

What drives liberal policies in developing countries?

Vatcharin Sirimaneetham

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Department of Economics
University of Bristol
8 Woodland Road
Bristol BS8 1TN

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Vatcharin Sirimaneetham[†]

Department of Economics, University of Bristol
8 Woodland Road, Bristol BS8 1TN, UK

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Abstract

This paper investigates why governments in some developing countries have adopted more liberal policies than others. To construct a composite policy index, the paper applies a robust principal components analysis to Washington Consensus policy variables. The paper shows that income growth is higher in countries with more liberal policies. Using a Bayesian approach which addresses the model uncertainty problem, this study finds that government policies are more liberal in countries which possess right-wing or centrist governments, have greater political stability, and are former Spanish colonies. In contrast, countries which are less ethnically diverse, are former French colonies, and have a military leader tend to implement less liberal policies.

JEL Classifications: C11, O11, O40

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[†]Email: V.Sirimaneetham@bristol.ac.uk

1 Introduction

Why have some developing countries adopted state-oriented policies while others have followed more liberal policies? Although a number of low-income countries have initiated liberalization programmes in recent decades, partly influenced by conditional loans from international financial institutions such as the World Bank and the IMF, the extent of economic freedom continues to vary significantly across countries.¹

Table 1 illustrates recent economic freedom levels in high and low-income countries. It first clearly shows, as expected, that various aspects of policy which influence economic freedom are more liberal in rich countries than in poorer countries. These policy areas include more open trade policy, fewer government regulations, and better protection of property rights. Table 1 also notes that the economic freedom gap between developed countries and developing countries with the most liberal policies is not large.² In contrast, the gap is considerably wider between developing countries with the most and the least liberal policies. Countries with more liberal policies also grow faster. The annual income per capita growth during 1970-2000 for the most liberal group is 3.73 percent, and 1.77 percent for the least liberal group. Figure 1 shows a partial scatter plot of growth in GDP per capita against a new liberal policy index that this paper derives, after controlling for the initial income level.

This paper seeks to explain why some developing countries had more liberal government policies than others during 1970-1999. Research on the determinants of economic freedom is not new. This paper contributes to the existing literature in at least two ways. First, I provide some evidence that a concept of economic freedom that the Fraser Institute and the Heritage

¹Throughout this paper, I use the terms liberal policy and economic freedom interchangeably. Higher economic freedom can be viewed as an outcome of the implementation of liberal policies or economic liberalization.

²In fact, the latter group performs better in some policy areas, such as the flexibility of employment regulation. Note that the figures for the most liberal, developing countries are derived from Singapore, Chile, South Korea, Cyprus and Uruguay. The figures for the least liberal countries are for Iran, Syria, Rwanda, Haiti and the Republic of Congo. These are the top five countries with the most and the least liberal policies, according to the newly constructed policy index. See section 5.2 for more details.

Foundation use to derive their widely used economic freedom indices appears to combine two different aspects of government policy together. These two aspects can be labelled as macroeconomic and development policies. This paper argues that, if our interest is in the measurement of economic freedom, only elements of development policy should be used. I derive a new composite index of liberal policy following this argument.

Second, whilst a range of variables have been proposed, the factors that influence economic liberalization in less developed countries remain unclear. Partly this is because many studies focus on a narrow set of possible explanations, while papers which examine a wider range of variables tend to suffer from model uncertainty problems. This paper adopts Bayesian methods to deal with this problem. This allows us to consider a much wider range of explanatory variables than previous research.

To construct a new composite index of liberal policy, I apply both classical and outlier-robust principal components analysis to a set of five different, but related, Washington Consensus policy indicators. These include trade reform, the promotion of foreign direct investment, privatization, deregulation, and the protection of private property rights. Using standard growth regressions, I then show that income per capita growth during 1970-1999 is positively associated with higher economic freedom, as measured by the new index. The size of the association is also notable. A one-standard-deviation increase in the policy index raises annual growth by 0.67-0.72 percentage points.

A model uncertainty problem is likely to prevail in our context because there are many variables which could potentially explain economic freedom, while there seems to be no established theories that guide how these variables may affect reform. My preferred experiment considers 45 candidate variables. Since the main focus is on a political economy approach, many of these explanatory variables are political variables, although I also investigate the roles of social and pre-determined factors such as media development and social heterogeneity.

The key findings of the paper are that government policies are more liberal in countries which are governed by right-wing or centrist political parties, have greater political stability, and are former Spanish colonies.

In contrast, countries which are less ethnically diverse, are former French colonies, and have a military leader tend to adopt less liberal policies. A one-standard-deviation change in these variables results in a 0.17-0.41 standard deviation change in the liberal policy index, so these effects are substantial.

The rest of the paper is organized as follows. Section 2 briefly reviews the literature on the determinants of economic freedom. Section 3 describes the proxies for Washington Consensus policy indicators and some key explanatory variables. Section 4 discusses the concept of Bayesian model averaging (BMA). Section 5 briefly explains principal components analysis and describes the construction of composite liberal policy indicators. Section 6 analyzes the growth effects of the liberal policy index. Section 7 presents the findings from BMA and then tests whether the independent variables suggested by BMA can explain economic liberalization in a more orthodox regression analysis. The final section concludes.

2 Related Literature

This section briefly reviews the literature on socio-political determinants of economic freedom. In the context of this paper, economic freedom refers to composite indices of economic freedom and five Washington Consensus policy aims including trade reform, the promotion of foreign direct investment, privatization, government deregulation, and property rights protection. It does not however cover a large literature on the relationship between these policies and income growth.³

A number of papers that search for determinants of economic freedom adopt indices of economic freedom proposed by the Fraser Institute (Gwart-

³For survey papers on the growth effects of trade openness, see Baldwin (2003), Berg and Krueger (2003), Winters (2004), Winters et al. (2004) and Santos-Paulino (2005). More recent articles include Wacziarg and Welch (2003), Dollar and Kraay (2004), Lee et al. (2004), Rruka (2004), Parikh and Stirbu (2004), Niyongabo (2004), Berggren and Jordahl (2005) and Rigobon and Rodrik (2005). Berggren (2003), De Haan (2003) and De Haan et al. (2006) provide surveys on the growth effects of economic freedom. More recent papers include Assane and Grammy (2003), Bengoa and Sanchez-Robles (2003), Feld and Voigt (2003), Cole (2003), Heitger (2003), Vega-Gordillo and Álvarez-Arce (2003), Lundström (2003), Hasan et al. (2003), Ulubasoglu and Doucouliagos (2004), Chang et al. (2005), Chheng (2005), Dawson (2005) and Rodrik et al. (2005). Finally, Cook and Uchida (2003) investigates growth effects of privatization in developing countries.

ney and Lawson, 2004) and the Heritage Foundation (Miles et al., 2004) as their dependent variable. The Fraser Institute's index has five sub-indices including government size, legal structure and property rights, access to sound money, freedom to exchange with foreigners, and regulation of credit, labour and business.⁴ The Heritage Foundation's index consists of ten sub-index scores including trade policy, fiscal burden, government intervention, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and informal market activity. This paper also uses some of these sub-indices. Section 3.1 discusses this in more detail.

De Vanssay et al. (2005) use several political variables to explain economic freedom in non-OECD countries, and show that government policies are less liberal in countries which use a proportional electoral rule, and are governed by a left-wing or centrist party. In contrast, limits on government terms in office and the absence of executive party special interests (such as nationalist and regional orientations) help to raise economic freedom. The type of political regime (parliamentary and presidential), political constraints, and whether the chief executive is from the military appear to have only limited explanatory power.

The effects of different types of political regime and electoral rule are however inconclusive. Mudambi et al. (2002) find that countries which adopt a presidential regime, use majoritarian electoral rule, and have fewer electoral districts enjoy higher economic freedom and are also more likely to implement liberalization programmes.⁵ In contrast, economic reform is more common under a parliamentary regime in Pitlik and Wirth (2003), while Panizza (2001) finds that countries which adopt a proportional electoral rule tend to reduce government regulation. These two studies also document the positive effect of stronger political constraints on economic freedom.

Another common finding is that government fragmentation, as measured, among others, by the number of parties in a coalition government and the

⁴De Haan et al. (2006) survey the determinants of the economic freedom index by the Fraser Institute.

⁵Economic freedom is measured by the Fraser Institute's index in 1995 while economic liberalization is the change in the index during 1990-1995.

share of government seats in total seats, appears to have no effect on the implementation of liberal policies (Pitlik and Wirth (2003) and Lora and Olivera (2004)).

Note that several of these political variables can be endogenous. For example, while a left-wing executive party generally implements state-oriented policies, parties with this ideology may gain less support in countries with more freedom. To avoid this endogeneity issue, La Porta et al. (1999) focus on pre-determined factors, and find that policies toward property rights, business regulations, and state-owned enterprises are more liberal in less ethnolinguistically fragmented countries. As expected, a socialist legal origin is linked with less liberal policies. The share of population with different religions is shown to have only limited explanatory power.

Whilst economic reforms in many developing countries are encouraged by the World Bank and the IMF, recent studies have shown that the influences of these institutions are less strong than generally believed. First, Boockmann and Dreher (2002) reveal that while countries with more World Bank projects exhibit more liberal policy, the amount of funding received from the Bank is negatively associated with economic freedom. They also discover no link between IMF activities and economic freedom. This result is consistent with Kobrin (2005), who shows that the presence of IMF obligations and the degree of democracy do not affect laws and regulations that promote foreign direct investment. Finally, WTO member countries do not have more open trade policy, although they seem to implement more liberal policy in general (Rose, 2004).

Research on economic freedom also emphasizes another two arguments. The first argument documents interdependence of political and economic freedom, and shows that political rights and civil liberties are positively associated with liberal policies (De Haan and Sturm (2003) and Lundström (2005)). The second argument contends that corruption is lower in countries with more liberal policies. De Mello and Sab (2002), Graeff and Mehlkop (2003), and Goel and Nelson (2005) provide supportive evidence. The timing of economic liberalization is crucial. Corruption is lower only when economic liberalization is implemented in rapid succession with democratization. When democratization lags behind economic liberalization, reform

tends to increase corruption (Tavares, 2005).

Now we turn to papers which aim to explain the Washington Consensus policy variables. First, Keefer and Knack (2002) show that more polarized countries experience worse property rights protection, where polarization is measured by ethnic tensions, income and land ownership inequality, and the share of the largest ethnic group in total population. Norton (1998) obtained similar results, and also notes that the share of Protestants (Muslims) in total population is linked with stronger (weaker) property rights protection. Finally, while property rights are generally less well maintained in autocratic countries, Clague et al. (1996) provide evidence that both mature autocratic and democratic regimes tend to have better property rights protection. This could be because secure autocrats are also concerned about future national income and tax revenues.

The extent of privatization is much influenced by characteristics of the government. In particular, we observe a positive effect of right-wing government and a detrimental role for military or authoritarian government (Bortolotta et al. (2003), Bortolotti and Siniscalco (2004), Banerjee and Rondinelli (2003), and Banerjee and Munger (2004)). Taken together, these papers also suggest that privatization is more common in countries that adopt plurality electoral rules, are less ethnically diverse, and are more democratic. Finally, a German legal origin, which is arguably more interventionist than common law, is associated with fewer privatizations, whilst income inequality and government fragmentation have no effect.

The evidence is more limited in a Latin American sample. The following factors have no link with the extent of privatization: degree of democracy, the executive party's ideology, the share won by leftists in elections, the effective number of parties, and whether the executive party holds a majority of seats in legislature (Biglaiser and Brown, 2003).

On the determinants of trade policy, Henisz and Mansfield (2004) find that trade policy becomes less liberal when macroeconomic conditions, particularly the unemployment rate and income growth, are worse.⁶ This may be due to pressure from domestic interest groups to adopt a more protective

⁶See Krishna and Gawande (2003) for a review of the political economy of trade policy.

policy, e.g. by raising import tariff rates. This pressure can however be offset by strong political constraints. Less open trade policy is also more common in more populous countries (Alesina and Wacziarg, 1998) and in more democratic countries in a sample of African countries (Ancharaz, 2003).

