

Decomposed Effects of Democracy on Economic Freedom ^A

By

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Abstract:

Many previous empirical studies conclude that democracy increases economic freedom. However, these studies use highly aggregated indices of economic freedom, which eliminate interesting information and obstruct policy conclusions. The purpose of this study is to empirically study how different categories of economic freedom are affected by democracy in developing countries. There seems to be a positive effect of democracy on the categories *Government Operations and Regulations* and *Restraints on International Exchange*, but for the categories *Money and Inflation* and *Takings and Discriminatory Taxation* there is no effect. The robustness to extreme points and the model specification is tested.

Keywords: democracy, economic freedom, decomposition.

JEL classification: P51

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1 INTRODUCTION

There are many studies showing a positive effect of economic freedom on growth (see e.g. Vanssay and Spindler, 1994; Easton and Walker, 1997; Wu and Davis, 1999; Gwartney et al., 1999; de Haan and Strum, 2000; Strum and de Haan, 2001). The importance of analyzing the impact of democracy on economic freedom comes mainly from the findings that political freedom increases growth indirectly by its impact on economic freedom, while the direct effects on growth often are negligible (see e.g. De Melo, et al., 1996; Dehtier et al., 1999; Fidrmuc, 2000; Popov, 2000). Many other empirical studies confirm that democracy increases economic freedom (see e.g. De Melo et al., 1997; Sturm and de Haan, 2002).¹ However, all these studies use highly aggregated indices of economic freedom, which eliminate a lot of interesting information and obstruct policy conclusions. One might ask what kind of economic freedom increases as political freedom increases. Can it be that some categories of economic freedom are not related to democracy at all, or even that some categories decrease as democracy increases?

Many arguments exist for positive and negative, as well as insignificant, effects of democracy on economic liberalization. On the basis of the inconclusive theoretical arguments, it is not at all obvious that all categories in an economic freedom are equally affected by democracy. The rationale for decomposing the economic freedom index becomes even more obvious when taking into account the effects on economic growth. Studies show that depending on the category of economic freedom used, the impact on economic growth differs when it comes to sign, significance and robustness (Ayal and Karras, 1998; Carlsson and Lundström, 2002).

The purpose of this study is to empirically study how different categories of economic freedom are affected by democracy in developing countries. The sensitivity of the results is analyzed when it comes to extreme points and model specification.

The paper is organized as follows. Chapter 2 gives a theoretical background and discusses, on the basis of these arguments, the effect of democracy on different categories of economic freedom. In Chapter 3, the data is presented. The model

¹ Clague et al. (1996) finds, however, that it is rather the length of the period in power than the type of regime that determines property and contract rights, which is one dimension of economic freedom.

specification and sensitivity tests are described in Chapter 4. Chapter 5 presents and analyzes the results from the basic regressions and the sensitivity tests. Chapter 6 concludes the paper.

2 THEORETICAL ARGUMENTS

The theoretical arguments for the impact of democracy on economic freedom and growth are ambiguous. The arguments can be divided into three groups: the conflict view, the compatibility view and the skeptical view (Sirowy and Inkeles, 1990).

According to the *conflict view* there is a choice between either a democratic process or rapid economic transition. A first argument is that political and civil freedoms make it harder for a government to make tough but necessary decisions (World Bank, 1991). An authoritarian government is needed at least in the beginning of the liberalization process, since massive layoffs and cuts in entitlements are common in the initial stages (Fidrmuc, 2000). Examples in favor of this view are countries such as Chile, South Korea and Taiwan, which all successfully implemented economic reforms under an autocratic regime and subsequently replaced the regime with a more democratic government (Edwards, 1991). Another example is Russia who started out with a political liberalization that ended up in institutional chaos, which retarded the economic reforms (Shleifer, 1998). A second argument for a negative effect of democracy on economic freedom is that the positive long run effects of a reform involve great uncertainty. This may lead a rational voter to oppose the changes in economic freedom even though the final effects are expected to be welfare augmenting for a majority (Fernandez and Rodrik, 1991; Conley and Maloney, 1995). An example is workers opposing privatization, even though they believe most will benefit in the end, because they do not know if their individual skills will be demanded after the reform. Since political backlashes would be unavoidable, only an autocratic regime would be able to implement these policies, which ex-post would be popular. A third argument concerns the inefficiencies that might be created by the lobbying of interest groups under a democratic regime. Some argue that elected governments are more likely to follow the demands of some interest groups in society as a means to win votes in the short run. The redistributive role of a democratic government may lead to overspendings and adverse effects on savings and productive

investment (Alesina and Perotti, 1994; Block, 2002). Necessary restraints on consumption and real wages would decrease the probability of re-election. Alesina and Drazen (1991) illustrate how efficiency-enhancing reforms may be delayed because of wars over asymmetric pay-offs. The welfare-loss is not only the delayed reform but also the loss of productive activity during the conflict.

