BIST, FOREIGN CAPITAL AND EXCHANGE RATE RELATIONS: 1988-2015

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Abstract: In this study, the Borsa Istanbul index, which reflects its reaction to short-term changes in the economy, has been transformed into real (RBIST) with the US dollar. RBIST with Real Exchange Rate (RER) as the short-run variables that either affect RBIST or affected by it, foreign direct investment (FDI) to GDP ratio (FDIY) and the ratio of portfolio investments to GDP (PIY) as both short and long-term indirect capital investments were taken into consideration in this study. This study which is on the relationship between these four variables covers the period from 1988 to 2015 and the data are taken on an annual basis. According to the results of the stationary survey, it was determined that while some of the series were stationary in the level and some of them were stationary in the first difference. According to the causality analysis with stationary series, one-way causal relations from RBIST to FDIY and RER to FDIY were obtained. According to this, it can be said that the real economy policies in Turkey have triggered direct foreign capital attraction and the stock market has attracted direct foreign capital as a leading indicator.

Keywords: Stock exchange, Direct and indirect investments, Real exchange rate, Time series analysis

BIST, YABANCI SERMAYE VE DÖVİZ KURU İLİŞKİLERİ: 1988-2015

Özet: Bu çalışmada ekonominin kısa dönemli değişmelerine tepkilerini yansıtan Borsa İstanbul endeksi ABD doları ile reel (RBIST) olarak dönüştürülmüştür. Çalışmada RBIST ile bunun etkilediği ve/veya etkilendiği değişkenler olarak kısa dönemli değişken olarak Reel Kur (RER) ile uzun süreli sermaye akımlarından, Doğrudan Yabancı Sermaye Yatırımları (FDI)'nın GSYİH'ya oranı (FDIY) ve hem kısa hem de uzun süreli dolaylı sermaye yatırımları olarak Portföy Yatımlarının GSYİH'ya oranı (PIY) alınmıştır. Bu dört değişken arasındaki ilişkilerin inceleme konusu yapıldığı çalışma 1988-2015 arası dönemini kapsamakta ve veriler yıllık bazda alınmıştır. Durağanlık araştırması sonuçlarına göre serilerin bir kısmının seviyede ve bir kısmının da birinci farklarda durağan olduğu tespit edilmiştir. Durağan serilerle yapılan nedensellik analizlerine göre RBIST'ten FDIY'a doğru ve RER'den FDIY'a doğru tek yönlü nedensel ilişkiler yakalanmıştır. Buna göre Türkiye ekonomisi özelinde gerçekçi kur politikalarının doğrudan yabancı sermaye çekimini

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tetiklediği ve borsanın da öncü gösterge olarak yine doğrudan yabancı sermaye çekimine yol açtığı söylenebilir.

Anahtar Kelimeler: Borsa, Doğrudan ve dolaylı yatırımlar, Reel kur, Zaman serisi analizleri

INTRODUCTION

Real economy is the part of the economy that is dirven by actually produced goods and services on which incomes, jobs and consumer spending depend as opposed to the other part of the economy which is concerned with selling and buying on the financial markets. Therefore, it is concerned with labor as a performer of power of production in the narrow sense and use of all production factors beside labor in the broad sense. Full employment, in macroeconomics, is an economic situation in which all available working capacities are being used in the most efficient way possible and so there is not any cyclical or deficient-demand unemployment in the economy. In this regard, full employment is interested in efforts to increase the the prosperity by contributing to the country's output by gaining job opportunities for those who are willing to work in a workplace. In this respect, country's stock exchange market is the most basic barometer of common indicator of production and employment in an economy.

In addition to the fact that the stock market is a barometer of economy, at the same time it is also a leading indicator of political economy in today's world where economy and politics are intertwined. In this case, a large drop in the Russian stock market index RTS after the embargo laid on Russia after the Ukrainian crisis can be given as an example of politics and economic relations. Since the share prices of companies are determined according to the expected profits of the companies, the risks of oil prices are priced separately in the Russian stock market (Özdemir et al., 2016). With a broader expression, it can be said that developments in both internal and external politics, as well as internal and external economies, can be measured by stock exchanges performace and otherwise negative developments also can be perceived from losses in the stock market index. For example, the signals of the US Central Bank to implement strict monetary policy or deepening in the case of cold / hot war in the world, or the elections in the domestic politics and the uncertainties that may be caused by it, or the deficits in the public budget or foreign trade balance may show itself as a downward trend in the stock market in the first place

Considering the microeconomic effects of the companies traded on the stock exchange and the macroeconomic effects of the exchange rates, fluctuations in the currencies affect the stock market and the exchange rates also affect the companies traded on the stock exchange through input and output prices. It is highly probable that the interactions between firms and stock exchange index affect more to listed firms than non-listed firms (Horobet and Ilie, 2007).

