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Capital Flight Hysteresis and Its Determinants: The Case of Türkiye

Koray Yıldırım[1], Harun Bal[2]

Abstract

Hysteresis behaviour in capital flight emerges as a permanent and resilient form of temporary shocks in capital flows. In our study, smooth transition structural break test and Hatemi-J (2012 and 2016) asymmetric causality tests are used for analyses. The findings obtained from the structural break test indicate the presence of a structural break and hysteresis. In the analyses designed to determine the determinants of capital flows, the use of some selected variables considered important was preferred. As empirical and theoretical determinants of capital flows; banking and other sectors indebtedness ratio, inflation rate, real effective exchange rate, VIX volatility index and real interest rate variables were used. Within the framework of the analyses, the existence of an asymmetric relationship between the real effective exchange rate and capital flight was found, whereas this validity was not observed in other variables. When the capital flight hysteresis is evaluated within the scope of push-pull factors, it is observed that it is affected by real effective exchange rate developments. The expected structural movement in capital flight is short-term. The empirical literature also supports this to a large extent. However, the fact that real effective exchange rate-driven capital flight shows long-run spillover effects is a striking finding on the nature of capital flight and hysteresis.

Keywords: *Capital Flows, Capital Flight, Hysteresis, Fear of Volatility, Türkiye.*

Sermaye Kaçışında Histerezis ve Belirleyicileri: Türkiye Örneği

Öz

Sermaye kaçışında histerezis davranış sermaye akışlarında meydana gelen geçici şokların kalıcı ve dirençli formu olarak ortaya çıkmaktadır. Çalışmamızda yumuşak geçişli (smooth transition) yapısal kırılma testi ve Hatemi-J (2012 ve 2016) asimetrik nedensellik testleri analizler için kullanılmıştır. Yapısal kırılma testinden elde dilen bulgular yapısal kırılmanın varlığı ile histerezise işaret etmektedir. Sermaye akışlarının belirleyicilerinin tespiti amacıyla dizayn edilen analizde ise önemli görülen bazı seçilmiş değişkenlerin kullanımı tercih edilmiştir. Sermaye akışları üzerinde ampirik ve teorik belirleyicileri olarak; bankacılık ve diğer sektörler borçluluk oranı, enflasyon oranı, reel efektif döviz kuru, VIX volatilite endeksi ve reel faiz oranı değişkenleri kullanılmıştır. Analizler çerçevesinde Reel efektif döviz kuru ve sermaye kaçışları arasında asimetrik ilişkinin varlığı tespit edilmiş, buna karşın diğer değişkenlerde bu geçerlilik görülememiştir. Sermaye kaçışı histerezisi, itici-çekici faktörler kapsamında değerlendirildiğinde reel efektif döviz kuru gelişmelerinden etkilendiği görülmektedir. Sermaye kaçışında beklenen yapısal hareket kısa dönemlidir. Ampirik literatür de büyük oranda bunu desteklemektedir. Ancak reel efektif döviz kuru kaynaklı sermaye kaçışlarının uzun döneme yayılım etkileri göstermesi, sermaye kaçışlarının doğası ve histerezis üzerine çarpıcı bir bulgudur.

Anahtar Kelimeler: *Sermaye Akışları, Sermaye Kaçışları, Histerezis, Dalgalanma Korkusu, Türkiye.*

[1] Sorumlu Yazar (Corresponding Author) Dr., Çukurova Üniversitesi, İktisat Bölümü korayyildirim80@gmail.com, https://orcid.org/0000-0002-2524-1746

[2] Prof. Dr., Çukurova Üniversitesi, İktisat Bölümü,, harunbal@cu.edu.tr, https://orcid.org/0000-0003-0878-8253

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INTRODUCTION

Capital flight first attracted attention and gained importance in the 1970s, when some developing countries began to experience significant outflows of foreign capital along with a large outflow of domestic capital. In the 1980s and 1990s, the persistence and growth of this problem increased the interest in the subject. Capital flight has become a critical concern for many developing economies due to its effects on growth performance, reducing domestic investment and worsening financing problems as a result of the transfer of domestic capital from capital-scarce developing countries to developed countries (Epstein, 2005).

Due to its complex structure, capital flight is interpreted from different perspectives. However, the World Bank's (1985) 'residual' method is widely preferred in empirical studies. Here, capital flight is basically defined as the difference between capital flow sources and capital flow utilization. The necessity of estimating capital flight with such a method stems from the fact that capital flight is not included in the balance of payments. Generally accepted estimation methods, particularly the World Bank (1985) 'Residual' method, are organized to separate all short- and long-term capital outflows for speculative purposes from normal capital inflows and outflows, as well as exchange rates, financial repression, and tax regulations that cause political and economic uncertainties and deterioration in expectations.

Basically, the inflows of capital flows into an economy imply economic growth. However, fluctuations in the volatility, volume and efficiency of capital flows have brought along problems such as financial fragility and financial crisis. Forbes and Warnock (2012a) define the common problems arising from capital flows as sudden stops when capital inflows stop sharply, surges or bonanzas when capital inflows increase rapidly and capital flight (capital flight) when capital flows outward. Given the structural form of capital flows, their volume, volatility and frequency can change rapidly and can even trigger or deepen financial crises with systemic risk (Claessens & Ghosh, 2013). Among these factors, capital flight is one of the most repulsive types of capital flows and movements experienced by developing countries.

While pioneering the theoretical foundations and positive effects of capital flows for developing countries in the economic literature (McKinnon, 1973; Shaw, 1973), empirical support has been provided by many studies in terms of promoting growth (e.g. Summers, 2000; Kinda, 2008). However, in the 1970s and afterwards, capital flight, as a different form of capital flows that has become increasingly widespread in developing countries, has become one of the important dynamics (Corsetti et al., 2001; Fratzscher, 2012). As a matter of fact, the problems arising from capital flight and the financial crises observed in some country cases (such as the 1997 Far East Asian crisis) have also led to an intensification of attention on the forms and effects of capital flows.

Despite the increasing rise of hysteresis analyses of capital flows and capital flight as one of its forms, the empirical literature has not sufficiently investigated whether there are permanent effects such as hysteresis on capital flows or whether there are hysteresis effects arising from the determinants of capital flows (inflows, outflows). This gap in this area continues to be significant. The related literature remains extremely limited due to the expectation that hysteresis behaviour specific to the real sector and labour markets is very low in the financial sector. Our study aims to examine and analyse these two topics together, and capital flight hysteresis and the reasons behind it constitute the main focus of the study.

