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The Impact of Political Leaders' Profession and Education on Reforms

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The impact of political leaders' profession and education on reforms

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September 2006

Abstract

This paper analyzes whether the educational and professional background of a head of government matters for the implementation of market-liberalizing reforms. Employing panel data over the period 1970-2002, we present empirical evidence based on a novel data set covering profession and education of more than 500 political leaders from 73 countries. Our results show that entrepreneurs, professional scientists, and trained economists are significantly more reform oriented. Contrary, union executives tend to impede reforms. We also highlight interactions between profession and education with time in office and the political leaning of the ruling party.

Keywords: Reforms, Economic Policy, Economic Freedom, Interest Groups, Lobbying

JEL-Codes: D72, E61, H11

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Introduction

Market-liberalizing reforms have been shown to boost economic growth by increasing trade (Wacziarg and Welch 2003), lowering prices and improving productivity (Megginson and Netter 2001), as well as attracting foreign direct investment (Henry 2003).[1] Nevertheless, some countries are more reluctant than others to implement such reforms. The economics literature provides various insights as to why this might be the case. As one example, reform deadlocks can be explained by the uncertainty over the distribution of gains and losses from policy changes (Fernandez and Rodrik 1991).[2] Fear of policy persistence provides a second explanation (Coate and Morris 1999).[3]

In modern democracies, elected politicians decide on policies and reform-strategies. When it comes to designing reform policy, in particular, politicians' education and professional experience is likely to be important. As Kotsogiannis and Schwager (2005, p.2) argue, "the implementation of new and unknown policies is more demanding than running 'business as usual' since it requires imaginative leadership on the part of a governor, rather than operational routine." Politicians with a certain educational or professional background are more likely than others to demonstrate such kind of leadership. These politicians thus have an advantage in fostering reforms. According to Rajan (2004), for example, the "gains from reform are never as clear to the wider public as they are to economists." Hence, reforms might be delayed due to a lack of understanding and education. Some background education in economics could thus be advantageous for politicians in implementing reforms as they are more likely to distinguish good from bad advice and might be more able to resist the pressure of lobbying groups preferring the status quo. This knowledge might bring them into a better bargaining position as well. They might also have an advantage in communicating the consequences of reforms to the public and the parliament, thus decreasing uncertainty and overcoming the deadlock.

The impact of education and profession on policy has been discussed in the previous literature. Göhlmann and Vaubel (2006) provide recent empirical evidence. Their results show that education and profession of the central bank's governing council members matter for the

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[1] See also McMillan (2004) and de Haan and Sturm (2000). See de Haan et al. (2006) for an excellent survey on the relationship between market-oriented institutions and economic growth.

[2] "For the initiator [of a new system] has the enmity of all who would profit by the preservation of the old institution and merely lukewarm defenders in those who would gain by the new ones", Machiavelli, The Prince, 1513, cited in Feinberg (2006).

[3] Even if a policy is pareto dominating in the short-run, the fear of its persistence might lead to this policy failure.

effectiveness in controlling inflation. In a related study, Adolph (2004) shows that personal career ambitions affect the performance of central bankers. Regarding education of politicians, Duflo (2004) shows that reservation of political power for historically disadvantaged groups and women in India does not come at the expense of the quality of decision making, even though reservation brings to power a group of relatively inexperienced and less educated politicians. Besley et al. (2005), to the contrary, use household survey data from India and find that differences in the performance of Indian village politicians are systematically linked to politicians' education. In particular, education significantly reduces the probability that a politician uses his power opportunistically. This evidence leads a corresponding World Bank (2005: v) report to conclude "that more educated politicians are better" adding to "a growing appreciation among economists that education [of politicians] may be important because of its role in inculcating civic values." Similarly, Jones and Olken (2005) find that the impact of *who* is the head of government matters for economic growth.

In this study, we go one step further and analyze *why* it would matter for policy outcomes who is the chief executive of a country. Arguably, the most important channel by which politicians can affect growth rates is on deciding about whether or not pursuing reform-oriented policies. In fact, the indicator of reforms introduced below is a robust determinant of economic growth (e.g. de Haan and Sturm 2000). Investigating the link between leading politicians' background and reforms is thus important. Surprisingly, this question has so far not been investigated with respect to heads of national governments. It is this question our analysis deals with.

Specifically, we test whether the educational and professional background of heads of governments influences the implementation of reforms. Employing panel data over the period 1970-2002, we present empirical evidence based on a novel data set covering profession and education of more than 500 political leaders prior to entering office from 73 countries. In a nutshell, our results show that entrepreneurs, professional scientists, and trained economists are significantly more likely to implement market-liberal reforms as are politicians with no university education and profession providing the skills required to implement reforms. The political leaning of the governing party is not found to have an effect on reform activity itself. However, the political leaning matters depending on the type of the head of government, as for example trained economists who are members of a left-wing party are found to be significantly more reform-oriented. For economists, the time in office matters, as they become more reform-oriented the longer they stay in office. Finally, the effect of education and profession is tested with respect to reform areas.

We proceed as follows. The next section outlines theoretical considerations and derives our hypotheses. Section 3 describes method and data, while the fourth section contains the results; Section 5 provides extensions and discussion. Finally, Section 6 concludes.

Hypotheses

We see several reasons why the type of a politician should matter for reform activity.[4] First, better educated and trained politicians might simply be more open to ideas of good governance, or reforms in general (see, e.g. Rocamora 2004). This general openness to new ideas is not likely to materialize as a consequence of advice, against the mindset of the politician himself. Previous research has shown that better educated politicians are less opportunistic – they take less advantage of their public position for private gain (Besley et al. 2005). According to Potůček (2003: 8), "it is a sort of a truism that the principles and practices of *good governance* cannot be implemented by badly educated politicians or civil servants." We expect the same to be true for reforms in general.

Second, well-trained and convincing politicians might be more likely to be able to organize democratic majorities in parliament. However, well-trained politicians might be linked to the local basis to a lesser extent than local politicians with an early career in politics, as evidence from Denmark suggests (Pedersen et al. 2004). This might even handicap their ability to organize majorities.

Third, better trained politicians might be better in communicating the need for reforms: voters are likely to trust politicians with an appropriate educational or professional background more than they trust those without. Therefore, such politicians might be more convincing when it comes to explaining expected gains and losses of these new policies. Fernandez and Rodrik (1991) show that reform projects that benefit a majority of the population are likely to be rejected when there is ex-ante uncertainty about the identity of the losers and winners of reform. This status quo bias might be resolved, if policymakers can identify the losers and the winners from a reform, and if they are able to credibly communicate their projections.

However, a certain educational and professional background might also impede reforms. As Cuperus (2006: 79) describes for the British Labour Party, "in terms of their approach and background, Labour Party representatives no longer reflect the sections of the

[4] Note that there is some discussion whether education can actually change people's mindset or, alternatively, whether certain types of people self-select into specific types of education (e.g. Frey and Meier 2003). Though interesting, this distinction is not relevant in the context of our study.

population they aim to represent; they are professional, highly-educated politicians with a public sector background." As a consequence, Cuperus argues that the voters do no longer feel to be represented by their government and, consequently, do not trust their proposals for reform. Accordingly, blue collar workers, or union members might be more convincing in proposing reforms, in particular as they might be perceived as "belonging to their people," or as "knowledgeable of what they are talking about."

The educational and professional background, finally, can be interpreted as signal to lobbying groups, suggesting they will be less likely to be influenceable. This could directly reduce pressure from certain lobbying groups, potentially increasing social welfare.[5] Lobbying, however, might also be a valuable source of information for the policymaker. Given that politicians are imperfectly informed, and assuming that politicians are not self-interested, but target maximum social welfare, the choice of adequate policy will depend on the politician's ability to extract the informative part from the lobbies' noisy information about the true state of the world. This ability however, can reasonably be assumed to depend on the politician's expertise in the respective field of policy. Hence, a decision maker who is, e.g., trained economist is more likely to choose tax rates optimally, or to balance positive and negative externalities more successfully than a politician with different educational background.[6]

We see an additional impact of educational and professional background on policy. As is well known from the theory of public choice, it can not necessarily be assumed that politicians maximize social welfare rather than their own welfare.[7] If politicians are partisan we expect them to pursue policies benefiting their professional peer groups in order to ensure their support and respect. We hypothesize:

Hypothesis 1: Profession and education affect the implementation of reforms

Arguably, education of the chief executive not only matters for the degree of reforms implemented, but also for the timing of those reforms. Education can reduce the *delay* in introducing reforms significantly. In a democracy, policymakers have to engage in bargaining

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[5] Excellent surveys on the political economy of lobbying activities are Austen-Smith (1997) and Drazen (2000).

