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DP16436
(v. 2)

**Globalization, Freedoms and Economic
Convergence: An empirical exploration
of a trivariate relationship using a large
panel**

Jorge de Macedo, Joaquim Oliveira Martins and
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INTERNATIONAL MACROECONOMICS AND FINANCE

CEPR

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Discussion Paper DP16436
First Published 09 August 2021
This Revision 14 August 2021

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www.cepr.org

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Abstract

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JEL Classification: F02, F11, F13

Keywords: Globalization, democracy, freedoms, Development, convergence, panel data, three-stage least squares

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Acknowledgements

This paper has matured for a long period. The authors gratefully acknowledge comments on earlier versions by Barry Eichengreen, Carles Boix, the late Jean-Pierre Contzen, Marc Flandreau, Yves Guillemette, Paul Leblang and other participants in conferences and seminars at Princeton University, Nova School of Business and Economics and the Royal Academy of Belgium. We also thank Sébastien Jean and the participants at the EIIW workshop, 11 June 2021, for their comments. We are grateful to Ricardo Vicente who performed the initial estimations in 2007, Bruno Desormière who provided further research assistance, and, finally, Louise Phung for outstanding research assistance for the current version. We also grateful to Luis Brites Pereira who co-authored the NBER Working Paper 19575 (October 2013). The views expressed are our own and do not necessarily reflect those of our institutional affiliations.

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(Revised version August 2021)

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Keywords: globalization; democracy; freedoms; development;
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JEL classification: F02, F10, F13, F63

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1. Introduction

The interactions among Globalization, Democratic governance and Economic development have been a widely studied subject in the economy and political science literature. The empirical literature to date has typically focused on the links between pairwise combinations of the three variables of interest.

For example, globalization is expected to support economic development and vice-versa. A nation's resource endowments and its productivity determine the level of its income per capita, both in absolute terms and relative to the global frontier. Globalization, through trade, capital flows or migration can influence the effective level of endowments available in an economy, or through international technology transfers, its productivity. Conversely, a country's endowments of natural resources, labor, and capital, as well as its geographic location and efficiency of its production structures may determine how much it trades with the rest of the world in terms of goods, services and assets.

Similarly, a country with good democratic governance (rights and political liberties, high-quality institutions, low levels of corruption and an effective government), and a flourishing civil society may likely increase the quality of its economic endowments. Once more, cause and effect can be swapped: well-endowed countries may evolve towards better governance more easily, or, at least, they may be able to afford investment in more resources to build well-functioning institutions. These interactions have been at the core of development economics. Acemoglu and Robinson (2012) collected evidence from many historical episodes worldwide showing that, while extractive societies may grow for a while, sustainable development requires inclusive institutions.

Globalization interacts with democratic governance. Trade policy, competition by foreign producers and international investors, and openness-related differences in institution building costs are three major transmission mechanisms through which openness affects a country's corruption levels. Bonaglia et al. (2011) summarise available theoretical explanations of causal relationships between globalization and governance and look at how trade openness improves the quality of domestic institutions in a sample of 119 countries during the period 1984-98. They show that trade causes reductions in perceived corruption, suggesting one channel through which globalization can have positive governance-related spillovers¹. Subsequent emphasis on inclusive institutions multiplied the possible channels. Eichengreen and Leblang (2008) confirmed a two-way interaction between democracy and globalization using a long-time period (from 1870 to 2000) and relying on binary measures of democracy

¹ In fact, after controlling for many cross-country differences, Braga de Macedo (2001) found that trade openness' influence on corruption was close to that exercised by the level of development (proxied by income per capita). With the same sample as Bonaglia et al. (2011) and also using the ICRG index of perceived corruption and a parsimonious specification - which included import openness, per capita GDP and an index of political rights - he explained almost 50 per cent of the variability in the corruption index. Moreover, a 10% increase in imports openness results in 0.03-point change in the corruption score. This is a sizeable effect, especially when compared to the 0.09-point changes due to a 10% increase in income per capita.

and of financial openness with less emphasis on institutions. However, as discussed above, the links between globalization and democratic governance cannot be separated from the effect of the level of development, as their interaction is always context-specific.

The relation between democracy and development is perhaps the most controversial in economic and political science literature. The study of this interaction was pioneered by Lipset (1959), who posited that economic development was likely to favour a democratic system (the, so-called, ‘modernization theory’). Urbanisation brings increased literacy, media development and industrialization, which favours participatory institutions. Wealth permits popular classes to take a longer and moderate view. The development of a middle class is good for democracy because it tends to reward moderate and democratic parties, penalising extremist groups. This view was partly revived by Barro (1996, 1997, 1999), although subsequently Acemoglu et al. (2008) did not find evidence of the effect of economic growth on democracy.

Inglehart and Welzel (2009) proposed a mechanism through which economic development can lead to democracy. Analysing the World Values Survey and the European Values Study, they found that “all the countries that experienced rising GDP per capita also experienced predictable shifts in their values”. Thus, beyond a certain threshold of economic development (or economic convergence), there are changes in behaviour and values that make democratic governance more likely to survive. It also brings structural changes through the development of a knowledge sector, which is useful for economic development and supports a rising educated and more self-concerned middle-class, which questions the legitimacy of an authoritarian system.

Concerning the reverse effect of democracy on development (often proxied by economic growth), the literature has also not reached a consensus. Some have argued that a representative government may slow down economic growth. For example, elected politicians can run excessive deficits to favour re-election. Enabling competition for political influence may also lead to economic inefficiencies. Alesina and Rodrik (1994) and Persson and Tabellini (1994) suggested that high inequalities may increase the demand for redistribution and, under elections that favour the majority, the governments are likely to raise taxes, bringing down investment and growth. Through this channel, in democratic countries, inequalities may be detrimental for economic development. In contrast, other papers suggest that, even when democracies favour redistribution, it may still have a positive impact on development if public spending focuses on education (Saint-Paul and Verdier, 1993; Bourguignon and Verdier, 2000) or addresses imperfections in capital market (Galor and Zeira, 1993). Democracies may also have lower political instability and lower output volatility which enables, in the long run, economic development. Olson (1993) argued that a lasting democracy provides security and contract rights that ultimately support growth. Sen (1999) supports the view that development goes with freedom, notably because democracies enable the gathering and transmitting of information.

Acemoglu et al. (2014) improved the empirical method to prove the causality of democracy on economic growth. They address the common problem of measurement error of political indicators by building a dichotomous index purged of spurious changes in democratic scores based on the previous work of Papaioannou and Siourounis (2008). They introduce country and time fixed effects to control for country and period characteristics that can potentially be correlated with democracy. They account for the dynamics of the democratic process, with a possible short-run negative impact of democracy impact of economic growth. Finally, they also use instrumental-variables to address any omitted variable bias.

Other recent studies further improved the understanding of the interaction between economic liberalization and democratic governance and its impact on development. Persson and Tabellini (2006) show that if economic liberalisation happened before democratization then there is a positive impact on development while, if economic liberalization happens after democratization there is a negative impact on development. Cervellati, Naghavi and Toubal (2018) use a disaggregated measure of technology to avoid any reverse causality with economic liberalization and democratization. They show that the result of a positive impact of democracy on development, relies on country-specific characteristics and once adding time and country fixed effects, the cross-country correlation completely disappears. Murin and Wacziarg (2014) showed that estimated effects of democracy on development depends on sample composition and time horizon. They conclude that it is the interaction between trade openness and democratization that lead to technological adoption and thus higher productivity and higher economic growth, underlying the need to look at the interactions between economic liberalization and democratization when analysing their impact on development.

Lopez-Cordova and Meissner (2005) noted that that the existing literature has suffered from econometric problems that may explain the difficulty of reaching a consensus. In particular, endogeneity as well as the difficulties of finding valid instruments challenge a number of previous results. This problem applies to the analyses of the interactions between economic growth and democracy or globalization, although estimates of positive relationships were consistently found by Rodrik and Wacziarg (2005) and Acemoglu et al. (2015).

