Capital Flight In The 1990s – Lessons From E. Europe

Angelos A. Antzoulatos*[*]
Theodosios Sampaniotis**

Abstract

We analyze capital flight from Eastern Europe in the 1990s, a problem that although was as significant, and possibly as detrimental to economic growth, as its 1980s Latin American predecessor, has received scant attention in the literature so far. Specifically, we employ five capital-flight measures used in earlier studies and apply a "general to specific" modeling approach in a panel of seventeen E. European countries, trying to uncover the main determinants of the problem. Though these determinants differ across the estimated models, three appear consistently significant: real exchange rate appreciation, inflation and budget deficits. Lastly, we discuss the implications of the empirical findings for the IMF-sponsored economic stabilization programs.

1.   Introduction.

Capital flight became a serious problem for E. European countries in the 1990s. Simply put, it deprived these countries, which were heavily dependent on external financing in their tortuous path towards a market-based economy after decades of a centrally-planned one, from financial resources that were badly needed for their development. Yet, despite its magnitude and severe consequences for the affected countries, this problem has received scant attention so far. The existing literature has

[.] Department of Banking & Financial Management   **Economist
  University of Piraeus   Office of the Prime Minister
  80 Karaoli & Dimitriou street   Greece
  Piraeus 18534
  Greece
  Phone: (30-1) 414-2185
  Fax: (30-1) 414-2341
  antzoul@unipi.gr

focused on Latin America (L.A.) –where capital flight in the late 1970s and early 1980s contributed to both the eruption and the severity of the "debt crisis"—and to a lesser extent E. Asia (see, for example, Cuddington [1987], Dooley [1987], Gordon and Levine [1989], Kant [1996], Myrvin and Hallet [1992], Pastor [1990], Schineller [1997], Ul Haque and Khan [1985]), while the few studies that refer to E. Europe focus on Russia (Loukine [1998], Sicular [1998], Wintrobe [1998]).

E. European countries share some of the pathologies of L.A. in the 1970s and 1980s. Prominent among them are domestic distortions, economic and political alike, that not only discourage capital inflows from developed countries to finance investment, but additionally encourage outflows. These distortions often arise from binding policy constraints, the products of inelastic government expenses and limited revenue sources, which cannot be eased without considerable social cost. In addition, limited access to the international financial markets hinders the ability of these countries to smooth shocks, such as, a deterioration in the terms of trade or an increase in the world interest rates, and leads to a more volatile economic environment. The latter not only is conducive to capital outflows, but may additionally lead to a vicious cycle of deteriorating access to the international financial markets, more economic volatility and more outflows.

Nevertheless, E. European countries are sufficiently different from L.A. ones and, at the same time, share enough common characteristics among themselves to justify this study. To begin with, these countries, former COMECON members, have similar economic structure –despite that they followed different paths to economic transformation, and face similar economic and social problems. Among the latter, they are dependent on external financing, characterized by relative technological backwardness, and plagued by crime and corruption. They also aspire, with the exception of Russia, to join the European Union.

Further justifying this study, the magnitude of the problem is considerable. Depending on the measure used (see below for details), capital flight for the years 1994-1998 ranged on the average between 1% and 6% of GDP. For comparison, the corresponding figures for Western Europe were well below 1% of GDP, and could be readily accounted for by short-term investment flows. In addition, the external environment was very different in the 1990s from that in the preceding two decades, with globalization, financial liberalization and market-friendly reforms becoming the norm as opposed to the more state-interventionist practices of the past.

Owing to the difficulty of estimating capital flight, a difficulty well recognized in the literature (see, among others, IMF [2000] and Myrvin and Hallet [1992]) and also amply illustrated by the proliferation of measures proposed in earlier studies, we employ five of these measures. They are chosen with two criteria: quarterly availability and consistency. In addition, we apply a "general to specific" modeling approach, pooling data for all E. European countries for which the relevant time series exist.

Our empirical findings have some strong policy implications. To begin with, for all five capital-flight measures employed, real appreciation appears to have been a significant determinant, suggesting that outright devaluation of an over-valued currency might be more appropriate than gradual depreciation. Inflation was significant for four measures, indicating that the inflation tax, which some of the sample countries have resorted to trying to finance their budget deficit, may have backfired in the form of capital flight. The deficit, itself, was significant for three

measures, providing some support to IMF's recommendation of balancing the budget.

The importance of the above findings is further highlighted by some potential explanatory variables that were not significant. To begin with, the insignificance of dummies for capital controls indicates that IMF's recommendation for elimination of all such controls requires further justification. Also, the insignificance of the difference between the domestic and international nominal interest rates, in contrast to what several previous studies have found (Mikkelsen [1991], Gibson and Tsakalotos [1993], Pastor [1990], Dooley [1987]), suggests that, to the extent this difference reflects expected currency depreciation (Bansal and Dahlquist [2000]), the growing liberalization and integration of financial markets in the 1990s has rendered deviations from interest rate parity inconsequential and thus affected the nature and determinants of capital flight.