The hysteresis phenomenon is defined as temporary shocks in the economy having permanent effects. In this dimension, it refers to the effect of past imbalances in shaping the future. In the empirical literature, structural break tests are widely used to detect hysteresis (Lee

& Chang, 2008; Furuoka, 2017). Although the permanent effects of shocks are detected by structural break tests, there is an insufficiency in detecting the dynamics that cause hysteresis. At this point, the asymmetric behaviour of the variable whose hysteresis is investigated has enabled the detection of hysteresis dynamics (Bagnai & Ospina, 2015; Fedoseeva & Werner, 2016). Therefore, the asymmetric responses of capital flows to their determinants identify the basic dynamics of hysteresis as well as hysteresis. By using the Hatemi-j (2012) technique for the asymmetric relationships between capital flight and the determinants of capital flight, we aim to contribute to the empirical literature with capital flight hysteresis in the Turkish economy as a previously unexplored area.

In addition to structural breaks, the hysteresis form in economies can also be estimated through the relationship between endogenous variables in the economic system. Dargay (2001) argues that the fact that a variable does not respond symmetrically to an endogenous variable affecting it implies a resilient structure. Negative correlation that does not follow the positive correlation between variables is a form of hysteresis. In terms of the empirical application of the study, it exhibits a behaviour in which a negative endogenous variable shock does not cause a negative movement in capital flows in response to a positive endogenous variable shock that positively affects capital flight (outflows). Göcke (2002) defines this indifference relationship between endogenous variables as a permanent and resistant structure as a form of behaviour suitable for hysteresis. In this study, these permanent and resilient effects implying hysteresis are analysed with asymmetric relationships. The behaviour of capital flows against their theoretical determinants, the dynamics that cause hysteresis and the dynamics that prepare the economy for this process in the context of capital flight are also examined.

The remaining sections of the study are organised in a way to elaborate and analyse the above-mentioned issues. Following the literature review in the second section and the information on the relevant variables and data in the third section, the empirical strategy and analyses will be presented. The study will be concluded with a concluding section summarising the findings and discussions.

1. LITERATURE REVIEW

One of the specific determinants of developing countries is that they are economies with relatively lower values of capital per capita than developed economies. The marginal productivity of capital, which is scarce vis-à-vis labour, is higher in developing countries than in advanced economies, and therefore, assuming that capital flows are free and competitive, capital (in all its forms) needs to flow from advanced economies to developing economies until capital-labour ratios are equalised. In other words, capital should flow from countries with more physical capital per worker and hence lower returns to capital to countries with relatively less capital and hence more unused investment opportunities (Lucas, 1990). In principle, these capital flows should provide developing countries with access to more financial resources, make them better off and enable them to invest in physical capital such as equipment, machinery and infrastructure, thereby improving employment and income levels in those countries (Prasad et al., 2007). The important study of Lucas (1990), in which he determines why this process does not work sufficiently and the reasons for it, draws attention to the problems of developing countries in this regard. Another important problem of developing countries in this process that exacerbates the problem is the migration (flight) of the existing capital to other countries, which are generally developed, through various mechanisms. In other words, contrary to the expected process described above, there are

large amounts of capital flight from capital-scarce developing economies to capital-rich developed economies.

Capital flight is often associated with uncertainty. Caballero and Krishnamurthy (2009), for example, point out that economies or regions with relative confidence in the rest of the world face capital inflows even during crises. Exceptionally (Bhattacharya, 1999), taxation of capital income by policy makers and taxation advantages offered by some other countries can also be among the incentive variables. Except in exceptional cases involving substitution effects (Salisu & Isah, 2021), macroeconomic and other uncertainties are among the main dynamics in the strong relationship between capital flight and economic growth. In the analyses of Alesina and Tabellini (1989), external borrowing risks, insufficient capital accumulation, political risk and uncertainty were found to be important evidence of capital flight. In conclusion, when empirical determinants of capital flows are analysed, indebtedness ratio, inflation, real exchange rate, uncertainty indicators and real interest rates and political risks and uncertainties are the prominent empirical determinants. These determinants are selected as the variables affecting capital flows (inflows, outflows) in the empirical application of the study.

Capital flows on the basis of financial liberalisation define a process that starts with the expectation of economic growth dynamics. However, even though it stimulates growth in developing countries, most economies have experienced capital flight, which is defined as the sudden cessation of capital inflows or the withdrawal of capital to foreign markets. Although studies on capital flows (inflows, outflows) and their determinants are widespread in the empirical literature, studies focusing on hysteresis in capital flows in permanent or resilient form have been limited. There is also a significant literature gap on the processes and dynamics that prepare capital flows for hysteresis behaviour. Hence, the focus and the empirical strategy of this study have been formulated accordingly. As mentioned above, there is a very limited literature on capital flow hysteresis and these studies have generally focused on the hysteresis of capital flight. Ndikumana & Boyce (2008) conclude that the dynamics leading to capital flight will lead to more capital flight in the long run, other things being constant. On the other hand, Ndikumana & Boyce (2003) argue that this process spreads over the long run as investor actors gain experience in terms of capital flight. Collier et al. (2001) find that the effects of capital flight can spread up to ten years. This strengthens the hysteresis phenomenon in capital flows. However, capital flows differ for each economy due to their unique behaviour and the persistence period of shocks. The structural differences of economies are the basis of these differences (Kant, 1996). Korinek (2011), who associates the reason why capital flight may have a more destructive effect in some country cases with rapid capital inflows (surges or bonanzas), emphasises that this process makes the economy vulnerable to financial crises. Rodrik and Velasco (1999) found that short-term indebtedness ratios accompany high risk and at the same time, the debt/foreign exchange reserve ratio is a common trigger of financial crises in developing countries. Cuddington (1986) and Davies (2008) point out that inflation rates are crucial determinants of capital flight.

According to Acharya et al. (2022), hysteresis behaviour in macroeconomic variables has become much more important for developing countries in terms of the policies implemented. If policies are not implemented in a timely manner for variables with hysteresis behaviour, market frictions on the real economy side deepen and lead to policy inefficiency. At the same time, according to Sarno & Taylor (1999), the existence of permanent effects on capital flows in developing countries involves many costs. Reversal of capital flows requires a difficult adjustment process with resource allocation, sunk costs and other effects in the form of hysteresis. Although the direction of capital flows (inflows, outflows) is not important here, every movement involves

these costs. In this context, it is stated that the hysteresis form has a multi-directional movement area. The direction of the relationship between macroeconomic variables in hysteresis, which is defined as the permanent effects of temporary shocks, is mostly similar in the empirical literature. However, Yellen (2016), who defines the relationships between macroeconomic variables beyond the common relationships between macroeconomic variables, which have permanent effects in the opposite direction that are not expected in hysteresis, as hysteresis, has determined that reverse hysteresis is also valid.