To sum, while it is unclear which effect dominates the other, it is certain that economic development and democratic governance interact, as well as globalization and democratic governance and, globalization and economic development. In some sense there are multiple causes that can trigger a virtuous cycle between Globalization, Democratic governance and Development. They are heterogeneous and context-dependent and, that a vast literature has already been trying to answer the causality question.

The research question addressed in this paper is not the causality among these variables, but the signs of their co-movements. In particular, if the all two-by-two interactions are positive, a mechanism triggering the increase in one of the variables may generate a virtuous cycle, and conversely. Analyzing the precise trigger mechanism or in which direction the causality flows is beyond the scope of this paper. Our aim is to assess the tripartite relationships among

the three variables and the of law of motion of the system. We believe that this analysis may be particularly relevant in the context of economic recovery from a series of large shocks, namely the one generated by the Covid-19 pandemic, that affected globalization trends, the level of political and civil freedoms, and economic convergence.

Against this background, our approach naturally evolved towards the estimation of a simultaneous equation model representing the trivariate relationship between globalization, democratic governance and economic development. Indeed, under the assumption that these three variables interact with each other, treating them separately would induce endogeneity and/or omitted variable biases.

The empirical estimation relies on an unbalanced heterogeneous panel with over 3700 country-year observations. To capture a continuous and multi-dimensional measure of the Globalization process, we use the KOF index of Globalization (hereafter, labelled *GLOB*) put forward by Dreher (2006) and Dreher et al. (2008) using the 2017 version of the database. Contrary to simple trade openness ratios, the KOF index accounts both for different levels and types of globalization (economic, social and political). To capture economic development, we use the distance to US GDP per capita using data from the Penn World Tables (hereafter, *CONV*). Admittedly, this is a narrow definition of economic development, notably given the recent debate and efforts to go beyond GDP, and replace it by Well-Being measures. While this measurement agenda is very important, it has not yet produced sufficiently consistent datasets that can be used for a large panel data estimation.

Democratic governance is best understood by looking at its constituent elements, possibly on a case-by-case basis, rather than by a binary variable, or even by a regime characterized exclusively by electoral competition and political participation. Thus, to extend the analysis of Eichengreen and Leblang (2008), who focused on a dichotomous nature of the democracy variable (including its age of democracy), possibly limiting the interpretation of the results, in this paper we employ a more detailed (and continuous) index based on civil and political freedoms. We averaged the index of political rights and civil liberties (hereafter, this variable is labelled *FREE*). These are *de facto* and continuous measures of democratic governance as opposed to the *de jure* and dichotomous ones that have been typically employed.

Our results suggest the existence of strong two-way relationships between Globalization and Convergence, as well as, between Freedoms and Convergence. However, the positive interaction is driven by countries where inclusive institutions are the norm: globalization notwithstanding, relationships between Freedoms and Economic convergence are either non-significant or negative outside of the OECD. Thus, our findings suggest a self-reinforcing process led by the OECD group.² The virtuous cycle breaks due to countries with the *FREE*

² It is worth recalling that national responses to interdependence, or mutual sensitivity tend to be defensive or exploitative rather than cooperative, so that even between two identical countries, the benefits of increased interdependence are more strongly felt at home than abroad, making each country dependent on the other's expansion. Moreover, the symmetry in cyclical positions does not prevent an increase in the current account balance so that deficit countries face additional external vulnerability. The mutual interaction that Cooper (1968)

index around the sample mean.³ The relationship between *FREE* and *CONV* appears to be non-monotonic: positive between the values of 1 to 3 and above 4.5, negative in the middle (as a comparison the mean of the *FREE* indicator for OECD countries is around 6.7).

The remainder of this paper is organized as follows. Section 2 discusses the data. Section 3 presents the empirical methodology, most notably a simultaneous system estimation of the reciprocal effects between our three variables of interest. Section 4 presents and discusses our main results together with some sensitivity and robustness checks. The last section concludes.

2. Data

2.2. Globalization

To account for Globalization trends, we use the KOF index (Dreher, 2006; Dreher et al., 2008) over the period 1970-2014, using the 2017 version of the database.⁴ This index offers a multi-dimensional and continuous measure of the globalization process for our sample of countries. It is probably closer to reality than measures focusing on only one dimension (e.g. trade openness). It actually includes three types of globalization. *First*, economic globalization accounts for actual flows (trade, foreign direct investments, and portfolio investments) and restrictions on trade and capital (hidden import barriers, mean tariff rate, taxes on international trade, and capital account restrictions). *Second*, political globalization is measured by the number of embassies, membership of international organizations, and participation in UN Security Council missions. *Third*, social globalization is decomposed into personal contact (tourism, foreign population, transfers), information flows (internet users, telephone mainlines, daily newspapers), and cultural proximity. The KOF index ranges from 0-100, a higher score corresponding to a more “globalised” country.

Box-plots for globalization, Freedoms and Convergence (available upon request) show, as one would expect, that the level of globalization, Freedoms and Convergence are much higher and have lower dispersion in OECD countries than in non-OECD countries.

2.1. Freedoms

The measures of democratic governance commonly used in empirical research of the Globalization-Development nexus suffer from one notable limitation, namely the rudimentary manner in which democracy is usually conceptualized and measured, e.g. a regime characterized exclusively by electoral competition and political participation (Przeworski et al., 2000). Garoupa and Tavares (2009) show that higher income increases the survivability of democracy and a history of democratic instability, as well as the international political context, helps predict how regime transitions impact on democracy. However, they do not

analyzed in the North Atlantic security community was at the heart of complex interdependence, a form of international relations which spread to the founding members of the OECD and Japan.

³ The *FREE* indicator varies between 1 and 7. The sample mean is around 4.6, which corresponds roughly to the level Philippines (see Summary statistics in the Appendix).

⁴ Downloadable from the Swiss Federal Institute of Technology, Zurich: <http://globalisation.kof.ethz.ch/>

pursue the definition of democracy *per se*, while Eichengreen and Leblang (2008) use a definition that is essentially *de jure* in nature, labelling a country as democratic if its governments are designated through competitive elections - elections in which more than one party competes and the winning party is not always the same, though they also use the number of years during which the system was in force.

The use of a dichotomous variable prevents from identifying the effect of intermediate levels of democracy on development. The extension of suffrage, for example, would not appear in this dichotomous variable. Yet a negative interaction between democracy and debt default has been found for the period of the classical gold standard. Specifically, Flandreau and Zimmer (2004, p. 44) find that the extension of suffrage reduces the default probability with an elasticity of 0.5 for the whole sample and of 1.3 for capital-poor countries. They note that contemporaries saw democracy and parliaments as a source of greater stability because they put checks and controls on the sovereign and imply a greater implied ability to tax. This contradicts the widespread view that the repression of democracy facilitated the operation of the pre-1914 international monetary system by making external adjustment easier.

Some of these points also apply to the related literature attempting to find the nexus between democracy and growth. For example, Tavares and Wacziarg (2001) define democracy in purely procedural terms.⁵ As a result of this tendency to measure democracy in a purely political and formal manner, quantitative studies may misrepresent the effect of democracy on Globalization or misinterpret the aspect of democracy responsible for that effect. The concept of democratic capital proposed by Persson and Tabellini (2006, 2007, 2009), where own history of democracy and that of democratic capital accumulation among neighbouring countries help to determine the rate of economic growth, is another way of introducing quality considerations.⁶

Against this background, our approach is that political rights and civil liberties are essential ingredients of democratic governance. First civil liberties (*CL*) include freedom of thought, religion, association, free press and respect for the rights of minorities. We derived these elements from the Freedom House Civil Liberties index, which is computed for almost all countries for the period 1972 onwards, using the 2017 version of the database. Second, political rights (*PR*) are associated with free and fair elections for the executive and legislative branches of power, freedom to constitute political parties, freedom of association, independence from political, religious and military authorities, real possibilities of the change of power and other related aspects of the political system. All of these and other features of political rights are taken into account by the Political Rights Index, which is published by

⁵ Wanting to clearly distinguish democracy from other characteristics of political systems, they use the Freedom House indicator of political rights, based precisely on this procedural definition of democracy. They add that all previous studies focus on the *direct* effect of democracy on growth, conditional on other growth-determining factors and they question this procedure: "In theory, if a comprehensive institution such as democracy matters, it should matter *indirectly* through its effect on variables that in turn determine economic growth. Existing theoretical arguments point to links between democracy and a number of societal characteristics that influence growth. However, none of those arguments suggest that democracy has a direct impact on growth".