The remainder of the paper is organized as follows. Section 2 presents the five measures of capital flight employed, along with some statistics that highlight the magnitude of the problem. Section 3 discusses the potential explanatory variables and analyzes the empirical results, while Section 4 concludes.

2.   Capital Flight Measures.

In the estimation of capital flight, a task that would border the impossible even without the inherent difficulty of properly counting legal cross-border flows,[1] two approaches have been followed. The first distinguishes capital flows between "regular", i.e., for trade, investment and portfolio diversification, and "irregular", i.e., all other flows; and assigns capital flight to the second. In the words of Kindleberger, capital flight is "money that runs away" (Kant [1996, p. 2]). The second approach is more inclusive and categorizes as capital flight all outflows. The rationale is that all outflows deprive the countries in question –in which the growth potential and hence the expected returns are higher than in industrial countries— from resources needed to finance domestic investment –the vehicle for growth– and current account deficits (Tornell and Velasco [1992]).

In this study, we employ five of the measures used in the literature, the criteria for their selection being quarterly availability and consistency. The first three derive from the first approach, while the remaining two from the second. These measures are described below.

- *Hot Money I,* shorthand notation *HM-I.* It is equal to *errors & omissions* (line 78cad in the International Financial Statistics – IFS) plus *non-bank short-term private capital outflows* (line 78brd which corresponds to the sub-category *Other Sectors* of *Other Investment Assets*). The name derives from the often-used characterization of short-term capital flows, which are very volatile, as "hot money".

- *Hot Money II, HM-II*. As above, with *net non-bank short-term private capital flows* (IFS lines 78brd and 78bvd. Line 78bvd corresponds to the sub-category

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[1] For related discussions, see, among many, Dooley (1987), Eggerstedt et al. (1993), Gordon and Levine (1989) and Myrvin and Hallet (1992). See also IMF (2000).

Other Sectors of *Other Investment Liabilities*). Comparing these two measures, the first uses the (change in the) asset side of the private non-bank sector balance sheet, while the second –recognizing that the private sector holds simultaneously both foreign assets and liabilities—uses (the change of) its net position.

- *Errors & Omissions, E &O*. The justification is that this IFS account includes capital flight in addition to actual errors and omissions.

- *World Bank – Residual Method*, *W.B.*. It measures capital flight as the difference between the "sources" and the "uses" of funds. As sources of funds are regarded changes in the net external position of the official sector (IFS lines 78bpd and 78btd), plus net FDI flows (IFS lines 78bdd and 78bed), plus net equity flows (IFS lines 78bkd and 78bmd). The uses of funds include the financing of the current account (IFS line 78ald) plus the change in foreign exchange reserves (IFS line 79dad).

- *Claessens-Naudé, C-N*. It is a variation of the previous measure, named after the researchers who proposed it (Claessens and Naudé [1993]), that uses the net external position of the country (from the joint BIS-OECD-IMF-WB statistics on external debt) instead of that of the official sector.

Giving some reassurance about the empirical results, the five measures, despite their different conceptual foundations, exhibit the same trends over time. Figures 1 and 2, which exhibit capital flight in millions of U.S. dollars from Lettonia and Russia for the period 1993:Q1 to 1999:Q2, are characteristic of this feature. In them, a positive number indicates outflows, while a negative one indicates inflows.