In Edwards (2008), the profit opportunity motive of financial assets in the process that started with the formation of capital mobility conditions constitutes the theoretical foundations of capital flows. In addition, Igan et al. (2020) argue that capital inflows triggered value-added industrial growth in developing countries. However, on the basis of the reversal of capital inflows, Salvatore (1998) states that the international returns of financial assets and the risks associated with returns constitute the nature of capital flight. In addition to the return differentials of financial assets, Eichengreen (2004) argues that volatility arising from information asymmetries in international markets is another characteristic of capital flow in the context of deepening or triggering financial crises through speculative movements. Therefore, understanding the nature of capital flows and the processes that lead to crises requires a comprehensive analysis in terms of variables, which includes many dynamics such as the level differences of macroeconomic variables across countries, structural differences of economies and information asymmetries.

Although the basis of capital flows is theoretically based on return differentials, risk factors on a global scale turn into a natural determinant as they can adjust financial asset returns through macroeconomic variables. Forbes & Warnock (2012b) recognise risk factors as an important dynamic in capital flows, but specifically the impact of debt ratios is quite effective. Hein (2006) observes that from the perspective of capital flows, growth changes debt dynamics, and then debt interest payments can turn into a spiral. Analysing this debt system from a long-run perspective, Vague (2023) argues that the borrowing path turns into a spiral over time, turning growth into an illusion as a reflection of the trade-off between borrowers and lenders. Moreover, Krugman (1989), who explained the motivational bases of lending and borrowing, brought a new perspective to the nature of borrowing. He stated that in the process in which the banking sector becomes the main decision maker of borrowing, lenders can change the level of lending according to the risk perception. As a matter of fact, the incentive to borrow does not always imply that the level of indebtedness will increase, revealing the importance of the long-run cycles of borrowing in terms of capital flows. This is evidence that debt-capital flight relationships involve permanent effects in the long run.

The relationship between capital flows and inflation is a prominent finding in the empirical literature that they affect each other through many key macro variables. Crotty & Epstein (1999) argue that capital flows are mainly based on global return differentials, but they involve many complex relationships, including inflation. In economies with a policy choice in favour of monetary easing, financial assets may trigger capital flight with lower expected returns. Dailami & Leipziger (1998) argue that since inflation is always considered a risk, higher risk premiums are demanded for borrowing economies. Looking at the impact of inflation on capital flows in terms of more specific relationships (Schineller, 1997), periods of intensified capital flows (inflow, outflow) are characterised by a rapid increase in risk, accompanied by a rise in inflation. In this case, capital flows may face taxation risks on the part of policymakers and may lead to capital flight. Analysing the relationship between capital flight and inflation and other macroeconomic variables, Ndiaye (2011) argues that capital flight has consequences such as increased inflation, currency crises and

uncertainty in many macro variables. Loungani et al. (2001), who analysed the importance of capital flows through the sacrifice ratio, found that in the case of capital controls, although it implies a contraction in output compared to inflationary policies, it causes more output loss than disinflation policies.

Yalta & Yalta (2023) conclude that different dynamics are effective in each country in terms of capital flows. Domestic currency appreciation, in other words, exchange rates are of high importance in capital flight. There are also countries with asymmetric relationships between exchange rates and capital flight. Asymmetric relationships indicate that capital flight has permanent effects. Otieno et al. (2022) show that exchange rate volatility has a significant relationship with the decline in capital inflows, while exchange rate depreciation will cause financial assets to flow to foreign markets. Fratzscher (2009) argues that beyond exchange rate fluctuations, foreign exchange reserves become crucial in times of heightened risk. While insufficient foreign exchange reserves are effective for the onset of a financial crisis, foreign exchange positions during the financial crisis determine how deep the financial crisis can go. Harrigan et al. (2002) argue that although exchange rates are clearly related to capital flows, the effects are transmitted through other macroeconomic variables. The fact that economic growth is sensitive to capital flows confirms these relationships. On the other hand, the empirical literature has yielded mixed findings in models that include exchange rates and other key macroeconomic variables. In this context, Khan & Haque (1987) observed that the risk of capital loss of residents as a result of overvaluation in real exchange rates is an important determinant of capital flight, while Nelson et al. (2018) drew attention to the relationship between exchange rate developments and expectations with processes dominated by uncertainty indicators in terms of capital flight.

For developing countries, the determinants and risks in terms of capital flows may vary on a country basis and periodically. According to Kim (2000), policies related to macroeconomic variables and regulations in the financial system become important during periods of accelerated capital flows. However, empirical findings based on the historical decomposition function show that changes in world interest rates are more influential than endogenous dynamics in capital flows in developing countries. Analysing the push and pull factors of capital flows by categorising them, Koepke (2019) observes that world interest rates are more important for portfolio decisions. At the same time, it is among the main findings that world interest rates are less significant for the banking sector. These findings prove that dynamics such as banking sector soundness and indebtedness ratio, which are important for capital flows, have more limited impact than world interest rates. Mostly developing countries have inflationary cycles. In the case of high inflation, the real interest rate for financial assets becomes the variable measured in terms of return. Ito & Tran (2023) find a strong relationship between short- and long-term interest rates and capital flows in economies with a high degree of openness. Since the short and long-term interest rate relationship is determinant in the yield curve, capital flows are also adjusted. Virmani (2014) argues that when inflationary tendencies and cross-country differences are high, nominal interest rate differentials can converge rapidly and cause distortions in the expected returns on financial assets. These processes make real interest rates, rather than nominal interest rates, the main dynamic in the return on capital in economies with strong inflation dynamics.

Beyond the macro and micro effects of hysteresis effects, it is observed that it also affects institutional variables such as the perspective and management of economic problems by the economic administration. Akyüz (2012) argues that how capital flows are managed in developing countries also determines the financial crises in developing countries and their permanent effects. In developed countries, shocks have been experienced that the near-zero interest rate policy is not

sustainable for developed countries. Emerging economies are exposed to deep financial crises due to the reversal of this process after intensive capital inflows. For this reason, the fact that continuous supervision has become the optimum solution for capital flight in developing countries proves the existence of hysteresis as a permanent managerial effect of capital flight. Dow et al. (2018) show that the permanent effects of temporary shocks in terms of liquidity emerge as liquidity hysteresis. This process results in the immobilisation of less liquid capital in the domestic market as a result of the transfer of arbitrage capital to foreign markets after a temporary shock in liquidity volume. In order to change this structure, a change in the liquidity regime becomes inevitable. Therefore, temporary liquidity shocks cause a change in the liquidity regime in the economy and manifest themselves as a different form of hysteresis.