⁶ Eichengreen and Leblang (2008) used the age of democracy instead. Giuliano and Nunn (2013) showed the positive effect of democracy from the village to the Nation-state using *Ancestral Characteristics Database*.

Freedom House and covers the same period as that of the CL index.⁷ Both indexes are measured in the 1-7 scale, with 1 corresponding to high institutional quality and 7 corresponding to low institutional quality. We used here the opposite so that high values represent high quality. Economic liberties are excluded from the simple average of *CL* and *PR*, because the multi-dimensional nature of the Globalization index features some of these economic liberties. Otherwise, the results would have been biased, displaying an automatic correlation between the two due to their common components. This problem, however, does not seem to concern the political rights and civil liberties indices.

The choice of this indicator entails a trade-off, as our measure of democratic governance implies a smaller sample period (1972-2014) compared to that of Eichengreen and Leblang (2008), which covered the period 1870-2000. Although this might make the results more sensitive to sample bias (because the number of countries is much bigger than the number of years), the loss is not as large as might appear because of the missing values problem in the data.⁸

2.3. Economic convergence

The measure of economic Convergence is captured here by the distance to the income frontier, as the GDP per capita gap between each country and the US (ratio of the GDP pc of a given country to the GDP pc of the US, expressed in %). This measure is a rough way to measure convergence to the technological frontier. The latter is evident from the time averages of a heterogeneous sample of over 90 countries between 1970 and 2014 remain roughly constant (Figure 1).⁹ However, it may not suffer from the usual problems related to the use of GDP per capita levels, which may display common time trends with the globalization and democracy variables. This variable is derived from the Penn World Tables database version 9.0. It is measured at constant prices and, in order to obtain a consistent series, the data are PPP adjusted, using the GDP indicator “cgdpe”: expenditure-side real GDP at current PPPs (millions of 2011 US\$).

The list of countries together with summary statistics for the three variables of interest are presented in a table in the Appendix. The averages of the three variables over the country sample, together with the US GDP per capita, are displayed in Figure 1. The *GLOB* average shows a strong upward trend, especially after the early 90's. The *CONV* average shows an acceleration in the turn of the XXIth century, then a relative stabilization. The *FREE*

⁷ Downloadable from <https://freedomhouse.org/report/freedom-world/freedom-world-2017>

⁸ The Eichengreen and Leblang sample covers 135 years for 202 countries (taking into account name and border changes) but no regression includes more than one third of the maximum number of observations (about 27K). Using our measures of Freedoms cuts the sample size by half rather than by two thirds.

⁹ This is consistent with the idea of asymmetric growth (see Acemoglu et al., 2014), where some countries will opt for a type of capitalism that generates greater inequality and more innovation and will become the technology leaders, while others will free-ride on the cutthroat incentives of the leaders and choose more cuddly reward structures. In addition, “domestic constraints from social democratic parties or unions may be beneficial for a country because they prevent cutthroat capitalism domestically, instead inducing other countries to play this role”.

increased at much lower rates than the other two variables and remained relatively over the last decade of the sample.

[Insert Figure 1]

3. Empirical Method

As discussed above, we rely on a simultaneous system of three equations, as follows:

$$\begin{cases} GLOB_{it} = \alpha_1 \cdot FREE_{it} + \delta_1 \cdot CONV_{it} + \beta_1 \cdot Z_{1it} + \mu_t + \rho_i + \varepsilon_{it} \\ FREE_{it} = \gamma_1 \cdot GLOB_{it} + \delta_2 \cdot CONV_{it} + \beta_2 \cdot Z_{2it} + \mu_t + \rho_i + \varepsilon_{it} \\ CONV_{it} = \alpha_2 \cdot FREE_{it} + \gamma_2 \cdot GLOB_{it} + \beta_3 \cdot Z_{3it} + \mu_t + \rho_i + \varepsilon_{it} \end{cases} \quad (1)$$

for $i = 1, \dots, N$ and $t = 1970-2014$

where, for each country i , *GLOB* stands for the KOF index of Globalization. *FREE* is the Freedom House index variable averaging political rights (PR) and civil liberties (CL). *CONV* represents the ratio of a given country's GDP per capita over that of the United States, while the vector Z_{it} denotes a set of appropriate control variables for each equation.¹⁰ μ_t , ρ_i denote time and country effects, respectively. The former are included to control for global shocks, while the latter are included to control for unobserved cross-country heterogeneity. ε_{it} denotes the disturbance term satisfying usual assumptions of zero mean and constant variance; N is the total number of countries and t is time in years.

In estimating a system of simultaneous equations, the question often arises whether to use two (2SLS) or three-stage least squares (3SLS). While 2SLS is computationally easier, the 3SLS is known to be asymptotically more efficient, from exploiting non-zero cross-equation covariation (Belsey, 1988). Moreover, 3SLS can have greater small-sample efficiency than 2SLS even when pairwise correlations are small. Since we expect a strong degree of intercorrelation among the errors of the different equations in our system, this increases the attractiveness of 3SLS. The 3SLS method uses all the information provided by the exogenous right-hand-side (RHS) variables to instrument the endogenous (LHS) left-hand-side variables.¹¹ As such, it avoids the potential pitfall of having to find “good” instruments within a single equation context.

In order to provide consistent estimates, the 3SLS method requires in each equation a set of exogenous variables specific to each endogenous variable. We took a model selection

¹⁰ We followed Eichengreen and Leblang (2008) benchmark's identification strategy very closely. Similarly to their study, we used a set of control variables for globalisation and Freedoms: the equation for globalisation includes size variables, (as larger countries tend to be less open to trade), a distance variable, regional dummies for Latin America, Middle-East, Africa and Asia, a variable equal to the number of currency crisis, and the rate of inflation; the equation for Freedoms includes regional dummies, a dummy for fuel exporters and a number of institutional controls: the number of prior transitions to dictatorship, the constitutional age, the number of other democracies in the global system, dummies for the socialist legal system, colonial heritage (British, French and Spanish), the percentage of the population living in urban areas and the population density.

¹¹ At the first stage, endogenous variables are instrumented by all exogenous variables in the system; at the second stage an efficient estimate for the covariance matrix of the disturbances is obtained; and at the final stage a GLS-type estimation uses this covariance matrix in a regression of the dependent variables on the instrumented values of endogenous variables and on the exogenous variables, with some identification restrictions.

approach of a large set of potential determinants of each of our main variables of interest, following the literature. To this end, we employed the widely used Bayesian Model Averaging (BMA) (Raftery, 1995) and the more recent Weighted-Average Least Squares (WALS) proposed by Magnus et al. (2010). Essentially BMA treats parameters and models as random variables and attempts to summarise the uncertainty about the model in terms of a probability distribution over the space of possible models. The WALS is claimed to be theoretically and practically superior to the BMA and presents two major advantages over it: its computational burden is trivial and it is based on a transparent definition of prior ignorance (Magnus et al., 2010). The full set of results are available upon request. This ex-ante exercise allowed us to include in the vector of controls Z_{it} , the number of financial crises¹² in the year in the Globalization equation, and the investment rate (approximated by capital formation¹³) in the Development equation. We also include dummy variables standing for legal and colonial origins¹⁴, as well as for fuel export dependence¹⁵, the number of democracies in the world¹⁶, population density, and a measure of urban population in the Freedoms equation. Other control variables, common to at least two equations, are also used. These include gravity controls (distance¹⁷, area, and population), inflation and regional dummies. We recognize that the 3SLS method may be more sensitive to the existence of spurious correlations or multi-collinearity among the regressors in one equation, thereby "contaminating" the remaining equations. Yet, this does not seem to be an issue in our sample. Since serial correlation can arise in this environment due to the presence of individual effects (Baltagi, 1980), each equation in system (1) is estimated with HAC robust standard errors clustered at the country level to allow us to make valid inferences.

