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Abstract

This paper shows that policy uncertainty, measured by the uncertainty of budget deficits, tax payments, government consumption and the inflation rate, has a statistically significant positive impact on capital flight. This result remains robust after having applied stability tests.

Key words: capital flight, uncertainty, macroeconomic policy

JEL Classification: F39, O11

1. INTRODUCTION

Since the early 1980s the issue of capital flight from less developed countries (LDCs) has gained much attention in academic as well as in policy circles. The debt crisis that hit these countries stimulated massive outflows of capital. Capital flight from these countries appeared to be voluminous in absolute terms. This posed a threat to national solvency and economic growth perspectives. From the end of the 1980s and early 1990s the debt crisis appeared to be solved and attention for capital flight phenomenon waned. Certainly, capital flight had not stopped for a number of countries. In particular, several countries in Africa and Eastern Europe still experienced outflows. Yet, many countries in Asia and Latin America were receiving large capital inflows, instead of experiencing massive outflows during this period. However, from the mid-1990s the international financial system was confronted with the outbreak of several major financial and economic crises. First, in 1994-1995 Mexico and some Latin American countries experienced the Tequila crisis. Then, in 1997-1998 several Asian countries experienced a deep financial and economic crisis, followed by Russia (1998) and Brazil (1999). In all these cases countries experienced massive withdrawal of capital due to financial and economic problems.

These current and past crisis situations and their consequences for economic conditions in recipient countries call for more research on the determinants of capital flows. This paper aims to increase our understanding of the determinants of capital flight. Its contribution to existing empirical evidence on the determinants of capital flight is that it focuses on a very important, but until now empirically neglected determinant of capital flight, namely the effects of uncertainty of domestic government policies on capital outflows. The main argument to focus on the uncertainty regarding the direction of government policies as perceived by residents is that this will probably stimulate them to hold their wealth abroad. As long as government policies and their impact on the real value of wealth are unclear, residents are likely to decide to take their money and run, since real returns on foreign assets are more clear and certain.

The paper is structured as follows. Section 2 pays attention to the concept of capital flight, as well as to the methodology used to measure capital flight. Section 3

provides an overview of the theory on the determinants of capital flight. Section 4 focuses on the role of policy uncertainty as a factor that may explain capital outflows and presents our estimates on the relationship between policy uncertainty and capital flight. Section 5 concludes.

2. CONCEPTS AND MEASUREMENT OF CAPITAL FLIGHT

In the literature on capital flight there is no general agreement on what exactly is meant by the term. In several studies, it is suggested that capital flight should be distinguished from *normal* capital outflows. According to these studies 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. In their view, the phenomenon of capital flight is somehow related to the existence of extremely high uncertainty and risk with respect to returns on domestically held assets. Residents take their money and run in order to avoid extremely high losses on their domestic asset holdings. Capital flight is motivated by the fear of losing wealth due to, for example, expropriation of wealth by the government, sudden exchange rate depreciation, non-repayment of government debts, (changes in) capital controls and financial market regulations, and (changes in) tax policies (Deppler and Williamson, 1987; Walter 1987; and Kindleberger, 1987). These studies suggest that capital flight should be related to the abnormal or illegal nature of certain capital outflows. Yet, in practice it is extremely difficult to empirically distinguish between normal and abnormal or illegal capital outflows (see also Gordon and Levine, 1989).

One may question whether it is indeed useful to distinguish capital flight and capital outflows. For countries struggling with (large) current account deficits – and which are thus in need of foreign capital –, any capital outflow increases the problems of financing their net imports, thus reducing economic growth. In this paper all resident capital outflows leading to a build-up of assets held abroad by residents will be labelled capital flight. In our view, capital flight is the result of a private portfolio decision. The individual wealth holder compares expected rates of return of different domestic and foreign assets. Taking into account portfolio diversification, rates of return differentials, and risk and uncertainty aspects, the individual divides

his or her wealth over domestic and foreign assets (Eggerstadt, Brideau Hall and Van Wijnbergen, 1995; Collier, Hoeffler and Patillo, 1999).