Figure 1.
Lettonia – Capital Flight Measures

Figure 2.
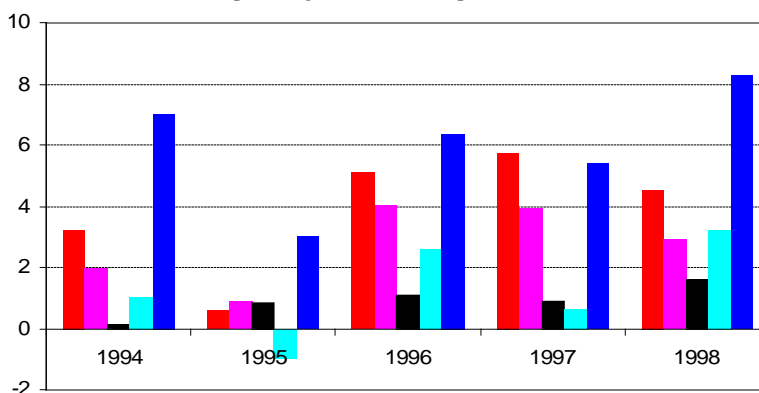Russia – Capital Flight Measures
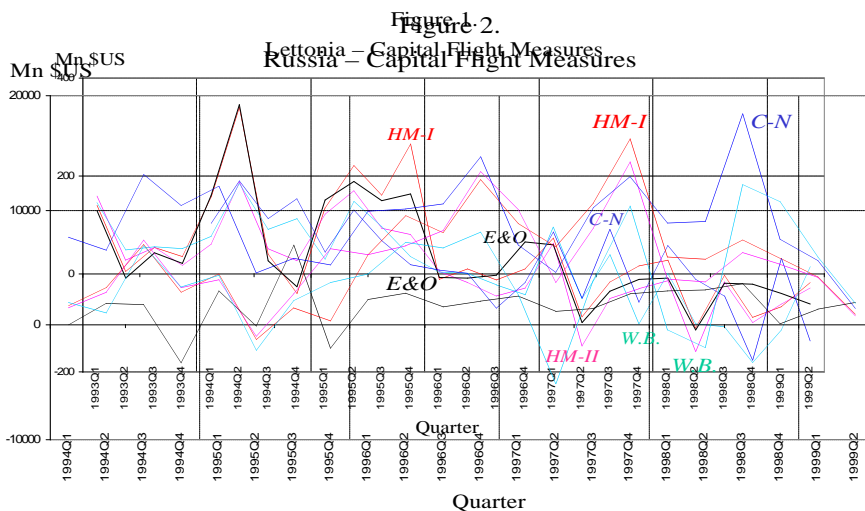
Figures 1 and 2 also reveal two important things. First, the characteristics of each country seemingly affect capital flight. Briefly, all measures tend to decline over time for Lettonia, but increase for Russia. Second, the third measure, *Net Errors &*

Omissions exhibits low correlation with the other four. This is consistent with the fact that this measure has the weakest foundations and has also performed poorly in previous empirical studies (Eggerstedt et al. [1993]).

Figure 3 indicates that the magnitude of the problem is significant. Depending on the measure employed, capital flight ranges between 1% and 6% of GDP on the average, for the period 1994-the first full year in the sample to 1998-the last full year. The highest estimates are given by the *HM-I, HM-II* and *C-N* measures. For comparison, the corresponding figures for Western Europe were well below 1% of GDP, and could be readily accounted for by short-term investment flows.

Figure 3.
Capital Flight From E. Europe [% of GDP]

Note: From left to right, *HM-I, HM-II, E&O, W.B* and *C-N* measures of capital flight.

3. Modeling Capital Flight.

We begin with a brief discussion of the variables that have been found significant determinants of capital flight in earlier studies (see, for example, Cuddington [1987], Dooley [1987], Gibson and Tsakalotos [1993], Kant [1996]). We also justify theoretically their inclusion using the extended version of the *interest rate parity* (IRP) presented in equation (1) below. To the best of our knowledge, it is the first time such a rigorous justification is offered in the literature.

$$i_t \approx i_{t,\$} + (\ E_t e_{t+1} - e_t\ )/e_t + (RP + LP) + TC \qquad (1)$$

In it, i_t stands for the country's nominal interest rate, $i_{t,\$}$ for the world interest rate (proxied here with the appropriate US$ rate), e_t the nominal exchange rate in units of domestic currency per unit of foreign currency (here the US$), $E_t e_{t+1}$ the expected nominal exchange rate in the same units, RP and LP the risk and liquidity premia, and TC the transaction costs incurred when investing in the country relative to the transaction costs of investing abroad. RP and LP are grouped together because it is next to impossible to disentangle them. Also, $(\ E_t e_{t+1} - e_t\ )/e_t$ expresses the expected nominal depreciation; if it is positive, the country's currency is expected to depreciate, and vice-versa.

The IRP essentially says that investors, domestic and foreign alike, will be indifferent between investments in the country and abroad as long as the difference in the respective interest rates is equal to the expected currency depreciation plus the required by them risk and liquidity premia, plus some compensation for the relative transaction costs in the country and abroad.

Alternatively, in case

$$i_t < i_{t,\$} + (E_t e_{t+1} - e_t)/e_t + (RP + LP) + TC \qquad (2)$$

the return from investing in the country, i_t, will not be adequate, investment abroad will be more profitable, and capital flight will occur.

Conversely, in case

$$i_t > i_{t,\$} + (E_t e_{t+1} - e_t)/e_t + (RP + LP) + TC \qquad (3)$$

domestic investments will be more profitable and an inflow will occur.

Starting from equilibrium, when IRP holds—equation (1), an increase in the expected depreciation, or in the risk and liquidity premia, or in the relative transaction costs will make the inequality (2) hold and thus lead to capital flight. The increase in the relative transaction costs can happen through an increase in the cost of investing in the country, a decrease in the cost of investing abroad, or a combination thereof. As for an increase in the domestic interest rate, i_t, it is not certain whether it will lead to capital flight or capital inflow (inequality (3)). It depends, as elaborated below, on whether this increase is autonomous or it takes place in an effort to stem capital flight.