The growth dynamics of developing countries are based on more complex and risk-bearing relationships compared to developed countries. On the other hand, it is a common empirical finding that macroeconomic variables in emerging economies involve complex interactions. For example, according to Gu & Huang (2011), developing countries generally tend to allow capital inflows to boost growth. However, when it becomes an intensive and long-term process, financial crises triggered by speculative movements deepen. In other words, in the process of triggering financial crises, the depth of the crisis is determined by the volume of capital flows. The general debate on financial crises due to capital flows is the volume of capital flowing out. However, for an open economy, the destructive effect of capital flight is determined by the value it attributes to the country (capital flight/GDP). Therefore, based on empirical studies, focusing only on the shock period in capital flight crises will lead to neglect of the dynamics that prepare the economy for financial crises. As a result, an empirical strategy that considers capital flow-based macroeconomic variables and the dynamics that can prepare economies for crises and analyses the permanent effects in the form of hysteresis can answer an important gap in the literature.

2. DATA, METHODOLOGY AND EMPIRICAL RESULTS

In this study, the analysis is preferred through two empirical approaches that have become widespread in hysteresis analysis. Smooth transition structural break analysis, which detects permanent effects or hysteresis with structural break, is used. The second approach is to test the resilient structure of capital flight through its determinants to identify the dynamics that cause hysteresis beyond the detection of hysteresis. The Hatemi-J asymmetric causality test is used to analyse the hysteresis in capital flights on the basis of its determinants. Time series include annual observations for the period 1991:2022 (T=32). The data on capital flight used in the analyses are obtained by calculating the World Bank data with the World Bank data within the framework of the World Bank (1985) "Residual" method. Yalta (2009), according to the 'Residual' method, capital flight is defined as the difference between the sources of capital inflows (net increase in external debt and net inflow of foreign investment) and the utilization of capital flows (current account deficit and foreign reserve additions). The equation form of capital flight is shown below.

$$CF_t = \triangle D_t + FI_t - CA_t - \triangle R_t \quad (1)$$

$\triangle D$ is the change in external debt, *FI* is net foreign investment consisting of the sum of foreign direct investment and portfolio capital flows, *CA* is the current account deficit, and *R* is the change in foreign reserves. Banking sector indebtedness ratio, other sectors indebtedness ratio, inflation rate, real effective exchange rate data are obtained from the Central Bank of the Republic of Türkiye CBRT/EVDS database. VIX volatility index data are obtained from FRED-Economic Data database. (CF), which represents capital flows, is defined as the dependent variable. The independent variables whose negative and positive effects on capital flows are analysed are

banking sector indebtedness ratio (DEBTB), other sectors indebtedness ratio including imports, exports and trade credits (DEBTO), CPI-based inflation rate (INF), real effective exchange rate (REER), The Chicago Board Options Exchange Volatility Index (VIX) is an index that measures the degree of fear in the markets, real interest rate (RIR) obtained by adjusting for inflation effects are determined as independent variables in the model.

2.1. Smooth Transition Structural Break Test

Traditional approaches to structural breaks consider the nonlinearity of the series. For this process, which reduces the effectiveness of the empirical method, Leybourne et al. (1998) developed a structural break test that considers the nonlinearity of the series. The effectiveness of the smooth transition break test stems from the fact that it detects breaks in the smooth transition form while detecting structural breaks in nonlinear time series. The smooth transition break test is estimated with the help of a logistic function defined as St instead of hard and sudden breaks modelled with the help of a dummy variable. The logistic smooth transition function is shown below.

$$S_t(\gamma, \tau) = [\,1 + \exp\{-\lambda (t - \tau T)\}]^{-1} \quad (2)$$

Since it tests a nonlinear structure, error terms are obtained using the nonlinear OLS method. The models from which the error terms are obtained have three different structures. Model A considers smooth transition break in level, Model B considers smooth transition break in trend, and Model C considers smooth transition break in both level and trend. The final models that detect smooth-transition structural breaks in the time series are defined below as Model A, Model B for smooth-transition structural break in trend, and Model C for smooth-switching structural break in level and trend.

Model A $$y_t = \alpha_{1+}\alpha_2 S_t(\lambda, \tau) + \nu_t \quad (3)$$

Model B $$y_t = \alpha_{1+}\beta_{1t} + \alpha_2 S_t(\lambda, \tau) + \nu_t \quad (4)$$

Model C $$y_t = \alpha_{1+}\beta_{1t} + \alpha_2 S_t(\lambda, \tau) + \beta_{2t} S_t(\lambda, \tau) + \nu_t \quad (5)$$

The interpretation of the test results is done by hypothesis tests. While the hypothesis H_0: δ=0 accepts the existence of a unit root with a smooth structural break, the alternative hypothesis H_1: $\delta < 0$ is interpreted as stationary with a smooth structural break. The results of the smooth transition structural break test are shown in Table 1.

Table 1: Smooth Transition Structural Break Test Results

Variables	Breaking Point	t Statistics	Critical Value %1	Critical Value %5	Critical Value %10
CF	2005	-0.73	-7.15	-6.05	-5.55
Model A	Smooth transition structural break model at level				
Model B	Smooth transition structural break model at trend				
Model C	Smooth transition Structural break model both of trend and level				

Note**:** Leybourne vd., (1998) critical values. Probability values: %10*, %5**, %1***

In the smooth transition structural break test, Model C, which considers both breaks for level and trend, is used. Since the t statistic calculated for the hypothesis test is smaller than the critical value in absolute value, it indicates the presence of structural break and hysteresis in capital flight.

In sum, the findings obtained from the structural break test in the hysteresis analysis of capital flight indicate the presence of a structural break and hysteresis effect.

2.2. Hatemi-J Asymmetric Causality Test

As an empirical strategy, causality tests analyse the causality relations between dependent and independent variables through lagged effects. Granger (1969) and Toda-Yamamoto (1995) causality tests, which are considered as traditional tests and based on standard VAR models, were developed to test the unidirectional relationship between variables. However, there are cases where positive and negative shocks in the independent variable, called asymmetric relationship between variables, do not have the same effect on the dependent variable. Granger & Yoon (2002) first developed the empirical method to analyse the asymmetric cointegration relationship between variables. Asymmetric causality relationship was developed by Hatemi-J (2012). The studies of Hatemi-J (2012) and Hatemi-J & El-Khatib (2016) were used to define the asymmetric causality method.

Based on the assumption that the time series yt is tested with the m×1 vector in which each observation is integrated to the first degree in the model with constant and trend, based on the time series $Y_t = \alpha + b_t + Y_{t-1} + \varepsilon_t$.