In summary, it can be said that the mutual causal relations between the variables since the FDI and portfolio investments are highly likely to affect the stock market as well as FDI and portfolio investments are influenced by the stock exchange. Here, it is inevitable that the developments in capital movements affect the value of national money against foreign currencies. Therefore, in this study, the subject of stock exchange, direct foreign capital investments, portfolio investments and real exchange rate relations was examined in the context of Turkey. In the direction of designated purpose the second part of the study was created by reviewing studies on the stock market, FDI, portfolio investments and real exchange rate relations. The third part of the study was formed and econometric analyzes were conducted according to information related to signs and statistical significance levels of stock exchange, FDI, portfolio investments and real exchange rate ratios.In the fourth part, the policy outcome was derived from the application results.

I. LITERATURE REVIEW

While arguments are developed in favor of and against of classical thought in economics literature, mostly the advantages of overseas expansion are highlighted. Overseas expansion have been seen at the beginning of the 1960s in South East Asian countries (Taiwan, Hong Kong, Singapore and South Korea) or in the Asian Tigers with a well known expression, and have started to become more and more evident in most developing countries in the 1970s and 1980s (Emsen and Değer, 2007). In liberal practice, inadequacy of the closed-autarchy tendency, the fall of the Berlin Wall and the continuation of the Eastern Bloom collapse are taking attention if the 2008 crisis is accepted as an exception. Liberal policymakers also see the success of implementing equity markets as well as commodity markets. Particularly in countries with developmental deficits, "foreign exchange deficits" and "savings deficits", which are described as "twin deficiencies", are the obstacles to development. In this context, it is argued that the elimination of savings-investment-capital deficiency depends only on the availability of outside sources. According to the World Bank, the ability of countries to attract FDI and general foreign capital depends on;

(i) the abolition of restrictions on capital,

(ii) ensuring a strong macroeconomic stability,

(iii) domestic financial reforms,

(iv) liberalization of the capital account,

(v) tax incentives and

(vi) subsidies.

This is also likely to contribute to the development of the stock exchange mechanism that will turn the projects into investment vehicles (Adam and

Tweneboah, 2008). It is also known that the study of the factors related to the FDI withdrawal ability, which is a relatively more robust foreign capital type, is at the same time the factors that trigger the entry of other capital varieties such as portfolio investments and the stock market to that country's economy. Whether through the stock market, FDI, or portfolio investments, one should not overlook the fact that outsourcing of resources to one country activates the process of increasing the value of the national currency of that country (Horobet and Ilie, 2007, Budden et al., 2010). Table 1 summarizes the literature review of empirical studies showing the reflections of movements between variables.

Table 1: Summary of Research on Exchange and Foreign Investments and Real Exchange Rates

Author(s)	**Year, country, methodology**	**Variables**	**Findings**
Paramati, et al. (2016)	1991-2012, 20 rising economies including Turkey, heterogeneous panel causality and long term analysis	FDI, Stock Exchange, Economic output and clean energy consumption	Findings indicate that positive and significant effects of FDI, stock exchange and economic output on clean energy consumption have been reached. In the short term, while causal relations from FDI to energy have been caught, it has been determined that in the long run the stock market and FDI have had an impact on energy consumption.
Malik and Amjad (2013)	1985-2011, Johansen cointegration and short-term causality tests for long term on Pakistan	Annual data from the stock exchange, FDI and GDP	It has been determined that foreign direct investment has a positive effect on the stock market, there is a one-way causality relationship between the stock market and economic growth, and between the stock market and economic growth. In the long term, foreign capital affects the stock market positively.
Claessens et al. (2001)	1975: 1-2000: 11, 77 Descriptive statistics and regression analyzes for high,	The stock market, per capita GDP which is characterized by market	While FDI was determined to be positively related to stock market capitalization trade value, it was determined that the stock market developed due to liberalization.