The potential explanatory variables for capital flight follow.

- Inflation, symbol *INFL*. Rising inflation provides the incentive to the residents of a country to reduce their holdings in domestic currency. Part of their holdings will be directed to domestic real assets, while another part will find its way to real and financial investments abroad, through legal or illegal channels. In terms of the IRP, rising inflation may indicate poor economic performance and lead to higher risk premium—inequality (2) holds. *INFL* is measured as the percent change of the consumer price index (line 64 in the IFS) from the same period a year ago and is expected to have positive sign.

- Nominal interest rate, *i*. The sign of this variable is not certain. A rising interest rate may compensate domestic residents for the high inflation (term *RP* in IRP) and the possibility of depreciation (term $(E_t e_{t+1} - e_t)/e_t$), as well as for the risk of holding domestic currency (term *RP*), leading, as a result, to lower outflows or even inflows in case inequality (3) holds–negative sign. On the other hand, the nominal interest rate may be rising in an effort by the authorities to stem outflows, in which case this variable may be positively correlated with capital flight—inequality (2) holds (positive sign). The nominal interest rate used is the domestic deposit rate and comes from publications of the central banks of the sample countries.

- Difference between the domestic and international nominal interest rate, adjusted for exchange rate changes, $IDIF = i_t - i_{t,\$} - (E_t e_{t+1} - e_t)/e_t$. Everything else equal, a rise in *IDIF* will make investments in the country more profitable and thus lead to lower outflows, and vice-versa. Hence, this variable is expected

to have a negative sign. The foreign interest rate used is the U.S. Treasury bill rate (IFS line 60c), while the nominal exchange rate in units of the country's currency per US dollar is the average rate (line rf). Owing to the difficulty of predicting nominal exchange rates, $E_t e_{t+1}$ is proxied with the realized exchange rate e_{t+1}. Lastly, a variation of this variable tested but found insignificant was the actual difference between the domestic and international nominal interest rates, $i_t - i_{t,\$}$.

- The size of the external sector, *MXGDP*, measured as the sum of exports and imports (source: IMF's <u>Direction of Trade Statistics</u>) as percentage of GDP (line 99b). (GDP, which is reported at annual intervals, is divided by 4 to get a quarterly estimate.). A bigger external sector is associated with more transactions with foreigners and, hence, with more opportunities to circumvent foreign exchange restrictions plus more funds to deposit in international banks abroad. These opportunities essentially translate to lower transaction costs for domestic residents investing abroad and, hence, higher relative costs for investing domestically—higher *TC*. This variable is expected to have a positive sign.

- Government balance as percent of GDP, *GDEF*. A falling balance (line 80 in IFS), which corresponds to a rising deficit, may lead to difficulties in financing it and force the government to raise taxes directly or indirectly, the latter often through an inflation tax. In both cases, a falling balance may be associated with higher risk premium—inequality (2) holds. This variable is expected to have a negative sign.

- Changes in the real exchange rate, in percent, *DREER*. Since a negative *DREER* denotes –by construction— real appreciation, which renders the country's goods less competitive and creates pressures for a nominal depreciation and, more generally, for a change in the policy mix. Thus, real appreciation may be associated with higher risk premium, suggesting a negative expected sign for this variable. The real exchange rate comes from the IFS (line reu).

- Foreign direct investment (IFS line 78bed) as percent of GDP, *FDI*. The sign of this variable is not certain *à priori*. A rise in FDI may essentially finance capital flight, by providing foreign exchange to those who want it (positive sign). On the other hand, it may reflect foreign investors' increasing confidence in the prospects of the country which, if shared by domestic residents, will be associated with smaller capital flight (negative sign). In terms of the IRP, in the first case we have lower transaction costs for domestic residents investing abroad (higher *TC*); in the second, lower risk premium.

- Number of capital controls, *CCONTR*. Though capital controls are thought to help a country reduce capital flight, the sign of this variable is not certain. On the one hand, capital controls may –perhaps for a limited time— be successful in stemming outflows by increasing domestic residents' cost of investing abroad— lower relative cost of investing domestically (lower *TC*); which implies a

negative sign. On the other hand, the imposition of (more) controls may signal a deteriorating external financing situation, raise the prospect of devaluation and, hence, induce through higher risk and liquidity premia domestic residents to intensify their efforts to get their money out of the country; which implies a positive sign. Conversely, a reduction of controls may signal an improving situation and, hence, reduce the incentive for outflows (negative sign as well). The number of capital controls has been estimated from the IMF's annual publication Exchange Arrangements and Exchange Restrictions. Though this number cannot account for the effectiveness and degree of enforcement of the controls, it is a good proxy that has been used in other studies as well (Bartolini and Drazen [1997]).