3 The Data

This section first discusses proxies for Washington Consensus policy variables. These variables will be used to construct a new liberal policy index in section 5.2. It then highlights some key independent variables that could potentially explain economic liberalization.

3.1 The Dependent Variables

To measure how liberal government policies are, I use 13 variables to proxy for five Washington Consensus policy aims, which can be considered as development policy elements. Recall that these five areas are trade reform, foreign direct investment promotion, privatization, deregulation, and property rights protection.⁷ The sample covers developing countries where the population size in 1970 was greater than 250,000 but excludes transition economies. The sample period is 1970-1999. Appendix Table 2 reports the correlations among these policy variables.

I adopt four variables to proxy for the extent of trade liberalization. The first two variables are the proportion of import duties in import values (*MDUTY*) from Yanikkaya (2003) and World Bank (2004), and the Sachs and Warner (1995) trade openness dummy (*SW*), which is updated by Wacziarg and Welch (2003). I use the mean values during 1970-1999

⁷Williamson (1990) and Fischer (2003) discuss the Washington Consensus in more detail. In total, the Consensus covers ten policy aims. The remaining five areas, which can be considered as macroeconomic policy elements, include fiscal discipline, interest rate liberalization, a competitive exchange rate, tax reform, and public expenditure prioritization. Using Bayesian methods, Sirimaneetham and Temple (2006) provide some evidence that a composite macroeconomic policy indicator (derived from the government budget surplus, the inflation rate, and proxies for a competitive exchange rate) is associated with higher income growth in developing countries, even after controlling for a range of institutional variables and other growth determinants. Sirimaneetham (2006) studies the determinants of volatility of all ten Consensus policy variables.

for each of these two variables. The next two variables are the mean tariff rate score (*TRADEFI*) from Gwartney and Lawson (2004) at the Fraser Institute, and the trade policy score (*TRADEHF*) from Miles et al. (2004) at the Heritage Foundation. *TRADEFI* is determined by mean tariff rate while *TRADEHF* considers both tariff and non-tariff barriers to international trade.⁸

The Fraser Institute score ranges from 1 to 10, where a higher value indicates a more liberal policy. During 1970-1999, the scores are available at five-year intervals from 1970 to 1995, so I use the mean values of these six observations. The Heritage Foundation score ranges from 1 to 5, where a higher value indicates a less liberal policy. The data are available annually from 1995, so I use the mean values during 1995-1999. The scores from both sources are derived from observed data and subjective assessments.

I use the capital flows and foreign investment score (*FDIHF*) to measure how much each country promotes foreign direct investment. This score considers factors such as restrictions on foreign ownership of business and land, restrictions on capital transactions, and equal treatment under the law for both foreign and domestic firms.

The extent of state-owned enterprises (SOEs) is proxied by three variables. The first two variables are the government enterprise and investment score (*SOEFI*), which measures the share of SOEs and government investment in total investment, and the government intervention score (*SOEHF*), which captures, among others, the share of government revenues from SOEs and state ownership of businesses in total revenues. The third variable is the share of central government employment in total employment (*GOVTEM*) from World Bank (2001).⁹

Next, I employ three variables to measure government regulations. The first measure is the simple average of three sub-index scores from the Heritage foundation, namely, the banking and finance score, the wages and prices score, and the regulation score (*REGHF*). The second measure is the

⁸Note that all score names ending with *FI* are from the Fraser Institute and those ending with *HF* are from the Heritage Foundation.

⁹A more direct measure for the extent of privatization would be the share of state-owned enterprises in total investment and output. World Bank (1995) provides these data but only for a limited number of developing countries.

regulation of credit, labour and business score (*REGFI*). The last variable is the regulatory quality score from Kaufmann et al. (2003) (*REGKKM*). Among others, these variables cover minimum wage laws, government price and interest rate controls, ownership of banks, the ease of obtaining a business license, and the efficiency of the tax collection system.

Finally, the degree to which property rights are protected is measured by the legal system and property rights score (*PROPMI*) and the property rights score (*PROPHF*). These variables reflect, for example, government expropriation risk of property, judicial independence, protection of intellectual property, and military interference in the rule of law.

3.2 The Independent Variables

This section describes some of the key independent variables. Appendix Table 6 provides descriptions and data sources for all independent variables.

Perhaps the most widely studied political variables are political regime types (presidential, *DIRCPRES*, and parliamentary, *PARLIA*) and electoral rules (plural, *PLURAL*, and proportional, *PROPOR*). These variables are taken from Beck et al. (2001). The literature survey in section 2 has shown that the effects of these variables have proved ambiguous in empirical work to date.

The effect of political constraints on economic liberalization is also less clear. Although some studies in the literature survey above find that stronger political constraints result in more liberal policies¹⁰, economic reform might be less likely where the constraints are very strong because the short-term costs of reforms, such as rising unemployment, can be high. The extent of political constraints (*POLCON*), from Henisz (2000), is considered stronger when there are many independent veto players (such as presidents and judiciary), those veto players are not aligned, and they exhibit different political ideologies.

A variable closely related to *POLCON* is the legislative index of electoral competitiveness (*LIEC*) (Beck et al., 2001). Higher values correspond to more intense competition in elections. For example, the maximum score

¹⁰See Panizza (2001), Pitlik and Wirth (2003), and Henisz and Mansfield (2004).

indicates that the largest party obtained less than 75 percent of total seats in the election while the minimum score indicates that there is no legislature.

The concept of political constraints highlights the importance of differences in political ideology across political agents (*WINGDIFF*). This is measured by the maximum difference between the executive party's political ideology and the four principal parties of the legislature (the three largest government parties and the largest opposition party). In this paper, political ideology has three classifications: right-wing (*RGHTWING*), left-wing (*LEFTWING*) and centrist (*CNTRWING*). Right-wing parties can be labelled as conservative, and in general adopt liberal, market-based policies. Left-wing parties can be labelled as communist, socialist or social democratic parties, and would typically believe in state-based policies. Finally, centrist parties are those that adopt both right- and left-wing policies, e.g. promoting private enterprises but also social liberalism. These political ideology variables are taken from Beck et al. (2001).

When the constitution allows the government to serve additional terms in the office (and each term has a finite length), this should act as an incentive for the government to implement more effective policies in order to attract more votes in the next election. I refer to this as the re-electability incentive (*FIMUTERM*). In contrast, when the threat of changes in government is persistent, the quality of policy may be poorer because the government is unlikely to face the consequences of bad policies. I measure government instability by two pairs of variables. The first pair, from Beck et al. (2001), measures the actual changes in executives and executive parties during 1975-1999 (*EXECHG* and *PARTYCHG*). The second pair, from Feng (1997) and Feng et al. (2000), measure probabilities of changes in the government (*PROBIRCH* and *PROBMJCH*).¹¹ *PROBIRCH* predicts unconstitutional, irregular changes such as those result from coups, while *PROBMJCH* predicts constitutional, major changes such as changes in leadership.

On a wider scale, I measure political stability (*POLSTAB*) by the variable introduced in Kaufmann et al. (2003). This composite index covers

¹¹These probabilities are derived from a logit model, and depend on various factors such as past macroeconomic performance and political disorder.

events such as political protests, coups, riots, civil wars, and ethnic and religious-based tensions. The alternative proxies for *POLSTAB* are two new variables which I construct from a principal components analysis. The first of these is violent unrest (*VIUNREST*), which measures assassinations, guerilla warfare, government crises, purges, revolutions, coups, and riots. A measure of non-violent unrest (*NVUNREST*) reflects general strikes and antigovernment demonstrations.¹² I use data from De Mesquita et al. (2003).

In measuring the degree of democracy, I use the Polity score (*POLITY*) by Marshall and Jaggers (2002). The score is obtained by subtracting an autocracy score from a democracy score, and this depends on factors such as political constraints and competitiveness of political participation. In democratic societies, a transparent, corruption-free election should typically result in a more efficient government being elected. Beck et al. (2001) provide a dummy variable indicating the presence of election fraud, such that the outcome is not reliable (*FRAUDELE*).

In a society where citizens are concerned with public affairs, the government should be less likely to implement a severely harmful policy. I proxy how active political participation is by voter turnout (*TURNOUT*) (Pintor et al., 2002). But such interest in politics may be more beneficial when the mass media is sufficiently developed. When the media is more developed, voters are better informed about their government's performance, and politicians are more likely to be held accountable for their actions. I construct a measure of media development (*MEDIADEV*) from a principal components analysis which includes the number of television sets, radios, and daily newspaper circulation during 1970-1999.¹³

An important set of historical variables are three proxies for the determinants of the quality of current institutions (Acemoglu et al. (2001) and

¹²See section 5.1 for a brief discussion of principal components analysis. $VIUNREST = 0.360*assassinations + 0.316*purges + 0.466*revolutions + 0.235*coups + 0.308*riots + 0.422*government\ crises + 0.475*guerilla\ warfare$. The first principal component explains nearly 40 percent of the total variation in the data. $NVUNREST = 0.707*general\ strikes + 0.707*antigovernment\ demonstrations$.

¹³ $MEDIADEV = 0.572*television\ set + 0.577*radio + 0.583*newspaper$. The first principal component explains 84 percent of the total variation in the data.

Hall and Jones (1999)). These are the proportion of population that speak European languages (*EURFRAC*), the mortality rates of European settlers between the 17th and 19th centuries (*MORTAL*), and the proportion of the population that was of European descent in 1900 (*EUR1900*).

Finally, I also test the effects of geographic variables on economic freedom. The relevant variables are land area (*AREAKM2*), latitude (*LATILLSV*), the proportion of land area with a tropical climate (*TROPICAR*), minimum distance to a major market (*LMINDIST*), a dummy for landlocked countries (*LANDLOCK*), and a dummy specifying that a country is an exporter of point-source natural resources such as oil and diamonds (*RESPOINT*) (Isham et al., 2005).

4 Bayesian Model Averaging

Even when the main focus is on a political economy approach, one can imagine that there are many variables that could potentially explain why some governments adopt more liberal policies than others. There also appears to be no established theories that guide how these variables affect liberal policies. This suggests that the model uncertainty problem is likely to prevail in our context.

This section briefly discusses a Bayesian model averaging (BMA) approach. It follows closely the discussions in Raftery (1995), Raftery et al. (1997), and Malik and Temple (2005). BMA reduces model uncertainty by taking into account many possible models. A standard Bayesian principle can be expressed as:

$$\Pr(\Delta \mid D) = \sum_{k=1}^K \Pr(\Delta \mid M_k, D) \Pr(M_k \mid D) \quad (1)$$

where Δ is a parameter of interest, $\Pr(\Delta \mid D)$ is the posterior distribution of Δ given the data D , and M_1, M_2, \dots, M_K denote models. Equation (1) suggests that the density of the parameter Δ given the data D is the weighted average of the posterior distributions of Δ under each model, $\Pr(\Delta \mid M_k, D)$, where the weights reflect the corresponding posterior model probability (PMP), $\Pr(M_k \mid D)$.

The PMP is the probability that model M_k generates the data D , and can be computed by Bayes' theorem:

$$\Pr(M_k | D) = \frac{\Pr(D | M_k) \Pr(M_k)}{\sum_{\ell=1}^K \Pr(D | M_\ell) \Pr(M_\ell)} \quad (2)$$

where

$$\Pr(D | M_k) = \int \Pr(D | \theta_k, M_k) \Pr(\theta_k | M_k) d\theta_k \quad (3)$$

$\Pr(D | M_k)$ is the marginal likelihood of the data given M_k , θ_k is the vector of parameters of model M_k , $\Pr(D | \theta_k, M_k)$ is the likelihood of θ_k under model M_k , $\Pr(\theta_k | M_k)$ is the prior density of θ_k under model M_k , and $\Pr(M_k)$ is the prior probability that M_k is the true model. Without reliable prior information, it is assumed that each model has an equal prior probability of being the true model, so that $\Pr(M_1) = \Pr(M_2) = \dots = \Pr(M_K) = 1/K$. It should also be noted that the sum of all PMPs equals one, $\sum_{\ell=1}^K \Pr(M_\ell | D) = 1$.