[6] See, for example, Blendon et al. (1997) or Caplan (2002), who show that economists have significantly different assessments and expectations about the economy than the wider public. This might explain why economists can be more reform oriented as they give more weight to future benefits than to short-term costs of such reforms.

[7] See Bjørnskov et al. (2006) for a recent discussion and empirical evidence.

processes with interest groups before any policy measure can be implemented. The stronger his power, the higher the likelihood of reforms and the shorter the time span until agreement is reached. Delay in a reform process however does not necessarily reduce the total number or extent of reforms, as the implementation of reforms might just be postponed to a later point of time in the incumbency.

Based on Alesina and Drazen (1991), delay of stabilization can be modelled as the outcome of a war of attrition between two parties who disagree over how the adjustment costs of a reform have to be divided. In their recent overview about the different extensions and empirical applications of the 'war of attrition' model, Alesina et al. (2006) highlight the role of political institutions and elections for the outcome of the game. They argue that "…in political systems where the executive has strong powers and cannot be blocked by the opposition easily, the opposition that does not hold the executive faces high costs of fighting the war of attrition… Then stabilization would occur very soon…" Alesina et al. thus clearly underline the importance of executives in the political process. This implies that strong executives may be able to reduce the delay in reforms.[8] The power of a politician is likely to depend on his political experience and personal skills, as they influence arguments that can be brought forth in negotiations, and enhance the standing of the politician among the electorate. Hence, the longer a politician is in office, the stronger he might be. This effect can also be suspected to be different for different types of politicians, as e.g. professional politicians can be expected to be already quite experienced when entering office.

In the literature on fiscal policy, empirical evidence for the impact of the time in office and the importance of a strong government on political outcomes has already been tested. For example, Roubini and Sachs (1989) suggest that there is a tendency towards larger deficits in countries characterized by a short average tenure of government. They argue that budget reductions require political consensus which is harder to achieve by weaker governments, which can (inter alia) be proxied by expected tenure of office.

Klick (2004) provides further support for this hypothesis. If the head of government is convinced of the necessity of reforms while the majority of voters are opposed to them, reforms risk the politicians' incumbency. Hence, he faces a trade-off between implementing

[8] Spolaore (2004) points out that a dominant executive is not necessarily always a good thing in terms of welfare. His model shows that for instance in a political system in which political power is condensed in a very small group, reforms may be inefficiently frequent. This result is basically driven by missing internalization of society's welfare.

the desired reforms but facing a high risk of not being re-elected, and not implementing the reforms and a greater likelihood of staying in office. As the utility from staying in office is likely to decline with time in office, marginal costs from not being re-elected decline and approach the marginal utility of reforming. Thus, reforms become more likely over time.

On the other hand, according to Olson's (1982) argument of institutional sclerosis, reforms might well be more likely to occur directly after a regime change. Moreover, reforms frequently imply substantial short-term costs. In order not to risk the incumbents' re-election, the probability of reforms might decline over time. With the next election approaching, the likelihood of major reforms becomes smaller.

The impact of time spent in office on reforms might depend on the incumbents' education and profession in a twofold way. We have already discussed the effect of qualification on the time span it takes to implement reforms and, respectively, whether or not reforms are implemented in the early stage of the legislative period. That said, the effect of politicians' background might even change with the time they spend in office. For example, the impact of professional peer groups on the incumbent might change over time, and so might his ability to communicate with parliament and public and organize majorities due to learning effects. Also, with a longer period in office, the head of government might feel greater responsibility for all citizens, as compared to being interested mainly in approval by his former peers. Former union executives, for example, might only over time become less reluctant to introduce market-liberal reforms. In summary, the overall direction of the impact of politicians' time in office is likely to depend on education and profession (but is not obvious a priori). We hypothesize:

Hypothesis 2: The impact of politicians' education and profession depends on the time the incumbent has spent in office

The importance of professional peer groups has already been stressed above. Not only professional peer groups, but also the leaning of the incumbent's party, in addition to education and profession, is likely to influence their policy making.

Notably, the party's orientation itself has consequences for policy outcomes. For example, de Haan and Sturm (1994) show that in countries with left-wing governments the growth of the share of government spending in total output generally tends to be higher.

Turning to the impact of the interaction between party and education the outcome is not obvious. The impact of union members, e.g., might be more significant in left-wing parties, as parties more to the center are not likely to support union members with particular

left-wing views. Martinelli and Escorza (2005) show that it is rational for, e.g., a left-wing party to chose a leader with strong left-wing orientation. This is because a credible threat by a left incumbent not to accept right-wing dominated proposals might accelerate the opposing right-wing party's willingness to concede. On the other hand, Cukierman and Tommasi (1998) argue that policymakers cannot always credibly communicate that a proposed policy is beneficial for society. This is due to the fact that there may be the perception of partisan bias in the reform proposal, which leads to the non-adoption of a socially optimal policy. A policy proposal that has a certain ideological flavor and is proposed by a policymaker on the other side of the range of political positions is perceived as being more likely to be optimal. Hence, a market-oriented policy proposal made by, e.g., an economist from a right-wing party is more likely not to be adopted than an identical proposal by a left-wing economist.
We derive our third hypothesis from these considerations:

Hypothesis 3: The impact of politicians' education and profession depends on the political leaning of their party

To test our hypotheses empirically we pursue the following setup. We focus on the chief executive and extract information concerning his education and profession. Clearly, the chief executive does not rule a country alone. However, he or she has a prominent position and is dominating the political agenda of the government.[9]

Concerning the choice of professions and education to focus on, we slightly adopt the categories by Göhlmann and Vaubel (2006). Göhlmann and Vaubel distinguish the following categories with respect to education: economics, business, law, engineering, and other. Regarding profession their categories comprise bankers, insurance executives, businessmen, farmers, lawyers, economic scholars, central bank staff, union leaders, ministerial public servants, other public servants, politicians, and unknown. We initially employed the following professional categories: entrepreneurs, white collar workers, blue collar workers, union executives, economics scientists, other scientists, lawyers, military professionals, politicians, and no or other professions. With respect to education, we distinguish economics, law, politics, natural science, not university, other and unknown education. To reduce complexity (and after testing for the – statistically insignificant – impact of some of the individual categories), we subsumed white and blue collar workers in the category "other profession;"

[9] Chappel et al. (2004) show that the chairman exercises 40% to 50% of the voting weight in Committee decisions. Germany's chancellor, for instance, has the constitutional power to set the overall policy direction.

lawyers have been merged into the category "other scientists." Regarding education, the category "other university" also comprises education in law and politics.

Our reasoning for building these categories is as follows: Military leaders are included as they have been quite common in many governments for some time. We do not code the finance sector separately, as we do not expect experience in this sector to make a difference regarding market-oriented reforms (while it obviously does with respect to central bank policies). We presume that entrepreneurs and science economics should foster reform due to their strong economic background. Furthermore, it is likely that union executives impede reforms, while the impact of professional politicians is not obvious a priori. On the one hand, they frequently lack economic knowledge. On the other hand, they are usually better connected with the political basis. Our ex-ante hypotheses concerning the possible effects of professions and education are summarized in Appendix D. Clearly, the attributes listed there are not exhaustive, and ex-ante expectations regarding specific professions or types of educations depend on how various attributes are weighted and combined.

In the next section we proceed to our method of estimation and data.