The following form is obtained by solving $Y_t = \alpha + b_t + Y_{t-1} + \varepsilon_t$ series with the recursive method.

$$Y_t = \alpha_t + (t(t+1)/2)b + y_0 + \sum_{i=1}^{t} \varepsilon i$$

If it is necessary to take the difference d times for the series to become stationary, it will be integrated into the d order of the m-dimensional stochastic process as I(d) and solved as y_t~ I(d) if $\Delta^d y_t$~ I(0). Δ represents the difference operator. As a result of this process, negative and positive shocks will be defined in the form below:

$$Y_t = \alpha + b_t + Y_{t-1} + \varepsilon_t = \alpha_t + (t(t+1)/2)b + y_0 + \sum_{i=1}^{t} \varepsilon i^+ + \sum_{i=1}^{t} \varepsilon i^-$$

In the next step, the cumulative forms of positive and negative shocks are defined as follows:

$$Y_t^+ = (\alpha_t + (t(t+1)/2)b + y_0)/2 + \sum_{i=1}^{t} \varepsilon i^+ \text{ and } Y_t^- = (\alpha_t + (t(t+1)/2)b + y_0)/2 + \sum_{i=1}^{t} \varepsilon i^-$$

As a result, estimation can be made with time series when cumulative negative and positive shocks are considered. Since asymmetric causality is structurally modeled according to a cumulative structure, it also allows to measuring the permanent effects of positive and negative shocks on the main variable. Therefore, it can be accepted as an effective test technique for measuring hysteresis effects.

As an example of the process in the asymmetric causality test, an estimation will be made in the form of a p-degree vector, namely VAR(p), based on the assumption that the causality between the negative components is analyzed in the two-dimensional vector. The VAR model form of the vector in which the negative components are estimated will be in the form of: $Y_t^- = (y_{1t}^-, y_{1t}^-)$

and in the form of $Y_t^- = V^- + A_1^- y_{t-1}^- + \ldots + A_p^- y_{t-p}^- + \mu_t^-$.

After the VAR (vector autoregressive) form is obtained, the presence or absence of asymmetric causality is decided by Wald test for the series Y_t^- of H_0 hypothesis that there is no Granger cause. On the other hand, in the asymmetric causality test, since the Toda-Yamamoto χ2 distribution can prevent normal distribution by affecting the asymptotic distribution, the observations are estimated after the normal distribution form is provided by bootstrap simulation. If the Wald statistic is greater than the bootstrap critical values as a result of the estimation, it is

interpreted as the presence of asymmetric causality. The estimated asymmetric causality test results are reported in Table 2.

Table 2: Asymmetric Causality Test Results

H_0:	MWALD Test Statistic	1% Bootstrap Critical Value	5% Bootstrap Critical Value	10% Bootstrap Critical Value	Optimal Lag
DEBTB+ ≠> CF+	0.345	30.453	13.183	9.215	2
DEBTB + ≠> CF-	2.064	31.545	12.735	7.501	2
DEBTB - ≠> CF-	0.318	27.402	11.685	7.864	2
DEBTB - ≠> CF+	2.952	36.985	13.247	9.232	2
DEBTO+ ≠> CF+	0.744	40.508	17.549	11.651	2
DEBTO + ≠> CF-	4.209	19.089	9.536	6.360	2
DEBTO - ≠> CF-	2.975	26.881	13.779	9.446	2
DEBTO - ≠> CF+	4.709	36.619	15.322	10.006	2
INF+ ≠> CF+	0.111	10.893	5.332	3.288	1
INF + ≠> CF-	0.106	11.159	5.680	3.742	1
INF - ≠> CF-	1.219	11.776	5.776	4.103	1
INF - ≠> CF+	0.003	14.681	6.009	4.129	1
REER+ ≠> CF+	20.471**	31.045	15.478	9.227	2
REER + ≠> CF-	4.590	37.965	17.095	10.715	2
REER - ≠> CF-	6.562*	21.612	9.797	6.449	2
REER - ≠> CF+	2.196	28.024	11.835	7.613	2
RIR+ ≠> CF+	2.066	20.118	10.322	6.927	2
RIR + ≠> CF-	0.009	13.899	5.364	3.283	1
RIR - ≠> CF-	0.078	12.366	6.074	3.859	1
RIR - ≠> CF+	0.445	11.742	5.324	3.219	1
VIX+ ≠> CF+	0.275	26.054	13.044	8.841	2
VIX + ≠> CF-	0.385	30.888	12.136	7.603	2
VIX - ≠> CF-	1.657	34.785	11.079	7.374	2
VIX - ≠> CF+	0.593	25.706	12.245	8.459	2

Note: Significance levels are expressed with the notation ***1%, **5%, *10%.

According to the test results, no significant relationship was found between capital flights (CF) and real interest rate (RIR), banking sector indebtedness ratio (DEBTB), other sectors' indebtedness ratio including imports, exports and trade credits (DEBTO), VIX volatility index (VIX), inflation rate (INF). While there is a causality relationship between positive shocks of real effective

exchange rate (REER) and positive shocks of capital flight (CF), there is no causality relationship between negative shocks of real effective exchange rate (REER) and negative shocks of capital flight (CF). These findings indicate the existence of an asymmetric relationship between capital flight (CF) and real effective exchange rate (REER). An increase in the real effective exchange rate (appreciation of the national currency) increases capital flight, whereas a decrease in the real effective exchange rate (depreciation of the national currency) does not lead to a decrease in capital flight. Based on the empirical findings and the volume of capital flight, it is concluded that the real effective exchange rate is effective in capital flight, while the link between capital and macroeconomic variables is broken in capital inflows. In fact, the asymmetric relationship between the real effective exchange rate and capital flight confirms the validity of hysteresis. At the same time, it is concluded that real effective exchange rate shocks are the main dynamic in hysteresis.

Woo (2000) points out that during panic periods, capital flight can intensify and materialise in a very short period of time. While Eichengreen (2004) argues that more liquid financial assets facilitate flows, and Stulz (2009) argues that the removal of restrictions in international markets on the basis of financial liberalisation reduces the costs of capital flights, Crystal (1994) argues that the speed of capital flows may slow down due to information and transaction costs, even if financial liberalisation is the main reason. Therefore, the relationship between the determinants of capital flight and its determinants is far from an effective measurement in empirical terms. In this context, our empirical findings explain an important structure in capital flight models. Compared to real economic variables, capital flight has a high speed of fluctuation and adjustment. Therefore, our asymmetric causality findings point to important practical implications for interest rate arbitrage on the basis of rapidly evolving and adapting financial market frictions.