The arguments of the *compatibility view*, i.e. increased democracy foster economic freedom, are similar to the argument that democracy facilitates economic growth (see Przeworska and Limongi, 1993, and De Haan and Siermann, 1995, for surveys). First, some argue that, in contrast to the conflict view, only a government with some legitimacy would be able to stand by policies with short run costs. Democratic regimes can be assumed to have greater legitimacy because of the political and civil freedom the system allows the people to have. Second, many of the institutions needed in a democracy are also the source of a successful economic liberalization, such as an independent legal system, a professional civil service and stable property rights. Third, democracy, and not autocracy as argued by the conflict perspective, may limit rent seeking because of its system of checks and balances hindering self-interested leaders. Åslund et al. (1996) argue that in countries lacking such a system, the old elite, especially state enterprise directors and political leaders, continues to have advantages over the rest of the population, and a de-monopolization becomes difficult. According to North (1993), civil and political liberties are necessary to protect citizens from predatory behavior of the government. Finally, the institutions for debate following politically free systems, such as free elections with opposition parties and freedom of speech, may be a fundamental base for conflict management under liberalization (Rodrik, 1999). An authoritarian regime may avoid conflicts in the short run, but has no institution for solving them.

Followers of the *skeptical view* argue, more or less, that the question is mis-specified and that it is other institutions, not directly connected to a specific regime, that affect economic development. According to Clague et al. (1996), there are large variations within a democratic or an autocratic regime. In autocracies it is the time horizon of the individual autocrat that determines property and contract rights, whereas in democracies it is the durability of the regime that determines these rights. Alesina and Perotti (1994) argue that instability and uncertainty discourage investments and growth, rather than the specific political system. Moreover, it is not

at all clear if a dictator would be more resistant to interest groups and rent-seeking behavior, or be a better conflict manager than a democratic government.

As is clear from the survey of arguments above, there are many aspects of the effect of democracy on economic freedom. However, this is not very surprising. Economic freedom includes many, sometimes very different, aspects and the effect of democracy can be expected to depend on what kind of economic freedom one refers to. Earlier empirical studies have tended to support the compatibility view, but this does not mean that this is the only proper view, since only the effects on a summary index has yet been analyzed. For example, the compatibility view may be right when predicting the government size as a measure of economic freedom, while the conflict view is more appropriate when looking at discriminatory regulations, and the skeptical view is maybe more in accordance with reality if economic freedom refers to inflation issues. The aim of the following empirical analysis is to examine the possibility of parallel views on the relation between democracy and economic freedom, depending on the specific economic freedom measure.

3 DATA

The data on economic freedom is obtained from “Economic freedom of the world; 1975-1995” by Gwartney et al. (1996) - an often used index. The main components of the economic freedom index are personal choice, protection of property and freedom of exchange. The index is divided into four categories, each measured on a scale from 0 to 10, where 10 is the highest level of freedom. The first category, *Money and Inflation (EFmon)*, is a measure of the availability of “sound” money to the citizens. High economic freedom in this sense means slow monetary expansion, stable price levels and absence of restrictions limiting the use of alternative currencies. The category is constructed of the variables: (i) average annual growth rate of the money supply during the last five years minus the annual growth rate of potential GDP, (ii) the standard deviation of annual inflation rate during the last five years, (iii) freedom of residents to own foreign money domestically and (iv) freedom of residents to maintain bank accounts abroad.

The second category, *Government Operations and Regulations (EFgov)*, represents the extent of reliance on market allocation rather than allocation through

the political process. High economic freedom is assumed to prevail if the government mainly functions as a provider of protection and a public good producer. The category consists of the variables: (i) government general consumption expenditures as a share of GDP, (ii) government-operated enterprises as a share of the economy, (iii) price controls – the extent that businesses are free to set their own prices, (iv) freedom to enter and compete in markets, (v) equality of citizens under the law and citizen access to a non-discriminatory judiciary and (vi) freedom from government regulations and policies that cause negative real interest rates.

The third category, *Takings and Discriminatory Taxation (EFtak)*, measures the extent to which the government treats citizens equally rather than engages in tax and transfer activities. High economic freedom is achieved if the government does not engage in actions that favor or discriminate one group of citizens. The category includes the variables: (i) transfers and subsidies as a percent of GDP, (ii) top marginal tax rate and (iii) the use of conscripts to obtain military personnel.

The last category, *Restraints on International Exchange (EFint)*, is a measure of citizen possibilities of gaining from division of labor, economies of scale and from specialization in areas where they have a comparative advantage. High economic freedom defined in this sense means low restrictions on exchanges across the nation borders. The category is constructed of the variables: (i) taxes on international trade as a percent of exports plus imports, (ii) difference between the official exchange rate and the black market rate and (iii) actual size of the trade sector compared to the expected size.

Gwartney et al. (1996) present three alternative aggregation techniques to construct an economic freedom *Summary Index* from the different variables *Ie*, *Is1* and *Is2*. The variables in *Ie* are weighted by the inverse of its standard deviation. In the other summary indices, each variable is assigned a weight based on expert surveys, with experts in the field of economic freedom for *Is1* and country experts for *Is2*. Since all three indices give very similar results, only the results from the regressions with *Ie (EFsum)* will be presented in this paper.

