THE NONLINEAR CAUSALITY BETWEEN THE INTERNATIONAL CAPITAL FLOWS AND ECONOMIC GROWTH IN TURKEY

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ABSTRACT

The orthodox economic view regarding the relationship between the free international capital flows and economic growth is clear. Capital flows positively affect growth all around the world. That is, a causal relationship from capital flows to growth is assumed. However, recent empirical findings call the orthodox thinking into question since some authors reported no relationship between the international capital flows and growth and some other authors found causal relationship from growth to capital inflows. Finally, some truly shocking results such as negative relationship between capital inflows and growth are also reported. However, it is shown that a nonlinear relationship structure such as the regime-switching framework might allow for both negative- and positive-impact regimes of capital inflows on growth. Therefore, this paper had three aims. First aim was to find whether there exists any causal relationship between the capital flows and growth. Second aim was to investigate the direction possible causal relationship(s). Third aim was to check for possible nonlinearities in the possible causal relationship(s). We conducted a new nonparametric causality test which has the ability to capture nonlinear causalities on Turkish data. In conclusion, we reported that capital inflows Granger cause growth both linearly and nonlinearly. The causality relationship is unidirectional, i.e. runs only from capital inflows to growth but not the other way round. Hence, capital inflows and growth are not endogenous variables and growth is not a pull factor for international capital.

Keywords: Granger Causality, Diks-Panchenko Test, Pull Factors for Capital Flows, Endogeneity, Economic Growth

JEL Code: E2, E22.

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TÜRKİYE'DE ULUSLARARASI SERMAYE HAREKETLERİ VE EKONOMİK BÜYÜME ARASINDAKİ DOĞRUSAL OLMAYAN NEDENSELLİK İLİŞKİSİ

ÖZ

Serbest uluslararası sermaye hareketleri ile büyüme arasındaki ilişki hakkındaki yerleşik iktisadi görüş açıktır: Sermaye hareketleri dünyanın her yerinde büyümeyi olumlu etkiler. Yani sermaye hareketlerinden büyümeye doğru bir nedensellik ilişkisi varsayılır. Ancak bazı yazarlar uluslararası sermaye akımları ile büyüme arasında hiçbir ilişki raporlamadığı, başka bazı yazarlar ise büyümeden sermaye akımlarına doğru bir nedensellik saptadığı için yakın zamandaki ampirik bulgular bu yerleşik düşünüşü sorgulamaya açmaktadır. Nihayet, sermaye girişleri ile büyüme arasında olumsuz ilişki gibi bazı gerçekten şok edici sonuçlar da raporlanmıştır. Yine de rejim değişikliği gibi doğrusal olmayan bir yapının, sermaye girişlerinin büyüme üzerindeki etkisinin negatif ve pozitif olduğu farklı rejimlere izin verebileceği gösterilmiştir. Bu nedenle çalışmanın üç amacı vardır. İlk hedef, sermaye akımları ile büyüme arasında herhangi bir nedensellik ilişkisinin olup olmadığının bulunması. İkinci hedef, muhtemel nedensellik ilişkisinin(ya da ilişkilerinin) yönünün araştırılması. Üçüncü hedef, muhtemel nedensellik ilişkisinde (ya da ilişkilerinde) potansiyel doğrusal olmama durumlarının kontrol edilmesi. Türkiye verisi üzerinde doğrusal olmayan nedensellik ilişkilerini yakalama yeteneğine sahip yeni bir parametrik olmayan test uyguladık. Sonuç olarak, sermaye hareketlerinin büyümenin hem doğrusal hem de doğrusal olmayan Granger nedeni olduğunu raporladık. Bu nedensellik ilişkisi tek taraflıdır, yani sermaye girişlerinden büyümeye doğrudur ama tersi yönde gerçekleşmemektedir. Bu nedenle, Türkiye'de sermaye akımları ile büyüme içsel değişkenler değildir ve büyüme uluslararası sermaye için bir çekim faktörü değildir.

Anahtar Kelimeler: Granger Nedenselliği, Diks-Panchenko Testi, Sermaye Akımlarını Çeken Faktörler, İçsellik, Ekonomik Büyüme

JEL Kodu: E2, E22.