	middle and low income countries	capitilization, inflation, country risk and FDI	
Poshakwale and Thapa (2007)	2001: 1-2007: 1, short-term causality on the Indian asset market and long-run VAR impact-response and cointegration analyzes	Daily yields and portfolio investments	It has been determined that the Indian asset market moves in concert with the US and UK asset markets.
Pal (1998)	1990: Q1-1997: Q1, 1980-1997 Descriptive statistics on India, Korea, China, Malaysia, Mexico and Brazil	Indian stock market and foreign portfolio investments	It has been observed that the theoretical expectations that the foreign portfolio investment inflows will increase the stock market of the country did not happen, on the contrary, it increased uncertainty.
Phylaktis and Ravazzolo (2005)	1980: 1-1998: 12, short term causality and long term cointegration analyzes on the Pacific Basin countries	Stock market prices and real exchange rates, US stock market and financial crisis	It has been found that the real exchange rates are correlated positively with the stock market, and the US stock market is connected with these ways and the financial crises have transitory effects with long-term mutual movements with these markets.
Horobet and Ilie (2007)	1999: 1-2007: 2, causality and co-integration analysis on Romania	Nominal and real effective exchange rates and Bucharest Stock Exchange indices	It has been determined that there is a long-run equilibrium relationship between the nominal and real effective exchange rates and the stock market index.
Budden et al. (2010)	1996: Q3-2009: Q3, Generalized least squares method on Brazil	The real exchange rate, the Brazilian currency real, the ratio of budget	The higher the price of the real stock market, the more the Brazilian currency Real gets stronger, which also makes the Brazilian economy stronger.

		deficits to GDP, the US production	
Dimitrova (2005)	1990: 1-2004: 8, Vector autoregression (VAR) and structural (SVAR) models on the US	Interest Rate, Exchange Rate, Domestic Expenditures, Exports, Imports and Stock Market	There is a positive relationship between the exchange rates and the stock market; the stock exchange is seen to have a leading variable role; it has been found that the depreciation of a country's national currency triggers the depreciation of the stock market.
Jamil and Ullah (2013)	1998: 1-2009: 2, Cogeneration for long-term relationships and causality tests for short-term relationships on Pakistan	Monthly changes in exchange rates and changes in stock market index value	It has been determined that exchange rate fluctuations have short-term effects on stock market yields and fluctuations in prices.
Adam and Tweneboah (2008)	1994: 9-2006: 12, VAR approach with multivariate cointegration tests on Ghana	Foreign direct investment, monthly exchange rate and market capitilization	In the first difference, the VAR approach shows that there is at least a short-term relationship between the FDI and the development of the stock exchange.
Gazioglu (2001)	1990: 1-1999: 11, VAR analyzes on Turkey	Foreign investments and exchange rates on the stock exchange with daily data	It has been determined that an increase in capital flows will lead to an increase in net international debt and to a decrease in exchange rate and stock market value.
Baker et al. (2004)	Descriptive statistics and panel data analysis on USA for 1984-1999 and UK and OECD countries for 1980-2001	The stock exchange, FDI, market capitilization, and control are variables such as real exchange rate, tax rate and per capita GDP	It has been determined that FDI flows affect the stock market value, and that it triggers a significant capital movement especially in the country where there is a bad pricing, that is, the overvalued stock market leads to FDI outflows.

When the literature examining the relationship between stock exchange and exchange rate, FDI and portfolio investments is evaluated, there are studies in the related literature which deal with one or both of these variables. When the relevant literature is evaluated,

(i) Paramati, et al. (2016), Malik and Amjad (2013) and Claessens et al. (2001) are among the studies dealing with the relationship between stock exchange and FDI,

(ii) Poshakwale and Thapa (2007) and Pal (1998) are among the studies examining the relationship between stock market and portfolio investments,

(iii) Phylaktis and Ravazzolo (2005), Horobet and Ilie (2007), Budden et al. (2010), Dimitrova (2005), Jamil and Ullah (2013), Adam and Tweneboah (2008) and Gazioglu (2001) are the studies analyzing the relationship between stock exchange and exchange rates,

(iv) Baker et al. (2004) is among the studies taking into consideration the stock exchange, FDI and exchange rate.

