Capital Flight and Political Risk*

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August 1998

SOM theme C: Economic and Financial Environment

Abstract

This paper provides the first serious attempt to examine the relationship between political risk and capital flight for a large set of developing countries. The outcomes of the analysis show that in most cases political risk variables do have a statistically robust relationship to capital flight once domestic and international macroeconomic circumstances are added, at least when the robustness test as proposed by Sala-i-Martin (1997) is applied. We conclude that on the basis of the analysis in this paper we have found support for the hypothesis that political risk leads to increased capital flight.

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The authors thank Jakob de Haan and an anonymous referee of the Journal of International Money and Finance for constructive suggestions and comments on an earlier draft of this paper. We thank Jan Egbert Sturm for writing the computer programme that enabled us to run the econometric tests.

1. Introduction

The capital flight problem has been examined quite extensively in the literature. In addition to discussing the concept and measurement of capital flight[1], several studies have investigated the determinants of the phenomenon. The studies emphasize the factors that determine capital flight, in terms of the impact of these factors on the domestic "investment climate" (Pastor, 1990, p.7). The stylized argument is that residents decide to invest their wealth abroad due to an adverse domestic investment climate, or because economic agents consider it too risky to invest domestically. According to this argument, variables that have been found to cause capital flight include overvalued exchange rates, high domestic inflation rates, government budget deficits, the domestic versus the international interest rate differential, and capital inflows. Thus, these variables measure the economic aspects of an adverse domestic investment climate.

Many observers suggest that political instability and uncertainty are particularly important in explaining the flight of capital: residents faced with such instability and uncertainty take their money and run to avoid the possibility that the government may in one way or another erode the future value of their asset holdings. What is amazing, therefore, is that in the literature on capital flight there has been no systematic investigation of the impact of political factors on the extent of the capital flight phenomenon. This paper aims to fill this gap in the literature. It makes use of data sets available for political variables to investigate the relationship between capital flight and political instability and uncertainty in developing countries. The paper makes one important additional contribution: it is the first attempt to analyse the determinants of capital flight for a large set of developing countries. All other empirical studies investigate the issue for individual countries (Cuddington, 1986, for Mexico, Venezuela and Argentina; Mikkelsen, 1991, for Mexico; Vos, 1990, for the Philippines), or for certain groups or regions of countries (Pastor, 1990, and Ketkar and Ketkar, 1989, for Latin America; Mikkelsen, 1991, for a set of 22 developing countries;

[1] See World Bank (1985), Dooley (1986), Deppler and Williamson (1987) and Claessens and Naudé (1993) to mention a few examples.

Hermes and Lensink, 1992 and Murinde, Hermes and Lensink, 1996, for Sub-Saharan African countries; and Hermes, Lensink and Murinde, 1998, for Eastern European countries).

The paper is organised as follows. Section 2 provides a brief discussion of the concept and measurement of capital flight. Section 3 presents summary statistics on the magnitude of capital flight for developing countries. Section 4 gives the main estimation results of the determinants of capital flight of developing countries. Section 5 contains the summary and conclusions.

2. Measurement of Capital Flight

Capital flight is a rather slippery concept: several interpretations have been given of what exactly is meant by the term. Usually, capital flight is related to the existence of high uncertainty and risk with respect to returns on domestically held assets. Residents take their money and run in order to avoid extremely high expected losses on their asset holdings. It is sometimes argued that capital outflows based on these considerations should be viewed as *abnormal,* and should therefore be distinguished from *normal* capital outflows, since normal outflows are based on considerations of portfolio diversification of residents, and/or activities of domestic commercial banks aiming at acquiring or extending foreign deposit holdings (Deppler and Williamson, 1987, p.41). Yet, when measuring capital flight it appears to be very difficult to empirically distinguish between normal and abnormal capital outflows.

It may come, therefore, as no surprise that several different capital flight measures are available in the existing literature. Inevitably, these measures lead to differences in capital flight estimates. However, the following three main methods of measuring capital flight can be distinguished in the literature. First, several studies measure capital flight indirectly from balance of payments statistics by comparing the *sources* of capital inflows (*i.e.* net increases in external debt and the net inflow of foreign investment) with the *uses* of these inflows (*i.e.* the current account deficit and additions to foreign reserves). If the sources exceed the uses of capital inflows, the difference is termed as capital flight. This is the so-called *residual method*. It has been the most widely used measure in the available literature. The method acknowledges the difficulties of separating abnormal from normal capital outflows and, therefore, measures all private capital outflows as being capital flight. Several variations on the measure have appeared in the literature, among them World Bank (1985), Morgan Guaranty (1986) and Cline (1987).[2]

Second, some authors measure capital flight by adding up net errors and omissions and non-bank private short-term capital outflows (Cuddington, 1986; Gibson and Tsakalotos, 1993). This measure reflects the idea that capital flight goes unrecorded, due to the illegal nature of these capital movements. It is argued that the unrecorded capital movements appear in the net errors and omissions. Moreover, by concentrating on short-term flows, medium- and long-term outflows are excluded, which according to these authors are more *normal* in character (Gibson and Tsakalotos, 1993, p.146). This measure is referred to as the *hot money method*. Capital flight measured in this way refers to short-term movements of capital, whereas the residual method additionally takes into account capital outflows that are more long-term in nature.

Third, the capital flight measure proposed by Dooley (1986) also aims at measuring abnormal or illegal capital outflows. Dooley defines capital flight as all capital outflows based on the desire to place assets beyond the control of domestic authorities, excluding normal outflows. Consequently, this measure includes all capital outflows that do not receive and/or register interest payments. However, Claessens and Naudé (1993, pp.5-7) show that the calculation of capital flight as proposed by Dooley (1986) is in fact also at least partly based on the residual approach, although he uses a different concept of capital flight. Therefore, the *Dooley method* gives rather identical magnitudes of capital flight as compared to those for the residual method.[3] Table 1 shows the correlation

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[2] See Claessens and Naudé (1993) for a description of the measurement of capital flight according to these variations of the residual method.

