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# *The Fed's Impact on Government Debt Interest*

## *Impact of the Fed's Interest Rate Decisions on Hungarian and other Emerging Market Sovereign Bond Yields*

**SUMMARY:** Heavily indebted countries – such as Hungary with rapidly accumulating public debt during the 2000s – enjoy significant room for manoeuvre if they can save on their debt rate. On the other hand, the dependence of small, open economies on global economy renders their economic policy vulnerable. It has been observed in numerous areas that when the US “sneezes”, emerging economies “catch a cold”. Using a sample of eleven countries – including Hungary – this paper is intended to test, in a changed global economic environment, the repeatedly validated assumption that the Fed's federal funds rate has an impact on the government debt rate of emerging economies. We use regression and causality analyses in the context of international interest rate transmission to study the determination. In addition to verifying the presence of interest rate transmission, we also found that the impact is different for different spatial and time horizons and it may even cease to exist in extreme circumstances.<sup>1</sup>

**KEYWORDS:** Fed, government bond yield, Fed rate, emerging markets

**JEL CODES:** E43, E52, F30, F41

The sustainability of government debt is strongly determined by the interest paid on government securities, which is not independent of international processes, particularly in the case of open economies financed in foreign currency. In this study, we review the impact of the Fed's interest rate decisions on the yield on selected emerging markets' sovereign debt in order to come up with recommendations for reducing the international interest rate dependence of government debt financing. We present the findings and conclusions of studies

published on the topic previously. With that, we confirm that the Fed's federal funds rate is a robust factor in the government bond yields of emerging economies.

Our primary goal is to study the relationship between the interest rate on Hungarian government bonds and the Fed rate; however, other emerging markets are also reviewed to test the power of our model. In addition to Hungarian government bond rates, from among the countries considered as speculative/junk grade in 2015 we included in the analysis the Polish, Croatian, Romanian, Turkish, Russian, Chilean, Columbian, South-African and Mexican government debt rates. In addition, the investment grade

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Czech government debt rate is reviewed as a point of reference.

The novelty and special feature of the analysis is the selection of countries graded similarly in a given period. While our primary focus is on the Hungarian government bond yield, we study several benchmark groups for reference, including similar Central and Eastern European competitors outside of the euro area on the one hand, and moderately developed emerging economies on the other hand. Regression analysis, on the one hand, studies a longer term time series subject to the availability of historic data from the beginning of the 2000s and, on the other hand, a shorter period beginning from 2008. The purpose of the latter is to determine whether the 2008/2009 global economic crisis, the near-zero target range for the federal funds rate and the European recession have changed the power of the Fed's interest rate transmission.

The data are analysed in a monthly breakdown. The time series of individual countries are available from 2000/2004 until August/November 2015. To avoid distortion by the outliers, the data are also analysed logarithmically. The impact of interest rate increase on the market of government securities has been studied using regression methodology. The time series have been tested for Granger Causality, which reinterprets the results received from the regression analysis.

Our hypothesis is that the government bond rates of the selected countries move closely together with the Fed rate. In other terms, we assert that the emerging, open economies under review cannot extricate themselves from the Fed's interest policy in respect of the interest expenses of debt financing. We draw conclusions to demonstrate the dependence of the selected countries' government bond rates on the Fed rate and the extent to which that impact could be fended off. Although the hypothesis has been tested in a number of earlier

studies, in this study the analysis is repeated relating to the selected emerging economies in the context of the changed global economic environment.

## FED RATE INCREASES AND THEIR IMPACT – SUMMARY OF THE RELEVANT LITERATURE

Reviewing the interest rate decisions of the Fed, *Kutasi* (2010) found that in the 2000s the Fed applied the monetary policy instrument of liquidity expansion and tightening alternately in order to boost the American national economy. In the course of varying interest rate decisions, the Fed lowered the rates to 1 percent from the beginning of the 2000s, then to mitigate the inflationary effects, it raised them gradually to 5.25 percent in 2006 and 2007. Next, in 2008 and 2009 the rates were reduced fast to 0.25 percent and liquidity was expanded. With respect to the monetary boost it has been proved that a substantial part of the liquidity found its way into existing assets, giving rise to bubbles in the stock markets while also facilitating the issue of riskier government bonds. Later on, the interest increase rendered debt repayment impossible. The outbreak of the financial crisis forced the American central bank to cut interest rates and expand liquidity again. The policy of expanding liquidity lasted until 13 December 2015, when the first steps towards interest rate increase were made in order to manage the inflation risk caused by expanded liquidity.

