Capital Flows to an Emerging Financial Market: Turkish Case Study

Şaziye Gazioglu

University of Aberdeen,
Edward Wright Building,
Old Aberdeen, AB24 3QY, UK.
Tel: +44 (0)1224 272182
Fax: +44 (0)1224 272181
Email: pec086@abdn.ac.uk

Abstract

Recent attacks on the foreign exchange market in February 2001 created a deep economic crisis in Turkey. We aim to explore various indicators of the financial crisis in Turkey based on a macro model.

Globalisation in Financial Markets implies that the share of the foreign investors in domestic stock markets has been increasing. We argue that the foreign share of the domestic economy is a key variable for a degree of vulnerability during a Global Financial Crisis. Our empirical investigation showed that the foreign share of the ISE has been increasing since 1995 and is about 50 percent of the total. Furthermore, the general index of stock market prices in 1999 was the highest figure since 1995.

Therefore, stock market price are other important indicator of the forthcoming financial crisis. We investigate the Turkish data and formulating a theoretical dynamic model. Sudden capital outflow would certainly cause exchange rates, balance of payments and international debt problems. Hot money inflow increase the stock market prices and keep the real exchange rate high. However, short stay implies sudden outflow that creates financial crisis. This results in international debt crisis and further loans from International Monetary Funds.

Capital Flows to an Emerging Financial Market: Turkish Case Study

Abstract

Recent attacks on the foreign exchange market in February 2001 created a deep economic crisis in Turkey. We aim to explore various indicators of the financial crisis in Turkey based on a macro model.

Globalisation in Financial Markets implies that the share of the foreign investors in domestic stock markets has been increasing. We argue that the foreign share of the domestic economy is a key variable for a degree of vulnerability during a Global Financial Crisis. Our empirical investigation showed that the foreign share of the ISE has been increasing since 1995 and is about 50 percent of the total. Furthermore, the general index of stock market prices in 1999 was the highest figure since 1995.

Therefore, stock market price are other important indicator of the forthcoming financial crisis. We investigate the Turkish data and formulating a theoretical dynamic model. Sudden capital outflow would certainly cause exchange rates, balance of payments and international debt problems. Hot money inflow increase the stock market prices and keep the real exchange rate high. However, short stay implies sudden outflow that creates financial crisis. This results in international debt crisis and further loans from International Monetary Funds.

1.　Introduction

There are masses of research work in the area of financial crisis.　Johnson et. al. (2000) created a vulnerability matrix using sets of criteria including macro indicators. Berg et. al. (2000) specifically looked at macroeconomic vulnerability using flow variables.　The other approach of crisis includes speculative attack (Krugman P. (1979), Krugman P., Flood and Garber (1984)), and self fulfilling approach (Obstfelt (1995)). Others includes fundamentals, second generation model, moral hazard and self-fulfilling expectations on liquidity.　Masson (1998), Kaminsky G. (1998) and Kaminsky and Sergio L Schumukler (1999) referred to these factors as 'contagion' or common factors affecting all countries.

Experiences show that short-term capital inflow became a vehicle to exchange rate speculations.　The result is increasing international debt and possible halving of the national wealth overnight, as happened in Turkey.　Most analyses are based on only the flow variables and ignore the effects of financial crisis on stock variables such as international indebtedness and wealth.　A recent IMF paper by Borensztein (2000) indicates the importance of linking theory with empirical work on real exchange rate and indebtedness.　The possibility of unstable long-run equilibrium based on our theoretical model is usually ignored in the literature

In this paper we base our arguments on a theoretical model that is different from others.　We argue that the possibility of future volatility is also closely related to the share of foreign investors in the domestic stock market and volatility of the stock market price index.

The sections of the paper are organised in the following way:　In section 2 we present a summary of the model, in the section 3 we investigate foreign shares in Istanbul Stock exchange and in section 4 we report the empirical results.　Finally, we conclude in section 5.