INTRODUCTION

The relationship between the unimpeded international capital flows and economic growth rates is complicated. According to the orthodox economic view, freely moving international capital should have positive impact on the economic growth all around the world for two main reasons. First, capital inflows could provide the external funding for the countries suffering from financing shortages at home. Second, capital outflows should allow for higher returns and better risk diversification for the investors at the countries that send capital abroad.[1] This orthodox way of thinking about the international capital – growth nexus clearly assumes a causal relationship between two variables running from capital flows to growth. That is, growth around the world is positively affected by the international capital flows but not the other way round.

[1] International capital flows might have beneficial effects for fostering economic growth and reducing global imbalances through other channels than those stated above such as imposing macroeconomic discipline and creating deeper financial markets in the emerging economies etc. See Köse et al. (2006) for more detailed discussion.

However, the orthodox view can be criticized at two levels. First, the causality can indeed run in the opposite direction as well from growth to capital flows. In a recent paper, Ghosh et al. (2012) investigated the external factors that push capital to the emerging countries and the internal factors that pull capital to them. According to the authors, growth rates of emerging economies are among the significant pull factors. To be precise, they estimated that a one percentage point increase in an emerging economy's real GDP growth rate, or a one percent of GDP increase in its external financing needs, raised the predicted likelihood of a capital surge by about one and three percentage points, respectively. In fact, the causal relationship does not even have to be a unidirectional (one-way) relationship. Growth and capital flows can be endogenous variables affecting each other in a circular fashion. For example, as Ghosh et al. (2011) argue the surges in capital inflows to a country might boost its growth and the country's growth accelerates, there might be need for even more capital inflows etc.

Second, the supposedly positive relationship assumed by the orthodox view between the free international capital flows and economic growth is called into question by a large number of empirical studies lately. Among them, Köse et al. (2006) reported that capital inflows to the developing countries did not have statistically significant impact on the economic growth rates of these countries, while they argued for the other benefits capital flows might provide for the developing countries such as macroeconomic discipline and deeper financial markets.

Inspired by the findings of Ghosh et al. and Köse et al., we first attempt to find whether there exists any causal relationship between the international capital inflows to Turkey and Turkey's economic growth. If there exists any causality, we then investigate to find which way the relationship is.

One year after the paper of Köse et al., Prasad et al. (2007) reported a more interesting empirical result that a statistically significant negative relationship between the capital inflows and growth existed. Prasad et al. also argued that positive relationship existed between the growth rates and capital outflows. This finding of Prasad et al. attracted considerable attention in the literature since it was contrary to the general belief behind the financial liberalization movement that occurred in a great number of developing countries.[2] As well known, since the early 1980s, many developing countries lifted their controls on cross-border capital transactions aiming to embark on higher rates of growth by attracting more international capital. Of course many follow-up papers tried to explain the finding of Prasad et al. In a recent article Mody and Murshid (2011) attempted to explain the capital inflows and growth relationship with a regime-switching model. Using a dataset for 61 countries over the 1980-2003 period, they tested the existence of different relationships between the capital and growth in the high- and low-volatility regimes. As a result of their analysis, they found that the capital inflows contributed – as expected – positively to the economic growth during the periods of low-volatility. During the periods of high volatility, they reaffirmed the negative relationship found in many empirical datasets. Then, such a nonlinear framework could be useful to partially explain the recent controversial findings in the literature. Hence, thirdly we attempt to find whether the capital inflows and growth relationship can be explained only linearly or we can detect any nonlinearities in the causality, too.

[2] See Gourinchas and Jeanne (2007), Alfaro et al. (2008), Devereux and Sutherland (2009), Sandri (2010), Aizenman (2011) for the recent studies trying to explain the findings of Prasad et al.

In sum, this paper has three aims. First aim is to look for the existence of causal relationship between the capital inflows and growth. Second aim is to check for the direction of potential causalities. Final aim is to check whether the potential causal relationships have only linear characteristics or some nonlinearities as well since, as Mody and Murshid's paper presented clearly, the relationship between capital inflows and growth could have a nonlinear structure. For these reasons, we employ a nonparametric Granger causality test which is able to capture nonlinearities.

