

Democracy and Reforms: Evidence from a New Dataset*

This version: November 2012

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Abstract

Empirical evidence on the relationship between democracy and economic reforms is limited to few reforms, countries, and years. This paper studies the effect of democracy on the adoption of economic reforms using a new dataset on reforms in the financial, capital and banking sectors, product markets, agriculture, and trade for 150 countries over the period 1960–2004. Democracy has a positive and significant impact on the adoption of economic reforms but there is scarce evidence that economic reforms foster democracy. Our results are robust to the inclusion of a large variety of controls and estimation strategies.

JEL Classification Numbers: O57, E6

Keywords: Institutions, political economy, transition, economic liberalization.

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* The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or its board of directors. We thank the Editor and two anonymous referees for comments and suggestions. We are especially indebted to Alessandro Prati with whom we discussed extensively during the early stage of this paper. We also thank Daron Acemoglu, Paola Conconi, Francesco Giavazzi, Dennis Quinn, Guido Tabellini, the seminar participants at the 2007 IMF seminar on structural reforms, the 2008 Annual Meetings of the American Economic Association in Atlanta, the 2008 North-Eastern Universities Development Conference in Boston, and the 2010 annual meeting of the Society for Economic Dynamics for helpful comments.

1. Introduction

Political and economic freedoms go hand in hand ... or do they not? This is one of the oldest questions in economics and in political science, which is still largely unanswered. This paper answers this question using a novel dataset on economic reforms, which is the most exhaustive in the literature in terms of country, year, and reform coverage. This question is still open because there are very good theoretical arguments and numerous examples as to why political freedom can either hinder or facilitate economic reforms.

History offers numerous examples where economic reforms were undertaken by non-democratic regimes. Take the historical examples of Chile under Pinochet, South Korea under Park, Mexico in 1986, or Guyana in 1988. In these cases, important economic reforms were undertaken under non-democratic regimes. Historically, many contemporary industrialized countries were not democracies when they took off economically (Schwarz, 1992). Most East Asian economies did not develop under fully democratic regimes. In addition to these historical examples from several regions of the world and different historical periods, compelling theoretical reasons may explain why less democratic regimes may favor economic reforms and growth.

Democracy can hinder reforms if special interests prevail on the general welfare. A democratic regime can fall prey to interest groups, which put their goals before general well being. Capitalists entrenched in their rent-seeking positions are often the main opponents of economic reforms (Rajan and Zingales, 2004). Interest groups can block reforms if there is uncertainty about the distribution of the benefits (Fernandez and Rodrik, 1991). A 'benevolent dictator' can shelter the institutions, avoid that the state becomes captive of any specific interest group, and allow the state to perform its function in an efficient way. Along these lines, Haggard (1990) argues "... Institutions can overcome collective-action dilemmas by restraining the self-interested behavior of groups through sanctions: collective action problems can be resolved by command." In addition to pressure from interest groups, wages are typically higher under democracy (Rodrik, 1999) and democracy can lead to excessive private and public consumption and lack of sufficient investment (Huntington, 1968). Dictatorial regimes can also rely on financial repression to increase the domestic saving rate. Several countries, including the Soviet Union and many East Asian countries, have been able to increase savings, and ultimately achieve high economic growth rates, thanks to a repressive political system and an attendant highly regulated financial system.

In sum, do the historical examples and the theoretical arguments provide a compelling case against the role of democracy in fostering economic reforms? The answer to this question is a resounding no.

The alternative view that democracy often accompanies economic reforms is also based on strong theoretical arguments and solid empirical evidence. Secured property rights, as guaranteed by a democracy, are considered key to economic development (De Soto, 2000). In general, dictators cannot credibly make commitments because of time-inconsistency; so no reform can be undertaken (McGuire and Olson, 1996). Autocratic rulers tend to be predatory, disrupting economic activity and making any reform effort meaningless; autocratic regimes have also an interest in postponing reforms and maintaining rent-generating activities for a restricted number of supporting groups (Acemoglu and Robinson, 2012.) On the opposite, democratic rulers should be more sensitive to the interest of the public, and so more willing to implement reforms, which destroy monopolies in favor of the general interests. In addition to these theoretical arguments, there is strong empirical evidence that reforms are highly correlated with democracy.

Figure 1 shows the behavior over time of the index of democracy (measured as polity2 and normalized between 0 and 1)¹ and our deregulation indices (all the indices are normalized between 0 and 1, with 0/1 corresponding to the lowest/highest degree of deregulation) in the following six sectors (or areas)—(i) domestic financial, (ii) capital account, (iii) product markets (electricity and telecommunications), (iv) agriculture, (v) trade (based on tariffs) and (vi) current account transactions (see below for description). In all sectors democracy and regulation indices move together over time, with democracy usually preceding the deregulation process. The figure in itself, however, does not show that an increase in democracy necessarily causes economic reforms. The relationship could run in the opposite direction, or the increase in democracy and economic reforms could be driven by a common third factor.

The sharp contrast between these opposing views has left the question of the effects of democracy on economic reforms largely unanswered. The goal of this paper is to address again this issue using a novel database, which covers almost 150 countries, 6 sectors and spanning more than 40 years of data.

¹ Note that the slightly different values for the polity2 index in Figure 2 are due to the different coverage of countries for each sector.

The main findings are that an increase in the quality of democratic institutions as measured by the commonly used indices is significantly correlated with the adoption of economic reforms but there is little evidence of a feedback effect from economic to political reforms. These results are robust to controlling for country, reform-specific effects, and any possible interaction among them. Global reform waves and possible country-time varying determinants of reforms (including crises, reforms in neighboring countries, existence of compensation for losers, human capital and bureaucratic quality, and several political variables) do not weaken these results, which are also robust to using an instrumental variable strategy.

The remainder of the paper is organized as follows. Section 2 reviews the existing literature on economic reforms and democracy; Section 3 presents the data; Section 4 presents the results on the effects of democracy on reforms, controlling for other possible determinants of reforms and the possibility of reverse causality and omitted variables; Section 5 concludes.

2. Democracy and Reforms: Theory and Empirics

While there are many theoretical predictions about the relationships between political and economic reforms, empirical evidence on the subject is limited to reforms in specific sectors, in particular international trade and finance, micro-reforms, or specific countries over a short period of time. Our study is the first one to combine a comprehensive coverage of reforms in different sectors, a significant coverage of countries, and a long time period. In particular, the dataset used in this paper spans six sectors, and a set of both developing and developed countries from the 1960 up until 2004.

Theory

Economic theory does not give a clear answer on whether democratization favors or hinders economic reforms or if the relationship could go both ways. A priori, indeed, democratic regimes lead to more economic reforms if reforms create more winners than losers. Democratically elected governments may also have greater legitimacy to implement and sustain policies bearing short-term costs; similarly institutional changes—e.g., strengthening an independent legal system or a professional civil service required to ensure political freedom and democracy—could lead also to successful market reforms.

Alternatively, democratization could lead to less economic reforms if the electoral system creates a pivotal voter with veto power. In fact, uncertainty about the impact of economic reforms at the individual level could also lead a rational electorate to vote against reforms even if they are known *ex ante* to benefit a majority of them (Fernandez and Rodrik, 1991).

The theoretical predictions about the feedback effect from economic reforms to democratization are ambiguous as well. Economic reforms improve the quality of democratic institutions by increasing the power of the middle class (López-Córdova and Meissner, 2008; Papaioannou and Siourounis, 2008; Acemoglu and Robinson, 2006; Rajan and Zingales, 2003). On the other hand, economic reforms could lower democracy through increases in income inequality and the associated political strife and violence (Quinn, 1997, Dixon, and Boswell, 1996).

Empirical evidence

A few empirical papers have looked at the relationship between democracy and reforms. None of these studies provides a systematic and comprehensive coverage in term of sectors and countries, but they all look at reforms in one specific sector and their relationship with political liberalization. Results are mixed.

Looking at the relationship between economic liberalization in the trade sector and democratization, Giavazzi and Tabellini (2005) find evidence of a positive and significant relationship between political and economic liberalization; they find that the feedback effect could run in both directions although the causality is *more* likely to run from political to economic liberalization.² Persson (2005) also shows that the forms of democracy (e.g. parliamentary, proportional and permanent ones) explain variation in trade reforms (measured by the Wacziarg and Welch index and an index of property rights protection). In a similar vein, Banerji and Ghanem (1997) and Milner and Kubota (2005) find evidence that democracy leads to liberalization in the trade sector.³

² Economic liberalization is defined as the event of becoming open in the trade sector (the measure of openness is taken by Wacziarg and Welch, 2008). Political liberalization is the event of becoming a democracy, defined by strictly positive values of polity 2. Their sample cover a panel of 140 countries over 1960-2000.

³ The former presents cross-country evidence to show that authoritarian regimes are associated with higher protectionism (measured by an index of protectionism from Dollar, 1992), while the latter shows that regime changes towards democracy are associated with greater liberalization (measured by tariff rates and Sachs Warner indices).

On the relationship between democracy and a more general measure of reforms (including capital account in addition to trade), Eichengreen and Leblang (2008) find evidence of a positive two-way relationship between the two.⁴ Quinn (2000) finds evidence that democracies liberalize international finance, especially capital accounts.⁵ He also finds evidence of feedback effects from financial liberalization to democratizations whereby capital account liberalization is associated with decreases in democracy 6 to 15 years later.

