_A5 on GINI	(5) BCFH_A5 on URB100	(6) BMR_F_A5 on URB100	(7) BCFH_A5 on RWAY	(8) BMR_F_A5 on RWAY	(9) BCFH_A5 on WAR	(10) BMR_F_A5 on WAR
Democracy.	0.453***	0.495**	-1.783**	-1.979*	1.628	7.751**	0.786***	1.183***	-0.247***	-0.271**
	(0.146)	(0.220)	(0.764)	(1.195)	(2.005)	(3.946)	(0.164)	(0.336)	(0.085)	(0.130)
Obs.	255	300	255	300	249	287	255	299	237	282
R-squared	0.671	0.682	0.967	0.965	0.875	0.802	0.635	0.518	0.428	0.593
Y-dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	×	×	×	×	×	×
Min. Eig.	55.20	19.65	55.20	19.65	58.61	23.76	55.20	18.73	54	25.84
F-stat.	65.69	19.97	65.69	19.97	68.92	22.92	65.69	19	64.52	22.81
1st stage coef.	-0.041***	-0.022***	-0.041***	-0.022***	-0.042***	-0.025***	-0.041***	-0.022***	-0.045***	-0.027***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. Mechanisms chosen are variables taken from Hatton (2014, H14). These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; GINI: Gini coefficient for income; URB100: Percent of population in urban areas > 100,000, beginning of period; RWAY: Railway miles per 1,000 population; WAR: Number of years of war in the last five years and divided by 5. Controls are drawn from H14, see Table AI1. The instrument (IV) is the log of the moving average (t-9, t) of the total area colonized by country i in year t (AREA_COLONY_MA10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. We report, respectively, the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

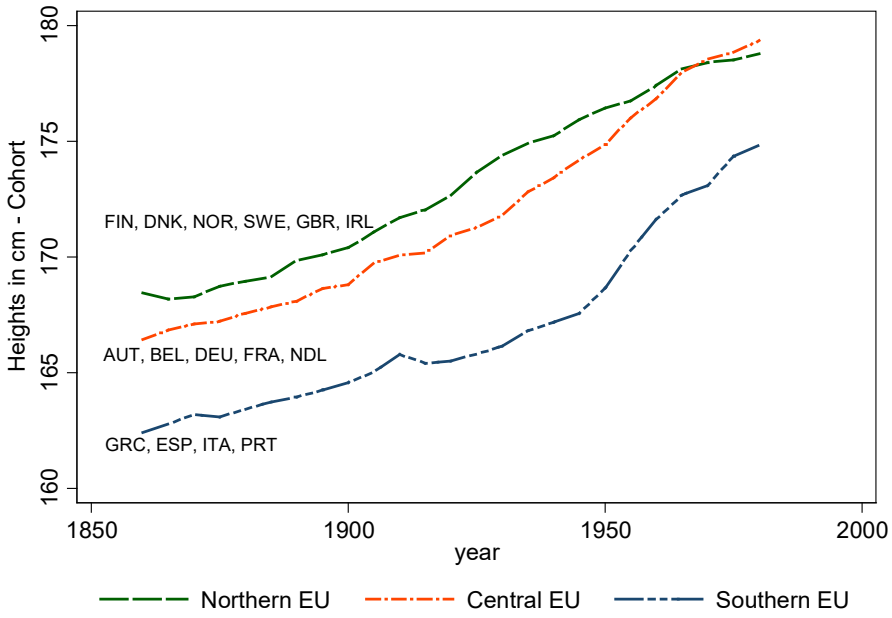
Table 9. Mechanisms. IV regressions with controls

Treat is:	(1) BCFH_A5 on UCOV	(2) BMR_F_A5 on UCOV	(3) BCFH_A5 on GINI	(4) BMR_F_A5 on GINI	(5) BCFH_A5 on URB100	(6) BMR_F_A5 on URB100	(7) BCFH_A5 on RWAY	(8) BMR_F_A5 on RWAY	(9) BCFH_A5 on WAR	(10) BMR_F_A5 on WAR	(11) BCFH_A5 on IMO	(12) BMR_F_A5 on IMO
Democracy.	0.466***	0.557**	-1.935***	-2.230**	0.557	4.429	0.688***	1.125***	-0.274***	-0.294**	-0.909	-4.271**
	(0.150)	(0.225)	(0.745)	(1.086)	(1.855)	(3.286)	(0.152)	(0.336)	(0.093)	(0.136)	(1.005)	(2.091)
Obs.	247	291	247	291	243	280	247	290	229	273	255	300
R-squared	0.672	0.683	0.968	0.965	0.905	0.868	0.696	0.555	0.422	0.607	0.928	0.895
Y-dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×
Min. Eig.	50.32	19.25	50.32	19.25	54.93	20.90	50.32	17.52	49.40	24.94	55.20	19.65
F-stat.	57.65	19.96	57.65	19.96	62.83	20.56	57.65	18.03	58.40	22.84	65.69	19.97
1st stage c.	-0.041***	-0.041***	-0.041***	-0.041***	-0.042***	-0.042***	-0.041***	-0.041***	-0.045***	-0.027***	-0.041***	-0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see section AI3. Controls are drawn from Hatton (2104, H14), see Table A1. The instrument (IV) is the log of the moving average (*t*-9, *t*) of the total area colonized by country *i* in year *t* (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. Mechanisms chosen are variables taken from H14. These include the controls used far (PC_GDP, IM), and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; GINI: Gini coefficient for income; URB100: Percent of population in urban areas > 100,000, beginning of period; RWAY: Railway miles per 1,000 population; WAR: Number of years of war in the last five years divided by 5. All regressions contain the set of three controls used throughout the paper, with the exception of regressions (11) and (12) which use the variable IMO (infant mortality) as a possible mechanism instead of as a control. We report, respectively, (a) the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

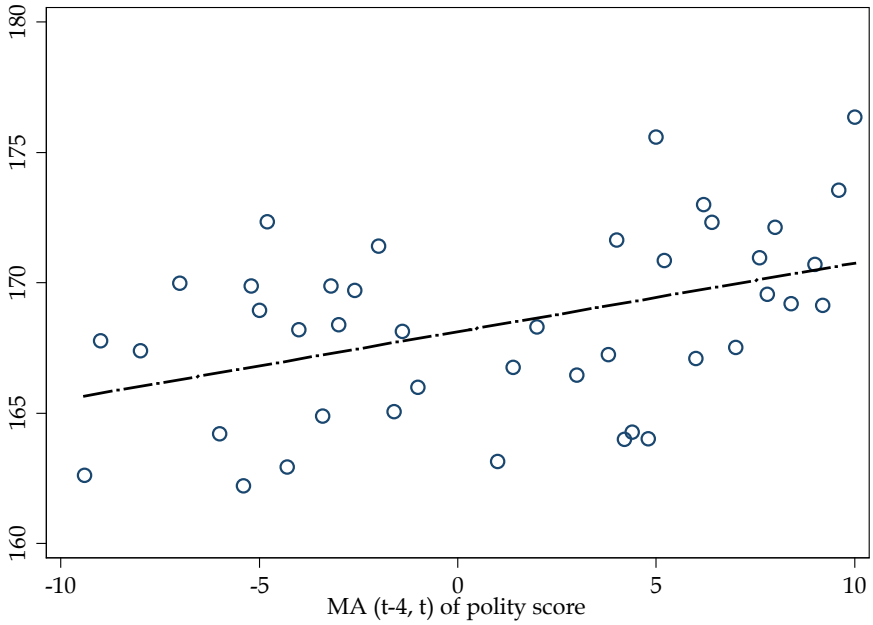
Figures

Figure 1. Heights trends by European regions (South, Centre, and North)



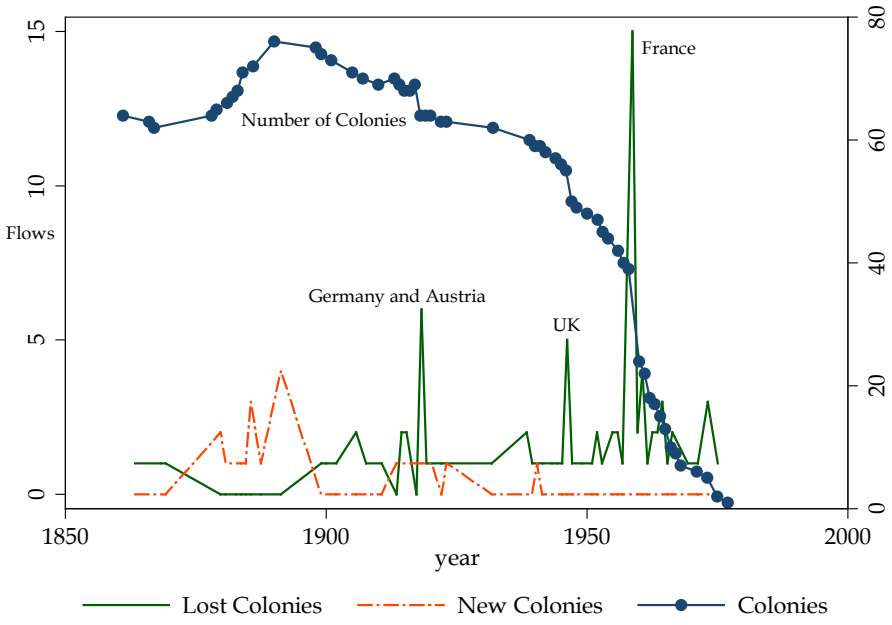
Notes: Heights" 1860-1980 trends in cm for three main country averages, geographically divided as: Northern (Finland, Denmark, Norway, Great Britain, Ireland, and Sweden), Central (Austria, Belgium, Germany, France, and Netherlands), and Southern (Greece, Spain, Italy, and Portugal) Europe. Data source is HB10.

Figure 2. Correlation: Five-year average polity score values (A (t-4, t), X-axis)), and height (Y-axis)



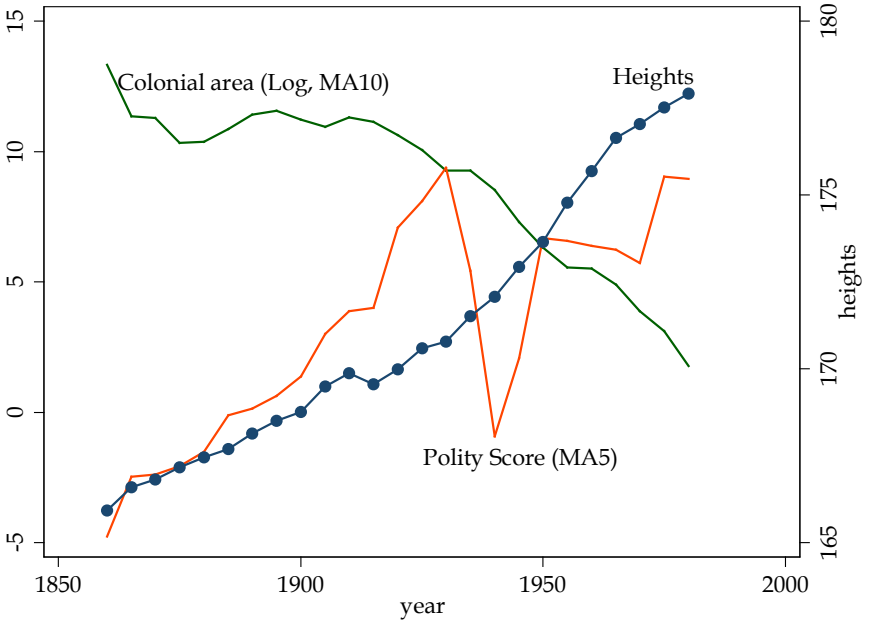
Notes: Scatter plot showing the correlation between average heights and polity score.

Figure 3. Countries colonized. Trends 1816-1980



Notes: Period 1816-1981 using the HB10 sample countries. Three important decolonization events are: (i) the 1918 Austrian and German decolonization; (ii) the 1947 UK decolonization; (iii) the 1960 French decolonization.

Figure 4. Unweighted Polity Index and Areal Colonized (in 10k of Km²) 1816-1980



Notes: Relationship between averaged polity index and average colonial area in tens of thousands of km² owned by the 15 European countries in the HB10 dataset.

Appendix I
Variables definitions, descriptive statistics, and methods

Table AI1. European Historical Data. Data sources and definitions

Variables	Sources and Definitions
	HB10, H14
HEI	The dependent variable is five-year average male height at around age 21 measured in cm. Note: that these are dated at year of birth not year when height was measured. The HB10 sample originally comprises 308 observations of heights from a sample of 15 European countries for the 1860-1980 period.
PC_GDP	Log per capita GDP is the log of the 5-year average of real GDP per capita originally from Maddison, see Hatton (2014, H14).
IMO	Infant mortality is deaths aged less than one divided by births, expressed in percent; see H14 for sources.
EDYEARS	Parental years of education is an estimate of the number of years of education of the parent's generation i.e. fifteen years before the start of the period (so for 1880-5 it is for the cohort of 1866-70); see H14 for sources and construction.
	Polity4 dataset.
POLITY	Original polity score (polity variable) from the Polity4 dataset. This is a score from -10 (full autocracy) to +10 (full democracy) obtained by adding a series of dummy and categorical variables set as basic components in the Polity dataset.
POLITY_D	Polity dummy. Obtained by classifying the dummy equal to 0 if the polity score is negative and equal to 1 for a weakly positive polity score.
	BMR13
BMR	Dummy variable for democracy as defined in BMR13. This according to the joint occurrence of two dimensions/three criteria (*verbatim* from BMR13, p.9): *I. Contestation* (1) The executive is directly or indirectly elected in popular elections and is responsible either directly to voters or to a legislature. (2) The legislature (or the executive if elected directly) is chosen in *free and fair* elections. *II. Participation* (3) A majority of *adult men* has the right to vote.
BMR_A5	Harmonized (t-4, t) 5-year average version of BMR. (=1 if average ≥ 0.6) For more details, please see section AI3.
BMR_F	BMR dummy with the additional restrictive condition that at least half of adult women have the right to vote.
BMR_F_A5	This is BMR_F averaged over the last five years. (=1 if the average is ≥ 0.6)
	Our dummy measures for democracy.
BCFH	Dummy obtained by combining the Polity and BMR13 data.
BCFH_A5	Harmonized democracy dummy obtained by combining the Polity and BMR13 data. For more details on BCFH construction and harmonization of the dummies used throughout, please refer to section AI3.
	MW06
AREA_COLONY_A10 (log of km^2)	Colonial area occupied by the country; average for years (t-9 to t), expressed as log of km^2 (0 for no colonial territory). The colonial relationships in dyadic form are from MW06.
AREA_COLONY_A5 (log of km^2)	Colonial area occupied by the country; average for years (t-4 to t), expressed as log of km^2. The colonial relationships in dyadic form are from MW06.
COLONIAL_STATUS	Dummy equal to 1 if the country has any colonial area, 0 otherwise. The colonial relationships in dyadic form are from MW06.

