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Working Paper

Role of Political Institutions on Economic Growth: Empirical Evidence

Role of Political Institutions on Economic Growth: Empirical Evidence[ǂ]

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This paper explores the effect of political institutions on economic development via its causation of economic reforms. Focusing on the causality between political institutions – democracy, specifically – and economic reforms. After all, one way of improving society's well-being is through promoting economic growth, thereby narrowing the cross-country income differences. We investigate whether economic reforms are more likely to take place in democracies since greater accountability may lead the government to adopt measures that gain majority support. Economic reforms are referred to as comprehensive measures that broaden the market's scope including the international. Using the same methodology as in the previous paper1, the dynamic panel GMM estimator, we study whether democracy causes economic reforms in different sectors, namely fiscal measures, trade liberalisation, credit market liberalisation, capital account openness and labour market deregulation. Reciprocally, test if economic reforms cause the democratisation process, and how political institutions and economic reforms interact.

Key Words: Economic Development, Institutions, Institutions Performance, Policy, Economic Growth, Political Institution

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ǂ A series of five papers contrived from my MPhil thesis entitled "Essay on Institutions, Policies, and Economic Development" was constructed of six chapters at University College London (UCL). The first paper is an overview, and the other four papers are empirical studies looking at the effects of institutions on economic growth across the country. The first paper, entitled "Institutions, Policies, and Economic Growth Overview", reviews the relationship between institutions and policy regulation with development from the perspective of economic literature. The second paper, entitled "Impact of Institutions and Policy on Economic Growth: Empirical Evidence", empirical analysis to explore the interaction between the institution and economic growth. The third paper, entitled "Role of Political Institutions on Economic Growth: Empirical Evidence", is an empirical analysis to explore the effect of political institutions on development. The fourth paper, entitled "Impact of Natural Environment, Regional Integration, and Policies on FDI", explores the effects of three determinants of bilateral FDI, including natural barriers, the "at-the-border" barrier (regional trade agreement), and the "behind-the-border" barrier (domestic regulatory environment). The fifth paper, entitled "Cross Countries Economic Performances - SPF Approach", explores the differences in technical inefficiency (inefficient allocation of production inputs) and explains the diverse cross-country economic performances, using estimating a "global" stochastic production frontier (SPF) mod.

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1 Introduction

This paper is an extension of our paper, titled "The Institutions and Politics Impact on Economic Growth: Empirical Evidence" with an aim to make progress toward understanding the effect of political institutions on economic development via its causation of economic reforms. We focus on the causality between political institutions – democracy, specifically – and economic reforms. We refer to the latter, as in Giavazzi and Tabellini (2005), as comprehensive reforms that broaden the scope of the market and international markets, i.e. they are market-creating. The causal relationship is tested empirically by using indices of democracy and liberalisation reforms on various fronts – namely, fiscal sector, banking sector, capital account and trade liberalisation and labour market regulation – for the period of 1970-2005 for 114 economies.

Literature has attempted to establish the relationship between reforms and political institutions, in which reforms are commonly referred to as liberalisation measures. Naturally, the research questions focus on under which political institution – using a dichotomous classification of democracy vis-à-vis autocracy – is more likely to cause liberalisation and what are the ex-ante and ex-post growth impacts of liberalisation.

Understandably, political institutions and policy choices form an interactive nexus. Since the wave of democratisation beginning in 1978 in Latin America, we saw the widespread adoption of outward orientation policies in the region. The opening up of the Central and Eastern European economies followed after the fall of Soviet-type socialism. Liberalisation reforms appear to take place together with changes in the political institution. It is commonly believed that democracy renders the government to be more accountable, and more sensitive to public demand. Economic liberalisation – the free exchange of goods and services, capital account liberalisation, free flow of capital or lax regulatory environment – introduces competition to the domestic market, expands the choice sets of the economy and thus improves the general welfare of the society. Liberalisation measures are more likely to gain public support in democracies. Reciprocally, market liberalisation also potentially leads to economic development and carries positive feedback to the demand for the democratisation process in the society (as in Schumpter (1950), Lipset (1959) and Hayek (1960)).

At first sight, data do show us that political liberalisation and economic liberalisation appear to move hand in hand. Indeed, we find more democracies over the last few decades alongside increased globalisation. Table 1 provides a very preliminary snapshot of regime transition around the world over the last few decades.

Using Polity IV's measure of institutionalised democracy (DEMOC)[4], an index ranging from 0 to 10 with a higher score indicating a more democratic society, the number of democratic economies rose from 36 economies in 1970 to an overwhelmingly 95 economies in 2007. Democracies represent over 60% of the total number of economies being studied in 2007.

Table 1: Number of economies under different political regimes

	1970	1990	2007
Democracy (DEMOC ≥ 5)	**36**	**59**	**95**
Autocracy (DEMOC < 5)	**88**	**72**	**58**
Total	**124**	**131**	**153**

In parallel, economic liberalisation marched forward rapidly. During 1970-2007, the value of total world exports rose by 37.6 times[1]. Foreign direct investment contributed some 0.5% of the world's GDP in 1970 to 3.3% in 2007[2]. Using the composite economic freedom index (EF) from the Fraser Institute, increasingly more democracies are classified as "economic free" over the years, as shown in Table 2 below. Indeed, Milner and Kubota (2005) similarly argue that preceding and concurrent with the move to free trade, there has been a global movement toward democracy. They suggest that the two trends are related.

Table 2: Number of economic free economies under democracy and autocracy

Political regime	Degree of Liberalisation	1970	1990	2004
Democracy	Economic Free	23	45	90
	Not Economic Free	3	12	1
Autocracy	Economic Free	17	22	24
	Not Economic Free	8	22	7

Note: Democracy (Autocracy) is defined as scoring 5 or above (below 5) in Polity IV's index on institutionalised democracy. The index ranges from 0 to 10, with a higher score indicating the economy is more democratic. The degree of liberalisation is based on the Fraser Institute's economic freedom index. The index ranges from 0 to 10, with a higher score indicating the economy is more economic-free. Economies are "economic free" if they receive of scores 5 or above and vice versa.

Apparently, this co-movement serves no robust foundation for arguing the causal relationship between a political institution and economic reforms. For example, developed economies like Hong Kong, while enjoying the well-acclaimed "the world's

[1] Data source: World Trade Organisation, International Trade Statistics 2007 (Retrieved from: http://www.wto.org/english/res_e/statis_e/its2007_e/its07_appendix_e.htm).

[2] Data source: UNCAD, Foreign Direct Investment Database (Retrieved from: http://www.unctad.org/Templates/Page.asp?intItemID=1923).

most free" economy for decades (e.g. Gwartney, et al. (2008) and Heritage Foundation (2009)), have no democracy (Gwartney, et al. (2008)). It may suggest that an autocrat could be equally likely to undertake liberalisation reforms if it deems fit. In fact, from Table 2 above, we find that increasingly more autocratic economies also enjoy greater economic freedom. In other words, having reforms or not may not necessarily relate to the political regime.

The causality relationship appears to be further weakened by the spectacular growth performances in the emerging markets during the last few decades. China, as a notable exception, has adopted market liberalisation reform since 1978. On the political institution front, nevertheless, there are very few signs showing dramatic democratisation (see Table 3 below). Amongst the four most growth-promising emerging markets – together with Brazil, Russia, and India – China is the only so-called "autocratic" society. However, all four economies show a substantial improvement in economic freedom.

Table 3: Scores on Democracy (DEMOC) and Economic Freedom (EF) of Selected Emerging Economies

Year	1980		1995		2000		2004	
	DEMOC	*EF*	*DEMOC*	*EF*	*DEMOC*	*EF*	*DEMOC*	*EF*
Brazil	2	4.35	8	4.42	8	5.88	8	5.88
China	0	4.00	0	5.20	0	5.82	0	5.66
India	0	5.15	0	6.42	7	5.90	8	6.03
Russia	..	..	8	4.42	7	4.95	7	5.60

Note: DEMOC is defined as above – an index ranging from 0 to 10 with higher scores denoting democracy. EF index is from Gwartney, et al. (2008), ranging from 0 to 10 with higher scores denoting more economically free.

While a causal relationship cannot be established, the use of the dichotomous classification of the political regime also covers up the dynamics of changes in political institutions, as well as the dynamic policy choices determined. Regime transition can happen in some economies within a fairly short period of time. For example, using the DEMOC index again, Argentina scored zero in 1970, then 6 in 1975. The score fell back to zero again in 1980 and then rose to some 7-8 from 1985 onwards. Peru scored zero in the 70s, then 7s in the 80s and reverted to around 3 in the late 90s.

Marginal changes in political institutions, instead of a fundamental regime switch, happen even more often. We attempt to classify economies as democracies/autocracies using the dichotomous classification as above. The classification of the economies in our dataset is set out in Appendix Section A.2. We find that the majority of economies generally stay as democracies throughout the sample period, with marginally improving and deteriorating DEMOC scores over the sample period without a complete regime switch. It suggests that marginal changes in political institutions, rather than regime switches, are more prevalent.

Henceforth, the question we are interested in naturally is whether these marginal changes in a political institution at a certain period could affect the policy choices made in the coming periods. In return, we wonder if there will be any feedback effect of these policy choices on the political institution. To test empirically these questions, we have to design a strategy to capture the dynamic, short-run impact of our variables of interest. We propose to use the dynamic panel GMM estimators as in the second paper of this series, entitled " Impact of Institutions and Policy on Economic Growth: Empirical Evidence" to this end. This would be different from the existing literature which is primarily interested in the effect of permanent regime transition, instead of any marginal changes in the political institution. Furthermore, our proposed estimation strategy helps address the endogenous problem of political institutions and policy choices, which are not often and satisfactorily dealt with in the literature.