Method and Data

We estimate pooled time-series cross-section (panel data) regressions. The data cover the years 1970-2002 and extend to 73 countries.[10] All data are averages over five years (as the dependent variable is not available on a yearly basis) and the regressions include a dummy for each sub-period. The regressions are estimated using feasible generalized least squares (FGLS). This allows estimation in the presence of AR(1) autocorrelation within panels and cross-sectional heteroskedasticity across panels.[11] The basic equations take the following form:

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[10] Sample selection is driven by data availability. The countries in our sample are Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Denmark, Ecuador, Egypt, Finland, France, Germany, Greece, India, Ireland, Israel, Italy, Japan, Kenya, Lebanon, Liberia, Liechtenstein, Luxembourg, Madagascar, Malaysia, Maldives, Mali, Malta, Mauritius, Mexico, Moldova, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russia, Saudi Arabia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Tunisia, Turkey, United Kingdom, United States, Uruguay, and Venezuela.

[11] The FGLS estimator has been shown to perform efficiently under heteroskedasticity and autocorrelation as compared to standard panel estimators. Note that the FGLS correction for a single AR1 term is unlikely to cause the standard errors to be flawed as would be the case employing the Parks correction with individual AR1 terms for each country (Beck and Katz 1995: 637). In all specifications a likelihood ratio test rejects the hypothesis of

$$reform_{it} = \alpha + \beta_1^{'} prof_{it} + \beta_2^{'} educ_{it} + \gamma^{'} X_{it} + \eta_t + \varepsilon_{it} \ , \qquad (1)$$

where $reform_{it}$ represents our measure of reforms (as introduced below), $prof_{it}$ is the vector of professions of the head of government in country i at time t, and accordingly $educ_{it}$ represents education. $\boldsymbol{X}$ is the vector of control variables, η_t are fixed period effects, while ε_{it} is the disturbance.

The data for this study are drawn from a wide range of sources. Appendix B lists all variables with the exact sources and definitions, while Appendix C reports descriptive statistics. Profession and education of the chief government executives are drawn from publicly available sources, including official government web pages and various lexica. We could obtain data for more than 500 chief executives from 73 countries. Clearly, classification sometimes has to rely on judgement to some extent, as some of the sources remain rather vague.[12]

To test our second and third hypotheses, we include interaction terms of profession and education with the head of government's time in office and, respectively, a variable measuring the government's political leaning into equation (1).

While equation (1) assumes reforms to be determined by politicians' background, note that crises or certain economic or social circumstances might affect both the probability of a specific type of politician to be elected and the probability of reforms at the same time.[13] Education and profession might thus well be endogenous to reforms. However, testing for a possible effect of (lagged) economic growth and crisis on the incumbent's background did not support this hypothesis.

Table 1 provides the number of politicians according to profession and education, and their average tenure. As can be seen, the by far biggest group in our sample is professional politicians – people who either never worked in any area outside politics, or have been in politics for a significant part of their career prior to becoming head of government. The second largest group comprises people with no education or education not classified in any

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no AR1 at conventional levels of significance. We also tried including fixed country effects. However, the country dummies are not significant at conventional levels when the AR1 process is taken into account. The procedure of estimation employed here is standard in the recent literature (see, e.g., Kilby 2006).

[12] As one example, Yitzchak Rabin served as high-ranked military in the Israeli army, as ambassador to the United States, member of the parliament, and labor minister before becoming Prime Minister. Whether Rabin has to be classified as military professional or professional politician is thus not obvious (and we opted for military professional).

[13] In the economics literature there is some evidence that, for instance, poor economic growth reduces the likelihood of being re-elected (e.g., Dreher 2004, Brender and Drazen 2006).

other category. The sample encompasses 82 scientists from an area other than economics, and 80 former military officers. Regarding education, the huge majority of politicians in our sample have university degrees. Average tenure ranges from 3.22 years for entrepreneurs to 6 years for former union executives. Table 1 also reports the percentage of professions and types of education belonging to left-wing parties. Among military professionals and entrepreneurs, 29 and, respectively, 25 percent are members of left-wing parties. Surprisingly, the share of union executives amounts to 17 percent only.

Turning to measures of market-liberalizing reforms, recent studies suggest using changes in the economic freedom index as calculated by the Fraser Institute (e.g. Heinemann 2004, Belke et al. 2005, Heckelman and Knack 2005). The data is available in five year-intervals over the period 1970-2002 for all our 73 sample countries. It covers five broad categories of market-oriented policies and institutions: Size of Government (Area 1), Legal Structure and Security of Property Rights (Area 2), Access to Sound Money (Area 3), Exchange with Foreigners (Area 4), and Regulation of Credit, Labor and Business (Area 5). Each index ranges from 0-10, with 10 showing higher values of economic freedom. Appendix A contains the individual sub-components.

The average change in the economic freedom index among our sample is an improvement of 0.21. Improvements were largest in Area 3 (with an average of 0.35), while – on average – reforms in Area 1 have been least prevalent (0.10). Appendix C reports initial values and changes for all areas.

The selection of covariates follows Heckelman and Knack (2005). Heckelman and Knack employ the average annual growth rate in per capita income, linguistic fractionalization, the initial level of civil liberties and the changes thereof, and development aid. Growth is included as it may disrupt special interests blocking reforms.[14] As an alternative hypothesis, reforms might be more likely in times of recession, as voters do not accept reforms when the economy prospers. Linguistic polarization might reflect societies where efficient policy reforms are more difficult to achieve. Civil liberties might increase the

[14] Clearly, growth might be endogenous to economic freedom. For example, de Haan and Sturm (2000) find that economic freedom robustly determines growth. Dawson (2003) also shows that economic freedom fosters growth, while changes in freedom are jointly determined with growth. Following Heckelman and Knack (2005) we include growth to the regressions and test the stability of our results without the growth variable. We alleviate the problem by lagging this variable by one five-year period.

probability of reforms but might also reduce it.[15] Development aid is often granted to induce reforms. However, aid induces some degree of moral hazard and might thus lead to less instead of more reforms.[16] In addition, the initial value of the economic freedom index is included to capture potential reversion-to-the-mean effects, as countries with greater economic freedom have less room for improvements than countries with less freedom.

Data for economic growth rates are taken from the World Bank's World Development Indicators (2003). Linguistic Fractionalization is from Alesina et al. (2003), the index of civil liberties is taken from Freedom House (2002). We transform the original scale of the civil liberties index, so that higher values represent more liberty, on a scale from 1 to 7.

In addition to the variables proposed by Heckelman and Knack (2005), we test for the impact of currency crises to control for the effect of countries that experienced serious economic crises, which are likely to trigger reforms. Our index of currency crises is based on the rate of change of the nominal exchange rate and the level of international currency reserves (as calculated in Dreher et al. 2006).

According to Hsieh (2000), crises which increase the welfare loss of delaying stabilization lower the probability of such delay. Following Dreher (2006) we measure political instability by the first principal component of the number of assassinations, strikes, guerilla warfare, major crises, riots, and revolutions in a particular country and year, and the number of successful coups d'etat (taken from Banks, 1999).

Another aspect that has to be taken into account is the effect of different political systems on reform activity. Proportional political systems are more likely to lead to short lived governments and coalition governments than majoritarian ones, which typically lead to one party governments. Alesina and Tabellini (1990) show that greater uncertainty regarding re-election leads governments to discount the future more heavily. Consequently, reforms requiring actions with short-term costs exceeding short-term benefits become less likely to be implemented. Empirically, this argument is supported by Grilli et al. (1991), who find that the average durability of a government has a negative effect on debt accumulation. Spolaore (1993) shows in a war-of-attrition model that the delay in the adoption of a reform increases

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[15] For example, de Haan and Sturm (2003) report that political freedom significantly improves economic freedom. Case study evidence by Devarajan et al. (2001), to the contrary, suggests that autocratic rulers might be more inclined to reform.