In the above studies, it is generally found that there is a relationship between the stock exchange and FDI, portfolio and exchange rate, while the relations generally show positive relations in the countries with strong structures, whereas it has more speculative effects in the underdeveloped countries which are not socio-economically strong structures.

II. METHODOLOGY

In analyzes that are thought to be made specifically for the Turkish economy the period data from 1988 to 2015 were used. In this context, RER and FDIY and PIY variables are taken as variables that are influenced and / or influenced by RBIST. The variables were compiled from CBRT and Istanbul Stock Exchange. Here, the usage patterns and possible expected signs of the variables involved in analyzes should be taken into account like this.

Budden et al. (2010), made the stock market value reel in their study. According to this, the nominal stock market index values are divided by consumer price index (CPI). In this study, the stock market index is revalued by being divided by the nominal US dollar price in TL and is called RBIST. In Pal (1998) 's study, it has been found that the expectations that foreign portfolio investments will play an increasing role in the stock market index are found in the underdeveloped economies. On the other hand, Malik and Amjad (2013) determined that foreign direct investment has positive effects on the stock exchange. Baker et al. (2004) argue that if FDI is overvalued by the stock market of the source country and the capital is cheaper then it moves to countries where the stock market is low and the capital is

expensive. TThe reactions of macroeconomic variables to stock market shocks are summarized in the following graph (Dimitrova, 2005).

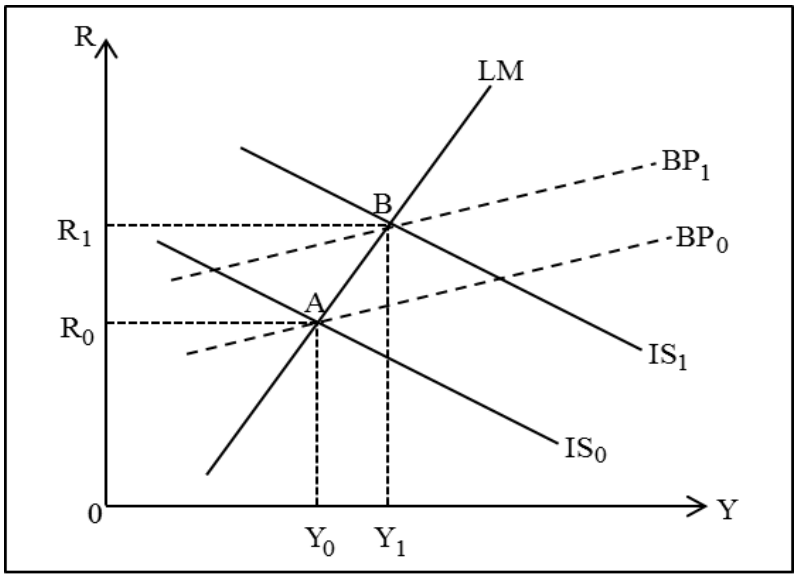

Figure 1: Reactions to Stock Market Shocks

According to the above chart, the entry of foreigners into the stock market will trigger the IS curve from IS0 to IS1. In this case, the BP curve will also trigger BP1 to BP1. Initially, the internal and external balance at point B will emerge from the internal and external balance at the point of economy. At the new equilibrium point, while the national income rises from Y0 to Y1, the exchange rate quoted with indirect quotation, (equivalent of 1 unit of national currency to amount of foreign currency) R0 will shift to R1 that is national currency will be gainen in value. Therefore, with the arrival of foreign investors, the rise in the stock market of the country will make improvements in the general economy of that country.

It is possible to express both graphical analysis and models which are used in econometric estimation according to literature expectations as follows:

$$RBIST = f(FDIY) \quad \textbf{\textit{(1)}}$$

$$RBIST = f(PIY) \quad \textbf{\textit{(2)}}$$

$$RBIST = f(RER) \quad \textbf{\textit{(3)}}$$

III. FINDINGS

It is necessary to investigate whether the series are stationary since the series are used in analyzes might give fake/false estimates if they have unit root (Gujarati, 1995). Table 2 summarizes the results of the stationarity survey for the series.