Our research motivations also extend to investigate what kinds of reforms are more likely to be implemented in democracies. Empirical work of this kind is less frequently explored. The effects of democracy on trade liberalisation and financial liberalisation were separately investigated in earlier studies. Only until recently, however, have some studies brought the two forms of liberalisation together. To measure liberalisation, quantitative statistics such as total trade as a percentage of GDP or the number of credit market restrictions as defined by IMF are usually used as proxies. Since 2000, there is a new strand of literature devoting efforts to compiling indicators (or indices) to measure liberalisation from a multi-dimensional perspective. Other than trade and financial liberalisations, empirical work on reforms in other sectors is even fewer.

To sum up, unlike previous studies, our empirical investigation is designed in a dynamic setting, allowing us to investigate if the causal relationship between the political institution and economic reforms can be found in a relatively short time span. This captures the effect of marginal changes in political institutions, but not necessarily a regime switch, on economic reform. In addition, we will also test the causal relationship with respect to sector-specific reforms. Our findings show that democracy seems more likely to lead to a more redistributive society and reforms in trade and financial liberalisation. The results survive even when using different measures of political institutions sub-samples. On the reverse causality, we find that redistributive policy and trade liberalisation likewise seemingly cause the economy to make progress in democratisation. However, financial liberalisation does not show such a causal effect.

In the following, we will present a brief literature survey in Section 2, with an emphasis on the strategies employed in previous studies. We will then discuss our model and data used in Section 3. Our empirical results follow in Section 4. We conclude in Section 5.

2 Literature Survey: mutual relations between Economic Reform and Political Regime

There is no conclusive theoretical argument or empirical evidence showing that democracy will cause economic reform. Economic reforms reflect policy changes. Democratic governments may have greater legitimacy to reforms and promote institutional changes – e.g. strengthening an independent legal system to ensure political freedom and democracy – thus leading to successful market reforms (Giuliano, Mishra, and Spilimbergo (2009), hereafter abbreviated as GMS). Democracy could also create an environment conducive to economic reforms by limiting rent-seeking activities and putting a system of checks and balances in place (Dethier, Ghanem, and Zoli (1999)).

2.1 Theoretical arguments

The interest group model suggests that economic reforms reflect changes in the economic choices that political elites made to maximise their payoffs (Acemoglu (2006)). Along with a similar line, Acemoglu and Robinson's (2006)'s model demonstrates that political institutions may change but economic policies could be quite persistent. In other words, political institutions do not directly cause policy choices. They propose that the persistence of economic choices is not due to the persistence of political elites, but the persistence of incentives of whoever is in power. Similarly, Alesina, Ardagna, and Trebbi (2006) also argue that delayed reforms are generally caused by the political conflict over what type of stabilisation to implement, in particular over the distribution of costs of the adjustment. The rationale of their model is that stabilisation occurs when one of the competing groups can impose its desired policies on others that have exhausted their ability to resist the undesired stabilisation. In a nutshell, the "interest group" view of reform suggests that democracy could only lead to more reforms if reforms create more winners than losers.

Specifically, concerning trade liberalisation, the conventional literature suggests that economies in crisis, say hyperinflation, are more likely to undertake economic reforms. However, Milner and Kubota (2005) refute such a proposition. Their work, with the support of empirical evidence, suggests that it is democracy that triggers trade liberalisation. As trade liberalisation is about to benefit most of the workers, thereby likely gaining political support in a democracy. Likewise, Rajan and Zingales (2003) also suggest that economic liberalizations could be associated with a higher quality of democratic institutions if such reform increases the economic power of the middle class. Aidt and Gassebner (2007) similarly argue that autocracies tend to trade less than democracies do because of trade taxes imposed. Autocracies, with less political accountability, usually result in poorer bureaucratic quality as

there is no incentive to build up control structures (e.g. red tape and other unobserved trade distortions). This leads to the differences in trade flows as compared to that in democracies. On the contrary, De Haan and Sturm (2003) suggest that democracies are less likely to cause trade liberalisation as it involves massive layoffs at the beginning. As they reckon, only an autocrat can possibly bear this short-term cost.

Other than trade liberalisation, democracy may also cause reforms in other aspects such as the provision of public goods. Sunde, Cervellati, and Fortunato (2006) propose an endogenous model of political institution, highlighting that democratic transition, economic development and economic policies are endogenously determined. Democratic transition, as they interpret it, is essentially about the provision of productive public goods and the redistribution of incomes. Redistribution and public good provision are public choices made by different interest groups under both democracies and autocracies. Their model argues that political elites, albeit their monopolised political power, will start to invest in public goods for efficient production once the economy reaches beyond a certain level of technology and economic development. Gradually they have to consider the trade-off between giving up some political power in exchange for a broader tax basis for the provision of public goods. Their model predicts that democracies tend to create environments that are more favourable for economic activities than the ones implemented under oligarchies. Furthermore, countries with more democratic institutions usually have a larger state, meaning more government consumption and more redistribution. Acemoglu, et al. (2005) provide a survey of cross-country evidence on the patterns of democracy. They conclude that democracies are more redistributive than oligarchies, especially with an increase in redistribution following democratisation.

2.2 Empirical Evidence

2.2.1 Trade Liberalisation

Empirical evidence of the causal relationship between democracy and economic reforms remains largely inconclusive. In terms of trade liberalisation reforms, empirical studies by Fidrmue (2003) and De Haan and Sturm (2003) suggest that democracy is likely to cause trade liberalisation. Milner and Kubota (2005) suggest that democratisation reduces the ability of governments to use trade barriers as a strategy for building political support. Political leaders in labour-rich countries may prefer lower trade barriers to obtain political support as democracy increases. Their empirical evidence also supports that regime change is associated with trade liberalization. In contrast, economic crises and external pressures, as conventionally believed, seem less salient.

Amongst all these empirical studies, Giavazzi and Tabellini (2005) is a more frequently cited

empirical article, which explicitly investigates the causality between economic and political liberalisation. They define economic liberalisation as openness to international trade, whereas political liberalisation is a permanent regime change from autocracy to democracy. By means of the "**difference-in-difference**" estimation technique and using the country-specific dates of liberalisation to cluster the pre-and post-liberalisation samples, their OLS and FE panel estimates show significant positive effects of liberalisations on economic performance (e.g. growth, investment and trade volume), macroeconomic policy (e.g. budget surplus and inflation) and structural policies (e.g. corruption). Nevertheless, they suggest no causal relationship between trade liberalisation to democracy. Their findings, however, provide support to the claim that the sequences of economic and political liberalisation do matter. Countries that first liberalise trade and then become democracies do better than those that pursue the opposite sequence in almost all dimensions.

Their work is, by all means, comprehensive in terms of measuring the impact of trade liberalisation on various economic outcomes. However, since they only consider a permanent regime change as political liberalisation, they inevitably have to consider merely those countries with political liberalisation and that did not reverse in the sample. Their estimation technique – "difference-in-difference" estimation – also makes it difficult to estimate temporary regime change and regime reversal. As they also recognise, this may create a selection bias. Moreover, the dichotomous classification of democracy does not capture the effect of continuous progress of democratisation in the country, unless the improvements are significant enough to be classified as a complete regime change.

Other empirical work like Rudra (2005) also finds a positive impact of trade openness on democracy, subject to the fact that the levels of social spending are high enough. Papaioannou and Siourounis (2008) carry their empirical test on the initially non-democratic countries and, likewise, demonstrate a positive causality. On the contrary, Li and Reuveny (2003) use lagged trade data and report a negative impact of trade liberalisation on democracy. Rigobon and Rodrik (2004) suggest a similar negative effect through the use of identification through heteroskedasticity estimation strategy.

2.2.2 Financial Liberalisation

Quinn (2000) is among the first to test the effect of political institutions on financial liberalisation. He creates his capital account openness indicator and estimates the causality relationship in a panel VAR setting. He concludes that democracies are more likely to remove capital controls. Reciprocally, financial liberalisation is associated with a decrease in democracy. Dailami (2000) provides a possible explanation for this negative relationship. He notes that capital account liberalisation may limit the ability of governments to deploy

redistributive taxation, regulation and risk-sharing policies, thereby weakening support for democratic forms of governance. His empirical evidence also shows that capital account liberalisation is negatively associated with democracy. Abiad and Mody (2005), on the other hand, show no influence of financial liberalisation on the political institution at all.

2.2.3 Joint Tests of Multi-Sector Reforms

Studies, that jointly test the effect of democracy on economic and financial liberalisation reforms, have only come up very late. Eichengreen and Leblang (2006)[3] empirically investigate how democracy interacts with globalisation over a long historical period of 1870-2000. They refer globalisation to as both trade and financial liberalisation, measured respectively by the percentage of total trade to GDP and capital controls – defined as whether there are explicit legal restrictions on capital transitions as adopted by IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. They argue that most of the studies previously done either ignore the possible two-way causality relationship or endogeneity problems in the model specification. They are of the view that very little effort has been made to develop an appropriate instrumental variables strategy for dealing with the endogeneity problem. To this end, inspired by earlier work by Lopez-Cordova and Meissner (2005) and Milner and Kubota (2005), they use the gravity model to obtain instruments for trade. They suggest that the basic gravity model variables are plausible instruments for identifying the exogenous component of trade. Similarly, for capital account policies, instrumental variables like country size, inflation, budget deficit, the number of countries with capital control or where those countries are experiencing currency crisis can also be used. Thanks to the long time span of their database, they further segregate the full sample into several sub-periods, including the gold standard, the interwar period, the Bretton Woods and the post-Bretton Woods periods. Although the standard Hansen-J test does not always support the validity of the instruments used, their results generally point to the conclusion that there is a positive two-way relationship between democracy and globalisation. The results still hold after controlling for legal origins, geographical regions and level of economic development of the countries.