In a simplified, two-model case, the predictive ability of the models is represented by the posterior odds (for M_2 against M_1), which can be written as:

$$\frac{\Pr(M_2 | D)}{\Pr(M_1 | D)} = \frac{\Pr(D | M_2)}{\Pr(D | M_1)} \frac{\Pr(M_2)}{\Pr(M_1)} \quad (4)$$

The first term on the right-hand side of equation (4) is called the Bayes factor for M_2 against M_1 , denoted by B_{21} . Here, the posterior odds depend only on the Bayes factor because $\Pr(M_1) = \Pr(M_2) = 0.5$. When $B_{21} > 1$, M_2 has better predictive ability than M_1 .

When there are many possible models, calculating the integral in equation (3) is computationally intensive. One solution is to use the Bayesian Information Criterion (*BIC*) to approximate the Bayes factors. For a linear regression with normal errors, the *BIC* of model M_k takes the following form:

$$BIC'_k = n \log(1 - R_k^2) + q_k \log n \quad (5)$$

where n is the sample size, R_k^2 is the R^2 value for model M_k , and q_k is the number of independent variables (excluding the intercept). Essentially, BIC'_k assesses how well M_k can predict the data, given its number of explanatory variables. A model with a higher R^2 and fewer parameters (which results in a lower BIC' value) is regarded as a better model by the BIC approximation.

An approximation, as in Raftery (1995) and Sala-i-Martin et al. (2004), suggests that $\Pr(D | M_k) \propto \exp(-0.5BIC'_k)$, and hence equation (2) can be re-written as:

$$\Pr(M_k | D) \approx \frac{\exp(-0.5BIC'_k)}{\sum_{\ell=1}^K \exp(-0.5BIC'_\ell)} \quad (6)$$

With many possible models, estimating every single model is not feasible because the number of terms in equation (1) will be huge. In this case there may be as many as 45 independent variables, so there are 2^{45} models to estimate. This is over 35 thousand billion models. One solution is Occam's Window due to Madigan and Raftery (1994). This paper uses a symmetric version of Occam's Window, where it excludes models that can predict the data much less well than the best model (the model with the highest PMP).¹⁴

A search algorithm is needed to find good subsets of all models, and place these models in Occam's Window. The search algorithm that is adopted here is a branch-and-bounds search algorithm. To perform a BMA exercise, I use the *bicreg* software which implements the Occam's Window algorithm for linear regression using the BIC approximation to Bayes factors.¹⁵

In addition to the Occam's Window approach, I also experimented with a Markov chain Monte Carlo model composition (MC^3) approach as a robustness check (Hoeting et al., 1996). MC^3 uses a Markov chain Monte Carlo method to approximate all models in equation (1). The results are generally more outlier-robust than those from the Occam's Window approach. The *MC3.REG* software is used to perform this task.¹⁶

¹⁴More specifically, I drop all models whose PMP is only 1/100 or less that of the best model. The strict version of Occam's Window also excludes models that predict the data worse than their smaller submodels.

¹⁵The software is written by Adrian Raftery and revised by Chris Volinsky.

¹⁶The software is written by Jennifer Hoeting with the assistance of Gary Gadbury.

One important statistic is the posterior inclusion probability (PIP), defined as the probability that the coefficient of an independent variable is not equal to zero, $\Pr(\beta_i \neq 0 \mid D)$. It is calculated by summing the PMPs across models where $\Pr(\beta_i \neq 0 \mid D)$. Hence, variables with high PIP values are those that appear in many models or appear in models with high PMP values.

Finally, it should be noted that the *bicreg* software cannot be applied where data on some variables are missing. I thus employed a simple imputation method, which predicts missing data from a given set of independent variables by a best-subset regression. A best-subset regression finds subsets of independent variables that best predict responses on a dependent variable. Even though up to 55 independent variables need imputation, the proportion of imputed data in the main data set is only 1.28 percent of the total number of cells. Appendix Table 7 provides more detail on variable imputation.

5 Measuring Liberal Policy

This section first briefly discusses methods of classical and outlier-robust principal components. Using these approaches, section 5.2 explains how the composite liberal policy indices are constructed.

5.1 Principal Components Analysis

I use a principal components analysis (PCA) to construct the composite index of liberal policy. PCA takes n specific variables (in this case, policy variables) and yields principal components P_1, P_2, \dots, P_n that are mutually uncorrelated. Each principal component is a linear, weighted combination of n specific variables X_1, X_2, \dots, X_n or more formally $P = \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_n X_n$ where α 's are component loadings.

The first principal component, P_1 , has the maximum variance for any possible weights, subject to the sum-of-squares normalization that $\alpha' \alpha = 1$.

Both the *bicreg* and *MC3.REG* routines were originally written in the S-Plus language and were modified for the R language by Ian Painter.

Thus, P_1 always accounts for the largest proportion of the variance in the data.

The method of principal components is a data reduction method because much of the total variance in the data can generally be accounted for by the first few principal components. I use only the first principal component to represent the liberal policy index. Because the measurement units differ across the proxies for the policy variables, the correlation matrix is used for the analysis. This makes component loadings comparable, and means the weights are determined independently of the measurement scales.

Note that the analysis based on a classical PCA can be sensitive to outlying observations. This is because its aim is to maximize the variance given the covariance (or correlation) matrix, and both the variance and the covariance matrix can be highly influenced by outliers. A preferred method is therefore a outlier-robust PCA as introduced in Hubert et al. (2005).

A robust PCA finds h observations out of the whole data set of n observations whose covariance matrix has the smallest determinant. This covariance matrix is used to derive robust principal components. I use the default choice $h = 0.75n$, which drops 25 percent of the most outlying data points. The degree of outlyingness assigned to each observation is based on the minimum covariance determinant (MCD) estimator. When the number of n (and therefore h) is large, a robust PCA uses an approximate algorithm as in Rousseeuw and Driessen (1999) to find the h observations.

A principal component from a robust PCA can be written as $P_{robust} = \alpha_1 X'_1 + \alpha_2 X'_2 + \dots + \alpha_n X'_n$ where X' 's are the original data adjusted by their robust centre using a robust estimate of their location. This is performed by the *robpca* software written in the S-Plus language.¹⁷

5.2 Constructing Composite Liberal Policy Index

This section shows how the new composite liberal policy index is derived. Recall that I construct this index by applying a principal components analysis (PCA) to a set of the Washington Consensus policy variables. The emphasis will be on the results obtained from a robust PCA rather than a

¹⁷The software is written by Jan Wijfels and adapted by Karlien Vanden Branden.

classical PCA.

The above literature survey has shown that the economic freedom indices from the Fraser Institute and the Heritage Foundation capture both macroeconomic aspects (such as fiscal and monetary policies) and development aspects (such as regulation and property rights) of government policy. This section will show that macroeconomic and development policies are two different dimensions of government policy. If our aim is to measure economic freedom or how liberal government policies are, rather than how well the government manages macroeconomic conditions, the emphasis should be on development policy rather than macroeconomic policy.

To demonstrate this, I applied the principal components analysis to 23 proxies for the ten Washington Consensus policy aims. I also add the inflation rate into this list. As Table 2 illustrates, the top five policy aims and the inflation rate can be considered as macroeconomic elements, and the bottom five as development elements. Here, it suffices to note that the proxies of macroeconomic elements include central government budget surplus (*SURPLUS*), central government debt (*DEBT*), the real interest rate (*REALI*), black market premium (*BMP*), an currency overvaluation index (*OVERVALU*), the variability of *OVERVALU* (*ERATE*), the share of educational and health spending in total public expenditure (*EDU* and *HEALTH*), and marginal tax rate score (*MARTAXFI*).¹⁸ Sirimaneetham and Temple (2006) describe these variables in greater detail.

The robust results in column (1) shows that seven out of ten proxies for the macroeconomic elements are more correlated with the second principal component (PC) than the first PC. In contrast, ten out of 13 proxies for the development elements are more correlated with the first PC than the second PC. These results suggest that while the second PC tends to represent government effectiveness in managing macroeconomic conditions such as public debt, the price level, and the real exchange rate, the second PC appears to capture the extent of government roles on economic activities

¹⁸Although it is arguable that *EDU*, *HEALTH* and *MARTAXFI* represent social policy rather than macroeconomic policy, the key idea here is to show that development policy is one distinctive dimension of government policy, which should be analyzed separately.

(such as public enterprises) and transactions (such as import tariffs and regulations).

In column (2), the sample size increases considerably when I drop four variables which are available for a lower number of countries. The findings are similar to those in column (1), although the robust results for the macroeconomic elements are less clear-cut. Overall, these results indicate that macroeconomic and development policies are two distinctive types of policy, and it is perhaps more sensible to use only development policy as a proxy for liberal policies or economic freedom.¹⁹

Table 3 illustrates the construction of the new liberal policy index. I begin by including all proxies for the development elements into a single model, as shown in column (1). The results are promising. Apart from *GOVTEM*, all other policy variables are correlated with the first PC with the expected signs. This first PC explains over 45 percent of the total variation in the data.

To increase the sample size, column (2) drops *TRADEFI* and *GOVTEM*, which are available for fewer countries. It shows that, apart from *PROPMI*, all other policy variables are more associated with the first PC than the second PC, and with the correct signs. The first PC explains nearly 55 percent of the total variation in the data. These results suggest that, in our context, a single measure (the first PC) can be used to measure economic freedom.

The robust liberal policy index, *RLIBERAL*, therefore consists of 11 variables, and can be written as:

$$\begin{aligned}
 RLIBERAL = & -0.184 * MDUTY' + 0.331 * SW' - 0.335 * & (7) \\
 & TRADEHF' - 0.309 * FDIHF' + 0.261 * SOEFI' \\
 & -0.269 * SOEHF' + 0.405 * REGKKM' + 0.250 * \\
 & REGFI' - 0.337 * REGHF' + 0.227 * PROPMI' \\
 & -0.342 * PROPHF'
 \end{aligned}$$

¹⁹Caudill et al. (2000) and Álvarez-Arce and Vega-Gordillo (2005) provide closely related arguments. Heckelman and Stroup (2005) also note that when different aggregation methods are used to aggregate sub-index scores into an overall score (such as simple averaging and principal components analysis), the rankings of overall economic freedom indices can be significantly different.

where the \prime on the policy variables indicates that each has been centred using a robust estimate of its location. The component loadings or weights are comparable across variables, as they are derived from the correlation matrix. A higher *RLIBERAL* value indicates a more liberal policy.

It is worth noting that the decision to drop *TRADEFI* and *GOVTEM* in column (1) and the use of robust rather than classical scores in column (2) are unlikely to affect the results in a meaningful way. The simple correlations between *RLIBERAL* and the robust scores obtained from column (1) with 13 policy variables, and between *RLIBERAL* and the index from the classical scores in column (2), *CLIBERAL*, are both over 0.99.²⁰

According to this new index, which is available for 68 developing countries, the top five countries with the most liberal policies during 1970-1999 were Singapore, Chile, South Korea, Cyprus and Uruguay. In contrast, government policies were state-oriented in Iran, Syria, Rwanda, Haiti and the Republic of Congo.

The correlations between *RLIBERAL* and the economic freedom indices from the Heritage Foundation and the Fraser Institute are high (0.95 and 0.56 in absolute terms, respectively). This is not surprising, given that many elements of *RLIBERAL* are from these two sources. But it is important to note that, unlike the two economic freedom indices, the new index does not include macroeconomic policy variables.