Table AI2. Descriptive Statistics

Variables	N	Mean	SD	Min	Max
HEI	308	171.57	4.77	162.21	182.7
POLITY	279	3.77	6.77	-9.4	10
POLITY_D	279	0.66	0.47	0	1
BMR	294	0.6	0.49	0	1
BMR_A5	293	0.57	0.5	0	1
BMR_F	301	0.41	0.49	0	1
BMR_F_A5	301	0.4	0.49	0	1
BCFH	272	0.59	0.49	0	1
BCFH_A5	256	0.57	0.5	0	1
PC_GDP	300	8.22	0.64	7.07	9.61
IMO	307	9.96	6.92	0.76	30.9
PARENT_EDUC	298	6.57	1.89	2.07	10.76
AREA_COLONY_A10 (log of km^2)	307	8.4	6.71	0	17.21
AREA_COLONY_A5 (log of km^2)	307	8.22	6.8	0	17.21
COLONIAL_STATUS	307	0.59	0.49	0	1

Notes: Descriptive statistics. For variables' definitions, please consult Table AI1.

AI3. Detailed Construction of the BCFH index

The construction of our dichotomous measure of democracy follows a three-step procedure.

1. **Generate polity dummies from polity scores.** The first step reduces the polity index to a dichotomous measure by taking the value 0 for threshold, as in Acemoglu et al. (2017). The raw Polity score is calculated by adding a series of subcategories defining a country as democratic and constrained to be not larger than 10 and below 0, and then by subtracting from this first total a series of subcategories defining a country as autocratic and constrained to be between 0 and 10. As a result the range goes from 10 (10 – 0) for a strongly democratic country, to – 10 (0 – 10) for strong autocracies. The dummy thus takes the value 1 when the Polity index is positive or zero, and 0 when negative.

2. **Generate our dummy variable (BCFH) for democratization.** The second step leads to the construction of the variable BCFH, and can be divided in the following three sub-steps:
   a) We first classify a country as a democracy/non-democracy only when both the dichotomized Polity dummy obtained in step 1 and the BMR index agree;
   b) We do not classify a country when one or both sources do not express a classification;
   c) We classify a country as non-democratic when the two sources do not agree.

3. **Harmonize BCFH by making a 5-year average.** The third and last step harmonizes our measure (BCFH) obtained from steps 1 and 2), with the 5-year spans of the heights data. We take the 5 years (from t-4 to t) moving average values of the BCFH dummy variable obtained in step 2. By construction this variable can take values of 0, 0.2, 0.4, 0.6, 0.8, and 1. We then replace its value with 0 for values below 0.6, and with 1 for values greater than or equal to 0.6.[19] This produces our BCFH_A5 variable. Our harmonization passes several robustness checks when raising this threshold to 0.8 and 1.

[19] We take into consideration only cases where there are non-missing values in the last four years. We also use 5-year averaged versions of the variable which divide the sum on the base of the years available in the case where these are less than 5. Results produced by using these smoothed variables are very similar to the ones reported in the paper. This is mainly because we do not have missing values, apart from the periods involving the World Wars.

AI4. Mechanisms: OLS and IV specification of the 2-step procedures for mechanisms

In the OLS estimates we use the following 2-steps structure:

$$mech_{it}^{k} = \rho_0 + \rho_1 Demo_{it}^{j} + (\boldsymbol{\rho_2 X'\gamma}) + \pi_i + \tau_t + \varepsilon_{it} \quad (5.1)$$

$$hei_{it} = \rho_0 + \rho_1 \widehat{mech_{it}^{k}}^{OLS} + (\boldsymbol{\rho_2 X'\gamma}) + \pi_i + \tau_t + \varepsilon_{it} \quad (5.2)$$

The dependent variable, $mech_{it}^{k}$, is the mechanism variable as measured in the panel for country i at period t. k is a specific indicator depending on which of the mechanisms is used in the regression, and j indicates which of the four possible treatment (democracy) variables is used. We regress first the mechanism on the $Demo_{it}^{j}$ variable (5.1), both with and without the three control variables ($\boldsymbol{\rho_2 X'\gamma}$) and including the two-way fixed effects. When treating one of the controls as mechanism, we do not use other controls. Then in (5.2) we take the estimated mechanism $\widehat{mech_{it}^{k}}^{OLS}$ and with robust and bootstrapped standard errors we estimate the effect of the part of the mechanism explained by the democratic treatment on heights.

We also propose an "IV"/two-step version, where the first step is the usual first stage of the IV to instrument democracy, and then use the instrumented democracy to measure the effect on the mechanism (equations 6.1 and 6.2 below). We then take the estimated mechanism $\widehat{mech_{it}^{k}}^{2SLS}$ and regress height on it (6.3), as in (5.2).

In both cases the second stage regressions use bootstrapped standard errors as they use the estimated mechanism derived from the first-step.

First Step

$$Demo_{it}^{j} = c_0 + c_1 ColArea_{it} + (\boldsymbol{c_2 X'\gamma}) + \pi_i + \tau_t + \varepsilon_{it} \quad 1^{st} \text{ stage IV} \quad (6.1)$$

$$mech_{it}^{k} = \rho_0 + \rho_1 Demo_{it}^{j} + (\boldsymbol{\rho_2 X'\gamma}) + \pi_i + \tau_t + \varepsilon_{it} \quad 2^{nd} \text{ stage IV} \quad (6.2)$$

Second Step (bootstrapped SE)

$$hei_{it} = \rho_0 + \rho_1 \widehat{mech_{it}^{k}}^{2SLS} + (\boldsymbol{\rho_2 X'\gamma}) + \pi_i + \tau_t + \varepsilon_{it} \quad (6.3)$$

Appendix II
Full 1st stage of IV regressions and full mechanisms results

Table AII1. Full 1st Stage Results

	(1)	(2)	(3)	(4)
	BCFH	BCFH_A5	BMR_F	BMR_F_A5
IV	-0.044***	-0.041***	-0.028***	-0.027***
	(0.005)	(0.005)	(0.005)	(0.005)
Obs.	255	255	255	255
R2	0.780	0.779	0.813	0.802
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
	(5)	(6)	(7)	(8)
	BCFH	BCFH_A5	BMR_F	BMR_F_A5
IV	-0.043***	-0.041***	-0.027***	-0.026***
	-0.005	-0.005	-0.005	-0.005
PC_GDP	0.072	0.099	0.11	0.202
	-0.116	-0.132	-0.108	-0.124
IMO	-0.006	-0.004	-0.004	-0.002
	-0.007	-0.007	-0.007	-0.007
PARENT_EDUC	-0.013	-0.004	0.064***	0.056**
Obs.	247	247	247	247
R-squared	0.778	0.776	0.823	0.811
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓

Notes: this table shows full 1st stage results of the main IV; 2nd stage results reported in Table 4. Please consult Table AI1 for variable definitions.

Table AII2. Mechanisms. 2WFE with no controls. First set (UCOV, HCOV, NEXP)

	DEMOCRACY ON MECHANISM					
	(1)	(2)	(3)	(4)	(5)	(6)
Democracy on Mechanism	BCFH_A5 on UCOV	BMR_F_A5 on UCOV	BCFH_A5 on HCOV	BMR_F_A5 on HCOV	BCFH_A5 on NEXP	BMR_F_A5 on NEXP
Coeff.	0.080	0.306***	-3.554	6.753**	0.733*	0.299
	(0.060)	(0.068)	(3.774)	(3.033)	(0.427)	(0.453)
Obs.	256	301	215	251	249	293
R-squared	0.718	0.693	0.843	0.843	0.872	0.854
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	×	×
	ESTIMATED MECHANISM ON HEIGHTS (Bootstrapped standard errors)					
	(7)	(8)	(9)	(10)	(11)	(12)
ESTIMATES Mechanism is:	UCOV	UCOV	HCOV	HCOV	NEXP	NEXP
Mechanism on Heights Coefficient	9.969***	2.940***	-0.223***	0.133***	1.083***	3.007***
	(2.886)	(0.689)	(0.065)	(0.031)	(0.313)	(0.704)
Obs.	256	301	256	301	256	301
R-squared	0.975	0.969	0.975	0.969	0.975	0.969
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	×	×

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH and BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F and BMR_F_A5). For more details on the construction of these variables, please see Table AI3. Controls are drawn from Hatton (2014, H14), see Table AI1. The instrument (IV) is the log of the average (t-9, t) of the total area colonized by country i in year t (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. Mechanisms chosen are variables taken from H14. These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables, (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; HCOV: Share of population covered by medical benefit schemes: NEXP: Expenditure on social services as a share of GDP. We report, respectively, (a) the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

Table AII3. Mechanisms. 2WFE with no controls. Second set. (GINI, TTWEN, URB25, RWAY)

	Effect of democracy measure on mechanism							
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	BCFH_A5 on GINI	BMR_F_A5 on GINI	BCFH_A5 on TTWEN	BMR_F_A5 on TTWEN	BCFH_A5 on URB25	BMR_F_A5 on URB25	BCFH_A5 on RWAY	BMR_F_A5 on RWAY
DEMOCRACY	-1.517***	-0.979***	-0.644**	-0.392	2.453**	-1.216	0.068	0.127***
	(0.357)	(0.298)	(0.316)	(0.238)	(1.070)	(0.967)	(0.046)	(0.047)
Obs.	256	301	256	301	249	293	256	300
R-squared	0.967	0.966	0.927	0.929	0.925	0.925	0.785	0.795
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	×	×	×	×
	Effect of Estimated mechanism on heights (bootstrapped standard errors used)							
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	GINI	GINI	TTWEN	TTWEN	URB25	URB25	RWAY	RWAY
MECH	-0.523***	-0.918***	-1.234***	-2.293***	0.324***	-0.739***	11.725***	7.091***
	(0.151)	(0.215)	(0.357)	(0.537)	(0.094)	(0.173)	(3.394)	(1.660)
Obs.	256	301	256	301	256	301	256	301
R-squared	0.975	0.969	0.975	0.969	0.975	0.969	0.975	0.969
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	×	×	×	×

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F_A5). For more details on the construction of these variables, please see Table AI3. Controls are drawn from Hatton (2014, H14), see Table A1. The instrument (IV) is the log of the moving average (*t*-9, *t*) of the total area colonized by country *i* in year *t* (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. Mechanisms chosen are variables taken from H14. These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): GINI: Gini coefficient for income; TTWEN: Income share of top 20 percent; URB25: Percent of population in urban areas > 25,000, beginning of period; RWAY: Railway miles per 1,000 population. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. We report, respectively, (a) the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

Table AII4. Mechanisms. 2WFE with controls.

Effect of democracy measure on mechanism

	(1) BCFH_A5 on UCOV	(2) BMR_F_A5 on UCOV	(3) BCFH_A5 on HCOV	(4) BMR_F_A5 on HCOV	(5) BCFH_A5 on GINI	(6) BMR_F_A5 on GINI	(7) BCFH_A5 on URB100	(8) BMR_F_A5 on URB100	(9) BCFH_A5 on RWAY	(10) BMR_F_A5 on RWAY	(11) BCFH_A5 on WAR	(12) BMR_F_A5 on WAR
Treat	0.071	0.300***	-3.873	4.149	-1.620***	-1.056***	1.918**	-2.168**	0.021	0.046	-0.009	-0.116**
	(0.059)	(0.069)	(3.548)	(2.791)	(0.359)	(0.321)	(0.834)	(0.859)	(0.043)	(0.046)	(0.059)	(0.054)
Obs.	247	291	209	244	247	291	243	280	247	290	229	273
R-sq.	0.723	0.704	0.873	0.875	0.968	0.966	0.907	0.896	0.828	0.838	0.533	0.630
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ctry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Effect of Estimated mechanism on heights (bootstrapped standard errors used)

	(1) Est. UCOV on HEI	(2) Est. UCOV on HEI	(3) Est. HCOV on HEI	(4) Est. HCOV on HEI	(5) Est. GINI on HEI	(6) Est. GINI on HEI	(7) Est. URB100 on HEI	(8) Est. URB100 on HEI	(9) Est. RWAY on HEI	(10) Est. RWAY on HEI	(11) Est. WAR on HEI	(12) Est. WAR on HEI
Mech	9.854***	2.449***	-0.180***	0.177***	-0.431**	-0.695***	0.364***	-0.338***	33.753***	15.871***	-77.154***	-6.305***
	(3.245)	(0.652)	(0.065)	(0.051)	(0.201)	(0.201)	(0.124)	(0.092)	(8.103)	(4.163)	(25.826)	(0.622)
Obs.	247	291	247	291	247	291	247	291	247	291	247	291
R-sq.	0.976	0.972	0.976	0.972	0.976	0.972	0.976	0.972	0.976	0.972	0.976	0.972
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ctry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (MR_F_A5). For more details on the construction of these variables, please see Table AI3. Controls are drawn from Hatton (2014, H14), see Table A1. The instrument (IV) is the log of the average (*t*-9, *t*) of the total area colonized by country *i* in year *t* (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; HCOV: GINI: Gini coefficient for income; URB100: Percent of population in urban areas > 100,000, beginning of period; RWAY: Railway miles per 1,000 population; WAR: Number of years of war in the last five years and divided by 5. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. We report, respectively, the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

Table AII5. Mechanisms. IV results not including controls

	Effect of democracy measure on mechanism									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	BCFH_A5 on UCOV	BMR_F_A5 on UCOV	BCFH_A5 on GINI	BMR_F_A5 on GINI	BCFH_A5 on URB100	BMR_F_A5 on URB100	BCFH_A5 on RWAY	BMR_F_A5 on RWAY	BCFH_A5 on WAR	BMR_F_A5 on WAR
Treat	0.453***	0.495**	-1.783**	-1.979*	1.628	7.751**	0.786***	1.183***	-0.247***	-0.271**
	(0.146)	(0.220)	(0.764)	(1.195)	(2.005)	(3.946)	(0.164)	(0.336)	(0.085)	(0.130)
Obs,	255	300	255	300	249	287	255	299	237	282
R-squared	0.671	0.682	0.967	0.965	0.875	0.802	0.635	0.518	0.428	0.593
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Min Eigenvalue	55.20	19.65	55.20	19.65	58.61	23.76	55.20	18.73	54	25.84
F-stat	65.69	19.97	65.69	19.97	68.92	22.92	65.69	19	64.52	22.81
1st stage coefficient	-0.041***	-0.022***	-0.041***	-0.022***	-0.042***	-0.025***	-0.041***	-0.022***	-0.045***	-0.027***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
	Effect of Estimated mechanism on heights (bootstrapped standard errors used)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Est. UCOV on HEI	Est. UCOV on HEI	Est. GINI on HEI	Est. GINI on HEI	Est. URB100 on HEI	Est. URB100 on HEI	Est. RWAY on HEI	Est. RWAY on HEI	Est. WAR on HEI	Est. WAR on HEI
Mech.	1.753***	1.817***	-0.445***	-0.454***	0.488***	0.116***	1.010***	0.760***	-3.209***	-3.312***
	(0.507)	(0.425)	(0.129)	(0.106)	(0.141)	(0.027)	(0.292)	(0.178)	(0.929)	(0.776)
Obs.	256	301	256	301	256	301	256	301	256	301
R-squared	0.975	0.969	0.975	0.969	0.975	0.969	0.975	0.969	0.975	0.969
Controls	×	×	×	×	×	×	×	×	×	×
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F_A5). For more details on the construction of these variables, please see Table AI3. Controls are drawn from Hatton (2014, H14), see Table A1. The instrument (IV) is the log of the average (*t*-9, *t*) of the total area colonized by country *i* in year *t* (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. Mechanisms chosen are variables taken from H14. These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; GINI: Gini coefficient for income; URB100: Percent of population in urban areas > 100,000, beginning of period; RWAY: Railway miles per 1,000 population; WAR: Number of years of war in the last five years and divided by 5. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. We report, respectively, (a) the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

Table AII6. Mechanisms. IV estimates including controls.