The joint tests of trade and financial liberalisation extend research interests to economic reforms in other dimensions. Naturally, this requires the development of a multi-sectoral reform dataset. The IMF (2008) has just completed a cross-country economic reform database, covering 10 sectors over the period of 1960-2004[4]. Giuliano, et al. (2009) (GMS) is possibly the first to test the effect of democracy on economic reform using these indicators. After

[3] In addition, they also provide an excellent review of the empirical studies of the effect of trade and financial liberalisation on democracy.
[4] We will briefly compare this dataset to the indicators we use in our empirical study in Section 3.1 below.

controlling for country, time and sector-specific effects, their fixed effect estimations show that democracy does cause economic reform. However, they find no empirical evidence of reverse causality.

The fundamental question we are interested in is similar to GMS, but our investigation is different in a number of ways. First of all, we will use a different set of reform indicators, namely the sub-indicators of the Fraser Institute's economic freedom index from Gwartney, et al. (2008). On one hand, the IMF's database is not publicly accessible. On the other hand, the two sets of measures do overlap in a number of aspects. We will compare the two datasets in greater detail in Section 3.1.1 below. Secondly, although GMS also use panel data fixed-effect model in their study, the presence of a lagged dependent variable (either democracy or economic reform) as a regressor may reflect the fact that they ignore the problem of "dynamic bias" as suggested by Nickell (1981). Yet, they do acknowledge the potential problem of endogeneity in their estimations. They suggest using the reform index of the neighbouring economy to be an instrument for their IV estimations. Nevertheless, there is no explicit theoretical justification or empirical validity test for these instruments used. Thirdly, despite a vast amount of additional covariates incorporated in their robustness check (e.g. education, inflation, real devaluation, public expenditure, bureaucratic quality etc.), the authors appear to fail to control for the income level. As shown in Eichengreen and Leblang (2006)'s survey, there is indeed a large amount of literature in which they argue that income levels (i.e. GDP per capita) are directly associated with democracy and also the economy's capability to undertake economic reform. It is also argued that economic growth helps build up the expectation of deepening economic reform and promoting democratisation.

We propose to use the sub-indices of the Fraser Institute's Economic Freedom Index (EF) (Gwartney, et al. (2008)) in the present study. Testing the causality between a political institution and economic freedom by using EF are not scarce in the literature. However, there are at least two limitations of these studies. They primarily use the aggregate EF indicator without considering its sub-indices, except in Lundstrom (2003). While EF measures broadly 5 areas, it is quite likely that each of them may have a different effect on the political institution[5] and vice versa. Second, it seems to be quite common that using EF relies heavily on the use of Granger causality to demonstrate a causal relationship, without considering the problem of endogeneity amongst variables. While EF reflects a broad spectrum of policy choices, one

[5] This strand of studies often tests the causality between economic freedom and political freedom. The latter refers to the indices of political freedom and civil liberties in a country from Freedom House, which is also a common measure of a political institution other than the Polity IV index. In our estimations, we will also use Freedom House indices as a robustness check.

should note that political institutions and policies measured may be endogenously determined. Table 4 below summarises selective relevant empirical studies in relation to the causality between economic freedom and political institution.

Table 4: Empirical Studies of Measuring the Causality between Economic Freedom and Political Institution

Study	Sample	Estimation Technique	Results
Dawson (1998)	92 countries, 1975–1990	Granger causality for cross-sections	The level of EF in 1990 is significantly related to political and civil freedom in 1975.
Farr, *et al.* (1998)	22 industrial and 78 developing countries, 1975–1990	Granger causality for cross-sections	No Granger-causal relationship between EF and political freedom and vice versa; EF Granger-causes income per capita, which, in turn, Granger-causes political freedom.
Wu and Davis (1999)	About 100 countries, 1975–1992.	Log-linear method	Political freedom is not associated with economic freedom.
De Haan and Sturm (2003)	55–68 developing countries, 1975–1995	OLS, Panel – period fixed effect	The change in EF is significantly related to level of democracy in 1975, taking various control variables into account; conclusion also holds if robust estimators are used.
Pitlik and Wirth (2003)	Panel model 1970–1999 with 5-year intervals for 57–122 countries	Panel – country fixed effect	Strong crises lead to more liberalization (i.e. higher EF); also democracy is positively related to increase in EF, as are some political system indicators that are based on the number of veto players.
Dawson (2003)	Granger causality tests, 1970–2000	Granger causality for cross-sections	Causation runs primarily from political to economic freedom.
Lundstrom (2003)	58 developing countries, 1975–1995	Panel – country fixed effect	Political freedom is related to some groups of components of EF ('government operations' and 'regulations and restraints on international exchange'), but no to others.

Source: De Haan, Lundstrom, and Sturm (2006) and author's augmentation

All in all, this paper intends to contribute to the literature in three ways. First, unlike the main strand, we consider economic reform by sectors, beyond the scope of merely trade and financial liberalisation. Second, we technically deal with the problem of endogeneity between reforms and political regimes by using a GMM estimator that was seldom satisfactorily addressed in the previous literature. Thirdly, unlike existing studies in relation to economic freedom, we estimate the causal relationship in a dynamic panel setting, allowing us to capture both the reverse relationship as well as inter-temporal and within-country changes. The contribution of this paper is entirely empirical.

3 Methodology and Data

3.1 Data

3.1.1 Economic Reforms

Using index-based measures of economic reforms serves two advantages. On one hand, an index approach allows us to measure multi-dimensional aspects of reforms. On the other hand, it can help benchmark across countries.

To the best of our knowledge, there are at least three databases measuring economic reform. First is Giavazzi and Tabellini (2005)'s dichotomy index of "economic reform". Their database is originally built up by Sachs and Warner (1995) and Wacziarg and Welch (2003). The composite index primarily measures trade openness, covering conditions like (i) average tariffs exceed 40%; (ii) non-tariff barriers covering more than 40% of its imports; (iii) the economy has a socialist economic system; (iv) the black market premium on the exchange rate exceeds 20%; and (v) most of its exports are controlled by a state monopoly. This index, like a dummy variable, classifies an economy as "open" or "close" based on the conditions above.

Second is the World Bank's Ease of Doing Business micro-reform database. Reforms in the database are at the micro-level, such as the improvements made in the number of days to set up or close businesses, cut of administrative costs or review of company law and alike. Based on this database, Amin and Djankov (2009) conclude that micro-reform is more likely to associate with democracies. Due to the short time span of the dataset (2004-2008), the authors can only undertake cross-sectional OLS estimations. Dynamic analysis is not possible. The authors also do not take into account the problem of endogeneity, as they reckon, the reverse causality is unlikely given the reform is at the micro-level.

The third is the IMF (2008) reform database, empirically tested by GMS to investigate the causal relationship between reforms and democracy. This is the only database that covers reforms in different sectors. The IMF database covers eight areas of measurement, including both the financial sector and real sector. Financial sector reform indicators include reforms pertaining to domestic financial markets and external capital accounts, while real sector structural reform indicators include measures of product and agriculture markets, labour, fiscal, trade and current account reforms. Each indicator contains sub-indices summarising different dimensions in each sector. GMS aggregate all the sub-indices and normalise them between 0 and 1, with higher scores representing a greater degree of liberalisation. In their empirical work, after controlling for country, year and sector-specific effects, democracy causes reform. The results hold true by sectors, except that democracy does not cause reforms in the product market and fiscal sector.

Unfortunately, the IMF database is not publicly accessible. We, therefore, have to seek appropriate alternatives with comparable dimensions, sample size and time span for our estimation to pursue similar research interests. We suggest that the Fraser Institute's economic freedom index (EF) (Gwartney, et al. (2008)) can be a plausible alternative. In fact, most of the sectors covered in the IMF's database are also measured by the EF indices.

We compare the EF indices to those in the IMF database in Table 5 below. In terms of coverage and time span, the two databases are quite comparable. In terms of dimensions, the IMF database is actually more superior as it includes reforms in product markets, agriculture sectors and security market liberalisation (subsumed under the index of the financial sector). The product market reforms indicator covers the degree of liberalisation in the telecommunication and electricity markets, including the extent of competition in the provision of these services and the presence of an independent regulatory authority and privatisation. The agricultural market reforms indicator captures intervention in the market for the main agricultural export commodity in each country. The securities markets sub-indicator 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. These three aspects, unfortunately, are not covered in EF.

The IMF reform index and EF index measure four common aspects, namely (a) fiscal sector; (b) trade liberalisation; (c) financial liberalisation and (d) labour market regulation. The EF indices are generally composed of broader measures in these areas. Concerning the fiscal sector, for example, the IMF reform index takes an average of the revenue sub-index – measuring personal income tax, corporate income tax and import tariffs – and the expenditure sub-index – measuring solely the efficiency of public expenditures in health and education. In contrast, the EF index covers income and payroll tax rates on the revenue side and general government consumption spending as a percentage of total consumption as well as transfers and subsidies as a percentage of GDP on the expenditure side.

Concerning trade and current account liberalisation, the IMF database defines the former as average tariff rates and the latter as to how a government is free from restricting the proceeds from international trade in goods and services. The EF index is more comprehensive on this front. The free trade index of EF is composed of taxes on international trade – including revenues from trade taxes, mean tariff rate and the variation in tariff rates as compared to a uniform tariff. In addition, the EF also captures the regulatory trade barriers, including the perception of the business impact of tariff and non-tariff barriers, the compliance cost of importing and exporting (obtained from the World Bank's Ease of Doing Business Survey), actual as compared to the expected trade size and the difference between the official and the

black market exchange rate.