4. Empirical Results

The cross-sectional nature of our panel is larger than the time series one (N=95 countries > T=43 years). Hence, we do not expect the time-series properties of the set of variables employed in our empirical exercise to give rise to potential spurious results. This being said, we still checked the panel stationary properties of our three main variables of interest.¹⁸ We carried out two different types of panel unit root tests: one first generation test, namely the Maddala and Wu (1999) test (MW), and one second generation test – the Pesaran (2007) CIPS test. The latter is associated with the fact that first-generation tests do not account for possible cross-sectional dependence of the contemporaneous error terms and failure to

¹² Data from Valencia and Laeven (2012), updated until 2014

<https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Systemic-Banking-Crises-Database-An-Update-26015>

¹³ Using the "csh_i" indicator from the Penn World Tables 9.0 version 2017 which is the gross capital formation at current PPPs (% of "cgdpo", Output-side real GDP at current PPPs (millions 2011 US\$))

¹⁴ Of note, this dummy variable cover a set of countries and therefore can be jointly estimated with country dummies. The same applies for the regional dummies.

¹⁵ From the WDI 2017 version, creating a dummy variable equals 1 if the % of oil in merchandise exports exceeds 50 (reference of the indicator: "TX.VAL.FUEL.ZS.UN").

¹⁶ Based on a dichotomous variable computed from polity2, a Polity IV Project's indicator.

¹⁷ The variable distance to the rest of the world, weighted by the % of trade with each trading partners comes from the computation of CEPII indicators http://www.cepii.fr/CEPII/fr/bdd_modele/presentation.asp?id=8

¹⁸ The advantage of panel data integration is twofold: firstly, the tests are more powerful than the conventional ones: secondly, cross-section information reduces the probability of a spurious regression.

consider it may cause substantial size distortions in panel unit root tests (Pesaran, 2007). The results of the panel stationarity tests are omitted for reasons of parsimony but available upon request. In both tests the null hypothesis is that of non-stationarity of the variable. It appears that only the KOF globalisation index suffers from non-stationarity, which has the immediate implication that co-integration is not a problem in our setting.

4.1 Baseline Results

Tables 1, 2 and 3 display the results of estimating the system given by the system (1) for all the countries pooled together, for the OECD sub-sample, and for the non-OECD sub-sample, respectively. For the whole sample, we observe strong positive two-way effects between Freedoms and Globalization on the one hand, and between Globalization and Convergence on the other hand. The effect of Convergence on Freedoms is also positive and statistically significant at the 5% level, but Freedoms impact negatively on Convergence, at a 1% significance. The latter result is driven by the non-OECD group, where both Freedoms and Convergence interact negatively (Table 3).¹⁹ The case of China and, to some extent, Vietnam are examples of a development model where rapid economic convergence was not accompanied by a significant change of democratic governance, despite a possible positive between Globalisation and Freedoms.

[Insert Tables 1, 2 and 3 here]

As for the remaining regressors, we observe that fuel export dependence negatively affects the level of Freedoms, except for OECD countries since only Norway, from 1983 to 2014, has more than 50% of its merchandise exports made out of oil related products. This is typical in what Acemoglu and Robinson (2012) call extractive societies and is also related to Dutch disease type of effects. Such natural resources are predominantly located in developing countries whose quality of institutions is to some extent low and corruption high, rent seeking behaviours easily emerge. Inflation affects negatively Globalization and has positive impact on Convergence only for OECD countries. In line with the growth literature, investment matters for Convergence, as attested by the positive and statistically significant coefficient of the investment rate.

Population affects positively Globalization, but has the reverse effect for Convergence. Interestingly, population density affects negatively Freedoms, but this effects is due to the non-OECD countries. This is probably due to lack of urban quality in some large non-OECD cities. However, increased urbanization seems to foster Freedoms in both OECD and non-OECD countries. Other controls reflect the impact of history and geography. On historical and cultural aspects, the socialist legal origin affects negatively Freedoms, but within the OECD group the effect is positive, suggesting that former socialists when provided with a strong policy anchor (for example, the process of EU accession) can overcome past legacies. In contrast, the English colony dummy is uniformly positive in all samples. the Spanish

¹⁹ Of note, the results already found in Braga de Macedo et al. (2013) on a negative relationship between Freedoms and Convergence for non-OECD countries are confirmed with our enlarged dataset.

colony dummy is never significant. Unlike the English and Spanish colony dummies, the socialist legal origin negatively affects Freedoms (a summary of these relations is provided in Figure 2).²⁰ The geography dummies (in particular the Middle East one) tend to show a negative effect on Globalization and Freedoms for the sample of non-OECD countries. Distant countries tend to be less globalized, but this geographic factor does not seem to hinder convergence forces.

Table 4 provides the calculated cross-elasticities for Globalization, Freedoms and Convergence derived from the estimates for a country presenting mean values of these three variables.²¹ In the full sample (Panel A), the largest effect is the impact of Globalization on Convergence (+1.9). For OECD, the largest effect is found for Freedoms on Convergence, while for the non-OECD group the impact of Globalization on Convergence is the most important.

As an illustration, an increase in the Globalization index from the non-OECD mean (around 43, cf. Appendix) to the sample mean (around 51, or an increase factor of around 20%) would narrow the distance to the frontier in the non-OECD group from 17.1% to around 57% of the US GDP pc, i.e. would more than triple. This result is obtained, *ceteris paribus*, keeping the other variables constant. Reflecting the simultaneity relations, if one takes into account second and above order effects could actually produce even higher values.

[Insert Table 4 here]

Looking at the mean effects, for OECD countries (Panel B), the positive two-way relationships between Freedoms and Globalization, as well as between Freedoms and Convergence, remain. In particular, the latter effect is much stronger. In contrast, Globalization has a much smaller effect on the reduction of the income gap. For non-OECD countries (Panel C), the elasticity of Globalization with respect to Convergence is 50% higher as for the full sample (1.91 vs. 2.81). However, the interaction between Freedoms and Convergence changes dramatically: the impact of Freedoms on Convergence becomes negative, and there is a very small negative effect of Convergence on Freedoms.

4.2 Robustness checks

As a robustness check, we re-estimated our system (1) using the SURE method with an iteration procedure over the estimated disturbance covariance matrix and parameter estimates that converge to stable maximum likelihood results (Zellner, 1962, 1963; Zellner and Huang,

²⁰ In a complementary explanation of the democracy-globalization interaction, Braga de Macedo (2014) discusses how the diversity, be it socio-cultural or economic, is addressed by a given society. This diversity depends on the ability to build inclusive institutions and is at the heart of “why nations fail”, borrowing the title of Acemoglu and Robinson (2012). Nevertheless, it goes beyond the asymmetric growth mentioned above in the text following Acemoglu et al (2014).

²¹ While computed elasticities for the effects of Globalization, Freedoms and Convergence, are based on mean values of the full sample, including the OECD and non-OECD samples, it may mask disparities within samples, our results are robust to the exclusion of outliers. Using the Least Absolute Deviation approach prior to the 3SLS estimation to remove potential outliers yields qualitatively the same results.