	Effect of democracy measure on mechanism											
	(1) BCFH_A5 on UCOV	(2) BMR_F_A5 on UCOV	(3) BCFH_A5 on GINI	(4) BMR_F_A5 on GINI	(5) BCFH_A5 on URB100	(6) BMR_F_A5 on URB100	(7) BCFH_A5 on RWAY	(8) BMR_F_A5 on RWAY	(9) BCFH_A5 on WAR	(10) BMR_F_A5 on WAR	(11) BCFH_A5 on IMO	(12) BMR_F_A5 on IMO
Demo	0.466***	0.557**	-1.935***	-2.230**	0.557	4.429	0.688***	1.125***	-0.274***	-0.294**	-0.909	-4.271**
	(0.150)	(0.225)	(0.745)	(1.086)	(1.855)	(3.286)	(0.152)	(0.336)	(0.093)	(0.136)	(1.005)	(2.091)
Obs.	247	291	247	291	243	280	247	290	229	273	255	300
R-sq.	0.672	0.683	0.968	0.965	0.905	0.868	0.696	0.555	0.422	0.607	0.928	0.895
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ctry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×
Min Eig.	50.32	19.25	50.32	19.25	54.93	20.90	50.32	17.52	49.40	24.94	55.20	19.65
F-stat	57.65	19.96	57.65	19.96	62.83	20.56	57.65	18.03	58.40	22.84	65.69	19.97
	Effect of Estimated mechanism on heights (bootstrapped standard errors used)											
	(1) Est. UCOV on HEI	(2) Est. UCOV on HEI	(3) Est. GINI on HEI	(4) Est. GINI on HEI	(5) Est. URB100 on HEI	(6) Est. URB100 on HEI	(7) Est. RWAY on HEI	(8) Est. RWAY on HEI	(9) Est. WAR on HEI	(10) Est. WAR on HEI	(11) Est. IMO on HEI	(12) Est. IMO on HEI
MECH	1.499***	1.317***	-0.361**	-0.329***	1.254***	0.166***	1.015***	0.652***	-2.552***	-2.493***	-0.873***	-0.210***
	(0.499)	(0.337)	(0.168)	(0.098)	(0.368)	(0.046)	(0.361)	(0.170)	(0.841)	(0.665)	(0.253)	(0.049)
Obs.	247	291	247	291	247	291	247	291	247	291	256	301
R-sq.	0.976	0.972	0.976	0.972	0.976	0.972	0.976	0.972	0.976	0.972	0.975	0.969
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ctry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×

Notes: The dependent variable is a five-year average of adult male height in cm for 15 European countries from Hatton and Bray (2010, HB10). Note that these are aligned with year of birth not year when height was measured. Treatment variables are democratic dummies generated by combining the information from Polity4 and BMR13 (BCFH_A5) and by using the BMR13 democracy indicator including stricter conditions for democracy classification by including that at least half of the female population has the right to vote (BMR_F_A5). For more details on the construction of these variables, please see Tables AI3AI3. Controls are drawn from Hatton (2014, H14), see Table A1. The instrument (IV) is the log of the moving average (t-9, t) of the total area colonized by country i in year t (AREA_COLONY_A10), and originally expressed in km^2. Colonial relationships in dyadic form are taken from WM06. Mechanisms chosen are variables taken from H14. These include the controls used previously (PC_GDP, IMO, and PARENT_EDUC), as well as the following variables (see H14 for sources and definitions): UCOV: Dummy for universal health coverage; GINI: Gini coefficient for income; URB100: Percent of population in urban areas > 100,000, beginning of period; RWAY: Railway miles per 1,000 population; WAR: Number of years of war in the last five years and divided by 5. In all regressions we report the 1st stage F-statistic, the minimum eigenvalue, and the 1st stage coefficient. We report, respectively, (a) the estimated coefficient, (b) and robust standard errors in parentheses below (*** p<0.01, ** p<0.05, * p<0.1.). All regressions contain both country fixed effects and year dummies.

Appendix III
(Not intended for publication)

Summary of Tests in Appendix III

- III.A Alternative instrument's definition (dummy)
- III.B Alternative definitions of democracy and voters' turnout from alternative sources
- III.C Additional tests with alternative measures from the same sources used in the main text
- III.D Controlling for trends in heights
- III.E Controlling for years of World War and countries involved
- III.F Changing exposures durations
- III.G Sensitivity to the exclusion of countries and years. All regressions with controls.
- III.H Including interactions with dummies for north, centre and south Europe.
- III.I Regressions with detrended heights (2WFE)
- III.J 2SLS results excluding non-coloniser countries

III.A Alternative instrument's definitions

In the first subsection III.A, we show results obtained by using as an instrument a colonial dummy equal to 0 if the country has no colonial territory, and 1 if the land colonised is strictly positive. We report full 1st and 2nd stage results.

Table IIIA.1 – Instruments defined as dummies

VARIABLES	(1) BCFH_dem_6 Dummy Colonial Status	(2) BMR_female_A5_6 Dummy Colonial Status	(3) BCFH_dem_6 Dummy Colonial Status	(4) BMR_female_A5_6 Dummy Colonial Status
Demo	1.636***	2.573***	1.459***	2.515**
	(0.468)	(0.881)	(0.521)	(1.054)
PC_GDP			0.257	-0.121
			(0.486)	(0.593)
IMO			-0.086***	-0.085***
			(0.027)	(0.028)
PARENT_EDUC			0.128	-0.019
			(0.087)	(0.119)
Observations	255	255	247	247
R-squared	0.972	0.969	0.975	0.970
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Min Eigenvalue	42.89	19.66	36.85	14.64
F-stat	38.70	16.87	30.92	12.21
Stock Yogo 10% Threshold	16.38	16.38	16.38	16.38
Durbin p-val	0.0461	0.0216	0.0778	0.0270
Hausman-Wu p-val	0.0669	0.0347	0.108	0.0436
	(1)	(2)	(3)	(4)
VARIABLES	BCFH_dem_6 Dummy Colonial Status	BMR_female_A5_6 Dummy Colonial Status	BCFH_dem_6 Dummy Colonial Status	BMR_female_A5_6 Dummy Colonial Status
IV	-0.404***	-0.257***	-0.393***	-0.228***
	(0.065)	(0.063)	(0.071)	(0.065)
PC_GDP (log)			0.050	0.179
			(0.144)	(0.135)
IMO			-0.002	-0.001
			(0.008)	(0.007)
PARENT_EDUC			-0.008	0.054**
			(0.030)	(0.025)
Observations	255	255	247	247
R-squared	0.768	0.797	0.763	0.804
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓

III.B Alternative definitions from an alternative source

Section III.B reports a series of additional robustness tests (both 2WFE and IV) using an alternative data source. The data used are from ADL06 [20] and shows that the estimates obtained are quite consistent with those reported in the main text. However, they tend to be less robust to a series of additional tests, and the first-stage F-tests of the IV regressions are quite low, revealing that decolonization is a weaker instrument.

Table IIIB.1 Additional data sources and variables' definitions used throughout the paper as robustness tests of our preferred estimates

Variables	Sources and Definitions
	ADL06.
ADL_E1	E1 is the enfranchised electorate measured as a percentage of the population of 20 and older based on historical data on parliamentary elections.
ADL_E2	E2 is the electorate as measured by the percentage of the enfranchised age and sex group, before female suffrage, and based on male population only (parliamentary elections). This variable can be considered as a measure of economic and social restrictions on the franchise.
ADL_F	FEMALE is a dummy variable equal to 1 in each year after the female suffrage was introduced in the country, and equal to 0 in each year before that one.
ADL_TURN	TURNOUT indicates the total number of votes (or total valid votes) recorded in each parliamentary election, as a percentage of the electorate.

Notes: definitions of all variables from ADL06 are reported *verbatim* from the data section of the paper. These data are originally from Flora et. al. (1983).

Table IIIB.2 Additional descriptive statistics used throughout the paper as robustness tests of our preferred estimates

Variables	N	Mean	SD	Min	Max
ADL_E1	228	59.71	35.22	3.5	100
ADL_E2	228	78.37	29.7	8.2	100
ADL_F	229	0.49	0.5	0	1
ADL_TURN	216	74.8	16.41	19.5	96.8

Table IIIB.3 Results with ADL06 data (2WFE)

	(1)	(2)	(3)	(4)
VARIABLES	E1	E2	Female(D)	Turnover
Demo	0.016***	-0.001	0.694***	0.002
	(0.119)	(-0.007)	(0.076)	(0.005)
	3.337	-0.285	2.898	0.249
Observations	228	228	229	216
R-squared	0.972	0.970	0.971	0.974
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Controls	NO	NO	NO	NO
	(5)	(6)	(7)	(8)
VARIABLES	E1	E2	Female(D)	Turnover
Demo	0.013***	0.001	0.446*	-0.002
	(0.097)	(0.007)	(0.049)	(-0.007)
	2.793	0.268	1.912	-0.314
Observations	225	225	226	214
R-squared	0.975	0.974	0.975	0.976
Country FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

[20] Aidt, T. S., Dutta, J. and Loukoianova, E. (2006), "Democracy comes to Europe: Franchise extension and fiscal outcomes,1830–1938," *European Economic Review*, 50(2), pp. 249-283. We thank TokeAidt for sharing the data.

Controls	YES	YES	YES	YES

IIIB.4 Results with ADL06 data (IV regressions)

	(1)	(2)	(3)	(4)
	E1	E2	Female (D)	Turnover
VARIABLES	2SLS	2SLS	2SLS	2SLS
Demo	0.110**	-0.079**	3.022***	0.075***
	(0.054)	(0.037)	(0.964)	(0.028)
Observations	228	228	229	216
R-squared	0.917	0.899	0.960	0.954
Country FE	✓	✓	✓	✓
Year dummies	NO	NO	NO	NO
Controls	NO	NO	NO	NO
l_area_km2_colony_a10	-0.480**	0.671**	-0.018***	-0.789***
	(0.216)	(0.329)	(0.004)	(0.215)
F-stat	4.945	4.159	18	13.50
	(5)	(6)	(7)	(8)
	E1	E2	Female(D)	Turnover
VARIABLES	2SLS	2SLS	2SLS	2SLS
Demo	0.101*	-0.087*	2.870***	0.074***
	(0.053)	(0.048)	(0.986)	(0.028)
Observations	225	225	226	214
R-squared	0.927	0.890	0.963	0.957
Country FE	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓
Controls	✓	✓	✓	✓
l_area_km2_colony_a10	-0.458**	0.532*	-0.016***	-0.734***
	(0.219)	(0.313)	(0.004)	(0.199)
F-stat	4.376	2.890	15.05	13.63

III.C Additional tests with alternative measures from the same sources used in the main text

Section III.C shows that our baseline/preferred estimates are robust to several alternative definitions of the democratic treatmentusing the same data sources used in the main text. For example, BMR_D is the original dummy from BMR18,BCFH_D(8) means that the dummy is created when the country has been a democracy for more than four years in the last five, i.e 80% of the time. Recall that our main variable is BCFH_D(6), where a country is classified as democratic if it has been a democracy for at least three of the last five years (equal or more than 60% of the time). As usual, we report 2WFE and IV estimates, as well as estimates with and without the three main controls used throughout.

Table III.C.1 Tests with alternative measures. BMR and alternative BCFH definitions (2WFE)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	BMR_D	BMR_D_A5(6)	BMR_F_A5(8)	BMR_F_A5(10)	BCFH_D(8)	BCFH_D_(10)
Demo	0.553***	0.560***	0.868***	0.712***	0.794***	0.723***
	(0.056)	(0.057)	(0.088)	(0.072)	(0.080)	(0.073)
	2.840	2.752	3.752	3.114	3.534	3.319
Observations	294	293	301	301	256	256
R-squared	0.968	0.968	0.969	0.968	0.975	0.974
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	NO	NO	NO
	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	BMR_D	BMR_D_ma5(6)	BMR_F_A5(8)	BMR_F_A5(10)	BCFH_D(8)	BCFH_D_(10)
demo	0.485***	0.514***	0.708***	0.575***	0.698***	0.639***
	(0.049)	(0.053)	(0.073)	(0.059)	(0.071)	(0.065)
	2.615	2.717	3.213	2.703	3.278	3.098
Observations	284	283	291	291	247	247
R-squared	0.971	0.971	0.972	0.971	0.976	0.976
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Table III.C.2 Additional tests with alternative measures. BMR and alternative BCFH (IV)

	(1)	(2)	(3)	(4)	(5)	(6)
	BMR_D	BMR_D_ma5(6)	BMR_F_A5(8)	BMR_F_A5(10)	BCFH_D(8)	BCFH_D_(10)
VARIABLES	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Demo	1.319***	1.407***	2.102***	2.227***	1.102***	1.093***
	(0.386)	(0.400)	(0.683)	(0.761)	(0.355)	(0.352)
Observations	293	292	300	300	255	255
R-squared	0.966	0.965	0.964	0.962	0.974	0.974
Country FE	✓	✓	✓	✓	✓	✓
Year dummies	NO	NO	NO	NO	NO	NO
Controls	NO	NO	NO	NO	NO	NO
l_area_km2_colony_A10	-0.040***	-0.039***	-0.023***	-0.022***	-0.041***	-0.042***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
F-stat	53.42	52.32	22.26	18.71	65.69	64.47
	(7)	(8)	(9)	(10)	(11)	(12)
	BMR_D	BMR_D_A5(6)	BMR_F_A5(8)	BMR_F_A5(10)	BCFH_D(8)	BCFH_D_(10)
VARIABLES	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Demo	1.043***	1.130***	1.619***	1.705***	1.035***	1.026***
	(0.366)	(0.378)	(0.606)	(0.655)	(0.378)	(0.374)
Observations	284	283	291	291	247	247
R-squared	0.970	0.970	0.969	0.968	0.976	0.976
Country FE	✓	✓	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
l_area_km2_colony_A10	-0.041***	-0.039***	-0.024***	-0.022***	-0.041***	-0.041***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
F-stat	52.77	50.71	22.54	19.48	57.65	56.87

We note, when using alternative polity-based measures (see following 2 tables with both 2WFE and IV estimates), we also modify the definition of the dummy. Recall, in the main text the dummy is equal to one if the polity score is weakly greater than zero. Here we use as threshold the mean (about 3.7) and the median (about 6.7), of the polity in-sample distribution, which reveals its left-skewedness. Interestingly the three measure in row from columns (4) to column (6), show that as the requirement for creating a dummy is restricted and made more "demanding" by increasing the threshold values, also the estimates increase from 0.974 (0-threshold) to 1.241 (mean threshold) to 1.437(median threshold), revealing that there is also a "quantity" effect of democracy on heights. The interpretation, however, is not straightforward because the increase in the polity index can be attributed to the increase of one of the several dimensions that comprise it. While some intensity effect is thus present, we cannot say which democratic dimension is more relevant as two countries might have the same polity index levelcomposed by different dimensions.