Table 5: Comparison between IMF Economic Reform Index and Fraser Institute's Economic Freedom Index

	IMF Economic Reform Index	Fraser Institute Economic Freedom Index
Sample Coverage		
	47 -142 countries, 1960 – 2006	141 countries, 1970 - 2005
Areas of Measurement		
(1)	**Fiscal Sector**	
	The fiscal sector index is an average of revenue and expenditures sub-indices. The revenue sub-index is an average of two sub-indices i) a weighted average of three rates: personal income tax, corporate income tax, and import tariffs. ii) an indicator of efficiency of revenue collection for personal income, corporate and trade taxes. The expenditure sub-index is an average of measures of efficiency of public expenditures in health and education. The efficiency of public spending is measured by comparing actual spending with the minimum spending theoretically sufficient to produce the same actual output.	The size of government index covers expenditure, taxes and enterprises. There are four sub-indices i) general government consumption spending as a percentage of total consumption; ii) transfers and subsidies as a percentage of GDP; iii) government enterprises and investment and iv) top marginal tax rate.
(2)	**Trade**	
	Trade liberalization is defined as average tariff rates.	Freedom to trade internationally index covers 5 sub-indices: i) taxes on international trade, measured by revenues from trade taxes as percentage of trade sector, mean tariff rate and standard deviation of tariff rates; ii) regulatory trade barriers, measured by non-tariff trade barriers and compliance cost of importing and exporting; iii) size to trade sector relative to expected; iv) black-market exchange rates, and v) international capital market controls, measured by foreign ownership/investment restrictions and capital controls.
(3)	**Current Account**	
	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. It distinguishes between restrictions on residents (receipts for exports) and on non-residents (payments for imports).	*[See the sub-indices "taxes on international trade" and "regulatory trade barriers" under Trade sector above.]*

Source: Giuliano, et al. (2009) and Gwartney, et al. (2008).

	IMF Economic Reform Index	Fraser Institute Economic Freedom Index
(4)	**Capital Account**	
	Qualitative indicators of restrictions on financial credits and personal capital transactions of residents and financial credits to non-residents, as well as the use of multiple exchange rates.	*[See the sub-index "international capital market controls" under Trade sector above.]*
(5)	**Labour Market**	
	The labour index is the tax wedge, which is defined as the difference between the firm's labour costs and worker's net income.	Labour market regulations index covers both qualitative and quantitative indices on i) minimum wage, ii) hiring and tiring regulations, iii) centralized collective bargaining, iv) mandated cost of hiring, v) mandated cost of worker dismissal and vi) conscription.
(6)	**Financial Sector**	
	The index of domestic financial liberalization is an average of five sub-indices related to *banking* and one related to the *securities market.* The banking sub-index 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. The securities market sub-index generally covers policies that develop domestic bond and equity markets.	Credit market regulations index has four sub-indices: i) ownership of banks; ii) foreign bank competition; iii) private sector credit, and iv) interest rate controls / negative real interest rates.
(7)	**Product Markets**	
	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. 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.	*[No comparable index]*
(8)	**Agriculture Market**	
	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).	*[No comparable index]*

Financial liberalisation refers to both capital account openness and credit market deregulation. On capital account openness, the IMF database measures the restrictions on financial credits and personal capital transactions of residents and restrictions on financial credits to non-residents, as well as the use of multiple exchange rates. This indicator is primarily a composite index using the IMF's definition of the 13 different types of international capital controls from its Annual Report on Exchange Arrangements and Exchange Restrictions. Similarly, the capital controls sub-component of the EF index is also constructed based on the same IMF definition. In addition, the EF supplements the capital account openness index by survey questions results on "whether foreign ownership of companies in the country is rare" and "whether rules governing FDI are damaging and discourage it".

On financial sector reform, as mentioned before, the IMF reform index covers both the banking sector and securities market liberalisation. The IMF refers to domestic banking liberalisation as (i) interest rate controls; (ii) credit controls; (iii) banking competition restrictions, e.g. limits on branches and entry barriers in the banking sector; (iv) degree of state ownership; and (v) the quality of banking supervision and regulation. In comparison, the EF only captures interest rate controls – measuring whether interest rates are determined by the market, stable monetary policy and positive real deposit and lending rates. Vis-à-vis credit market regulation, the EF index measures (a) the percentage of bank deposits held in privately owned banks; (b) the denial rate of foreign bank license applications and foreign bank assets; and (c) the percentage of domestic credit consumed by the private sector.

Finally, on labour market regulation, the IMF database measures the tax wedge – a sum of taxes paid by the worker (e.g. personal income taxes, social security contributions etc.) and the employer (payroll tax, social security contributions paid etc) expressed as a ratio of the gross wage. In contrast, the EF mostly relies on qualitative indices, including survey questions on (a) minimum wage; (b) hiring and firing regulations; (c) centralised collective bargaining; (d) mandated cost of hiring; (e) mandated cost of worker dismissal, and; (f) data on the use and duration of military conscription. Although the EF's labour market regulation is indeed more directly relevant to labour market regulation, these indicators are also fairly subjective.

All in all, we find that the different sub-indices of EF, as discussed above, can be used for our estimations as reform measures in different sectors. As Gwartney, et al. (2008) explain, the EF index does not intend to measure political institutions. It, however, helps measure the consistency of the choices made by the political institution. The only disadvantage of the EF index is that it is only available every 5 years before 1990.

3.1.2 Democracy

We use a continuous measure of democracy instead of a dichotomous measure. We argue that economic reform can potentially lead to marginal progress in democratisation and vice versa. We use the widely adopted Polity IV's measure of institutional democracy (DEMOC) to measure political institutions as defined in the second paper of this series, entitled " Impact of Institutions and Policy on Economic Growth: Empirical Evidence". Nevertheless, we will also use the dichotomous measure of democracy as a robustness check of our results.

3.1.3 Controlled Variables

As described earlier, we will control for income level in each specification. The natural log of PPP-adjusted GDP per capita (ln(GDPPC)) from WDI is used again. For robustness checks, we will also include additional covariates in the baseline specification. Details of these robustness checks will be discussed further in Section 4.3.

3.2 Specification of The Model and Strategic estimation

As we intend to investigate a causality relationship, we incorporate lagged variables in our baseline specification and employ the dynamic panel GMM estimator. Such dynamic analysis has not previously been used in the existing literature for estimating causality between democracy and economic reforms and/or economic freedom. In our baseline specification, unlike the work of GMS, we control for income level as proposed by Coviello and Islam (2006)[6]. We believe such control is essential as a political institution, economic development and economic reform can be endogenously determined (see Sunde, et al. (2006)) since the income level of the economy determines the capacity of policy reforms and it, in turn, may help build up the expectation of democratisation.

Our baseline model is basically specified as

$$\Delta REFORM_{it} = \alpha + u_i + \delta_i + \beta_1 DEMOC_{it-1} + \beta_2 REFORM_{it-1} + \beta_3 \ln(GDPPC)_{it-1} + \varepsilon_{it} \quad (1)$$

where *i* represents the *i*-th cross-section, *t* represents the time period. All regressors are in lagged forms to demonstrate the causality relationship. ***REFORM*** is a sub-index from EF, representing economic reform in each particular sector. We also control for the unobserved time-invariant and country-specific effect, time effect by means of period dummies and the income level in the previous period. All regressors are treated as pre-determined and endogenous variables. Due to data availability, we use data every 5 years. That is, t = 1970,

[6] Their work attempts to test the effect of foreign aid on institutional change. They argue that the level of economic development may well affect the capacity of institutional change in recipient economies.

1975, 1980 …, 2000 and 2005. The lagged variable represents the variable in the last period, i.e. 5 years ago. Eq. (1) can be rewritten as

$$REFORM_{it} = \alpha + u_i + \delta_i + \beta_1 DEMOC_{it-1} + (1+\beta_2) REFORM_{it-1} + \beta_3 \ln(GDPPC)_{it-1} + \varepsilon_{it} \quad (2)$$

is our baseline specification for estimation. We will replace ***DEMOC*** as the dependent variable in the baseline specification to test the reverse causality of whether ***REFORM*** causes ***DEMOC***. The baseline specification will be similar to Eq. (2):

$$DEMOC_{it} = \alpha + u_i + \delta_i + \beta_1 REFOM_{it-1} + (1+\beta_2) DEMOC_{it-1} + \beta_3 \ln(GDPPC)_{it-1} + \varepsilon_{it} \quad (3)$$

In terms of ***REFORM***, we measure 4 main sectors as discussed above: (a) fiscal sector – using indices of ***GOVTC***, ***TRANSFER*** and ***TAX***; (b) trade liberalisation – using indices of ***FREE TRADE***; (c) financial liberalisation – using ***K_AC*** and ***CREDIT***, and (d) labour market – using ***LABOR***. Data descriptions and sources are in Appendix Section A.1.

4 Results

4.1 Does Democracy a reason for Economic Freedom?

We first estimate the effect of democracy on the economic freedom index (***EF***) in a dynamic panel data setting[7]. Table 6 shows the impact of lagged DEMOC on the level of aggregate EF index using different estimation techniques. As explained in the second paper of this series, entitled " Impact of Institutions and Policy on Economic Growth: Empirical Evidence", as a rule of thumb, we look for a GMM estimator of the lagged dependent variable that lies somewhere between the OLS and fixed-effect within-group (FE) estimators. Models 3.(1) and 3.(2) show the OLS and FE estimations respectively, whereas Model 3.(3) shows the system GMM estimator.

We can comfortably argue that the system GMM estimator is an appropriate one since the coefficient of the lagged dependent variable is around 0.52 which lies somewhere between 0.72 for OLS and 0.43 for FE estimators. In addition, we also attempt to obtain the difference GMM estimator for comparison in Model 3.(4). As we can see, Model 3.(4) fails this preliminary test. The coefficient of lagged EF is significantly below that of the FE estimator, indicating a downward bias. The AR(1) test of Model 3.(4) also rejects the null hypothesis that the error

[7] Technical details of panel system GMM estimation are set out in the second paper of this series, entitled " Impact of Institutions and Policy on Economic Growth: Empirical Evidence".

terms are auto-correlated. All of these suggest that the difference GMM estimator may not be appropriate in our case. The lagged dependent variable (EF) is positive and significant,suggesting convergence of economic freedom across countries over time. Its coefficient is also well below 1 and it signifies that EF does not seem to be explosive. The presence of the lagged dependent variable also implies the coefficients of other regressors reflect their short-run to impact on the dependent variables. Model 3.(3) shows that a more democratic society appears cause the economy to be more economically free, even after controlling for country-specific and period effects as well as the lagged level of economic development, as proxied by the natural log of lagged GDP per capita (lagged ln(GDPPC))[3]. Nevertheless, we should note that lagged DEMOC is only marginally significant at the 10% level in Model 3.(3).