1962).²² Summary results for the three main variables of interest are displayed in Table 5. For the OECD sub-sample results are qualitatively unchanged compared to those in Table 2. However, for the whole sample, we no longer see a significantly negative coefficient running from Freedoms to Convergence, as in Table 1. For non-OECD countries, the negative effect of Freedoms on Convergence though remains.

[Insert Table 5 here]

Given the key role of Globalization in the positive dynamics in the system, to further test the robustness of our results we decompose the Globalization index into its components as discussed in Section 2. We therefore run our system (1) with 3SLS for each of the three main components of the total index: i) Economic Globalization; ii) Social Globalization; and iii) Political Globalization.

We begin with the full sample, whose results for the three main variables of concern are displayed in Table 6, Panel A.²³ The negative effect of Freedoms on Convergence seems to be driven by the interaction with Social Globalization, while with Economic or Political Globalization only, we get a positive and statistically significant effect of Freedoms on Convergence. Also, when considering Social Globalization, the positive effect of Convergence on Freedoms becomes non-significant. For OECD countries only (Table 6, Panel B) irrespectively of the type of Globalization most results hold, as in Table 2. The only exception is that we do get a negative and statistically significant coefficient running from Convergence to Globalization when the Political dimension is considered in isolation. This perhaps can be interpreted as the need to have a comprehensive approach to Globalization, rather than focusing only on political aspects.

For non-OECD countries (Table 6, Panel C), all the components are driving the negative impact of Convergence on Freedoms. When Political Globalization is considered only, we get the result that as countries become closer to the frontier, that contributes positively to the democratic governance process.²⁴

These sensitivity results show that our baseline estimates seem relatively robust, but the complex simultaneity relationships among the three variables can be sensitive to estimation method and definition of the type of Globalization index chosen.

[Insert Table 6 here]

²² In the classical linear SURE model, one usually assumes that the errors are i.i.d. over time with mean zero and homoscedastic variance $\Sigma = E(\varepsilon_{it} \varepsilon_{it}' | X)$ (with X being the vector of regressors). Furthermore, Σ is assumed to be positive definite. As in standard univariate models, non-spherical disturbances can be accommodated by either modelling the residuals or computing robust covariance matrices.

²³ To economize on space, the coefficient estimates on other regressors have been omitted from Table 5, but they are available from the authors upon request. Overall, the sign, statistical significance and economic interpretation do not qualitatively change throughout the different exercises conducted.

²⁴ See Huang (2006) for a model suggesting a long-run relationship between economic development and political development based on the inherent technical features of different production factors.

5. Summing-up and conclusions

In this paper, we analysed simultaneously the interactions between Globalization, Freedoms and Convergence for a sample of 95 countries over the period 1972-2014. Our starting point was the two-way robust relation between Democracy and Globalization found in Eichengreen and Leblang (2008). We extended their analysis by using multi-dimensional and continuous measures of democratic governance (Civil and Political Freedoms) and Globalization, as well as integrating the relationships between these two variables and the income gap relative to the US, as a measure of economic convergence.

The sample average evolution of these three variables shows a striking contrast between Freedoms, Globalization, on the one hand, and Convergence, on the other hand (recall Figure 1). Democratic freedoms rose steadily since they were first measured in the 1970s. Globalization also increases with an acceleration after the collapse of the Soviet Union in the 1990s. But the average level of Development measured by the average income gap, remains stable throughout the period. Of course, this relative stagnation still implies an increase in the absolute levels of GDP per capita, as shown by the steady increase in the world's technological frontier (GDP per capita in the US).

Two main results of our work ought to be highlighted. When separated into two groups, clearly distinct patterns emerge for OECD and non-OECD countries. Introducing the income gap as a third endogenous variable confirms the two-way interaction between Freedoms and Globalization found in Eichengreen and Leblang (2008), both for OECD and non-OECD countries. Globalization displays significant positive effects on both Freedoms and Convergence in non-OECD countries. Our analysis, however, indicates a significant negative impact of Freedoms on Convergence in non-OECD group. This may reflect the hypothesis that Globalization's effects on Freedoms are mediated by slow-moving cultural values, probably leading to a dynamic asymmetry between Globalization and Freedoms, moderated by the stage of economic and institutional development.²⁵

On the basis of these results, the positive systemic effect among Globalization, Freedoms and Convergence can be put into question by the recent negative shocks on Globalization and Freedoms related to the Covid-19 pandemic and previous shocks. Further work is, nevertheless, needed to better understand the long-run dynamics and sustainability of this global system, in particular, the mechanisms that could enforce or reinforce the expected positive effect of Globalization on both economic Convergence and Freedoms.

²⁵ Perhaps an interesting perspective could be to think in terms of the sequence between Freedoms and economic growth (or convergence). An early development of a strong, modern state may lay the foundations for economic development, but may also hurt the long-term consolidation of democratic governance (Germany and Japan are examples in the XXth century).