- Dummies for the exchange rate regime: *DPEG* for a pegged exchange rate regime, *DMANAG* for managed floating, *DFLEX* for limited flexibility, and *DFREE* for free floating. These dummies are constructed with information from the aforementioned IMF publication, as well as from the central banks of the sample countries. Their sign is not known a priori. For example, a fixed exchange rate regime, *DPEG=1*, if it is credible, may reduce outflows (negative sign). If it is not, it may increase outflows (positive sign) as domestic residents will try to convert their money to foreign currency before the collapse of the regime. In terms of the IRP, the significance of this variable may arise from the differing expectations of foreign and domestic investors regarding the sustainability of the exchange rate policy. Foreign investors' expectations regarding devaluation, which are captured by the term $(E_t e_{t+1} - e_t)/e_t$, may be regarded as too optimistic –as often is the case—by the better informed domestic investors.

The equation to-be-estimated follows. In it, the subscript *j* denotes the country, while the +, - and +/- signs above each variable denote its expected sign.

$$\overset{+}{} \quad \overset{+/-}{} \quad \overset{-}{} \quad \overset{+}{} \quad \overset{-}{} \quad \overset{-}{} \quad \overset{+/-}{} \quad \overset{+/-}{} \quad \overset{+/-}{} \quad \overset{+/-}{} \quad \overset{+/-}{} \quad \overset{+/-}{}$$
$$CF_j = \varphi(\text{INFL, i, IDIF, MXGDP, GDEF, DREER, FDI, CCONTR, DPEG, DMANAG, DFLEX, DFREE})$$

The sample is largely determined by data availability. It includes seventeen countries, Albania, Armenia, Belarus, Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Lettonia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine. Georgia is not included for the reason it started publishing balance of payments data consistent with the IMF guidelines in 1999. Further, Azerbaijan's data had many missing observations, while owing to war Yugoslavia's and Bosnia's data are unreliable. The sample also extends from 1993:Q1, when the three Baltic republics, plus Croatia, the Czech Republic, Slovenia and Slovakia started publishing quarterly data, to 1999:Q2, the last quarter for which data were available. Indicative of the challenges posed by the fragmented data is that Albania started reporting quarterly data in 1995 and Belarus in 1996.

The modeling approach is "general to specific", starting with four lags of all explanatory variables and dropping the insignificant ones with a series of F-test for joint significance, with pooled time-series cross-sectional data. The four lags, besides allowing for the delayed effects of the potential determinants of capital flight, allow for the lags in the collection and reporting of economics statistics. For

the sample countries, as well as for all countries that do not have sophisticated data collection systems, these lags are considerable.

The estimated equation also included country dummies to capture country-specific effects, such as, the political situation and the stage of reforms. These dummies are not likely to be collinear with the exchange rate dummies because the exchange rate regime of the sample countries changed during the sample period. Further, the estimation was done with a heteroskedasticity-consistent variance/covariance matrix, using the ROBUSTERRORS option in *RATS*.

Table 1 summarizes the empirical results. Staring from the left, the fist column reports the determinants that were significant for at least one capital flight measure, while the remaining five columns report the estimated coefficients and their *t*-statistics (in parentheses) – one column for each measure.

TABLE 1.
The Determinants of Capital Flight

$$+ \quad +/- \quad - \quad + \quad - \quad - \quad +/- \quad +/- \quad +/- \quad +/- \quad +/- \quad +/-$$
$$CF_j = \varphi(INFL,\ i,\ IDIF,\ MXGDP,\ GDEF,\ DREER,\ FDI,\ CCONTR,\ DPEG,\ DMANAG,\ DFLEX,\ DFREE)$$

Explanatory Variables	Capital Flight Measure				
	HM-I	HM-II	E&O	W.B.	C-N
$INFL_{t-4}$	0,0002634 (3,157)*	0,000834 (1,917)***	0,0002834 (1,65)***	0,000556 (3,51)*	
$MXGDP_t$	0,0525 (2,426)*				
$MXGDP_{t-2}$				0,0532 (2,033)**	
$GDEF_t$	-0,000421 (-4,39)*	-0,000379 (-2,47)*			
$GDEF_{t-4}$					-0,000399 (-2,686)*
i_{t-1}	-0,0365 (-2,164)**				
i_{t-3}		-0,0233 (-2,0013)**			
$DREER_t$	-0,1373 (-2,83)*	-0,1185 (-2,293)*	-0,1322 (-2,0275)**	-0,2177 (-3,566)*	-0,182 (-3,52)*
$IDIF_t$				0,04687 (3,463)*	
$IDIF_{t-4}$		-0,0128 (-2,4953)*			
$DPEG_t$				-0,03688 (-2,547)*	
R^2	0,564	0,451	0,186	0,417	0,264
D.W.	2,04	1,64	2,19	1,93	2,09

<u>Notes</u>:
1. Variable definitions: see main text.
2. Sample: 1993:4 – 1999:2.
3. *t*-statistics in parentheses, below the estimate coefficients.
4. One, two and three asterisks (*) denote significance at the 1%, 5% and 10% levels, respectively.
5. The estimation was done with a

- "general to specific" modeling approach, starting with four lags of the independent variables and eliminating all the insignificant ones with a series of *F*-tests for joint significance.
- heteroskedasticity-consistent variance/covariance matrix, using the ROBUSTERRORS option in RATS.