[16] See Boockmann and Dreher (2003) for a discussion and an empirical application to IMF and World Bank lending. Clearly, aid might also concentrate on more reform-oriented countries. Heckelman and Knack (2005) employ instrumental variables to take this potential endogeneity into account. As aid is not the key focus of this paper, we take aid as exogenous regressor. In any case, aid is not selected for our base model (see below).

with the number of parties in a coalition government. Empirical support for this argument is provided in de Haan et al. (1999), showing that the number of parties in the government affects the growth rate of public debt.[17] As the growth rate of debt is most likely linked to some change in policies, this suggests that it is easier to conduct such policy changes when the government is less fractionalized. We thus also include variables that proxy for political systems and constellations. We employ a dummy that is one if the current government is a coalition of at least two parties, and zero otherwise. We further include a dummy for direct presidential systems, a dummy that is one if the party of the head of government controls all houses, and the percentage of veto players that drop. The data on political systems and constellations are taken from Beck et al. (2001).

The next section presents the results.

Results

Column 1 of Table 2 presents results where the dummies for profession and education of the chief government politician are included at the same time in addition to the covariates discussed in the previous section. We omit the categories 'no and other profession' and 'no university education'. Hence, the interpretation of all results regarding the impact of a politicians' profession or education is relative to these baseline groups.

As can be seen, market-oriented reforms are significantly more likely with less initial economic freedom, with a coefficient significant at the one percent level. At the ten percent level, more initial civil liberty also fosters reforms. The lagged growth rate has a significant negative effect on reforms. Hence, countries which suffer from economic downturns are more likely to pass reforms.

The results also show that the other covariates are not individually significant at conventional levels. This is contrary to Heckelmann and Knack (2005) who find reforms to be significantly more likely with increasing civil liberties, and less aid.[18] The covariates are, however, jointly significant in all our regressions.

According to the results, profession and education of politicians indeed matter. The dummies are jointly significant at the one percent level. Turning to the individual impact, it can be seen from column 1 that reforms are significantly more likely when the politician has

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[17] See also Roubini and Sachs (1989), who find that the size of government depends on the political power dispersion in parliament.

[18] However, many countries among our sample did not receive any aid during the period under study. The difference to Heckelmann and Knack is thus not surprising.

an entrepreneurial or scientific background, and less likely, when the politician is a former union executive compared to politicians with 'no and other profession' or 'no university education'. Regarding education, politicians with degrees in economics are significantly more reform-oriented. These results are easy to explain: Entrepreneurs are likely to seek for efficiency, are strong leaders and have a proven record of experience in leading a company. Moreover, due to the high correlation between entrepreneurs and business education they have basic knowledge of economic principles. They are thus more reform-oriented than average politicians.[19] Similar reasoning applies to professional background in science. Such education provides in general some problem solving skills enabling the politician (to some extent) to infer the right choices. In line with our expectations, unionists reduce the probability of market liberalizing reforms. Due to long traditional ties to low-skilled labor force, they seem to refrain from implementing reforms that would increase the probability of lay-offs of their peer group. Coming back to education, economic training and being equipped with a toolbox of economic concepts increases the chance for market liberalizing reform. Again this fits into our ex-ante considerations, as trained economists are more rational and less emotional in taking economic decisions.[20] In all regressions, the initial reform index and the rate of economic growth remain significant at the five percent level at least.

Columns 2-9 add our additional covariates to the regression. Among the additional variables, only currency crises significantly affect reforms, with the expected positive sign, and a coefficient significant at the one percent level. This is in line with the assumption that reforms might be triggered by crises, and confirms the theoretical analysis of Drazen and Grilli (1991) and Hsieh (2000). Column 10 combines all covariates in addition to the professional and educational background variables that have been previously significant: the initial reform index, per capita growth, initial civil liberties, and the index of currency crises. This is the baseline we will use in what follows.

Regarding our variables of prime interest, the previous results are fairly robust to the changes in control variables. Most of the significant coefficients remain significant at the five percent level at least. The only exception is the impact of union executives. The negative impact becomes insignificant in two specifications, but remains significant at the ten percent level at least in three specifications.

[19] However, our results for entrepreneurs have to be handled with care, as there are only nine observations for this group in our sample.

[20] See, e.g., Rubinstein (2006).

In column 11 we exclude the dummies for profession, column 12 omits those for education. The regression is thus obviously misspecified, as important control variables are missing. We report them as test for robustness nevertheless. When educational background is excluded, reforms are still more likely with politicians with entrepreneurial experience and scientific background. The coefficients are significant at the one and, respectively, the ten percent level. Being a former union executive, however, does not affect reforms according to this specification. When we do not control for profession, education in economics does no longer affect reforms.

Table 3 tests our second hypothesis. We have thus included the interaction term between profession/education, and the time the politician has already spent in office. In the first column we present results for the regression including both education and professional background as explanatory variables for reforms. Furthermore, we have augmented the regressions by a variable measuring the time a political leader has spent in office. In column 1, the impact of time spent in office is negative, with a coefficient significant at the ten percent level. The pace of reforms thus decreases with the number of years of incumbency – a result that supports Olson's (1982) argument of institutional sclerosis. Column 1a presents the results for the interaction variables, which capture the joint impact of time spent in office and education/profession. According to our results, the performance of professional economists and other scientists becomes significantly more reform-oriented with each year they spend in office. Overall, the impact on reforms becomes positive when economists stay in office for at least four and a half years. The positive impact of entrepreneurs does not depend on time in office – according to the estimates their impact would only turn negative after more than nine years. Regarding education, the negative impact of "other university" education becomes positive after five years. These results all remain when we exclude education or, respectively, profession from the estimation, as reported in columns 2/2a and 3/3a.

To summarize, our results are in line with our hypothesis 2. Economists, other scientists, and politicians with "other" university education seem to lack experience when starting their time in office and then significantly improve their performance the more experience they collect as a political leader.

Table 4 tests whether controlling for political leaning of the head of government's party influences our results (Hypothesis 3). We add a dummy that is one if the chief executive party is left-wing, and zero otherwise, to our basic specification.[21] As can be seen, there is no

[21] Party orientation is provided by Beck et al. (2001) and is identified with respect to economic policy. Right-wing parties are those that are described as conservative, Christian democratic, or right-wing in the party name,

direct significant impact of left-wing party affiliation on reforms. However, there are significant interactions. Compared to the base category of uneducated right-wing politicians, left-wing politicians with economics education increase the probability of reform. Interestingly, the coefficient of the interaction between left-wing parties and economics education is also slightly greater in magnitude as the left-wing dummy. This implies that left-wing economists are more reform-oriented than right-wing ones. The results are similar for the category "other university". The negative effect of persons with other university education is cancelled by the positive effect for left-wing party members. The results are easy to explain: Market-liberal reforms are typically the domain of center and right-wing parties. Cukierman and Tommasi (1998) suggest that political announcements and reform proposals are more likely to be implemented when they are formulated by an incumbent who is not expected to follow an ideology that is compatible with that specific reform. Hence, market liberal-reforms might be easier to implement for left-wing governors. These findings confirm that the impact of education and profession of politicians on reforms also depends upon the leaning of politicians (Hypothesis 3).

Finally, Table 5 replicates the basic analysis for area-specific reforms. This breakdown allows us to analyze which areas are affected by a specific profession or education. The results show that entrepreneurs mainly reform access to sound money, regulations of credit, labor and business, and government size. Union executives increase the size of government, a result that needs no further explanation. Surprisingly, economics scientists tend to behave alike. This result is likely to be driven by a specific school of thought. Like economists were responsible for high inflation rates in the 1970s (trying to exploit the Phillips curve trade-off), Keynesians may be responsible for this result. Other scientists significantly promote reforms regarding government size and regulations of credit, labor and business. Turning to education, an economics background positively affects reforms in the legal structure and security of property rights and also the regulation of credit, labor and business. Reforms in the latter area are also more likely when the head of government is educated in a natural science. Our findings thus confirm that economists are particularly interested in liberalizing markets and reducing the involvement of the state.

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program, or orientation. Left-wing parties are those identified as communist, socialist, social democratic, or left-wing.