[3] Still other measures have been proposed in the literature. In some studies, capital flight has been measured by looking at trade misinvoicing. Proponents of this measure stress the fact that abnormal capital outflows of residents may be included in export underinvoicing and/or import

matrix of the three capital flight measures and confirms the similarity between the Morgan and Dooley measures.

<insert Table 1>

3. Magnitude of Capital Flight

Figure 1 presents the annual flow of capital flight for 84 developing countries during the 1971-1991 period.[4] The figure provides capital flight data according to three methods of measurement: the Morgan Guaranty method, the hot money method and the Dooley method. The Morgan Guaranty method is used here to represent the residual method of measuring capital flight, since the most widely used variation on this measure follows Morgan Guaranty (1986). The annual flows measured according to the Morgan Guaranty and Dooley methods show similar patterns. This may be expected, since as discussed in the previous section, both methods - although conceptually different - measure capital flight using the same data definitions. The annual flows measured according to the hot money method differ in two respects from those based on the other two methods. First, the flows based on the hot money method fluctuate less severely. Second, hot money flows turn negative after 1985, whereas for the other measures this is the case only after 1988. Nevertheless, the general trend of the

overinvoicing, since both these malpractices provide channels to siphon domestically accumulated wealth outside the country (Gulati, 1987; Lessard and Williamson, 1987; Vos, 1990). However, there are good reasons for not using trade misinvoicing as a measure of capital flight, since trade misinvoicing may also occur as a reaction to the presence of trade taxes. Calculated trade misinvoicing may therefore be unrelated to the phenomenon of capital flight (Gibson and Tsakalotos, 1993, p.150). Other studies have taken the total stock of capital held outside the country by non-bank residents as a measure of capital flight; this is the so-called *asset method* (Hermes and Lensink, 1992). Yet, data for calculating the asset method are available only from 1981 onwards. For these reasons, both trade misinvoicing and the asset method are not taken into account in this study.

[4] The figure represents an aggregation of the magnitude of capital flight for the 84 sample countries. It is assumed that there are no intercountry flows within this sample.

flows for all the three measures presented in Figure 1 shows a similar pattern for most of the 1971-1991 period.

<insert Figure 1>

4. Estimation Procedure and Results

The central hypothesis to be tested in this paper is that political risk stimulates the magnitude of capital flight, controlling for macroeconomic and policy variables. The role of political instability in explaining economic phenomena such as differences in patterns of economic growth, inflation, investment, and fiscal policy among countries has been investigated quite extensively during recent years.[5] Moreover, the relationship between political instability and country risk - an issue closely related to the phenomenon of capital flight - has been studied, albeit less extensively.[6] This study is one of the very few that investigates the relationship between political instability and capital flight.[7]

The data used in the estimations are taken from various sources. Data on capital flight were taken from the World Bank data set (the 1993-94 version) on capital flight. This data set, described in Claessens and Naudé (1993), provides capital flight data for all developing countries for different measures during the 1971-1991 period. The political risk variables were taken from Barro and Lee (1994), and from the so-called Polity III code book (available on internet; see appendix I). Finally, the World Bank Economic Indicators disk, 1997, was used for data on different macroeconomic and policy variables.

The existing literature on capital flight does not offer a consistent theoretical

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[5] See Siermann (1996) for a survey of the theoretical and empirical literature on these issues.

[6] Studies in this area are from Balkan (1992), Citron and Nickelsburg (1987), De Bondt and Winder (1996) and De Haan, Siermann, and Van Lubek (1997).

[7] To our knowledge only Pastor (1987) has included political instability variables in his empirical investigation on the determinants of capital flight.

framework for guiding our empirical work. No single model exists that completely specifies the variables that may be held constant in order to investigate the impact of political risk on capital flight. The most commonly employed empirical procedure consists of running regressions of the following form:

$$CF = \alpha + \beta_1 y_1 + \beta_2 y_2 + ... + \beta_n y_n + \mu \qquad (1)$$

where *CF* is the vector of capital flight, and $y_1 ... y_n$ are different explanatory variables. These explanatory variables vary across the different empirical investigations available in the literature.

In order to investigate the impact of political variables on capital flight, we use a procedure that follows the so-called Barro tradition that has been hitherto used mainly in studies on endogenous growth (Barro, 1991; Barro and Sala-i-Martin, 1995; King and Levine, 1993; Levine and Renelt, 1992; Sachs and Warner, 1997; Sala-i-Martin, 1997). Generally, the procedure consists of cross-section regressions. To be able to treat political risk as the variable of interest, and allow for testing the sensitivity of political variables to alterations in the conditioning set of variables that have been mentioned in the literature to be related to capital flight, we use a variant of Leamer's extreme bounds analysis (EBA) following Levine and Renelt (1992), as well as a (less strict) sensitivity test suggested by Sala-i-Martin (1997). Both these tests will be explained below. First, however, the design of our empirical analysis is discussed in more detail.

In the analysis we use the following cross-section regression:

$$CF = \alpha_j + \beta_{ij} I + \beta_{mj} M + \beta_{zj} Z + \mu \qquad (2)$$

where *I* is a set of variables always included in the regressions. *M* is a vector of variables of interest. In our case, *M* is a set of political variables. *Z* is a vector of domestic and international macroeconomic variables taken from the pool χ of N variables identified by past studies as being potentially important explanatory variables of capital flight. Appendix I presents a list of all variables used in the empirical analysis.