Table III.C.4
Additional tests with alternative measures. Polity-based categorical measures and dummies. Test of polity intensity effects (2WFE)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	P	P_A5	P_A5_D(6)	P_A5_D	P_A5_D_mean	P_A5_D_median	P_A5_int
Demo	0.036***	0.042***	0.631***	0.652***	0.628***	0.468**	0.250***
	(0.050)	(0.057)	(0.062)	(0.064)	(0.063)	(0.048)	(0.070)
	2.818	3.091	3.731	3.900	3.961	2.550	3.952
Obs.	279	264	264	264	264	264	264
R-squared	0.970	0.974	0.974	0.975	0.974	0.973	0.974
Country FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Controls	NO	NO	NO	NO	NO	NO	NO
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	P	P_A5	P_A5_D(6)	P_A5_D	P_A5_D_mean	P_A5_D_median	P_A5_int
Demo	0.029**	0.040***	0.556***	0.583***	0.602***	0.530***	0.236***
	(0.041)	(0.055)	(0.055)	(0.057)	(0.061)	(0.055)	(0.067)
	2.145	2.839	3.035	3.139	3.556	2.895	3.588
Obs.	270	255	255	255	255	255	255
R-squared	0.972	0.976	0.976	0.976	0.976	0.976	0.976
Country FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓

Table III.C.5 Additional tests with alternative measures. Polity-based categorical measures and dummies. Test of polity intensity effects (IV)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	P	P_A5	P_A5_D(6)	P_A5_D	P_A5_D_mean	P_A5_D_median	P_A5_int
	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Demo	0.081***	0.083***	0.972***	0.974***	1.241***	1.437***	0.395***
	(0.030)	(0.031)	(0.355)	(0.357)	(0.479)	(0.532)	(0.144)
Obs.	278	263	263	263	263	263	263
R-squared	0.968	0.973	0.974	0.974	0.972	0.970	0.974
Country FE	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO	NO	NO
Controls	NO	NO	NO	NO	NO	NO	NO
IV coef.	-0.540***	-0.513***	-0.044***	-0.044***	-0.034***	-0.030***	-0.108***
	(0.088)	(0.086)	(0.007)	(0.007)	(0.007)	(0.006)	(0.017)
F-stat.	37.36	35.30	44.30	43.12	25.94	25.89	40.03
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	P	P_ma5	P_ma5_D(6)	P_ma5_D	P_ma5_D_mean	P_ma5_D_median	P_ma5_int
	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Demo	0.070**	0.074**	0.887**	0.894**	1.100**	1.193**	0.349**
	(0.031)	(0.031)	(0.377)	(0.380)	(0.473)	(0.476)	(0.144)
Obs.	270	255	255	255	255	255	255
R-squared	0.971	0.975	0.976	0.976	0.975	0.974	0.976
Country FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓
IV coef	-0.522***	-0.496***	-0.042***	-0.041***	-0.034***	-0.031***	-0.106***
	(0.087)	(0.085)	(0.007)	(0.007)	(0.007)	(0.006)	(0.017)
F-stat	35.89	33.79	40	38.85	26.37	30.25	39.87

III.D Controlling for trends

Technology is often reported a one of the main confounding factors in our regressions. In this section we add quadratic trends as controls. We show estimates both including and excluding year fixed-effects. The unbalanced nature of the panel creates the lack of perfect collinearity between linear trends and time fixed effects, so that it allows us to include the year dummies together with time trends. It is worth noting that the most robust estimations are obtained when using a quadratic trend.

Table IIID.1 Controlling for trends. Quadratic Trends (2WFE)

	(1)	(2)	(3)	(4)
	BCFH_dem_6	BCFH_dem_6	BMR_female_A5_6	BMR_female_A5_6
VARIABLES	1WFE	1WFE	1WFE	1WFE
Treat	0.592**	0.474**	0.953***	0.761***
	(0.247)	(0.229)	(0.241)	(0.219)
Trend	0.028**	0.022	0.017	0.016
	(0.013)	(0.014)	(0.012)	(0.011)
Trend squared	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	256	247	301	291
R-squared	0.966	0.970	0.960	0.966
Country FE	✓	✓	✓	✓
Year dummies	NO	NO	NO	NO
Controls	NO	✓	NO	✓

Table IIID.2 Controlling for trends. Quadratic Trends Mixed to Time Fixed Effects (2WFE)

	(1)	(2)	(3)	(4)
	BCFH_dem_6	BCFH_dem_6	BMR_female_A5_6	BMR_female_A5_6
VARIABLES	2WFE	2WFE	2WFE	2WFE
Treat	0.782***	0.684***	0.886***	0.720***
	(0.222)	(0.211)	(0.228)	(0.218)
Trend	0.127***	0.099***	0.130***	0.100***
	(0.021)	(0.022)	(0.021)	(0.021)
Trend squared	-0.000	-0.000	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	256	247	301	291
R-squared	0.975	0.977	0.970	0.972
Country FE	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓
Controls	NO	✓	NO	✓

Table IIID.3 Controlling for trends. Quadratic Trends (IV)

	(1)	(2)	(3)	(4)
	BCFH_dem_6	BCFH_dem_6	bmr_female_A5_6	bmr_female_A5_6
VARIABLES	2SLS	2SLS	2SLS	2SLS
Treat	0.815**	0.745**	1.641**	1.422**
	(0.367)	(0.364)	(0.679)	(0.633)
Trend	0.025*	0.016	0.018	0.015
	(0.014)	(0.014)	(0.012)	(0.011)
Trend squared	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	255	247	300	291
R-squared	0.965	0.970	0.958	0.965
Country FE	✓	✓	✓	✓
Year Dummies	NO	NO	NO	NO
Controls	NO	YES	NO	YES
IV first stage coef.	-0.050***	-0.051***	-0.026***	-0.027***
	(0.005)	(0.006)	(0.006)	(0.006)
F-stat	84.66	79.19	19.78	20.60

Table IIID.4 Controlling for trends. Quadratic Trends mixed to years' fixed effects (IV)

	(1)	(2)	(3)	(4)
	BCFH_dem_6	BCFH_dem_6	BMR_female_A5_6	BMR_female_A5_6
VARIABLES	2SLS	2SLS	2SLS	2SLS
Treat	1.315***	1.206***	2.611***	2.152***
	(0.330)	(0.352)	(0.699)	(0.625)
Trend	0.125***	0.095***	0.112***	0.093***
	(0.019)	(0.019)	(0.020)	(0.019)
Trend2	-0.000	-0.000	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	255	247	300	291
R-squared	0.974	0.976	0.961	0.967
Country FE	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓
Controls	NO	✓	NO	✓
IV first stage coef.	-0.048***	-0.046***	-0.026***	-0.026***
	(0.006)	(0.006)	(0.005)	(0.005)
F-stat	68.66	61.56	23.95	23.62

IIIE Controlling for World Wars Years and Countries Involved

Missing observations in our panel are not random andreflect the lack of information on heights and democracy during world wars. This is especially because the Polity index in several cases does not classify a country as democratic or not during the world wars. This is less so when looking at the information provided by BMR18, where an effort is made to classify a country also during world wars.Therefore, we have several cases where the lack of information is correlated with democratic transitions before and after the two world wars and period-to-period increases in heights due to the lack of data during wars.We also consider if and how these effects aremitigated by the negative effect that world wars likely produced on heights. To control for this possible bias, we listed all the cases where a country transitioned before and/or after any of the two world wars (see first table), and created a dummy (WWInt) capturing all the country/periods involving the two war periods, 1914-1918 and 1939-1945. Our estimates are robust to the inclusion of this dummy as well as to the inclusion of the variable WAR, which is an average of how many of the previous five years a country has spent in war.

Table IIIE.1 Controlling for World Wars Years and Countries. Construction of WWInt Variable

War periods: [1914:1918] ; [1939:1945]

iso3c	year	hei	Polity Dummy	BMR Dummy	BCFH Dummy	iso3c	year	height	Polity Dummy	BMR Dummy	BCFH Dummy
AUT	1915	169.51	0	0	0	FRA	1915	168.92	1	1	1
AUT	1940	173.06	---	0	---	FRA	1920	169.2	1	1	1
AUT	1945	174.46	---	0	---	FRA	1935	169.37	1	1	1
AUT	1950	174.8	1	1	1	FRA	1940	170.41	1	1	1
DEU	1935	173.88	0	0	0	FRA	1945	171.7		0	
DEU	1940	174.9	0	0	0	FRA	1950	171.7	1	1	1
DEU	1945	175.47	---	0	---	GRC	1935	167.2	1	1	1
DEU	1950	176.35	1	0	0	GRC	1940	167.4	0	0	0
ESP	1915	165.81	1	0	0	GRC	1945	167.18	---	0	---
ESP	1920	165.71	1	0	0	GRC	1950	170.3	1	1	1
ESP	1935	166.13	1	1	1	ITA	1945	168.93	---	0	---
ESP	1940	166.75	1	0	0	ITA	1950	169.75	---	1	---
ESP	1945	167.26	0	0	0	NLD	1915	173.24	0	1	0
ESP	1950	167.65	0	0	0	NLD	1920	174	1	1	1

Table IIIE.2 Controlling for World Wars Years and Countries. No controls. (2WFE)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES		BCFH_dem_6			BMR_female_A5_6	
Treat	0.797***	0.700***	0.615**	0.910***	1.035***	0.756***
	(0.080)	(0.070)	(0.062)	(0.093)	(0.103)	(0.077)
	3.535	2.929	2.091	3.909	4.051	2.629
War		-0.052			0.541*	
		(-0.002)			(0.032)	
		-0.096			1.908	
Demo × War		0.196			0.306	
		(0.006)			(0.010)	
		0.360			0.715	
Treat ×WWInt	-0.158			-0.252		
	(-0.003)			(-0.004)		
	-0.450			-0.745		
Duration (BMR13)			-0.002			-0.004
			(-0.013)			(-0.027)
			-0.669			-1.608
Treat × duration			0.008			0.006
			(0.040)			(0.031)
			1.380			0.938
Observations	256	238	256	301	283	294
R-squared	0.975	0.975	0.975	0.969	0.971	0.969
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Controls	NO	NO	NO	NO	NO	NO

Table IIIE.3 Controlling for World Wars Years and Countries. With controls. (2WFE)

	(1)	(2)	(3)	(9)	(10)	(11)
		BCFHdem_6			BMR_female_A5_6	
Democracy	0.701***	0.621***	0.313	0.753***	0.855***	0.228
	(0.071)	(0.063)	(0.032)	(0.078)	(0.087)	(0.024)
	3.280	2.785	1.142	3.322	3.423	0.878
War		-0.110			0.467*	
		(-0.005)			(0.028)	
		-0.238			1.695	
Democracy × War		0.287			0.321	
		(0.010)			(0.011)	
		0.651			0.771	
Democracy × WWII	-0.151			-0.374		
	(-0.003)			(-0.007)		
	-0.516			-1.012		
Regime Duration (BMR)			-0.002			-0.003
			(-0.014)			(-0.023)
			-0.737			-1.417
Democracy × Regime Duration			0.019***			0.019***
			(0.103)			(0.104)
			3.419			3.051
Observations	247	229	247	291	273	284
R-squared	0.976	0.977	0.978	0.972	0.973	0.973
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

III.F Exposures

Section III.F is called "exposures" because it includes regressions where the baseline dummy (t-4, t) is augmented with a 10 year forward average (t-4, t+10), and then the resulting value turned into a dummy if more than 60% of the years were passed in a democratic political status. When we forward an additional 10 years, we are calculating the exposure to democracy that spans for the first 10 to 15 years of life of a cohort, while the dummy of our baselines estimates covers on average the first five years. Interestingly there is an increase in the coefficients for the 2WFE analysis. Though the increase in the effect is not confirmed in the IV regressions for dummies that include female enfranchisement. However, the increase in exposure is consistent throughout the estimates when including the baseline dummies including only male enfranchisement.

Table III.F1 Exposures (2WFE)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BCFH	BCFH	BMR_female	BMR_female	BCFH	BCFH	BMR_female	BMR_female
VARIABLES	dem_6	dem_6f10	A5_6	A5f10_6	dem_6	dem_6f10	A5_6	A5f10_6
Demo	0.794***	0.973***	0.899***	1.125***	0.698***	0.859***	0.734***	0.919***
	(0.080)	(0.094)	(0.092)	(0.116)	(0.071)	(0.083)	(0.076)	(0.096)
	3.534	3.574	3.930	4.861	3.278	3.454	3.347	4.113
Obs.	256	218	301	301	247	211	291	291
R-squared	0.975	0.979	0.969	0.970	0.976	0.982	0.972	0.972
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	✓	✓	✓	✓

Table III.F2 Exposures (IV)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BCFH	BCFH	BMR_female	BMR_female	BCFH	BCFH	BMR_female	BMR_female
	dem_6	dem_6f10	A5_6	A5f10_6	dem_6	dem_6f10	A5_6	A5f10_6
VARIABLES	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Demo	1.102***	1.344***	2.201***	1.952***	1.035***	1.198**	1.707***	1.557***
	(0.355)	(0.465)	(0.714)	(0.605)	(0.378)	(0.506)	(0.636)	(0.581)
Obs.	255	217	300	300	247	211	291	291
R-squared	0.974	0.979	0.964	0.968	0.976	0.981	0.969	0.971
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	×	×	×	×	✓	✓	✓	✓
IV	-0.041***	-0.036***	-0.022***	-0.025***	-0.041***	-0.034***	-0.022***	-0.025***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
F-stat	65.69	46.71	19.97	29.03	57.65	38.46	19.96	25.89

III.G Sensitivity to excluding observations by country and year. All regressions with controls.

Here in III.G we report the estimates when dropping, respectively, each country and each year. This is done both for 2WFE and IV estimates. For space reasons we report only the regressions that include the set of three controls used throughout the paper.