Table 6: Does Democracy Cause Economic Freedom?
Different Estimation Techniques

Model	**3.(1)**	**3.(2)**	**3.(3)**	**3.(4)**
Estimation	**OLS**	**FE**	**System GMM**	**Difference GMM**
Lagged EF	0.7155***	0.4314***	0.5186***	0.2140
	(0.0298)	(0.0476)	(0.1620)	(0.4051)
Lagged DEMOC	0.0291***	0.0410***	0.0411*	-0.0699
	(0.0076)	(0.0129)	(0.0237)	(0.1090)
Lagged ln(GDPPC)	0.0865***	-0.1534	0.1546	-0.4171
	(0.0238)	(0.1488)	(0.1967)	(0.8599)
Const	0.7907***	4.7943***	1.8405***	
	(0.1617)	(1.1253)	(0.6484)	
Obs	502	502	502	378
No. of cty		114	114	103
Adj. R^2	0.781	0.423		
F-stat	257.6	61.08	85.49	32.12
AR(1) p-value			*[0.0495]*	*[0.628]*
AR(2) p-value			*[0.289]*	*[0.347]*
Hansen Test Statistics			8.545	4.951
Hansen Test p-value			*[0.576]*	*[0.666]*

The dependent variable is EF. Models 3.(2) – 3.(4) include country fixed effect and period dummies, but the results are not reported. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. For Models 3.(1) and 3.(2), robust standard errors are in parenthesis. For Models 3.(3) and 3.(4), lagged EF is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen's test is used for overidentifying restrictions.

[3] Nevertheless, one should note that the coefficients of the lagged GDP per capita are quite unstable across the four models.

4.2 Does Democracy a Reason for the Economic Reform in Different Sectors?

Table 7 shows the 2-step system GMM estimations of the impact of lagged DEMOC on reforms by sectors. This baseline specification attempts to address whether democracy is more likely to cause reform in different sectors. We find that the system GMM estimators work fairly well for the models, except Model 3.(9) on the capital account openness index (K_AC). All models reject the null hypothesis of the AR(1) test but do not reject the AR(2) test. The Hansen tests also do not reject the over-identification restrictions.

Models 3.(5) – 3.(7) investigate the impact of democracy on the fiscal sector, specifically the effects of government consumption (GOVTC), transfer and subsidy (TRANSFER) and marginal income tax rate (TAX). The results show that a more democratic economy is more likely to have low government consumption as a percentage of total consumption, a higher level of transfer of subsidy as a percentage of GDP and a higher marginal income tax rate. The effects of democracy on GOVTC and TAX are not statistically significant nevertheless. Strictly speaking, we only find that democracy causes society to be more redistributive (hence the lower score of TRANSFER). The effect is significant at the 5% significance level. The insignificant effects of democracy on government spending and income are also consistent with the results obtained by GMS, where they find that democracy does not significantly cause any reform in fiscal revenue and expenditure. Our dataset extends one more dimension of the financial sector, i.e. redistribution through the use of transfer and subsidy. We find that this is the only dimension of financial sector reform that is likely to be caused by democracy.

Model 3.(8) measures whether democracy is likely to cause trade liberalisation (FREE TRADE). Our empirical findings affirm that this is the case and the effect is statistically significant. In financial liberalisation, the two indicators – capital account openness (K_AC) and credit market regulation (CREDIT) – in Models 3.(9) and 3.(10) respectively are used. As explained earlier, we do find democracy causes capital account openness. However, we should be very cautious when interpreting Model 3.(9) since the estimation fails the AR(2) test. Hence, the error term is suspected to be auto-correlated in level. On the other hand, our empirical evidence does support that democracy causes credit market liberalisation at a 1% significance level as shown in Model 3.(10).

Finally, Model 3.(11) tests whether democracy causes labour market regulation relaxation (LABOR). In our estimation, we find that democracy is more likely to cause stricter labour market regulation (i.e. lower score of LABOR), although the result is not statistically significant. It may illustrate that more labour market regulations are more likely to be welcome by employees, because this favours the majority in a democratic society. Understandably, labour market regulations are easier to gain support and be rolled out in democracies.

Table 7: Does Democracy Cause Economic Reform in Different Sectors? – 2-step System GMM Estimation

Model	3.(5)	3.(6)	3.(7)	3.(8)	3.(9)	3.(10)	3.(11)
Dep. var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged DEMOC	0.0359	-0.3394**	-0.0111	0.1381**	0.7430***	0.3895***	-0.0973
	(0.0511)	(0.1520)	(0.1304)	(0.0535)	(0.2021)	(0.0788)	(0.0710)
Lagged dep var	0.6738***	0.5395*	0.6962***	0.6187***	0.6439*	0.6249***	0.7980***
	(0.0826)	(0.3130)	(0.1161)	(0.0801)	(0.3745)	(0.1160)	(0.2510)
Lagged ln(GDPPC)	-0.3808	0.2937	-0.0070	0.0190	-0.6091	-0.5418**	0.1320
	(0.2468)	(0.3560)	(0.3978)	(0.1405)	(1.0079)	(0.2290)	(0.1708)
Const	4.7564**	3.2990	2.1112	1.2341	1.6734	5.5890***	1.1353
	(2.2107)	(5.1499)	(3.5003)	(1.2061)	(6.3390)	(1.6196)	(2.1345)
Obs/No. of cty	679/112	504/103	458/96	629/114	501/112	665/112	234/70
AR(1) p-value	*[0.0000]*	*[0.0099]*	*[0.0000]*	*[0.0000]*	*[0.0822]*	*[0.0001]*	*[0.0547]*
AR(2) p-value	*[0.925]*	*[0.947]*	*[0.879]*	*[0.277]*	*[0.0190]*	*[0.449]*	*[0.279]*
Hansen Test Statistics	15.56	9.954	15.93	9.413	12.78	11.81	17.61
Hansen Test p-value	*[0.341]*	*[0.268]*	*[0.253]*	*[0.224]*	*[0.120]*	*[0.544]*	*[0.225]*

All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. ***Lagged dep var*** is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

β_1 in the dynamic models represent the short-run impact of ***DEMOC*** on economic reform. The long-run effects can be derived by dividing β_1 by β_2, i.e. 1 - coefficient of the lagged dependent variables. Based on Models 3.(6), 3.(8) and 3.(10), where the results are statistically significant, the effects of DEMOC in both the short-run and long-run in these sectors are calculated in the Table 8 below.

Table 8: Causal Impact of Democracy on Economic Reform

	Short-run impact	Long-run impact
TRANSFER	-0.34	-0.74
FREE TRADE	0.14	0.37
CREDIT	0.39	1.03

These results suggest that, using FREE TRADE as an example, 1 point increase in DEMOC will lead to 0.14 point and 0.37 point increases in the FREE TRADE index in the short-run and long-run respectively.

4.3 Robustness Tests

In the following, we carry out several robustness tests using different measures of democracy and additional covariates to test the sensitivity of our results. First of all, we use IPOLITY2, a composite score of political freedom and civil liberties as defined in the second paper of this series, entitled " Impact of Institutions and Policy on Economic Growth: Empirical Evidence", as an alternative measure of democracy. The results are presented in Table 9.

The conclusion is generally similar. Again, the dynamic setting in Model 3.(16) (where K_AC as dependent variable) appears to be problematic. Other than that, Models 3.(13), 3.(15) and 3.(17) show similar significant results as before, indicating that a democratic society is likely to be more redistributive, more free to international trade and to have a more liberalised credit market. Comparing the magnitudes, the coefficients of lagged IPOLITY2 are consistently larger than those using lagged DEMOC.

Like in previous literature, using a dichotomous measure of democracy, we undertake a similar exercise by constructing a dummy variable DEMOC1. DEMOC1 equals to 1 if DEMOC is greater than 5 and equals to 0 if otherwise. The estimations are at Table 10. Results of Models 3.(19) – 3.(25) show that our key results survive. The only difference is that the effect of DEMOC1 on labour market regulation (LABOR) becomes statistically significant in Model 3.(25). The negative effect is now statistically significant at 1% significance level. This reinforces the empirical evidence that democracy causes more labour market regulation. However, we should note that the AR(1) test fails in the Model, which makes one to cast doubt on the validity of the results.