The democracy variable is based on the Freedom House indices of political and civil freedom (Freedom House, 1999). The political freedom index measures whether a government came to power by election or by gun, whether elections, if any, are free and fair and whether an opposition exists and has the opportunity to take power at the consent of the electorate. The civil freedom index measures constraints

on the freedom of the press, and constraints on the rights of individuals to debate, to assemble, to demonstrate and to form organizations, including political parties and pressure groups. Although the two indices are highly correlated, we will use both freedom variables as a proxy for democracy to see if it affects the result. The democracy measure is measured on a scale from 1 to 7, where 7 is the highest level of freedom.²

The control variables and the variables used in the model sensitivity analysis are all from the *2000 World Development Indicators CD-Rom* (World Bank, 2000), with the exception of the dummy variables for regions, legal origin and developing country which come from the *Global Development Network Data Base* (World Bank, 1999). The resulting samples include 60 developing countries, presented in Table A.1 in the Appendix, for the period 1975-1995. Table 1 presents descriptive statistics for the variables included in the basic regressions and in the model specification test. Note that income is presented in dollars per capita and that gEF_j is the change in EF_j from 1975 to 1995, where $j = sum, mon, gov, tak$ or int .

Table 1: Descriptive statistics. Developing countries.

Variable	Mean	Std.Dev.	Minimum	Maximum	Variable	Mean	Std.Dev.	Minimum	Maximum
CIVIL	3,64	1,50	1	7	Y75	1403,79	1038,83	231,78	4593,24
POLIT	3,31	1,83	1	7	Aid75	4,54	5,76	-0,01	30,20
gEFsum	0,78	1,50	-3,30	3,58	Open7090	22,67	15,99	3,77	73,28
gEFmon	1,53	2,57	-5,54	6,73	Growth6575	5,02	2,59	-0,54	13,82
gEFgov	-0,42	1,81	-5,52	3,30	SSA	0,30	0,46	0	1
gEFtak	-0,41	3,82	-10	6,04	MENA	0,13	0,33	0	1
gEFint	1,02	1,90	-5,74	6,37	ECA	0,02	1,13	0	1
EFsum75	3,99	1,12	2,11	7,27	EAP	0,11	0,31	0	1
EFmon75	2,64	1,79	0	7,92	SA	0,09	1,29	0	1
EFgov75	5,21	1,70	1,17	8,86	LAC	0,36	0,48	0	1
EFtak75	6,20	2,84	0	10	British	0,30	0,46	0	1
EFint79	3,65	1,80	0,24	8,48	French	0,68	0,47	0	1

CIVIL is civil freedom and *POLIT* is political freedom both measured as the 1973 to 1975 average; gEF_j is the change in EF_j from 1975 to 1995, where $j = sum, mon, gov, tak$ or int ; $EF_j 75$ is the level of economic freedom j in 1975; *Y75* is the level of income in 1975; *Aid75* is aid received as a share of GDP from 1971 to 1975; *Open7090* is the share of imports and exports as a share of GDP from 1970 to 1990; *Growth6575* is growth of GDP from 1965 to 1975; the regional dummies are Sub-Saharan Africa (*SSA*), Middle East and North Africa (*MENA*), East Europe and Central Asia (*ECA*), East Asia and the Pacific (*EAP*), South Asia (*SA*) and Latin America and the Caribbean (*LAC*); *British* and *French* are dummies for legal origins.

² The variable is rescaled since 1 is the highest level of political and civil freedom, and 7 the lowest level, in the original data set.

Already by looking at the partial regression plots in Figures A.1 in the Appendix, we could suspect different effects of democracy on the change in economic freedom depending on the economic freedom category analyzed. None of the categories seem to be affected negatively, but the categories *Government Operations and Regulations* and *Restraints on International Exchange* seem to have a stronger positive relation to democracy than the *Money and Inflation* and *Takings and Discriminatory Taxation*.³

4 THE MODEL

4.1 Basic regressions

The model specification follows the methodology of Levine and Renelt (1992).⁴ The control variables are the same ones that Sturm and de Haan (2002) apply with the exception that all regional dummies are included.

$$gEF_{j,i} = \alpha M_i + \beta F_i + \gamma Z_i + u_i$$

where $gEF_{j,i}$ is the change in the economic freedom measure j in country i 1975 to 1995;⁵ M_i is a vector of standard explanatory variables, which according to previous studies have shown to be robustly related to economic freedom; F_i is the variable of interest, i.e. democracy in our case; Z_i is a vector of up to three possible explanatory variables, which according to previous literature may have an impact on the change in economic freedom; and u_i is an error term. By examining earlier empirical studies and testing for several potential explanatory variables, we conclude that the vector M_i should contain $EF_{i,j}$, which is the initial, 1975, level of economic freedom measure j , and regional dummies, since they are the only variables showing a robustly

³ Only the partial regression plots for civil freedom are presented, but the plots for political freedom are very similar.