2.　Theoretical Model

The model is based on Gazioglu (2000) , Gazioglu and McCausland (1999,2002), with a profit maximising firm and a representative domestic consumer maximising time separable utility functions (Obstfeld and Rogoff (1995) Ramsey (1928)).　Following Obstfeld and Rogoff (1995) the stock market constraint is as follows:

$$V^d \dot{X}^d \equiv X^d \dot{V}^d + X^d D^d \tag{6}$$

Equation (6) states[1] that a change in the proportion (X^d) of the value of domestic firms[2] that domestic individuals own (in other words, shares: the value of domestic claims to the entire future profits of domestic firms, V^d), $V^d \dot{X}^d$, is equal to the domestic proportion of the change in the stock market valuation of these shares, $X^d \dot{V}^d$, plus their proportion of dividends, $X^d V^d$.

Secondly, the balance of payments constraint

$$\dot{H} = \Pi - T + H(1 + \frac{\dot{E}}{E})\left[1 + R^f\right] \tag{7}$$

The aggregate constraint of stock market and net accumulation of foreign assets, and $-\dot{H}$, can only be accumulated by running a trade surplus, Π is the foreign owned share of domestic dividends minus the domestic owned share of foreign dividends and $H(1 + \frac{\dot{E}}{E})\left[1 + R^f\right]$ is any capital gain from holding foreign money in terms of foreign goods (simple representation is in Gazioglu (1996)) where, external balance is also equal to internal balance.

$$\dot{X} - E\dot{H} \tag{8}$$
$$= Y - A - I + X^d \left(\dot{V}^d / V^d + D^d / V^d\right) + X^f \left(\dot{V}^f / V^f + D^f / V^f\right)$$
$$+ H\left(1 + \frac{\dot{E}}{E}\right)\left(1 + R^f\right)$$

In essence, therefore, the right hand side of the constraint represents net domestic 'income' (factor earnings, net interest from asset holdings, return on shares) minus 'consumption' (private and investment), reflected by the 'saving' (net wealth accumulation) on the left hand side. It is the combination of the stock market constraint, following Obstfeld and Rogoff (1995) and Net International Debt (Gazioglu and McCausland (1999)). If the share of foreign ownership of the domestic stock market increases, debt of the domestic economy increases, analogue to selling 'family silver'. We argue that the vulnerability of domestic economy is very sensitive to the share of the foreign investment in the stock market. How severe a

---

[1] See Obstfeld and Rogoff (1996, p.100) for a discrete time formulation.
[2] We assume that there are a large number of homogenous perfectly competitive domestic firms producing goods for both domestic and foreign consumption. It should be noted that trade in this

foreign shock effects domestic market, will be positively related to the share of foreign ownership. The bigger the share of foreign investors in the domestic stock market, the greater will be the vulnerability of the domestic economy. The Asian crisis can be argued to be in this category. Whether other emerging financial markets become similarly vulnerable depends on the share of foreign investment in the domestic market

The dynamics of the whole system, may be summarised[3] in matrix form by

$$
\begin{bmatrix} \dot{E} \\ \dot{H} \\ \dot{V} \end{bmatrix} = \begin{bmatrix} \dot{E}_E & \dot{E}_H & \dot{E}_V \\ \dot{H}_E & \dot{H}_H & \dot{H}_V \\ \dot{V}_E & \dot{V}_H & \dot{V}_V \end{bmatrix} \begin{bmatrix} E \\ H \\ V \end{bmatrix} + \begin{bmatrix} \dot{E}_k \\ \dot{H}_k \\ \dot{V}_k \end{bmatrix} [k] \tag{9}
$$

where the signs of the elements of the matrix are, from the discussion above: $\dot{E}_E > 0$, $\dot{E}_H < 0$, $\dot{E}_V > 0$ and $\dot{E}_E < 0$; $\dot{H}_E < 0$, $\dot{H}_H < 0$, $\dot{H}_V < 0$ and $\dot{H}_k > 0$; $\dot{V}_E < 0$, $\dot{V}_H > 0$, $\dot{V}_V < 0$ and $\dot{V}_k > 0$. Now construction of the dynamic model is completed, we continue with empirical analysis in the next section. Model has two stable and one unstable equilibrium. Gazioglu and McCausland (1999, 2000) shows that high share of the foreign investment has asymmetry effect during inflows and outflows. Unstable equilibrium can be referred to the case when a country has to borrow in order to pay her debt repayments. (See Gazioglu and McCausland (1999) for further detail).