Overall, most cases in literature suggest that causality is more likely to run from political to economic reforms; some evidence for a feedback effect also exists, but it is limited to few sectors and time periods. Our dataset allows us to study this relationship systematically across a large number of sectors, countries, and spanning a longer time period. We find consistent and robust evidence of an effect of democracy on reforms. There is scarce evidence that economic reforms foster democracy. We see our results as more general and robust across specifications, sectors and time periods.

3. Data

3.1. Regulation indices

Our analysis is based on a completely new and extensive dataset, compiled by the Research Department of the IMF, describing the degree of regulation for a sample of 150 industrial and developing countries. The new dataset thus has significant advantages over existing data sources, which cover a limited number of sectors and countries. Regulation indices cover six sectors, including both financial and real sectors. Financial sector regulation indices cover the domestic financial market and the external capital account, while real sector indicators include measures of regulation for product and agriculture markets, trade and the current account. Each indicator contains different sub-indices summarizing different dimensions of the regulatory environment in each sector. The sub-indices are then aggregated into indices and normalized between 0 and 1. Higher values are associated with lower regulation.

⁴ See also Alesina, Ardagna, and Trebbi (2005), Abiad and Mody (2005), Drazen and Easterly (2001), and Lora (1998).

⁵ Financial regulation is measured through changes in current and capital account openness created using the *Exchange Arrangement and Exchange Restrictions* from the IMF. Democracy is measured by changes in polity 2. The sample consists of 50 countries over 1950-1997.

Table 1 presents a brief definition and sources of the regulation indicators used in this paper. IMF (2008) describes all data sources and full details of the construction of the indicators.

3.1.1. Domestic financial sector

The measure of regulation in the domestic financial market is captured by two different sub-indicators.

- i) A measure of securities markets. This sub-index assesses the quality of the market framework, including the existence of an independent regulator and the extent of legal restrictions on the development of domestic bond and equity markets.
- ii) A measure of banking sector regulation. This sub-index captures reductions or removal of interest rate controls (floors or ceilings), credit controls (directed credit and subsidized lending), competition restrictions (limits on branches and entry barriers in the banking market, including licensing requirements or limits on foreign banks), and public ownership of banks. This sub-index also captures a measure of the quality of banking supervision and regulation, including the power and independence of bank supervisors, the adoption of Basel capital standards, and the presence of a framework for bank inspections.

3.1.2. Capital account

The regulation index for the capital account includes information on a broad set of restrictions such as, for example, controls on external borrowing between residents and non-residents, as well as approval requirements for foreign direct investment (FDI).

3.1.3. Product market

Turning to the real sector, the product market indicator covers the degree of regulation in the telecommunication and electricity markets, including the extent of competition in the provision of these services, the presence of an independent regulatory authority, and privatization.

3.1.4. Agricultural market

The agricultural sector indicator captures intervention in the market for the main agricultural export commodity in each country. It measures the extent of public intervention in the market going from total monopoly or monopsony in production, transportation or

marketing (i.e., the presence of marketing boards), the presence of administered prices, public ownership of relevant producers or concession requirements to free markets.

3.1.5. Trade

The degree of regulation in the trade sector is meant to capture distortions in international trade. It is measured by average tariffs and normalized between zero and one, where a zero value means that tariff rates are 60 percent or higher and one means that tariff rates are zero.

3.1.6. Current account

Another way of looking at the degree of regulation in the trade sector is to define the extent of current account liberalization. This measure captures the extent to which a government is compliant with its obligations under the IMF's Article VIII to free from government restriction the proceeds from international trade in goods and services.

Additional details on the sources and specifics of each indicator can be found in IMF (2008) and Table 1.

3.2. Aggregation and normalization

For each of our six sectors, we construct an aggregate index of regulation by averaging the sub-indices for that particular sector (for the cases in which we do have multiple sub-indices, like product market or the financial sector). Each sectoral indicator is then normalized between 0 and 1, where 1 indicates a higher degree of deregulation. Table 2 reports the pair wise correlations between the different regulation indices. Overall, we do find that the degree of regulation is correlated across sectors. More specifically, financial sector, trade, current, and capital account indices are strongly correlated among themselves, and less so with agricultural and product market indices (with the exception of the financial sector index which is strongly correlated to the product market one).

For all our analysis, "reform" in a given sector is defined as an annual change in the index. We run most of our regressions at the sector-country and year level; however as one of our robustness checks we also aggregate the six reform indicators using a principal component analysis.

3.3. Other data

Democracy is measured using the standard, well-established measure of democracy taken from the Polity IV database. In particular, we use the combined polity2 index ranging

from -10 to 10 (-10=high autocracy; 10=high democracy). We also check our results using the *Freedom House Index* and the index proposed by Przeworski, Alvarez, Cheibub, and Limongi (1993). Note that the trend toward more democratic regimes has not been linear. Significant retrenchment of democracy has not only been observed in isolated countries but also in several regions of the world. The examples include the general decrease in democracy in Asia in the 1950s and 1960s, the marked decline in Latin America in 1960s and 1970s, and the prolonged stasis in Africa since the 1960s (Acemoglu and Robinson, 2006). We normalize the index so that 1 indicates the most democratic country and 0 the least democratic regime.

We also include in our specifications the following controls:

- **Initial level of regulation** (as measured by the lagged level of the regulation index): this variable can be a proxy for important incentives in favor and against the implementation of structural reforms. Excessive government regulation and/or market failures may be perceived as more costly when the economy is least reformed. At the same time, the beneficiaries of existing large rents may oppose reforms.
- **Economic crises:** According to a widely held view, economic crises foster economic reforms by making evident the cost of stagnation and backwardness. The opposite view maintains that it is easier to implement reforms during periods of economic growth when potential losers can find other opportunities in a booming economy or when countries become richer and have more resources to compensate the losers. In order to test for this hypothesis, we use several measures of crisis: a dummy equal to 1 if the country is experiencing inflation larger than 40 percent in that year, a measure for recession (as summarized by a dummy indicating negative growth in per-capita GDP), terms of trade shocks, and banking and debt crises. The data on banking and debt crises come from Reinhart and Rogoff (2008).
- **Public expenditures/GDP and real devaluation:** Compensation schemes can offset costs associated with reforms. A large government may compensate losers from reforms compared to a very lean government with a small budget. We use public expenditures/GDP as a proxy of the size of social safety nets. As an alternative measure of compensation, we also control for real devaluation, which could promote exports and therefore help compensate losers from reforms. For

instance, some important reforms happened together with large devaluations and in the context of IMF-supported programs.

- **Human capital and effectiveness of bureaucracy** could also facilitate reforms (Besley and Persson, 2007). We use enrollment in tertiary education from Barro and Lee (2001) as a measure of human capital and bureaucratic quality from the International Country Risk Guide. The measure of bureaucratic quality from ICRG is scored between 0-6. High scores indicate “autonomy from political pressure” and “strength and expertise to govern without drastic changes in policy or interruptions in government services”; also existence of an “established mechanism for recruiting and training.”
- **Reforms in neighboring countries or in trading partners** may affect the adoption of domestic reforms through peer pressure and imitational effects. We use the weighted average of reforms in neighboring countries, where the weights are given by two concepts of distance defined by geography and trade. The source for geographic distance is <http://www.cepii.fr/anglaisgraph/bdd/distances.htm> and for bilateral trade flows, the IMF’s Direction of Trade Statistics.
- **The ideology of the ruling government and the form of government** may determine the adoption of reforms. Alesina and Roubini (1992) argue that right-wing governments are normally considered more inclined to market-oriented reforms; Persson and Tabellini (2002) finds that a presidential system facilitates reforms as they are more able to overcome the resistance of small interest groups. We capture the ideological orientation of the executive with the indicator *left*, which is equal to 1 if the executive belongs to a party of the left and 0 if it belongs to a right-wing, centrist or other party.⁶ The form of government is proxied by the variable *presidential*, which takes the value of 1 if the system is directly presidential and 0 if the president is elected by the assembly or parliamentary. The source for these two variables is the Database of Political Institutions from the World Bank. We also included in the regressions additional political variables such as the number of executive constraints, the presence of legislative or executive elections, the number of years left in the current term for the executive and the presence of an absolute majority in the

⁶ Note that the Dataset of Political Institutions defines the ideology of the government also for autocratic regimes.

legislature by the party of the executive. The results are robust to the inclusion of these additional political variables.

Table A1 provides the summary statistics for the key variables used in the empirical analysis.

4. Empirical strategy

The unit of analysis is a sector-country-year observation (there are 6 sectors, 150 countries, and 45 years); the resulting dataset is a panel of 20,123 observations. We define reform as a change over time in the index of regulation for each of the six sectors, s , in country c at time t :

$$\text{reform}_{s,c,t} \equiv \text{Index}_{s,c,t} - \text{Index}_{s,c,t-1},$$

Our baseline specification is as follows:

$$\text{reform}_{s,c,t} = \alpha \text{Index}_{s,c,t-1} + \beta \text{democracy}_{c,t-1} + \phi X_{c,t-1} + \delta_s + \gamma_c + \chi_t + \delta_s * \gamma_c + \delta_s * \chi_t + \varepsilon_{s,c,t} \quad (1)$$

where δ_s , γ_c and χ_t are sector, country, and year fixed effects, respectively, and $X_{c,t-1}$ are country-specific and time-varying controls to be described below.⁷ $\delta_s * \gamma_c$ and $\delta_s * \chi_t$ are the interactions between country and sector fixed effects; and sector and time fixed effects respectively.