The dependent variable is the average capital flight to GDP ratio over the 1970-1990 period. The three different measures of capital flight - discussed in Section 2 - have been used in the estimation.[8] These three measures have been used to show to what extent the measurement methodology may influence the outcomes of the regression analysis. Average values of (dependent and independent) variables over the whole period have been used in the estimation since the political variables used are dummy variables showing relatively little variation over time, which rules out time series analysis. As was already mentioned above, many empirical studies in the Barro tradition have followed the same estimation methodology of using average across years.

Next, the estimation procedure needs to be explained. First, we have to decide on the vector of variables *I*. We take as *I* variables different capital inflow variables, since most studies investigating the determinants of capital flight have found that capital inflows are an important, robust determinant of the phenomenon.[9] Since different categories of capital inflows may affect capital flight differently, we start by regressing capital flight on a set of capital inflow variables in order to determine which capital inflow measures should be taken into account. The results of these estimations are presented in Table 2. The table shows that bank lending (BANK) is an important variable in explaining the capital flight phenomenon. The variable appears with a positive and statistically significant sign in all three capital flight equations. Inflows of development aid (AID) appear to explain capital flight measured by both the Morgan Guaranty and Dooley method. The inflow of foreign direct investment (FDI) was also included in the regression analysis but was not found to be statistically

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[8] As discussed in Section 2, the different measures of capital flight reflect different concepts of the phenomenon.

[9] See Hermes and Lensink (1992) for an overview of these studies.

significant.[10] Based on the above set of estimates we include BANK and AID in all other regressions with respect to the Morgan Guaranty and the Dooley methods. BANK is used in the estimates regarding the hot money method. The regressions including the capital inflow variables represent the basic model.

<insert Table 2>

As a second step in the estimation procedure, a number of variables proxying political (in)stability and risk is selected to augment the basic model. These variables represent the vector of variables of interest (*M*). The analysis includes the following six political risk variables: a measure of political instability based on the number of assassinations per million of population per year and the number of revolutions per year (INSTAB); a dummy variable (from 1 to 7), indicating the extent of political rights (RIGHTS); a dummy variable (from 1 to 7), indicating the extent of civil liberties (CIVIL); a dummy variable (from 0 to 10), representing the general openness of political institutions (DEMOC); a dummy variable (from 0 to 5), representing the extent to which non-elites are able to access institutional structures for political expression (PARCOM); and a dummy variable (0 or 1) for countries that participated in at least one external war during 1960-1985 (WAR).[11] With respect to INSTAB, CIVIL and RIGHTS, the higher the value of the dummy, the higher is the extent of political instability in a particular country assumed to be. This means that for these three

[10] In earlier regressions we also included bond and equity portfolio investments. These variables appear to be insignificant for the Dooley and the Morgan Guarantee method. Bond portfolio investment was significant for the Hot Money method. However, since many observations for this variable were missing and since for many countries in our data set the value of Bond portfolio investment equals zero, this variable has not been taken into account in this set of regressions.

[11] In an earlier set of regressions, we also tested the number of political coups in each year (COUP). This variable appeared to be insignificant in all regressions and is therefore not represented here.

variables the relationship with capital flight should be positive. With respect to DEMOC and PARCOM, the higher the value of the dummy, the more political rights residents of a country have. Thus, for these two variables the relationship with capital flight should be negative. Finally, the variable WAR is 0 if a country did not participate in a war during the entire estimation period.

The use of INSTAB and WAR as variables to measure political instability might be clear. They aim to measure directly the extent of political instability a country has been confronted with, by focusing on issues such as the number of revolutions, assassinations and war incidents. The variables CIVIL, RIGHTS, DEMOC, and PARCOM indirectly measure political instability. These variables focus on the existence (or absence) of political freedom, which can be seen as a measure of the potential of the occurrence of political instability in a country. The absence of political freedom is seen as an important source of the occurrence of political instability.

Table 3 shows the correlation matrix of the various political variables. As is clear from the table, multicollinearity between some of these political risk variables appears to be relatively high.

<insert Table 3>

Tables 4A-4C show the results of the estimations of adding the political risk variables to the basic model one by one. The results show that all political risk variables have a statistically significant effect on capital flight, measured by the Dooley and the Morgan-Guaranty method. Moreover, the political variables have the expected sign. With respect to the Hot Money method, only INSTAB and PARCOM are significant. The results seem to strongly confirm the hypothesis that political risk stimulates capital flight.

<insert Tables 4A-4C>

The third step in the estimation procedure involves testing the robustness of the results presented in Tables 4A-4C. This entails carrying out the robustness tests suggested by Levine and Renelt (1992) and Sala-i-Martin (1997). To begin with, the estimations as presented in Tables 4A to 4C are extended by adding a group of domestic and international macroeconomic variables to the regressions. The selection of the set of domestic and international macroeconomic variables - the *Z* variables - was made based on the existing empirical capital flight literature. The following variables were used: the black market premium (BMP); the standard deviation of inflation (STDINFL); the openness of a country (TRADE); the budget deficit of the government to GDP ratio (BUDDEF); debt service as a percentage of GDP (DEBTS); the inflation rate (INFL); the primary school enrollment rate (PRENR); credit to the private sector as a percentage of GDP (CREDITPR); the external debt to GDP ratio (DEBTGDP); the real interest rate (RINTR); the standard deviation of the real interest rate (STDRINTR); the interest rate spread, measured as the domestic lending rate minus the LIBOR (SPREAD); the standard deviation of the spread (STDSPREAD); the deposit rate (DEPR); the real GDP growth rate (GROWTH); per capita GDP (GDPPC); gross domestic investment as a percentage of GDP (INVEST); the ratio of money and quasi money to GDP (MGDP); a dummy for countries in Sub-Saharan Africa (DUMA); a dummy for countries in Latin-America (DUMLA); a variable measuring terms of trade shocks (TOT); and an additional measure of free trade openness (DFREEOP).