Following the 2008 credit crisis, the Fed commenced a different monetary policy. After keeping interest rates persistently at zero, it gradually set the rate at a low level and at the same time, issued a large quantity of long-term government bonds and provided interim reports on future interest rate hikes. The publication of such reports was encouraged by ar-



ticles and empirical studies proving the macro-economic effect of interest rate increases by the Fed using several methods. Those effects had a major impact on the emerging economies.

Prompted by Fed's interest rate cuts, other national banks also reduced their reference rates during the crisis. Partly to boost the economy and partly to maintain global competitiveness, they wanted to avoid excessive interest rate differences, or wanted to prevent the loss of exports resulting from the appreciation of the exchange rate. Nevertheless, the European impact of the current tightening cycle is still questionable and yet to be assessed. It should be determined whether the monetary policy decisions have reached their goal and have been able to influence money markets and hence, price stability. This phenomenon is referred to as monetary transmission, which can be measured by means of the following efficiency indicators: market rates, exchange rates, bank loans (Lőrincné [2001, pp. 378–382] and Palánkai [2004, pp. 204–207]). The phenomenon can also be interpreted in an international context, for instance based on Edwards (2010) or Fidrmuc *et al.* (2010); on the other hand, the effectiveness of (international) interest rate transmission is subject to the financial and saving structure and culture of each national economy in question. In addition, the financing form and maturity of securities, the monopolistic status of the banking sector, or such international factors as the openness of a market, the rate of indebtedness and savings, the income level or price flexibility, are also influencing factors. Identifying the effects of the international interest rate transmission is particularly important in the context of the increase in public debt during the crisis, because the issuance of government bonds denominated in foreign currency – for instance, USD bonds – carries both exchange risk and interest rate risk, which might jeopardise the financing of public debt.

Based on the Balanced Portfolio (BP) model, Neely's (2010) analysis has shown that the policy was detrimental to both the European and American bond markets since it reduced yields. Using case studies, the paper called attention to the international effects of the US monetary policy, which – in the author's view – led to the reduction of interest rates on a global scale. Expanding the subject of the studies, other authors have concluded that the economies are closely interrelated. The findings of Fink and Schüler (2013) have shown that the status and performance of the American economy has a fundamental impact on the economies of emerging countries, which is also proven by the rapid spread of the 2008 credit crisis. The effects of unexpected economic shocks were tested between 1999 and 2012 using the structural VAR analysis of monthly economic data. The study was based on six variables that describe the economic relationship of different national economies with the USA: real GDP, bilateral exports over imports, net accumulated foreign stocks, prime lending rate, real effective exchange rate and consumer price index. According to the authors' findings, the US economy has a major impact on the dynamics of emerging economies and on the business cycles, mainly by reducing capital flows and reducing the transactions between money markets. According to the authors' recommendation, emerging countries should lower their exposure to foreign denominated debt, pursue a policy of monetary easing and maintain strict fiscal policies, but they also point out that foreign exchange reserves can alleviate the shock by stabilising the value of the domestic currency.

According to further studies, the low interest policy of the US beginning from the early 2000s can be related to the gross capital flows on emerging markets. According to Borio and Disyatat (2011), the Fed's interest rate policy resulted in a sharp increase in outstanding borrowing and the emergence of global financial



imbalances. *McKinnon* (2011) pointed out that the international interest rate transmission induced by the Fed facilitated the generation of asset bubbles, and its effects must be expected again during the next tightening cycle. *Hoffmann and Loeffler* (2014) confirmed the monetary policy dependence of emerging economies. In fear of an overflow of portfolio capital and the appreciation of the nominal exchange rate, smaller and weaker economies followed the Fed's low interest rate policy. The high rate of USD-based foreign currency reserves and international trade are in the background of the phenomenon, as a result of which exchange rate fluctuation represents a major risk for the national economies.