Table 2: ADF Unit Root Test

Variables	Stable	Critical Values		Trendy and Stable	Kritik Değerler	
		%1	%5		%1	%5
FDIY	-2.037628	-3.699871	-2.976263	-3.781911	-4.33933.	-3.587527
PIY	-3.003026	-3.699871	-2.976263	-2.943611	-4.339330	-3.587527
RER	-1.600192	-3.699871	-2.976263	-2.026441	-4.339330	-3.229230
RBIST	-2.613476	-3.699871	-2.976263	-3.781911	-4.339330	-3.587527
ΔFDIY	-7.149490	-3.711457	-2.981038	-6.994061	-4.356068	-3.595026
ΔPIY	-5.154530	-3.711457	-2.981038	-5.020483	-4.356068	-3.595026
ΔRER	-6.987616	-3.711457	-2.629906	-7.012765	-4.356068	-3.233456
ΔRBIST	-7.149490	-3.711457	-2.981038	-6.994061	-4.356068	-3.595026

According to stationary tests on the series to be used in the analyzes in the study, the PIY variable stays fixed at the level value and the FDIY variable stays stable at 5% at the level value. In the two other series stability could not be found. Accordingly, all the series become stable both in fixed and trendy form when the first differences are taken. Therefore, in analyzes to be performed, all the series will be analyzed by taking the first differences (Δ).

After the unit root tests, it is necessary to determine the delay length for the models to be used in analyzes. In table 3, statistical tests on the delay lengths are given.

Table 3: Determination of Lag Delay

First LAG						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-298.2109	NA*	1017568*	25.18424*	25.38058*	25.23633*
1	-285.9805	19.36483	1427772	25.49837	26.48008	25.75882
2	-269.8996	20.10107	1613564	25.49163	27.25872	25.96044
3	-250.4609	17.81883	1745102	25.20507	27.75752	25.88224
Fourth LAG						
0	-286.7765	NA*	1125373*	25.28491	25.48239*	25.33458
1	-275.0588	18.34082	1679449	25.65728	26.64467	25.90561
2	-259.0132	19.53368	1939802	25.65333	27.43062	26.10031
3	-240.8090	15.82974	245133	25.46166	28.02886	26.10730
4	-211.0093	15.54770	2159968	24.26168*	27.61879	25.10598*

In the tests made in terms of the delay lengths, 1 and 4 delay lengths are valid and therefore 1 and 4 delay lengths will be used in the analyzes and estimations to be made.

As the annual series are planned to be analyzed in the study, that is, since the series are medium termed they will be subjected to causality tests including short-term. Regarding the variables used here, the correlation coefficients are primarily given for the series reaching the stationary position below.

Table 4: Correlation Coefficients

	RBIST	FDIY	ΔRER	ΔPIY
RBIST	***1.00000***			
FDIY	-0.56455	***1.00000***		

ΔRER	0.19798	-0.09182	***1.00000***	
ΔPIY	-0.250504	0.28389	-0.26836	***1.00000***

When the correlation coefficients are evaluated, only ΔRER is positive and weakly effective on RBIST, while FDIY and ΔPIY are negatively affected, and FDIY is moderate and ΔPIY is weak. Accordingly, it is observed that BIST, FDIY and ΔPIY are almost in a rival position, and thus function as substitutes for investment tool. However, it can be said that in the developed economies, the complementary principle is working rather than the competition principle between the stock exchange and direct and indirect foreign capital. On the other hand, as the national currency is gained in value, the stock market seems to be positively related to this, signaling that exchange rates and stock market relations are open to speculative attacks.

After the above correlations, the following Tables are explored the mutual causality relationships for the equations (1), (2) and (3) among the variables considered. According to the results in Table 3, causality tests were performed in terms of 1 and 4 delay lengths and 1 and 4 delay lengths in accordance with the signal to perform causality tests.