Next, we estimate all possible regressions that can be specified by adding any combination of four out of the 22 variables to the individual equations presented in Tables 4A-4C. As was stated above, this procedure is based on the idea that the empirical literature does not offer a consistent theoretical framework for guiding our empirical work so that no single model exists that completely specifies the variables that may be held constant in order to investigate the impact of political risk on capital flight. The total number of regressions estimated for every individual equation in Tables 4A-4C then is 7,315. Since we have six *M*-variables and three definitions of the dependent variable, performing the stability test involves estimating over 130,000 regressions.

We now come to explaining the robustness tests in more detail. The procedure of the EBA suggested by Levine and Renelt (1992) is as follows. For each regression *j*, we find an estimate β_{mj} and a standard deviation σ_{mj} for each political variable m. The lower extreme bound is the lowest value of β_{mj} - $2\sigma_{mj}$, whereas the upper bound is β_{mj} + $2\sigma_{mj}$. The extreme bounds test for variable *M* involves the degree of confidence we accept on the partial correlations between *M* and *CF*. If the upper extreme bound for *M* is positive and the lower extreme bound is negative (*i.e.* the sign of the coefficient β_{mj} changes), then variable *M* is not robust. This means that alterations in the conditioning information set change the statistical inferences on political risk and capital flight. Therefore, in case the sign of the coefficient β_{mj} switches when carrying out the EBA, the relationship between capital flight and political risk variables is said to be fragile.

Tables 5A-5C present the results of the EBA. Quite disappointingly, it appears that all political risk variables are fragile. Hence, the conclusion must be that, based on this robustness test, the political risk variables do not have a statistically robust relationship to capital flight, once we control for domestic and international macroeconomic circumstances.

<insert Tables 5A-5C>

Sala-i-Martin (1997a) criticizes the *EBA* analysis of Levine and Renelt (1992) for using too strict a robustness test and presents an alternative stability analysis. We agree with his criticism of the EBA. Taking the EBA seriously means that a relationship between two variables is already considered to be fragile if just one regression out of many (7,315 in our case) is responsible for the change in the sign of the coefficient.

Instead, the approach taken by Sala-i-Martin is based on looking at the entire distribution of the coefficient β, instead of a zero-one (robust-fragile) decision, and calculating the fraction of the cumulative distribution function lying on each side of zero. By assuming that the distribution of the estimates of the coefficients is normal and calculating the mean and the standard deviation of this distribution, the cumulative distribution function (*CDF*) can be calculated. His methodology starts by computing the point-estimates of β and the standard deviation σ. Next, the mean estimate of β and the average variance are calculated as:[12]

$$\overline{\beta_z} = \frac{\Sigma \beta_{zj}}{n}$$

$$\overline{\sigma_z^2} = \frac{\Sigma \sigma_{zj}^2}{n}$$

The mean estimate of β and the average standard error are the mean and the standard deviation of the assumed normal distribution. Finally, by using a table for the (cumulative) normal distribution, it can be calculated which fraction of the cumulative distribution function is on the right or left hand side of zero.

The CDFs have been calculated for all political risk variables for each of the three different capital flight measures. The results of the robustness test are presented in Tables 6A-6C. The column CDF denotes the largest fraction of the cumulative distribution function, lying either on the right or left hand side of zero. We use a standard significance level of 95 per cent to decide whether or not a political risk variable is robustly related to one of the measures of capital flight. The results of this more moderate robustness test show that CIVIL, DEMOC and PARCOM have a significantly robust relationship with capital flight, at least when it is measured in line with the Dooley and the Morgan Guaranty method. RIGHTS and WAR are also robust for the Dooley method, whereas their significance level is just below 95 per cent for the Morgan-

[12] Sala-i-Martin uses a weigthed average with the likelihoods as weights. He shows that results of his empirical analysis do not differ very much when an unweighted average is used.

Guaranty method. The significance level is also just below 95 per cent for INSTAB, both for the Morgan-Guaranty and Dooley method. When capital flight is measured according to the Hot Money method, none of the political variables have a statistically robust relationship to capital flight, at least when the 95 per cent level of significance is used. INSTAB, DEMOC, and PARCOM are significant at the 90 per cent significance level, whereas RIGHTS and WAR are clearly insignificant. Notwithstanding these last results, the overall conclusion of the analysis is that political variables have a significant, and in many cases a statistically robust relationship to capital flight.[13] [14]

<insert Tables 6A-6C>

5. Conclusions

The empirical analysis in this paper is the first serious attempt to examine the relationship between political risk and capital flight for a large set of developing countries. The outcomes of the analysis show that, no matter how capital flight is defined conceptually and/or measured, political risk factors do matter in the case were no other macro-economic variables are taken into account. Moreover, in most cases (except when capital flight is measured according to the Hot Money method) political risk variables do have a statistically robust relationship to capital flight, once domestic and international macroeconomic circumstances are added, at least when the robustness test as proposed by Sala-i-Martin (1997) is applied. When we apply the EBA proposed by Levine and Renelt (1992), no

[13] Since, in principle, it is arbitrary to do the above described stability test using combinations of four variables, we also did the stability test by including all combinations of three *Z* variables. In this case the number of regressions for every political variable equals 1,540. The results of this analysis are similar to the regressions carried out with combinations of four variables. The results using combinations of three *Z* variables are available on request from the authors.

[14] For completeness we also performed the robustness test as suggested by Sala-i-Martin (1997) for the 22 *Z* variables used in our analysis. The results of the test are presented in Appendix II.

robust relationship between political risk and capital flight can be found. Yet, we agree with Sala-i-Martin that the EBA is a too strict test for the robustness of relationships between variables. Therefore, we conclude that on the basis of the analysis in this paper we have found support for the hypothesis that political risk leads to increased capital flight.

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TABLE 1: CORRELATION MATRIX; CAPITAL FLIGHT MEASURES

	Hot Money	Dooley	Morgan
Hot Money	1.00		
Dooley	0.66	1	
Morgan	0.67	0.92	1

Note: The capital data have been calculated for the period 1971-1991. The data set used - including a list of countries - in the analysis is available on request from the authors.