We also control for the lagged level of the index to identify the existence of convergence toward some possible country specific levels of regulation. Being bounded between zero and one, the reform variables do not have a unit root; however, they can still exhibit a trend within the bounds. In Table A5 we report standard panel unit root tests for each reform indicator and for the democracy index. We reject the null of unit roots for

⁷ All our independent variables are lagged to avoid problems of endogeneity. Note that the choice of the lag structure does not affect our results. As a robustness check we run our regressions with contemporary controls. The coefficient on democracy stays the same, whereas the controls are for most of the cases not significant with the exception of the coefficient on bureaucratic quality and the presence of presidential democracy (both significant at the 10% level when controls are included one by one). In addition, we also test the robustness of the results to a longer lag structure (2, 3 and 4 lags). When we include all lagged controls in the regression, the coefficient on democracy is equal to 0.082, 0.085 and 0.059, all significant at the 1% level, for twice, thrice, and four-lags respectively. Among the controls, human capital appears to be consistently significant when we use a longer time structure. The sample with the inclusion of all controls and a longer lag structure is substantially smaller (4,756 observations when we use two lags and only 4,503 observations when we use four lags). We decided to report the results using one year lag, since it is the most common lag structure which has the advantage of reducing problems of endogeneity without losing too many observations.

polity2 at the 10 percent level; in addition most of our reform indices do not show evidence of unit roots; hence we use the level of the reform index, $reform_{s,c,t}$ ($\equiv \Delta Index_{s,c,t}$) as the dependent variable.

The dependent variable (reform in a country) is highly persistent; for this reason the error terms in specification (1) may also exhibit serial correlation. We allow for first-order serial correlation in the error terms: $\varepsilon_t = \rho\varepsilon_{t-1} + u_t$. The Durbin-Watson statistic for the transformed regression is 1.94 indicating that there is little evidence of serial correlation in the transformed error terms.⁸

Our first specification includes only sector, country, and time fixed effects (Table 3, column 1). The coefficient on the lagged level of the index is negative and significant at the 1 percent level, indicating convergence toward country specific levels of regulation. The coefficient on the lagged level of democracy is significant at the 1 percent level. The magnitude of the estimated effect implies that a one standard deviation increase in the democracy index explains 7 percent variability in reforms. In addition, moving to a complete democracy in the long-run is associated with a $0.22 \left(= -\frac{\beta}{\alpha} \right)$ increase in the index of reform (using the coefficients of column 1).

We then add country-sector specific effects, and sector-year specific effects and both of them (column 2, 3, and 4 respectively).⁹ The interactions between country and sector fixed effects take into account that reforms are inherently different across countries, e.g., trade sector reforms in India have different characteristics than banking reforms in Brazil (Specification 2). The interactions between sector and year effects account for the possibility of global reform waves across all countries (Specification 3). Specification 4 is the most demanding because it includes all the individual fixed effects and possible two-way interactions. Notice that we cannot control for country-time effects, since the main variable of interest, which is democracy, is country-time varying. The results are very similar across specifications. The magnitude of the coefficients on the democracy variable ranges from .02 to .03 in columns 2-4.

⁸ We also test the robustness of our results by clustering the error terms at the country-reform and country level. See Section 4.4 for details.

⁹ In specifications (2) and (4), we allow the serial correlation coefficients in the error term to be country-sector specific. In specifications (1) and (3), the serial correlation coefficients are country-specific.

To have a sense of the magnitude of the effects we can compare China and the US, using the coefficient of β/α (0.22) of Table 3 (column 1). If China, which had a polity2 index of 0.15 in 2000, were to increase its level of democracy to that of the US in the long-run (1 on the polity2 index in 2000), its financial sector regulation index would increase by 0.20 points ($=0.22*0.85$) (the higher level of democracy would reduce the gap in the financial sector index between the two countries by 20%, the gap being equal to 1 in 2000, with China at 0 and US at 1 on the financial sector regulation index). The increase in democracy would have completely closed the regulation gap in the trade sector (the trade regulation index is equal to 0.93 in the US and 0.72 in China in 2000). The impact would also be sizeable in the other sectors (the gap would have been reduced by 30 to 37%).

The results in Table 3 show that the correlation between (lagged) democracy level and the adoption of reforms is not driven by country or sector-fixed characteristics or by the fact that there was a worldwide movement toward reforms and democracy, or any interactions between country-sector and sector-time fixed characteristics.

If the correlation between economic reforms and democracy is not due to spurious correlation owing to a common trend, could it be driven by other country-time varying omitted variables? The next subsection checks whether this correlation is robust to the inclusion of several variables, which (current theories suggest) may explain both economic reforms and democracy, i.e., the possible bias deriving from country-sector-time varying omitted variables.

4.1. Additional controls

Reforms may be triggered by a wide range of factors other than democracy. Following the theoretical literature reviewed above, in Table 4 we control for the following possible determinants of reforms: measures of crisis (a dummy equal to 1 if the country experiences inflation larger than 40 percent, we include alternative measures of crisis in Table 7b), public expenditure/GDP and real devaluation, human capital and bureaucratic quality, reforms in neighbors, and political variables (Columns 1-5). Column 6 includes all the controls simultaneously. The results on the coefficients of our controls go in the expected direction but are often not significant. For example, episodes of hyperinflation appear to reduce the probability of reforming (Column 1), but the effect disappears when all the other controls are added to the specification. Reforms in neighboring countries appear to spur domestic reforms. This result, which extends the results of IMF (2004) on OECD

countries, is also in line with Buera, Monge, and Primiceri (2008), who find a spillover effect from beliefs in neighboring countries. The variable however also loses significance when all the controls are included.¹⁰

Democracy is the only variable which remains consistently significant across all specifications. We also look at the standardized beta coefficients for democracy across the different regressions and find them to be remarkably similar.

The inclusion of the different controls changes the sample size in each column of Table 4. To check that our results are not driven by the specific sample, we also estimate the basic specification (Table 3, column 4) for each column of Table 4. The results shown in Table 4 do not appear to be driven by sample selection. The results on the various restricted samples of Table 4 are reported in Table A4 in the Appendix.

4.2. Endogeneity

Another source of bias derives from the fact that reforms themselves may have an effect on democracy. In order to deal with this issue we have two approaches: 1) we use instrumental variables, and 2) we check if reforms cause democracy (in the final section of the paper).

While an ideal source of exogenous variation of democracy is difficult to find, we use democracy in neighboring countries as an instrument. Democracy in neighboring countries is calculated as the average level of democracy in neighboring countries, where neighbors are defined by countries which are part of a common alliance (the variable is taken from the Correlates of War Database).¹¹ The idea behind this instrument is that democracy in political allies has influence on domestic democracy but no direct impact on a country's ability/willingness to reform. For instance, the political alliance between the U.S. and Western Europe had surely an effect on democracy in Western Europe but not a direct effect on the reform level in Europe. The idea underlying this instrument is based on Persson and Tabellini (2009), who use democracy in neighboring countries as a proxy for democratic capital. In addition, building on this concept, we also tried different measures of

¹⁰ In additional robustness checks, we also include dummies for WTO, EU, and OECD accessions (=1 in years following the accession) and for the existence of an IMF program. The coefficient on democracy remains positive and statistically significant at the 1 percent level. The coefficients on EU, OECD and IMF program dummies are significant in the specification without any controls, but lose their significance when included along with other controls in Table 4, column 6.

¹¹ The dataset records all formal alliances among states, including mutual defense pacts, non-aggression treaties and ententes.

distance, including geographical distance between countries and commercial distance defined as the (inverse of) trading flows between countries. These measures, which are highly correlated, confirm the result of political distance reported here.

Table 5A shows the regressions using lagged democracy in political neighbors as an instrumental variable. The coefficient of lagged democracy in the first stage (Table 5B) confirms the relevance of democracy in neighbors in promoting the democratic process in the domestic economy. The results in our second stage show that, consistent with the OLS specification, there is evidence for a strong and positive effect of democracy on reforms. The estimated effect is not statistically significant in the specification which includes all the controls (column 1c). The magnitude of the estimated effect is, however, not significantly different from column 1b, which uses a larger sample and a restricted set of controls suggesting that the statistical insignificance in specification 1c is likely to be driven by the large standard errors from the smaller sample. The regression in column 1d, where the sample is the same as column 1c but without the inclusion of controls, indeed confirms that this is the case.

4.3. Regressions by sector

Does democracy have a differential effect across sectors? Alternatively, are the results presented above driven by a particular sector? We explore this possibility by looking at the impact of democracy on reforms in different sectors. Table 6 presents one specification without any control except country and year fixed effects (this is analogous to the specification in Table 3) and one specification with control variables, including indicators of crisis, devaluation, public expenditure as a share of GDP, bureaucratic expenditure, tertiary enrollment, reforms in neighboring countries, dummy for parties for the left in power, and dummy for presidential form of government (this is analogous to column (6) in Table 4).

The results in Table 6 show that democracy promotes reforms in all sectors with the exception of product markets in the specification with controls. In most cases the coefficient on democracy is significant at the one percent level despite the reduced number of observations.

We prefer the general specification that encompasses all sectors in order to maximize the number of observations so that we can control for country, reform, and year fixed effects and (most importantly) their interactions as shown in Table 3.