6 Liberal Policy and Growth Regressions

This section empirically tests the growth effects of the liberal policy index (*RLIBERAL*). The growth regression specification that I use is based on Mankiw et al. (1992). The dependent variable is defined as the log difference in GDP per capita between 1970 and 1999. The explanatory variables include the log of GDP per capita in 1970, the log of the average investment share in GDP, the log of population growth adjusted by the capital depreciation rate (0.05), a measure of educational attainment in

²⁰ $CLIBERAL = -0.194 * MDUTY + 0.323 * SW - 0.339 * TRADEHF - 0.332 * FDIHF + 0.251 * SOEFI - 0.239 * SOEHF + 0.394 * REGKKM + 0.257 * REGFI - 0.356 * REGHF + 0.204 * PROPFI - 0.350 * PROPHF$

1970, and regional dummies.

Column (1) in Table 4 shows that, without any other explanatory variables, *RLIBERAL* has a positive relationship with growth and this is significant at the 1 percent level. The liberal policy index alone explains about 15 percent of the total variation in growth rates. Column (2) adds the standard growth determinants while column (3) further adds the regional dummies. *RLIBERAL* remains significant at the 5 percent level. The strength of the association is sizeable. In column (3), a one-standard-deviation increase in *RLIBERAL* (from Brazil to Thailand's level) raises growth by 0.72 percentage points. Over the 30-year period, this translates into a 23 percent increase in income per capita.

In column (4), I exclude the investment variable, and show that the size of the growth effect of *RLIBERAL* increases. This suggests that more liberal policy partly contributes to higher growth by raising the share of investment in GDP.²¹

These results are not sensitive to the deletion of outlying observations, as detected by median or least absolute deviation (LAD) regression²², DFIT, DFBETA, and added-variable plots.²³ Diagnostic tests do not indicate any problems with omitted structure and functional form (from Ramsey's regression specification error test) and heteroskedasticity (from the Breusch-Pagan and White tests).

7 Explaining Liberal Policy

This section searches for the determinants of liberal policy. It first uses a Bayesian model averaging (BMA) approach to evaluate sets of possible independent variables. Section 7.2 then uses the sets of variables that are

²¹This finding is however not confirmed in regressions that directly test the effects of *RLIBERAL* on investment. Countries with more liberal policies do not seem to have higher shares of total and private investment in output during 1970-1999. The results are available upon request.

²²Outlying observations are defined as countries whose residuals are greater (less) than the mean value of all residuals plus (minus) two times standard deviation of that country's residual.

²³The results are available upon request. Cook and Uchida (2003, p. 153-54) briefly explain how DFITS and DFBETA are computed and used.

suggested by BMA in regressions that aim to explain *RLIBERAL*.

7.1 BMA Results

This section describes how the BMA exercise is performed. It suggests two lists of explanatory variables that form the best models in two different approaches. I start in column (1) of Table 5 by including 40 main independent variables. Most of these are political and social variables, which tend to have a clearer interpretation as to how they affect economic freedom than pre-determined factors such as geographical variables. In this paper, only variables with a posterior inclusion probability (PIP) value of 0.20 and over are considered important.

The first column suggests 11 variables with a PIP over 0.20, while (+) and (-) indicate the directions of the relationship between each variable and *RLIBERAL*.²⁴ These results are not sensitive to various alternative proxies.²⁵ One unrobust case is when the political stability variable (*POLSTAB*) is replaced by political violence variables from Vu Le (2001, *VULESPI*, *VULESPI1* and *VULESPI2*) and by two new political unrest variables (*NVUNREST* and *VIUNREST*). Unlike *POLSTAB*, these variables have low PIP values. One possible explanation might be that while *POLSTAB* captures wide-scale social and political disorders, the alternative proxies only focus on political violence.²⁶

²⁴In another experiment, I also included the shares of population with different religions. These variables however have low PIP values.

²⁵This includes (1) replace *POLITY* with the degree of democracy variables from Reich (2002, *REICEDEM*) and Golder (2004, *GOLDERDE*). (2) Replace *POLCON* with the share of government seats in total seats (*MAJORITY*), the Herfindahl index of government seat shares (*HERFGOV*), the chance that two randomly selected deputies will be from different parties (*GOVFRAC*), a dummy showing if the executive party controls all houses with lawmaking powers (*ALLHOUSE*), and the share of veto players who drop from the government (*STABS*). These variables are from Beck et al. (2001). I also tried the executive constraints variable from Marshall and Jaggers (2002, *XCONST*). (3) Replace *MEDIADEV* with an index of press freedom by Karlekar (2004, *FREEPRES*). (4) Replace *FRUADELE* with the score of free and fair elections by Coppedge and Reinicke (1990, *POLYARC*) and a variable that measures the universal application voting right by Paxton et al. (2003, *SUFFRAGE*). (5) Replace ethnic fragmentation (*ETHNFRAC*) with linguistic (*LINGFRAC*) and religious (*RELIFRAC*) fragmentation.

²⁶Another fragile case is when *POLCON* is replaced by the strength of political checks and balances system score from Beck et al. (2001, *CHECKS*). Unlike *POLCON*,

One can imagine that some of the independent variables in column (1) may affect liberal policy through changes in the degree of political instability. For example, more ethnically homogeneous societies may experience less social disorder, which, according to the results above, leads to more liberal policy. An inclusion of variables which measure severe disorder might therefore reduce the explanatory power of other variables. To test this argument, column (2) drops three variables including political stability (*POLSTAB*), adverse regime changes (*ADREGCHG*), and the probability of unlawful changes in the government (*PROBIRCH*). The results in column (1) do not seem to change significantly.²⁷

Column (3) adds five regional dummies while column (4) adds two historical variables and eight geographic variables into column (1).²⁸ In total, column (4), which is the preferred set of results, suggests 14 variables with PIPs over 0.20. Among others, it reveals that economic freedom is higher in countries which experience less social and political disorder, exhibit higher government stability, and where their government believes in market-oriented policy. In contrast, countries which are less ethnically diverse, have a military officer as head of state, and where corruption is widespread, adopt less liberal policies.

The results also highlight the important roles of historical and geographical variables. In particular, economic liberalization is more common in former Spanish colonies than in their French counterparts. Countries with a smaller proportion of tropical land area, and countries which are further away from a major world market also experience lower economic freedom.

To check the robustness of these results from the *bicreg* approach, I applied a MC^3 approach to column (4). The results are shown in column

CHECKS has a high PIP value with a negative sign. *CHECKS* however lacks explanatory power when added into a later regression that explains *RLIBERAL* (column (2) of Table 8).

²⁷This finding remains unchanged when dropping only *POLSTAB*, which has a high PIP value in column (1).

²⁸In another experiment, I also included two additional historical variables (setter mortality rate, *MORTAL*, and European settlers, *EURO1900*) into column (4). These variables however reduce the sample size significantly. Note also that although the *bicreg* software for R can handle up to 49 variables in a single model, the maximum number of variables I use is 45 variables to allow for a manageable computation time. As a result, column (4) drops ten variables with low PIP values in column (3).

(4.1). An important software limitation here is that the number of variables that can be included in a MC^3 exercise must not be greater than half of the number of observations. Hence, only the top 30 variables with the highest PIP values in column (4) are used. Similar to the *bicreg* case, variables with posterior probabilities of 0.20 or greater are considered important and are in bold.

This robustness test indicates that the results from the *bicreg* approach are not excessively influenced by outlying observations. In column (4.1), nine out of 14 variables with high PIP values in column (4) are suggested by the MC^3 approach. Moreover, we can see that most of the variables with very high PIP values in column (1) remain important across all experiments.

It is interesting to note that some key political variables, such as political constraints and the types of political regime and electoral rule, have only limited influence on economic freedom. In addition, the roles of a nationalist executive party, media development, and trade openness, which have high PIP values in column (1), disappear once regional dummies and pre-determined factors are controlled for.

Table 6 displays the structure of the top ten models, ranked by their posterior model probability (PMP) values, from column (4) in Table 5. It shows that the best model from the *bicreg* approach consists of 11 variables. These variables will form the baseline model in the next section. The PMP value of the best model is nearly 0.05, compared with the prior probability, considering that there are 2^{45} possible models to estimate, of 2.8×10^{-14} . Table 7 shows the top ten models obtained from the MC^3 approach from column (4.1) in Table 5. The best model has nine variables, where six of these also appear in the best model from the *bicreg* method.

7.2 Regression Results

This section uses a regression analysis to estimate the roles of the variables in the best models in Tables 6 and 7 in explaining *RLIBERAL*. Column (1) in Table 8 contains 11 variables that form the best model from the *bicreg* approach. It shows that all variables, except tropical land area, have a significant relationship with *RLIBERAL* at the 5 percent level. Taken

together, these variables explain about 85 percent of the total variation in the data.

Column (2) adds regional dummies and the initial income level and population size as control variables. The results emphasize the importance of political executives in pursuing liberalization programmes. More specifically, while right- and centrist-wing executive parties tend to adopt market-based policies, countries that are led by a military officer have typically followed state-oriented policies more often. Social conditions are also influential. Societies that possess higher political stability, have lower corruption, and are more ethnically diverse tend to have more liberal policy. Finally, former Spanish colonies seem to enjoy higher economic freedom.

The finding that ethnic fragmentation (*ETHNFRAC*) leads to higher economic freedom is rather surprising.²⁹ Existing research, at least since Easterly and Levine (1997), has generally suggested that ethnic divisions lead to lower income growth and less effective policies.³⁰ In our context, Alesina et al. (2003) show that *ETHNFRAC* has no effect on two elements of the liberal policy index, *PROPHF* and *REGHF*. In addition, while *ETHNFRAC* is negatively associated with *SOEFI* at the 10 percent level, this relationship disappears in models which also control for population size and regional dummies.³¹ One possible explanation for the positive effect of ethnic diversity is that governments in ethnically diverse societies may prefer market-based policies to state-oriented policies since the latter are potentially more divisive by favouring certain ethnic groups.

Column (3) is used to investigate whether the negative association between corruption (*CORRUPT*) and *RLIBERAL* might be influenced by outlying observations. *CORRUPT* becomes significant only at the 10 level

²⁹I also tested for a non-linear effect of *ETHNFRAC* by adding its squared terms into column (2). The result is unclear, since although the squared term is significant at the 5 percent level, the linear term is no longer significant.

³⁰See, for example, La Porta et al. (1999). The detrimental effect of ethnic heterogeneity can however be mitigated in democratic countries (Collier, 2000) and in countries which possess good quality institutions (Easterly, 2001). Alesina and La Ferrara (2005) provide a recent survey on ethnic diversity.

³¹They also document that religious diversity (*RELIFRAC*) leads to more liberal policies in terms of *PROPHF* and *REGGHF*. Linguistic fragmentation (*LINGFRAC*) has no effect on *PROPHF*, *REGHF* and *SOEFI*.

when excluding outliers suggested by the median regression method. It is no longer significant when dropping outliers from the DFIT method (results not shown).³²

Column (4) contains nine variables that form the best model from the MC^3 approach. Column (5) adds control variables into column (4). It can be seen that six of these nine variables also appear in columns (1) to (3), and the overall results are very similar to those discussed above. One additional finding is that liberal policy is less likely in former French colonies. These results are robust to the deletion of outlying observations.³³

While it is well known that an English colonization legacy is more liberal than the French approach³⁴, it is less clear why economic freedom is higher in former Spanish colonies than in former French colonies. Partly this is because Spain's legal origin is based on French civil law, so the effects of different legal traditions play no role here. Spanish and French colonization strategies were also similar in various aspects, such as centralization of power and restricted trade policy (Grier, 1999).³⁵

The strength of association between these explanatory variables and the liberal policy index are displayed at the bottom panel of Table 8. Each "beta" value indicates the size of the change in *RLIBERAL* (in terms of its standard deviation) given a one-standard-deviation change in the independent variable. For example, based on the estimates in column (2), a one-standard-deviation increase in *POLSTAB* (from Philippines to Malaysia's

³²The outliers from the median regression method are Kenya, Syria, Uganda and Zambia, and those from the DFIT method are Colombia, Sri Lanka, Syria and Uganda.

³³In addition to the DFIT and median regression methods, this also includes dropping Sri Lanka and Syria, the potential outliers suggested by the MC^3 approach.