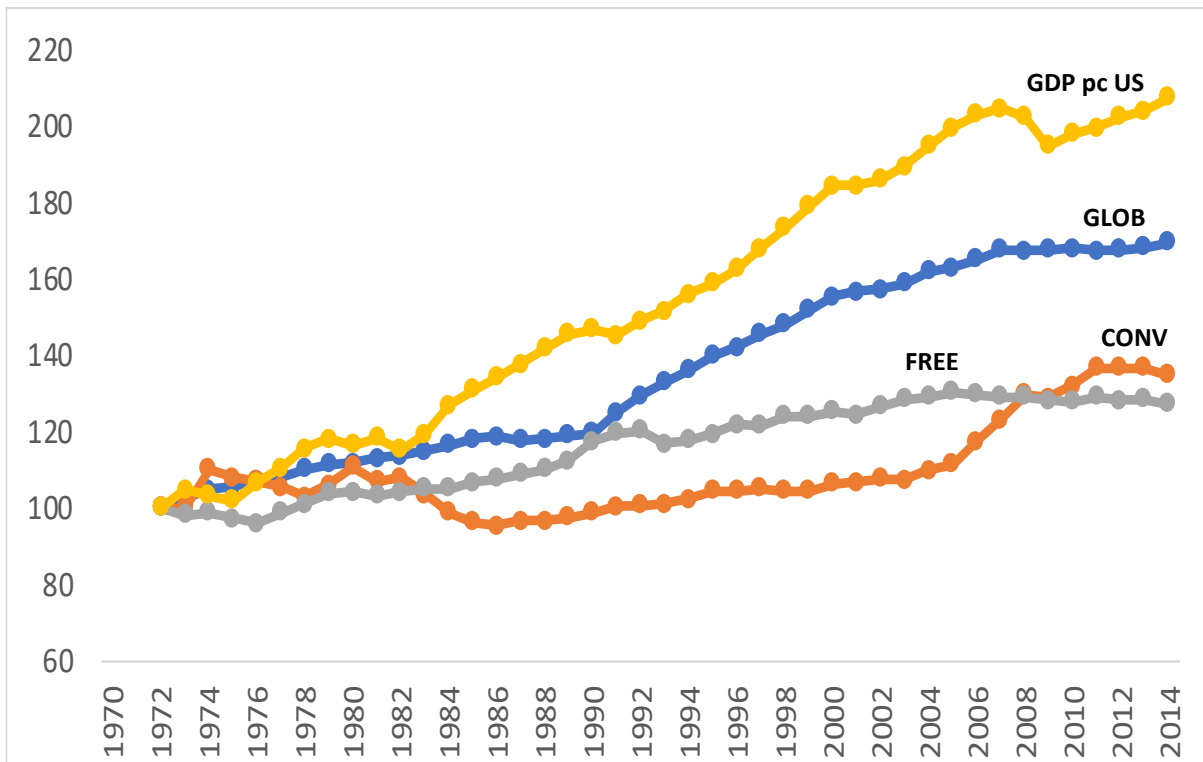
References

1. Acemoglu, D., S. Johnson, J. A. Robinson, P. Yared, 2008, "Income and democracy", *American Economic Review*, 98(3), 808–842.
2. Acemoglu, D., J. A. Robinson, 2012, *Why Nations Fail The origins of power prosperity and poverty*, Princeton University Press
3. Acemoglu, D., J. A. Robinson, T. Verdier, 2014, "Asymmetric Growth and Institutions in an Interdependent World", *NBER Working Paper* No. 18441, October 2012 revised April
4. Acemoglu, D., S. Naidu, P. Restrepo, J. A. Robinson, 2015, "Democracy Does Cause Growth", *NBER Working Paper* No. 20004, March 2014 revised May.
5. Alesina, A., D. Rodrik, 1994, "Distributive Politics and Economic Growth", *The Quarterly Journal of Economics*, 109(2), 465-490.
6. Arellano, M., O. Bover, 1995, "Another look at the instrumental variable estimation error component models", *Journal of Econometrics*, 68(10), 29-51.
7. Arellano, M., S. Bond, 1991, "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *Review of Economic Studies*, 58(2), 277-297.
8. Barro, R. (1996), "Democracy and growth", *Journal of Economic Growth*, 1(1), 1–27.
9. Barro, R. (1997), *The determinants of economic growth: A cross-country empirical study*, Cambridge: MIT Press.
10. Barro, R. (1999), "The determinants of democracy", *Journal of Political Economy*, 107, S158–S183.
11. Belsley, D., 1988, "Two or Three stage least squares?", *Computer Science in Economics and Management*, 1, 21-30.
12. Bonaglia, F., J. Braga de Macedo, M. Bussolo, 2011, "How Globalization Improves Governance", in Linda Yueh (ed.) *The Law and Economics of Globalization*, Edward Elgar, 193-224.
13. Bourguignon, F., T. Verdier, 2000, "Oligarchy, democracy, inequality and growth", *Journal of Development Economics*, 62(2), 285-313,
14. Bowsher, C. G., 2002. "On testing overidentifying restrictions in dynamic panel data models", *Economics Letters*, 77(2), 211–220
15. Braga de Macedo, J., 2001, "Globalization and Institutional Change: A Development Perspective", in *Globalization Ethical and Institutional Concerns*, edited by L. Sabourin and E. Malinvaud, The Pontifical Academy of Social Sciences, Acta 7, Vatican City, pp. 223-267.
16. Braga de Macedo, J., L. Brites Pereira, J. Oliveira Martins and J. Tovar Jalles (2013), "Globalization, Democracy and Development", *NBER Working Paper* no. 19575.
17. Braga de Macedo, J., 2014, "Interdépendance, liberté et développement international", *FERDI Working Paper Development Policies* n° 86, February.
18. Cooper, R., 1968, *The Economics of Interdependence, Economic Policy in the Atlantic Community*, McGraw Hill.
19. Diebolt, C., T. Mishra, B. Ouattara and M. Parhi, 2013, "Democracy and Economic Growth in an Interdependent World", *Review of International Economics*, pp. 733-749.
20. Dreher, A., 2006, "Does Globalization affect Growth? Evidence from a new index of Globalization", *Applied Economics*, 38, pp.1091-1110.
21. Dreher, A., 2008, "Has Globalization increased Inequality?". *Review of International Economics*, 16(3), pp.516-536.
22. Eichengreen, B., D. Leblang, 2008, "Democracy and Globalization", *Economics and Politics* vol. 20(3), pp. 289-334.
23. Flandreau M., F. Zummer, 2004, *The Making of Global Finance 1880-1913*, Paris: OECD Development Centre Studies.

24. Galor, O., J. Zeira, 1993, "Income Distribution and Macroeconomics", *The Review of Economic Studies*, 60(1), 35–52.
25. Garoupa, N., J. Tavares, 2009, "Institutions and Portuguese economic History: Implications and (Brief) Applications", in J. Braga de Macedo, A. Ferreira da Silva, L. Amaral and A. C. Henriques (editors), *Nove Ensaios na tradição de Jorge Borges de Macedo*, Lisboa: Tribuna da História, pp. 133-154.
26. Giuliano, P., N. Nunn, 2013, "The transmission of democracy: From the village to the Nation-State", *American Economic Review* 103(3), pp. 86-92.
27. Huang, F., 2006, "The coevolution of Economic Development and Political Development". *mimeo* Singapore Management University.
28. Inglehart, R., C. Welzel, 2009, "How Development Leads to Democracy", *Foreign Affairs*, 88(2), 33-48.
29. Lipset, S.M., 1959, "Some institutional requisites of democracy: economic development and political legitimacy", *American Political Science Review*, 53, 69-105.
30. Lopez-Cordova, E., C. Meissner, 2005, "The Globalization of Trade and Democracy, 1870-2000", *NBER Working Paper* nº11117, February.
31. Maddala G.S., S. Wu, 1999, "A comparative study of unit root tests with panel data and new simple test", *Oxford Bulletin of Economics and Statistics*, Special issue, 631-652
32. Magnus, J. R., Powell, O., and Prüfer, P., 2010, A comparison of two model averaging techniques with an application to growth empirics. *Journal of Econometrics*, 154(2), 139-153.
33. Milner, H., K. Kubota, 2005, "Why the Move to Free Trade? Democracy and Trade Policy in the Developing Countries", *International Organization*, 59, Winter, pp.107-143.
34. Murtin, F., R. Wacziarg, 2014, "The democratic transition", *Journal of Economic Growth*, 19, 141–181.
35. Olson, M., 1993, "Dictatorship, Democracy, and Development", *The American Political Science Review*, 87(3), 567-576.
36. Papaioannou, E., G. Siourounis, 2008, "Democratisation and Growth", *Economic Journal*, 118 No. 532, 1520-1551.
37. Persson, T., G. Tabellini, 1994, "Is Inequality Harmful for Growth?", *American Economic Review*, 1994, vol. 84, issue 3, 600-621.
38. Persson, T., G. Tabellini, 2005, "Democracy and Development: Devil in the Details", December.
39. Persson, T., & Tabellini, G. (2006). "Democracy and development: The devil in the details", *American Economic Review*, 96(2), 319–324.
40. Persson, T., G. Tabellini, 2007, "The growth effects of democracy: Is it heterogeneous and how can it be estimated?", March.
41. Persson, T., G. Tabellini, 2009, "Democratic capital: The nexus of political and economic change", *American Economic Journal: Macroeconomics*, 1(2), 88–126.
42. Pesaran, M. H., 2007, "A simple panel unit root test in the presence of cross section dependence", *Journal of Applied Econometrics*, 22(2), 265-312.
43. Przeworski, A., M. Alvarez, J.A. Cheibub and F. Limongi, 2000, "Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990", Cambridge: Cambridge University Press.
44. Raftery, A. E., 1995, Bayesian model selection in social research. *Sociological methodology*, 111-163.
45. Rodrik, D., R. Wacziarg, 2005, "Do Democratic Transitions Produce Bad Economic Outcomes?", *American Economic Review*, 95(2), May, pp. 50-55.
46. Roodman, D., 2009. "A Note on the Theme of Too Many Instruments". *Oxford Bulletin of Economics and Statistics*, 71(1), 135–158.

47. Saint-Paul, G., T. Verdier, 1993, "Education, Democracy and Growth", *Journal of Development Economics*, 42, 399–407.
48. Sen, A. (1999), *Development as freedom*, Oxford: Oxford University Press.
49. Tavares, J., R. Wacziarg, 2001, "How Democracy Affects Growth", *European Economic Review*, August 2001, 1341-1378.
50. Yu, M., 2005, "Trade Globalization and Political Liberalization: A Gravity Approach", November.
51. Zellner, A., 1962, "An Efficient Model of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias", *Journal of the American Statistical Association*, 57, 348-368.
52. Zellner, A., 1963, "Estimators for seemingly unrelated regression equations: Some exact finite sample results". *Journal of the American Statistical Association*, 58: 977-992.
53. Zellner, A., D. S. Huang, 1962, "Further properties of efficient estimators for seemingly unrelated regression equations". *International Economic Review*, 3: 300-313.