Further Discussion

One problem of the analysis so far is that the perception among the majority of the economics profession of what sound economic policy actually is did change substantially since the 1970s. The impact of education on market-liberal reforms might thus change over time, and the same is true with respect to professional background. Ideally, we would want to control for the school of thought according to which the respective politician has been educated. However, we lack the data for such analysis. In order to check the robustness of our results with respect to changing views over time we split the sample along the time dimension. In Table 6 we report results separated for the periods before and after 1990 (where the cut-off is chosen in order to split the sample approximately in half). Clearly, market-liberal reforms became more prominent during the 1990s, whereas in earlier years of our sample the majority of the economics profession, e.g., favored interventionist Keynesian economic policies. According to the results, entrepreneurs significantly promote reforms in both sample periods, although their impact is more than three times stronger in the earlier period as compared to the later one. “Other” scientists promote reforms in the second period, but not in the first, while economics education has no significant impact in the sub-samples. Other university education now reduces the reform probability in the years after 1990, at the ten percent level of significance.

Some of the results in Table 6 are surprising. Former military officers, for example, significantly promote reforms prior to 1990. This might reflect the impact of military governments per se, rather than the executives’ professional background, as in the pre-1990 period, military officers are way more often heads of autocratic regimes than in the later period. Whether and to what extent the absence of democracy promotes reform is the focus of some debate. De Haan and Sturm (2003) summarize the arguments. They point out that authoritarian governments might be in a better position to introduce liberalization measures that initially may involve massive hardship. A military regime may be in a better position at the beginning of liberalization, because in a democracy electorates might turn down economic reform even when it would in the end benefit a majority of voters. In fact, when we control for the level of democracy, the impact of military background no longer persists. However, the level of democracy also enters the regression with a completely insignificant coefficient.

As another surprising result, professional politicians promote reforms according to both sub-samples, with coefficients significant at the ten, and respectively, the five percent level, while the impact of politicians has been completely insignificant in the overall sample. Clearly, some features of a long career in politics give those politicians an advantage in implementing reforms. They are, for example, more likely to be established in networks within their own party, enabling them to overcome opposition and implement reforms.

Table 6 also tests the robustness of our results with respect to outliers, by excluding the tails of the distribution of GDP, and respectively, the level of economic freedom. We opted for the 5 and, respectively, 95 percentiles as cut-off points. Again our major results remain unaffected – reforms are significantly more likely when the head of government is an educated economist or has work experience as entrepreneur or scientist.

As another point of interest, governments are not always free to implement the policies they prefer. Developing countries, in particular, are frequently restricted in their leeway while under IMF or World Bank programs. Boockmann and Dreher (2003) and Dreher and Rupprecht (2006) provide empirical evidence. With respect to the World Bank, Boockmann and Dreher find that the number of projects has a positive impact on overall economic freedom, while the effect of the amount of World Bank credits appears to be negative. Dreher and Rupprecht show that IMF programs inhibit reforms as measured by the change in the economic freedom index. We therefore include the IMF and World Bank variables suggested in Boockmann and Dreher to test for the robustness of our results.

Arguing along similar lines, membership in the European Union also restricts governments' leeway for independent economic policies.

Columns 7 and 8 of Table 6 present the results. As can be seen, neither (lagged) money or programs of the World Bank, nor membership in the European Union significantly affect reforms. In line with the results of Dreher and Rupprecht (2006), IMF programs prevent reforms, with a coefficient significant at the 10 percent level. Our results regarding education and profession are again unchanged by the inclusion of the additional variables.

And finally, with the breakdown of communism, some of the former communist countries substantially and rapidly reformed their economies. As six of those countries are included in our sample, we also introduce a dummy for countries in transition from central to market economy. The results show that transition countries indeed promoted market-liberal reforms, with the coefficient of the transition country dummy being significant at the one percent level. The results also show that the impact of profession on reforms is not affected by the inclusion of the dummy. However, the impact of economics education becomes marginally insignificant.

Conclusions

This study analyzed whether politicians' education and profession matters for the introduction of market-liberal reforms. Employing panel data over the period 1970-2002, we presented empirical evidence based on a novel data set covering profession and education of over 500 political leaders prior to entering office from 73 countries.

Overall, our results show that education and professional background of politicians matter for market liberalizing reforms. According to our results, heads of governments that have been entrepreneurs before entering into politics enhance reforms. Personal capabilities required to manage a company thus seem to be advantageous in promoting economic reform also. Moreover, professional scientists and trained economists foster reforms as well. On the other hand, former union executives tend to impede reforms. In addition, we provide evidence that the time in office and political leaning of the incumbent's party matter for the overall effect. An economist belonging to a left-wing party is found to be (slightly) more successful in inducing reforms than a member of a right-wing party with the same education. This finding supports Cukierman and Tommasi (1998), who argue that reforms are easier to implement for politicians that are not suspected to act for ideological reasons. Furthermore, former professional economists promote reforms only after a certain time in office. It seems that economists have to get familiar with their new position before they can successfully organize political support for policy reforms.

In summary, our analysis confirms that the personal background of incumbents indeed matters. Our result is thus in line with those of Adolph (2004) and Göhlmann and Vaubel (2006) for central bank governors. For the first time, cross-country evidence clearly supports the World Bank's (2005: v) claim of "a growing appreciation among economists that education [of politicians] may be important because of its role in inculcating civic values."

What are the policy implications of these results? Do they imply that it might actually be desirable that people would vote for experts only? Clearly, other characteristics of politicians also matter for successful policy – profession and education alone do not guarantee success. In addition, the focus of our analysis was restricted to reform-oriented policy reforms. Arguably, other policy dimensions are equally or even more important than economic policy. Whether and to what extent those types of education and profession identified here as being supportive for market-liberal reforms are also successful in other areas remains for future research.

As an obvious extension, the focus of the analysis might be broadened to the entire cabinet instead of just analyzing heads of governments. This may be done in several ways.

First, similar to the analysis presented above, it might be interesting to study whether the professional background of ministers matters for their own field of policy, and whether the impact of politicians differs between policy fields. Whether the type of field ministers or those of the head of government dominates policy outcomes is also a question we leave for future research. Furthermore, different types of head of governments might choose different types of ministers, giving rise to interesting interactions. Clearly, our analysis provides a starting point for many interesting questions on the impact of education and profession of politicians on policies and outcomes.

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Table 1: Chief government official, profession and education, 1970-2005, summary

	number of politicians	percent left-wing	average tenure
profession			
entrepreneur	9	25	3.22
union executive	10	17	6.00
science economics	20	43	3.55
science other	82	31	4.96
military	80	29	5.83
politician	220	44	4.45
none/ other	106	31	4.39
summary	527	36	4.70
education			
economics	84	33	4.24
natural science	14	18	4.50
other university	268	34	4.74
unknown	63	49	3.05
not university	98	39	6.06
summary	527	36	4.70

Note:
Percent left-wing refers to a smaller sample as data on political leaning is missing prior to 1975 and after 2002.