³⁴Compared to the French, the English gave more authority to local governments in colonized territories, allowed freer international trade, and provided better education to local people (Grier, 1999). La Porta et al. (1999) also note that while English common law aims to protect citizens from the power of state, French civil law is designed to extend such power. We can therefore expect better property rights protection in former British colonies. Bortolotti and Siniscalco (2004) also find that the size of state-owned enterprises in an economy is larger in civil law countries than in common law countries.

³⁵Between the two, Grier (1999) notes that the Spanish had more restricted trade policy than the French by establishing a mercantilist trade system, which allowed colonies to trade only with Spain. Acemoglu et al. (2001) also document the exploitative colonization strategy adopted by the Spanish (and the Portuguese). For example, the main objective of colonization was to obtain valuable resources such as gold from America.

level) raises *RLIBERAL* by 0.24 of a standard deviation (from Brazil to Malaysia's level).

It has so far been shown that economic freedom is associated with several social and political variables. The directions of the relevant causal effects are however not always clear. It is not hard to imagine that changes in economic freedom levels can also affect some of the explanatory variables above. For instance, while political instability tends to disrupt economic reform, a government's decision to privatize state-owned enterprises or to raise import tariffs in some sectors may lead to antigovernment demonstrations by adversely affected groups, and therefore higher political instability in general. Although an ability to develop causal relationships is important, it is rather difficult to find a convincing set of instrument variables.

In relation to the existing literature, three conclusions can be drawn from this section. First, consistent with several studies, I find that the characteristics of the political executive (right-wing governments and military or authoritarian governments) play a significant role in the implementation of liberal policies. Second, while the literature has noted the positive effects of stronger political constraints and democratization on economic freedom, this paper showed that these associations disappear once we control for a wider range of independent variables. I also found no link between economic freedom and the types of political regime and electoral rule, whilst the evidence in this area has so far been inconclusive. Third, although it is generally found that higher corruption is associated with less liberal policy, this paper highlights the significant roles of anomalous observations in this context.

8 Conclusions

This paper has sought to explain why some developing countries had more liberal government policies than others during 1970-1999. To measure liberal policies, I applied a method of classical and outlier-robust principal components to the proxies of five Washington Consensus policy aims. These include trade liberalization, foreign direct investment promotion, privatization, deregulation, and property rights protection. I also argued that, if our aim is to measure economic freedom, we should restrict our focus to these

policy areas, rather than also considering macroeconomic variables such as the fiscal surplus and the inflation rate.

This paper then showed that more liberal policy, as measured by the new policy index, is associated with higher income per capita growth. The size of the association is notable. In the preferred model, a one-standard-deviation increase in the liberal policy index raises growth by 0.72 percentage points.

Since the model uncertainty problem is likely to prevail in our context, the paper adopts a Bayesian model averaging approach to address this problem. The key findings are that government policies are more liberal in countries which possess a right-wing or centrist executive party, enjoy greater political stability, and are former Spanish colonies. In contrast, countries which are less ethnically diverse, are former French colonies, and have a military leader as head of state tend to implement less liberal policies. A one-standard-deviation change in these variables results in a 0.17-0.41 standard deviation change in the liberal policy indicator, so their effects are substantial.

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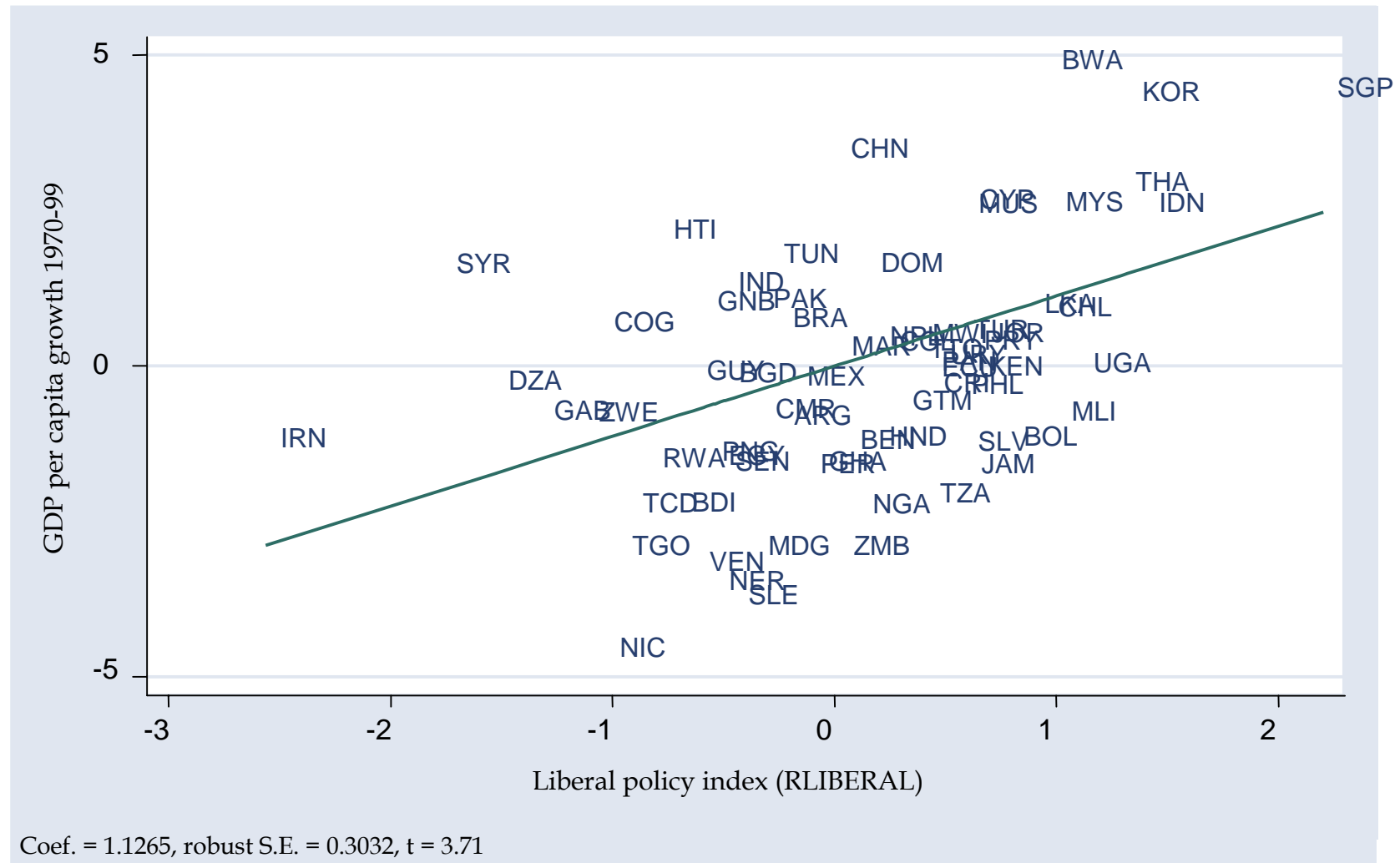
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Table 1: Economic freedom in high and low-income countries

Liberal policy	Variable	High-income countries	Low-income countries			
			Overall	Most liberal	Least liberal	
Deregulation	Starting a business	Time (days)	23	54	27	77
		Cost (% of income per capita)	7.4	95.3	15.3	152.6
	Dealing with licenses	Time (days)	155	223	135	283
		Cost (% of income per capita)	85.4	791	98.8	848
	Hiring & firing workers	Rigidity of employment index	34.4	43.0	23.6	50.4
	Registering property	Time (days)	48	95	24	245
		Cost (% of property value)	4.5	7.2	4.8	15
	Closing a business	Time (years)	1.8	3.5	2.5	4.3
		Cost (% of estate)	8.4	18.6	12.4	18.0
	Protection of property rights	Getting credit	Legal rights index	6.4	4.5	5.8
Credit information index			4.8	2.2	4.8	1.8
Protecting investors		Investor protection index	6.1	4.8	6.1	3.9
Enforcing contracts		Time (days)	273	425	292	491
		Cost (% of debt)	11.7	35.4	12.8	31.5
Trade liberalization	Import duties/tax revenue	4.1	16.9	4.9	25.3	
	Time for export (days)	13	37	17	53	
	Time for import (days)	15	46	19	66	

Notes: All variables, except import duties, are taken from World Bank (2005). The import duties data, measured in 2004 or the most recent year available, are from World Bank (2004). The figures for the most (least) liberal countries are derived from top five countries with the most (least) liberal policies, according to a new policy index proposed in this paper. See text for more details. Higher rigidity of employment index means more rigid regulation. Higher legal rights index indicates that laws are better designed to expand access to credit. Higher credit information index reflects more credit information available to facilitate lending decisions. Higher investor protection index refers to better investor protection.

Figure 1: Liberal policy and GDP growth



Notes: This figure shows a partial scatter plot of GDP per capita growth, against the liberal policy index (RLIBERAL) during 1970-1999. This correlation is conditional on log GDP per capita in 1970.

Table 2: Principal components analysis for the Washington Consensus policy indicators

Aspect of policy	Washington Consensus	Variable	Expected sign	(1) Classical		(1) Robust		(2) Classical		(2) Robust	
				1st PC	2nd PC	1st PC	2nd PC	1st PC	2nd PC	1st PC	2nd PC
Macroeconomic	Fiscal discipline	SURPLUS	+	0.608	0.108	0.556	0.212	0.351	0.322	0.313	0.089
		DEBT	-	-0.428	0.323	-0.489	0.180				
	Public spending prioritization	EDU	+	-0.323	0.475	-0.409	0.430	0.006	0.164	0.020	0.562
		HEALTH	+	-0.049	-0.465	0.054	-0.345	0.231	-0.474	0.257	-0.118
	Tax reform	MARTAXFI	+	0.511	-0.389	0.577	-0.170				
	Interest rate lib'n	REALI	+	0.023	-0.389	0.103	-0.276	0.102	-0.171	0.101	-0.073
	Competitive exchange rate	BMP	-	-0.314	-0.788	-0.145	-0.827	-0.287	-0.753	-0.251	-0.632
		OVERVALU	-	-0.383	-0.353	-0.310	-0.420	-0.428	-0.325	-0.404	-0.105
		ERATE	-	-0.012	-0.715	0.128	-0.691	-0.057	-0.736	-0.026	-0.763
		INFLA	-	0.047	-0.733	0.209	-0.643	0.066	-0.684	0.103	-0.584
Development	Trade policy reform	MDUTY	-	-0.496	0.311	-0.536	0.103	-0.533	0.376	-0.545	0.311
		SW	+	0.732	0.334	0.650	0.579	0.778	0.198	0.769	0.258
		TRADEFI	+	0.338	0.178	0.276	0.297				
		TRADEHF	-	-0.850	0.095	-0.846	-0.168	-0.777	0.111	-0.783	0.127
	FDI promotion	FDIHF	-	-0.690	0.343	-0.737	0.119	-0.748	0.258	-0.757	0.164
	Privatization	GOVTEM	-	0.411	0.016	0.424	0.208				
		SOEFI	+	0.726	-0.078	0.719	0.120	0.604	-0.058	0.589	-0.231
		SOEHF	-	-0.695	0.249	-0.748	0.018	-0.556	0.264	-0.562	0.377
	Deregulation	REGKKM	+	0.854	-0.145	0.864	0.154	0.906	-0.150	0.917	-0.040
		REGFI	+	0.410	0.503	0.312	0.665	0.579	0.202	0.578	0.260
REGHF		-	-0.737	0.116	-0.749	-0.170	-0.809	0.190	-0.823	0.012	
Property rights protection	PROPHI	+	0.481	0.470	0.374	0.628	0.520	0.458	0.504	0.566	
	PROPHF	-	-0.723	-0.309	-0.648	-0.532	-0.799	-0.128	-0.799	-0.244	
		Number of countries		34		34		62		62	
		% Variance explained		28.87		16.05		28.47		18.18	
				31.08		14.34		35.50		14.78	

Notes: Numbers shown are the correlations between principal components (PCs) and corresponding variables. Numbers in bold indicate the higher correlations between that PC and corresponding variables.