Table 9: IPOLITY2 As An Alternative Measure of Democracy

Model	3.(12)	3.(13)	3.(14)	3.(15)	3.(16)	3.(17)	3.(18)
Dep. Var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged IPOLITY2	0.0498	-0.4892*	-0.0837	0.2882**	1.3444***	0.5413***	-0.1320
	(0.0700)	(0.2939)	(0.1814)	(0.1229)	(0.4286)	(0.1168)	(0.0889)
Lagged dep. var	0.6263***	0.4531	0.6834***	0.5635***	0.3721	0.5959***	0.9461***
	(0.1009)	(0.4394)	(0.0920)	(0.0738)	(0.2484)	(0.0944)	(0.2281)
Lagged ln(GDPPC)	-0.6403**	0.1987	0.0524	0.0069	-0.7329	-0.6206**	0.2051*
	(0.2684)	(0.3653)	(0.3822)	(0.1216)	(0.5329)	(0.2401)	(0.1190)
Const	6.9837***	6.0545	2.2441	0.5101	-0.6499	5.0853***	0.1102
	(2.5052)	(7.4815)	(3.1658)	(1.0536)	(2.7315)	(1.6522)	(1.9259)
Obs/No. of cty	647/118	502/108	485/102	615/120	448/118	641/118	222/72
AR(1) p-value	*[0.0002]*	*[0.0512]*	*[0.0000]*	*[0.0000]*	*[0.1340]*	*[0.0000]*	*[0.0396]*
AR(2) p-value	*[0.977]*	*[0.785]*	*[0.952]*	*[0.118]*	*[0.00141]*	*[0.284]*	*[0.326]*
Hansen Test Statistics	12.49	9.936	15.75	6.613	11.10	9.111	17.82
Hansen Test p-value	*[0.407]*	*[0.192]*	*[0.203]*	*[0.251]*	*[0.196]*	*[0.612]*	*[0.121]*

All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. ***Lagged dep var*** is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

Table 10: Dichotomous DEMOC1 As An Alternative Measure of Democracy

Model	3.(19)	3.(20)	3.(21)	3.(22)	3.(23)	3.(24)	3.(25)
Dep. Var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged DEMOC1	0.0300	-1.7366*	-0.6070	0.9042**	0.9463	2.8441***	-1.4985***
	(0.3826)	(0.9386)	(0.8335)	(0.3955)	(1.2755)	(0.7152)	(0.4117)
Lagged Dep. Var	0.6617***	0.5576**	0.6644***	0.6070***	0.8545***	0.6059***	0.3303
	(0.0774)	(0.2344)	(0.0976)	(0.0701)	(0.2279)	(0.1005)	(0.2462)
Lagged ln(GDPPC)	-0.2864*	-0.0031	0.0134	0.0405	-0.4960	-0.2703	-0.0060
	(0.1722)	(0.2681)	(0.3454)	(0.0873)	(0.5012)	(0.2140)	(0.1439)
Const	4.2736***	4.5944	2.5570	1.3595*	3.9346	3.9906**	5.2461**
	(1.5697)	(3.9752)	(3.0542)	(0.8017)	(3.0893)	(1.5402)	(2.2407)
Obs/No. of cty	756/119	561/110	506/103	692/121	556/119	739/119	248/73
AR(1) p-value	*[0.0000]*	*[0.0003]*	*[0.0000]*	*[0.0000]*	*[0.0032]*	*[0.0001]*	*[0.1970]*
AR(2) p-value	*[0.944]*	*[0.725]*	*[0.990]*	*[0.912]*	*[0.209]*	*[0.278]*	*[0.298]*
Hansen Test Statistics	16.24	8.355	15.40	13.71	22.22	14.69	12.49
Hansen Test p-value	*[0.299]*	*[0.400]*	*[0.283]*	*[0.0566]*	*[0.00452]*	*[0.327]*	*[0.567]*

All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. ***Lagged dep var*** is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

We carry out further estimations for the baseline specifications for the non-high income countries[8] sample and test if the estimation results are sensitive to the sample size. Moreover, we wonder whether democracy works particularly poorly in developing countries, in which economic reform is less likely to be implemented. Our estimation results in Table 11 below show that it is not the case. The results still suggest that democracy is more likely to cause a redistributive society, trade liberalisation and financial market liberalisation.

More robustness checks are carried out for TRANSFER, FREE TRADE and CREDIT by having additional covariates in the baseline model using our full sample again. These results are shown in Table 12 and Table 14. We controlled for human capital stock (i.e. SCHOOLING, measured by average years of schooling), government spending as a percentage of GDP (gcon_gdp) and exchange rate (ER) from the Penn World Table (ver 6.2) of Heston, summers, and Aten (2006), and the natural log of the population (POP) from the WDI. All the control variables are in lagged terms. In conclusion, our results generally survive, suggesting democracy is likely to cause redistributive policies via transfer and subsidy, trade liberalisation as well as credit market liberalisation.

Table 11: Baseline Specification for Non-High income Countries

Model	3.(26)	3.(27)	3.(28)	3.(29)	3.(30)	3.(31)	3.(32)
Dep. Var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged DEMOC	-0.0211	-0.1962*	0.2375	0.0719*	0.2503	0.3816***	0.0881
	(0.0818)	(0.1010)	(0.1575)	(0.0422)	(0.7819)	(0.1288)	(0.1129)
Lagged dep. var	0.6927***	0.5769***	0.6425***	0.6826***	0.3852	0.7604***	0.1733
	(0.1006)	(0.1802)	(0.0883)	(0.0782)	(0.6280)	(0.1399)	(0.2435)
Lagged ln(GDPPC)	-0.1927	0.2297	-0.2165	0.1900	1.4827	-0.6972	-0.6970
	(0.3416)	(0.3214)	(0.6705)	(0.2305)	(0.8939)	(0.4667)	(0.8672)
Const	3.6302	2.9148	2.3758	0.0391	-8.9231	5.8814*	9.0994
	(2.5261)	(2.7702)	(4.8061)	(1.7317)	(7.5116)	(3.0396)	(6.1708)
Obs/No. of cty	465/77	314/68	277/61	426/79	344/77	452/77	80/40
AR(1) p-value	*[0.0003]*	*[0.0132]*	*[0.0000]*	*[0.0000]*	*[0.3800]*	*[0.0001]*	*[0.5400]*
AR(2) p-value	*[0.886]*	*[0.723]*	*[0.731]*	*[0.329]*	*[0.0203]*	*[0.626]*	*[0.262]*
Hansen Test Statistics	17.70	8.398	4.837	8.577	14.51	9.735	5.800
Hansen Test p-value	*[0.221]*	*[0.590]*	*[0.979]*	*[0.477]*	*[0.0695]*	*[0.715]*	*[0.886]*

All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. Lagged dep var is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen's test is used for overidentifying restrictions.

[8] High-income countries are classified in accordance with the World Bank's classification.

Table 12: Robustness Check for TRANSFER

Model	3.(33)	3.(34)	3.(35)	3.(36)	3.(37)
Lagged DEMOC	-0.4185**	-0.2979**	-0.4305***	-0.5004*	-0.3316**
	(0.1942)	(0.1301)	(0.1618)	(0.2614)	(0.1457)
Lagged TRANSFER	0.2631	0.5538***	0.2238	0.2446	0.3646*
	(0.3503)	(0.1849)	(0.2521)	(0.5602)	(0.2007)
Lagged gcon_gdp	-0.0462		0.0063	-0.0114	-0.0193
	(0.0571)		(0.0393)	(0.0544)	(0.0260)
Lagged SCHOOLING		-0.0189	-0.2286	-0.4268	-0.3581*
		(0.1437)	(0.1875)	(0.4679)	(0.2020)
Lagged ER					0.0000
					(0.0000)
Lagged ln(GDPPC)				0.5403	0.4000
				(0.9156)	(0.3925)
Lagged POP					-0.5355
					(1.1268)
Const	9.2173**	5.4864**	10.3136***	7.7384	15.3583
	(4.5718)	(2.4670)	(3.4489)	(10.7792)	(18.6693)
Obs/No. of cty	517/105	463/83	463/83	451/82	451/82
AR(1) p-value	*[0.0269]*	*[0.0027]*	*[0.0021]*	*[0.0435]*	*[0.0022]*
AR(2) p-value	*[0.505]*	*[0.942]*	*[0.939]*	*[0.563]*	*[0.800]*
Hansen Test					
Statistics	1.196	8.204	1.301	1.935	5.052
p-value	*[0.754]*	*[0.224]*	*[0.935]*	*[0.963]*	*[0.929]*

Dependent variable is TRANSFER. All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. Lagged TRANSFER is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for over-identifying restrictions.

Table 13: Robustness Check for FREE TRADE

Model	3.(38)	3.(39)	3.(40)	3.(41)	3.(42)
Lagged DEMOC	0.0849*	0.1174**	0.1032**	0.0952**	0.0792*
	(0.0428)	(0.0448)	(0.0426)	(0.0422)	(0.0439)
Lagged FREE TRADE	0.6596***	0.6718***	0.6800***	0.6774***	0.6706***
	(0.0756)	(0.0716)	(0.0761)	(0.0713)	(0.0694)
Lagged gcon_gdp		0.0087	-0.0024	0.0150	0.0133
		(0.0099)	(0.0161)	(0.0195)	(0.0227)
Lagged SCHOOLING	0.0207		-0.0004	-0.0353	-0.1068
	(0.0539)		(0.0552)	(0.1598)	(0.1369)
Lagged ER				0.1327	0.2350
				(0.3211)	(0.3196)
Lagged ln(GDPPC)					-0.0000
					(0.0000)
Lagged POP					-0.0022
					(0.2142)
Const	1.2184**	0.9574*	1.1429	0.0550	-0.0944
	(0.5552)	(0.5266)	(0.7407)	(1.8639)	(4.0420)
Obs/No. of cty	568/94	644/115	560/93	546/92	546/92
AR(1) p-value	*[0.0000]*	*[0.0000]*	*[0.0000]*	*[0.0000]*	*[0.0000]*
AR(2) p-value	*[0.393]*	*[0.280]*	*[0.366]*	*[0.436]*	*[0.429]*
Hansen Test					
Statistics	10.89	11.00	12.63	19.29	25.91
p-value	*[0.366]*	*[0.358]*	*[0.396]*	*[0.201]*	*[0.169]*

Dependent variable is FREE TRADE. All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. Lagged FREE TRADE is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for over-identifying restrictions.