In the study, we use the Turkish dataset. The reason to work with Turkish data is Turkey's being a small open economy which liberalized its capital account in late 1989. In this regard, the country is representative for many emerging economies since quite a large number of emerging economies lifted their capital controls since the beginning of 1990s. Furthermore, in the aftermath of the liberalization, domestic savings (total of private and public savings) over GDP ratio in Turkey decreased radically (World Bank, 2012, 3). Besides, tax collections over GDP ratio is relatively low in Turkey as well (www.ntvmsnbc.com/id/25307225, 12.03.2013). As a result, for Turkey the relationship between the external funding opportunities (international capital inflows) and growth is highly important. As a growing economy where the capital inflows are expectedly playing an important role, we believe Turkey makes an interesting case to study the potential causal relationships between growth and international capital.

The rest of the paper is organized in the following way. In section two, Granger causality concept is discussed. In section three, dataset is described. In section four, results for the linear and nonlinear causality tests are reported. Section five concludes.

1. GRANGER CAUSALITY

Since it was first proposed by Clive Granger in 1969, Granger causality has been the workhorse econometric approach to characterize the dependence relationships between economic time series. The general idea behind Granger causality is simple. X and Y being two time series, X Granger causes Y if past values of X can help to predict the future value of Y beyond what could have been done with the past value of Y only. Granger causality was originally defined by Clive Granger in 1969 as follows. X causes Y, if $\mathbb{P}[Y(t+1) \in A \mid I^{*}(t)] \neq \mathbb{P}[Y(t+1) \in A \mid I^{*}_{-x}(t)$ for some measurable set $A \subseteq \mathbb{R}$ and all equally spaced time stamps $t \in \mathbb{Z}$, where $I^{*}(t)$ is the set of all information up to time t while $I^{*}_{-x}(t)$ is the set of all information excluding X up to time (Liu and Bahadori, 2). Of course, there is a big shortcoming of this methodology: since it puts emphasis on the prediction power, time sequence of variables determines the causality relationship which might result in awkward conclusions in some cases. To make this point clearer, let us stretch the Granger causality idea a little bit with the following example. Every year, before the Christmas, the total amount of money spent on gifts increases because people purchase gifts for their friends and family. According to the prediction-based approach of Granger causality, one has to conclude that every year Christmas arrives because people spend too much money on gifts although the real direction of causality is just the opposite. Nevertheless, Diks and Panchenko (2006) argue that Granger causality has been shown to be useful in establishing economic and econometric relationships through many cases.

Granger obviously did not impose any assumption on the data generating process in his own definition which is presented above. However, modeling time series data is a complex task. Hence, an understandable tendency to use linear specifications exists since linear modeling is simple yet powerful approach. Liu and Bahadori (2012) argue that, as a result of this simplicity and power, linear regression based tests became the dominating methods in identifying Granger causality. The linearity of the standard tests mean these test put emphasis on the conditional mean predictions.[3] That is why, although they have high power in identifying linear causal relations (Hiemstra and Jones, 1994), their power against nonlinear causal relations can be low (since nonlinear relations might have been caused by relations in higher order moments than mean).

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Hiemstra and Jones (1994) proposed a nonparametric test for general (linear or non-linear) Granger causality investigations. Their test subsequently became popular in the literature. However, the Hiemstra and Jones (HJ) test has recently been questioned by Diks and Panchenko (2006). Diks and Panchenko proposed a new test and argued that their causality test (the DP test) reduced the risk of overrejection of the null hypothesis of noncausality, observed in the HJ test (http://davegiles.blogspot.com/2012/07/beware-of-tests-for-nonlinear-granger.html, 12.03.2013) Additionally, the DP test is a nonparametric test, too. Therefore, it does not impose any assumption on the data generating process in accordance with the spirit of Clive Granger's original definition. For a summary of the DP test, let X and Y be two time series and suppose that our aim is to test the null hypothesis X does not Granger cause Y. In a nonparametric setting, this is equivalent to testing for the conditional independence of Y on the past values of X. Under the null hypothesis is conditionally independent on , given . However, since using infinitely many past observations in testing is impossible in practice, a model restriction such as imposing finite lags is necessary. Assuming and are lags for the past values of X and Y that are to be considered in the test, our null hypothesis becomes the following.