4.4 Other robustness checks

Structural reforms and democratization sometimes come in waves. For instance, several countries in Central and Eastern Europe became more democratic and implemented economic reforms in few years after 1989. In this section we control to which extent the inclusion of a group of countries in our sample drives the results. The results are reported in Table 7a. In columns 1a–1b and 2a–2b, the sample is restricted to non-communist and developing countries respectively (we estimate two regressions for each subsample with and without the inclusion of controls).¹²

Giavazzi and Tabellini (2005) use a zero-one definition of democracy (where $\text{democracy}=1$ if polity2 has positive values) because the degree of democracy can be difficult to quantify using a cardinal measure. Following this line, we repeat our baseline regression using a zero-one definition of democracy. Columns 3a-3b of Table 7a reports the results. The results do not change in the baseline regression but are weaker when we include all the controls because the sample size is much smaller, in column 3c we indeed show that the impact of democracy on reforms on the restricted sample but without the inclusion of controls is also not significant. For each specification with controls in Table 7a, we also estimate the basic specification (Table 3, column 4) without any controls on the restricted sample (not shown). We do this to analyze the effect of adding controls on a consistent sample. The results in Table 7a are not driven by sample selection.

Assumptions on the error terms are key to evaluate the significance of the coefficients. So far we have allowed for an AR(1) term in the model. Column 1 in Table 7b presents the basic specification without controls in which the standard errors are clustered at the country-reform level. The results are similar if we cluster at the country rather than country-reform level.

Reforms in trading partners (Column 2 of Table 7b) and reforms in other sectors (Column 3 of Table 7b) also do not alter our main conclusion, and the results are also robust to a variety of crisis definitions (negative per-capita GDP growth, banking and debt crises and terms-of-trade shocks-columns 4 to 7 of Table 7b).

¹² We also check the robustness of the results to the exclusion of transition economies, since most reforms happened in those countries. The coefficients when transition countries are excluded are equal to 0.008 and 0.050 (without and with the inclusion of controls, respectively) and significant at the five and one percent level respectively. The results are very similar to the ones obtained when excluding from the sample the communist countries.

By including the lagged level of reforms, the specifications so far have assumed that there is (conditional) convergence in the reform adoption. By including country fixed effects, we assume a country specific long run level of reforms. However, unlike growth regressions, there is no theoretical reason why we should expect convergence in the level of regulation. In order to test if our results depend on this assumption, we replicate the specification in Table 3 without the lagged reform index using the following specification:

$$\Delta Index_{s,c,t} = \beta democracy_{c,t-1} + \delta_s + \gamma_c + \chi_t + \delta_s \gamma_c + \delta_s \chi_t + \varepsilon_{s,c,t} \quad (2)$$

Column (8) in Table 7b reports the results from estimating Equation (2). The estimated coefficient on lagged (democracy) is positive and statistically significant at the 1 percent level. The magnitude of the estimated coefficient ($\beta = 0.011$) is smaller than in Table 3. This is consistent with a positive correlation between (lagged) democracy and the lagged reform index, and a negative relationship between reform and the lagged reform index. This coefficient, however, is not comparable to the coefficient in the previous regressions in Table 3 given that the magnitude of the estimated coefficient on democracy in this regression can be interpreted only as the effect of democracy on the *rate* of adoption of structural reforms rather than on the steady-state *level*. Unlike Equation (1), the specification in Equation (2) has the drawback that the steady state level of the index is undefined; hence the long-run effect of democracy on the reform index cannot be estimated. In effect, we are assuming that a certain level of democracy is associated only with a rate of growth of the reform index.

Democracy could have a non linear effect on reforms if reforms start only when a certain level of democracy is reached. To check this hypothesis, we replicate our baseline regression (with different combinations of fixed effects) for different levels of democracy. These regressions reported in Table 8 show some evidence for non-linear effects of democracy on reforms: the more democratic the country is initially, the easier it is to reform.

We also explore whether democracy affects the probability of reversal in reforms (defined as a decrease in the level of index). Reform reversals constitute 8 percent of the observations in our sample. We do not find any evidence for this hypothesis (see Table A6).

4.5. The feedback effect

In this section, we check whether economic reforms foster democracy. We test for the possibility of a feedback effect from reforms to democracy by estimating the following regression:

$$\Delta \textit{democracy}_{c,t} = \alpha \textit{democracy}_{c,t-1} + \beta \textit{average reform}_{c,t-1} + \gamma_c + \chi_t + \varepsilon_{c,t} \quad (3)$$

In order to estimate the feedback effect, we need to collapse our data at the country level. The term “average reform” in equation 3 now refers to the arithmetic average of the reform indices.

Overall, we find little evidence that reforms promote the democratic process (Table 9a).¹³ Our results therefore do not support a reverse causality story. Since income is considered an important determinant of democratization, we also test robustness to including per capita income in the regressions (results available upon request). Including the lagged level of the index, rather than the change as in Table 9a, also does not alter the findings in Table 9a. We also repeat the same exercise reform by reform (Table 9b) and find little evidence of feedback (we find evidence of a feedback effect for the agricultural sector but only in the specification in which all controls are included).

4.6. Difference-in-difference approach

In this section we use a different empirical strategy to test for the presence of a feedback effect. Giavazzi and Tabellini (2005) look at the relationship between political and economic liberalizations in the trade sector using a difference-in-difference approach. In particular, the authors run two regressions: in the first, the dependent variable is economic liberalization, the “treatment” is democratization, and the “control” group is given by countries that never changed their political regime. In the second specification, the dependent variable is political liberalization and the “treatment” is defined as economic liberalization, whereas the “control” group includes all the countries that never changed their economic regime.¹⁴

¹³ The results are similar when we use longer lags.

¹⁴ More specifically, the explanatory variable in the first regression is political liberalization which is defined as a dummy variable taking a value of 1 in the years after democratization. Democratization is defined as the event of becoming a democracy (defined by discrete jumps in polity2 around zero), given that a country was not a democracy in the previous year. The dependent variable in the first regression is becoming economically open (defined by Wacziarg and Welch (2008) 0/1 openness

Based on these two regressions, they find that the causality is *more* likely to run from political to economic liberalization. Their approach is a useful alternative way to check both directions of causality from democratization to introduction of economic reforms and vice versa. In Table 10, we report the results repeating their methodology on our dataset.¹⁵ All regressions control for time and country fixed effects. Democratization has a positive effect on all economic liberalization indices with significant effect on finance, agriculture, and trade. However, there is little evidence of the opposite (i.e. economic liberalization does not precede political liberalization).¹⁶ We view our results as broadly in line with those of Giavazzi and Tabellini.

4.7. Factor analysis

In this section, we implement a different approach from the panel analysis presented above. To take into account the possibility that the reform process is one unique process common to all sectors, we undertake a factor analysis of our measures of reforms in the six sectors. In particular, we extract the first principal component from the whole dataset with all the data on reforms for each sector.¹⁷ The results are reported in Table 11. The impact of democracy seems to be relevant for the overall tendency of a country to reform (the coefficient on the lagged level of democracy is significant at the 1 percent level): moving to a complete democracy in the long-run is associated with a 0.03 increase in the index of reform (the magnitude doubles when we instrument for lagged democracy using lagged democracy

index). Similarly, in their second regression, the explanatory variable is economic liberalization, defined as a dummy taking a value of 1 in the years after becoming economically open (defined by the openness index). The dependent variable in the second regression is polity2 (redefined as 0/1 based on negative/positive values). Note that they call the discrete jumps in polity 2/openness index as political and economic “liberalizations”. Since they are looking at the jump in the indices this would be an alternative way of defining a process of “reform”.

¹⁵ The top panel shows the effect of becoming a democracy; in the bottom panel the “treatment” is defined as a jump toward more deregulation in each one of our indices.

¹⁶ Giavazzi and Tabellini (2005) find a coefficient of -0.16 when regressing democracy on trade liberalization (Table 4, Column 1 in their paper). Their coefficient like ours is not significant. To make our results as comparable as possible to their strategy, we first replicate their estimation on their sample and their political and economic liberalization measures. The coefficient is very close to the original paper and equal to -0.06. We then use our trade index measure on their sample and use their empirical strategy. The coefficient is in this case equal to 0.39, but is also statistically indistinguishable from zero. Therefore, even using our trade index on exactly their sample, and replicating their methodology, we fail to find any significant feedback effect.

¹⁷ The variable is then normalized between 0 and 1 to make the results comparable to the remaining part of the paper.

in neighboring countries). On the other hand, we do not find any evidence of a feedback effect from the impact of the overall tendency of a country to reform on democracy.

5. Conclusions

The question of whether democratic countries favor economic reforms is central to the political economy literature. Political economists study why apparently welfare-enhancing reforms are postponed or adopted with long delays and the presence (or the absence) of democracy is one of the main causes investigated. Unfortunately, despite the vast theoretical literature and limited empirical evidence (restricted to some countries, to some reforms, and to some periods), the answer to this question has been tentative because of data limitations, which has also limited the techniques that can be used.

This paper answers this question using a novel dataset on structural reforms, which encompasses several sectors and many countries for several years. This dataset allows us to control for a set of possible omitted variables, including country and reform fixed effects, possible two-way interactions between the fixed effects and waves of reforms.