Table 3: Principal components analysis for the development elements of the Washington Consensus

Variable	Expected sign	(1) Classical		(1) Robust		(2) Classical		(2) Robust	
		1st PC	2nd PC	1st PC	2nd PC	1st PC	2nd PC	1st PC	2nd PC
MDUTY	-	-0.518	-0.617	-0.489	-0.523	-0.454	-0.589	-0.452	-0.226
SW	+	0.778	0.035	0.778	0.290	0.756	0.011	0.761	-0.153
TRADEFI	+	0.459	0.720	0.424	0.816				
TRADEHF	-	-0.845	-0.135	-0.837	-0.245	-0.792	-0.260	-0.792	-0.120
FDIHF	-	-0.714	0.242	-0.729	0.172	-0.778	0.061	-0.771	-0.200
GOVTEM	-	0.417	-0.363	0.401	0.029				
SOEFI	+	0.661	-0.135	0.658	-0.048	0.587	0.428	0.591	0.297
SOEHF	-	-0.628	0.322	-0.656	0.293	-0.560	-0.375	-0.568	-0.498
REGKKM	+	0.911	-0.072	0.917	0.108	0.923	-0.047	0.921	0.032
REGFI	+	0.545	-0.178	0.530	0.224	0.600	-0.197	0.600	-0.180
REGHF	-	-0.812	0.116	-0.819	-0.098	-0.834	0.227	-0.828	0.005
PROPMI	+	0.472	0.310	0.453	0.521	0.478	-0.499	0.484	-0.745
PROPHF	-	-0.803	0.081	-0.818	-0.161	-0.819	0.374	-0.817	0.214
Number of countries		50		50		68		68	
% Variance explained		45.91	10.64	45.16	12.20	49.77	11.12	54.63	9.93

Notes: Numbers shown are the correlations between principal components (PCs) and corresponding variables. Numbers in bold indicate the higher correlations between that PC and corresponding variables. Column (2) Robust shows the components of RLIBERAL.

Table 4: The liberal policy index (RLIBERAL) and GDP growth regressions

	(1)	(2)	(3)	(4)
RLIBERAL	0.772 (0.25)**	0.667 (0.30)*	0.716 (0.34)*	0.766 (0.38)*
GDP per capita in 1970		-1.111 (0.35)**	-1.104 (0.47)*	-0.896 (0.39)*
Investment		0.985 (0.26)**	0.670 (0.32)*	
Population growth		-0.232 (0.21)	-0.177 (0.27)	-0.085 (0.27)
Literacy in 1970		0.407 (0.25)	0.444 (0.29)	0.589 (0.31)
Regional dummies	No	No	Yes	Yes
R ²	0.15	0.49	0.53	0.46
Number of countries	68	66	66	66
hetttest	0.65	0.05	0.15	0.70
whitetst	0.76	0.30	0.77	0.96
ovtest	0.07	0.82	0.25	0.77

Notes: The dependent variable is the annual GDP per capita growth over 1970-99, in percentage points. ** and * denote significance at the 1% and 5%, respectively. Numbers shown in parentheses are MacKinnon and White (1985) heteroskedasticity-consistent (hc3) standard errors. The explanatory variables are standardized to have a standard deviation of one, and so the coefficients represent the effect of a one-standard-deviation change on the annual growth rate. All regressions have a constant. Regional dummies are for East Asia and the Pacific, Sub-Saharan Africa, South Asia, Latin America and the Caribbean, and Middle East and North Africa. hetttest performs the Breusch-Pagan test for heteroskedasticity in the independent variables. whitetst performs a variant of the White test for heteroskedasticity that uses the predicted values from the original regression and their squared values. ovtest performs the Ramsey's regression specification error test for omitted variables. The corresponding numbers shown are p-values.

Table 5: Posterior inclusion probability (PIP) of independent variables explaining the liberal policy index (RLIBERAL)

Independent variable	(1)	(2)	(3)	(4)	(4.1)
1 Military head	1.000 (-)	1.000 (-)	1.000 (-)	1.000 (-)	1.000
2 French colony	1.000 (-)	1.000 (-)	0.882 (-)	0.327 (-)	0.704
3 Nationalist executive party	0.998 (-)	1.000 (-)	0.465 (-)	0.043	0.028
4 Political stability	0.990 (+)		1.000 (+)	0.993 (+)	0.999
5 Centre-wing government	0.986 (+)	0.933 (+)	1.000 (+)	1.000 (+)	0.866
6 Lack of corruption	0.985 (+)	1.000 (+)	0.987 (+)	0.894 (+)	0.053
7 Right-wing government	0.732 (+)	0.818 (+)	0.980 (+)	1.000 (+)	0.965
8 Media development	0.621 (+)	0.986 (+)	0.050	0.003	
9 GDP per capita in 1970	0.526 (+)	0.053	0.881 (+)	0.138	0.361
10 Trade openness	0.360 (+)	0.689 (+)	0.042	0.000	
11 Voter turnout	0.300 (+)	0.085	0.115	0.036	0.015
12 Ethnic fragmentation	0.150	0.106	0.947 (+)	0.984 (+)	0.656
13 Population in 1970	0.129	0.075	0.000		
14 Spanish colony	0.107	0.341 (+)	0.382 (+)	0.930 (+)	0.304
15 Political particularism	0.075	0.051	0.000		
16 British colony	0.055	0.102	0.101	0.082	0.021
17 Presidential system	0.055	0.025	0.067	0.001	0.026
18 Lack of political rights	0.038	0.000	0.000		
19 Re-electability incentive	0.019	0.037	0.233 (-)	0.000	
20 Changes in constitutions	0.019	0.182	0.280 (-)	0.875 (-)	0.016
21 Political system maturity	0.013	0.196	0.000	0.091	0.009
22 Political constraints	0.010	0.000	0.392 (-)	0.045	0.016
23 Degree of democracy	0.004	0.000	0.066	0.088	0.022
24 Parliamentary system	0.001	0.000	0.016	0.119	0.011
25 Int'l political engagement	0.001	0.001	0.058	0.137	0.021
26 Unconst gov't instability	0.000		0.076	0.358 (-)	0.122
27 Adverse regime change	0.000		0.003		
28 Ideology difference	0.000	0.001	0.095	0.062	0.016
29 Plurality	0.000	0.005	0.000	0.000	
30 Women in parliament	0.000	0.001	0.031	0.000	
31 Electoral competitiveness	0.000	0.034	0.070	0.000	
32 Left-wing government	0.000	0.000	0.191	0.000	
33 Other colonies	0.000	0.000	0.081	0.001	
34 Proportionality	0.000	0.008	0.000	0.000	
35 Const gov't instability	0.000	0.060	0.017		
36 Changes in executives	0.000	0.000	0.003		
37 Income inequality	0.000	0.030	0.000		
38 Government tiers	0.000	0.000	0.000		
39 Changes in executive parties	0.000	0.000	0.000		
40 Election fraud	0.000	0.000	0.000		
41 South Asia			0.094	0.113	0.576
42 East Asia & Pacific			0.955 (+)	0.885 (+)	0.389
43 Latin America & Caribbean			0.063	0.108	0.367
44 Middle East & North Africa			0.029	0.125	0.053
45 Sub-Sahara Africa			0.152	0.493 (-)	0.658

Table 5 (continued)

Independent variable	(1)	(2)	(3)	(4)	(4.1)
46 State antiquity				0.041	0.106
47 European languages				0.005	
48 Land area				0.132	
49 Elevation				0.000	
50 Tropical land area				0.623	(+) 0.148
51 Distance to major markets				0.307	(-) 0.032
52 Landlocked				0.028	0.013
53 Latitude				0.000	
54 Point-source resources				0.000	
55 People in tropics				0.007	
Number of variables	40	37	45	45	30
Number of countries	68	68	68	61	63

Notes: Numbers shown are the posterior inclusion probabilities (PIPs), i.e. the probabilities that coefficients of independent variables are not zero. Variables whose PIPs are 0.20 or greater are considered important. (+) and (-) show the signs between the variables and RLIBERAL. The results in column (4.1) are obtained from the MC³ approach.

Table 6: Top ten models and their posterior model probabilities for RLIBERAL from the bicreg approach

Independent Variable	PIP	1	2	3	4	5	6	7	8	9	10
Right-wing government	1.000	•	•	•	•	•	•	•	•	•	•
Centre-wing government	1.000	•	•	•	•	•	•	•	•	•	•
Military head	1.000	•	•	•	•	•	•	•	•	•	•
Political stability	0.993	•	•	•	•	•	•	•	•	•	•
Ethnic fragmentation	0.984	•	•	•	•	•	•	•	•	•	•
Spanish colony	0.930	•	•	•	•	•	•	•	•	•	•
Lack of corruption	0.894	•	•	•	•	•	•	•	•	•	•
East Asia & Pacific	0.885	•	•	•	•	•	•	•	•	•	•
Changes in constitutions	0.875	•	•	•	•	•	•	•	•	•	•
Tropical land area	0.623	•		•	•				•	•	
Sub-Sahara Africa	0.493	•			•	•		•			
Unconstitutional gov't instability	0.358				•		•	•			
French colony	0.327		•	•			•				•
Distance to major markets	0.307		•	•			•				•
GDP per capita in 1970	0.138										•
International political engagement	0.137									•	
Land area	0.132									•	
Number of variables		11	11	12	12	10	12	11	10	12	12
Posterior model probability		0.0484	0.0459	0.0332	0.0305	0.0210	0.0210	0.0209	0.0187	0.0186	0.0184

Notes: The posterior inclusion probabilities (PIPs) shown are taken from column (4) in Table 5.

Table 7: Top ten models and their posterior model probabilities for RLIBERAL from the MC³ approach

Independent Variable	PIP	1	2	3	4	5	6	7	8	9	10
Military head	1.000	•	•	•	•	•	•	•	•	•	•
Political stability	0.999	•	•	•	•	•	•	•	•	•	•
Right-wing government	0.965	•	•	•	•	•	•	•	•	•	•
Centre-wing government	0.866	•	•	•	•	•	•	•	•	•	•
Sub-Sahara Africa	0.658	•	•	•			•	•	•		•
French colony	0.704	•	•	•	•	•	•	•	•		•
Ethnic fragmentation	0.656	•	•	•			•	•	•		•
South Asia	0.576	•	•	•			•	•	•		•
East Asia & Pacific	0.389				•	•				•	
GDP per capita in 1970	0.361				•	•				•	
Latin America & Caribbean	0.367	•	•	•			•				
Spanish colony	0.304		•	•							
Tropical land area	0.148		•								
Unconstitutional gov't instability	0.122							•			
Number of variables		9	11	10	7	7	9	9	8	6	8
Posterior model probability		0.0229	0.0222	0.0195	0.0169	0.0138	0.0131	0.0113	0.0110	0.0109	0.0096

Notes: The posterior inclusion probabilities (PIPs) shown are taken from column (4.1) in Table 5.