$$h_0: Y_t \mid (X_{t-1}, \ldots, X_{t-l_x}; Y_{t-1}, \ldots, Y_{t-l_y}) \sim Yt \mid (Y_{t-1}, \ldots, Y_{t-l_y}) \quad (1)$$

where "~" represents equivalence of distributions. Diks and Panchenko further argues that if we denote $(X_{t-1}, \ldots, X_{t-l_x}; Y_{t-1}, \ldots, Y_{t-l_y})$ by $(X^{l_x}_{t-1}, \ldots, Y^{l_y}_{t-1})$ and if X and Y produces a bivariate stationary time series process, this null hypothesis becomes a statement about the invariant distribution of a vector $W_t = (X^{l_x}_{t-1}, Y^{l_y}_{t-1}, Z_t)$ where $Z_t = Y_t$. In order to understand what that means, assume $l_x = l_y = 1$ and for ease of notation drop the time index. Then, the null hypothesis is which says the conditional distribution of Z given $(X, Y) = (x, y)$ is the same as that of Z given only $(Y) = (y)$. Under the null, the joint probability function $f_{X, Y, Z}(x, y, z)$ and its marginals must satisfy $\frac{f_{X,Y,Z}(x,y,z)}{f_Y(y)} = \frac{f_{X,Y}(x,y)}{f_Y(y)} \frac{f_{X,Z}(x,z)}{f_Y(y)}$ for each vector (x,y,z) in the support of (X,Y,Z).

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[3] Most commonly, linear regression refers to a model in which the conditional mean of y given the value of X is an affine function of X. That is, the linear regression model in most cases assumes that the mean of Y is a straight line function of X, plus an error term.

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This null hypothesis satisfies $E\left[\frac{f_{X,Y,Z}(x,y,z)}{f_Y(y)} - \frac{f_{X,Y}(x,y)}{f_Y(y)}\frac{f_{Y,Z}(y,z)}{f_Y(y)}\right] = 0$. Therefore, the following holds under the null hypothesis. $q = E\left[\frac{f_{X,Y,Z}(x,y,z)}{f_Y(y)} - \frac{f_{X,Y}(x,y)}{f_Y(y)}\frac{f_{Y,Z}(y,z)}{f_Y(y)}\right] g(x,y,z) = 0$ where g(.) is a positive weight function. In their paper, Diks and Panchenko (2004) consider alternative weight functions and based on power and asymptotical performance results, they select $g(x, y, z) = f_Y^2(y)$. Hence, q becomes $\widetilde{q} = E[f_{X,\,Y,\,Z}(x,\,y,\,z)f_Y(y) - f_{X,\,Y}(x,\,y)\,f_{Y,\,Z}(y,\,z)]$ This simplifies to the following notation $T_n(\epsilon_n) = \frac{n-1}{n(n-2)}\sum i\left(\hat{f}_{X,Y,Z}(X_i,Y_i,Z_i)\hat{f}_Y(Y_i) - \left(\hat{f}_{X,Y}(X_i,Y_i)\left(\hat{f}_{Y,Z}(Y_i,Z_i)\right)\right)\right.$ if $\hat{f}_W(W_i)$ is a local density estimator of random vector W at W_i defined as $\hat{f}_W(W_i) = [((2\epsilon_n)^{-d_w})/(n-1)]\sum_{i,j\neq i} I_{ij}^W$ where $I_{ij}^W = I(\| W_i - W_j \| < \epsilon_n)$ while $I(.)$ is an indicator function and ϵ_n is the bandwidth. Note that W is the $(I_x + I_y + 1)$ -dimensional vector $W_{it} = (X_{t-1}^{l_x}, Y_{t-1}^{l_y}, Z_t)$ as described previously. For a sequence of bandwidths $\epsilon_n = Cn^{-\beta}$ with $C > 0$ and $\beta \in \left(\frac{1}{4}, \frac{1}{3}\right), Tn(\epsilon_n)$ implies the following test statistic (Hernandez and Toreo, 2010, 21).

$$\sqrt{n}\frac{T_n(\epsilon_n - q}{S_n} \xrightarrow{D} \quad N(0,1) \tag{2}$$

where S_n is the asymptotic variance of $T_n(\epsilon_n)$.