⁴ Levine and Renelt study changes in income while we look at changes in economic freedom, but this does not affect the appropriateness of the regression methodology.

⁵ We have chosen the long run perspective of 20 years since we believe the political process of democratization and the implementations of economic reforms take time to stabilize especially when starting out with low initial values, which is the case for many developing countries. Shorter run effects for 5 and 10 years will be discussed in Section 6.

and significant relation to the dependent variable. The regional dummies are Sub-Saharan Africa (*SSA*), Middle East and North Africa (*MENA*), East Europe and Central Asia (*ECA*), East Asia and the Pacific (*EAP*), South Asia (*SA*) and the base case Latin America and the Caribbean (*LAC*). F_i is initial democracy and is measured either as the average 1973-75 value of civil freedom or political freedom. In the basic regressions there are no variables included in the Z_i vector; these will be added to the model specification test in the next section. This results in ten models - two models for each economic freedom variable $j = \text{sum, mon, gov, tak or int}$, using either civil freedom or political freedom as the democracy measure. Since all variables refer to the beginning of the estimation period, there is no problem of reverse causality.⁶

4.2 Sensitivity tests

4.2.1 Extreme points

There are several ways to identify extreme points and several ways to deal with the identified points. This section gives a brief explanation of the identification tests and the robust regression technique used, while Appendix A.1 presents the methods in more detail. An outlier is an observation with a large residual, i.e. a point with a large deviation from the fitted value. The studentized residual r_i measures the residual of the i th observation, adjusted for its standard deviation. r_i can hence be interpreted as the t -statistic for testing the significance of a dummy, taking the value 1 if the i th observation is excluded and 0 otherwise.

Observations that are isolated or “outliers” in the \mathbf{X} space, where \mathbf{X} represents the matrix of the independent variables, have a large leverage on the prediction value. Hence, a point with a high leverage value may have a small residual and can in that case not be identified as an outlier. The leverage method tests the change in prediction of the dependent variable from the whole sample and from the sample with the i -th observation deleted.

⁶ An alternative specification would be to analyze how changes in democracy 1975-80, 1980-85, 1985-90 and 1990-95, affect changes in economic freedom 1975 to 1995. This would however cause severe causality problems leaving no room for credible conclusions.

There are several summary statistics based on an index, increased both by a large residual and by a large leverage point. Here we will use the Cook's Distance, D_i , which can be viewed as the scaled measure of the distance between the coefficient vectors when the i th observation is deleted.

If extreme points that may influence the basic regression have been identified, there are reasons to use a robust regression technique to see if the basic result changes significantly or not. The robust regression technique used in this study is the biweight procedure, where weights between 0 and 1 are attached to the residuals, with lower weights placed on large residuals. However, first observations are deleted if they have a Cook's Distance larger than 1. After this initial screening the procedure is iterative; after a regression, weights are calculated on the basis of absolute residuals and then re-estimated using those weights. First, Huber iterations are performed until the change in the Huber weights falls below a tolerance level, then biweight iterations are performed until convergence in the biweights.⁷

4.2.2 *Model Specification*

To check how robust the coefficients of economic freedom are to changes in the conditioning set of information, we first apply the extreme bound analysis (see Levine and Renelt, 1992). We add up to three new control variables to the vector Z_i described above, which according to the literature may have explanatory value, to each of the ten basic models and then re-estimate the models. The Z_i variables are log of initial income in 1975 ($\log Y75$), aid received as a share of GDP during the 1971-75 period ($Aid75$), openness measured as imports and exports as a share of GDP 1970-90 ($Open7090$), economic growth 1960-75 ($Growth6975$), and a dummy representing a French legal origin ($French$).⁸ This results in 25 regressions for each of the ten basic models, with different combinations of the new variables. For each of these new models $z = 1, \dots, 25$, we estimate the parameter for the democracy variable, β_z , and the corresponding standard deviation, σ_z . The lower extreme bound is defined to be the

⁷ The reason why both methods are used is that Huber weights have problems dealing with large outliers, and biweights sometimes fail to converge or have multiple solutions. The initial Huber weighting is performed to improve the behavior of the biweights.

⁸ Most other countries have a British legal origin (*British*).

lowest value of $\beta_z - 2\sigma_z$ and the upper extreme bound is the largest value of $\beta_z + 2\sigma_z$. If the lower and upper extreme bounds are of opposite signs, then the variable is not robust according to the extreme bound test.

The extreme bound analysis has been criticized for being too restrictive. Sala-i-Martin (1997a,b) suggests a method looking at the whole distribution of the estimator β_z . We start by assuming a normal density function and calculate beta values and standard deviations of all z models, produced in the same way as explained in the extreme bound case. Thereafter the means, $\bar{\beta}_z$ and $\bar{\sigma}_z$, are calculated as the average of the z estimated β values and variances.⁹ The cumulative density function CDF(0) can then be constructed using the normal tables, and is used to estimate the robustness of the variables when it comes to model specification.