As Table 1 indicates, the change in the real exchange rate, *DREER*, is significant at high confidence levels (5% for the *Errors & Omissions* measure and 1% for all others) and has the expected sign. The next most important determinant of capital flight is lagged inflation, $INFL_{t-4}$, which also has the expected sign. $INFL_{t-4}$ is significant at the 1% level for *HM-I* and *W.B.*, and at the 10% level for *HM-II* and *E&O*. The third most important determinant is government deficit (as percent of GDP) which is significant at the 1% level for *HM-I, HM-II* and *C-N* (fourth lag).

Other less important determinants are the size of the external sector, *MXGDP*, the nominal interest rate, *i*, and the difference between the domestic and international nominal interest rate adjusted for exchange rate changes, *IDIF*, each of which is significant at the 5% or higher level for two capital flight measures. Lastly, the dummy for a pegged exchange rate system, *DPEG*, is significant at the 1% level for the *W.B.* measure only.

In general, however, the dummies for the exchange rate regime are not significant. Nor are the variables for FDI and the number of capital controls.

It is worth noting that the two significant determinants whose sign was not certain *á priori*, the nominal interest rate, *i*, and the dummy for a pegged exchange rate system, *DPEG*, have negative sign. This means that a rising interest rate helped stemmed capital flight, while the second indicates that the pegged exchange rate system was credible. In addition, the equation for the *E&O* capital-flight measure has the lowest R^2, consistent with the fact that this measure has the weakest foundations of all.

As noted in the introduction, the above results have important policy implications. Briefly, they indicate that real appreciation should be avoided. Hence, for countries with higher inflation than their major trading partners a fixed exchange rate regime may not be appropriate and, perhaps, a once-and-for-all depreciation of an overvalued currency might be preferable than gradual depreciation. In addition, inflation and government deficits should be reigned at.

The empirical results also highlight some of the acute dilemmas policy-makers in the sample countries were facing. Specifically, allowing for a rapid enough nominal depreciation of the currency, in an effort to avoid real appreciation, might fuel inflation and thus backfire. This severity of this dilemma is further highlighted by the fact that many countries anchor their stabilization programs on the exchange rate (exchange-rate based stabilization; for references and details, see Calvo and Végh [1994]).

And these dilemmas are more acute than one might be led to believe based on the existing literature. Briefly, all the variables that were significant determinants of capital flight in previous studies are significant here as well—with the exception of the difference between the domestic and the international nominal interest rates (see, also, the discussion in the introduction) and the number of capital controls. There is a caveat though, which, on the positive side, further underscores the results of this paper: The significance of these variables varies across the measure of capital flight used. Only the real exchange rate appreciation is consistently significant for all five measures used; and inflation for four of them.

4. Concluding Remarks.

Studies like this one are hampered by severe data limitations, a fact that may explain why capital flight from E. Europe has received scant attention in the literature so far. Nevertheless, the high level of statistical significance of the estimated coefficients, their consistency across the estimated models as well as with expectations, together with the fact that the five capital flight measures exhibit similar trends despite their different conceptual foundations, are reassuring about the robustness of the conclusions. An implication of these conclusions is that the path to development and prosperity of E. European countries, along which they must fully utilize all their resources, real and financial alike, will be difficult and fraught with many policy dilemmas.

References.

1. Bansal, Ravi and Magnus Dahlquist (2000). "The Forward Premium Puzzle: Different Tales from Developed and Emerging Economies", *Journal of International Economics*, Vol. 51, pp. 115-144.

2. Bartolini, Leonardo and Allan Drazen (1987). "Capital-Account Liberalization as A Signal", *American Economic Review*, Vol. 87, No. 1, pp. 138-154.

3. Calvo, Guillermo A. and Carlos A. Végh (1994). "Inflation Stabilization and Nominal Anchors", Chapter 4 in Approaches to Exchange Rate Policy, Richard C. Barth and Chorng-Huey Wong (Editors), International Monetary Fund.

4. Claessens, Stinj and David Naudé (1993). "Recent Estimates of Capital Flight", World Bank Policy Research Working Paper No. 1186.