2. DATASET DESCRIPTION

In this paper, capital inflows refer to the year-over-year (YoY) quarterly changes in the total capital inflows/GDP ratio in Turkey. Total capital inflows are measured to be the sum of foreign direct investments (FDI), portfolio investments, other investments and net errors and omissions. Economic growth refers to the YoY quarterly growth of the GDP in Turkey. FDI, portfolio and other investments, and net errors and omissions data come from the Central Bank of Republic of Turkey's statistical database. GDP data comes from the Turkish Statistical Institute database. The time span of observations is 1992:Q1 – 2012:Q2. The graphical representations of the two series are as follows.

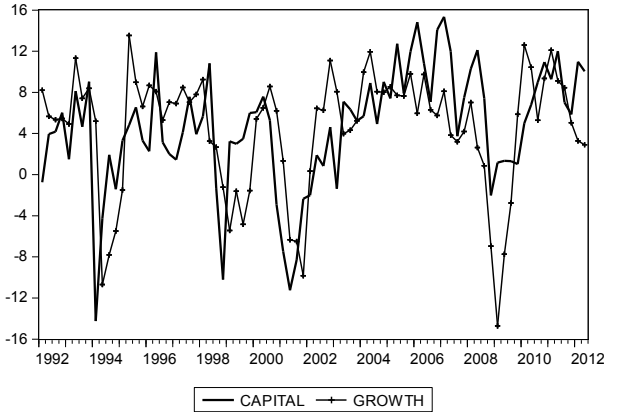

Figure: 1: Capital Inflows / GDP and GDP Growth (both series show YoY quarterly % changes)

Descriptive statistics of the two variables in this study are presented in table 1. The means, standard deviations, and the values for the maximum and minimum observations, medians, skewness and kurtosis values of the two variables are strikingly similar.

Table 1
Descriptive Statistics of Capital Inflows / GDP and GDP Growth

	Capital Inflows	Growth
Mean	4,59	4,36
Median	5,12	5,90
Maximum	15,34	13,54
Minimum	-14,24	-14,74
Std. Deviation	5,81	5,92
Skewness	-0,83	-1,18
Kurtosis	4,04	3,84
Coeff. of Variation	1,27	1,36
5% Percentage	-8,17	-7,80
95% Percentage	12,64	11,85

The graphical representation (figure 1) and descriptive statistics (table 1) show how similar both time series are.

For further visual inspection, sketches of the empirical probability density and cumulative distribution functions of the two series are presented in figure 2 below. Figure 2 is useful for eyeballing the distributional resemblance of the series. To see the correlations, scatter diagram of the two series along with the histograms of their relative frequencies are also presented below in figure 3.

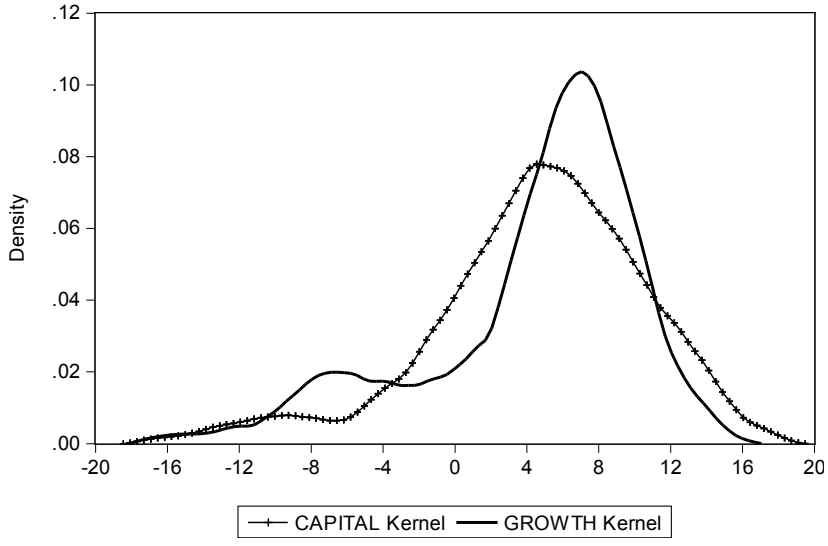

Figure 2
Empirical Probability Density Functions of Capital Inflows / GDP and GDP Growth