TABLE 2: THE BASIC MODEL; CAPITAL FLIGHT AND CAPITAL INFLOWS

	Morgan	Hot Money	Dooley
BANK	0.78	0.48	1.10
	(3.16)	(3.97)	(3.62)
FDI	-0.16	0.10	-0.05
	(-0.86)	(1.26)	(-0.22)
AID	0.10	0.02	0.13
	(2.76)	(0.98)	(2.89)
Constant	-0.11	-0.71	-1.21
	(-0.17)	(-2.41)	(-1.56)
adj. R^2	0.14	0.15	0.16
observations	89	82	89
Mean Dep. Var.	1.57	0.14	1.25
S.D. Dep. Var.	3.75	1.69	4.67

Notes: For list of variables, see Appendix I

TABLE 3: CORRELATION MATRIX; POLITICAL VARIABLES						
	INSTAB	CIVIL	RIGHTS	DEMOC	PARCOM	WAR
INSTAB	1.00					
CIVIL	0.20	1.00				
RIGHTS	0.16	0.94	1.00			
DEMOC	-0.15	-0.85	-0.91	1.00		
PARCOM	-0.17	-0.89	-0.92	0.93	1.00	
WAR	0.44	0.08	0.01	-0.04	-0.03	1.00

Notes: For list of variables, see Appendix I

TABLE 4A: MODEL EXTENSIONS WITH POLITICAL RISK VARIABLES; MORGAN METHOD

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BANK	0.78	0.65	0.77	0.63	0.65	0.65	0.75
	(3.16)	(2.63)	(3.29)	(2.56)	(2.51)	(2.50)	(3.18)
AID	0.10	0.08	0.10	0.08	0.07	0.07	0.11
	(2.86)	(2.19)	(2.96)	(2.03)	(1.62)	(1.50)	(3.17)
RIGHTS		0.50					
		(2.20)					
INSTAB			7.22				
			(3.13)				
CIVIL				0.65			
				(2.52)			
DEMOC					-0.25		
					(-1.96)		
PARCOM						-0.72	
						(-2.01)	
WAR							1.91
							(2.63)
Constant	-0.30	-2.27	-1.08	-2.77	0.86	1.81	1.12
	(-0.52)	(-2.14)	(-1.76)	(-2.52)	(1.15)	(1.70)	(-1.7)
adj. R^2	0.14	0.18	0.22	0.19	0.13	0.14	0.20
obs.	89	89	89	89	79	79	89
Mean DV	1.57	1.57	1.57	1.57	1.77	1.77	1.57
S.D. DV	3.75	3.75	3.75	3.75	3.78	3.79	3.75

Notes: For list of variables, see Appendix I

TABLE 4B: MODEL EXTENSIONS WITH POLITICAL RISK VARIABLES; HOT MONEY METHOD

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BANK	0.47	0.45	0.47	0.44	0.46	0.46	0.47
	(4.03)	(3.77)	(4.11)	(3.68)	(3.80)	(3.82)	(4.00)
RIGHTS		0.08					
		(0.79)					
INSTAB			2.37				
			(2.24)				
CIVIL				0.18			
				(1.56)			
DEMOC					-0.09		
					(-1.61)		
PARCOM						-0.28	
						(-1.88)	
WAR							0.25
							(0.74)
Constant	-0.44	0.08	-0.71	-1.19	-0.24	0.15	-0.54
	(-2.04)	(0.79)	(-2.93)	(-2.26)	(-0.87)	(0.37)	(-2.13)
adj. R^2	0.15	0.15	0.19	0.17	0.17	0.18	0.15
obs.	86	86	86	86	77	77	86
Mean DV	0.12	0.12	0.12	0.12	0.15	0.15	0.12
S.D. DV	1.66	1.66	1.66	1.66	1.66	1.66	1.66

Notes: For list of variables, see Appendix I

TABLE 4C: MODEL EXTENSIONS WITH POLITICAL RISK VARIABLES; DOOLEY METHOD

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BANK	1.10	0.93	1.09	0.90	0.92	0.91	1.07
	(3.64)	(3.09)	(3.79)	(3.01)	(3.00)	(2.98)	(3.69)
AID	0.13	0.10	0.13	0.09	0.09	0.08	0.14
	(2.94)	(2.25)	(3.05)	(2.08)	(1.79)	(1.63)	(3.31)
RIGHTS		0.65					
		(2.33)					
INSTAB			8.84				
			(3.12)				
CIVIL				0.84			
				(2.68)			
DEMOC					-0.43		
					(-2.85)		
PARCOM						-1.22	
						(-2.89)	
WAR							2.56
							(2.89)
Constant	-1.27	-3.81	-2.22	-4.47	0.44	2.03	-2.37
	(-1.77)	(-2.94)	(-2.96)	(-3.24)	(0.50)	(1.62)	(-3.00)
adj. R^2	0.17	0.21	0.25	0.23	0.21	0.22	0.24
obs.	89	89	89	89	79	79	89
Mean DV	1.25	1.25	1.25	1.25	1.49	1.49	1.25
S.D. DV	4.67	4.67	4.67	4.67	4.68	4.68	4.67