5. Cuddington, John T. (1987). "Capital Flight", *European Economic Review*, No. 31, pp. 382-388.

6. Dooley, Michael P. (1987). "Capital Flight – A Response to Differences in Financial Risk", *IMF Staff Papers*, No. 34, pp. 422-436.

7. Eggerstedt, Herald, Rebecca B. Hall and Sweder van Wijnbergen (1993). "Measuring Capital Flight – A Case Study of Mexico", World Bank Policy Research Working Paper No. 1121.

8. Gibson, Heather D. and Euclid Tsakalotos (1993). "Testing A Flow Model of Capital Flight in Five European Countries", *The Manchester School*, Vol. LXI, No. 2, pp. 144-166.

9. Gordon, David R. and Ross Levine (1989). "The Problem of Capital Flight: A Cautionary Note", *World Economy*, No. 12, pp. 237-252.

10. International Monetary Fund. Exchange Arrangements and Exchange Restrictions (various issues).

11. International Monetary Fund. Direction of Trade Statistics (various issues).

12. International Monetary Fund (2000). "Conference on Capital Flows and Debt Statistics – Can We Get Better Data Faster?", Background Paper 23/24.

13. Kant, Chanter (1996). "Foreign Direct Investment and Capital Flight", *Princeton Studies in International Finance*, No. 80, April.

14. Loukine, Constantin (1998). "Estimation of Capital Flight from Russia: A Balance of Payments Approach", *The World Economy*, Vol. 21, No. 5, pp. 613-628.

15. Mikkelsen, Jan Giehm (1991). "An Econometric Investigation of Capital Flight", *Applied Economics*, pp.73-85.

16. Myrvin, Anthony L. and Andrew J. Hughes Hallet (1992). "How Successfully Do We Measure Capital Flight? The Empirical Evidence from Five Developing Countries", *Journal of Developing Economics*, Vol. 28, No. 3, pp. 538-556.

17. Pastor, Manuel Jr. (1990). "Capital Flight from Latin America", *World Development*, Vol. 18, No. 1.

18. Schineller, Lisa M. (1997). "An Econometric Model of Capital Flight from Developing Countries", Board of Governors International Finance Discussion Paper No. 579.

19. Sicular, Terry (1998). "Capital Flight and Foreign Investment: Two Tales from China and Russia", *The World Economy*, Vol. 21, No. 5, pp. 589-602.

20. Wintrobe, Ronald (1998). "Privatization, the Market for Corporate Control and Capital Flight from Russia", *The World Economy*, Vol. 21, No. 5, pp. 603-612.

21. Tornell, Aaron and Andrés Velasco (1992). "The Tragedy of the Commons and Economic Growth: Why Does Capital Flow from Poor to Rich Countries?", *Journal of Political Economy,* Vol. 100, pp. 1208-1231.

22. Ul Haque, Nadeem and Moshin S. Khan (1985). "Foreign Borrowing and Capital Flight", *IMF Staff Papers,* Vol. 32, No. 4, pp. 606-628.

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	HM-I	*HM-II*	*E&O*	*W.B.*	*C-N*
$INFL_{t-4}$	0,0002634 (3,157)*	0,000834 (1,917)***	0,0002834 (1,65)***	0,000556 (3,51)*	
$MXGDP_t$	0,0525 (2,426)*				
$MXGDP_{t-2}$				0,0532 (2,033)**	
$GDEF_t$	-0,000421 (-4,39)*	-0,000379 (-2,47)*			
$GDEF_{t-4}$					-0,000399 (-2,686)*
i_{t-1}	-0,0365 (-2,164)**				
i_{t-3}		-0,0233 (-2,0013)**			
$DREER_t$	-0,1373 (-2,83)*	-0,1185 (-2,293)*	-0,1322 (-2,0275)**	-0,2177 (-3,566)*	-0,182 (-3,52)*
$IDIF_t$				0,04687 (3,463)*	
$IDIF_{t-4}$		-0,0128 (-2,4953)*			
$DPEG_t$				-0,03688 (-2,547)*	
R^2 D.W.	0,564 2,04	0,451 1,64	0,186 2,19	0,417 1,93	0,264 2,09

Notes:

6. Variable definitions: see main text.
7. Sample: 1993:4 – 1999:2.
8. *t*-statistics in parentheses, below the estimate coefficients.
9. One, two and three asterisks (*) denote significance at the 1%, 5% and 10% levels, respectively.
10. The estimation was done with a