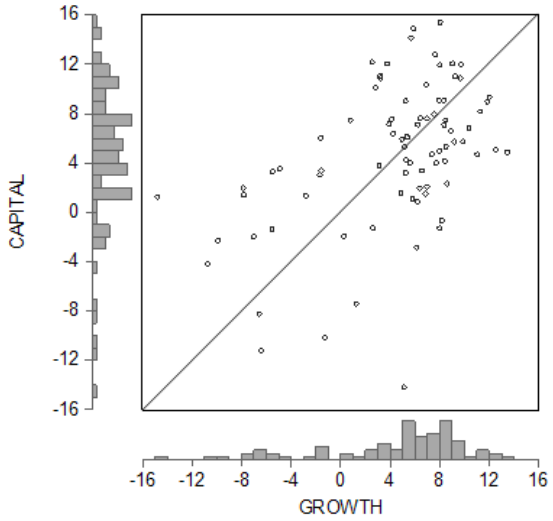

Figure 3:
The Scatter Diagram and Relative Frequency Histograms of Capital Inflows and Growth

These descriptive and visual evidences indicate the noteworthy resemblance of the two time series in this study. Moreover, Söylemez and Yılmaz (2013) already reported a casual link between the same variables in a recent study. They found that capital inflows linearly cause growth in Turkey but not the other way round. However, in light of the statistical and distributional similarities noted above in high moments such as variances, skewness and kurtosis vaşues; one might suspect that the only possible causality relationship in the Turkish dataset need not be linear. Therefore, we next search for possible nonlinear causalities in the Turkish dataset.

3. RESULTS OF THE CAUSALITY TESTS AND THE SIGN OF RELATIONSHIP BETWEEN THE VARIABLES

In a recent paper, Söylemez and Yılmaz (2013) investigated the linear dynamic interdependencies between capital flows and growth in Turkey with the same dataset as in this study which covers the post-financial liberalization period in Turkey. The following linear causality test results are taken directly from their study. Those results indicate that there exists causality relationship between capital flows and growth in Turkey running from capital flows to growth. However, this relationship is unidirectional since reverse causality from growth to capital flows could not be detected.

Table2*:
Linear Granger Causality Test Results for Capital Flows and Growth

Explained Variable	Excluded Variable	Test statistic	P-value
Growth	Capital Inflows	16.59	0.0002
Capital Inflows	Growth	1.42	0.4920

* Augmented Dickey Fuller test results indicate that growth series has unit root. Therefore, Söylemez and Yılmaz (2013) adopted the Toda-Yamamoto correction procedure in their linear causality test. Test-statistics are chi-square distributed with two degrees of freedom. The null hypothesis is that the "excluded variable" should be excluded from the model that predicts the "explained variable." Hence, a large p-value indicates Granger causality.

As aforesaid, from an econometric point of view, these results indicate that as capital inflows rise, growth rates rise linearly in return. However, as growth rates increase, capital inflows do not increase in linear proportion. From an economic point of view, this indicates that economic growth of Turkey is not a pull factor for international capital.

Although these linear results are interesting enough, they may nevertheless be insufficient to summarize the entire causal relationships between the capital inflows and growth rates in Turkey because we have already noted in section three that these two time series are highly similar to each other not only with respect to their means but also in higher moments of their distributions. Hence searching for possible nonlinear causal effects is important for the Turkish data because at an extreme case growth volatility in Turkey might be causing volatility in capital inflows to Turkey although the mean value of growth does not influence the conditional mean of capital inflows as the linear test results showed. That is why we conducted the nonlinear Diks - Panchenko test on our dataset as well. However, the Augmented Dickey Fuller test (with constant term and time trend) results indicate that growth series in our dataset has a unit root while capital inflows series is stationary. To work with the stationary series, we decided to use the four-quarter averages of each series in the Diks – Panchenko test.[5] The p-values for Diks - Panchenko test with various bandwidths and number of lags are presented below.