The main conclusions of the papers are that 1) democracy and economic reforms are positively correlated (after controlling for country and reform-specific characteristics, any interaction between country and reform characteristics, and global reform waves); 2) this correlation is robust even after we control for standard factors, which are usually correlated with reforms and democracy, including bureaucratic quality and education, and political stability; 3) the correlation is also robust to the variables that are usually associated with reforms (but not necessarily with democracy) such as crises, neighboring country effects, and compensation schemes; and 4) there is no evidence that economic reforms pave the way for political reforms.

The strong correlation between (lagged) democracy and the adoption of economic reforms, even controlling for many possible factors as well as the finding that (lagged) economic reforms are not associated with the adoption of democracy point to the fact there is probably a causal link from democracy to reforms.

These strong results call for an effort to study the precise mechanisms through which democracy has an impact on economic reforms.

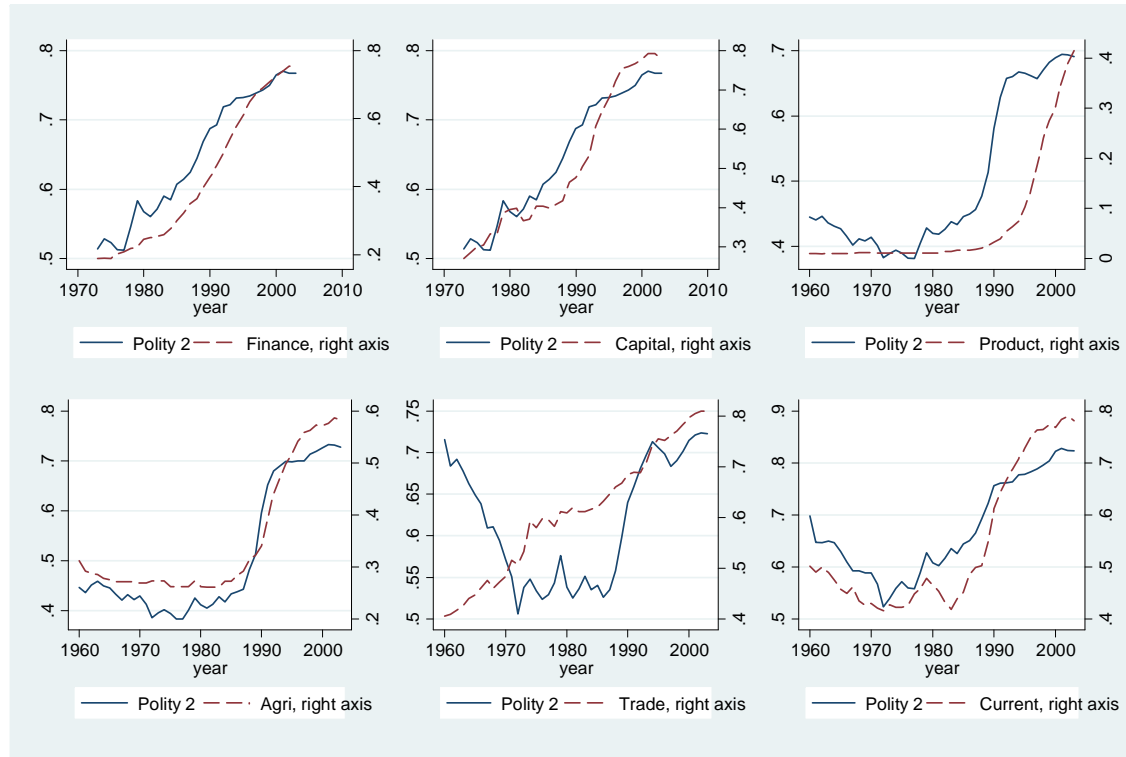
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Figure 1. Democracy and Deregulation Over Time



Note to Figure 1: This figure shows the behavior over time of the index of democracy (measured as polity2 and normalized between 0 and 1) and six indices of regulation (all indices are normalized between 0 and 1, with 0/1 corresponding to the lowest/highest level of deregulation): (i) domestic financial sector, (ii) capital account, (iii) product markets (electricity and telecommunications), (iv) agriculture, (v) trade (based on tariffs) and (vi) current account transactions. The definitions are given in Table 1. Note that the average polity2 index is calculated over the countries for which a liberalization index is available

Table 1.
Regulation Indices

<i>Financial sector</i>	
<i>Banking</i>	<p>The index of domestic financial liberalization is an average of six subindices, five related to <i>banking</i> and one related to the <i>securities market</i>.</p> <p>The banking subindex is an average of the following 5 indicators: (i) interest rate controls, such as floors or ceilings; (ii) credit controls, such as directed credit and subsidized lending; (iii) competition restrictions, such as limits on branches and entry barriers in the banking sector, including licensing requirements or limits on foreign banks; (iv) the degree of state ownership; and (v) the quality of banking supervision and regulation, including power of independence of bank supervisors, adoption of Basel capital standards, and a framework for bank inspections.</p>
<i>Securities market</i>	<p>The sixth subindex relates to <i>securities markets</i> and covers policies to develop domestic bond and equity markets, including (i) the creation of basic frameworks such as the auctioning of T-bills, or the establishment of a security commission; (ii) policies to further establish securities markets such as tax exemptions, introduction of medium- and long-term government bonds to establish a benchmark for the yield curve, or the introduction of a primary dealer system; (iii) policies to develop derivative markets or to create an institutional investor's base; and (iv) policies to permit access to the domestic stock market by nonresidents. The subindices are aggregated with equal weights. Each subindex is coded from zero (fully repressed) to three (fully liberalized).</p>
Data sources	Abiad and others (2008), following the methodology in Abiad and Mody (2005), based on various IMF reports and working papers, central bank websites, and others.
Coverage	1973–2005; Minimum and maximum number of countries in any year are 72 and 91 respectively.
<i>Capital account</i>	
Data sources	Abiad and others (2008), following the methodology in Abiad and Mody (2005), based on various IMF reports and working papers, central bank websites, and others.
Coverage	1973–2005; Minimum and maximum number of countries in any year are 72 and 91 respectively.
<i>Product markets</i>	
<i>Electricity</i>	<p>The electricity indicators capture (i) the degree of unbundling of generation, transmission, and distribution; (ii) whether a regulator other than government has been established; and (iii) whether the wholesale market has been liberalized; and (iv) privatization. Each subindex is coded from 0 to 1 or from 0 to 2.</p>

<i>Telecommunication</i>	The telecommunication indicator captures (i) the degree of competition in local services; (ii) whether a regulator other than government has been established; (iii) the degree of liberalization of interconnection changes; and (iv) privatization. Each subindex is coded from 0 to 1 or from 0 to 2.
Data sources	Electricity: Based on various existing studies and datasets as well as national legislation and other official documents. Telecommunication: Based on IMF commodities data, various existing studies and datasets, and national legislation and other official documents.
Coverage	1960–2003; Minimum and maximum number of countries in any year are 106 and 108 respectively.

Agriculture market

Data sources	The index captures intervention in the market for the main agricultural export commodity in each country. The index can take four values (i) zero (public monopoly or monopsony in production, transportation, or marketing, e.g., export marketing boards); (ii) one-third (administered prices); (iii) two-thirds (public ownership of relevant producers or concession requirements); and (iv) one (no public intervention). Based on IMF commodities data, various existing studies and datasets, and national legislation and other official documents.
Coverage	1960–2003; Minimum and maximum number of countries in any year are 96 and 104 respectively.

Trade

Data sources	Trade liberalization is defined by looking at average tariff rates, with missing values extrapolated using implicit weighted tariff rates. Index normalized to be between zero and unity: zero means the tariff rates are 60 percent or higher, while unity means the tariff rates are zero. Various sources, including IMF, World Bank, WTO, UN, Clemens and Williamson, 2004.
Coverage	1960-2005; Minimum and maximum # of countries in any year are 47 and 142 respectively.

Current account

Data sources	Current account liberalization is defined with an indicator describing how compliant a government is with its obligations under the IMF's Article VIII to free from government restriction the proceeds from international trade in goods and services. The index represents the sum of two subcomponents, dealing with restrictions on trade in visibles, as well as in invisibles (financial and other services). It distinguishes between restrictions on residents (receipts for exports) and on nonresidents (payments for imports). Although the index measures restrictions on the proceeds from transactions, rather than on the underlying transactions, many countries in practice use restrictions on trade proceeds as a type of trade restriction. The index is scored between zero and 8 in half-integer units, with 8 indicating full compliance. Based on the methodology in Quinn (1997) and Quinn and Toyoda (2007), drawing on information contained in the Fund's AREAER database (Annual Reports on Exchange Arrangements and Exchange Restrictions).
Coverage	1960–2005; Minimum and maximum number of countries in any year are 50 and 65 respectively.

This table presents brief description of the reform indicators used in the paper. For a full description of all variables, data and sources refer to IMF (2008).