III.G.1 Countries' exclusion: 2WFE

Country Excluded	Coef.	T-stat	Obs-	R-sq.
	BCFH_dem_6			
AUT	0.819	(3.751)	229	0.977
BEL	0.842	(3.696)	226	0.977
DEU	0.768	(3.410)	230	0.976
DNK	0.612	(2.882)	228	0.977
ESP	0.666	(3.045)	229	0.976
FIN	0.684	(3.211)	239	0.976
FRA	0.567	(2.481)	228	0.976
GBR	0.561	(2.521)	223	0.978
GRC	0.757	(3.659)	239	0.979
IRL	0.698	(3.282)	241	0.976
ITA	0.733	(3.138)	227	0.974
NLD	0.616	(2.753)	225	0.978
NOR	0.761	(3.520)	233	0.977
PRT	0.594	(2.538)	235	0.977
SWE	0.797	(3.357)	226	0.976
	BMR_female_A5_6			
AUT	0.780	(3.442)	271	0.972
BEL	0.799	(3.478)	267	0.972
DEU	0.852	(3.618)	273	0.971
DNK	0.747	(3.280)	267	0.973
ESP	0.744	(3.338)	268	0.970
FIN	0.713	(3.235)	283	0.971
FRA	0.736	(3.181)	267	0.973
GBR	0.709	(3.164)	267	0.974
GRC	0.715	(3.280)	281	0.975
IRL	0.735	(3.364)	285	0.971
ITA	0.735	(3.100)	267	0.969
NLD	0.691	(2.955)	267	0.973
NOR	0.643	(2.838)	267	0.972
PRT	0.588	(2.690)	277	0.972
SWE	0.787	(3.263)	267	0.971

III.G.2 Countries' exclusion: IV

Exclusion	Treat	t-stat	Obs.	R-sq.	1st stage IV	t-stat 1st stage	F-stat
			BCFH_dem_6				
AUT	1.351	(3.527)	229	0.976	-0.041	(-7.337)	53.83
BEL	0.826	(2.481)	226	0.977	-0.047	(-8.443)	71.29
DEU	0.812	(2.278)	230	0.976	-0.045	(-8.628)	74.44
DNK	0.655	(1.912)	228	0.977	-0.044	(-8.205)	67.33
ESP	0.801	(2.236)	229	0.976	-0.042	(-7.839)	61.45
FIN	0.891	(2.573)	239	0.976	-0.043	(-8.177)	66.86
FRA	0.775	(1.990)	228	0.976	-0.040	(-7.072)	50.02
GBR	0.792	(2.310)	223	0.978	-0.044	(-7.808)	60.97
GRC	1.165	(3.471)	239	0.978	-0.044	(-8.272)	68.42
IRL	0.923	(2.689)	241	0.976	-0.043	(-8.253)	68.11
ITA	0.697	(1.523)	227	0.974	-0.043	(-6.357)	40.41
NLD	1.157	(3.909)	225	0.977	-0.050	(-9.137)	83.49
NOR	1.018	(2.957)	233	0.977	-0.043	(-7.369)	54.30
PRT	0.750	(1.995)	235	0.976	-0.040	(-7.746)	60
SWE	1.463	(3.518)	226	0.974	-0.044	(-7.378)	54.44
			BMR_female_A5_6				
AUT	2.273	(3.057)	271	0.966	-0.022	(-4.298)	18.47
BEL	2.137	(2.495)	267	0.967	-0.019	(-3.542)	12.54
DEU	2.100	(2.321)	273	0.967	-0.018	(-3.444)	11.86
DNK	1.245	(1.652)	267	0.972	-0.019	(-3.449)	11.89
ESP	1.657	(2.097)	268	0.968	-0.018	(-3.740)	13.98
FIN	1.959	(2.534)	283	0.967	-0.020	(-3.889)	15.13
FRA	1.336	(2.050)	267	0.972	-0.022	(-4.156)	17.28
GBR	1.415	(2.356)	267	0.972	-0.023	(-4.477)	20.04
GRC	2.615	(3.252)	281	0.966	-0.020	(-3.970)	15.76
IRL	1.981	(2.614)	285	0.967	-0.020	(-3.952)	15.62
ITA	2.435	(1.904)	267	0.960	-0.017	(-2.557)	6.540
NLD	2.307	(3.437)	267	0.966	-0.024	(-4.549)	20.70
NOR	2.143	(2.726)	267	0.965	-0.021	(-3.895)	15.17
PRT	1.664	(1.972)	277	0.969	-0.017	(-3.401)	11.56
SWE	3.199	(3.044)	267	0.954	-0.021	(-3.625)	13.14

III.G.3 Years' Exclusion (2WFE)

Year Excluded	Treat	t-stat	Obs.	R-sq.	Year Excluded	Treat	t-stat	Obs.	R-sq.
	Treat is: BCFH_dem_6					Treat is: BMR_female_A5_6			
1860	0.698	(3.278)	247	0.976	1860	0.734	(3.347)	291	0.972
1865	0.678	(3.151)	239	0.976	1865	0.686	(3.151)	281	0.972
1870	0.672	(3.132)	239	0.976	1870	0.684	(3.137)	280	0.971
1875	0.698	(3.241)	239	0.976	1875	0.707	(3.218)	280	0.971
1880	0.691	(3.215)	238	0.976	1880	0.709	(3.225)	280	0.971
1885	0.636	(2.956)	237	0.976	1885	0.705	(3.217)	280	0.971
1890	0.654	(2.969)	237	0.976	1890	0.730	(3.314)	280	0.971
1895	0.655	(2.965)	237	0.976	1895	0.738	(3.337)	280	0.972
1900	0.666	(2.982)	238	0.976	1900	0.724	(3.262)	281	0.972
1905	0.781	(3.531)	238	0.977	1905	0.746	(3.354)	281	0.972
1910	0.782	(3.573)	239	0.977	1910	0.728	(3.292)	281	0.972
1915	0.699	(3.038)	239	0.976	1915	0.738	(3.211)	280	0.972
1920	0.729	(3.193)	238	0.976	1920	0.802	(3.450)	281	0.972
1925	0.665	(3.061)	238	0.976	1925	0.695	(2.995)	281	0.972
1930	0.723	(3.390)	239	0.977	1930	0.699	(3.052)	280	0.972
1935	0.854	(3.938)	235	0.978	1935	0.794	(3.645)	279	0.973
1940	0.664	(3.104)	239	0.977	1940	0.743	(3.205)	278	0.972
1945	0.695	(3.217)	242	0.976	1945	0.727	(3.132)	277	0.973
1950	0.747	(3.418)	234	0.977	1950	0.777	(3.409)	277	0.972
1955	0.686	(3.107)	232	0.976	1955	0.704	(3.116)	276	0.971
1960	0.682	(3.091)	232	0.976	1960	0.741	(3.243)	276	0.971
1965	0.652	(2.971)	232	0.975	1965	0.717	(3.213)	276	0.971
1970	0.742	(3.698)	232	0.977	1970	0.767	(3.424)	276	0.972
1975	0.678	(3.145)	235	0.976	1975	0.865	(3.861)	276	0.972
1980	0.656	(3.053)	233	0.976	1980	0.690	(3.140)	276	0.971

III.G4. Years' Exclusion (IV)

Year Excl.	treat	t-stat	Obs	R2	IV coef	IV t-stat	F	Year Excl.	treat	t-stat	Obs	R2	IV coef	IV t-stat	F
			BCFH_dem_6								BMR_female_A5_6				
1860	0.931	(2.712)	247	0.976	-0.044	(-8.258)	68.20	1860	1.999	(2.637)	291	0.967	-0.020	(-3.962)	15.70
1865	0.911	(2.624)	239	0.976	-0.045	(-8.229)	67.71	1865	1.951	(2.576)	281	0.967	-0.021	(-3.972)	15.78
1870	0.877	(2.558)	239	0.976	-0.045	(-8.221)	67.59	1870	1.857	(2.496)	280	0.967	-0.021	(-3.992)	15.93
1875	0.934	(2.679)	239	0.976	-0.045	(-8.187)	67.02	1875	2.019	(2.618)	280	0.966	-0.021	(-3.965)	15.72
1880	0.894	(2.577)	238	0.976	-0.045	(-8.232)	67.76	1880	1.961	(2.582)	280	0.967	-0.021	(-3.977)	15.82
1885	0.931	(2.644)	237	0.976	-0.044	(-8.110)	65.78	1885	2.085	(2.715)	280	0.966	-0.020	(-4.002)	16.02
1890	0.907	(2.541)	237	0.976	-0.042	(-7.917)	62.67	1890	1.977	(2.655)	280	0.967	-0.021	(-4.042)	16.33
1895	0.963	(2.714)	237	0.976	-0.043	(-7.969)	63.51	1895	2.109	(2.794)	280	0.966	-0.021	(-4.052)	16.42
1900	0.908	(2.517)	238	0.976	-0.042	(-7.878)	62.06	1900	1.992	(2.652)	281	0.967	-0.021	(-4.012)	16.10
1905	1.052	(2.949)	238	0.977	-0.042	(-7.751)	60.08	1905	1.988	(2.676)	281	0.968	-0.021	(-4.022)	16.17
1910	1.026	(2.914)	239	0.977	-0.043	(-7.836)	61.40	1910	1.932	(2.634)	281	0.968	-0.021	(-4.020)	16.16
1915	0.924	(2.481)	239	0.976	-0.041	(-7.686)	59.08	1915	1.873	(2.420)	280	0.968	-0.020	(-3.884)	15.09
1920	0.939	(2.538)	238	0.976	-0.042	(-7.838)	61.44	1920	1.906	(2.590)	281	0.968	-0.021	(-4.165)	17.35
1925	0.904	(2.607)	238	0.976	-0.044	(-8.051)	64.81	1925	2.166	(2.437)	281	0.966	-0.018	(-3.454)	11.93
1930	0.847	(2.548)	239	0.977	-0.046	(-8.808)	77.57	1930	1.934	(2.463)	280	0.968	-0.020	(-3.864)	14.93
1935	1.000	(2.692)	235	0.978	-0.042	(-7.813)	61.04	1935	2.344	(2.504)	279	0.967	-0.018	(-3.440)	11.83
1940	1.061	(2.934)	239	0.976	-0.043	(-7.607)	57.86	1940	2.481	(2.727)	278	0.965	-0.019	(-3.589)	12.88
1945	0.941	(2.716)	242	0.976	-0.043	(-8.172)	66.79	1945	2.248	(2.728)	277	0.967	-0.019	(-3.765)	14.18
1950	0.949	(2.799)	234	0.977	-0.045	(-8.540)	72.94	1950	1.964	(2.642)	277	0.968	-0.021	(-3.959)	15.67
1955	1.018	(2.889)	232	0.976	-0.043	(-8.054)	64.87	1955	2.087	(2.634)	276	0.966	-0.020	(-3.761)	14.15
1960	0.999	(2.869)	232	0.976	-0.043	(-8.162)	66.62	1960	2.050	(2.672)	276	0.966	-0.020	(-3.857)	14.88
1965	0.911	(2.541)	232	0.975	-0.043	(-8.088)	65.42	1965	1.944	(2.486)	276	0.966	-0.020	(-3.766)	14.18
1970	0.819	(2.380)	232	0.977	-0.043	(-8.068)	65.09	1970	1.816	(2.335)	276	0.969	-0.019	(-3.631)	13.19
1975	0.892	(2.606)	235	0.975	-0.044	(-8.236)	67.83	1975	1.834	(2.549)	276	0.969	-0.020	(-3.974)	15.79
1980	0.771	(2.408)	233	0.976	-0.045	(-8.207)	67.36	1980	1.612	(2.212)	276	0.969	-0.020	(-3.789)	14.36

III.H Controlling for Southern and Central European Countries Dummies

In section III.H we control for area dummies which group the 15 European countries in Southern, Central, and Northern. Note that, by using countries' fixed effects in the specifications, we can include each of the three dummies separately as an interaction with the democratic treatment dummy.

Table IIIH.1 2WFE regressions

	(1) BCFH dem_6	(2) BCFH dem_6	(3) BCFH dem_6	(4) BMR a5_6	(5) BMR a5_6	(6) BMR a5_6	(7) BMR FEMALE a5_6	(8) BMR FEMALE a5_6	(9) BMR FEMALE a5_6
Democratic Treatmemt	0.639***	0.993***	0.814***	0.520**	0.611***	0.562**	0.888***	0.873***	0.936***
	(0.244)	(0.243)	(0.249)	(0.240)	(0.202)	(0.231)	(0.248)	(0.220)	(0.270)
Treat × Central Europe	0.409			0.103			0.030		
	(0.264)			(0.277)			(0.240)		
Treat × Southern Europe		-0.554			-0.145			0.105	
		(0.348)			(0.371)			(0.373)	
Treat × Northern Europe			-0.075			-0.007			-0.096
			(0.268)			(0.272)			(0.255)
Observations	256	256	256	293	293	293	301	301	301
R-squared	0.975	0.975	0.975	0.968	0.968	0.968	0.969	0.969	0.969
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	×	×	×	×	×	×	×	×	×

	(10) BCFH dem_6	(11) BCFH dem_6	(12) BCFH dem_6	(13) BMR a5_6	(14) BMR a5_6	(15) BMR a5_6	(16) BMR FEMALE a5_6	(17) BMR FEMALE a5_6	(18) BMR FEMALE a5_6
Democratic Treatmemt	0.649**	0.930***	0.564**	0.544**	0.631***	0.397*	0.821***	0.787***	0.589**
	(0.257)	(0.222)	(0.232)	(0.240)	(0.187)	(0.219)	(0.274)	(0.209)	(0.252)
Treat × Central Europe	0.129			-0.080			-0.201		
	(0.325)			(0.305)			(0.300)		
Treat × Southern Europe		-0.640*			-0.328			-0.231	
		(0.338)			(0.353)			(0.350)	
Treat × Northern Europe			0.529			0.455			0.435
			(0.326)			(0.328)			(0.327)
Observations	247	247	247	283	283	283	291	291	291
R-squared	0.976	0.977	0.977	0.971	0.971	0.972	0.972	0.972	0.972
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table III.H.2 IV regressions

	(1) BCFH dem_6	(2) BCFH dem_6	(3) BCFH dem_6	(4) BMR a5_6	(5) BMR a5_6	(6) BMR a5_6	(7) BMR FEMALE a5_6	(8) BMR FEMALE a5_6	(9) BMR FEMALE a5_6
Democratic Treatmemt	1.092***	1.267***	1.315***	1.564***	1.780***	1.861***	2.788***	3.129***	3.244***
	(0.359)	(0.383)	(0.420)	(0.414)	(0.489)	(0.521)	(0.862)	(1.092)	(1.016)
Treat × Central Europe	0.167			-0.529			-0.773*		
	(0.290)			(0.348)			(0.447)		
Treat × Southern Europe		-0.740*			-1.052*			-1.084	
		(0.432)			(0.538)			(0.740)	
Treat × Northern Europe			-0.311			-0.693*			-1.171**
			(0.298)			(0.388)			(0.519)
Observations	255	255	255	292	292	292	300	300	300
R-squared	0.974	0.974	0.974	0.965	0.964	0.963	0.960	0.957	0.957
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	NO	NO	NO	NO	NO	NO
l_area_km2_A10	-0.039*** (0.004)	-0.038*** (0.004)	-0.037*** (0.005)	-0.038*** (0.004)	-0.034*** (0.004)	-0.034*** (0.005)	-0.020*** (0.004)	-0.017*** (0.005)	-0.017*** (0.004)
F-stat	81.87	91.24	54.74	76.06	56.83	41.85	20.71	14.09	15.31

	(10) BCFH dem_6	(11) BCFH dem_6	(12) BCFH dem_6	(13) BMR a5_6	(14) BMR a5_6	(15) BMR a5_6	(16) BMR FEMALE a5_6	(17) BMR FEMALE a5_6	(18) BMR FEMALE a5_6
Democratic Treatmemt	1.092***	1.267***	1.315***	1.564***	1.780***	1.861***	2.788***	3.129***	3.244***
	(0.359)	(0.383)	(0.420)	(0.414)	(0.489)	(0.521)	(0.862)	(1.092)	(1.016)
Treat × Central Europe	0.167			-0.529			-0.773*		
	(0.290)			(0.348)			(0.447)		
Treat × Southern Europe		-0.740*			-1.052*			-1.084	
		(0.432)			(0.538)			(0.740)	
Treat × Northern Europe			-0.311			-0.693*			-1.171**
			(0.298)			(0.388)			(0.519)
Observations	255	255	255	292	292	292	300	300	300
R-squared	0.974	0.974	0.974	0.965	0.964	0.963	0.960	0.957	0.957
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
l_area_km2_ma10	-0.039***	-0.038***	-0.037***	-0.038***	-0.034***	-0.034***	-0.020***	-0.017***	-0.017***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)
F-stat	81.87	91.24	54.74	76.06	56.83	41.85	20.71	14.09	15.31

III.I Regressions with detrended heights (2WFE)

In section III.D we proceeded by including directly quadratic trends in the main regressions. In this section we proceed by first running a regression to detrend heights with, respectively, linear, quadratic, and cubic trends. We then use the estimated residuals from this stage as our measure of heights. Overall, the 2WFE are consistent with our baseline estimates. Not surprisingly, these estimates also produce lower R-squared values than the baselines, which are often 0.97 or higher. However, the IV results are robust only when a linear trend is used.