Since there is no general agreement on what exactly is meant by capital flight, several capital flight measures are available in the literature.[1] Not surprisingly, this leads to differences in capital flight estimates for different countries. In this paper we use the so-called *residual method.* This method measures capital flight indirectly 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. This approach starts from the standard balance of payments framework. In principle, if the balance of payments statistics were to be used, the uses and sources of funds should be equal. However, since these statistics may not accurately measure flows, and in particular private capital flows, World Bank statistics on the change in the external private debt are used instead. The statistics of this institution provide a more accurate picture of private capital flows. If the sources, calculated by using World Bank debt data, exceed the uses of capital inflows calculated from national balance of payments statistics, the difference is termed as capital flight. The residual method acknowledges the difficulties of separating abnormal from normal capital outflows and, therefore, measures all private capital outflows as being capital flight.

The residual method has been widely used, in some cases with (minor) modifications. Morgan Guaranty (1986) provides an interesting modification to the standard residual method. This version of the residual method takes into account the change in the short-term foreign assets of the domestic banking system as an additional term. This modification is introduced to focus exclusively on non-bank capital flight. The Morgan Guaranty variant of the residual method can thus be calculated as:

$$KF_m = \Delta ED + FI - CAD - \Delta FR - \Delta B \qquad (1),$$

[1] See Hermes and Lensink (1992) for an extensive survey of the measurement of capital flight.

where KF_m is capital flight according to the Morgan Guaranty variant of the residual method, Δ denotes change, *ED* is stock of gross external debt reported in the World Bank data, *FI* is the net foreign investment inflows, *CAD* is the current account deficit, *FR* is the stock of official foreign reserves, and *B* the change in the short-term foreign assets of the domestic banking system. In this paper we will use this method to calculate capital flight.

3. EXPLAINING CAPITAL FLIGHT: THEORY

Stated in a formal way, capital flight is directly related to the behaviour of a risk-averse individual who diversifies its wealth in order to maximise its returns. This emphasises the decision to hold assets abroad as part of the process of portfolio diversification (Cuddington, 1986; Gibson and Tsakalotos, 1993; Lensink, Hermes and Murinde, 1998). Differences in rates of return between domestic and foreign asset holdings, the amount of wealth, and risk and uncertainty aspects influence this decision. Individual decisions with respect to portfolio diversification are influenced by, among other things, macroeconomic instability, political instability, the stock of capital, and real interest rate differentials.

Macroeconomic instability occurs when aggregate domestic demand exceeds aggregate domestic supply on a structural basis. Whenever a country experiences macroeconomic instability this may manifest itself in a number of ways: budget deficits rise, current account deficits increase, exchange rate overvaluation occurs and inflation is growing. Macroeconomic instability leads to raising expectations of imposing higher taxes and tax-like distortions, such as exchange rate devaluation. This will lower returns and increase risk and uncertainty of domestically held wealth (Hermes and Lensink, 1992; and Collier, Hoeffler and Pattillo, 1999, p.4). Therefore, macroeconomic instability increases incentives for capital flight.

Next, *political instability* may have an impact on the risks and uncertainty regarding the policy environment and its outcomes for domestic wealth holders. More specifically, residents may decide to hold their assets abroad, based on a lack of confidence in the domestic political situation and its adverse consequences for the future value of their assets. Political instability may increase the possibility that the

government policies in one way or another will erode the future value of asset holdings. In these cases, perceived political instability may generate capital flight (Alesina and Tabellini, 1989; Tornell and Velasco, 1992; Bhattacharya, 1999; and Lensink, Hermes and Murinde, 2000).

Additionally, the *stock of capital flight* may increase capital flight. When residents hold large amounts of foreign assets, the domestic tax base is reduced considerably. Under these circumstances, the tax burden due to increased public expenditures and foreign borrowing has to be shared by a smaller tax base, increasing the burden per unit of domestically held asset. Consequently, this will further stimulate residents to take their money and run. Thus, the larger the stock of capital flight, the higher the incentives to flee (Collier, Hoeffler and Pattillo, 1999).

Capital flight may also occur simply because the returns on assets are higher abroad as compared to assets held domestically. Thus, capital flight can be explained by existing (after tax) real *interest rate differentials* (Hermes and Lensink, 1992).