*Borensztein et al.* (2001) came to a similar conclusion studying Asian and Latin American countries. According to their hypothesis, although a "floating" interest rate policy guarantees the independence of national banks by enabling them to influence interest rate levels, this independence is not sufficient to rule out the impact of US interest rate changes. In other words, while central banks' monetary policy becomes independent of economic policy in compliance with the central bank laws, this increases monetary policy's dependence on the Fed's interest rate policy. Therefore, to prevent inflation and to maintain the confidence of market investors, they engage in flexible monetary policy, which follows the fluctuations of the American interest rate policy and the USD exchange rate.

After the outbreak of the 2008 global crisis, *Edwards* (2010) studied the spread of the crisis and the impact of the Fed's interest rate decisions on Latin American and Asian economies. The author monitored the changes between national and foreign (USA) interest rate level differentials in the period of 2000–2008, also in consideration of exchange rate risk and country risk factors. He concluded that the interest rate differentials are on the decline in

Latin American and East Asian markets and consequently, they gradually approach the interest rate set by the Fed. However, due to the characteristic features of those regions, the transmission of changes in the Fed's rate into interest rates in Latin America is a rapid and cyclical process, whereas interest rate changes are slower and gradual in East Asia followed by a slower adjustment process.

The Fed's monetary policy has a direct or indirect impact on almost all economies of the world as the economic power of the US is unquestionable, and the USD is a globally accepted currency also used to maintain foreign currency reserves. In accordance with this review of the literature and the case studies, the vulnerability of emerging markets is obvious. We assume that the interest rate changes in developing countries, and particularly in the US, have a major impact on the performance of the national economies. However, the responses given to potential economic shocks highly depend on the economic stability of the countries, the success of their monetary and budgetary policy and their regional role. In addition, keeping public debt balanced primarily by issuing local currency bonds is of primary importance. There is abounding evidence that financial contagion between different states may have serious effects not only on the local or regional but even on the global markets as well.

However, global monetary variables – such as the assumption of a significant relationship and co-movement between the Fed rate and the CDS spread – are not as self-evident and obvious as they usually appear in the practice of monetary market analysis. A review of the literature by *Kocsis* (2013) and the author's factor analysis-supported findings calls into question whether the Fed's interest rate transmission power should be taken for granted on the government bond markets of emerging economies. That is why a causality analysis should be performed.



## AN ANALYSIS OF THE RELATIONSHIP BETWEEN THE AMERICAN INTEREST POLICY AND THE GOVERNMENT BOND YIELDS OF EMERGING ECONOMIES

According to our starting hypothesis, the Fed's federal funds rate determines the government bond yields of the selected emerging markets. To prove this, we performed a regression analysis. Our hypothesis is that the government bond rates of the selected countries move closely together with the Fed rate. In other terms, we assert that the emerging, open economies under review cannot extricate themselves from the Fed's interest policy in respect of the interest expenses of debt financing.

The analysis uses regression to study the strength of the correlation between the Fed rate (Federal Funds Rate – FFR) and the 10-year government bond yields of the individual countries is (GBY – government bond yield). We conducted a Granger Causality test on the results with the zero hypothesis that the Fed rate has no impact on the interest rates of the given countries' government bonds assuming a time lag of one period ( $t-1$ ).

The countries were selected as follows: on the one hand, we strived to select countries with a grading similar to that of Hungary, which had a similar risk rating according to Standard and Poor's, Moody's and Fitch (<http://countryeconomy.com/ratings>) in the decade prior to the analysis. On the other hand, the availability of data was another crucial factor. Consequently, we included the following countries in our analysis in addition to Hungary: Poland, Turkey, Croatia, Romania, Russia, Chile, Columbia and the Republic of South Africa. Moreover, we performed the analysis for the Czech Republic – which is a more developed economy with a more stable economic policy background and a significantly better credit rating – to serve as our benchmark. The source of the data is Euro-

stat and OECD. We could not include China in the analysis, as the People's Bank of China publishes time series for government bonds from 2014 only, which did not allow for a sufficient number of observations.