Table 2 . Correlation Between Regulation Indices

	Agriculture	Prod. Mkt	Trade	Cap. Acc.	Curr. Acc.	Finance
Agriculture	1					
Prod. Mkt	.30***	1				
Trade	.32***	.35***	1			
Cap. Acc.	.40***	.46***	.57***	1		
Curr. Acc.	.42***	.47***	.63***	.77***	1	
Finance	.44***	.63***	.62***	.73***	.71***	1

*** denotes statistical significance at the 1 percent level.

Table 3
Reforms and democracy

Dependent variable: reform in country, sector, year				
	(1)	(2)	(3)	(4)
Lagged democracy	.016*** [.003]	.017*** [.003]	.033*** [.003]	.017*** [.003]
Lagged level of index	-.073*** [.003]	-.124*** [.004]	-.047*** [.002]	-.131*** [.004]
Country FE	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Country*Sector FE		Y		Y
Sector*Year FE			Y	Y
Observations	20,123	20,123	20,123	20,123

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. Standard errors are denoted in parentheses.***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 4
Reforms and democracy, robustness to controls

Dependent variable: reform in (country, sector, year)	(1)	(2)	(3)	(4)	(5)	(6)
Lagged democracy	.011*** [.004]	.014** [.006]	.048*** [.014]	.011*** [.003]	.014*** [.004]	.045*** [.016]
Lagged level of index	-.149*** [.004]	-.205*** [.006]	-.401*** [.011]	-.135*** [.004]	-.173*** [.005]	-.412*** [.012]
Lagged crisis (inflation>40)	-.005* [.003]					-.003 [.006]
Lagged real devaluation		.007 [.005]				-.009 [.008]
Lagged public expenditure to GDP		-.000 [.000]				-.001* [.001]
Lagged bureaucratic quality			.003 [.003]			.006* [.003]
Lagged tertiary enrollment			.006 [.028]			-.003 [.029]
Lagged reforms in geographical neighbor				.055*** [.021]		.044 [.054]
Lagged dummy for left					.003 [.002]	-.004 [.004]
Lagged dummy for presidential					-.001 [.004]	.006 [.017]
Observations	17,235	10,128	6,111	18,400	14,776	5,252

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions control for country sector, year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 5A
Reforms and democracy: Instrumental variables second stage

Dependent variable: reform in (country, sector, year)	(1a)	(1b)	(1c)	(1d)
Lagged democracy	.078*** [.016]	.151*** [.043]	0.19 [.124]	.141 [.090]
Lagged level of index	-.135*** [.007]	-.180*** [.012]	-.281*** [.024]	-.281*** [.024]
Lagged crisis (inflation>40)		-.005 [.005]	-.010 [.008]	
Lagged real devaluation		.008 [.006]	.003 [.010]	
Lagged public expenditure to GDP		.000 [.000]	-.001 [.001]	
Lagged bureaucratic quality			.004 [.003]	
Lagged tertiary enrollment			.023 [.033]	
Lagged reforms in geographical neighbors		.056 [.045]	.053 [.078]	
Lagged dummy for left		-.001 [.002]	-.001 [.003]	
Lagged dummy for presidential		.029** [.013]	.049 [.035]	
Observations	18,970	10,007	5,252	5,252
First stage F-stat	764.59	229.09	36.47	50.77
p-value of F test	0.000	0.000	0.000	0.000

Note. Lagged democracy is instrumented by (lagged) democracy in neighboring countries. All regressions control for country sector, year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 5B
Reforms and democracy: Instrumental variables first stage

Dependent variable: reform in (country, sector, year)	(1a)	(1b)	(1c)	(1d)
Lagged democracy in neighboring countries	.014*** [.002]	.009*** [.001]	.005*** [.001]	.006*** [.001]
Lagged level of index	.022 [.028]	-.016 [.028]	-.008 [.020]	-.005 [.021]
Lagged crisis (inflation>40)		-.015 [.014]	.013 [.008]	
Lagged real devaluation		-.011 [.009]	.020** [.009]	
Lagged public expenditure to GDP		.001 [.002]	-.002 [.002]	
Lagged bureaucratic quality			-.003 [.007]	
Lagged tertiary enrollment			-.199*** [.045]	
Lagged reforms in geographical neighbors		.052 [.064]	.198*** [.060]	
Lagged dummy for left		.001 [.010]	-.009* [.005]	
Lagged dummy for presidential		-.226*** [.029]	-.238*** [.037]	
Observations	18,970	10,007	5,252	5,252

Note. All regressions control for country sector, year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 6
Reforms and democracy: by reform

Dependent variable: reform in (country, year)						
	(1)	(2)	(3)	(4)	(5)	(6)
	Finance	Cap. Acc.	Prod. Mkt	Agricult.	Trade	Curr. Acc.
<i>Panel A: no controls</i>						
Lagged democracy	.001 [.007]	.025 [.018]	.008** [.004]	.023*** [.007]	.013* [.008]	.017* [.009]
Lagged level of index	-.188*** [.012]	-.258*** [.014]	-.044*** [.006]	-.074*** [.007]	-.179*** [.009]	-.157*** [.011]
Observations	2,437	2,437	5,092	3,853	3,664	2,640
<i>Panel B: with controls</i>						
Lagged democracy	.067*** [.024]	.182*** [.060]	-.026 [.033]	.202*** [.041]	.075*** [.022]	.179*** [.046]
Lagged level of index	-.379*** [.028]	-.521*** [.031]	-.278*** [.026]	-.558*** [.030]	-.420*** [.029]	-.554*** [.038]
Observations	861	861	975	887	946	722

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions control for country and year fixed effects. All regressions in Panel B control for one year lags of the following: indicators of crisis, real devaluation, public expenditure as a ratio of GDP, bureaucratic quality, tertiary enrollment, reforms in geographical neighbors, dummies for party of the executive being left, and dummy for presidential form of government. Standard errors are denoted in

Table 7a. Reforms and democracy
Robustness checks

Dependent variable: reform in (country, sector, year)							
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(3c)
Lagged democracy	.007**	.070***	.014***	.063***			
	[.003]	[.016]	[.004]	[.020]			
Lagged level of index	-.130***	-.463***	-.149***	-.565***	-.0135***	-0.495***	-0.497***
	[.004]	[.013]	[.005]	[.016]	[.004]	[.013]	[.013]
Democracy dummy (polty2>0)					.010***	0.013	0.013
					[.002]	[.010]	[.009]
Lagged crisis (inflation>40)		-0.002		-0.002		-0.002	0.009
		[.007]		[.008]		[.007]	
Lagged real devaluation		-0.006		-0.009		-0.009	
		[.008]		[.013]		[.008]	
Lagged public expenditure to GDP		0.000		-0.001		-0.001	
		[.001]		[.001]		[.001]	
Lagged bureaucratic quality		.009**		0.007		.010**	
		[.004]		[.005]		[.004]	
Lagged tertiary enrollment		-0.022		0.024		0.011	
		[.033]		[.059]		[.032]	
Lagged reforms in geographical neighbors		0.063		0.012		0.025	
		[.055]		[.065]		[.052]	
Lagged dummy for left		-0.005		-0.003		-0.004	
		[.005]		[.008]		[.005]	
Lagged dummy for presidential		0.010		0.023		-0.007	
		[.017]		[.020]		[.017]	
Observations	17,301	4,751	15,666	3,683	20,123	5,252	5,252

Note. In Columns 1a-1b and 2a-2b, the sample is restricted to non-communist and developing countries respectively. In Columns 3a-3b, we use a zero-one definition of democracy (as in Giavazzi and Tabellini, 2005), where democracy=1 if polity2 has positive values. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions control for country and year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 7b. Reforms and democracy
Additional robustness checks

Dependent variable: reform in (country, sector, year)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged democracy	.016*** [.004]	.065*** [.017]	.062*** [.017]	.061*** [.017]	.066*** [.017]	.066*** [.023]	.069*** [.023]	.011*** [.003]
Lagged level of index	-.125*** [.007]	-.495*** [.013]	-.510*** [.013]	-.479*** [.012]	-.494*** [.013]	-.523*** [.014]	-.520*** [.014]	
Lagged crisis (inflation>40)		-0.003 [.007]	-0.001 [.007]					
Lagged real devaluation		-0.009 [.008]	-0.008 [.008]	-0.007 [.008]	-0.009 [.008]	-0.011 [.008]	-0.01 [.009]	
Lagged public expenditure to GDP		-0.001 [.001]	-0.001 [.001]	0.000 [.001]	-0.001 [.001]	-0.001 [.001]	-0.001 [.001]	
Lagged bureaucratic quality		.010** [.004]	.009** [.004]	.010*** [.004]	.010** [.004]	.007* [.004]	.008** [.004]	
Lagged tertiary enrollment		0.006 [.032]	0.011 [.032]	0.000 [.032]	0.007 [.032]	0.01 [.033]	0.01 [.033]	
Lagged reforms in geographical neighbors		0.038 [.054]	0.029 [.052]	0.036 [.053]	0.026 [.052]	0.063 [.056]	0.058 [.056]	
Lagged dummy for left		-0.004 [.005]	-0.004 [.005]	-0.005 [.005]	-0.005 [.005]	-0.007 [.005]	-0.008 [.005]	
Lagged dummy for presidential		0.000 [.017]	0.002 [.017]	0.001 [.017]	0.002 [.017]	-0.001 [.021]	0.003 [.021]	
Lagged reform in trade neighbors		-0.043 [.054]						
Lagged average reform in other sectors			.122*** [.034]					
Lagged crisis (growth<0)				-.007** [.003]				
Terms of trade shocks					-0.004 [.014]			
Lagged crisis (debt)						0.01 [.011]		
Lagged crisis (bank)							-.016*** [.006]	
Observations	20,123	5,252	5,252	5,234	5,252	4,679	4,679	20,123