Table 8: Determinants of the liberal policy index (RLIBERAL)

	(1)	(2)	(3)	(4)	(5)
Political stability	0.622 (0.23)**	0.766 (0.28)**	0.935 (0.19)**	1.466 (0.30)**	1.300 (0.25)**
Right-wing government	2.360 (0.49)**	2.405 (0.45)**	2.464 (0.45)**	2.016 (0.68)**	1.685 (0.60)**
Centre-wing government	3.117 (1.14)**	3.149 (1.44)*	3.224 (0.62)**	3.862 (1.60)*	3.329 (1.42)*
Military head	-12.741 (2.97)**	-13.895 (2.51)**	-14.893 (2.19)**	-19.191 (2.38)**	-17.650 (2.91)**
Ethnic fragmentation	2.382 (0.54)**	2.439 (0.58)**	2.201 (0.51)**	1.936 (0.65)**	1.760 (0.66)**
Sub-Saharan Africa	-0.945 (0.38)*	-2.619 (2.85)	-3.372 (0.90)**	-2.179 (0.58)**	-2.543 (0.79)**
Spanish colony	1.212 (0.39)**	1.467 (0.40)**	1.395 (0.38)**		
Lack of corruption	1.303 (0.38)**	0.990 (0.48)*	0.588 (-0.32)		
Changes in constitutions	-3.675 (1.72)*	-2.593 (2.05)	-0.421 (1.44)		
Tropical land area	0.312 (0.20)	0.411 (0.11)**	0.401 (0.13)**		
East Asia & Pacific	1.745 (0.41)**	0.174 (2.83)	-0.217 (0.87)		
French colony				-1.173 (0.33)**	-0.969 (0.34)**
South Asia				-1.962 (0.85)*	-1.999 (1.02)
Latin America & Caribbean				-0.832 -0.48	-1.854 (0.60)**
Approach	bicreg	bicreg	bicreg	MC ³	MC ³
Control variables	No	Yes	Yes	No	Yes
R ²	0.85	0.86	0.92	0.77	0.83
Number of countries	66	66	62	68	68
hettest	0.86	0.54	0.35	0.00	0.08
whitetst	0.05	0.07	0.10	0.61	0.94
ovtest	0.74	0.95	0.93	0.17	0.33
Beta value	Col (2)	Col (5)			
Political stability	0.24	0.41			
Right-wing government	0.34	0.22			
Centre-wing government	0.22	0.22			
Military head	-0.31	-0.36			
Ethnic fragmentation	0.28	0.19			
Tropical land area	0.16				
Spanish colony	0.29				
French colony		-0.17			

Notes: The dependent variable is the liberal policy index (RLIBERAL). ** and * denote significance at the 1% and 5%, respectively. Numbers shown in parentheses are MacKinnon and White (1985) heteroskedasticity-consistent (hc3) standard errors. Control variables include GDP per capita level and population in 1970, and five regional dummies. For other notes, see notes in Table 4.

Appendix Table 1: Descriptive statistics

	Variable	Obs.	Mean	Std. Dev.	Min	Max
Washington Consensus	MDUTY	68	10.464	4.976	0.825	31.311
	SW	68	0.333	0.326	0.000	1.000
	TRADEFI	64	4.615	1.985	0.000	9.930
	TRADEHF	68	3.961	0.978	1.000	5.000
	FDIHF	68	2.761	0.856	1.000	5.000
	GOVTEM	54	1.133	1.111	0.000	5.000
	SOEFI	68	3.137	2.321	0.000	8.000
	SOEHF	68	3.043	0.809	1.667	4.800
	REGKKM	68	0.047	0.631	-1.515	1.799
	REGFI	68	5.165	0.862	2.804	6.878
	REGHF	68	3.099	0.685	1.667	4.833
	PROPHF	68	3.002	0.904	1.000	5.000
Composite index	RLIBERAL	68	0.000	1.000	-2.153	2.944
	CLIBERAL	68	0.000	1.000	-2.162	2.939
Growth regressions	RGDP7099C	68	0.014	0.020	-0.031	0.064
	SCHOOL70	58	0.846	0.769	-1.619	1.826
	LITERACY	66	3.731	0.667	1.749	4.536
	INVEST	68	2.513	0.556	0.797	3.814
	PRIINVEST	65	2.492	0.488	0.855	3.261
	PUBINVEST	65	2.040	0.378	1.296	3.119
	RGDPPC70	68	6.460	0.673	5.189	7.927
	POPG	68	-2.577	0.093	-2.894	-2.419
	RGNEAP	68	0.118	0.325	0.000	1.000
	RGNECA	68	0.015	0.121	0.000	1.000
	RGNMENA	68	0.103	0.306	0.000	1.000
	RGNSA	68	0.074	0.263	0.000	1.000
	RGNSSA	68	0.353	0.481	0.000	1.000
RGNLAC	68	0.324	0.471	0.000	1.000	

Note: These descriptive statistics are computed from 68 countries that the liberal policy indices are available.

Appendix Table 2: Simple correlations among the proxies of Washington Consensus development element variables

	MDUTY	SW	TRADEFI	TRADEHF	FDIHF	GOVTEM	SOEFI	SOEHF	REGKKM	REGFI	REGHF	PROPMI	PROPHF
MDUTY	1.000												
SW	-0.347	1.000											
TRADEFI	-0.532	0.382	1.000										
TRADEHF	0.555	-0.590	-0.427	1.000									
FDIHF	0.320	-0.433	-0.128	0.606	1.000								
GOVTEM	-0.062	0.333	0.061	-0.290	-0.315	1.000							
SOEFI	-0.326	0.457	0.167	-0.583	-0.417	0.208	1.000						
SOEHF	0.182	-0.536	-0.026	0.543	0.412	-0.201	-0.465	1.000					
REGKKM	-0.453	0.610	0.328	-0.751	-0.711	0.298	0.582	-0.554	1.000				
REGFI	-0.089	0.424	0.192	-0.360	-0.233	0.313	0.416	-0.184	0.516	1.000			
REGHF	0.367	-0.494	-0.359	0.552	0.702	-0.442	-0.392	0.445	-0.779	-0.376	1.000		
PROPMI	-0.238	0.439	0.284	-0.379	-0.125	0.130	0.178	-0.176	0.360	0.253	-0.275	1.000	
PROPHF	0.170	-0.662	-0.342	0.584	0.502	-0.193	-0.441	0.505	-0.726	-0.447	0.698	-0.459	1.000

Appendix Table 3: List of countries and the robust (RLIBERAL) and classical (CLIBERAL) liberal policy indices

Code	Country name	RLIBERAL	CLIBERAL	Code	Country name	RLIBERAL	CLIBERAL
DZA	Algeria	-1.265	-1.250	MWI	Malawi	-0.652	-0.626
ARG	Argentina	0.980	0.985	MYS	Malaysia	1.195	1.181
BGD	Bangladesh	-1.047	-1.046	MLI	Mali	0.177	0.208
BEN	Benin	-0.428	-0.423	MUS	Mauritius	1.056	1.027
BOL	Bolivia	0.956	0.981	MEX	Mexico	0.616	0.602
BWA	Botswana	0.595	0.600	MAR	Morocco	0.030	0.040
BRA	Brazil	0.205	0.191	NPL	Nepal	-0.613	-0.630
BDI	Burundi	-1.451	-1.464	NIC	Nicaragua	-0.464	-0.457
CMR	Cameroon	-0.549	-0.574	NER	Niger	-0.924	-0.934
TCD	Chad	-1.364	-1.377	NGA	Nigeria	-0.657	-0.640
CHL	Chile	1.690	1.674	PAK	Pakistan	-0.751	-0.726
CHN	China	-0.797	-0.801	PAN	Panama	0.950	0.978
COL	Colombia	0.529	0.545	PNG	Papua New Guinea	-0.194	-0.204
COG	Congo, Republic	-1.479	-1.458	PRY	Paraguay	0.758	0.778
CRI	Costa Rica	1.000	0.996	PER	Peru	0.563	0.566
CYP	Cyprus	1.385	1.374	PHL	Philippines	0.680	0.658
DOM	Dominican Republic	0.203	0.163	RWA	Rwanda	-1.626	-1.630
ECU	Ecuador	0.556	0.538	SEN	Senegal	-0.712	-0.701
EGY	Egypt	-0.502	-0.505	SLE	Sierra Leone	-0.740	-0.761
SLV	El Salvador	1.121	1.131	SGP	Singapore	2.944	2.939
GAB	Gabon	-0.345	-0.318	KOR	South Korea	1.497	1.481
GHA	Ghana	-0.279	-0.269	LKA	Sri Lanka	0.625	0.628
GTM	Guatemala	0.638	0.620	SYR	Syria	-1.718	-1.714
GNB	Guinea-Bissau	-1.267	-1.303	TZA	Tanzania	-0.551	-0.544
GUY	Guyana	-0.347	-0.319	THA	Thailand	1.248	1.220
HTI	Haiti	-1.488	-1.491	TGO	Togo	-1.182	-1.190
HND	Honduras	0.062	0.062	TTO	Trinidad and Tobago	1.111	1.136
IND	India	-1.069	-1.088	TUN	Tunisia	-0.105	-0.083
IDN	Indonesia	0.611	0.596	TUR	Turkey	1.012	1.008
IRN	Iran	-2.153	-2.162	UGA	Uganda	0.040	0.078
JAM	Jamaica	0.965	0.986	URY	Uruguay	1.346	1.335
JOR	Jordan	0.578	0.609	VEN	Venezuela	0.137	0.133
KEN	Kenya	-0.068	-0.069	ZMB	Zambia	0.326	0.334
MDG	Madagascar	-0.608	-0.634	ZWE	Zimbabwe	-0.989	-0.991

Appendix Table 4: Variables and definitions for the Washington Consensus development element variables

Variable	Variable description	Source
Sachs and Warner index (SW)	Dummy variable. 0 indicates closed economy and 1 indicates open economy. Closed economy has high tariff rates, high non-tariff barriers, high black market premiums, adopts socialist system, and has state as an export monopolist.	Sachs and Warner (1995) and Wacziarg and Welch (2003)
Import duty (MDUTY)	Mean import duty over total import value	World Bank (2004) and Yanikkaya (2003)
Mean tariff rate score (TRADEFI)	0-10 scale with higher score value means lower average tariff rate	Gwartney and Lawson (2004)
Trade policy score (TRADEHF)	1-5 scale with higher score value means higher weighted average tariff rate	Miles et.al. (2004)
Openness to FDI (FDIHF)	Investment score. 1-5 scale with higher score value means an economy is less open to foreign direct investment	Miles et.al. (2004)
Government employment (GOVTEM)	Civilian central government employment over total employment, excluding those in education, health, and police affairs.	World Bank (2001)
Government enterprises and investment score (SOEFI)	0-10 scale with higher score value means lower extent of state-owned enterprises and government investment in the economy.	Gwartney and Lawson (2004)
Government intervention score (SOEHF)	An average of two sub-scores: government consumption and state-owned enterprises scores. Higher score value means higher extent of state-owned enterprises in an economy.	Miles et.al. (2004)
Regulation of credit, labour, and business score (REGFI)	0-10 scale with higher score value means less regulated credit markets and labour markets, and fewer business regulations.	Gwartney and Lawson (2004)
Banking & finance, wages & prices, and regulation scores (REGHF)	Average of three scores: banking and finance, wages and prices, and regulation scores. Higher score value means more regulated economy.	Miles et.al. (2004)

Regulatory quality (REGKKM)	Measures market-unfriendly policies, e.g. price control, bank supervision and excessive regulation. Higher index value indicates fewer regulations.	Kaufmann et al. (2003)
Legal structure and property rights score (PROPFI)	0-10 scale with higher score value means better protection of private property rights.	Gwartney and Lawson (2004)
Property rights score (PROPHF)	1-5 scale with higher score value means worse protection of private property rights.	Miles et.al. (2004)

Appendix Table 5: Variables and definitions for the growth regressions variables

Variable name	Variable description	Source
Investment (INVEST)	Natural log of real investment over real GDP	Heston et al. (2002)
Population growth (POPG)	Natural log of average annual growth rate of population aged 15-64, 1970-99. This rate is added with depreciation rate of 0.05.	World Bank (2004)
Schooling (SCHOOL70)	Natural log of average years of schooling at all educational levels of population aged over 15 in 1970	Barro and Lee (2000)
Literacy rate (LITERACY)	Natural log of (100 - illiteracy rate of population aged over 15 in 1970)	World Bank (2004)
Initial GDP (RGDPPC70)	Natural log of real GDP per capita in 1970	Heston et al. (2002)
GDP growth (RGDP7099)	Natural log of real GDP per capita in 1999 minus that of 1970. This is divided by 29, to obtain annual growth rates.	Heston et al. (2002)
Regional dummy	Five regions: East Asia and the Pacific, Middle East and North Africa, South Asia, Sub-Saharan Africa, and Latin America and Caribbean	Easterly and Sewadeh (2002)
Liberal policy index (RLIBERAL)	A score from a robust principal components analysis derived from 11 proxies for the Washington Consensus development elements. Higher index value indicates more liberal government policy. See text for more details.	Own construction. See data sources in Appendix Table 4.