Yeldan (2005) argues that interest rate arbitrage conditions are determined by real interest rate and exchange rate fluctuations and their interaction, while Brunnermeier et al. (2008) argue that exchange rate volatility-driven interest rate arbitrage (carry trade) is also determined by liquidity management failures. These market developments raise two scenarios for the Turkish economy. They can be interpreted as the result of inefficient interest rate-based liquidity management in response to capital flows or a strongly managed exchange rate that is not sensitive to capital flows. Our empirical findings suggest that both scenarios are valid. Firstly, the absence of a significant relationship between the real interest rate and capital flows confirms the first scenario. On the other hand, the asymmetric structure between the real exchange rate and capital flight (an increase in the real effective exchange rate triggers capital flight, while a decrease in the real effective exchange rate does not reduce capital flight) can define the situation in which the elasticity of the real effective exchange rate to capital flows is restricted. This process indicates that the Central Bank acts more operationally to the depreciation of the national currency than to its appreciation. Because the stability of the national currency constitutes the primary objective. Reinhart (2000) draws attention to the origins of exchange rate controls, while Khan and Haque (1987) draw attention to the processes of decreasing relative returns for investors in emerging market economies with comprehensive controls. He associated such policies with the fear of floating exchange rates. This is because the destructive effects of high foreign currency borrowing and inflationary pressures will be stronger in exchange rate collapses. In conclusion, our empirical findings and the theoretical and empirical literature converge on the same ground that financial market controls and fear of floating exchange rates explain the asymmetric relationship between the real effective exchange rate and capital flight, which implies hysteresis.

3. CONCLUSION

This study analyses the hysteresis effect on capital flight through the case of the Turkish economy. Based on the theoretical and empirical literature, the behaviour of capital flows and the existence of hysteresis form are analysed through banking sector indebtedness ratio, other sectors' indebtedness ratio, inflation, real effective exchange rate, VIX volatility index and real interest rates. Unlike the related literature, the study is differentiated from the related literature by its attempt to determine the existence and dynamics of hysteresis in capital flight through the theoretical determinants of capital flows as well as structural break analysis. Therefore, this study adds to the related literature in two aspects. First, it develops an analysis on the existence and nature of the hysteresis behaviour of capital flight in the Turkish economy. The second is that it determines on the effectiveness of the determinants of capital flight on hysteresis. Based on the empirical findings obtained from the study, firstly, structural break is detected and the existence of hysteresis in capital flight is found to be valid. Based on the asymmetric causality findings, it is determined that the main variable affecting capital flight is the real effective exchange rate. Real effective exchange rate shocks cause hysteresis behaviour in capital flight. The empirical strategy of the study has important connections with the empirical literature. Asymmetric causality detects the presence of hysteresis through non-symmetric relationships from the independent variable to the dependent variable. The asymmetric relationship defined as hysteresis also includes strong and persistent effects on capital flight. According to the asymmetric causality findings, bank indebtedness ratio, other sectors' indebtedness ratio, inflation, VIX volatility index and real interest rate do not have effects on capital flows that would cause hysteresis. However, positive real effective exchange rate shocks have a causality relationship that triggers a positive movement in capital flight, while real effective exchange rate decreases do not lead to the expected decrease in capital flight and exhibit hysteresis behaviour as capital flight becomes permanent. The fact that positive real effective exchange rate shocks cause permanent effects on capital flight provides important information on the nature of capital flight in Türkiye. It strengthens the inference that the real effective exchange rate is in the form of a strongly managed fluctuation in order to stabilise the value of the national currency together with financial management and restrictions on this basis, which are effective on capital flight. Policies affecting capital flight support the existence of a structure in which capital returns are relatively restricted in international markets. On the other hand, the existence of an asymmetric form between capital flight and the real effective exchange rate (permanent effects) reveals the importance of fear of floating on the basis of expectations. In addition to these developments, although macroeconomic variables other than the real effective exchange rate have no effect on capital flight, other variables have effects on the real effective exchange rate. In this context, the relationship between the debt stock and the real effective exchange rate (Akduğan, 2020), the relationship between the VIX index and the exchange rate (Corte et al., 2016), the bidirectional relationship between inflation and exchange rates (Kara & Sarıkaya, 2021), and interest rates significantly affect exchange rates (Aksu & Emsen, 2019).

AUTHOR STATEMENT

Statement of Research and Publication Ethics

This study has been prepared in accordance with scientific research and publication ethics.

Author Contributions

The authors contributed equally to the study.

Conflict of Interest

There is no conflict of interest for the authors or third parties arising from the study.

REFERENCES

Acharya, S., Bengui, J., Dogra, K., & Wee, S. L. (2022). Slow recoveries and unemployment traps: Monetary policy in a time of hysteresis. *The Economic Journal*, *132*(646), 2007-2047. https://doi.org/10.1093/ej/ueac016

Akduğan, U. (2020). Türkiye'de döviz kuru hareketleri ve kamu borcu ilişkisi. *Karadeniz Sosyal Bilimler Dergisi, 12*(22), 75-97. https://doi.org/10.38155/ksbd.665188

Aksu, H., & Emsen, Ö. S. (2019). Enflasyon, Faiz ve Döviz Kuru İlişkileri: Türkiye İçin ARDL Analizleri İle Asimetrik Eş-Bütünleşme Araştırması (2003: 01-2017: 12). *Ataturk University Journal of Economics & Administrative Sciences, 33*(1), 69-90

Akyüz, Y. (2012). The boom in capital flows to developing countries: Will it go bust again? *Ekonomi-tek, 1*(1), 63-96.

Alesina, A., & Tabellini, G. (1989). External debt, capital flight and political risk. *Journal of International Economics, 27*(3-4), 199-220. https://doi.org/10.1016/0022-1996(89)90052-4

Bagnai, A., & Ospina, C. A. M. (2015). Long-and short-run price asymmetries and hysteresis in the Italian gasoline market. *Energy Policy, 78*, 41-50. https://doi.org/10.1016/j.enpol.2014.12.017

Bhattacharya, R. (1999). Capital flight under uncertainty about domestic taxation and trade liberalization. *Journal of Development Economics, 59*(2), 365-387. https://doi.org/10.1016/S0304-3878(99)00017-6

Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes. *NBER Macroeconomics Annual, 23*(1), 313-348. https://doi.org/10.1016/j.jfineco.2025.104075

Caballero, R. J., & Krishnamurthy, A. (2009). Global imbalances and financial fragility. *American Economic Review*, 99(2), 584-588. https://www.aeaweb.org/articles?id=10.1257/aer.99.2.584