We use the dynamic variables of real exchange rate, real stock market index and foreign capital flows in our empirical work. Ghosh (2000) used only the real exchange rate and real stock market index to find out the direction of causality. Our causality tests show that the order of the variables is as followis: capital flows (fornflp), stock market index (stockp) and real exchange rate (exccpi). During our empirical investigation, we concentrate on unstable eigen values which are greater than unity.

3. Foreign Share in Istanbul Stock Exchange

---

model takes place not due to comparative advantage but rather to differences in time preference between countries.

[3] Although portfolio shares dynamically adjust to flow disequilibrium, they are, of course, constant in long run equilibrium, hence $\dot{X} = 0$. Furthermore, following Obstfeld and Rogoff (1996), in order to concentrate on the dynamics of domestic net international debt, real exchange rate and the stock market, we assume $\dot{V}^f = 0$.

One of the main aims of this paper is to argue that the share of the foreign investors in the domestic stock market is an important indicator for measuring the vulnerability of the domestic stock market. The theoretical Macro-model includes the dynamics of this important indicator. As a case study in Turkey, we use data from the Istanbul Stock Market (ISM). It is worth noting that liberal foreign exchange policies have applied since 1989, so foreign investors are free to buy and sell in the ISM.

Foreign investment in the Istanbul Stock Market (ISM or IMKB) increased from $33,654 million in 1996 to $83,069 million in 1999 and to $ 111,157 million in 2000. Since 1996 foreign investment has been increasing very rapidly. Furthermore, the share of the foreign investors is around 50 percent of the total market. This is quite high. No figures were available for foreign investment before 1995.

Graph 1 shows that there has been turbulence in both stock market prices and the real exchange rate between 1993-1995. Before 1992 the real exchange rate had been fairly stable but stock market prices had a downward trend. Stock market prices are turbulent, but overall they are at a high level. Since 1995 there seems to have been upward trend in real stock market prices, while the real exchange rate settled down to its pre-1993 level. In 1997 the world financial crisis did not affect the overall amount of investment in the next period. Prices fell sharply to the 1990 level and picked up later. A more serious fall was in 1998. However, we do not observe the real exchange rate volatility, except for the period 1993-1995.

4   Structured VAR Approach

The daily data is extracted from the IMF data stream for the period 1:1:1990-11:26:1999. Other stock market data is taken from Istanbul Stock Exchange publications. We use the real exchange rate, the stock market prices and international debt variables in order to link it with the theory. Our theory shows the possibility of unstable equilibrium when the share of foreign investment in the economy is high. We adopted a 'Structural VAR' model as it overcomes the identification problem of VAR estimation. Our contribution is to have a full macro-model behind the econometric analysis.

4.1   Stationarity and Co-integration Tests

We test stationarity of all variables. We divided the data into sub-periods by using Romers' Narrative 'VAR Approach'.   The entire period 01/01/90 – 11/26/99 and the crisis period 11/26/95 – 11/26/99 were separately investigated. We reported the Augmented Dickey Fuller (ADF) tests with and without a linear trend for the data in levels and first differences in Table

1.   The hypothesis of unit root cannot be rejected for two of the variables. Both real exchange rate (exccp) and stock market values (stockp) are rejected to be I(0) without the trend. However, real exchange rate (exccpi) and real stock market index (stockp) with trend have no unit roots for the entire and final period respectively with 5% confidence level. For foreign capital flows (Fornflp), we reject having unit roots for even 1 percent confident level. Note that Fornflp is the first difference of debt (ddebt). We need to take the first difference of (exccpi) and (stockp) in order to make them all stationary.