Note. The estimators in all columns except (1) are within estimators and allow for first-order autoregressive disturbance term. In Column (1), instead of explicitly allowing for an AR(1) term in the model, the standard errors are clustered at the country-reform level. The definition of bank and debt crises are based on Reinhart and Rogoff (2008). All regressions control for country and year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 8
Reforms and democracy - flexible functional form

Dependent variable: reform in (country, sector, year)				
	(1)	(2)	(3)	(4)
Lagged democracy (polity2<0.15)	.014 [.040]	.011 [.044]	-.005 [.042]	.014 [.044]
Lagged democracy (0.15<=polity2<0.75)	.012** [.006]	.009 [.006]	.036*** [.006]	.010 [.006]
Lagged democracy (polity2>=0.75)	.015*** [.003]	.016*** [.003]	.038*** [.003]	.016*** [.003]
Lagged level of index	-.073*** [.003]	-.129*** [.004]	-.036*** [.002]	-.135*** [.004]
Country FE	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Country*Sector FE		Y		Y
Sector*Year FE			Y	Y
Observations	20,123	20,123	20,123	20,123

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 9a
Reforms and democracy: feedback effects

Dependent variable: change in democracy (country, year)			
	(1)	(2)	(3)
	No controls	With controls	No controls/ sample
Lagged democracy	-.132*** [.007]	-.303*** [.019]	-.273*** [.018]
Lagged reform in (country, year)	-.001 [.023]	.056 [.034]	.061* [.035]
Observations	5,431	1,550	1,550

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions include country and year fixed effects. The reform variable is measured by averaging across all sectors at the country-year level. All regressions control for one year lags of the following: indicators of crisis, real devaluation, tertiary enrollment, democracy in political neighbors and log of per capita income. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 9b
Reforms and democracy: feedback effects

Dependent variable: change in democracy (country, year)						
	(1)	(2)	(3)	(4)	(5)	(6)
	Finance	Cap. Acc.	Prod. Mkt	Agricult.	Trade	Curr. Acc.
<i>Panel A: no controls</i>						
Lagged democracy	-0.181*** [.012]	-0.180*** [.012]	-0.131*** [.007]	-0.136*** [.009]	-0.193*** [.010]	-0.166*** [.011]
Lagged reform in (country, year)	-0.085** [.035]	-0.015 [.012]	-0.001 [.028]	0.008 [.018]	0.013 [.019]	-0.036 [.022]
Observations	2,257	2,257	4,864	3,765	3,399	2,501
<i>Panel B: with controls</i>						
Lagged democracy	-0.259*** [.021]	-0.259*** [.021]	-0.284*** [.020]	-0.289*** [.022]	-0.322*** [.021]	-0.238*** [.023]
Lagged reform in (country, year)	-0.043 [.037]	0.012 [.013]	-0.015 [.029]	0.075*** [.021]	-0.012 [.026]	0.037 [.027]
Observations	1,090	1,090	1,381	1,131	1,382	935

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions include country and year fixed effects. All regressions in Panel B control for one year lags of the following: indicators of crisis, real devaluation, tertiary enrollment, democracy in political neighbors, and log of per capita income. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 10
Reforms and democracy: Difference-in-Difference Estimator

Dependent variable:	Becoming economically open in						
	country- sector-year	country-year					
	(1)	(2)	(3)	(4)	(5)	(6)	
	All	Finance	Cap. Acc.	Prod. Mkt	Agricult.	Trade	Curr. Acc.
Political reform	.045*** [.011]	.051* [.030]	0.011 [.036]	0.017 [.018]	.057*** [.015]	.062** [.030]	0.018 [.033]
Observations	22,565	2,671	2,671	5,863	4,355	4,148	2,857

Dependent variable:	Polity2 in (country, year)						
		(1)	(2)	(3)	(4)	(5)	(6)
	All	Finance	Cap. Acc.	Prod. Mkt	Agricult.	Trade	Curr. Acc.
Economic reform	0.48 [.310]	0.214 [.223]	0.054 [.219]	-0.128 [.186]	0.321 [.304]	0.326 [.235]	0.309 [.284]
Observations	5,715	2,437	2,437	5,095	3,950	3,681	2,641

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions control for country and year fixed effects. Political reform is a dummy variable taking a value of 1 in the years after democratization. Democratization is defined as the event of becoming a democracy (and staying as a democracy for at least 4 years), given that a country was not a democracy in the previous year. The economic reform variable in Panel B, column (1), is measured at the country-year level, by averaging across all sectors. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table 11
Reforms and democracy: Principal component

	Dependent variable: change in reform index (country, year)		Dependent variable: change in democracy (country, year)
	(1) OLS	(2) IV	(3)
Lagged democracy	.001*** [.000]	.006*** [.002]	-.218*** [.017]
Lagged level of index (country, year)	-0.029*** [.004]	-0.096*** [.018]	
Lagged reform in (country, year)			-1.775 [1.220]
Observations	1,418	1,418	1,361
First stage F-stat		41	
p-value of F-stat		0.000	

Note. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions include country and year fixed effects. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively. In Column (2), lagged democracy is instrumented by (lagged) democracy in neighboring countries.

Appendix (Not for publication)
Appendix Table A1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Change in reform index	20,123	0.01	0.08	-1	1
Lagged democracy	20,123	0.59	0.37	0	1
Lagged reform_index	20,123	0.40	0.37	0	1
Lagged crisis (inflation>40)	5,252	0.10	0.30	0	1
Lagged real devaluation	5,252	0.01	0.17	-1.00	1.30
Lagged public expenditure as a percent of GDP	5,252	15.06	5.18	2.98	34.39
Lagged bureaucratic quality	5,252	2.54	1.14	0	4
Lagged tertiary enrollment	5,252	0.27	0.22	0.00	0.97
Lagged reforms in geographical neighbor	5,252	0.02	0.03	-0.21	0.22
Lagged dummy for left	5,252	0.33	0.47	0	1
Lagged dummy for presidential	5,252	0.55	0.50	0	1
Lagged democracy in political neighbors	18,970	1.25	5.12	-9	10
Lagged crisis (growth<0)	5,234	0.26	0.44	0	1
Terms of trade shocks	5,252	-0.01	0.14	-0.70	0.47
Lagged crisis (debt)	4,679	0.01	0.12	0	1
Lagged crisis (bank)	4,679	0.05	0.22	0	1
Lagged reform in trade neighbors	5,252	0.01	0.03	-0.21	0.39
Change in reform index (principal component)	1,418	0.02	0.04	-0.18	0.31
Lagged reform index (principal component)	1,418	0.50	0.25	0	1.00
Political reform (Giavazzi and Tabellini, 2005)	22,565	0.20	0.40	0	1

Table A3. Country Groups in Figure 2.

Finance			Capital					
Country	Code	Group	Country	Code	Group	Country	Code	Group
Burkina Faso	BFA	1	Belarus	BLR	1	Bolivia	BOL	14
Kyrgyz Rep	KGZ	1	China	CHN	1	India	IND	14
Indonesia	IDN	2	Viet Nam	VNM	1	Thailand	THA	14
Turkey	TUR	2	Egypt	EGY	2	Chile	CHL	15
Colombia	COL	3	Morocco	MAR	2	Jamaica	JAM	15
Paraguay	PRY	3	Cameroon	CMR	3	Poland	POL	15
Ukraine	UKR	3	Kazakhstan	KAZ	3	Taiwan	TWN	15
Madagascar	MDG	4	Burkina Faso	BFA	4	South Afr	ZAF	15
El Salvador	SLV	4	Tunisia	TUN	4	Australia	AUS	16
Bulgaria	BGR	5	Jordan	JOR	5	Austria	AUT	16
Dominican Rep	DOM	5	Kenya	KEN	5	Belgium	BEL	16
Nicaragua	NIC	5	Singapore	SGP	5	Canada	CAN	16
Senegal	SEN	5	Ghana	GHA	6	Switzerland	CHE	16
Korea	KOR	6	Tanzania	TZA	6	Czech Rep	CZE	16
Romania	ROM	6	Albania	ALB	7	Germany	DEU	16
Argentina	ARG	7	Georgia	GEO	7	Denmark	DNK	16
Philippines	PHL	7	Mozambique	MOZ	8	Spain	ESP	16
India	IND	8	Nepal	NPL	8	Finland	FIN	16
Jamaica	JAM	8	Bangladesh	BGD	9	UK	GBR	16
Bolivia	BOL	9	Ecuador	ECU	9	Greece	GRC	16
Chile	CHL	9	Russia	RUS	9	Hungary	HUN	16
Austria	AUT	10	Ukraine	UKR	9	Ireland	IRL	16
Czech Rep	CZE	10	Indonesia	IDN	10	Israel	ISR	16
Finland	FIN	10	Madagascar	MDG	10	Italy	ITA	16
Greece	GRC	10	Colombia	COL	11	Japan	JPN	16
Lithuania	LTU	10	Paraguay	PRY	11	Lithuania	LTU	16
Portugal	PRT	10	El Salvador	SLV	11	Netherlan	NLD	16
Norway	NOR	11	Turkey	TUR	11	Norway	NOR	16
Israel	ISR	11	Venezuela	VEN	11	New Zeala	NZL	16
Japan	JPN	11	Argentina	ARG	12	Portugal	PRT	16
Germany	DEU	12	Brazil	BRA	12	Sweden	SWE	16
Hungary	HUN	12	Guatemala	GTM	12	Uruguay	URY	16
Italy	ITA	12	Philippines	PHL	12	US	USA	16
Belgium	BEL	13	Senegal	SEN	12			
Switzerland	CHE	13	Bulgaria	BGR	13			
Denmark	DNK	13	Korea	KOR	13			
Netherlands	NLD	13	Latvia	LVA	13			
New Zealand	NZL	13	Mexico	MEX	13			
Sweden	SWE	13	Nicaragua	NIC	13			
Australia	AUS	14						
Canada	CAN	14						
Spain	ESP	14						
UK	GBR	14						
Ireland	IRL	14						
US	USA	14						

Table A3 contd. Country Groups in Figure 2.