5 RESULTS

The results for the basic regressions are presented in Table 2.

Table 2: Basic regressions. All models also include a constant and control variables for initial economic freedom and regional dummies.

	gEFsum	gEFmon	GEFgov	gEFtak	gEFint
Civil	0,236** (2,140)	-0,010 (-0,058)	0,316** (2,198)	0,294 (1,460)	0,257* (1,962)
Adj-R2	0,57	0,54	0,62	0,56	0,49
	gEFsum	gEFmon	GEFgov	gEFtak	gEFint
Political	0,188** (2,411)	0,050 (0,036)	0,214** (2,084)	0,247 (1,646)	0,245** (2,393)
Adj-R2	0,57	0,54	0,60	0,57	0,50

t-values in parentheses. *** = variables significant at the 1% level, ** = the 5% level and * = the 10% level.

The first impression from the basic regressions is that the results are almost identical for the models using civil freedom and political freedom as a proxy for democracy. The first column represents the regression seen in many previous studies, with the summary index as the measure of economic freedom, and the democracy variable is, as in most of these studies, positive and significant. The other columns

⁹ Sala-i-Martin also calculates the likelihood for all models, and constructs a weighted average of beta and the variance. We do not do this since the goodness of fit does not vary considerably in our models.

represent the models with the decomposed parts of the summary index. Democracy only affects two of the categories, *EFgov* and *EFint*, and, as in the case with the summary index, the effect is positive. The effect of democracy on the categories *EFmon* and *EFtak* is insignificant.

In all basic regressions, a constant and the control variables in M_i are included, although they are not presented in Table 2. The initial level of economic freedom has also been strongly significant in previous studies, which is confirmed in this study for all ten models. It has a negative effect on the change in economic freedom, implying that low initial economic freedom leads to larger changes in economic freedom. Hence, there seems to be a strong convergence effect no matter which of the economic freedom categories is analyzed.¹⁰ The significance of the regional dummies varies depending on the economic freedom variable used.

So far there seems to be a positive relation between democracy and two of the economic freedom categories, while there is no relation with the two remaining categories. But do the results hold for robustness tests? In Table A.2 in the Appendix, the countries identified as extreme points in each of the ten models are presented using the studentized residual method, the leverage value and the Cook's Distance. Since there are up to 6 extreme points depending on the model and identification test, it is of interest to estimate the models using a robust regression technique. The results from biweight regressions are presented in Table 3.

Table 3: Robust regressions. All models also include a constant and control variables for initial economic freedom and regional dummies.

	gEFsum	gEFmon	GEFgov	gEFtak	gEFint
Civil	0,185*	0,098	0,133	0,150	0,199
	(1,960)	(0,470)	(1,290)	(0,610)	(1,410)
	gEFsum	gEFmon	GEFgov	gEFtak	gEFint
Political	0,161**	0,073	0,117	0,065	0,247**
	(2,410)	(0,430)	(1,460)	(0,330)	(2,270)

t-values in parentheses. *** = variables significant at the 1% level, ** = the 5% level and * = the 10% level.

The overall result of the robust regressions is, again, that the result is similar independent of the democracy proxy used and there is, with some exceptions, a general decrease in the explanatory power of democracy compared to the basic

¹⁰ To some extent this may follow naturally since there is an upper limit of ten for the economic freedom score.

results. However, the results seem to hold except for the *EFgov* model, where democracy becomes insignificant. The result from earlier studies is still reproduced with a significant effect of democracy on the *gEFsum* even though extreme points are down-weighted. This follows the results of De Haan and Sturm (2002). The insignificant effect of democracy on *gEFmon* and *gEFtak* also remains after dealing with extreme points. The explanatory power of the democracy variable is affected in the model with *EFint* as the measure of economic freedom, but only in the case where civil freedom is used. When using political freedom, the result is robust. To conclude, the explanatory power of democracy seems to be fragile to extreme points only in the model with *EFgov* as the economic freedom measure.

In Table 4, the results from the model specification analysis are presented. First we report the share of number of times the variable is significant at the 5% level. For the extreme bound test, a variable passes if the lower and upper bound is of the same sign, and the critical value of the CDF normal test, the Sala-i-Martin test, is set to 0.95. Concluding from the extreme bound test, the democracy variable is only robust in the *EFgov* model with civil freedom as the democracy proxy, while it is fragile in all other models. However, as mentioned, the extreme bound analysis has been criticized for being too restrictive and it is therefore important to complement this result with the results from the share significant and the Sala-i-Martin method before drawing any firm conclusions. Starting with the share of time the democracy variable is significant, when running the $z=25$ numbers of models, the results are indeed robust in all models except for *EFint* using civil freedom. In all other cases the democracy variable is significant in 100% of the regressions when it is significant in the basic model, and significant in 0% of the regressions when it was insignificant in the basic model. Using the Sala-i-Martin test, all models seems to be robust to the model specification, even though the model with *gEFint* using civil freedom is right at the limit of passing the test. In all other cases the democracy variable passes the 0.95 limit when it is significant in the basic model, but does not pass when it is insignificant in the basic model. A general conclusion from these tests is therefore that the basic results seem to be robust to the model specification.