- "general to specific" modeling approach, starting with four lags of the independent variables and eliminating all the insignificant ones with a series of *F*-tests for joint significance.
- heteroskedasticity-consistent variance/covariance matrix, using the ROBUSTERRORS option in RATS.
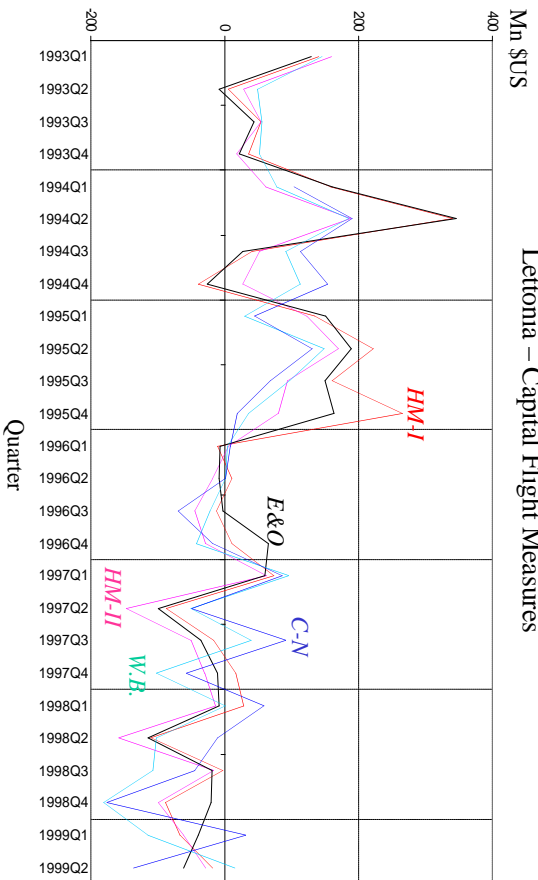
Figure 1.
Lettonia – Capital Flight Measures

Mn $US

Quarter

HM-I

E&O

HM-II

C-N

W.B.

1993Q1 … 1999Q2

Figure 2.
Russia – Capital Flight Measures

Mn $US
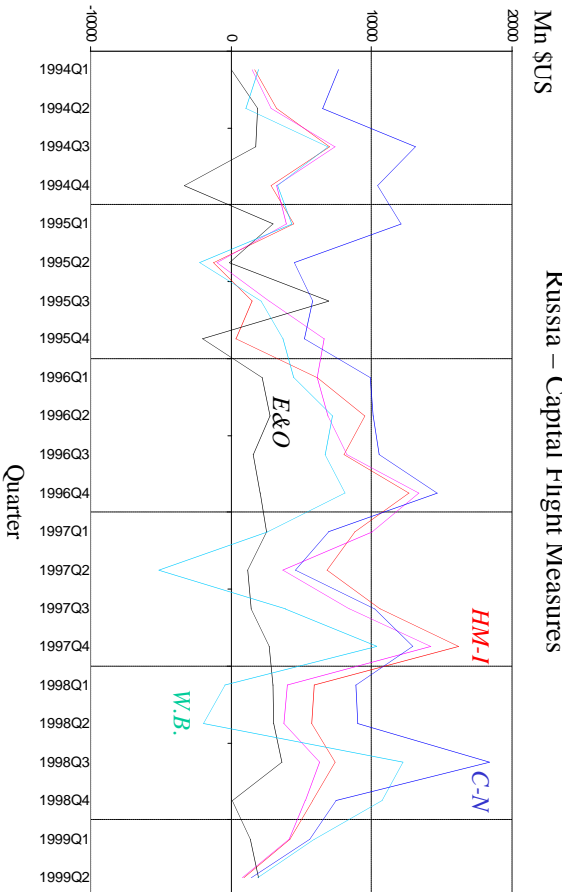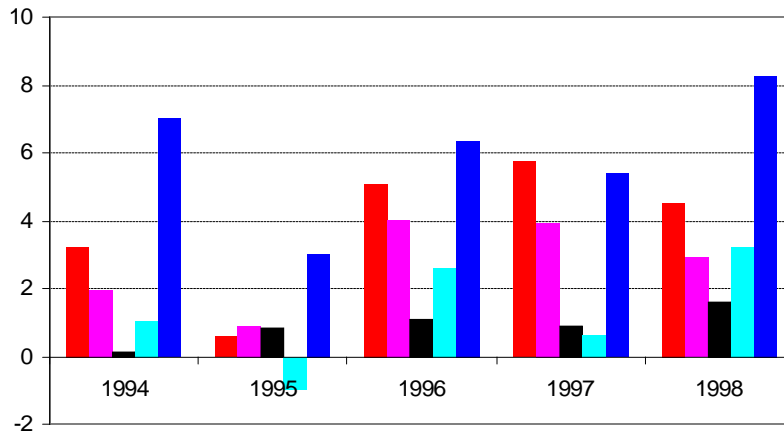
Quarter

E&O

HM-I

W.B.

C-N

1994Q1 … 1999Q2

Figure 3.
Capital Flight From E. Europe [% of GDP]

Note: From left to right, *HM-I, HM-II, E&O, W.B* and *C-N* measures of capital flight.