Product			Agri					
Country	Code	Group	Country	Code	Group	Country	Code	Group
Oman	OMN	1	Turkmenistan	TKM	1	India	IND	15
Turkmenistan	TKM	1	Uzbekistan	UZB	1	South Africa	ZAF	15
Azerbaijan	AZE	2	Belarus	BLR	2	Chile	CHL	16
China	CHN	2	China	CHN	2	France	FRA	16
Lao	LAO	2	Egypt	EGY	3	Jamaica	JAM	16
Viet Nam	VNM	2	Pakistan	PAK	3	Poland	POL	16
Kenya	KEN	3	Cameroon	CMR	4	Thailand	THA	16
Chad	TCD	3	Uganda	UGA	4	Bolivia	BOL	17
Togo	TGO	3	Burkina Faso	BFA	5	Slovak Rep	SVK	17
Solomon Is	SLB	4	Tunisia	TUN	5	Australia	AUS	18
Sierra Leone	SLE	4	Kenya	KEN	6	Canada	CAN	18
Benin	BEN	5	Chad	TCD	6	Czech Rep	CZE	19
Guyana	GUY	5	Togo	TGO	6	Japan	JPN	19
Mozambique	MOZ	5	Cote D'Ivoire	CIV	7	Trinidad Tob	TTO	19
Bangladesh	BGD	6	Nigeria	NGA	7	Belgium	BEL	20
Namibia	NAM	6	Georgia	GEO	8	Germany	DEU	20
Honduras	HND	7	Sri Lanka	LKA	8	Denmark	DNK	20
Madagascar	MDG	7	Benin	BEN	9	Spain	ESP	20
Turkey	TUR	7	Guyana	GUY	9	Finland	FIN	20
Mexico	MEX	8	Mali	MLI	9	UK	GBR	20
Philippines	PHL	8	Bangladesh	BGD	10	Greece	GRC	20
France	FRA	9	Mozambique	MOZ	10	Hungary	HUN	20
South Africa	ZAF	9	Namibia	NAM	10	Ireland	IRL	20
Lithuania	LTU	10	Nepal	NPL	10	Lithuania	LTU	20
Trinidad Tob	TTO	10	Colombia	COL	11	Norway	NOR	20
Uruguay	URY	10	Venezuela	VEN	11	Portugal	PRT	20
Czech Rep	CZE	11	Honduras	HND	12	Sweden	SWE	20
Hungary	HUN	11	Moldova	MDA	12	Switzerland	CHE	21
Japan	JPN	11	Malawi	MWI	12	Italy	ITA	21
Australia	AUS	12	Ukraine	UKR	12	Mongolia	MNG	21
Belgium	BEL	12	Indonesia	IDN	13	Netherlands	NLD	21
Canada	CAN	12	Madagascar	MDG	13	New Zealand	NZL	21
Ireland	IRL	12	Argentina	ARG	14	Uruguay	URY	21
New Zealand	NZL	12	Bulgaria	BGR	14	US	USA	21
Portugal	PRT	12	Brazil	BRA	14			
US	USA	12	Guatemala	GTM	14			
Denmark	DNK	13	Mexico	MEX	14			
Finland	FIN	13	Philippines	PHL	14			
Italy	ITA	13						
Norway	NOR	13						
Sweden	SWE	13						
Spain	ESP	14						
UK	GBR	14						
Netherlands	NLD	14						

Table A3 contd. Country Groups in Figure 2.

Trade					
Country	Code	Group	Country	Code	Group
China	CHN	1	Dominican Rep	DOM	14
Viet Nam	VNM	1	Philippines	PHL	14
Congo	COG	2	Latvia	LVA	15
Mauritania	MRT	2	Nicaragua	NIC	15
Gabon	GAB	3	Bolivia	BOL	16
Cameroon	CMR	3	Chile	CHL	16
Uganda	UGA	4	Jamaica	JAM	16
Kazakhstan	KAZ	4	Taiwan	TWN	16
Jordan	JOR	5	Panama	PAN	16
Kenya	KEN	5	South Africa	ZAF	17
Togo	TGO	5	Slovak Rep	SVK	17
Tanzania	TZA	6	Hungary	HUN	18
Cambodia	KHM	6	Slovenia	SVN	18
Cote D'Ivoire	CIV	7	Trinidad Tob	TTO	18
Niger	NER	7	Uruguay	URY	18
Georgia	GEO	8	Cyprus	CYP	19
Sri Lanka	LKA	8	Costa Rica	CRI	19
Macedonia	MKD	9	Austria	AUT	19
Nepal	NPL	9	Czech Rep	CZE	19
Benin	BEN	9	Israel	ISR	19
Mozambique	MOZ	9	Australia	AUS	20
Ecuador	ECU	10	Belgium	BEL	20
Mali	MLI	10	Germany	DEU	20
Guyana	GUY	10	Denmark	DNK	20
Malawi	MWI	11	Spain	ESP	20
Turkey	TUR	11	Finland	FIN	20
Venezuela	VEN	11	UK	GBR	20
Croatia	HRV	11	Greece	GRC	20
Colombia	COL	11	Ireland	IRL	20
Russia	RUS	11	Italy	ITA	20
Paraguay	PRY	11	Netherlands	NLD	20
Moldova	MDA	12	Portugal	PRT	20
Indonesia	IDN	12	Sweden	SWE	20
Honduras	HND	12	Canada	CAN	20
El Salvador	SLV	12	US	USA	20
Brazil	BRA	13	New Zealand	NZL	20
Bulgaria	BGR	13	Lithuania	LTU	20
Romania	ROM	13	Japan	JPN	20
Korea	KOR	13	Norway	NOR	20
Argentina	ARG	13			

Table A3 contd. Country Groups in Figure 2.

Current		
Country	Code	Group
Indonesia	IDN	1
Turkey	TUR	1
Guatemala	GTM	2
Philippines	PHL	2
France	FRA	3
Jamaica	JAM	3
Australia	AUS	4
Costa Rica	CRI	4
Japan	JPN	4
Austria	AUT	5
Israel	ISR	5
Belgium	BEL	6
Canada	CAN	6
Germany	DEU	6
Denmark	DNK	6
Spain	ESP	6
Finland	FIN	6
UK	GBR	6
Greece	GRC	6
Italy	ITA	6
Netherlands	NLD	6
Norway	NOR	6
New Zealand	NZL	6
Portugal	PRT	6
Sweden	SWE	6
Uruguay	URY	6
US	USA	6
Hong Kong	HKG	6
Peru	PER	6

Table A4

Reforms and democracy, robustness to controls: Sample

Dependent variable: reform in (country, sector, year)						
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged democracy	0.011*** [.004]	0.014** [.006]	0.044*** [.014]	0.011*** [.003]	0.014*** [.004]	0.039** [.016]
Lagged level of index	-0.148*** [.004]	-0.207*** [.006]	-0.402*** [.011]	-0.135*** [.004]	-0.173*** [.005]	-0.415*** [.012]
Observations	17,235	10,128	6,111	18,400	14,776	5,252

Note. All regressions are restricted to corresponding samples in Table 4. The estimators are within estimators and allow for first-order autoregressive disturbance term. All regressions control for country sector, year fixed effects and country*sector and sector*year interactions. Standard errors are denoted in parentheses. ***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.

Table A5 . Panel Unit Root Test (Reform)

	Agriculture	Prod. Mkt	Trade	Cap. Acc.	Curr. Acc.	Finance	Polity2 (overall sample)
Levin-Lin ADF-stat	2.93	1.63	-2.57	-2.46	-1.39	-1.50	-1.53
Im, Pesharan & Shin ADF-stat	1.71	-0.63	-5.91	-3.25	-3.86	-1.70	-5.17
Number of countries	91	118	95	71	60	71	135
Number of years	43	44	44	31	44	31	44

Notes. The missing values for intermediate years have been interpolate to apply the unit root tests. All reported values are distributed $N(0,1)$ under null of unit root or no cointegration. Large negative values imply rejection of the unit root, with the 5% and 10% critical values being -1.64 and 1.28 respectively.

Table A6
Reform Reversals and democracy

Dependent variable: dummy for reform reversal in country, sector, year				
	(1)	(2)	(3)	(4)
Lagged democracy	-.006 [.014]	-.009 [.017]	-.008 [.014]	-.009 [.018]
Lagged level of index	.118*** [.013]	.210*** [.018]	.115*** [.014]	.212*** [.020]
Country FE	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Country*Sector FE		Y		Y
Sector*Year FE			Y	Y
Observations	20,123	20,123	20,123	20,123

Note. The regressions are estimated by OLS. Reform reversal is defined by a decrease in the level of the reform index. Standard errors are denoted in parentheses.***, ** and * denote statistical significance at 1, 5 and 10 percent respectively.