Table 4: Effects on the democracy variable from the model specification tests.

Civil Freedom					
	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Beta	0,232	-0,001	0,356	0,223	0,229
Variance	0,014	0,040	0,023	0,049	0,021
Share sign	1	0	1	0	0,35
Lower	-0,027	-0,460	0,015	-0,420	-0,119
Upper	0,539	0,480	0,774	0,746	0,583
Normal	0,974	0,502	0,991	0,844	0,945
Political Freedom					
	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Beta	0,171	0,028	0,219	0,145	0,233
Variance	0,007	0,023	0,011	0,025	0,011
Share sign	1	0	1	0	1
Lower	-0,025	-0,344	-0,032	-0,334	-0,027
Upper	0,381	0,405	0,518	0,559	0,491
Normal	0,979	0,573	0,981	0,819	0,987

How democracy affects the different measures of economic freedom is summarized in Table 5. The results are the same for all models regardless of whether civil or political freedom is used as a proxy for democracy, with the exception of the sensitivity tests of the last economic freedom category. The results for the model with the *Summary Index* are not surprising. As in earlier studies the effect is positive and robust both to extreme points and the model specification. When economic freedom is measured as *Money and Inflation*, democracy has no effect, and this seems to hold even when the model specification is changed or if a robust estimation technique is used to deal with the extreme points. With *Government Operations and Regulations*, democracy is again positive and significant. Democracy is stable when it comes to the model specification, but fragile to extreme points. Using *Takings and Discriminatory Taxation* as the economic freedom measure, the democracy variable is again insignificant and the result passes both robust regressions and model specification tests. In the model with the *Restraints on International Exchange* as the economic freedom measure, democracy is positive and significant in the basic regressions, no matter what proxy of democracy used. However, when using political freedom the result is robust both to extreme points and to the model specification, while when using civil freedom the result is fragile to extreme points and at least slightly fragile to the model specification.

Table 5: Summary results for the democracy variable.

	Basic regression	Extreme points	Model specification
gEFsum	Positive	Robust	Robust
gEFmon	Insignificant	Robust	Robust
gEFgov	Positive	Fragile	Robust
gEFtak	Insignificant	Robust	Robust
gEFint	Positive	Robust/Fragile	Robust/Fragile

6 SHORTER RUN EFFECTS

The main focus of this paper is to study the long run effects of democracy on economic freedom over a period of 20 years. As an extension, we will also look 5 and 10 years ahead at the effect of democracy on changes in the economic freedom categories. The data period is still 1975 to 1995, and the same 60 countries are included. The results from the basic regressions using civil freedom as a proxy for democracy are reported in Table 6, and using political freedom in Table 7.

Table 6: Basic regressions for changes in the economic freedom measures over 5 and 10 year periods. Civil freedom is measured at the beginning of each period. All models also include a constant, control variables for initial economic freedom and regional dummies, and time period dummies.

5 years	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Civ75/80/85/90	0,061 (1,536)	0,018 (0,215)	0,112* (1,902)	0,034 (0,525)	0,040 (0,612)
10 years	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Civ75/85	0,212*** (3,044)	0,035 (0,246)	0,373*** (3,831)	0,314** (1,973)	0,165 (1,609)

t-values in parentheses. *** = variables significant at the 1% level, ** = the 5% level and * = the 10% level.

Table 7: Basic regressions for changes in the economic freedom measures over 5 and 10 years periods. Political freedom is measured at the beginning of each period. All models also include a constant, control variables for initial economic freedom and regional dummies, and time period dummies.

5 years	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Pol75/80/85/90	0,060** (2,020)	-0,005 (-0,081)	0,084* (1,892)	0,062 (0,803)	0,070 (1,432)
10 years	gEFsum	gEFmon	gEFgov	gEFtak	gEFint
Pol75/85	0,140** (2,591)	-0,024 (-0,216)	0,175** (2,255)	0,181 (1,476)	0,214** (2,785)

t-values in parentheses. *** = variables significant at the 1% level, ** = the 5% level and * = the 10% level.

A general first comment is that the results are indeed weaker for the 5 year period, especially for the civil freedom measure, which is expected since the outcome of political and economic reforms are highly unpredictable in the short run. However, the results for the 10 year period using political freedom as a proxy for democracy confirm the long run results for all measures of economic freedom. This is also true for the 10 year regressions using civil freedom, except for the *EFtak* regression where democracy suddenly becomes significant and *EFint* becomes slightly insignificant.