Appendix Table 6: Variables and definitions for the independent variables

Variable	Variable description	Source
Political variable		
Degree of democracy (POLITY)	Degree of democracy=democratic score-autocratic score. Higher value indicates more democratic society. This is the main proxy for degree of democracy variable.	Marshall and Jaggers (2000)
Degree of democracy (GOLDERDE)	Two classifications: democracy and dictatorship. Higher score value indicates less democratic society.	Golder (2004)
Degree of democracy (REICEDE)	Three classifications: authoritarian, semi-democratic and democratic. These are assigned the values of 0, 1 and 2 respectively. Hence, a higher score value indicates more democratic society.	Reich (2002)
Parliamentary system (PARLIA)	Share of years between 1975-99 that a parliamentary system was adopted	Beck et al. (2001)
Presidential system (DIRCPRES)	Share of years between 1975-99 that a direct presidential system was adopted. An omitted category for political regime variables (PARLIA and DIRCPRES) is elected presidential.	Beck et al. (2001)
Right-wing party (RGHTWING)	Dummy variable indicates Conservative or Christian democratic parties adopting liberal policies	Beck et al. (2001)
Left-wing party (LEFTWING)	Dummy variable indicates Communist or socialist parties adopting state-based policies	Beck et al. (2001)
Centre-wing party (CNTRWING)	Dummy variable indicates parties adopting both market- and state-based policies	Beck et al. (2001)
Political constraints (POLCON)	Extent of political constraints in policy-making process. Higher value means stronger constraints. This is the main proxy for political constraints variable.	Henisz (2000)
Executive constraints (XCONST)	Extent of political constraints in policy-making process. Higher value means stronger constraints.	Marshall and Jaggers (2000)
Government Herfindahl index (HERFGOV)	The sum of the squared seat shares of all parties in the government	Beck et al. (2001)
Government fragmentation (GOVFRAC)	Probability that two deputies selected at random from among government parties will be from different parties	Beck et al. (2001)
Margin of majority (MAJORITY)	Share of government seats in total seats	Beck et al. (2001)
All houses control (ALLHOUSE)	Dummy variable indicates whether executive party has an absolute majority in all houses that have law-making powers	Beck et al. (2001)

Checks (CHECKS)	Extent of checks and balances in policy-making process. Higher value means stronger checks and balances (e.g. by having competitively elected executives)	Beck et al. (2001)
Stability (STABS)	Percent of veto players who drop from the government. Higher value means less stable roles of veto players.	Beck et al. (2001)
Political system maturity (PARTYAGE)	Average age (in years) of the largest two government parties and the largest opposition party	Beck et al. (2001)
Nationalist party (NATIOPAR)	Dummy variables indicates executive party being a nationalist party	Beck et al. (2001)
Regional-oriented party (REGIOPAR)	Dummy variables indicates executive party being a regional-oriented party	Beck et al. (2001)
Electoral competitiveness (LIEC)	Legislative index of electoral competitiveness. Higher score value means more intense competition in the election for legislative body.	Beck et al. (2001)
Proportionality (PROPOR)	Share of years between 1975-99 that a proportional electoral rule was adopted	Beck et al. (2001)
Plurality (PLURAL)	Share of years between 1975-99 that a plural electoral rule was adopted.	Beck et al. (2001)
Ideology difference (WINGDIFF)	Difference in political ideology between executive party and those of the three largest government parties and the largest opposition party.	Beck et al. (2001)
Election fraud (FRUADELE)	A dummy indicates whether election fraud tends to affect electoral outcomes significantly	Beck et al. (2001)
Re-electability incentive (FIMUTERM)	Dummy variable equals to one if there is a finite office term for executive and serving multiple terms is possible	Beck et al. (2001)
Military head (MILIHEAD)	Dummy variable indicates having military as a head of state	De Mesquita et al. (2003)
Political stability (POLSTAB)	Extent of political stability including a chance that a current government will be overthrown and political violence. Higher score means higher political stability.	Kaufmann et al. (2003)
Violent political unrest (VIUNREST)	A score from a principal components analysis derived from assassinations, guerrilla warfare, major government crises, purges, riots, revolutions and coups. Higher value means more frequent political unrest. See text for more details.	Own construction with data from De Mesquita et al. (2003)
Non-violent political unrest (NVUNREST)	A score from a principal components analysis derived from general strikes and anti-government demonstration. Higher value means more frequent political unrest. See text for more details.	Own construction with data from De Mesquita et al. (2003)

Socio-political instability	Three different indicators. VULESPI1 and VULESPI2 are scores from a principal components analysis. VULESPI1 includes general strikes, riots and government demonstrations. VULESPI2 covers assassinations, guerrilla warfare and purges. VULESPI includes all six variables, derived from a logit method.	Quan Vu Le (2001)
Unconstitutional government instability (PROBIRCH)	Probability of irregular, violent changes in government such as those from coups. It is derived from a logit model, and depends on variables such as past macroeconomic performance and political disorder.	Feng, Kugler and Zak (2000)
Constitutional government instability (PROBMGCH)	Probability of regular, major changes in government such as the public desire in replacing a current government. Same methodology as PROBIRCH.	Feng, Kugler and Zak (2000)
Changes in executives (EXECHG)	Number of changes in executives during 1975-99	Beck et al. (2001)
Changes in executive parties (PARTYCHG)	Number of changes in party of executives during 1975-99	Beck et al. (2001)
Changes in constitution (CONSTCH)	Number of changes in constitutions during 1970-99	De Mesquita et al. (2003)
Adverse government changes (ADREGCHG)	Measure of the magnitude of events such as shifts from democratic to authoritarian system and collapses of central state authority.	Marshall et al. (2002)
Polyarchy scale (POLYARCH)	Extent of fair and free elections. Higher score value means less freedom for political participation and expression.	Coppedge and Reinicke (1990)
Suffrage (SUFFRAGE)	Right of voting index. Higher index value indicates fewer restrictions on characteristics of citizens who can vote.	Paxton et al. (2003)
Government tiers (GOVTIER)	Number of government tiers, e.g. central and local governments	Treisman (2002)
Voter turnout (TURNOUT)	Share of actual number of voters in total registered number of voters	Pintor et al. (2002)
Political particularism (PARTICU)	The degree to which individual politicians are concerned about their own narrow geographic districts versus about their party as a whole. Simple average of ballot, pool and vote.	Seddon et al. (2003)
International political engagement (POLENGAGE)	Degree which a country engages in international politics, measured by number of embassies in a country, membership in international organizations, and participation in the United Nations. Higher value means more involvement.	Dreher (2003)
Women in parliament (WOMENPAR)	Share of women seats in total seats in parliament	UN common database

Social variable		
Media development (MEDIADEV)	A score from a principal components analysis derived from daily newspaper circulation per capita, radio per capita, and television per 1,000 people. See text for more details.	Own construction with data from World Bank (2004) and De Mesquita et al. (2003)
Press freedom (FREEPRES)	Extent of freedom of press and media. Lower value means higher freedom.	Karlekar (2004)
Lack of political rights (POLRIGHT)	Extent of free, fair elections and political participation. Higher score value indicates freer political rights.	Piano and Puddington (2004) Dollar and Kraay (2002)
Income inequality (GINI)	GINI coefficient of income	
Ethnic fragmentation (ETHNFRAC)	Extent of social diversity in term of different ethnic groups. Higher value means higher diversity.	Alesina et al. (2003)
Linguistic fragmentation (LINGFRAC)	Extent of social diversity in term of different languages spoken. Higher value means higher diversity.	Alesina et al. (2003)
Religious fragmentation (RELIFRAC)	Extent of social diversity in term of different religions. Higher value means higher diversity.	Alesina et al. (2003)
Population with different religions	Share of population with different religions. Four classifications: Protestant (PROTEPOP), Catholic (CATHOPOP), Muslim (ISLAMPOP) and other religions (NARELPOP).	La Porta et al. (1999)
Lack of corruption (CORRUPT)	Control of corruption index. Higher index value means lower corruption.	Kaufmann et al. (2003)
Economic variable		
Trade openness (OPEN)	Share of exports and imports in GDP	Heston et al. (2002)
Population size (POP70)	Population size in 1970	World Bank (2004)
GDP per capita 1970 (GDPPC70)	Real GDP per capita in 1970	Heston et al. (2002)
Fixed, historical variable		
Latitude (LATILLSV)	Absolute value of the latitude	La Porta et al. (1999)
Landlocked (LANDLOCK)	Dummy variable indicates whether a country has direct access to seas and oceans	Easterly and Sewadeh (2002)

Distance to major market (LMINDIST)	Natural Log of minimum distance to a major market (USA, Japan and Belgium)	Haveman's website
Land area (AREAKM2)	Natural log of total land area in squared kilometres	Gallup et al. (1999)
Elevation (ELEV)	Natural log of mean elevation	Gallup et al. (1999)
Tropical land area (TROPICAR)	Share of land area in tropical climate	Gallup et al. (1999)
People in tropics (KGPTEMP)	Share of people living in the Koeppen-Geigger temperate zone	Gallup et al. (1999)
Point-source resources (RESPOINT)	Dummy variable indicating exporters of point-source natural resources such as gold	Isham et al. (2005)
European settler (EURO1900)	Share of European settlers in total population in 1900	Acemoglu et al. (2001)
European-speaking population (EUROFRAC)	Share of population speaking a European language	Hall and Jones (1999)
Regional dummy	Six regions: East Asia and the Pacific (RGNEAP), East Europe and Central Asia (RGNECA), Middle East and North Africa (RGNMENA), South Asia (RGNSA), sub-Saharan Africa (RGNSSA), and Latin America and Caribbean (RGNLAC)	Easterly and Sewadeh (2002)
Colonial dummy	Four classifications: British (COLOGBR), French (COLOFRA), Spanish (COLOESP) and other colonies (COLOETC). COLOETC includes former Portuguese, Dutch, Belgian, Italian and German colonies.	Acemoglu et al. (2001)
Settler mortality (MORTAL)	Natural log of settler mortality rate between 17 th and 19 th centuries.	Acemoglu et al. (2001)
State antiquity (STATEHIS)	Extent of independence and maturity of states. Countries with high index score will have had government above the tribal level during 1-1950 C.E, such government is locally based (i.e. not colony), and over 50 percent of the modern territory was ruled by this government.	Bockstette et al. (2002)

Appendix Table 7: Description of data imputation

Imputed variables	Number of imputed data cells	Imputed variables	Number of imputed data cells
GOVTIER	7	CHRISPAR	1
WOMENPAR	2	CATHOPAR	1
PARTICUL	1	ISLAMPAR	1
EXECHG	1	HINDUPAR	1
PARTYCHG	3	BUDDHPAR	1
PROBIRCH	3	JEWISPAR	1
PROBMGCH	3	NARELPAR	1
PROTEPOP	1	PLURAL	2
CATHOPOP	1	PROPOR	4
ISLAMPOP	1	DIRCPRES	1
NARELPOP	1	ELECPRES	1
LINGFRAC	3	PARLIA	1
POLITY	1	NATIOPAR	1
VANDEMOC	1	RURALPAR	1
REICEDEM	6	REGIOPAR	1
CHECKS	1	PARTYAGE	3
STABS	1	FIMUTERM	1
HERFGOV	1	LIEC	1
GOVFRAC	1	EIEC	1
MAJORITY	1	XRCOMP	1
ALLHOUSE	2	WINGDIFF	1
XCONST	1	CIVLIBER	4
FRAUDELE	2	POLRIGHT	4
POLYARC	1	POLENGAG	1
TURNOUT	3	GINI	1
LEFTWING	2	CONSTCHG	1
RGHTWING	2		
CNTRWING	2		
NAWING	2		
(1) Number of imputed observations		95	
(2) Number of independent variables		109	
(3) Number of RLIBERAL		68	
(4) Number of total observations; (2)*(3)		7,412	
(5) Share of imputed data; (1)/(4)		1.28%	