Table 3:
Nonlinear Granger Causality Test Results

	H_0: Capital Inflows do not Granger cause Growth			
Number of lags	$\epsilon_n = 0{,}5$	$\epsilon_n = 1{,}0$	$\epsilon_n = 1{,}5$	$\epsilon_n = 2{,}0$
2	1.780 (0.038)	1.679 (0.047)	1.221 (0.111)	1.368 (0.086)
3	1.672 (0.047)	1.552 (0.060)	1.089 (0.138)	1.335 (0.091)
4	1.565 (0.059)	1.821 (0.034)	1.037 (0.150)	1.330 (0.092)
5	1.413 (0.079)	1.499 (0.067)	1.352 (0.088)	1.448 (0.074)

	H_0: Growth does not Granger cause Capital Inflows			
Number of lags	$\epsilon_n = 0{,}5$	$\epsilon_n = 1{,}0$	$\epsilon_n = 1{,}5$	$\epsilon_n = 2{,}0$
2	-0.201 (0.580)	0.895 (0.185)	0.018 (0.493)	-0.538 (0.705)
3	0.221 (0.413)	0.522 (0.301)	0.984 (0.163)	-0.490 (0.688)
4	0.533 (0.297)	0.499 (0.309)	0.585 (0.280)	-0.622 (0.733)
5	0.732 (0.232)	0.768 (0.221)	1.111 (0.133)	-0.105 (0.542)

[5] We detected unit root in Growth series in the ADF test where constant and time trend are included. In cases like that, the statistical significance of trend variable in the ADF equation should be checked. If trend is significant, that means we have a deterministic trend variable and series containing this kind of a trend are known as trend-stationary series. To make trend-stationary series stationary, one simple has to subtract the trend component from the series. However, in our testing, trend in ADF equation turned out to be insignificant. In cases like ours, the ADF test should be renewed only with a constant term in the ADF equation. If constant is significant, then the problem might be a stochastic trend caused by the constant term. Unfortunately, it is impossible to have stationarity simply by removing the trend from the series. To render a series with stochastic trend stationary, econometric literature suggests taking time differences of observations. However, we could not take the time differences in our study since this would make our series meaningless from an economic point of view since our series are YoY quarterly changes and taking their differences (i.e. subtracting their percentage quarterly changes from each other) would be meaningless. Therefore, we decided to smooth out our series to have stationary series. That is why we took the four-quarter moving averages of each observation and that made our capital inflows and growth series stationary.In the Diks – Panchenko test we used these smoothed-out stationary series.

Test statistics and p-values for various bandwidths and lags are reported in the table. P-values in parantheses
The nonlinear test results present the existence of nonlinear causality running from capital inflows to growth in Turkey (at 10% level of significance for 13 out of 16 cases). However, growth does not Granger cause capital inflows nonlinearly at any conventional level of significance. Based on the results obtained from linear and nonlinear tests, we can claim that capital inflows Granger cause growth in Turkey (linearly and nonlinearly) but growth does not Granger cause capital. These findings indicate from an econometric standpoint that these two variables are not endogenous in Turkey. Economic interpretation of these findings is that Turkish economic growth is not a pull factor for the international capital.

CONCLUSIONS

The relationship between the unimpeded international capital flows and economic growth is a complex one. Although the standard economic thinking on this relationship tends to assume positive impact of capital flows on growth, real life observations do not provide the empirical confirmation for this assumption. More interestingly, recent literature even documented negative impact of capital inflows on growth in the capital receiving countries.

Another interesting point which is not studied well yet in the literature is the way of causality between the capital flows and growth. Ghosh et al. (2011) recently documented that growth might be a pull factor for international capital since fast-growing countries could need to attract more capital to fund their fast growth. Then growth might be an explanatory variable for capital inflows although the standard thinking assumes the opposite. In fact, the relationship might even be bidirectional rather than being unidirectional, i.e., the capital flows and growth might be endogenous. Hence the causal relationship from capital flows to growth assumed by the standard thinking should be questioned as well.

In this paper, we initially showed that the capital inflows in the post-financial liberalization era Granger cause Turkish economic growth both linearly and nonlinearly. However reverse causations could not be detected. Hence, we conclude from an econometric point of view that growth and capital inflows in Turkey are not endogenous variables. From an economic point of view that means Turkish economic growth is not a pull factor for the international capital with reference to the pull – push discussion introduced in the paper.

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