Figure 1: Country-time Average of GLOB, FREE and CONV



Notes: GLOB is the KOF Globalization index; FREE is the average of political and civil rights; CONV is the ratio between GDP per capita in each country vis-à-vis the US (in %); and GDP pc US is the level of GDP per capita in the US (as a proxy of the income frontier). All variables are expressed as an index with 1972=100.

Source: Authors' calculations.

Table 1: Baseline specification System Three Stage Least Squares, all countries

Specification	(1)	(2)	(3)
COEFFICIENT	Globalization	Freedoms	Convergence
Globalization		0.0382*** (0.002)	1.1388*** (0.022)
Freedoms	5.2819*** (0.161)		-1.2223*** (0.285)
Convergence	0.4525*** (0.009)	0.0032** (0.001)	
Lagged number of transitions to democracy		0.3740*** (0.029)	
Lagged constitutional age		0.0255*** (0.002)	
Lagged total number of democracies		-0.0033*** (0.001)	
Lagged fuel export dependence		-0.4362*** (0.064)	
Socialist legal origin		-0.6876*** (0.081)	
English colony		0.4215*** (0.046)	
French colony		-0.1697** (0.068)	
Spanish colony		0.0363 (0.066)	
Lagged urban population		0.0078*** (0.001)	
Lagged population density		-0.0002*** (0.000)	
Latin America	10.4120*** (0.732)	-0.3408*** (0.086)	-27.2957*** (1.041)
Middle East	6.7291*** (0.893)	-1.5868*** (0.089)	-4.6207*** (1.419)
Africa	11.7434*** (0.851)	-1.0769*** (0.093)	-24.6042*** (1.265)
Asia	8.7773*** (0.916)	-0.7500*** (0.085)	-19.9558*** (1.441)
Lagged total financial crises	-0.0906*** (0.025)		
Lagged inflation	-0.0004 (0.000)		0.0002 (0.001)
Log distance from the rest of the world	-6.2728*** (0.431)		10.3365*** (0.717)
Log area	-0.5443*** (0.136)		0.5784** (0.226)
Log population	1.9671*** (0.174)		-3.3153*** (0.296)
Investment rate			26.7893*** (2.825)
Constant	61.3379*** (3.381)	2.4727*** (0.107)	-98.5700*** (5.781)
Observations	3,773	3,773	3,773
R-squared	0.6192	0.6539	0.6737

Note: The system is estimated by three-stage least squares. Time and countries dummies are included but not presented for reasons of parsimony. Heteroskedastic-consistent standard errors are in parentheses. ***, ** and * denote significant coefficients, respectively at the 1, 5 and 10 % confidence levels.

Table 2: Baseline specification System Three Stage Least Squares, OECD countries

Specification	(1)	(2)	(3)
COEFFICIENT	Globalization	Freedoms	Convergence
Globalization		0.0280*** (0.002)	0.5674*** (0.055)
Freedoms	11.6373*** (0.699)		16.4318*** (1.137)
Convergence	0.0998*** (0.019)	0.0141*** (0.001)	
Lagged number of transitions to democracy		-0.1640*** (0.040)	
Lagged constitutional age		-0.0019 (0.002)	
Lagged total number of democracies		-0.0008 (0.001)	
Lagged fuel export dependence		0.0525 (0.066)	
Socialist legal origin		0.2322*** (0.078)	
English colony		0.1283*** (0.041)	
Spanish colony		0.0423 (0.090)	
Lagged urban population		0.0058*** (0.001)	
Lagged population density		-0.0001 (0.000)	
Latin America	5.9879*** (2.152)	-0.2136 (0.148)	-10.8138*** (3.372)
Middle East	6.0879 (4.599)	-0.3278 (0.254)	-3.6675 (7.317)
Asia	-3.7646 (2.452)	0.1804 (0.153)	-7.5481* (3.957)
Lagged total financial crises	-0.0786 (0.050)		
Lagged inflation	-0.1666*** (0.032)		0.1931*** (0.053)
Log distance from the rest of the world	-6.2453*** (0.696)		6.8151*** (1.168)
Log area	-0.3967 (0.258)		0.2447 (0.413)
Log population	1.4396*** (0.262)		-0.7416* (0.431)
Investment rate			86.1708*** (9.194)
Constant	42.5190*** (6.105)	3.2734*** (0.161)	-162.9118*** (10.852)
Observations	1,021	1,021	1,021
R-squared	0.3903	0.4220	0.4054

Note: The system is estimated by three-stage least squares. Time and countries dummies are included but not presented for reasons of parsimony. Heteroskedastic-consistent standard errors are in parentheses. ***, ** and * denote significant coefficients, respectively at the 1, 5 and 10 % confidence levels.

Table 3: Baseline specification System Three Stage Least Squares, non-OECD countries

Specification	(1)	(2)	(3)
COEFFICIENT	Globalization	Freedoms	Convergence
Globalization		0.0388*** (0.003)	1.0825*** (0.024)
Freedoms	4.9847*** (0.175)		-4.0641*** (0.276)
Convergence	0.5519*** (0.012)	-0.0058*** (0.002)	
Lagged number of transitions to democracy		0.5167*** (0.036)	
Lagged constitutional age		0.0499*** (0.003)	
Lagged total number of democracies		-0.0027* (0.001)	
Lagged fuel export dependence		-0.5084*** (0.083)	
Socialist legal origin		-1.2001*** (0.143)	
English colony		0.4241*** (0.071)	
French colony		-0.1888** (0.085)	
Spanish colony		-0.0666 (0.084)	
Lagged urban population		0.0071*** (0.002)	
Lagged population density		-0.0002*** (0.000)	
Latin America	0.5222 (1.083)	-0.6627*** (0.155)	-5.6053*** (1.557)
Middle East	-5.6110*** (1.197)	-1.5136*** (0.158)	13.2700*** (1.702)
Africa	2.1973* (1.126)	-1.3464*** (0.156)	-8.3420*** (1.619)
Asia	-1.3291 (1.267)	-1.0177*** (0.146)	-2.1775 (1.889)
Lagged total financial crises	-0.1240*** (0.031)		
Lagged inflation	-0.0005 (0.000)		0.0005 (0.001)
Log distance from the rest of the world	-4.9008*** (0.563)		8.4924*** (0.843)
Log area	0.0909 (0.175)		-0.7287*** (0.262)
Log population	1.9957*** (0.243)		-2.9045*** (0.371)
Investment rate			18.8558*** (2.916)
Constant	51.2898*** (4.469)	2.7195*** (0.173)	-70.8752*** (6.844)
Observations	2,752	2,752	2,752
R-squared	0.2865	0.4823	0.3934

Note: The system is estimated by three-stage least squares. Time and countries dummies are included but not presented for reasons of parsimony. Heteroskedastic-consistent standard errors are in parentheses. ***, ** and * denote significant coefficients, respectively at the 1, 5 and 10 % confidence levels.