Table 2: Reforms, Profession, and Education, 1970-2002, FGLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)	(10)	(11)	(12)
Economic Freedom, intitial	-0.124	-0.131	-0.112	-0.125	-0.120	-0.123	-0.120	-0.113	-0.118	-0.114	-0.112
	(6.02***)	(6.25***)	(4.82***)	(5.9***)	(5.5***)	(5.66***)	(5.35***)	(5.04***)	(5.96***)	(5.93***)	(5.54***)
Growth p.c. (t-1)	-0.030	-0.029	-0.030	-0.022	-0.025	-0.035	-0.025	-0.025	-0.022	-0.024	-0.025
	(3.78***)	(3.65***)	(2.9***)	(2.4**)	(2.63***)	(4.24***)	(2.65***)	(2.62***)	(2.47**)	(2.78***)	(2.75***)
Linguistic fractionalization	0.018	0.037	-0.003	0.014	-0.001	-0.007	0.013	0.006			
	(0.24)	(0.5)	(0.03)	(0.18)	(0.01)	(0.1)	(0.17)	(0.08)			
Civil liberties, initial	0.024	0.022	0.019	0.027	0.022	0.017	0.025	0.023	0.028	0.032	0.029
	(1.81*)	(1.64)	(1.34)	(1.96**)	(1.6)	(1.33)	(1.82*)	(1.56)	(2.27**)	(2.63***)	(2.28**)
Civil liberties, change	-0.009	-0.008	-0.003	-0.007	-0.006	-0.020	0.003	0.006			
	(0.29)	(0.25)	(0.08)	(0.2)	(0.19)	(0.62)	(0.08)	(0.18)			
Aid (percent of GDP)	-0.001	-0.002	0.004	0.001	0.000	0.001	-0.001	0.003			
	(0.17)	(0.28)	(0.55)	(0.1)	(0.04)	(0.16)	(0.13)	(0.47)			
Instability		-0.023									
		(0.6)									
Government fractionalization			0.107								
			(1.61)								
Currency Crises				0.219					0.211	0.250	0.197
				(2.97***)					(2.89***)	(3.38***)	(2.61***)
Coalition government, dummy					0.047						
					(1.24)						
Direct presidential, dummy						-0.073					
						(1.5)					
Veto players drop (percent)							-0.063				
							(0.52)				
Control of all houses, dummy								-0.024			
								(0.5)			
Profession											
entrepreneur	1.081	1.088	1.171	1.279	1.151	1.040	1.082	1.115	1.246		1.208
	(3.41***)	(3.43***)	(3.66***)	(5.82***)	(3.57***)	(3.26***)	(3.48***)	(3.53***)	(5.6***)		(5.43***)
union executive	-0.158	-0.166	-0.161	-0.154	-0.151	-0.160	-0.161	-0.151	-0.134		-0.070
	(1.95*)	(2.07**)	(2.01**)	(1.53)	(1.91*)	(2.03**)	(1.95*)	(1.77*)	(1.37)		(0.73)
science economics	-0.080	-0.091	-0.070	-0.087	-0.058	-0.095	-0.052	-0.108	-0.041		0.056
	(0.52)	(0.6)	(0.5)	(0.63)	(0.38)	(0.62)	(0.32)	(0.77)	(0.31)		(0.43)
science other	0.182	0.176	0.181	0.177	0.195	0.183	0.179	0.193	0.150		0.099
	(2.88***)	(2.8***)	(2.7***)	(2.61***)	(2.96***)	(2.95***)	(2.78***)	(2.91***)	(2.3**)		(1.69*)
military	0.086	0.065	0.067	0.063	0.091	0.098	0.105	0.102	0.067		0.011
	(1.08)	(0.8)	(0.74)	(0.72)	(1.07)	(1.24)	(1.24)	(1.16)	(0.78)		(0.13)
politician	0.039	0.037	0.063	0.055	0.036	0.038	0.042	0.048	0.053		0.021
	(0.72)	(0.69)	(1.16)	(0.92)	(0.66)	(0.72)	(0.75)	(0.85)	(0.95)		(0.4)
Education											
economics	0.167	0.178	0.191	0.182	0.156	0.169	0.161	0.180	0.146	0.081	
	(2.38**)	(2.56***)	(2.69***)	(2.3**)	(2.23**)	(2.45**)	(2.25**)	(2.41**)	(1.98**)	(1.28)	
natural science	0.206	0.216	0.199	0.236	0.195	0.202	0.196	0.185	0.231	0.157	
	(1.53)	(1.59)	(1.56)	(1.73*)	(1.48)	(1.52)	(1.44)	(1.41)	(1.75*)	(1.31)	
other university	-0.041	-0.034	-0.001	-0.030	-0.047	-0.033	-0.044	-0.033	-0.011	0.019	
	(0.61)	(0.51)	(0.02)	(0.42)	(0.68)	(0.5)	(0.62)	(0.45)	(0.15)	(0.35)	
unknown	0.085	0.089	0.089	0.059	0.087	0.078	0.081	0.100	0.057	-0.022	
	(0.81)	(0.85)	(0.87)	(0.52)	(0.85)	(0.75)	(0.76)	(0.91)	(0.51)	(0.22)	
Number of countries	65	65	64	62	64	65	64	64	64	62	62
Number of observations	348	347	318	331	343	348	344	341	343	335	335
Joint sign. (Prob>chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

* denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Base categories are “no and other profession” and “no university education”. All regressions include a dummy for each five-year-period.

Table 3: Reforms, Profession, Education, and time in office, 1970-2002, FGLS

	(1)	(1a)	(2)	(2a)	(3)	(3a)
Economic Freedom, intitial	-0.134		-0.114		-0.117	
	(6.69***)		(5.95***)		(5.66***)	
Growth p.c. (t-1)	-0.032		-0.026		-0.034	
	(3.45***)		(2.94***)		(3.59***)	
Civil liberties, initial	0.033		0.030		0.033	
	(2.79***)		(2.44**)		(2.55**)	
Currency Crises	0.214		0.238		0.199	
	(3.19***)		(3.27***)		(2.83***)	
Time in office	-0.049		-0.015		-0.014	
	(1.89*)		(1.81*)		(1.23)	
Profession						
entrepreneur	1.506	-0.167			1.275	-0.141
	(4.9***)	(1.37)			(4.46***)	(1.12)
union executive	-0.071	-0.010			-0.036	-0.007
	(0.3)	(0.24)			(0.15)	(0.15)
science economics	-0.705	0.166			-0.378	0.140
	(2.97***)	(2.96***)			(1.76*)	(2.37**)
science other	-0.044	0.049			-0.138	1.275
	(0.41)	(2.7***)			(1.34)	(2.78***)
military	0.103	0.026			0.114	-0.004
	(0.78)	(0.94)			(0.92)	(0.25)
politician	0.024	0.014			-0.047	0.016
	(0.27)	(0.92)			(0.6)	(1.16)
Education						
economics	0.091	0.029	0.012	0.012		
	(0.66)	(0.89)	(0.1)	(0.5)		
natural science	0.331	-0.023	0.368	-0.048		
	(1.24)	(0.43)	(1.47)	(1.06)		
other university	-0.207	0.041	-0.112	0.022		
	(1.93*)	(1.54)	(1.4)	(2.14**)		
unknown	-0.211	0.073	-0.114	0.012		
	(0.81)	(0.95)	(0.47)	(0.17)		
Number of countries	62		62		62	
Number of observations	335		335		335	
Joint sign. (Prob>chi2)	0.00		0.00		0.00	

Notes:

* denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Base categories are "no and other profession" and "no university education". All regressions include a dummy for each five-year-period.

Columns (a) report the coefficient of the interaction term of governments' time in office and the respective profession or education.

Table 4: Reforms, Profession, Education, and government leaning, 1970-2002, FGLS

	(1)	(1a)	(2)	(2a)	(3)	(3a)
Economic Freedom, intitial	-0.104		-0.102		-0.100	
	(4.64***)		(4.98***)		(4.73***)	
Growth p.c. (t-1)	-0.026		-0.023		-0.025	
	(2.8***)		(2.71***)		(2.6***)	
Civil liberties, initial	0.017		0.025		0.022	
	(1.39)		(2.03**)		(1.72*)	
Currency Crises	0.239		0.255		0.230	
	(2.9***)		(3.38***)		(2.7***)	
Left government	-0.232		-0.170		0.032	
	(1.57)		(1.59)		(0.29)	
Profession						
entrepreneur	1.133	2.461			1.120	2.181
	(5.23***)	(1.61)			(5.1***)	(1.33)
union executive	-0.058	-0.073			-0.007	-0.064
	(0.3)	(0.33)			(0.04)	(0.31)
science economics	-0.167	0.401			-0.026	0.384
	(1.09)	(1.31)			(0.18)	(1.09)
science other	0.223	-0.222			0.155	1.120
	(2.54**)	(1.47)			(1.88*)	(0.79)
military	0.094	0.180			0.060	-0.037
	(0.86)	(1.05)			(0.59)	(0.22)
politician	0.088	-0.041			0.008	0.067
	(1.2)	(0.31)			(0.12)	(0.53)
Education						
economics	0.126	0.252	-0.019	0.229		
	(1.15)	(1.64*)	(0.19)	(1.66*)		
natural science	0.320	0.097	0.347	-0.153		
	(1.83*)	(0.39)	(2.09**)	(0.74)		
other university	-0.072	0.420	-0.079	0.264		
	(0.78)	(2.68***)	(1.02)	(2.21**)		
unknown	0.095	0.181	0.049	-0.036		
	(0.53)	(0.7)	(0.3)	(0.15)		
Number of countries	61		61		61	
Number of observations	324		324		324	
Joint sign. (Prob>chi2)	0.00		0.00		0.00	

Notes:

* denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Base categories are “no and other profession” and “no university education”. All regressions include a dummy for each five-year-period.