Figure III.I1

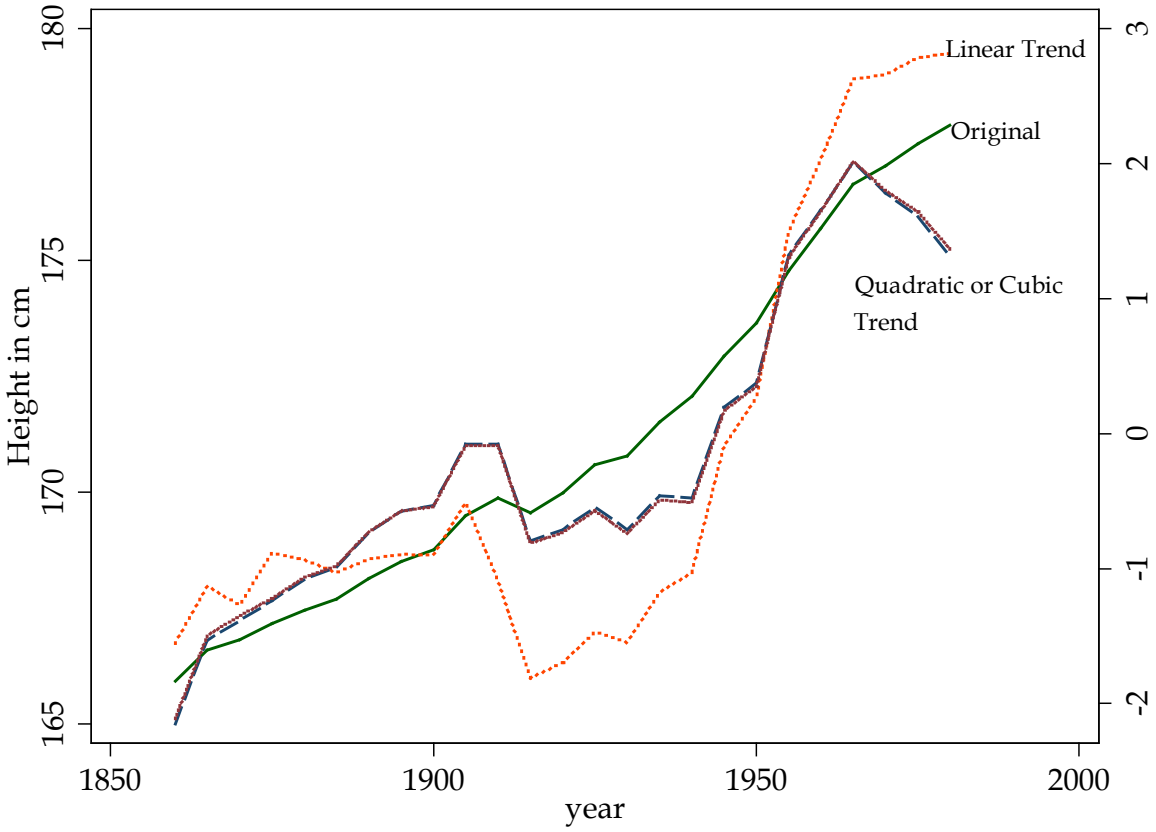


Table III.I1 – Detrended Heights

	BCFH	BMR *Female Enfranchisement*	BCFH	BMR *Female Enfranchisement*	BCFH	BMR *Female Enfranchisement*
Heights Detrending	Linear	Linear	Quadratic	Quadratic	Cubic	Cubic
	(1)	(2)	(3)	(4)	(5)	(6)
Demo	0.794***	0.899***	0.857***	0.954***	0.854***	0.949***
	(0.225)	(0.229)	(0.254)	(0.247)	(0.252)	(0.246)
Observations	256	301	256	301	256	301
R-squared	0.957	0.948	0.937	0.927	0.938	0.928
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	NO	NO	NO
	(7)	(8)	(9)	(10)	(11)	(12)
Demo	0.698***	0.734***	0.777***	0.784***	0.773***	0.781***
	(0.213)	(0.219)	(0.243)	(0.241)	(0.241)	(0.240)
PC_GDP (Log)	0.420	0.836*	0.167	0.673	0.167	0.672
	(0.473)	(0.453)	(0.614)	(0.566)	(0.606)	(0.559)
IMO	-0.092***	-0.104***	-0.076**	-0.075**	-0.077**	-0.076**
	(0.028)	(0.026)	(0.035)	(0.032)	(0.035)	(0.032)
PARENT_EDUC	0.129	0.155*	0.106	0.147	0.103	0.146
	(0.093)	(0.091)	(0.112)	(0.110)	(0.111)	(0.109)
Observations	247	291	247	291	247	291
R-squared	0.962	0.954	0.942	0.933	0.943	0.934
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

Figure III.I2

2WFE – Estimated effects, from Regressions Without Controls

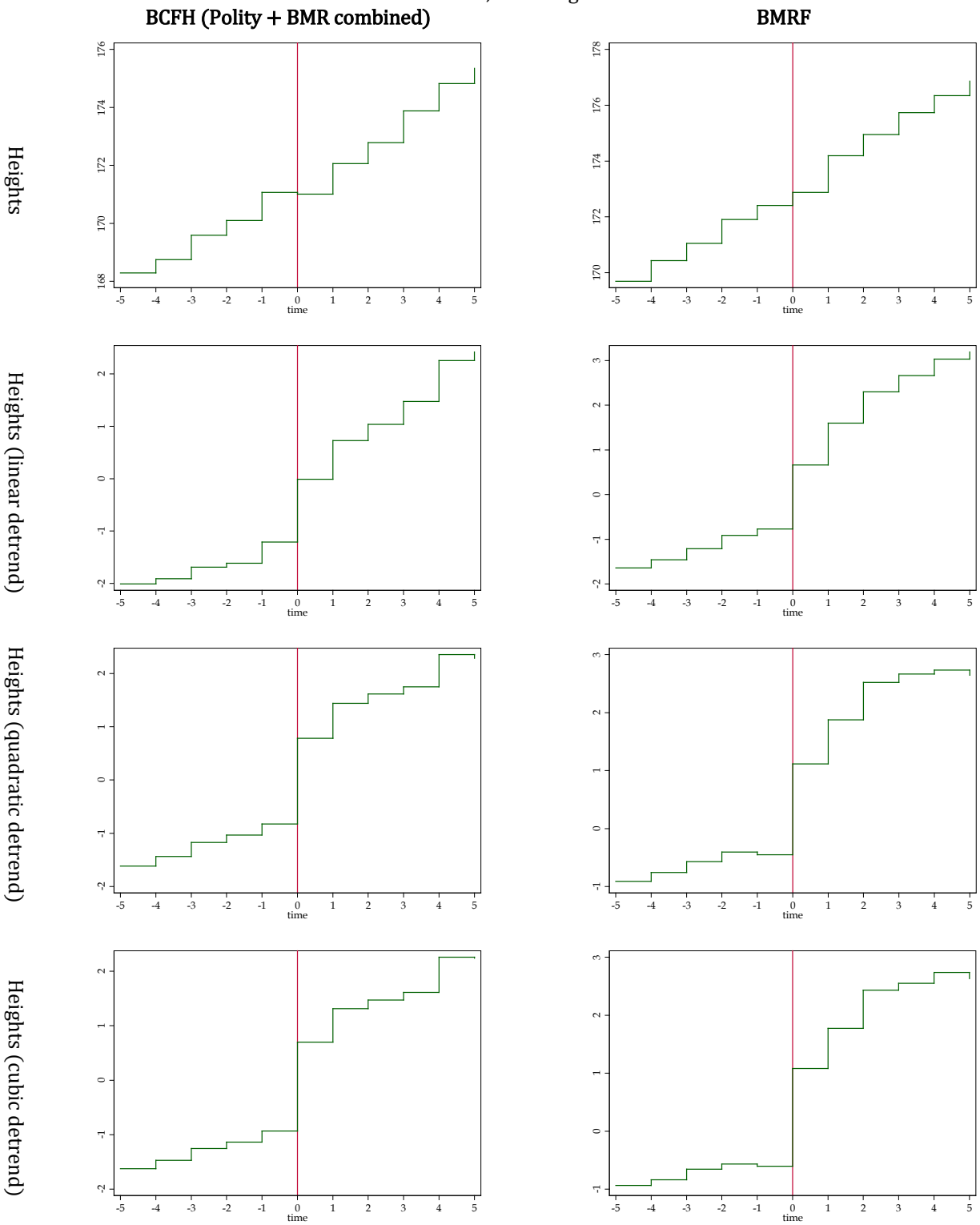


Table III.I3 IV Regressions using detrended heights

	BCFH	BMR *Female Enfranchisement*	BCFH	BMR *Female Enfranchisement*	BCFH	BMR *Female Enfranchisement*
Heights Detrending	Linear	Linear	Quadratic	Quadratic	Cubic	Cubic
	(1)	(2)	(3)	(4)	(5)	(6)
Democratic Treatment	1.507***	3.027**	0.350	0.747	0.370	0.790
	(0.500)	(1.187)	(0.569)	(0.998)	(0.563)	(0.991)
Obs.	255	300	255	300	255	300
R-squared	0.955	0.927	0.935	0.926	0.936	0.927
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	NO	NO	NO
	(7)	(8)	(9)	(10)	(11)	(12)
Democratic Treatment	1.427***	2.189**	0.334	0.061	0.354	0.099
	(0.534)	(1.069)	(0.599)	(1.099)	(0.591)	(1.085)
PC_GDP (log)	0.264	0.397	0.261	0.891	0.257	0.877
	(0.490)	(0.611)	(0.588)	(0.651)	(0.580)	(0.643)
IMO	-0.086***	-0.104***	-0.080**	-0.075**	-0.080**	-0.076**
	(0.027)	(0.026)	(0.033)	(0.030)	(0.032)	(0.030)
PARENT_EDUC	0.128	0.087	0.107	0.181	0.104	0.178
	(0.086)	(0.107)	(0.104)	(0.125)	(0.103)	(0.124)
Obs.	247	291	247	291	247	291
R-squared	0.959	0.945	0.941	0.930	0.942	0.931
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

III.J Excluding non-coloniser countries

In our sample four countries, Finland, Greece, Ireland, and Norway, have never been colonisers. In what follows we show 2SLS results when excluding those countries.

Table III.J1 – Descriptive Statistics Between Colonialist and Non-Colonialist Countries

Country	BCFH dem_6	BMR Female Enfranchisement A5_6	Height (cm)	Log of km sq. area of colonized countries
		COLONISERS		
AUT	0.37	0.33	171.67	7.32
BEL	0.67	0.29	171.49	12.60
DEU	0.39	0.37	173.06	8.27
DNK	0.55	0.52	173.17	5.96
ESP	0.05	0.08	166.66	10.38
FRA	1.00	0.28	169.96	15.21
GBR	0.79	0.54	172.16	15.75
ITA	0.29	0.28	167.39	5.76
NLD	0.48	0.48	173.79	13.47
PRT	0.33	0.07	167.47	13.82
SWE	0.55	0.48	174.24	5.23
		NEVER COLONISERS		
FIN	1.00	1.00	176.20	0.00
GRC	0.78	0.36	171.98	0.00
IRL	1.00	1.00	172.05	0.00
NOR	1.00	0.58	174.56	0.00

Table III.J3 – 2SLS Results Between Colonialist and Non-Colonialist Countries

2nd stage 2SLS Regressions including only Colonialist countries

	(1) BCFH	(2) BMR *Female Enfranchisement*
Democratic Treatment	1.292***	2.320***
	(0.370)	(0.664)
PC_GDP (Log)	-0.004	-0.368
	(0.476)	(0.538)
IMO	-0.083***	-0.102***
	(0.026)	(0.028)
PARENT_EDUC	0.116	0.068
	(0.085)	(0.094)
Observations	211	243
R-squared	0.978	0.967
Year FE	YES	YES
Country FE	YES	YES
Min Eigenvalue	39.87	18.73
F-stat	44.30	17.55
Stock Yogo 10% Threshold	16.38	16.38
Durbin p-val	0.20	0.009
Hausman-Wu p-val	0.247	0.0162

Appendix IV
(Not intended for publication)

Additional Robustness and Heterogeneity Tests

1. Evidence using the 'high-Level' democracy índices of the V-dem (Varieties of Dmeocracy) database

Table IV.A
Descriptives from V-Dem v.9
Scale: Interval, from low to high (0-1)

Variable	N	Mean	SD	Min	Max
V2X_POLYARCHY	292	0.49	0.27	0.04	0.92
V2X_LIBDEM	290	0.44	0.25	0.01	0.88
V2X_PARTIPDEM	292	0.32	0.2	0.01	0.72
V2X_DELIBDEM	210	0.46	0.26	0.01	0.89
V2X_EGALDEM	210	0.47	0.25	0.08	0.88

Notes: (i) V2X_POLYARCHy is the electoral democracy index measuring to what extent is the ideal of electoral democracy in its fullest sense achieved. (ii) V2X_LIBDEM is the liberal democracy index, capturing to what extent is the ideal of liberal democracy achieved. (iii) V2X_PARTIPDEM is the participatory democracy index, looking at to what extent is the ideal of participatory democracy achieved. (iv) V2X_DELIBDEM is the deliberative democracy index and (v) V2X_EGALDEM is the egalitarian democracy index. Definitions of the main high-level indices variables are *verbatim* from V-dem version 9 codebook, pages 39 and following for more details.

Table IV.B
2WFE results. With and without controls.