Table 4. Estimated cross-elasticities, baseline specification

<i>Countries</i>		Panel A: All countries		
<i>Impact of row on column</i> →	Globalization	Freedoms	Convergence	
Globalization	--	0.42	1.91	
Freedoms	0.48	--	-0.19	
Convergence	0.27	0.02	--	
<i>Countries</i>		Panel B: OECD countries		
<i>Impact of row on column</i> →	Globalization	Freedoms	Convergence	
Globalization	--	0.31	0.61	
Freedoms	1.05	--	1.60	
Convergence	0.09	0.14	--	
<i>Countries</i>		Panel C: Non-OECD countries		
<i>Impact of row on column</i> →	Globalization	Freedoms	Convergence	
Globalization	--	0.43	2.81	
Freedoms	0.45	--	-0.95	
Convergence	0.21	-0.02	--	

Table 5: System Three Stage Least Squares SURE estimation

<i>A. All countries</i>			
<i>Variables</i>	Globalization	Freedoms	Convergence
Globalization		0.0321*** (0.002)	1.0431*** (0.021)
Freedoms	4.2185*** (0.132)		0.0641 (0.226)
Convergence	0.4220*** (0.008)	0.0062*** (0.001)	
<i>B. OECD</i>			
<i>Variables</i>	Globalization	Freedoms	Convergence
Globalization		0.0261*** (0.002)	0.7429*** (0.051)
Freedoms	8.2812*** (0.555)		11.7841*** (0.893)
Convergence	0.1749*** (0.017)	0.0117*** (0.001)	
<i>C. Non-OECD</i>			
<i>Variables</i>	Globalization	Freedoms	Convergence
Globalization		0.0306*** (0.003)	0.9174*** (0.024)
Freedoms	3.8271*** (0.142)		-1.9689*** (0.219)
Convergence	0.4641*** (0.011)	0.0005 (0.002)	

Note: Each block of results correspond to the system (1) estimated by three-stage least squares seemingly unrelated regression (SURE) with iteratively convergence to ML estimates, as in Table 1-3 for the full sample, OECD and non-OECD (blocks A, B and C, respectively). Other regressors' coefficient estimates are available upon request. Time and countries dummies are included but not presented for reasons of parsimony. Heteroskedastic-consistent standard errors are in parentheses. ***, ** and * denote significant coefficients, respectively at the 1, 5 and 10 % confidence levels.

Table 6: System Three Stage Least Squares estimation by type of Globalization

A. All countries

<i>Variables</i> <i>(Table 1)</i>	Globalization	Freedom s	Convergence	<i>Variables</i>	Globalization Economic	Freedom s	Convergence
Glob Total		0.0382*** (0.002)	1.1388*** (0.022)	Glob Econ		0.0286*** (0.002)	0.8312*** (0.020)
Freedom s	5.2819*** (0.161)		-1.2223*** (0.285)	Freedom s	5.6493*** (0.205)		0.7087** (0.287)
Convergence	0.4525*** (0.009)	0.0032** (0.001)		Convergence	0.5028*** (0.011)	0.0071*** (0.001)	

<i>Variables</i>	Globalization Social	Freedom s	Convergence	<i>Variables</i>	Globalization Political	Freedom s	Convergence
Glob Social		0.0307*** (0.002)	1.1449*** (0.018)	Glob Polit		0.0158*** (0.001)	0.5175*** (0.025)
Freedom s	4.3115*** (0.179)		-1.2610*** (0.264)	Freedom s	6.2054*** (0.200)		3.3896*** (0.309)
Convergence	0.6025*** (0.009)	0.0004 (0.001)		Convergence	0.2048*** (0.012)	0.0199*** (0.001)	

B. OECD countries

<i>Variables</i> <i>(Table 2)</i>	Globalization	Freedom s	Convergence	<i>Variables</i>	Globalization Economic	Freedom s	Convergence
Glob Total		0.0280*** (0.002)	0.5674*** (0.055)	Glob Econ		0.0238*** (0.002)	0.4176*** (0.048)
Freedom s	11.6373*** (0.699)		16.4318*** (1.137)	Freedom s	12.6103*** (0.831)		18.3235*** (1.127)
Convergence	0.0998*** (0.019)	0.0141*** (0.001)		Convergence	0.0954*** (0.023)	0.0149*** (0.001)	

<i>Variables</i>	Globalization Social	Freedom s	Convergence	<i>Variables</i>	Globalization Political	Freedom s	Convergence
Glob Social		0.0233*** (0.002)	0.5810*** (0.042)	Glob Polit		0.0150*** (0.002)	0.0657 (0.067)
Freedom s	12.9678*** (0.884)		14.7951*** (1.123)	Freedom s	10.0070*** (0.676)		23.8042*** (1.091)
Convergence	0.2139*** (0.024)	0.0118*** (0.001)		Convergence	-0.0528*** (0.018)	0.0204*** (0.001)	

C. Non-OECD countries

<i>Variables</i> <i>(Table 3)</i>	Globalization	Freedom s	Convergence	<i>Variables</i>	Globalization Economic	Freedom s	Convergence
Glob Total		0.0388*** (0.003)	1.0825*** (0.024)	Glob Econ		0.0286*** (0.002)	0.8093*** (0.021)
Freedom s	4.9847*** (0.175)		-4.0641*** (0.276)	Freedom s	5.5966*** (0.225)		-3.1374*** (0.278)
Convergence	0.5519*** (0.012)	-0.0058*** (0.002)		Convergence	0.6542*** (0.015)	-0.0060*** (0.002)	

<i>Variables</i>	Globalization Social	Freedom s	Convergence	<i>Variables</i>	Globalization Political	Freedom s	Convergence
Glob Social		0.0375*** (0.003)	1.1747*** (0.021)	Glob Pol		0.0104*** (0.002)	0.4564*** (0.025)
Freedom s	3.8627*** (0.180)		-3.5351*** (0.255)	Freedom s	5.8243*** (0.229)		-1.5033*** (0.301)
Convergence	0.6680*** (0.011)	-0.0114*** (0.002)		Convergence	0.2894*** (0.017)	0.0092*** (0.002)	

Note: Each of the four blocks of results correspond to the system (1) estimated by three-stage least squares as in Table 1-3 for: the KOF composite index (repeated top left for convenience), Economic Globalization (top right), Social Globalization (bottom left) and Political Globalization (bottom right). Other regressors' coefficient estimates are available upon request. Time and countries dummies are included but not presented for reasons of parsimony. Heteroskedastic-consistent standard errors are in parentheses. ***, ** and * denote significant coefficients, respectively at the 1, 5 and 10 % confidence levels.

APPENDIX

List of countries

Albania, Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Central African Republic, Chad, China, Colombia, Costa Rica, Cyprus, Dominican Rep., Ecuador, Egypt, El Salvador, Ghana, Guatemala, Haiti, India, Indonesia, Iran, Ivory Coast, Jamaica, Jordan, Kenya, Kuwait, Madagascar, Malawi, Malaysia, Mali, Malta, Morocco, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Rwanda, Senegal, Sierra Leone, Singapore, Sri Lanka, Tanzania, Thailand, Togo, Tunisia, Uganda, Uruguay, Venezuela, Zambia, Zimbabwe. 29 OECD (non-founders membership: * after 2005; ** during 10 years; *** during 12 years): Australia, Austria, Belgium, Canada, Chile*, Denmark, Finland, France, Greece, Hungary**, Iceland, Ireland, Israel*, Italy, Japan, Korea**, Luxembourg, Mexico***, Netherlands, New Zealand, Norway, Poland**, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States:

Summary statistics of three key variables of interest: GLOB, FREE and CONV

All countries					
Variable	Obs.	Mean	Std. Dev.	Min	Max
Globalization (KOF)	4198	50.99	19.67	11.55	92.83
Freedoms	4230	4.62	1.92	1	8
Convergence	4247	31.5	32.5	0.9	267.6
OECD Countries					
Variable	Obs.	Mean	Std. Dev.	Min	Max
Globalization (KOF)	1144	72.82	13.61	31.19	92.83
Freedoms	1135	6.67	0.73	2	7
Convergence	1144	70.7	23.8	21.2	181.3
Non-OECD Countries					
Variable	Obs.	Mean	Std. Dev.	Min	Max
Globalization (KOF)	3054	42.83	14.76	11.55	88.27
Freedoms	3095	3.87	1.66	1	8
Convergence	3103	17.1	21.6	0.9	267.6