Columns (a) report the coefficient of the interaction term of left-wing governments and the respective profession or education.

Table 5: Areas of Reform, Profession, and Education, 1970-2002, FGLS

	Government Size	Legal Structure	Money	Trade	Regulation
Economic Freedom, intitial	-0.084	-0.050	-0.114	-0.108	-0.126
	(3.85***)	(2.13**)	(2.88***)	(5.31***)	(5.99***)
Growth p.c. (t-1)	-0.035	-0.008	0.005	-0.024	-0.011
	(2.75***)	(0.55)	(0.19)	(2.2**)	(1.12)
Civil liberties, initial	-0.010	0.085	-0.016	0.012	0.026
	(0.66)	(4.52***)	(0.45)	(0.81)	(2.25**)
Currency Crises	0.005	0.262	0.391	0.156	0.327
	(0.06)	(2.49**)	(1.57)	(1.25)	(3.58***)
Profession					
entrepreneur	1.108	0.233	2.542	0.007	1.042
	(4.63***)	(0.81)	(3.51***)	(0.03)	(2.6***)
union executive	-0.278	0.069	-0.397	0.065	0.083
	(1.87*)	(0.38)	(1.41)	(0.43)	(0.54)
science economics	-0.459	0.192	-0.223	-0.151	-0.148
	(2.42**)	(0.72)	(0.66)	(0.87)	(1.22)
science other	0.211	0.051	0.305	0.000	0.155
	(1.93*)	(0.45)	(1.5)	(0)	(2.11**)
military	-0.008	0.164	-0.037	-0.074	0.003
	(0.08)	(1.07)	(0.17)	(0.65)	(0.04)
politician	0.051	0.038	0.209	0.025	0.044
	(0.56)	(0.41)	(1.33)	(0.33)	(0.72)
Education					
economics	0.012	0.094	0.385	0.123	0.089
	(0.11)	(0.74)	(1.97**)	(1.13)	(1.08)
natural science	0.000	0.148	0.375	-0.010	0.382
	(0)	(0.63)	(0.8)	(0.05)	(2.82***)
other university	-0.084	0.068	-0.032	0.083	-0.001
	(0.83)	(0.57)	(0.16)	(0.84)	(0.01)
unknown	-0.106	0.085	-0.053	-0.052	-0.127
	(0.62)	(0.58)	(0.19)	(0.42)	(0.92)
Number of countries	62	62	62	62	62
Number of observations	343	328	343	339	324
Joint sign. (Prob>chi2)	0.00	0.00	0.00	0.00	0.00

Notes:

* denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Base categories are “no and other profession” and “no university education”. All regressions include a dummy for each five-year-period.

Table 6: Reforms, Profession, and Education, sub-samples, 1970-2002, FGLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Economic Freedom, intitial	-0.141	-0.111	-0.099	-0.108	-0.130	-0.128	-0.123	-0.110	-0.108
	(2.92***)	(6.19***)	(4.84***)	(5.08***)	(7.77***)	(6.38***)	(5.44***)	(5.53***)	(5.4***)
Growth p.c. (t-1)	-0.017	-0.027	-0.036	-0.031	-0.037	-0.026	-0.028	-0.028	-0.028
	(1.43)	(3.3***)	(4.56***)	(3.66***)	(5.97***)	(3.52***)	(3.39***)	(3.42***)	(3.41***)
Civil liberties, initial	0.097	-0.016	0.011	0.021	0.013	0.026	0.019	0.021	0.024
	(4.13***)	(1.3)	(0.97)	(1.82*)	(1.39)	(2.21**)	(1.64)	(1.84*)	(2.1**)
Currency Crises	0.441	0.277	0.034	0.043	0.021	0.027	0.043	0.040	0.045
	(2.69***)	(5.29***)	(0.54)	(0.65)	(0.39)	(0.5)	(0.69)	(0.65)	(0.73)
World Bank credit							0.002		
							(0.03)		
IMF loans							-0.151		
							(1.67*)		
World Bank projects							0.000		
							(0)		
IMF programs							-0.002		
							(0.23)		
EU member, dummy								-0.043	
								(0.81)	
Transition country, dummy									0.363
									(3.87***)
Profession									
entrepreneur	3.626	0.977	1.185	1.147	1.119	1.086	1.194	1.178	1.085
	(3.63***)	(4.54***)	(4.33***)	(4.05***)	(4.1***)	(2.13**)	(4.02***)	(4.18***)	(4.1***)
union executive	-0.185	0.054	-0.126	-0.140	-0.076	-0.141	-0.136	-0.144	-0.109
	(0.99)	(0.41)	(1.5)	(1.66*)	(1.43)	(1.76*)	(1.68*)	(1.79*)	(1.37)
science economics	0.112	-0.144	-0.040	-0.019	-0.051	-0.025	-0.044	-0.024	-0.124
	(0.38)	(1.08)	(0.29)	(0.13)	(0.38)	(0.17)	(0.3)	(0.16)	(0.87)
science other	0.176	0.276	0.173	0.167	0.189	0.194	0.180	0.151	0.171
	(1.56)	(4.12***)	(2.76***)	(2.58***)	(3.67***)	(3.09***)	(2.93***)	(2.42**)	(2.76***)
military	0.251	-0.024	0.122	0.060	0.100	0.074	0.071	0.064	0.073
	(2.08**)	(0.22)	(1.53)	(0.73)	(1.56)	(0.93)	(0.89)	(0.8)	(0.91)
politician	0.169	0.142	0.053	0.068	0.057	0.072	0.055	0.044	0.052
	(1.89*)	(2.42**)	(1.07)	(1.31)	(1.4)	(1.5)	(1.13)	(0.91)	(1.05)
Education									
economics	0.102	0.017	0.132	0.137	0.124	0.163	0.142	0.137	0.100
	(0.98)	(0.18)	(1.97**)	(1.97**)	(2.24**)	(2.48**)	(2.12**)	(2.09**)	(1.49)
natural science	0.169	-0.001	0.224	0.201	0.205	0.175	0.179	0.217	0.171
	(0.74)	(0.01)	(1.7*)	(1.56)	(1.85*)	(1.28)	(1.37)	(1.67*)	(1.32)
other university	-0.106	-0.143	-0.035	-0.029	-0.047	-0.027	-0.036	-0.021	-0.040
	(0.99)	(1.7*)	(0.53)	(0.42)	(0.9)	(0.44)	(0.53)	(0.32)	(0.6)
unknown	-0.187	-0.006	0.103	0.065	0.050	0.116	0.096	0.112	0.066
	(1.19)	(0.05)	(1)	(0.61)	(0.58)	(1.18)	(0.94)	(1.11)	(0.64)
Number of countries	54	61	62	63	64	65	65	65	65
Number of observations	153	179	325	325	325	326	344	344	344
Sample	<1990	>1990	no poor	no rich	no unfree	no free	all	all	all
Joint sign. (Prob>chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

* denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level**.**

Base categories are “no and other profession” and “no university education”. All regressions include a dummy for each five-year-period.