VDEM High-Level Index	V2X_POLYARCHY	V2X_LIBDEM	V2X_PARTIPDEM	V2X_DELIBDEM	V2X_EGALDEM
	(1)	(2)	(3)	(4)	(5)
Democratic Treatment	1.583***	1.765***	2.192***	1.500**	1.217
	(0.086)	(0.089)	(0.090)	(0.085)	(0.065)
	2.910	2.902	2.865	2.036	1.463
Observations	249	247	249	181	181
R-squared	0.974	0.974	0.974	0.972	0.972
Country FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Controls	×	×	×	×	×
	(6)	(7)	(8)	(9)	(10)
Democratic Treatment	1.377**	1.613**	2.098**	1.565**	1.254
	(0.076)	(0.083)	(0.088)	(0.089)	(0.068)
	2.472	2.592	2.580	2.119	1.468
GDP_PC (Log)	0.231	0.213	0.194	0.368	0.471
	(0.030)	(0.028)	(0.026)	(0.049)	(0.063)
	0.453	0.417	0.379	0.625	0.780
IMO	-0.088***	-0.091***	-0.096***	-0.136*	-0.130*
	(-0.131)	(-0.134)	(-0.143)	(-0.143)	(-0.137)
	-2.879	-2.980	-3.111	-1.929	-1.840
PARENT_EDUC	0.052	0.049	0.030	-0.025	-0.025
	(0.021)	(0.019)	(0.012)	(-0.010)	(-0.010)
	0.514	0.484	0.288	-0.216	-0.204
Obs.	240	238	240	180	180
R-squared	0.976	0.975	0.976	0.974	0.973
Country FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

2. Heterogeneity effects looking at Huntington's "waves" of democracy

Table IV.C
Waves of Democracy

iso3c	AUT	BEL	DEU	DNK	ESP	FRA	GBR	GRC	ITA	NLD	PRT	SWE	TOT	WAVE
1860	0	0	0	0	0	0	0	0	0	0	0	0	**0**	
1865	0	0	0	0	0	0	0	1	0	0	0	0	**1**	
1870	0	0	0	0	0	1	0	1	0	0	0	0	**2**	
1875	0	0	0	0	0	1	0	1	0	0	0	0	**2**	
1880	0	0	0	0	0	1	0	1	0	0	0	0	**2**	
1885	0	0	0	0	0	1	1	1	0	0	0	0	**3**	
1890	0	0	0	0	0	1	1	1	0	0	0	0	**3**	WAVE I
1895	0	1	0	0	0	1	1	1	0	0	0	0	**4**	
1900	0	1	0	0	0	1	1	1	0	1	0	0	**5**	
1905	0	1	0	1	0	1	1	1	0	1	0	0	**6**	
1910	0	1	0	1	0	1	1	1	0	1	0	0	**6**	
1915	0	1	0	1	0	1	1	0	0	1	1	1	**7**	
1920	1	1	1	1	0	1	1	0	1	1	1	1	**10**	
1925	1	1	1	1	0	1	1	0	0	1	1	1	**9**	
1930	1	1	1	1	0	1	1	1	0	1	0	1	**9**	
1935	0	1	0	1	1	1	1	1	0	1	0	1	**8**	
1940	0	1	0	1	0	0	1	0	0	1	0	1	**5**	
1945	0	1	0	1	0	0	1	1	0	1	0	1	**6**	
1950	1	1	1	1	0	1	1	1	1	1	0	1	**10**	
1955	1	1	1	1	0	1	1	1	1	1	0	1	**10**	WAVE II
1960	1	1	1	1	0	1	1	1	1	1	0	1	**10**	
1965	1	1	1	1	0	1	1	1	1	1	0	1	**10**	
1970	1	1	1	1	0	1	1	0	1	1	0	1	**9**	
1975	1	1	1	1	0	1	1	1	1	1	0	1	**10**	WAVE III
1980	1	1	1	1	1	1	1	1	1	1	1	1	**12**	

Notes: Most of our of the sample captures the first wave both in terms of time span than representativeness of the countries. As we use in this case the BMR index, this matches the methodology in Huntington to classify waves, and using basically the Dahl definition which is also the one used by BMR. The Huntington classification has been found quite sensitive to the definition of democracy. For example, it has been noted, and can easily be verified, that waves almost disappear if the 100% of male enfranchisement (instead of 50%) and/or female enfranchisement are added to the definition of democracy. In spite of these limitations, it seems that historical records are in line with heterogeneous social differences in determining the "type' of democratization, and this is also supported by not finding significance when using the V2X_EGALDEM variable.

Figure IV.A - Waves of Democracy

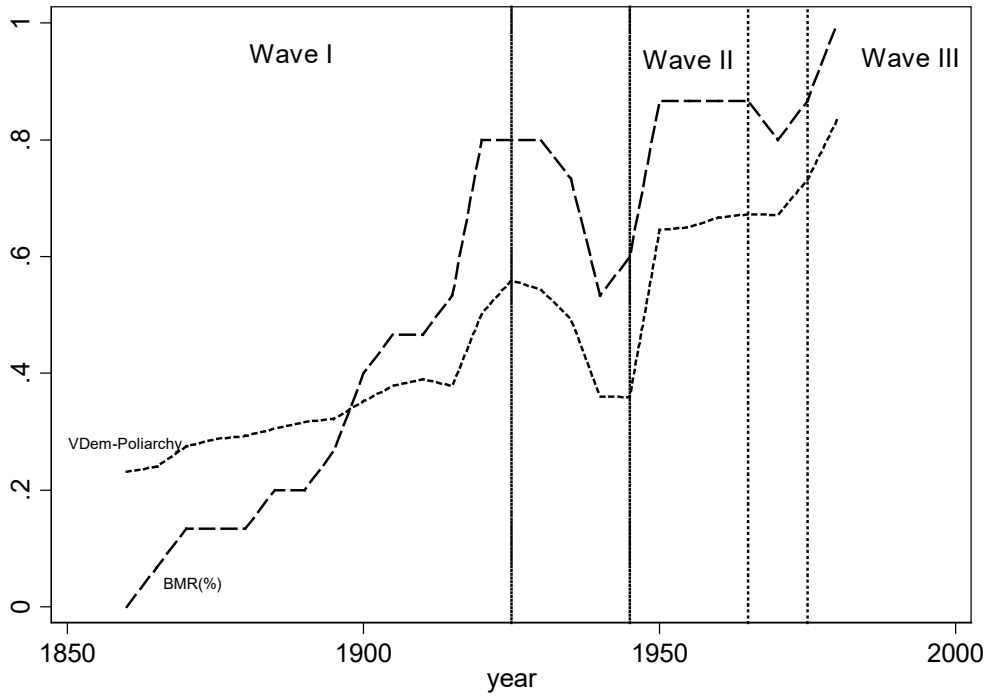


Table IV.D
Huntington Waves Heterogeneity captured through interactions

	(1)	(2)	(3)	(4)	(5)	(6)
Democracy is:	BCFH	BCFH	BMR	BMR	Polity	Polity
Democracy	0.708	0.670	0.350	0.418	0.434	0.490
	(0.458)	(0.414)	(0.368)	(0.330)	(0.473)	(0.420)
Democracy x Wave1	-0.0454	-0.124	-0.0358	-0.200	0.0496	-0.147
	(0.491)	(0.450)	(0.399)	(0.362)	(0.506)	(0.469)
Democracy x Wave2	0.326	0.286	0.748	0.619	0.631	0.505
	(0.566)	(0.540)	(0.468)	(0.436)	(0.584)	(0.560)
Joint Estimate: Demo + Demo x W1	0.663	0.546	0.314	0.218	0.483	0.343
Standard Error	*0.258*	*0.253*	*0.235*	*0.228*	*0.206*	*0.228*
t statistic	*2.571*	*2.163*	*1.334*	*0.959*	*2.342*	*1.503*
Joint Estimate: Demo + Demo x W2	1.034	0.957	1.097	1.037	1.065	0.996
Standard Error	*0.421*	*0.413*	*0.360*	*0.343*	*0.420*	*0.402*
t statistic	*2.456*	*2.319*	*3.048*	*3.020*	*2.538*	*2.474*
Observations	256	247	293	283	264	255
R-squared	0.975	0.976	0.969	0.972	0.975	0.976
Controls	NO	✓	NO	✓	NO	✓
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

Table IV.E
Huntington Waves Heterogeneity by mean demeaning interactions

	(1)	(2)	(3)	(4)	(5)	(6)
Democracy is:	BCFH	BCFH	BMR	BMR	POLITY	POLITY
Democratic Treatment	0.819***	0.699**	0.467*	0.442*	0.632**	0.563**
	(0.304)	(0.287)	(0.273)	(0.248)	(0.278)	(0.258)
Democracy × wave1 (wmd) (*within mean demeaned) See Balli Soerensen (2013)	-0.0167	0.161	0.0722	0.147	-0.124	-0.0891
	(0.582)	(0.550)	(0.512)	(0.469)	(0.576)	(0.532)
Democracy × wave2 (wmd) (*within mean demeaned) See Balli Soerensen (2013	-0.131	-0.196	0.557	0.341	0.183	0.0729
	(0.585)	(0.557)	(0.581)	(0.533)	(0.580)	(0.558)
Observations	256	247	293	283	264	255
R-squared	0.975	0.976	0.968	0.971	0.974	0.976
Controls	NO	✓	NO	✓	NO	✓
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Joint Estimate: Demo + Demo x W1	0.803	0.860	0.539	0.589	0.509	0.474
Standard Error W1	0.430	0.411	0.381	0.361	0.402	0.406
t statistic W1	1.867	2.095	1.413	1.630	1.266	1.167
Joint Estimate: Demo + Demo x W2	0.688	0.504	1.023	0.783	0.815	0.636
Standard Error W2	0.522	0.490	0.500	0.463	0.502	0.492
t statistic W2	1.318	1.027	2.046	1.692	1.622	1.292

Table IV.F

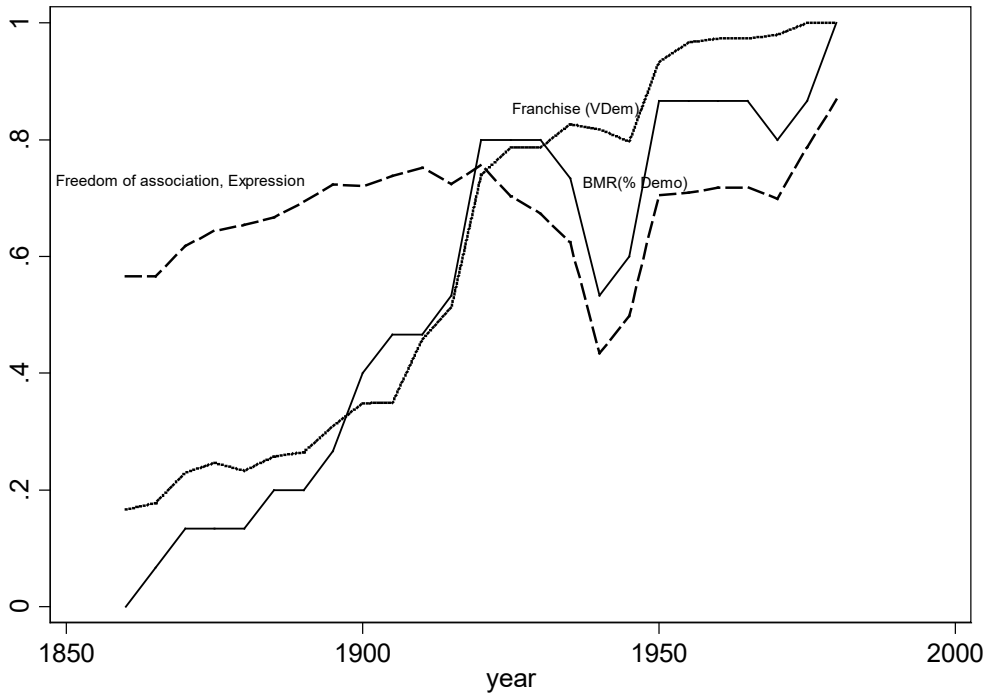
Results using V-Dem, baselines and interaction effects with post WWII sample

Mean demeaned interactions and conditional on having non missing measures of BCFH

NO CONTROLS	v2x_polyarchy			v2x_libdem			v2x_partipdem			v2x_delibdem			v2x_egaldem		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
demo	1.583***	1.623**	1.730***	1.765***	1.737**	1.949***	2.192***	2.465**	2.534***	1.500**	1.386	1.639**	1.217	0.680	1.444
	(2.910)	(2.457)	(3.120)	(2.902)	(2.330)	(3.116)	(2.865)	(2.483)	(3.161)	(2.036)	(1.624)	(2.133)	(1.463)	(0.728)	(1.615)
demo x post1945		-0.060			0.039			-0.358			0.143			0.711	
		(-0.088)			(0.054)			(-0.383)			(0.200)			(0.846)	
demo_wmd x post1945_wmd (*within mean demeaned) See Balli Soerensen (2013)			-1.581			-1.686			-2.841			-1.012			-1.456
			(-1.232)			(-1.143)			(-1.546)			(-0.565)			(-0.711)
Observations	249	249	249	247	247	247	249	249	249	181	181	181	181	181	181
R-squared	0.974	0.974	0.975	0.974	0.974	0.974	0.974	0.974	0.975	0.972	0.972	0.972	0.972	0.972	0.972
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
WITH CONTROLS	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
demo	1.377**	0.986	1.472***	1.613**	0.968	1.712***	2.098**	1.626*	2.339***	1.565**	0.668	1.586**	1.254	-0.272	1.317
	(2.472)	(1.538)	(2.638)	(2.592)	(1.355)	(2.751)	(2.580)	(1.675)	(2.802)	(2.119)	(0.785)	(2.065)	(1.468)	(-0.283)	(1.445)
demo x post1945		0.591			0.917			0.623			1.197*			2.110***	
		(0.907)			(1.314)			(0.700)			(1.773)			(2.669)	
demo_wmd x post1945_wmd (*within mean demeaned) Balli Soerensen (2013)			-1.273			-1.117			-2.106			-0.186			-0.453
			(-0.964)			(-0.748)			(-1.138)			(-0.097)			(-0.212)
Observations	240	240	240	238	238	238	240	240	240	180	180	180	180	180	180
R-squared	0.976	0.976	0.976	0.975	0.976	0.975	0.976	0.976	0.976	0.974	0.974	0.974	0.973	0.975	0.973
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

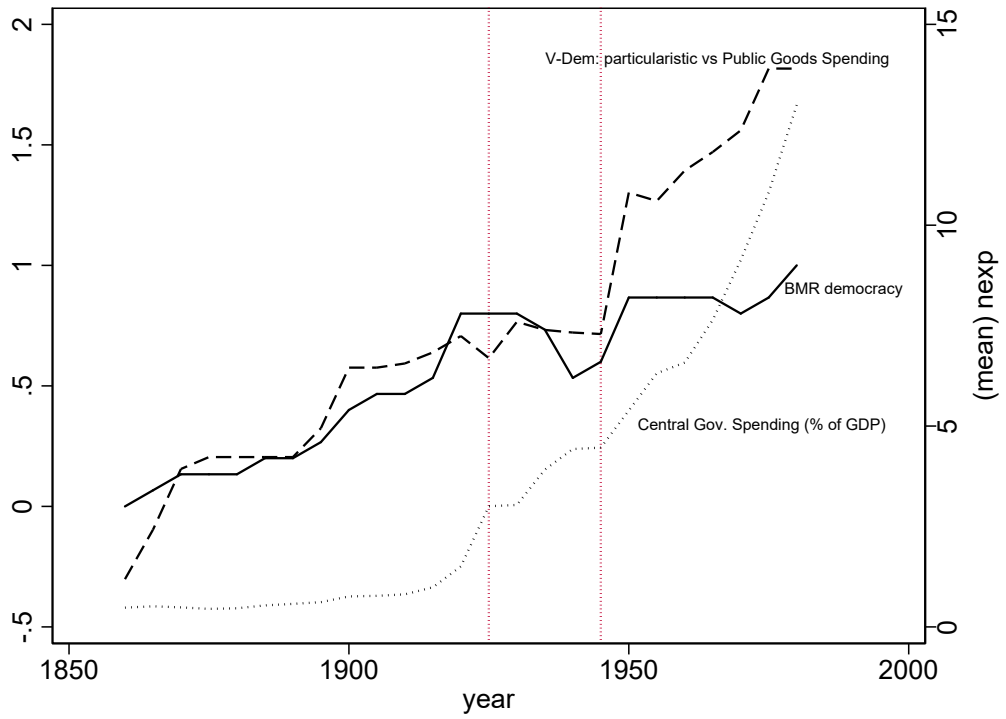
3. Additional heterogeneity effects using V-Dem indices

Figure IV. B



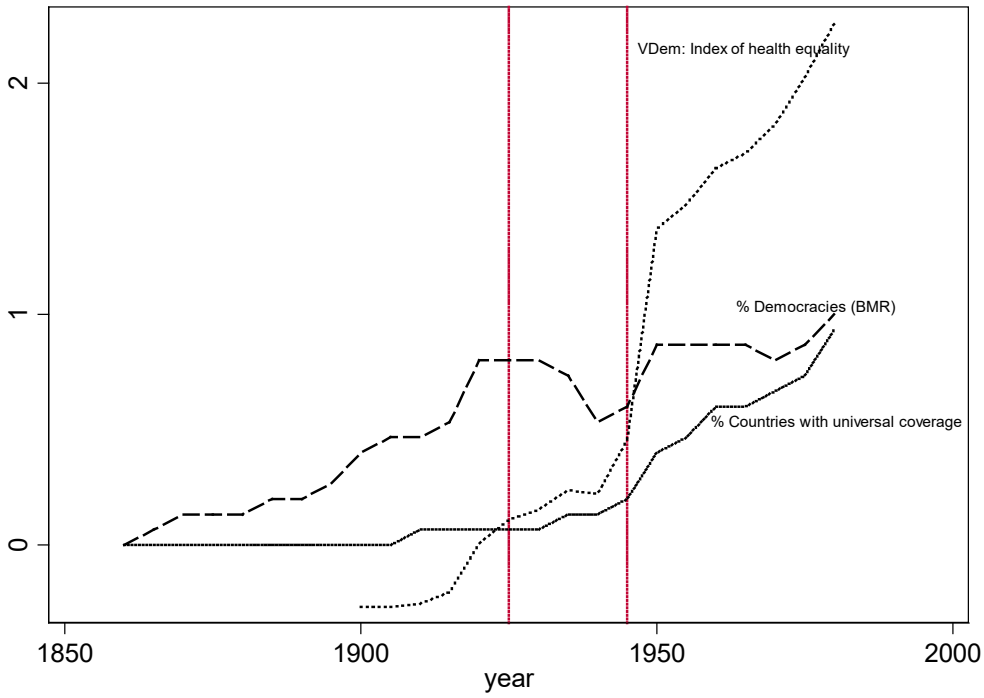
Notes: Comparing with freedom of association (expression would be very similar) with franchise extension and % of BMR democracies. Freedom was quite high before democratization, while franchise was high also during reversals, suggesting that competitiveness and freedom were lost, while franchisee was maintained but was inessential for the expression of real debate in the polity. This suggesting enfranchisement as being necessary but not enough for democracy.