4. CAPITAL FLIGHT AND UNCERTAINTY: ECONOMETRIC ANALYSIS

The discussion in the previous section shows that public sector behaviour appears to be one of the more important determining factors of capital flight. This behaviour is related to both macroeconomic and political instability. If the content and direction of current and future public policies are uncertain and/or unstable, domestic investors will be uncertain about the impact of these policies on the real value of domestically held assets in the future. This uncertainty may stimulate them to withdraw their investments from the country and buy foreign assets. In empirical studies on capital flight uncertain/unstable public policies are proxied by variables such as high inflation rates, overvalued exchange rates and high budget deficits. However, these variables do not directly measure uncertain public policies. At best they may be indirectly linked to the uncertainty surrounding policy behaviour of the public sector.

We attempt to directly focus on the uncertainty surrounding the future direction of public policies and its impact on capital flight. Our analysis focuses on uncertainty with respect to government consumption expenditures, taxes, budget deficits, inflation and real interest rates. In the remainder of this section we aim at discussing the

construction of policy uncertainty measures, the estimation methodology and the outcomes of the econometric investigation.

The construction of the policy uncertainty measures

The empirical literature on uncertainty distinguishes between ex-post and ex-ante approaches to measure uncertainty (see Bo, Lensink and Sterken, forthcoming). The ex-ante approach is primarily based on the variance derived from survey data. This approach is not useful for our analysis. The most popular ex-post approaches use measures based on: (1) the variance of the unpredictable part of a stochastic process; or (2) the conditional variance estimated from a General Autoregressive Conditional Heteroskedastic (GARCH)-type model. The GARCH-type model approach is especially relevant for high frequency data, such as financial market data, since such data display clustering effects. Since we use annual data, we proxy uncertainty by the variance of the unpredictable part of a stochastic process. More specifically, we first specify and estimate a forecasting equation to determine the expected part of the variable under consideration. Next, the standard deviation of the unexpected part of the variable, i.e. the residuals from the forecasting equation, is used as the measure of uncertainty. This approach has also been used by e.g. Aizenman and Marion (1993), Ghosal (1995), and Ghosal and Loungani (1996). Differences in the measurement of the uncertainty variable mostly stem from the way in which the forecasting equation is formulated. We follow the most widely used approach and specify a second-order autoregressive process, extended with a time trend, as the forecasting equation:

$$P_t = a_1 + a_2 T + a_3 P_{t-1} + a_4 P_{t-2} + e_t, \qquad (2),$$

where P_t is the variable under consideration, T is a time trend, a_1 is the intercept, a_3 and a_4 are the autoregressive parameters and e_t is an error term. We estimate the above equation for all LDCs in the data set, using data for the 1971-1991 period. The data are obtained from the World Bank; for a description of the data set, see Claessens and Naudé (1993). The uncertainty measure is determined by calculating the standard

deviation of the residuals for the entire sample period per individual country. We calculate the following five different types of uncertainty, all related to the uncertainty surrounding public policies: uncertainty with respect to (1) budget deficits (*UNBUD*); (2) tax payments (*UNTAX*); (3) government consumption (*UNGOVC*); (4) inflation (*UNINFL*); and (5) the real interest rate (*UNRINTR*).

The estimation methodology and outcomes

The estimation methodology is as follows. We start by estimating a base equation for capital flight. In an earlier study we showed that capital flight is mainly caused by capital inflows and by political risk variables (Lensink, Hermes and Murinde, 2000). Following the results of this earlier study, the base equation (column [1] of table 1) contains measures of different forms of capital inflows and several measures for political risk. With respect to capital inflows, we include the variables bank lending as a percentage of GDP (*BANKL*) and foreign aid as a percentage of GDP *(AIDGDP*). With respect to the political risk variables we use a measure for the degree of political instability (*PINSTAB*) and an index of civil liberties (*CIVLIB*).

<insert table 1>

Next, we add the different policy uncertainty variables one by one. These estimates are presented in the columns numbered [2] to [6]. It appears that almost all policy uncertainty variables have a highly significant and positive effect on capital flight. *UNINFL* is the only policy uncertainty variable that is not statistically significant. In general, the estimation results appear to be quite encouraging. Most importantly, in line with what might have been expected policy uncertainty appears to be an important determinant of capital flight.