Data were analysed in a monthly breakdown. The time series of individual countries are available from 2000/2004 until August/November 2015. In addition, we performed the analysis from 2008 Q3 to 2015 Q3 to determine the extent to which the Fed's interest rate transmission power was affected by the global financial crisis, the Fed's near-zero target range and the European recession.

Our regression equation is the following:

$$GBY_{i,t} = \alpha + \beta FFR_{t-1} + \varepsilon, \quad (1)$$

where  $i$  means the indicator of a given country and  $t$  means time. And, to avoid distortion by the outliers, the equation was also analysed logarithmically for the whole time series:<sup>2</sup>

$$\ln GBY_{i,t} = \alpha + \beta \ln FFR_{t-1} + \varepsilon. \quad (2)$$

The results of the analysis can be summed up as follows: The regression data indicate that the Fed rate has a major impact on the interest trends of certain countries, but this occurs side-by-side with international transmission of varying strengths, and interest levels move in opposite directions in certain cases. The regression analysis improved the accuracy of this interpretation. The regression calculation shows that there is a significant correlation between the FFR and the government bond rates of the countries under review. In most cases, the findings correspond to a 99 per cent significance level (*Table 1*). However, this is treated with caution, as also warranted by the Granger Causality test.

Our second conclusion is that the strength of the Fed's interest rate transmission is different across the countries. Considering long-



Table 1

**RESULT OF THE REGRESSION ANALYSIS  
(ADJUSTED BETA, SIGNIFICANCE LEVEL, ADJUSTED  $R^2$ )**

Medium, non-investment grade in 2015											Investment-grade with excellent rating in 2015
	HU	PL	HR	RO	TR	RU	CHL	COL	DAK	MEX	CZ
Linear regression	0.14* (0.014)	0.398*** (0.154)	-0.246** (0.052)	0.213* (0.038)	0.738*** (0.541)	0.473*** (0.22)	0.404*** (0.157)	0.281*** (0.079)	0.471*** (0.218)	0.394*** (0.149)	0.584*** (0.337)
Logarithmic regression	0.295*** (0.082)	0.518*** (0.264)	-0.107 (0.003)	0.346*** (0.113)	0.811*** (0.655)	0.345*** (0.115)	-0.267*** (0.064)	0.63*** (0.393)	0.471*** (0.218)	0.229*** (0.046)	0.515*** (0.262)
Number of observations	178	178	119	127	118	189	125	153	188	135	187
Linear regression 3 October 2008 – October 2015, number of observations: 85	0.282*** (0.068)	0.244** (0.048)	0.17 (0.029)	0.233** (0.043)	0.686*** (0.464)	0.032 (-0.011)	0.364*** (0.104)	0.613*** (0.369)	0.208* (0.032)	0.475*** (0.211)	0.262*** (0.058)

HU – Hungary, PL – Poland, HR – Croatia, RO – Romania, TR – Turkey, RU – Russia, CHL – Chile, COL – Columbia, DAK – Republic of South Africa, MEX – Mexico, CZ – Czech Republic

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%

Source: authors' own calculation based on Eurostat and OECD data, SPSS



term data, the Fed's interest policy has a strong impact on the Turkish and Czech government bond rates, where the indicator checking the adjustment of the regression function (adjusted  $R^2$ ) confirms the accuracy of the estimate, while the logarithmic estimator, which smooths single big differences also supports the conclusion. A strong Fed impact can be observed in the cases of Chile and Poland, which is best seen as a result of the logarithmic estimation. Even in the case of the Republic of South Africa, Columbia, Mexico and Russia it appears that the Fed strongly determines government bond rates in the long run, but in their case, inexplicable deviations (error terms) weakening the accuracy of the estimation are more pronounced. In addition, there are problems with causality. In the case of Hungary and Romania, relatively weaker determination can be observed in the correlation under review (weak Beta and low  $R^2$ ). On the other hand, the less noisy logarithmic analysis shows a stronger relationship and a weaker error term.

It appears that the Croatian interest data move independent of the Fed. However, the reason behind this cannot be determined from the regression analysis performed. The explanation requires further modelling and analysis. In this case, suffice it to note the interesting fact that such a relationship can also be measured.