Table 5: Causality Tests

	1 Delay (27 Observations)		**4 Delays (24 Observations)**	
H0 hypothesis	F-Statistic	Probability	F-Statistic	Probability
RBIST does not Granger Cause FDIY	0.68314	0.4166	2.31379	0.1001
FDIY does not Granger Cause RBIST	1.70624	0.2039	0.35602	0.8359
ΔRER does not Granger Cause FDIY	3.60114	0.0704	2.54533	0.0861
FDIY does not Granger Cause ΔRER	0.09921	0.7556	0.64302	0.6407
ΔPIY does not Granger Cause FDIY	1.33321	0.2601	1.22400	0.3448
FDIY does not Granger Cause ΔPIY	0.03309	0.8572	0.13426	0.9671

ΔRER does not Granger Cause RBIST	0.00848	0.9274	0.30663	0.8687
RBIST does not Granger Cause ΔRER	0.00467	0.9461	1.62662	0.2227
ΔPIY does not Granger Cause RBIST	2.72339	0.1125	0.49026	0.7430
RBIST does not Granger Cause ΔPIY	1.20997	0.2827	1.68884	0.2083
ΔPIY does not Granger Cause ΔRER	0.54073	0.4696	0.89788	0.4912
ΔRER does not Granger Cause ΔPIY	0.43392	0.5166	1.58395	0.2331

Causality test results provide results that will give clues to the results of the correlation. That is, the causality relations between the variables considered were significant only between ΔRER and FDIY and between RBIST and FDIY but statistically at 10% significance level. In the relationship between ΔRER and FDIY both 1 and 4 delays are found so it can be said that ΔRER is accepted as the reason for FDIY; RBIST has been accepted as the reason for FDIY in the relaitonship that only 4 delay can be founded. The causality relationships between the statistically significant variables in Table 5 above are summarized in Figure 2.

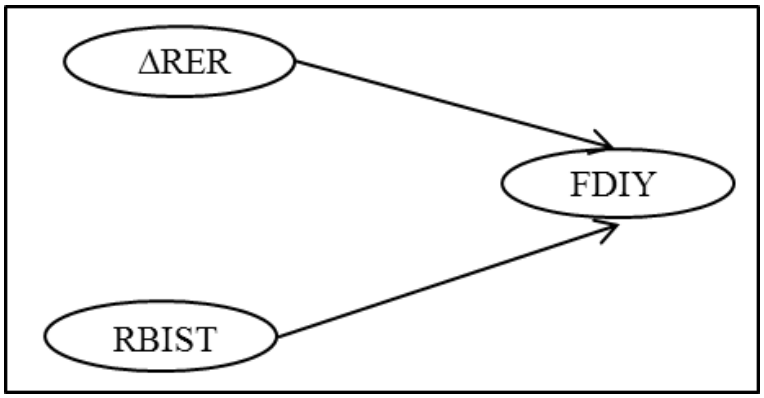

Figure 2: The Direction of Causal Relations

CONCLUSIONS

It is expected to exhibit some kind of complementarity relations rather than competitive realtion between the stock market which is in the position of development indicator and thus creates the perception that it is the barometer of the economies, and real exchange rate, foreign direct investment and portfolio investment. In this study, these relationships which are expressed as a theoretical expectation peculiar to developed countries are reviewed on the Turkish economy basis with time series analyzes.

After determining that some of the series are stable in the unit root tests and some of them are stationary in the first differences, the series are subjected to causality relations. According to the results of the tests of causality, the one-way causality relation from the real exchange rates and the real stock market value to direct foreign capital investments could be obtained for the Turkish economy. When the causality relations are evaluated in the correlation with the correlation coefficients, it seems that the real exchange rate is triggering foreign capital inflows.

When a general assessment is made in terms of the Turkish economy, since direct foreign capital investments are affected by real exchange rates and stock exchange; it can be said that it is a signal that speculative phenomena work in terms of exchange rate in the Turkish economy. On the other hand, in terms of direct foreign capital investments, it can be mentioned that competitive elements are working in relation to the stock exchange. It can be said that the further strengthening of the Turkish economy will come from the speculative nature of the exchange, especially with the decrease in the current account deficit-foreign dependence that feeds on the exchange rate movements, and therefore it will be a nurturing factor for the stock market or it will be an indicator like the stock market. On the other hand, it is highly probable that the competitiveness of the exchange between the stock market and foreign direct investment will also increase the ability to attract foreign direct investment with a strong economy, which in turn will have an effect on deepening the stock market.

This study can provide more powerful forecasting opportunities by making 3-monthly series for the same period, because the annual GDP data are published in 3-month periods. Thus, it can be said that the model can be increased by using both real sector and monetary sector variables such as export, import and real interest rates per capita GDP values which allow stronger estimation and more accurate policy extraction.

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