Table 1 Augmented Dickey-Fuller (ADF) Test

	01/01/ 1990 11/26/1999		11/26/1995- 11/26/1999	
Variables	**No Trend**	**Trend**	**No Trend**	**Trend**
Exccpi	-2.713	-2.779	-1.827	-3.514**
Stockp	-2.306	-3.301(**)	-2.083	-2.499
Fornflp	-3.231(**)	-5.066(***)	-3.779(***)	-4.545(***)
Dexccpi	-14.574(***)	-14.572(***)	-12.102(***)	-12.144(***)
Dstockp	-11.454(***)	-11.473(***)	-6.422(***)	-6.418(***)

Critical   values (no trend) for 1%, 5% and 10% are -3.436, -2.863, -2.568 respectively. Critical values with trend for 1% (***), 5(**)%, and 10%(*) are –3.97, -3.116, -3.13 respectively

The long-run relationships derived from Macroeconomic Theory are based on production, consumption, interest parity and external balances. We used the Johanson estimation with the assumption of quadratic deterministic trend in the data. Eigenvalues of the variables are the following with 20 lags[15] (one month):

Appendix Tables A1 and A2 report Eigenvalue tests for sample periods 1/01/90 to 11/26/1999 and 10/26/1995 to 11/26/1999. We also report two co-integrating equations, which are obtained by normalising co-integrating coefficients. For both sample periods, long-run test indicate three co-integrating equations at 5 percent significant levels[4]. For the entire sample period the effect of capital inflows on the change of real exchange rate is negative, implying 12 percent fall (appreciation) (Appendix, Table A1). We also observe 42 percent positive effect on change of stock market prices (the crisis period 1995-99 influence of foreign capital flows on the change of exchange rate and change of stock market prices goes up to 44 percent and 123 percent respectively) (Osterwald-Lenum (1992)).   These high figures are an indication of possible exchange rate crisis (Appendix, Table A2). Overvaluation of the stock market might have been interpreted as future exchange rate crisis. This is exactly what happened in November 00 and February 01.

---

[15] As Below

5. Conclusions

In this paper we emphasise the importance of foreign investment in the domestic stock market. Our investigation shows that the share of the foreign investment in the Istanbul stock exchange has been increasing since 1995. Furthermore, the real value of the index of stock market prices is another indicator for the forthcoming crisis.

Though our model highlights the difference between developed and emerging financial markets and implicitly assumes that the entire economy floats in the stock market. Small businesses and industries, which are not floating in the stock market, may be an important share of the total economy. In this case vulnerability is not very serious.

The world financial crisis hit the Turkish Economy mildly in 1997 possibly because the important part of the economy is not included in the ISE. This is in contrast to the South East Asian countries, where export orientated industry dominated the stock market and the entire economy. Further integration of the Turkish industry in the stock market might make the Turkish economy more vulnerable to external shocks. With such a possibility, the country may take two possible routes. One path to take would be further loans from the IMF, with Reform packages. The other one would be capital control. Malaysia refused to borrow and introduced capital control (Tan and Law (2000). Debate on sustainability of market intervention is still continuing. Indonesia had chosen to increase her international debt while social unrest and riots were taken to the streets while Malaysia introduced capital control to the short-term capital flows.

Whichever path a country takes depends on what the policy targets are. The recent Financial in February 2001, resulted the IMF Stand By Packages. Our both theoretical and empirical investigations show that Turkish economy is in unstable region. The limits of financial terror remained to be seen in Turkey.

Sources of Data:
E (e)   Nominal (real) exchange rate. TKUDSP : IMF Data stream

---

[4] We tried with 60, 10 and 5 lags (equivalent to three months, two and one weeks). However, 20 lags gave best statistics for all variables with Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC)

V(v)   Nominal (real) Turkey-DS General Industrial Price index in the ISE: IMF data stream.
K   Capital inflows: (TK121…A) TK Private Banks-Foreign Assets