Notes: For list of variables, see Appendix I

TABLE 5A: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING EXTREME BOUND ANALYSIS; MORGAN GUARANTY METHOD

M-variable	β	standard error	R^2	macro variables	robust/fragile
INSTAB	high: 13.64	2.547	0.22	DUMLA, GNPPC, DEBTS, PRENR	
	low: -4.32	1.712	0.37	DUMA, STDSPREAD, DFREEOP, STDRINTR	fragile
CIVIL	high: 1.68	0.328	0.23	DUMA, STDSPREAD, RINTR, TRADE	
	low: -0.83	0.292	0.37	DUMLA, STDSPREAD, DFREEOP, STDRINTR	fragile
RIGHTS	high: 1.43	0.281	0.17	DUMA, STDSPREAD, TOT, TRADE	
	low: -0.94	0.320	0.30	DUMA, DFREEOP, TRADE, DEBTGDP	fragile
DEMOC	high: 0.51	0.506	0.29	DUMLA, DFREEOP, TRADE, DEBTGDP	
	low: -0.64	0.128	0.14	DUMA, RINTR, GDPPC, TRADE	fragile
PARCOM	high : 1.24	0.426	0.35	DUMLA, DFREEOP, DEBTS, DEBTGDP	
	low: -1.84	0.378	0.11	DUMA, RINTR, DEBTS, TRADE	fragile
WAR	high: 3.97	0.835	0.21	DUMA, TOT, TRADE, GROWTH	
	low: -1.27	0.691	0.26	STDSPREAD, TRADE, MGDP, DEBTGDP	fragile

Notes: For list of variables, see Appendix I. R^2 is the adjusted R^2.

TABLE 5B: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING EXTREME BOUND ANALYSIS; DOOLEY METHOD

M-variable	β	standard error	R^2	macro variables	robust/fragile
INSTAB	high: 15.90	3.124	0.25	DUMLA, GDPPC, DEBTS, PRENR	
	low: -5.90	3.390	0.21	STDSPREAD, DEBTS, DEBTGDP, GROWTH	fragile
CIVIL	high: 2.35	0.443	0.22	DUMA, STDSPREAD, DUMLA, DEPR	
	low: -0.81	0.338	0.34	DUMLA, STDSPREAD, DFREEOP, STDRINTR	fragile
RIGHTS	high: 2.02	0.333	0.23	DUMA, STDSPREAD, TOT, DEBTS	
	low: -0.76	0.317	0.37	DUMA, DFREEOP, TRADE, DEBTGDP	fragile
DEMOC	high: 0.43	0.146	0.40	DUMLA, DFREEOP, TRADE, DEBTGDP	
	low: -0.97	0.162	0.23	DUMA, RINTR, GDPPC, DEBTS	fragile
PARCOM	high: 0.88	0.431	0.40	DUMLA, DFREEOP, DEBTS, DEBTGDP	
	low :-2.77	0.457	0.23	DUMA, RINTR, DEBTS, GDPPC	fragile
WAR	high: 4.92	0.973	0.15	DUMA, TOT, GDPPC, DEBTS	
	low: -1.76	1.029	0.24	STDSPREAD, TRADE, MGDP, DEBTGDP	fragile

Notes: For list of variables, see Appendix I. R^2 is the adjusted R^2.

TABLE 5C: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING EXTREME BOUND ANALYSIS; HOT MONEY METHOD

M-variable	β	standard error	R^2	macro variables	robust/fragile
INSTAB	high: 5.57	1.091	0.24	DUMA, DFREEOP, TOT, PRENR	
	low: -1.69	1.035	0.31	DUMA, STDSPREAD, DFREEOP, STDINFL	fragile
CIVIL	high: 0.80	0.162	0.21	DUMA, DUMLA, STDSPREAD, GDPPC	
	low: -0.54	0.180	0.16	DFREEOP, BMP, DEBTS, DEBTGDP	fragile
RIGHTS	high: 0.59	0.130	0.25	DUMA, STDSPREAD, TOT, GDPPC	
	low: -0.55	0.146	0.22	DFREEOP, DEBTS, INVEST, DEBTGDP	fragile
DEMOC	high: 0.23	0.078	0.21	DFREEOP, TRADE, DUMLA, DEBTGDP	
	low:-0.30	0.060	0.21	STDSPREAD, GDPPC, DUMLA, DEPR	fragile
PARCOM	high: 0.56	0.208	-0.04	DFREEOP, BUDDEF, DEBTS, DEBTGDP	
	low: -0.90	0.177	0.25	DUMA, STDSPREAD, GDPPC, BUDDEF	fragile
WAR	high: 1.59	0.376	0.19	DFREEOP, DUMA, TOT, GDPPC	
	low: -1.35	0.443	0.09	DUMA, STDSPREAD, TRADE, DEBTGDP	fragile

Notes: For list of variables, see Appendix I. R^2 is the adjusted R^2.

TABLE 6A: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING THE SALA-I-MARTIN ANALYSIS; MORGAN GUARANTY METHOD

M variable	mean β	mean standard error	R^2	CDF	robust/fragile*
INSTAB	3.64	2.321	0.18	0.941	fragile
CIVIL	0.48	0.276	0.19	0.959	robust
RIGHTS	0.16	0.237	0.18	0.946	fragile
DEMOC	-0.19	0.117	0.16	0.952	robust
PARCOM	-0.59	0.334	0.16	0.962	robust
WAR	1.18	0.719	0.16	0.950	robust

Notes: For list of variables, see Appendix I; R^2 is the adjusted R^2.