Table 14: Robustness Check for CREDIT

Model	3.(43)	3.(44)	3.(45)	3.(46)	3.(47)
Lagged DEMOC	0.3554***	0.3672***	0.3304***	0.2168***	0.2417***
	(0.0779)	(0.0858)	(0.0729)	(0.0683)	(0.0677)
Lagged CREDIT	0.5262***	0.6908***	0.5302***	0.6105***	0.5730***
	(0.1128)	(0.1408)	(0.1048)	(0.1221)	(0.1008)
Lagged gcon_gdp		0.0061	-0.0326	-0.0030	-0.0102
		(0.0211)	(0.0235)	(0.0230)	(0.0212)
Lagged SCHOOLING	0.0448		0.0547	0.2170	0.0849
	(0.0917)		(0.1044)	(0.2910)	(0.2223)
Lagged ER				-0.6130	-0.3163
				(0.4931)	(0.4262)
Lagged ln(GDPPC)					-0.0000
					(0.0000)
Lagged POP					-0.4589
					(0.2914)
Const	1.7485*	0.9331	2.4085**	5.9406***	12.2213**
	(0.8924)	(0.9483)	(1.0209)	(2.2228)	(4.7285)
Obs/No. of cty	600/93	680/113	587/92	567/91	567/91
AR(1) p-value	*[0.0001]*	*[0.0001]*	*[0.0001]*	*[0.0002]*	*[0.0001]*
AR(2) p-value	*[0.344]*	*[0.406]*	*[0.348]*	*[0.351]*	*[0.344]*
Hansen Test					
Statistics	8.140	6.836	7.919	14.22	16.74
p-value	*[0.774]*	*[0.868]*	*[0.894]*	*[0.582]*	*[0.670]*

Dependent variable is CREDIT. All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. Lagged CREDIT is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

4.4 Reverse Causality: Economic Reform Causes Democratisation?

Finally, we test the reverse causal relationship between economic reform and democratisation in Table 15. Our empirical results show that economic reforms generally do not improve democracy directly, except for TRANSFER and FREE TRADE. In other words, a more redistributive society causes the economy to be more democratic. As one can expect, governments that spend more on transfers and subsidies are more likely to benefit the majority of society. In turn, if the society is a democracy, it is more likely to persist. Trade liberalisation also has such an effect. While free trade may benefit the majority, it potentially provides feedback to the democratic regime. Finally, we find that, although a democratic society more likely leads to the liberalisation of the financial market through credit market liberalisation, the reverse effect is not found empirically. A word of caution about Model 3.(54) is that we find lagged LABOR does not work appropriately in this dynamic panel model as the null hypothesis of the AR(1) test is rejected.

The reverse causality results using IPOLITY2 in Table 16 are generally similar. We do not find particular empirical evidence to support the hypothesis that economic reforms cause democratisation. Perhaps the most interesting result is that while we use IPOLITY2 to measure democracy, we find that more government consumption (as a percentage of total consumption) is more likely to improve democracy in Model 3.(55). The negative relationship between the two indices was also previously obtained when we use DEMOC, but it turns out to be statistically significant only when using IPOLITY2.

Table 15: Economic Reforms Cause Democracy?

Model	3.(48)	3.(49)	3.(50)	3.(51)	3.(52)	3.(53)	3.(54)
Indep. Var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged indep. var	-0.2724	-0.6541**	0.1420	0.7855**	0.2916	0.1470	0.0628
	(0.2070)	(0.2811)	(0.0991)	(0.3195)	(0.2592)	(0.1299)	(0.0657)
Lagged DEMOC	0.7942***	0.6873***	0.6326***	0.7368***	0.6038***	0.7857***	0.3289***
	(0.0692)	(0.1430)	(0.1573)	(0.1074)	(0.1748)	(0.1673)	(0.0990)
Lagged ln(GDPPC)	-0.1365	-0.5576	-0.1397	-0.8701*	-0.3614	-0.5640*	0.5960***
	(0.4291)	(0.5415)	(0.3463)	(0.4436)	(0.6462)	(0.3166)	(0.1244)
Const	3.9621	11.8663**	3.1068	3.3697	3.9981	4.9854*	0.2922
	(4.2698)	(5.7229)	(2.9862)	(3.7496)	(4.0157)	(2.5639)	(1.0077)
Obs/No. of cty	663/112	518/105	457/97	621/114	575/112	649/112	231/69
AR(1) p-value	*[0.0000]*	*[0.0036]*	*[0.0031]*	*[0.0000]*	*[0.0101]*	*[0.0011]*	*[0.2710]*
AR(2) p-value	*[0.274]*	*[0.775]*	*[0.712]*	*[0.350]*	*[0.604]*	*[0.277]*	*[0.392]*
Hansen Test							
Statistics	20.43	9.030	14.93	10.22	7.178	13.08	6.860
p-value	*[0.117]*	*[0.340]*	*[0.312]*	*[0.510]*	*[0.518]*	*[0.363]*	*[0.652]*

Dependent variable is ***DEMOC***. All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. ***Lagged DEMOC*** is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

Table 16: Economic Reforms Cause Democracy? – Measured by IPOLITY2

Model	3.(55)	3.(56)	3.(57)	3.(58)	3.(59)	3.(60)	3.(61)
Indep. Var	*GOVTC*	*TRANSFER*	*TAX*	*FREE TRADE*	*K_AC*	*CREDIT*	*LABOR*
Lagged indep. var	-0.3838**	-0.6020*	0.0297	0.6005**	0.2165	-0.0078	0.0794
	(0.1798)	(0.3503)	(0.0676)	(0.2507)	(0.1870)	(0.2554)	(0.1257)
Lagged IPOLITY2	0.8052***	0.4278**	0.7571***	0.5019***	0.5618***	0.6117***	0.4996*
	(0.0660)	(0.2152)	(0.1866)	(0.1157)	(0.1264)	(0.1869)	(0.2947)
Lagged ln(GDPPC)	-0.2968	0.1687	-0.0240	-0.4088	-0.3120	-0.1931	0.3378
	(0.2677)	(0.3146)	(0.2467)	(0.2733)	(0.2960)	(0.2313)	(0.2173)
Const	6.2434**	7.7301	2.1590	2.9407	4.8274**	4.6366***	1.1975
	(3.0699)	(5.1838)	(2.4705)	(2.7081)	(1.8964)	(1.7036)	(1.0634)
Obs/No. of cty	648/118	527/111	493/103	625/120	545/118	641/118	223/72
AR(1) p-value	*[0.0000]*	*[0.0838]*	*[0.0043]*	*[0.0002]*	*[0.0014]*	*[0.0104]*	*[0.3050]*
AR(2) p-value	*[0.844]*	*[0.374]*	*[0.941]*	*[0.875]*	*[0.410]*	*[0.649]*	*[0.384]*
Hansen Test							
Statistics	11.64	7.993	10.35	6.982	9.308	10.55	16.12
p-value	*[0.392]*	*[0.535]*	*[0.585]*	*[0.639]*	*[0.157]*	*[0.103]*	*[0.0644]*

Dependent variable is ***IPOLITY2***. All models include country fixed effect and period dummies. ***, ** and * denote significance levels at 1%, 5% and 10% respectively. ***Lagged IPOLITY2*** is treated as pre-determined, while other regressors are endogenous. Standard errors are in parenthesis and Windmeijer-corrected, robust for heteroskedasticity and autocorrelation. Instruments are transformed by orthogonal deviation and collapsed. Hansen test is used for overidentifying restrictions.

5 Conclusion

In this paper, we make progress towards understanding the role of political institutions, specifically democracy, in the development process. We intend to argue that economic reforms are more likely to be implemented in democracy. Also, we attempt to investigate empirically if there is any reverse causality of democracy from economic reforms. Unlike previous studies, which focus on the effect of democratic transition or regime change, we are interested in the marginal change in the political institution.

The causal relationship between democracies to economic reforms is not definite. Theories argue that democracy is more likely to cause liberalisation since reform measures are likely to benefit the majority of workers and thus gain political support in democracies. The empirical literature shows mixed results, however. In particular, these studies only focus on trade or financial liberalisation before and after a political regime switch.

To pursue our empirical investigation, we use various sub-indices from the Fraser Institute's Economic Freedom Index to explore economic reforms in four sectors:

i. fiscal sector,
ii. trade liberalization,
iii. financial liberalisation and,
iv. labour market regulation.

We use a dynamic GMM panel data estimator, which allows us to estimate the short-run causality between economic reforms and political institutions, as well as tackle the problem of endogeneity between the interested variables.

From our empirical results, we find that democracy does cause redistributive policies in the form of transfer and subsidy, trade liberalisation and credit market deregulation. The causal relationship is robust to different measures of democracy and the incorporation of additional covariates in the baseline specification. Moreover, the results still survive when we use non-high income sub-samples. Reciprocally, redistributive policies and trade liberalisation are also associated with democratisation. Nevertheless, credit market deregulation does not have such a causal effect.

Our results provide empirical support to the Sunde, et al. (2006)'s model, i.e. democracy is more redistributive. In return, redistributive policies provide feedback to strengthen the democratic institution. Also, trade and financial liberalisations are likely to associate with more choices of goods and services, fewer regulatory barriers and more competition. These effects, which are beneficial to most sectors, are more likely to win political support in a democracy.

An autocracy, on the other hand, maybe reluctant to liberalise since it may threaten the vested interest of the political elites. Trade liberalisation also causes democratisation. This is possibly due to the fact that trade liberalisation may speed up growth and introduce a more competitive environment. Economic development may provide more resources for redistribution and the pursuit of more political rights. These bilateral causal relationships between redistributive policies, trade liberalisation and democracy may also suggest progressive development from economic reforms to democracy and vice versa. We hope these empirical results may shed light on those liberalised economies with democratisation not yet taken place, for example, China. Our results arguably suggest that political institutions may inevitably have to change when reforms continue to march forward.

APPENDICES

A.1 Data Description and Sources

The following table intends to summarise the detailed description of the variables used in our study, which were briefly discussed in this paper, and hereby presented in alphabetical order.