In order to test for the stability of the results presented in table 1 we use a methodology proposed by Sala-I-Martin (1997). Following this methodology, we add other variables to the different estimated equations containing the uncertainty measures. These other variables are taken from a group of variables that are found to be important for explaining capital flight in other studies. The total set of additional variables

include: two measures for free trade openness; per capita GDP; the primary enrolment rate; credit to the private sector as a percentage of GDP; the investment to GDP ratio; a dummy variable (from 0 to 5) representing the extent to which non-elites are able to access institutional structures for political expression; debt service as a percentage of GDP; the ratio of money and quasi money to GDP; the debt to GDP ratio; the interest rate spread; the black market premium; terms of trade shocks; the budget deficit of the government to GDP ratio; and the per capita growth rate. We use all possible combinations of four of the entire set of additional variables and perform regressions in which the base variables, the policy uncertainty measure, as well as four additional variables are included. This implies that, for each individual equation containing one of the policy uncertainty measures 15!/(11!4!) = 1,365 variants of this equation are estimated.

For each individual estimated equation, a coefficient as well as a standard error for the uncertainty measure are obtained. We then calculate the mean estimate for the coefficient and the mean estimate for the standard deviation. In table 2 the mean estimate is given in the column *Coef* and the mean standard deviation can be found in the column *St error*. Dividing the mean estimate of the coefficient by the mean estimate for the standard error gives a test statistic, which, assuming normality, holds information on the fraction of the cumulative distribution function (CDF) that is on the right or left-hand side of zero. In table 2 CDF denotes the larger of the two areas. If CDF is above 0.95, we conclude that the variable under consideration has a robust effect on economic growth.

<insert table 2>

When we evaluate the outcomes of the econometric investigation, the following general picture emerges. To begin with, it appears that *UNGOVC*, *UNTAX* and *UNBUD* have a robust impact on capital flight. The other two measures are not robust using the CDF test statistic. Note, however, that *UNINFL* is almost robust (CDF just below 0.95). Overall, the empirical results seem to confirm the importance of policy uncertainty for explaining capital flight. This emphasises the importance of

stable macroeconomic policies and a stable policy environment in LDCs in order to reduce the magnitude of capital outflows.

5. CONCLUSIONS

This paper has dealt with investigating the role played by the uncertainty with respect to government policies perceived by domestic wealth holders and its influence on capital flight. The existing empirical evidence on the determinants of capital flight so far has not really dealt with the relationship between the uncertainty of domestic policies and capital flight. The outcomes of our econometric investigation support the view that policy uncertainty stimulates capital flight. In particular, if the content and direction of current and future public policies are uncertain and/or unstable, domestic investors will also be uncertain about the impact of these policies on the real value of domestically held assets in the future. This uncertainty stimulates them to withdraw their investments from the country and buy foreign assets. As long as government policies and their impact on the real value of wealth are unclear, residents decide to take their money and run, since real returns on foreign assets are clear and certain. Policy uncertainty, measured by uncertainty of budget deficits, tax payments, government consumption and real interest rates appears to have a statistically significant positive impact on capital flight. This result remains robust after having applied stability tests as suggested by Sala-I-Martin (1997).

The results of the empirical investigation have clear policy implications. In order to reduce capital flight governments of LDCs should focus on stabilising their macroeconomic and political situation. In particular, they should follow clear and stable policies with respect to their public finances, which relates to tax policies and government expenditure policies, as well as with respect to monetary policies, affecting both inflation and interest rates. Such clear and stable policies reduce uncertainty over their policies and their impact on the real value of wealth as perceived by domestic wealth holders, which will positively contribute to reducing the outflow of domestic capital.

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Table 1: Capital flight and policy uncertainty

	[1]	[2]	[3]	[4]	[5]	[6]
Dependent variable: capital flight measured according to the Morgan Guaranty method (Morgan Guaranty, 1986)						
BANKL	0.701 (1.87)	0.545 (1.72)	0.051 (0.20)	0.156 (0.62)	0.647 (1.69)	0.103 (0.43)
AID	0.091 (2.71)	0.040 (0.92)	0.067 (1.55)	0.081 (2.19)	0.095 (2.79)	0.083 (2.10)
PINSTAB	5.244 (2.35)	4.791 (2.27)	2.474 (1.61)	3.032 (2.00)	4.248 (1.89)	2.559 (1.55)
CIVLIB	0.398 (2.06)	0.275 (1.54)	0.417 (2.43)	0.456 (3.05)	0.440 (2.28)	0.408 (2.21)
Additional Variable		*UNGOVC*	*UNTAX*	*UNBUD*	*UNINFL*	*UNRINTR*
		1.040 (2.52)	1.237 (4.00)	0.824 (4.19)	0.002 (1.61)	0.026 (1.81)
C	-2.541 (-2.84)	-3.012 (-3.26)	-3.101 (-3.66)	-3.575 (-4.21)	-2.729 (-3.02)	-1.828 (-2.30)
Adj. R^2	0.32	0.41	0.28	0.43	0.35	0.18
F-statistic	11.230	13.205	7.265	12.672	10.470	4.47
Jarque-Bera	4.364	1.553	6.852	1.835	1.947	8.738
N	89	89	80	78	89	79