Claessens, S., & Ghosh, S. R. (2013). Capital flow volatility and systemic risk in emerging markets: The policy toolkit. In Canito, O. and Ghosh, S (Eds.) Dealing with the challenges of macro

financial linkages in emerging markets. World bank (pp 91-118). http://dx.doi.org/10.1596/978-1-4648-0002-3

Collier, P., Hoeffler, A., & Pattillo, C. (2001). Flight capital as a portfolio choice. The World Bank Economic Review, 15(1), 55-80. https://doi.org/10.1093/wber/15.1.55

Corsetti, G., Pesenti, P., & Roubini, N. (2001). *Fundamental determinants of the Asian crisis: the role of financial fragility and external imbalances. In Regional and global capital flows: Macroeconomic causes and consequences* (pp. 11-41). University of Chicago Press. Chapter pages in book: (p. 11 - 41) http://www.nber.org/chapters/c10730

Crotty, J., & Epstein, G. (1999). A defense of capital controls in light of the Asian financial crisis. *Journal of Economic Issues, 33*(2), 427-433. https://doi.org/10.1080/00213624.1999.11506174

Crystal, J. (1994). The politics of capital flight: exit and exchange rates in Latin America. *Review of International Studies, 20*(2), 131-147. https://doi.org/10.1017/S0260210500117851

Cuddington, J. T. (1986). *Capital flight: Estimates, issues, and explanations. No:* 58. International Finance Section, Department of Economics, Princeton University.

Dailami, M., & Leipziger, D. (1998). Infrastructure project finance and capital flows: A new perspective. *World Development, 26*(7), 1283-1298. https://doi.org/10.1016/S0305-750X(98)00054-0

Dargay, J. M. (2001). The effect of income on car ownership: Evidence of asymmetry. *Transportation Research Part A: Policy and Practice, 35*(9), 807-821. https://doi.org/10.1016/S0965-8564(00)00018-5

Davies, V. A. (2008). Postwar capital flight and inflation. *Journal of Peace Research, 45*(4), 519-537. https://doi.org/10.1177/0022343308091359

Della Corte, P., Ramadorai, T., & Sarno, L. (2016). Volatility risk premia and exchange rate predictability. *Journal of Financial Economics, 120*(1), 21-40. https://doi.org/10.1016/j.jfineco.2016.02.015

Dow, J., Han, J., & Sangiorgi, F. (2018). Why is capital slow moving? Liquidity hysteresis and the dynamics of limited arbitrage. *The Journal of Finance, 73*(1), 229-274.

Edwards, S. (Ed.). (2008). Capital flows and the emerging economies: Theory, evidence, and controversies. University of Chicago Press.

Eichengreen, B. J. (2004). *Capital flows and crises*. The MIT Press Cambridge, Massachusetts London, England.

Epstein, G. A. (Ed.). (2005). Capital flight and capital controls in developing countries.

Fedoseeva, S., & Werner, L. M. (2016). How linear is pricing-to-market? Empirical assessment of hysteresis and asymmetry of PTM. *Empirical Economics, 50*, 1065-1090. https://doi.org/10.1007/s00181-015-0957-4

Forbes, K. J., & Warnock, F. E. (2012a). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of international economics, 88*(2), 235-251. https://doi.org/10.1016/j.jinteco.2012.03.006

Forbes, K. J., & Warnock, F. E. (2012b). Debt-and equity-led capital flow episodes (NBER Working paper No. 18329). https://doi.org/10.3386/w18329

Fratzscher, M. (2009). What explains global exchange rate movements during the financial crisis? *Journal of International Money and Finance, 28*(8), 1390-1407. https://doi.org/10.1016/j.jimonfin.2009.08.008

Fratzscher, M. (2012). Capital flows, push versus pull factors and the global financial crisis. Journal of International Economics, 88(2), 341-356. https://doi.org/10.1016/j.jinteco.2012.05.003

Federal Reserve Economic Data (FRED) (2024). Data. Retrieved on March 30 2024 from https://fred.stlouisfed.org/

Furuoka, F. (2017). A new approach to testing unemployment hysteresis. *Empirical Economics*, *53*(3), 1253-1280. https://doi.org/10.1007/s00181-016-1164-7

Göcke, M. (2002). Various concepts of hysteresis applied in economics. *Journal of Economic Surveys,* 16(2), 167-188. https://doi.org/10.1111/1467-6419.00163

Granger CW, Yoon G (2002) Hidden cointegration. University of California, Economics Working Paper, (2002–02). https://doi.org/10.2139/ssrn.313831

Granger, C.W.J. (1969). Investigating Causal Relations by Econometric Models and Crossspectral Methods. *Econometrica, 37* (3), 424-438. https://doi.org/10.2307/1912791

Gu, X., & Huang, B. (2011). A new approach to capital flows: Theory and evidence. *Economic Modelling, 28*(3), 1050-1057. https://doi.org/10.1016/j.econmod.2010.11.023

Harrigan, J., Mavrotas, G., & Yusop, Z. (2002). On the determinants of capital flight: A new approach. Journal of the Asia Pacific Economy, 7(2), 203-241. https://doi.org/10.1080/13547860220134824

Hatemi-j, A. (2012). Asymmetric causality tests with an application. *Empirical Economics, 43*, 447-456. https://doi.org/10.1007/s00181-011-0484-x

Hatemi-J, A., & El-Khatib, Y. (2016). An extension of the asymmetric causality tests for dealing with deterministic trend components. *Applied Economics, 48*(42), 4033-4041. https://doi.org/10.1080/00036846.2016.1150950

Hein, E. (2006). Interest, debt and capital accumulation—a Kaleckian approach. *International Review of Applied Economics, 20*(3), 337-352. https://doi.org/10.1080/02692170600736128

Igan, D., Kutan, A. M., & Mirzaei, A. (2020). The real effects of capital inflows in emerging markets. *Journal of Banking & Finance, 119,* 105933. https://doi.org/10.1016/j.jbankfin.2020.105933

Ito, H., & Tran, P. (2023). Emerging market economies' challenge: Managing the yield curve in a financially globalized world. *Open Economies Review, 34*(1), 171-194. https://doi.org/10.1007/s11079-021-09661-3

Kant, C. (1996). *Foreign direct investment and capital flight.* Princeton Studies in international finance No:80 March, 1996

Kara A. H., Sarıkaya Ç. (2021). *Enflasyon Dinamiklerindeki Değişim: Döviz Kuru Geçişkenliği Güçleniyor Mu?* (Koç University-TUSIAD Economic Research Forum Working Papers, No. 2121)

Khan, M., & Haque, N. U. (1987). Capital flight from developing countries. *Finance and Development, 24*(1), 2-5.