Appendix F - Symbols List
A domestic consumption

D real dividends
F real stock of foreign treasury bills
G domestic government deficit
H domestic net international debt
I domestic physical capital investment expenditure
J sunk costs (minimum V)
K domestic physical capital stock
L portmanteau coefficient representing exogenous effects on revenue
M portmanteau coefficient representing exogenous effects on costs
N composite term defined in equation
P maximum V
R real interest rate
T real domestic trade balance
U   domestic utility
V stock market value of physical capital
W real domestic wages
X domestic share of domestic shares
Y real domestic income
Z constant technology parameter
e (EXCCPI) deviation of E about long run equilibrium
d domestic (superscript)
f foreign (superscript)
g deviation of G about long run equilibrium
h deviation of H about long run equilibrium
k   FORNFLP capital inflows
kk installation costs of physical capital investment
q production function
v (STOCKP) deviation of V about long run equilibrium
ℵ   current value Hamiltonian
Ω omega   real wealth
α alpha   real exchange rate elasticity of revenu
γ gamma   wealth elasticity of revenue
ε epsilon   wealth elasticity of costs
μ mu   real exchange rate elasticity of costs
χ chi   matrix
λ lambda   multiplier associated with Hamiltonian ℵ

Sample: 01/01/1990 11/26/1999

Normalized

Cointegrating

Coefficients: 2

Cointegrating

Equation(s)

DEXCCPI	DSTOCKP	FORNFLP	@TREND(1/02/90)	C
1.000000	0.000000	-0.121046	0.000106	0.354050
		(0.19500)		
0.000000	1.000000	0.426881	-0.000655	-0.814636
		(0.40396)		
Log likelihood	-18486.28			

Sample: 10/26/1995 11/26/1999

Normalized

Cointegrating

Coefficients: 2

Cointegrating

Equation(s)

DEXCCPI	DSTOCKP	FORNFLP	@TREND(1/02/90)	C
1.000000	0.000000	0.442648	-0.000182	-1.484872
		(0.17807)		
0.000000	1.000000	1.231815	-0.001674	-2.057684
		(1.15787)		
Log likelihood	-7719.491			
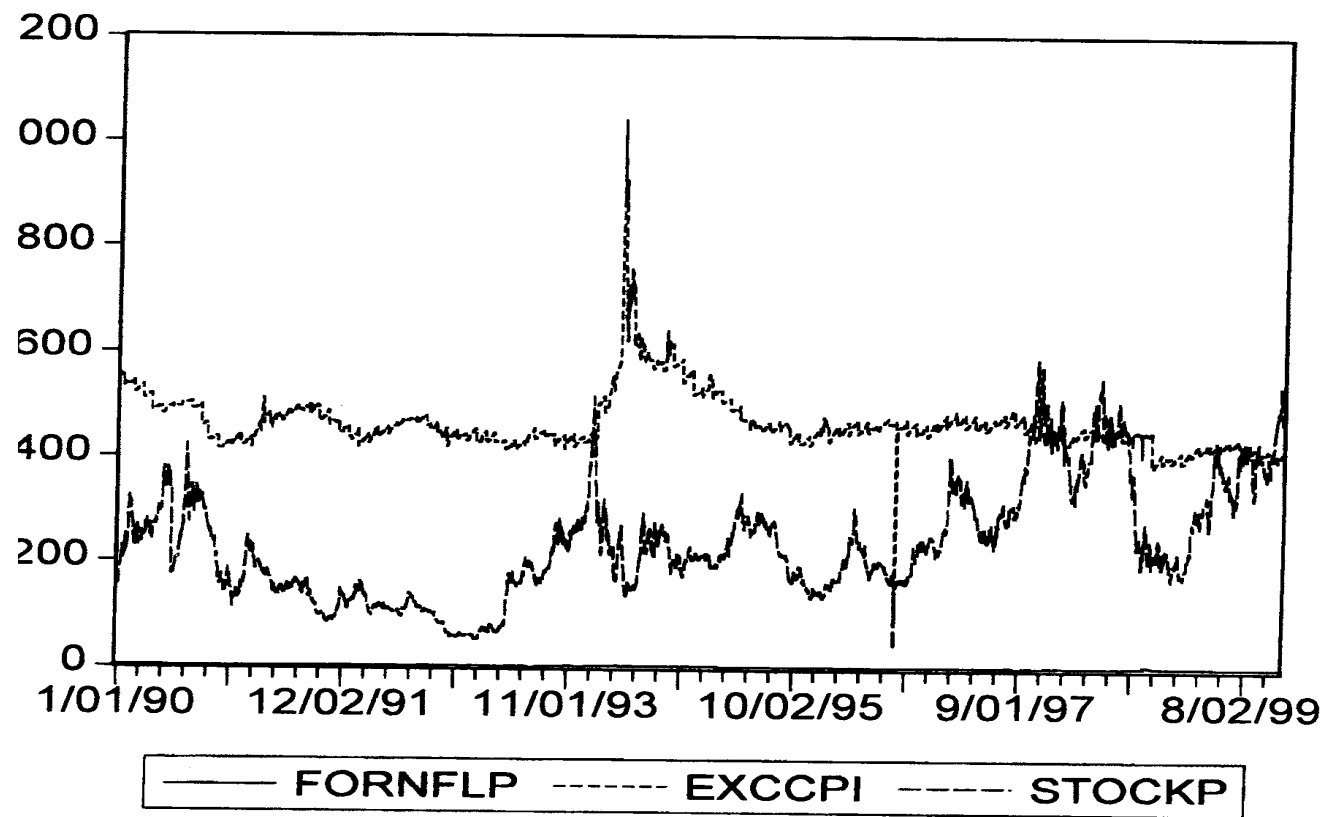
Graph1 : Raw Data