Variable	Description	Source
ca_open	Index for openness to capital account transactions	Chinn and Ito (2006)
CREDIT	Index of credit market regulation, ranging from 0 to 10. Higher scores mean less credit market control.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
DEMOC	The Democracy indicator is an additive eleven-point scale (0-10). Democracy is conceived as three essential interdependent elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation.	Polity IV Project Marshall and Jaggers (2009)
EF	Index of economic freedom, ranging from 0 to 10. Higher scores mean more economic free.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
ER	Real exchange rate (against USD).	Penn World Table ver 6.2
fdi_gdp	Foreign direct investment (net) as percentage of GDP	WDI
FIN	*(see variable **fin_open**)*	
fin_open	Volume-based measure of international financial integration, calculated by the sum of stock of external assets and liabilities as percentage of GDP	Lane and Milesi-Ferretti (2006)
FREE TRADE	Index of freedom to trade internationally, ranging from 0 to 10. Higher scores mean more open to trade.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
gcon_gdp	Government consumption as percentage of GDP (%)	Penn World Table ver 6.2
GDPPC_gr	Growth rate of real GDP per capita (PPP-adjusted)	WDI

Variable	Description	Source
GOVTC	Index of government consumption spending as a percentage of total consumption, ranging from 0 to 10. Higher scores mean less government consumption.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
H	*Average years of Schooling of aged 15 or above*	Barro and Lee (2001)
IPOLITY2	Scale ranges from 0-10 where 0 is least democratic and 10 most democratic. Average of Freedom House's political rights and civil liberties indices and Polity IV's ***DEMOC*** (as defined above).	Teorell, *et al.* (2009)
K_AC	Index of international capital market controls, ranging from 0 to 10. Higher scores mean less capital market controls.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
KAOPEN	*(see variable **ca_open**)*	
LABOR	Index of labour market regulation, ranging from 0 to 10. Higher score means less labour market controls.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
LEGAL	The index ranges from 0-10 where 0 corresponds to 'no judicial independence', 'no trusted legal framework exists', 'no protection of intellectual property', 'military interference in rule of law', and 'no integrity of the legal system' and vice versa. The index consists of the following indicators: - Judicial independence: The judiciary is independent and not subject to interference by the government or parties in dispute - Impartial courts: A trusted legal framework exists for private businesses to challenge the legality of government actions or regulations - Protection of intellectual property - Military interference in rule of law and the political process - Integrity of the legal system	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
Lliab_gdp	Total liquid liabilities as percentage of GDP.	Beck, *et al.* (2009)
ln(GDPPC)	Natural log of GDP per capita.	WDI
ln(invest_gdp)	Investment as percentage of GDP (ln)	Penn World Table ver 6.2
ln(trade_gdp)	Total trade as percentage GDP (ln)	WDI
POP	Natural log of population.	WDI
pop_gr	Population growth rate	WDI
QOG	The mean value of the ICRG variables of "Corruption", "Law and Order" and "Bureaucracy Quality", scaled 0-1. Higher values indicate higher quality of government.	Teorell, *et al.* (2009)

Variable	Description	Source
REG	The index ranges from 0-10 where 0 is the most regulated. The index consists of the following indicators: - Credit Market Regulations: corresponds to 'low percentage of deposits held in privately owned banks', 'high foreign bank license denial rate', 'private sector's share of credit is close to the base-year-minimum', 'deposit and lending rates is fixed by the government and real rates is persistently negative'. - Labor Market Regulations: corresponds to 'high impact of minimum wage'. - Business Regulations: corresponds to 'widespread use of price controls throughout various sectors of the economy', and 'starting a new business is generally complicated'.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
SCHOOLING	Average schooling years in the total population aged 25 and over.	Barro and Lee (2001)
SM	The index ranges from 0-10 where 0 corresponds to 'high annual money growth', 'high variation in the annual rate of inflation', 'high inflation rate', and 'restricted foreign currency bank accounts' and vice versa. The index consists of the following indicators: - Average annual growth of the money supply in the last five years minus average annual growth of real GDP in the last ten years - Standard inflation variability in the last five years - Recent inflation rate - Freedom to own foreign currency bank accounts domestically and abroad	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
TAX	Index of top marginal tax rate, ranging from 0 to 10. Higher score means lower tax rates.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
TRANSFER	Index of transfer and subsidies as percentage of GDP, ranging from 0 to 10. Higher scores mean less transfer and subsidies.	Fraser Institute 's Economic Freedom of the World Report Gwartney, *et al.* (2008)
TRADE	Total trade (exports and imports) to GDP	WDI
XCONST	Constraint on Chief Executive. Index ranges from 0 – 10. Higher Score means more constraints, implying better protection of private property rights.	Polity IV Project Marshall and Jaggers (2009)

Table 17 : Descriptive Statistics of Institutional Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
DEMOC	1283	4.0748	4.1998	0	10
IPOLITY2	1193	5.5610	3.4911	0	10
EF	688	5.7346	1.1754	2.30	8.78
ln(GDPPC)	1254	7.5600	1.5562	4.03	10.85
GOVTC	934	6.1040	2.2231	0	10
TRANSFER	736	7.6944	2.2268	0	10
TAX	657	4.4072	3.0687	0	10
FREE TRADE	871	6.1158	1.6058	1.35	9.78
K_AC	852	3.3595	3.2159	0	10
CREIDT	938	6.2549	2.6917	0	10
LABOR	390	5.2107	1.4963	1.84	8.92
SCHOOLING	907	4.4722	2.9035	0.04	12.25
gcon_gdp	1320	22.5158	11.2597	2.97	76.14
ER	1496	653.25	16237.44	0	625218.5
POP	1571	15.1253	2.1114	9.91	20.99

Table 18 : Correlation Matrix of Institutional Variables

	DEMOC	***IPOLITY2***	***EF***	***ln(GDPPC)***	***GOVTC***	***TRANSFER***	***TAX***
DEMOC	1						
IPOLITY2	0.9715	1					
EF	0.4582	0.4867	1				
ln(GDPPC)	0.5557	0.5353	0.6229	1			
GOVTC	-0.1812	-0.1756	-0.1866	-0.4758	1		
TRANSFER	-0.5379	-0.5095	-0.2276	-0.5897	0.4276	1	
TAX	-0.1157	-0.1191	0.313	-0.0139	0.0997	0.3478	1
FREE TRADE	0.4669	0.4521	0.7742	0.6088	-0.3633	-0.3815	0.2061
K_AC	0.5266	0.5037	0.7026	0.5593	-0.1921	-0.3391	0.269
CREIDT	0.4809	0.5187	0.7536	0.4749	-0.1469	-0.1014	0.2895
LABOR	-0.0207	-0.0079	0.3288	-0.0011	0.0616	0.3601	0.3116
SCHOOLING	0.6391	0.6617	0.5936	0.8311	-0.3899	-0.6148	-0.0719
gcon_gdp	-0.1251	-0.0529	-0.2243	-0.2052	-0.2168	-0.0857	0.0094
ER	0.0303	0.0077	-0.0011	0.0089	0.0206	0.0325	0.0153
POP	0.1068	-0.0995	-0.1221	-0.1345	0.2145	-0.1117	-0.1576

	FREE TRADE	***K_AC***	***CREIDT***	***LABOR***	***SCHOOLING***	***gcon_gdp***	***ER***	***POP***
FREE TRADE	1							
K_AC	0.7597	1						
CREIDT	0.5699	0.5297	1					
LABOR	0.1132	0.2166	0.2674	1				
SCHOOLING	0.5916	0.5968	0.4057	0.2161	1			
gcon_gdp	-0.0692	-0.1446	-0.1301	-0.0142	-0.1137	1		
ER	0.0285	0.0326	0.0094	-0.0218	0.0009	-0.0158	1	
POP	-0.0897	0.014	-0.2005	-0.0797	0.0357	-0.3062	0.0489	1

A.2 List of Economies

Country Coverage of the Fraser Institute's Economic Freedom of the World

Albania	Denmark	Latvia	Romania
Algeria	Dominican Rep.	Lesotho	Russia
Angola	Ecuador	Lithuania	Rwanda
Argentina	Egypt	Luxembourg	Senegal
Armenia	El Salvador	Macedonia	Serbia
Australia	Estonia	Madagascar	Sierra Leone
Austria	Ethiopia	Malawi	Singapore
Azerbaijan	Fiji	Malaysia	Slovak Rep
Bahamas	Finland	Mali	Slovenia
Bahrain	France	Malta	South Africa
Bangladesh	Gabon	Mauritania	South Korea
Barbados	Georgia	Mauritius	Spain
Belgium	Germany	Mexico	Sri Lanka
Belize	Ghana	Moldova	Sweden
Benin	Greece	Mongolia	Switzerland
Bolivia	Guatemala	Montenegro	Syria
Bosnia and Herzegovina	Guinea-Bissau	Morocco	Taiwan
Botswana	Guyana	Mozambique	Tanzania
Brazil	Haiti	Myanmar	Thailand
Bulgaria	Honduras	Namibia	Togo
Burkina Faso	Hong Kong	Nepal	Trinidad & Tobago
Burundi	Hungary	Netherlands	Tunisia
Cameroon	Iceland	New Zealand	Turkey
Canada	India	Nicaragua	Uganda
Central Afr. Rep.	Indonesia	Niger	Ukraine
Chad	Iran	Nigeria	Unit. Arab Em.
Chile	Ireland	Norway	United Kingdom
China	Israel	Oman	United States
Colombia	Italy	Pakistan	Uruguay
Congo, Dem. R.	Jamaica	Panama	Venezuela
Congo, Rep. Of	Japan	Pap. New Guinea	Vietnam
Costa Rica	Jordan	Paraguay	Zambia
Cote d'Ivoire	Kazakhstan	Peru	Zimbabwe
Croatia	Kenya	Philippines	
Cyprus	Kuwait	Poland	
Czech Rep.	Kyrgyz Republic	Portugal	

Notes:
Economies are classified as all-time democracy (autocracy) if they continuously score 5 or above (less than 5) in ***DEMOC*** during the sample period.
Economies are classified as more democratic (autocratic) if they switched from autocracy (democracy) to democracy (autocracy) during the sample period, i.e. from scores of less than 5

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