Kim, Y. (2000). Causes of capital flows in developing countries. *Journal of International Money and Finance, 19*(2), 235-253. https://doi.org/10.1016/S0261-5606(00)00001-2

Kinda, T. (2008). Infrastructure and private capital flows in developing countries. Munich Personal RePEc Archive Paper, 19158.

Koepke, R. (2019). What drives capital flows to emerging markets? A survey of the empirical literature. *Journal of Economic Surveys, 33*(2), 516-540. https://doi.org/10.1111/joes.12273

Korinek, A. (2011). Hot money and serial financial crisis. *IMF Economic Review, 59*(2), 306-339. https://doi.org/10.1057/imfer.2011.10

Krugman, P. R. (1989). Private capital flows to problem debtors. In Sachs jeffry (Ed.), Developing Country Debt and Economic Performance. University of Chicago Press. https://doi.org/10.7208/9780226733180

Lee, C. C., & Chang, C. P. (2008). Unemployment hysteresis in OECD countries: Centurial time series evidence with structural breaks. *Economic Modelling, 2*5(2), 312-325. https://doi.org/10.1016/j.econmod.2007.06.002

Leybourne, S., Newbold, P., & Vougas, D. (1998). Unit roots and smooth transitions. *Journal of Time Series Analysis, 19*(1), 83-97. https://doi.org/10.1111/1467-9892.00078

Loungani, P., Razin, A., & Yuen, C. W. (2001). Capital mobility and the output–inflation tradeoff. *Journal of Development Economics, 64*(1), 255-274. https://doi.org/10.1016/S0304-3878(00)00132-2

Lucas, R. E. (1990). Why doesn't capital flow from rich to poor countries? *The American Economic Review, 80*(2), 92-96. https://www.jstor.org/stable/2006549

McKinnon, R. (1973). *Money and Capital in Economic Development*. Brookings Institution

Ndiaye, A. S. (2009). Capital Flight and its Determinants in the Franc Zone. *African Journal of Economic Policy, 16* (1), 65-104.

Ndikumana, L., & Boyce, J. K. (2003). Public debts and private assets: Explaining capital flight from Sub-Saharan African countries. *World development, 31*(1), 107-130. https://doi.org/10.1016/S0305-750X(02)00181-X

Ndikumana, L., & Boyce, J. K. (2008). New estimates of capital flight from sub-Saharan African countries: Linkages with external borrowing and policy options. (PERI Working Paper No.166). University of Massachusetts, Political Economy Research Institute, http://dx.doi.org/10.7275/1282889

Nelson, J., Krokeme, O., Markjarkson, D., & Timipere, E. T. (2018). Impact of capital flight on exchange rate in Nigeria. *International Journal of Academic Research in Accounting, Finance and Management Sciences,* 8(1), 41-50. http://creativecommons.org/licences/by/4.0/legalcode

Otieno, S., Mose, N., & Thomi, J. (2022). Exchange rate and capital flight: An empirical analysis. *South Asian Journal of Social Studies and Economics, 13*(3), 1-10. https://doi.org/10.9734/SAJSSE/2022/v13i330356

Prasad, E., Rajan, R., & Subramanian, A. (2007). The paradox of capital. *Finance and Development*, *44*(1). International Monetary Fund.

Reinhart, C. M. (2000). The mirage of floating exchange rates. *American Economic Review, 90*(2), 65-70. DOI: 10.1257/aer.90.2.65

Rodrik, D., & Velasco, A. (1999). Short-term capital flows (NBER Working Paper No. 7364). National Bureau of Economic Research.https://doi.org/10.3386/w7364.

Salisu, A. A., & Isah, K. O. (2021). Capital flight-growth nexus in Sub-Saharan Africa: The role of macroeconomic uncertainty. *The Journal of Developing Areas, 55*(1). https://doi.org/10.1353/jda.2021.0013

Salvatore, D. (1998). Capital flows, current account deficits, and financial crisis in emerging market economies. *The International Trade Journal, 12*(1), 5-22. https://doi.org/10.1080/08853909808523895

Sarno, L., & Taylor, M. P. (1999). Hot money, accounting labels and the permanence of capital flows to developing countries: an empirical investigation. *Journal of Development Economics, 59*(2), 337-364. https://doi.org/10.1016/S0304-3878(99)00016-4

Schineller, L. M. (1997). An econometric model of capital flight from developing countries (Board of Governors of the Federal Reserve System Working Paper No.579). https://dx.doi.org/10.2139/ssrn.231754

Shaw, E., (1973). *Financial Deepening in Economic Development*. New York: Oxford University Press.

Stulz, R. M. (2009). *Globalization, corporate finance, and the cost of capital*. In Global Corporate Governance (pp. 106-134). Columbia University Press. https://doi.org/10.7312/chew14854

Summers, L. H. (2000). International financial crisis: causes, prevention, and cures. *American Economic Review, 90*(2), 1-16. https://doi.org/10.1257/aer.90.2.1

Türkiye Cumhuriyet Merkez BAnkası (TCMB), (2024). Data. Retrieved on March 30 2024 from https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of econometrics, 66*(1-2), 225-250. https://doi.org/10.1016/0304-4076(94)01616-8

Vague, R. (2023). *The paradox of debt: A new path to prosperity without crisis*. University of Pennsylvania Press.

Virmani, A. (2014). Macroeconomic management of the Indian economy: Capital flows, interest rates, and inflation 1. In Macroeconomics and Markets in India (pp. 3-28). Routledge. https://doi.org/10.4324/9781315872414

Woo, W. T. (2000). Coping with accelerated capital flows from the globalization of financial markets. ASEAN Economic Bulletin, 193-204. https://www.jstor.org/stable/25773628

World Bank. (1985). Data. Retrieved on March 30 2024 from https://data.worldbank.org/country/turkiye

World Bank. (1985). World Development Report 1985. Washington, DC: World Bank.

Yalta, A. Y. (2009). Capital flight: Conceptual and methodological issues. *Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 27*(1), 73-94.

Yalta, A. Y., & Yalta, A. T. (2023). Capital flight and the real exchange rate: evidence from resource scarce MENA countries. *Middle East Development Journal, 16*(1), 55–73. https://doi.org/10.1080/17938120.2023.2282325

Yeldan, E. (2005). Yükselen Piyasa Ekonomisi. Olarak Türkiye [Turkey as an" Emerging Market Economy"]", http://yeldane.bilkent.edu.tr/Yeldan14_2 Mar05.pdf (Retrieved March 30, 2024).

Yellen J. (2016) Macroeconomic research after the crisis: a speech at the elusive 'great' recovery: causes and implications for future business cycle dynamics. *In: 60th Annual Economic Conference* sponsored by the Federal Reserve Bank of Boston.