References

Borensztein, A, E., G Milesi-Feretti and C Pattill (2000) 'Anticipating Balance of Payments Crisis-The role of early warning Systems, **IMF Occasional Papers** No. 186 (Washington, International Monetary Funds).

Gazioglu, S. (1996) 'Influence of Demand shocks on Exchange Rate volatility, imperfect Capital Mobility and Substitutability' **The Manchester School**,Vol LXIV No 1, March.

Gazioglu S (2001): An Emerging Market, Volatility of Real Exchange Rate : The Turkish Case' **Middle East and North African Economies, the online journal of MEEA.**

Gazioglu, S. and D. McCausland (1999): 'An Intertemporal Model of Competitiveness, Stock Market, and International Debt Dynamics" Policy Simulations' mimeograph

Gazioglu S. and McCausland (2002): The cost of inward direct foreign investment to developing countries' **Applied Economic Letters** (with D. McCausland) (forthcoming).

Ghosh, D. (2000) 'from Turbulence To Tranquillity: Is Restructuring The Means For Malaysia' **1ˢᵗ International Conference on Banking and Finance**, Universityi Utara Malaysia,18-20 August 2000.

Johnston, B , J Chai, and L Schumacher (2000) 'Assessing Financial System Vulnerabilities' **IMF Working Paper**, WP/00/76, Washington, D.C.

Kaminsky G. (1998): 'High Real Exchange Rate in the Aftermath of stabilization: Is it a lack of Credibility? **Journal of Development Economics**, Vol. 35.

Kaminsky, G. and S. Schmukler (1999): 'What triggers Market Jitters'? A Chronical of the Asian Crisis' Board of Governors of the Federal Reserve System, International Financial Discussion paper No 634, April. and **Journal of International Money and Finance**, August, pp 537-560.

Krugman, P., Flood and Garber (1979): 'Collapsing Exchange Rate Regimes: some linear examples' **Journal of International Economics**, 17: 1-13.

Krugman, P. (1996): 'Are currency crisis self-fulfilling' NBER Macroeconomics Annual

Obstfeld, M and Rogoff, K (1995) 'Exchange Rate Dynamics Redux', **Journal of Political Economy** vol. 103, pp. 624-660.

Obstfeld, M and Rogoff, K (1996) 'Foundations of International Macroeconomics', MIT Press, Cambridge, Massachusetts and London, England.

Osterwald-Lenum, Michael (1992): A note with Quantiles of the Asymptotic Distribution of the Maximum Likelihood Co-integration Rank Test Statistics' **Oxford Bulletin of Economics and Statistics**, 54, 3,461-471.

Ramsey, Frank P. (1928) 'A Mathematical Theory of Saving' **Economic Journal** vol. 38, no. 152, pp. 543-559.

Tan Hui Boon and Law Siong Hook (2000) 'Financial Volatility and Stock Prices: The Malaysian Experience Before and During the Asian Currency Crisis'   **1ˢᵗ International Conference on Banking and Finance**, University Utara, Malaysia,18-20 August 2000.