* at the 95 per cent significance level

TABLE 6B: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING THE SALA-I-MARTIN ANALYSIS; DOOLEY METHOD

M variable	mean β	mean standard error	R^2	CDF	robust/fragile*
INSTAB	4.74	2.952	0.20	0.946	fragile
CIVIL	0.71	0.346	0.22	0.973	robust
RIGHTS	0.56	0.298	0.22	0.971	robust
DEMOC	-0.36	0.144	0.23	0.994	robust
PARCOM	-1.08	0.409	0.23	0.996	robust
WAR	1.59	0.912	0.21	0.959	robust

Notes: For list of variables, see Appendix I; R^2 is the adjusted R^2.
* at the 95 per cent significance level

TABLE 6C: ROBUSTNESS TEST, RESULTS FOR POLITICAL VARIABLES USING THE SALA-I-MARTIN ANALYSIS; HOT MONEY METHOD

M variable	mean β	mean standard error	R^2	CDF	robust/fragile*
INSTAB	1.57	1.139	0.14	0.915	fragile
CIVIL	0.17	0.139	0.14	0.893	fragile
RIGHTS	0.07	0.121	0.12	0.722	fragile
DEMOC	-0.08	0.058	0.15	0.916	fragile
PARCOM	-0.26	0.168	0.16	0.942	fragile
WAR	0.01	0.364	0.11	0.512	fragile

Notes: For list of variables, see Appendix I; R^2 is the adjusted R^2.
* at the 95 per cent significance level

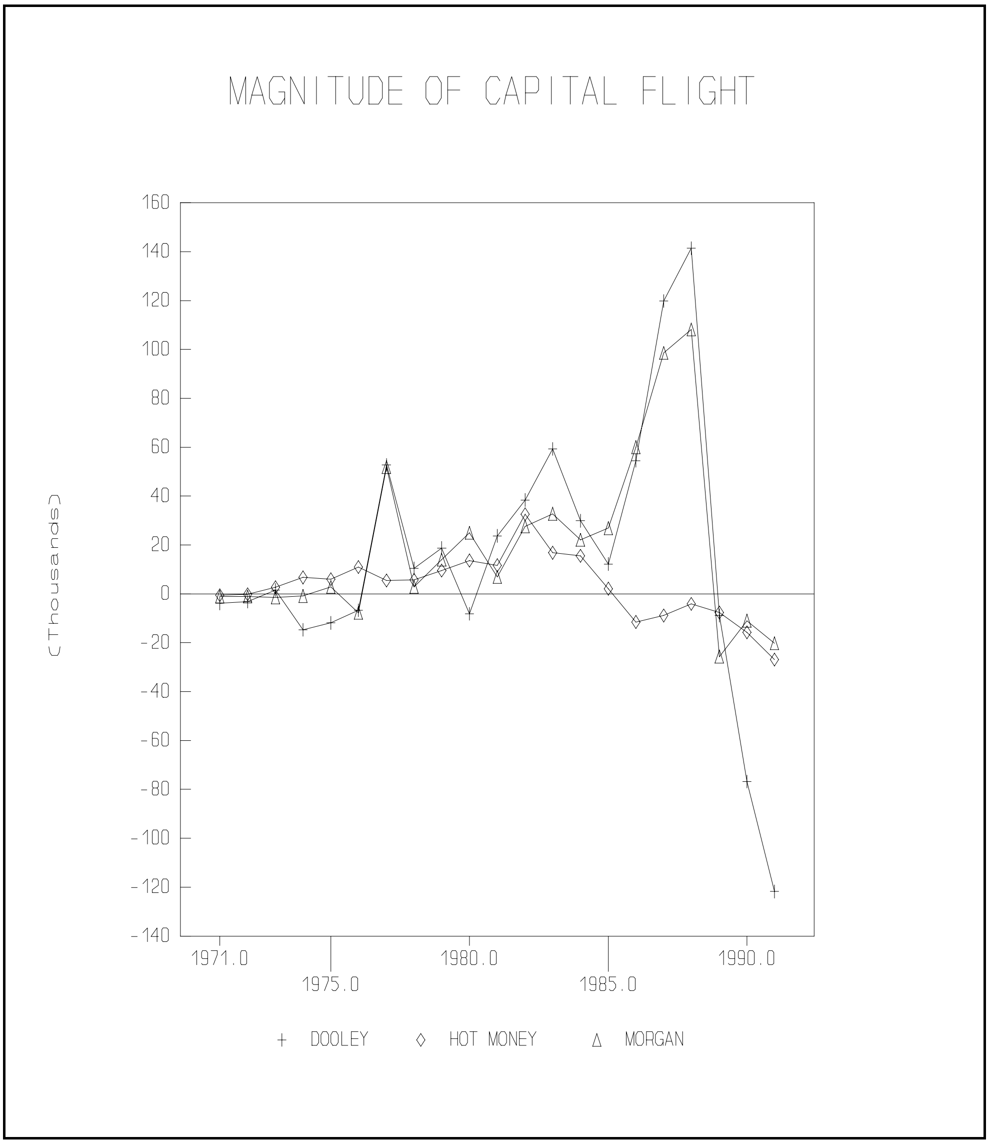

FIGURE 1: Annual flows of capital flight (US$ millions)

Appendix I: List of variables

All data used in this study were taken from the World Bank Economic Indicators disk, 1997, unless stated otherwise. All variables refer to averages for the 1970-1990 period, unless stated otherwise.

Capital flows variables

BANK = bank and trade related lending as a percentage of GDP

FDI = foreign direct investment as a percentage of GDP

AID = development aid as a percentage of GNP

The *I* variables are BANK (for hot money) or BANK and AID (for Morgan Guaranty and Dooley).

Political variables (the M variables)

INSTAB = measure of political instability, calculated as 0.5∗ASSASS + 0.5∗REVOL, where ASSASS is the number of assassinations per million population per year and REVOL is the number of revolutions per year

RIGHTS = index of political rights (from 1 to 7; 1=most political rights)

CIVIL = index of civil liberties (from 1 to 7; 1=most civil liberties)

WAR = dummy variable giving a one to countries that participated in at least one external war during the period 1960-1985, and a zero to all other countries

DEMOC = general openness of political institutions (from 0 to 10; 0 = low)

PARCOM = extent to which non-elites are able to access institutional structures for political expression (from 0 to 5; 0 = unregulated; 5 = competitive)

INSTAB, RIGHTS, CIVIL and WAR are taken from the Barro-Lee data set (available on the NBER Web-site). INSTAB is calculated over the 1970-1985 period. Originally, these data are from two different sources:

- A.S. Banks, "Cross-National Time Series Data Archive," Center for Social Analysis, State University of New York at Binghampton, September 1979, updated (INSTAB and WAR); and
- R.D. Gastil, *Freedom in the World*, New York, Freedom House, various years (RIGHTS and CIVIL).