7 CONCLUSIONS

The purpose of this paper is to empirically study how different categories of economic freedom are affected by democracy in developing countries. Both civil and political freedom are used as proxies for democracy, but the result is generally not dependent on the kind of democracy measure applied. The results for the model with the *Summary Index* as the economic freedom measure, are not surprising. As in earlier studies the effect of democracy on economic freedom is positive and robust, supporting the so-called compatibility view. There seems to be a positive effect of democracy on the categories *Government Operations and Regulations* and *Restraints on International Exchange*, but for the categories *Money and Inflation* and *Takings and Discriminatory Taxation* there is no effect. Accepting the definition of the categories, the results would imply that a higher level of democracy leads to an increased reliance on the market as the allocation mechanism, and to decreased restraints on international trade, while democracy has no effect on the availability of sound money or the tendency to discriminate against one group of citizens. However, some of these results may be fragile to alternative samples and specifications. The result for the measure *Government Operations and Regulations* is fragile to extreme points. The only case where the type of democracy proxy matters is in the case of robustness of democracy as an explanatory variable to the measure *Restraints on International Exchange*. Using civil freedom, it is fragile both to extreme points and to the model specification, while when using political freedom, it is robust in both cases. All other results are robust both to extreme points and the model specification.

Hence, the compatibility view, predicting a positive effect of democracy on economic freedom, seems to be suitable when the relation between democracy and

either of the economic freedom measures *Government Operations and Regulations* or *Restraints on International Exchange* are analyzed. However, there is no relation between democracy and *Money and Inflation* or *Takings and Discriminatory Taxation*, supporting the so-called skeptical view, which argues that other institutions not connected to the type of regime, are the true determinants. None of the economic freedom measures used in this study seem to be negatively affected by democracy, which would be the prediction of the conflict view.

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Appendix

A.1 Extreme Point Identification

Studentized Residual

The test statistic looks as follows:

$$r_i = \frac{e_i}{(s_{(i)}\sqrt{(1-h_i)})}$$

where e_i is the residual of the i th observation and $s_{(i)}$ is the corresponding standard deviation. h_i is defined below. r_i can hence be interpreted as the t -statistic for testing the significance of a dummy, taking the value 1 if the i th observation is excluded and 0 otherwise.

Leverage Point

High leverage points are points for which the input vector \mathbf{x}_i is far from the rest of the data. The so-called “hat-matrix”, $\mathbf{H} = \mathbf{X} \mathbf{inv}(\mathbf{X}'\mathbf{X})\mathbf{X}'$, where \mathbf{X} represents the matrix of the independent variables, plays a central role. For any vector \mathbf{y} , $\mathbf{H}\mathbf{y}$ is the set of fitted values in the least squares regression of \mathbf{y} on \mathbf{X} . \mathbf{H} is also called the prediction matrix since it is the transformation matrix that, when applied to \mathbf{y} produces the predicted values. $(\mathbf{I} - \mathbf{H})$ is hence the ordinary residuals matrix. A high leverage point means a high value of the diagonal value $h_i = \mathbf{x}_i \mathbf{inv}(\mathbf{X}'\mathbf{X})\mathbf{x}_i'$. The average of h_i is k/n , k being the number of independent variables and n the number of observations, and an observation is a leverage point if $h_i > 2k/n$, as suggested by Hoaglin and Welsh (1978).

Cook's Distance

The test statistic looks as follows:

$$D_i = \frac{1}{k} r_i^2 \frac{h_i}{(1-h_i)} \frac{s_{(i)}^2}{s^2}$$

where k is the number of dependent variables, r_i is the studentized residual, h_i is the leverage value, s is the root mean square error of the regression and $s_{(i)}$ is the root

mean square error when the i th observation is deleted. The Cook's Distance can also be written as

$$D_i = \left(\frac{1}{ks^2} \right) (\hat{\beta} - \hat{\beta}(i))' X' X (\hat{\beta} - \hat{\beta}(i)).$$

According to Bollen and Jackman (1990), the i th observation deserves further investigation if $D_i > 4/n$.

The Biweights Procedure

The biweights can be described with the following function,

$$\omega_i = \begin{cases} \left[1 - (u_i/c)^2 \right]^2 & \text{if } |u_i| \leq c \\ 0 & \text{otherwise} \end{cases}$$

where c is a constant and u_i is the scaled residual of the i th observation. $u_i = e_i/m$ where e_i is the residual of the i th observation, and m is the residual scale estimate. $m = M/0.6745$ where M is the median absolute deviation from the median residual, i.e. $M = \text{med}|e_i - \text{med}(e_i)|$. Hence,

$$u_i = \frac{e_i}{\text{med}|e_i - \text{med}(e_i)|} \frac{0.6745}{c}.$$

A low c downweights outliers greatly, while a large c makes the estimator more like OLS. $c = 4.685$ is used here.

Figure A.1: Partial leverage plots of the change in economic freedom and civil freedom. a=mon, b=gov, c=tak and d=int.