Notes: capital flight is measured based on the Morgan Guaranty variant of the residual method (Morgan Guaranty, 1986), using data for the 1971-1991 period. We have tested for the significance of intercept dummies for different groups of countries, such as a dummy for Latin America and a dummy for Sub-Saharan Africa. They all appeared to be insignificant, and are therefore not presented.
t-values are between brackets. The t-values are based on White heteroskedasticity-consistent standard errors.
N = number of of observations.

Table 2: Stability test results

	R^2	*Coef*	*St. error*	CDF
UNGOVC	0.32	0.974	0.384	0.99
UNTAX	0.27	1.150	0.314	1.00
UNBUD	0.40	0.831	0.193	1.00
UNINFL	0.25	0.113	0.073	0.94
UNRINTR	0.16	0.015	0.013	0.89

Note: the amount of regressions estimated per policy uncertainty measure is 1,365.

Appendix I: List of abbreviations and variables used in table 1 and in the econometric investigation presented in section 4

Δ = change in a variable

AIDGDP = development aid as a percentage of GDP

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

BMP = black market premium, calculated as (black market rate/official rate) minus 1.

BUDDEF = overall budget deficits, including grants as a percentage of GDP

CFS = stock of capital flight

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

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

DEBTGDP = the external debt to GDP ratio

DEBTS = total external debt service as a percentage of GDP

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

DUMG = dummy variable for regime change

FDI = foreign direct investment as a percentage of GDP

FINC = financial incentive variable, i.e. the difference between domestic and foreign interest rate corrected for changes in the exchange rate, based on Pastor(1990).

FREEOP = measure of free trade openness (calculated as 0.528 - 0.026 log (*AREA**0.095(*DIST*)), where *AREA* = size of land; and *DIST* = average distance to capitals of world 20 major exporters.

GDPPC = GDP per capita in 1970

GOVCGDP = government consumption as a percentage of GDP

INFL = annual domestic inflation rate

INVEST = average investment to GDP ratio over 1970-1990 period

MONGDP = average money and quasi money to GDP ratio over the 1970-1990 period

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

PCGROWTH = average real per capita growth rate over 1970-1990 period.

PINSTAB = measure of political instability, calculated as 0.5 times the number of assassinations per million population per year plus 0.5 times the number of revolutions per year.

PR = political risk variable (specified in Dooley, 1986)

PRIGHTS = index of political rights

PRENR = primary school enrolment rate in 1970

REER = real (effective) exchange rate

RINTR = real interest rate (%)

RINTRF = foreign real interest rate (%)

SHDGDP = short term debt to GDP ratio

SPREAD = interest rate spread (i.e. foreign minus domestic real interest rate)

TAXGDP = total taxes as a percentage of GDP

TOT = a variable measuring terms of trade shocks (growth rate of export prices minus growth rate of import prices). This variable is measured over 1970-1985 period.

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

UNBUD = uncertainty with respect to government budget deficit

UNGOVC = uncertainty with respect to government consumption expenditures

UNINFL = uncertainty with respect to inflation

UNRINTR = uncertainty with respect to real interest rate

UNTAX = uncertainty with respect to taxes

WAR = dummy variable (1 = country participated in at least one external war during 1960-1985; 0 = no participation in external wars)

YG = rate of domestic economic growth

The source for all variables is World Development Indicators, 1997 (World Bank, available on CD-ROM), except for *BMP, CIVLIB, FREEOP, PINSTAB,* and *TOT*. These variables have been obtained from the Barro-Lee data set. *PARCOM* is obtained from the POLITY III Code Book (please consult the following internetsite: fttp://isere/colorado.edu/pub/datasets/polity3/polity3.codebook). Uncertainty measures have been calculated by the authors (see section 4 of this chapter for an explanation of the methodology used).