DEMOC and PARCOM are taken from the POLITY III Code Book. Taken from internet: fttp:/ isere.colorado.edu/pub/datasets/polity3/polity3.codebook.

Macroeconomic variables (the Z- variables)

BMP = black market premium, calculated as (black market rate/official rate)-1. Data are taken from the Barro-Lee data set

BUDDEF = overall budget deficits, including grants as a percentage of GDP (positive figures are surpluses)

CREDITPR = credit to the private sector as a percentage of GDP

DEBTGDP = the external debt to GDP ratio

DEBTS = total debt service as a percentage of GDP

DEPR = the deposit rate (%)

DFREEOP = an measure of free trade openness from Barro-Lee data set. Calculated as: DFREEOP = 0.528-0.026 log (AREA) - 0.095 log (DIST). AREA = size of land, million sqaures Km; DIST = average distance to capitals of world 20 major exporters, weighted by values of bilateral imports, 1000 Km.

DUMA = a dummy for countries in Sub-Saharan Africa

DUMLA = a dummy for countries in Latin-America

GDPPC = per capita GDP

GROWTH = the real GDP growth rate

INFL = the annual inflation rate

INVEST = gross domestic investment as a percentage of GDP

MGDP = the ratio of money and quasi money to GDP

PRENR = the primary school enrollment rate (%)

RINTR = the real interest rate (%)

STDINFL = the standard deviation of the annual inflation rate, calculated from the inflation figures

SPREAD = the interest rate spread, measured as the lending rate minus the LIBOR

STDRINTR = the standard deviation of the real interest rate

STDSPREAD = the standard deviation of the spread

TOT = a variable measuring terms of trade shocks (growth rate of export prices minus growth rate of import prices: taken from Barro-Lee dataset. Variable is measured over 1970-1985 period)

TRADE = exports plus imports to GDP. This variable measures the degree of openness

The data set used for this study - plus a full description of the methodology - are available upon request from the authors.

Appendix II: Robustness tests for the *Z* variables

This appendix presents robustness tests for the set of Z variables using the Morgan Guaranty and the Hot Money method to estimate capital flight. The *I* variables are the same as the one used in the analysis in the paper (i.e. BANK and AIDGDP for the Morgan Guaranty method and BANK for the Hot Money method). For each variable from the set of *Z* variables discussed in Appendix I we applied the robustness tests described in the main text. The regressions include - next to the *I* variables and the *Z* variable of interest - all other *Z* variables used in our analysis of the robustness of the political variables. Moreover, PARCOM and INSTAB are included as Z variables. We have not included the other political variables to reduce the number of regressions. The amount of regressions for each variable tested is 8,855. None of the variables are robust according to the EBA analysis. Therefore, only the results of the method suggested by Sala-i-Martin (1997) are presented.

TABLE II.1: SENSITIVITY RESULTS FOR MACRO VARIABLES.
MORGAN GUARANTY METHOD

M-variable	R^2	β	standard error	CDF
BUDDEF	0.20	-0.222	0.088	0.994
DEBTGDP	0.20	0.029	0.0138	0.983
DFREEOP	0.23	-9.261	6.379	0.926
GROWTH	0.18	-22.53	17. 54	0.900
DUMLA	0.17	-0.976	0.894	0.883
TOT	0.13	14.32	12.71	0.869
BMP	0.16	0.450	0.433	0.849
STDRINTR	0.16	0.041	0.040	0.843
GDPPC	0.16	0.361	0.378	0.831
INFL	0.17	0.004	0.006	0.761
RINTR	0.16	-0.020	0.032	0.732
DUMA	0.16	-0.419	0.857	0.684
TRADE	0.16	-0.0053	0.0129	0.659
CREDITPR	0.15	-0.009	0.030	0.614
PRENR	0.16	-0.005	0.018	0.606
SPREAD	0.17	-0.001	0.005	0.587
MGP	0.20	0.0046	0.021	0.583
STDINFL	0.17	0.0003	0.0017	0.575
INVEST	0.16	0.008	0.065	0.544
DEPR	0.17	0.0004	0.0084	0.519
STDSPREAD	0.17	0.0006	0.005	0.544
DEBTS	0.16	0.0038	0.139	0.508

TABLE II.2: SENSITIVITY RESULTS FOR MACRO VARIABLES.
HOT MONEY METHOD

M-variable	R^2	β	standard error	CDF
GDPPC	0.19	0.442	0.184	0.992
TOT	0.17	11.35	6.03	0.970
STDINFL	0.17	0.0012	0.0008	0.932
DEBTGDP	0.15	0.009	0.0068	0.908
CREDITPR	0.12	0.015	0.014	0.856
INVEST	0.14	-0.031	0.030	0.851
GROWTH	0.13	-10.14	9.917	0.846
TRADE	0.13	-0.007	0.0069	0.826
INFL	0.16	0.002	0.003	0.785
BUDDEF	0.11	-0.032	0.048	0.749
DUMLA	0.13	0.235	0.432	0.705
DEBTS	0.13	-0.0075	0.0695	0.652
DEPR	0.13	-0.113	0.3311	0.633
DUMA	0.13	-0.135	0.411	0.629
MGP	0.11	-0.004	0.0127	0.618
STDSPREAD	0.13	0.0006	0.0023	0.603
STDRINTR	0.17	-0.971	3.636	0.602
PRENR	0.13	-0.002	0.008	0.591
DFREEOP	0.18	-0.829	3.656	0.587
RINTR	0.12	-0.001	0.015	0.528
SPREAD	0.12	-0.0001	0.002	0.520
BMP	0.12	0.001	0.200	0.500