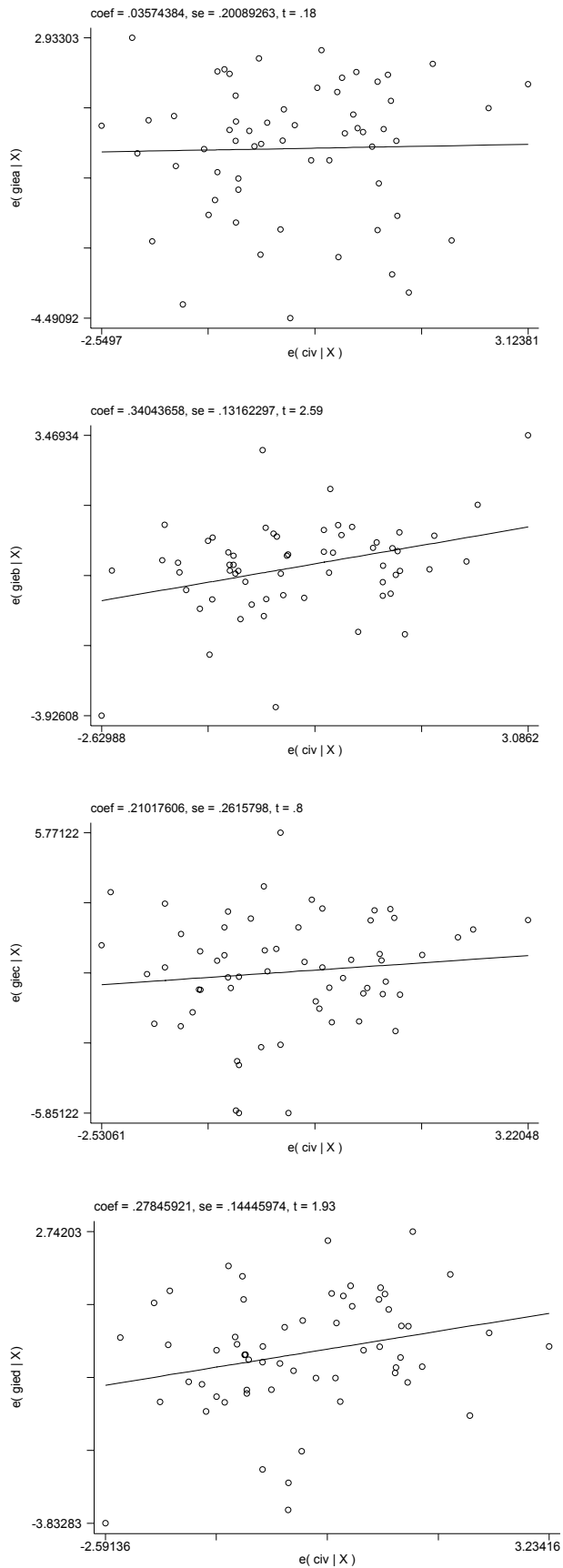


Table A.1: Countries included.

Africa	America(Ce/So)	Asia	Middle East	Europe (East)
Algeria	Argentina	Bangladesh	Iran	Hungary
Benin	Bolivia	Fiji	Jordan	
Botswana	Brazil	India	Syria	
Cameroon	Chile	Indonesia	Turkey	
Chad	Colombia	Malaysia		
Cote d' Ivoire	Costa Rica	Nepal		
Egypt	Dominican Rep	Pakistan		
Gabon	Ecuador	Philippines		
Ghana	El Salvador	South Korea		
Kenya	Guatemala	Sri Lanka		
Malawi	Haiti	Thailand		
Mali	Honduras	Trinidad/Tobago		
Mauritius	Jamaica			
Morocco	Mexico			
Niger	Nicaragua			
Nigeria	Panama			
Rwanda	Peru			
Senegal	Uruguay			
Sierra Leone	Venezuela			
South Africa				
Tanzania				
Tunisia				
Uganda				
Zambia				

Table A.2: Result from the extreme point tests.

	gEFsum		gEFmon		gEFgov		gEFtak		gEFint	
	<i>Civ</i>	<i>Pol</i>	<i>Civ</i>	<i>Pol</i>	<i>Civ</i>	<i>Pol</i>	<i>Civ</i>	<i>Pol</i>	<i>Civ</i>	<i>Pol</i>
Stud Res	Panama	Mauriti. Panama	Panama	Panama	Mauriti. Chile	Mauriti. Chile	Haiti Jordan	Jordan	Jamaica	Argent. Pakistan Argent.
Leverage	Panama Hungary Turkey	Nepal Hungary Turkey	Hungary Turkey	Nepal Hungary Turkey	India Nepal Turkey Hungary	India Jamaica Nepal Hungary Turkey	Nepal Pakistan Hungary Turkey Hungary	Pakistan Nepal Turkey Hungary	Panama Nepal Turkey Hungary Turkey	
Cooks	Fiji Iran Venezu. Nicarag. Brazil Panama	Venezu. Nicarag. Brazil Iran Panama	Fiji Brazil Panama Hungary Turkey	Fiji Brazil Panama Hungary Turkey	Nicarag. S. Korea Mauriti. Haiti Hungary Turkey	Nicarag. Haiti Mauriti. Turkey Hungary	Jordan Jordan	Jordan	Hungary Argent. Argent. Pakistan Fiji Haiti Banglad. Fiji Haiti Banglad. Pakistan Iran Iran	