Appendix A: Areas and Components of the Economic Freedom Index

Area 1: Size of Government: Expenditures, Taxes and Enterprises
- 1A General gov't consumption as share of total consumption
- 1B Transfers and subsidies as a share of GDP
- 1C Gov't enterprises and investment as a share of gross investment
- 1D Top marginal tax rate
  - 1Di Top Marginal Income Tax Rate
  - 1Dii Top Marginal Income and Payroll Tax Rate

Area 2: Legal Structure and Security of Property Rights
- 2A Judiciary independence
- 2B Impartial courts
- 2C Protection of intellectual property
- 2D Military in Politics
- 2E Law and Order

Area 3: Access to Sound Money
- 3A Avg. growth of money (last 5 years) minus growth of real GDP (last 10 years)
- 3B Standard deviation of annual inflation (last 5 years)
- 3C Annual inflation (most recent year)
- 3D Freedom of citizens to own foreign currency bank accounts (domestically and abroad)

Area 4: Freedom to Trade Internationally
- 4A Tarrifs
  - 4Ai International trade tax revenues (% of trade sector)
  - 4Aii Mean tariff rate
  - 4Aiii Standard deviation of tariff rates
- 4B Regulatory Trade Barriers
  - 4Bi Hidden import barriers
  - 4Bii Costs of importing
- 4C Actual vs. expected size of trade sector
- 4D Difference between official and black mkt exchange rates
- 4E International Capital Market Controls
  - 4Ei Access of Citizens to foreign captial markets/foreign access to domestic capital markets (GCR)
  - 4Eii Restrictions in Foreign Capital Market Exchange/Index of capital controls among 13 IMF categ

Area 5: Regulation of Credit, Labour, and Business
- 5A Credit Market Regulation
  - 5Ai Ownership of banks
  - 5Aii Competition in domestic banking
  - 5Aiii Extension of credit
  - 5Aiv Interest rate regulations (leading to neg. rates)
  - 5Av Interest rate controls
- 5B Labor Market Regulations
  - 5Bi Impact of minimum wage
  - 5Bii Hiring and firing practices
  - 5Biii Labor force share with wages set by centralized collective bargaining
  - 5Biv Unemployment insurance
  - 5Bv Use of conscripts
- 5C Business Regulations
  - 5Ci Price controls
  - 5Cii Administrative Conditions/Entry of New Business
  - 5Ciii Time with government bureaucracy
  - 5Civ Starting a new business
  - 5Cv Irregular payments

Appendix B: Sources and Definitions

Variable	Description	Source
Economic Freedom	Composite index of economic freedom. Ranges from 0-10, with higher values reflecting greater freedom.	Gwartney and Lawson (2004)
Area 1	Size of Government Index. Ranges from 0-10, with higher values reflecting greater freedom.	Gwartney and Lawson (2004)
Area 2	Legal Structure and Security of Property Rights Index. Ranges from 0-10, with higher values reflecting greater freedom.	Gwartney and Lawson (2004)
Area 3	Access to Sound Money Index. Ranges from 0-10, with higher values reflecting greater	Gwartney and Lawson (2004)
Area 4	Exchange with Foreigners Index. Ranges from 0-10, with higher values reflecting greater	Gwartney and Lawson (2004)
Area 5	Regulation of Credit, Labour and Business Index. Ranges from 0-10, with higher values reflecting greater freedom.	Gwartney and Lawson (2004)
Growth per capita	GDP per capita growth (constant 2000 US$).	World Bank (2006)
GDP	GDP, PPP (constant 2000 international $)	World Bank (2006)
Linguistic fractionalization	Fractionalization$_j$=, $1-\sum_{i=1}^{n} s_{ij}^2$ with s_{ij} being the share of group i in country j.	Alesina et al. (2003)
Civil liberties	Index ranging from 1 to 7; rescaled so that higher values reflect more liberty.	Freedom House (2002)
Aid (percent of GDP)	Actual international transfer of financial resources or of goods or services valued at the cost to the donor, less any repayments of loan principal during the same period. Grants by official agencies of the members of the Development Assistance Committee are included, as are loans with a grant element of at least 25 percent, and technical cooperation and	World Bank (2006)
Time in office	Number of years the incumbent has been in office.	Various sources
Left wing governments	Dummy variable that is one for left-wing governments, and zero otherwise.	Beck et al. (2001)
Instability	First principal component of various instablity indicators (number of assassinations, strikes, guerilla warfare, major crises, riots, and revolutions in a particular country and year, and the number of successful coups d'etat).	Dreher (2006)
Currency Crises	A country is defined as experiencing a currency crisis when index covering the rate of change of the exchange rate and international currency reserves is one standard deviation greater than the index mean	Dreher, Herz, Karb (2006)
Government fractionalization	Probability that two random draws will produce legislators from different parties.	Beck et al. (2001)
Coalition government, dummy	Dummy taking the value one if the current government is a coalition of at least two parties.	Beck et al. (2001)

Appendix B (continued)

Variable	Description	Source
Direct presidential, dummy	Dummy for systems with unelected executive presidents and presidents who are elected directly or by an electoral college.	Beck et al. (2001)
Veto players drop (percent)	Counts the percent of veto players who drop from the government in any given year. In presidential systems, the veto players are the president, the largest party in the legislature, and the largest party in the Senate; for parliamentary systems, veto players are defined as the PM and the three biggest coalition members.	Beck et al. (2001)
Control of all houses, dummy	Party of head of government controls all relevant houses.	Beck et al. (2001)
World Bank credit	Net change of countries outstanding IBRD loans and IDA credits in per cent of GDP.	World Bank (2006)
IMF loans	Net drawings on all IMF facilities as percent of GDP.	World Bank (2003)
World Bank projects	Number of World Bank programs negotiated.	http:/.worldbank.org
IMF programs	Number of IMF programs that were active over at least five months in a given calendar year.	IMF annual report (various years)
EU member, dummy	Dummy for EU members.	
Transition country, dummy	Dummy for Bulgaria, Czech Republic, Poland, Romania, Slovak Republic, Slovenia	

Appendix C: Descriptive Statistics, estimation sample, Table 2, column 1

Variable	Mean	Minimum	Maximum	Standard Deviation
Economic Freedom, initial	5.89	3.65	7.90	0.48
Reform index (change in economic freedom)	0.21	-1.05	1.90	0.48
Area 1, initial	5.13	2.20	7.50	1.36
Area 1, change	0.10	-2.70	2.70	0.75
Area 2, initial	6.01	2.50	8.30	1.75
Area 2, change	0.19	-2.40	3.90	0.95
Area 3, initial	6.87	2.55	9.50	1.66
Area 3, change	0.35	-4.10	6.10	1.26
Area 4, initial	6.15	2.20	9.05	1.74
Area 4, change	0.28	-1.95	2.70	0.73
Area 5, initial	5.37	3.10	6.90	0.76
Area 5, change	0.15	-1.45	2.30	0.60
Growth per capita	1.91	-8.45	8.59	1.98
GDP	2.2E+11	1.6E+08	1.1E+13	7.6E+11
Linguistic fractionalization	0.27	0.02	0.87	0.24
Civil liberties, initial	2.53	1.00	6.00	1.63
Civil liberties, change	0.09	-2.00	2.80	0.63
Aid (percent of GDP)	0.31	0.00	7.11	1.10
Time in office	5.01	1.00	32.00	4.69
Left wing governments	0.37	0.00	1.00	0.44
Instability	0.00	-0.52	17.84	0.67
Currency Crises	0.08	0.00	1.00	0.28
Government fractionalization	0.16	0.00	1.00	0.27
Coalition government, dummy	0.24	0.00	1.00	0.43
Direct presidential, dummy	0.50	0.00	1.00	0.50
Veto players drop (percent)	0.09	0.00	1.00	0.15
Control of all houses, dummy	0.52	0.00	1.00	0.49
World Bank credit	0.34	-1.13	15.02	1.04
IMF loans	0.08	-2.22	6.43	0.44
World Bank projects	0.84	0.00	16.50	1.77
IMF programs	0.15	0.00	2.20	0.34
EU member, dummy	0.03	0.00	1.00	0.16
Transition country, dummy	0.03	0.00	1.00	0.17

Appendix D: Ex-Ante Assumptions

Type	Foster reforms	Impede reforms	Overall Effect
Profession			
Entrepreneur	leadership seeks efficiency economic knowledge		(+)
Union executive		peer group bias limited outside options	(-)
Science economics	economic knowledge	lacks leadership	(+)
Science other	analytical capabilities	economic knowledge	?
Military officer	leadership	economic knowledge	?
Politician	well connected to basis	peer group bias limited outside options economic knowledge	?
Education			
Economics	economic knowledge		(+)
Natural Science	analytical capabilities	economic knowledge	(+)
Other university		economic knowledge	?
Unknown		economic knowledge	?
Not university		economic knowledge	(-)