Figure IV.C Particularistic vs Public Good Spending



Notes: here we use variable V2DLENCMPS, and index measuring particularistic vs public goods spending. From the codebook, particularistic spending is spending "narrowly targeted on a specific corporation, sector, social group, region, party, or set of constituents. Such spending may be referred to as "pork", "clientelistic", or "private goods."

Figure IV.D Particularistic vs Public Good Spending



Notes: Here we plot an index of health equality index from V-Dem, version 9. (variable: V2PEHEALTH). The index captures to "what extent is high quality basic healthcare guaranteed to all, sufficient to enable them to exercise their basic political rights as adult citizens".

Overall, it seems that having data on two waves, the democratizations in the two periods were accompanied by different underlying factors. The first period/ wave was lead by an increase in social participation and engagement of the civil society in the polity. The second by increasing and changing the destination of government spending, supported by a concomitant increase in health coverage and health equality. Both periods had a positive effect on heights, though the democratizations in the second wave about double than the ones of the second wave (1cm impact divided in 0.35 and 0.65 for respectively wave1 and wave 2.)

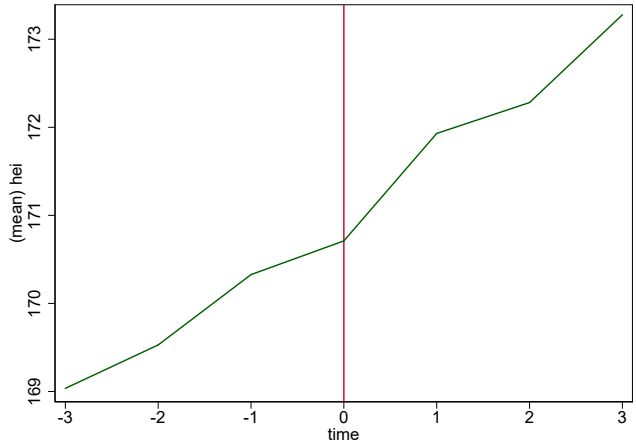
So the underlying social changes were basically (1) social engagement of the civil society in the polity, during wave 1, and (2) government being more responsive to citizens need, by not only increasing social spending overall and specifically in the welfare state shifting from more particularistic spending to the provision of public goods. Trends in health equality and coverage confirm that part of this shift involved providing more and better healthcare (recall that the second wave had also the opportunity to exploit in full the diffusion of the new treatments and medical discoveries during the 20s and 30s, as an example in 1928, when Alexander Fleming accidentally discovered the penicillin).

Adding an interaction capturing the second wave (post 1945) shows in fact that the interaction between the egalitarian and equality of access variables from V-Dem and the dummy are positive and significant, while the other variables are not. Please, see following table.

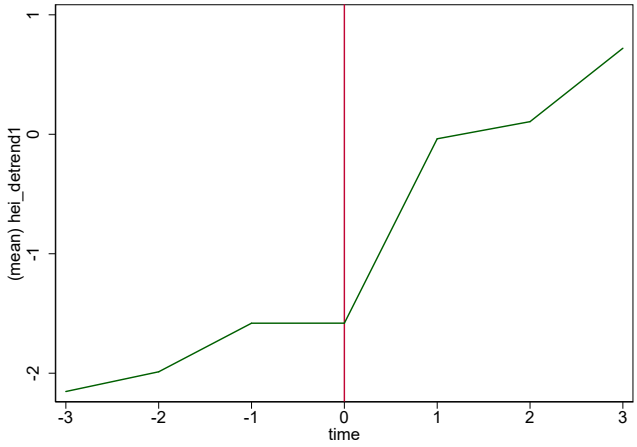
4. Event study

Figure IV. D
Change in Heigths in a 30 years window before and after democratization

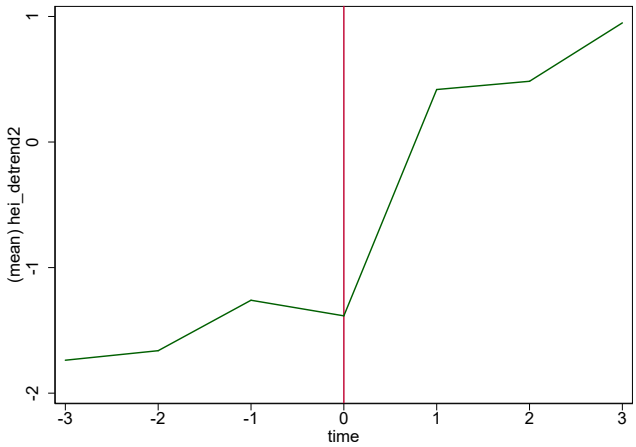
(A) Heights



(B) Linearly detrended heights



(B) Quadratic detended heights



(D) Cubic detrended heigts

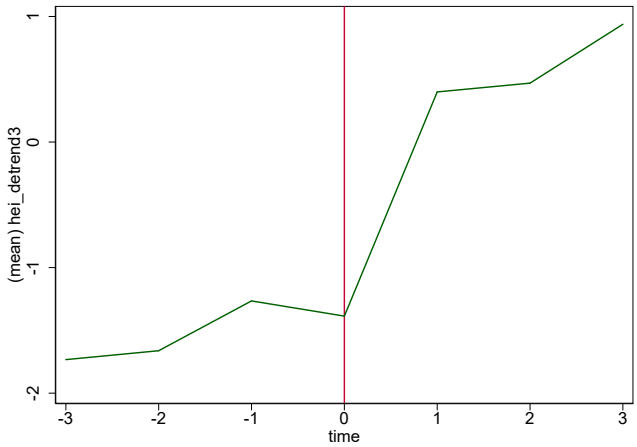


Table IV.G

Event study using BMR and the "Time" counter variable measuring periods to and from democratization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BMR	1.868***	0.319	2.058***	0.425*	1.056***	0.466**	1.002***	0.464**
	(0.639)	(0.543)	(0.552)	(0.239)	(0.334)	(0.234)	(0.323)	(0.221)
time	0.328***	0.568***	0.150***	0.0402	-0.329***	-0.133***	-0.420***	-0.0716*
	(0.0575)	(0.0447)	(0.0551)	(0.0338)	(0.0484)	(0.0338)	(0.0538)	(0.0400)
Time ×	-0.0461	-0.164**	-0.0217	-0.0256	0.373***	0.213***	0.471***	0.119***
	(0.0670)	(0.0685)	(0.0629)	(0.0331)	(0.0481)	(0.0314)	(0.0548)	(0.0405)
GDP_PC (Log)					2.459***	2.471***	3.672***	1.224**
					(0.340)	(0.261)	(0.386)	(0.484)
PARENT_EDUC					0.744***	0.237**	0.647***	0.182**
					(0.0974)	(0.0996)	(0.110)	(0.0908)
IMO					-0.329***	-0.344***	-0.420***	-0.177***
					(0.0284)	(0.0239)	(0.0495)	(0.0344)
Observations	294	294	294	294	284	284	284	284
R-squared	0.539	0.760	0.729	0.968	0.876	0.964	0.891	0.973
Country FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	NO	NO	YES	YES	NO	NO	YES	YES
Controls	NO	NO	NO	NO	YES	YES	YES	YES

Table IV.H

Event study using as dependent variables various versions of detrended heights. Note, this also controls for technological change as a possible element of confounding

	(1)	(2)	(3)		(4)	(5)	(6)
Dependent variable (Heigts) detrended	Linear detrend	Quadratic detrend	Cubic detrend		Linear detrend	Quadratic detrend	Cubic detrend
BMR	0.485***	0.536**	0.542**		0.464**	0.540**	0.543**
	(0.185)	(0.212)	(0.209)		(0.221)	(0.257)	(0.253)
Time					-0.0716*	-0.0977**	-0.0951**
					(0.0400)	(0.0453)	(0.0447)
Time × BMR					0.119***	0.153***	0.150***
					(0.0405)	(0.0433)	(0.0430)
GDP_PC (Log)	0.878*	0.248	0.277		1.224**	0.683	0.703
	(0.470)	(0.599)	(0.585)		(0.484)	(0.604)	(0.591)
PARENT_EDUC	0.192**	0.188*	0.186*		0.182**	0.176*	0.174*
	(0.0906)	(0.0983)	(0.0973)		(0.0908)	(0.0983)	(0.0973)
IMO	-0.105***	-0.0753**	-0.0759**		-0.177***	-0.167***	-0.166***
	(0.0271)	(0.0313)	(0.0308)		(0.0344)	(0.0379)	(0.0375)
Constant	-7.432	-3.860	-3.990		-10.81**	-8.137	-8.181
	(4.523)	(5.642)	(5.518)		(4.550)	(5.597)	(5.480)
Observations	284	284	284		284	284	284
R-squared	0.948	0.921	0.924		0.950	0.926	0.928
Country FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓

5. Set of placebo tests assigning randomly the treatment within a predetermined window around actual democratization

Table IV.H

	Random assignment of years around the time of democratization:								
Years	(-10, -5; +5; +10)			(-15, -10, -5; +5; +10, +15)			(-10, -5; +5; +10, +15)		
Democracy measure	BCFH	BMR	Polity	BCFH	BMR	Polity	BCFH	BMR	POLITY
	1	2	3	4	5	6	7	8	9
Placebo effect	0.146	0.282	0.060	-0.052	0.104	-0.160	0.047	0.150	-0.209
	(0.732)	(1.453)	(0.388)	(-0.246)	(0.510)	(-0.820)	(0.205)	(0.730)	(-0.958)
Observations	264	283	272	263	282	272	251	282	260
R-squared	0.972	0.971	0.972	0.971	0.971	0.971	0.971	0.971	0.971
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Robust and 999 repetitions bootstrapped standard errors in parenthesis.

Additional references for Appendix IV

Balli, H. O., & Sørensen, B. E. (2013). Interaction effects in econometrics. *Empirical Economics*, 45(1), 583-603.

Doorenspleet, R. (2000). Reassessing the three waves of democratization. *World Politics*, 52(3), 384-406.

Gartzke, E., & Rohner, D. (2011). The political economy of imperialism, decolonization and development. *British Journal of Political Science*, *41*(3), 525-556.

Huntington, S. P. (1991). Democracy's third wave. *Journal of democracy*, 2(2), 12-34.

Huntington, S. P. (1993). *The third wave: Democratization in the late twentieth century* (Vol. 4). University of Oklahoma press.

Pemstein, D., Meserve, S. A., & Melton, J. (2010). Democratic compromise: A latent variable analysis of ten measures of regime type. Political Analysis, 18(4), 426-449.

Smith, T. (1978). A comparative study of French and British decolonization. *Comparative Studies in Society and History*, 20(1), 70-102.

Young, A. (2017). Consistency without inference: Instrumental variables in practical application. *Unpublished Manuscript. http://personal. lse. ac. uk/YoungA/ConsistencyWithoutInference. pdf*

V-Dem Dataset suggested citations

• V-Dem Dataset:

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Michael Bernhard, M. Steven Fish, Adam Glynn, Allen Hicken, Anna L¨uhrmann, Kyle L. Marquardt, Kelly McMann, Pamela Paxton, Daniel Pemstein, Brigitte Seim, Rachel Sigman, Svend-Erik Skaaning, Jeffrey Staton, Steven Wilson, Agnes Cornell, Lisa Gastaldi, Haakon Gjerløw, Nina Ilchenko, Joshua Krusell, Valeriya Mechkova, Juraj Medzihorsky, Josefine Pernes, Johannes von Romer, Natalia Stepanova, Aksel Sundstr¨om, Eitan Tzelgov, Yi-ting Wang, Tore Wig, and Daniel Ziblatt. 2019. "V-Dem [Country-Year/Country-Date] Dataset v9" Varieties of Democracy (V-Dem) Project.

and:

Pemstein, Daniel, Kyle L. Marquardt, Eitan Tzelgov, Yi-ting Wang, Juraj Medzihorsky, Joshua Krusell, Farhad Miri, and Johannes von Romer. 2019. "*The V-Dem Measurement Model: Latent Variable Analysis for Cross-National and Cross-Temporal Expert-Coded Data*". V-Dem Working Paper No. 21. 4th edition. University of Gothenburg: Varieties of Democracy Institute.

• V-Dem Codebook:

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Michael Bernhard, M. Steven Fish, Adam Glynn, Allen Hicken, Anna L¨uhrmann, Kyle L. Marquardt, Kelly McMann, Pamela Paxton, Daniel Pemstein, Brigitte Seim, Rachel Sigman,

Svend-Erik Skaaning, Jeffrey Staton, Agnes Cornell, Lisa Gastaldi, Haakon Gjerløw, Valeriya Mechkov, Johannes von R¨omer, Aksel Sundtr¨om, Eitan Tzelgov, Luca Uberti, Yi-ting Wang, Tore Wig, and Daniel Ziblatt. 2019. ”V-Dem Codebook v9” Varieties of Democracy (V-Dem) Project.

• **V-Dem Methodology:**
Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, Kyle L. Marquardt, Juraj Medzihorsky, Daniel Pemstein, Josefine Pernes, Johannes von R¨omer, Natalia Stepanova, Eitan Tzelgov, Yi-ting Wang, and Steven Wilson. 2019. ”V-Dem Methodology v9” Varieties of Democracy (V-Dem) Project.

• **V-Dem Country Coding Units:**
Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, Vlad Ciobanu, and Lisa Gastaldi. 2019. ”V-Dem Country Coding Units v9” Varieties of Democracy (V-Dem) Project.

• **V-Dem Organization and Management:**
Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, Lisa Gastaldi, Nina Ilchenko, Josefine Pernes, Johannes von R¨omer, and Natalia Stepanova. 2019. ”V-Dem Organization and Management v9” Varieties of Democracy (V-Dem) Project.