The third part of our conclusions refers to a shorter period from October 2008 to October 2015, where the model measured a weakening in the Fed's interest rate transmission power in most countries. In the case of the Czech Republic, Poland, Turkey, Russia, Chile and the Republic of South Africa, both the closeness of the relationship (Beta) and the estimator's goodness of fit deteriorated. This may suggest that data pertaining to the last 5 years weakened the closeness of the relationship in the case of the longer term estimation. (In addition, the reverse negative relationship with the Croatian bond rate also weakened, but in

this case the measurement is not significant, i.e. we cannot state that in the shorter period the Fed's interest rate decisions had any impact on the Croatian bond yield whatsoever). Nonetheless, the picture is mixed once again. The Fed's interest rate decisions had a stronger impact on the Hungarian, Romanian, Columbian and Mexican rates beginning from the financial crisis than in the pre-crisis period. Most of these statements imply a correlation measured within a 1 per cent margin of error.

Doubting, however, such a significance level of the findings – in accordance with the Kocsis (2013) study already mentioned –, we performed the Granger Causality test on the entire dataset assuming a lag of  $t-1$  in the impact of the Fed rates on the government bond rates (*Table 2*). With this approach, the correlation between the Fed rate and the government bond rates under review is observed in only a limited group of countries. With respect to the Turkish government bond rates, the correlation's margin of error is within 1 per cent, while it is 5 per cent for the Czech rates and within a 10 per cent confidence interval for the Chilean and Polish cases. However, the Granger test did not confirm the significant results of the regression analysis for the other countries. In the case of the rest of the countries, the  $p$ -value is at a spectacular distance from the confidence interval. In the most extreme case, the  $p$ -value of the Russian government bond rate shows – at a confidence level of almost 100 per cent – that the Fed rate has no impact on the Russian one. Although not as clearly, the Granger test shows no correlation with the Fed rate for the time series of Mexico, South Africa, Croatia, Romania, Columbia and Hungary. It is specifically for this reason that the findings of the linear regression should be treated with caution for the non-significant Granger test results, whereas our assumption that changes in the Fed rate have an impact on the government bond mar-



Table 2

GRANGER CAUSALITY TEST, 1-PERIOD TIME LAG			
Government bonds by country	<i>p</i>	Significance	Number of observations
GBYtr	0.0017	***	189
GBYcz	0.0390	**	186
GBYchl	0.0568	*	118
GBYpl	0.0704	*	177
GBYhu	0.2712		177
GBYcol	0.2804		153
GBYro	0.3130		126
GBYhr	0.3145		118
GBYdak	0.5695		188
GBYmex	0.6423		106
GBYru	0.9733		189

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%

Source: authors' own calculation based on Eurostat and OECD data, EViews

ket appears to be confirmed in the four cases that proved to be significant (Turkey, Czech Republic, Chile and Poland).

## CONCLUSIONS

Our study was intended to determine whether the government bond rates of the selected countries moved closely in tandem with the Fed rate. The hypothesis has been tested in numerous studies previously; however, the changed global economic environment has provided an opportunity to make new statements in relation to the selected emerging economies. Our study focused on the time series of Hungarian, Polish, Croatian, Romanian, Turkish, Russian, Chilean, Columbian, South African and Mexican government bond rates – as dependent variables – in the period beginning in 2000–2004 and lasting until October/November 2015. The  $t-1$  period Fed rate was a determinant in the correlation.

Following a review of the international lit-

erature on the topic, we outlined the results and different methodological approaches that confirm the existence of the phenomenon; namely, that the Fed's interest rate decisions influence the government bond rates and the key policy rates of emerging markets. The empirical correlation outlined in our hypothesis was placed in the context of the international interest rate transmission. We presented the conclusions of the literature relating to the vulnerability of emerging markets as well as their recommendations for increasing foreign exchange reserves and lowering the foreign currency ratio of government bonds.

The empirical regression analysis was intended to demonstrate the determination effect of the Fed rate on the public bond rates of the countries under review. The regression analysis proved that the Fed rate determines interest trends as a rule, but the international transmission is of different strength for certain countries and periods. In addition, we found examples where interest levels moved in op-



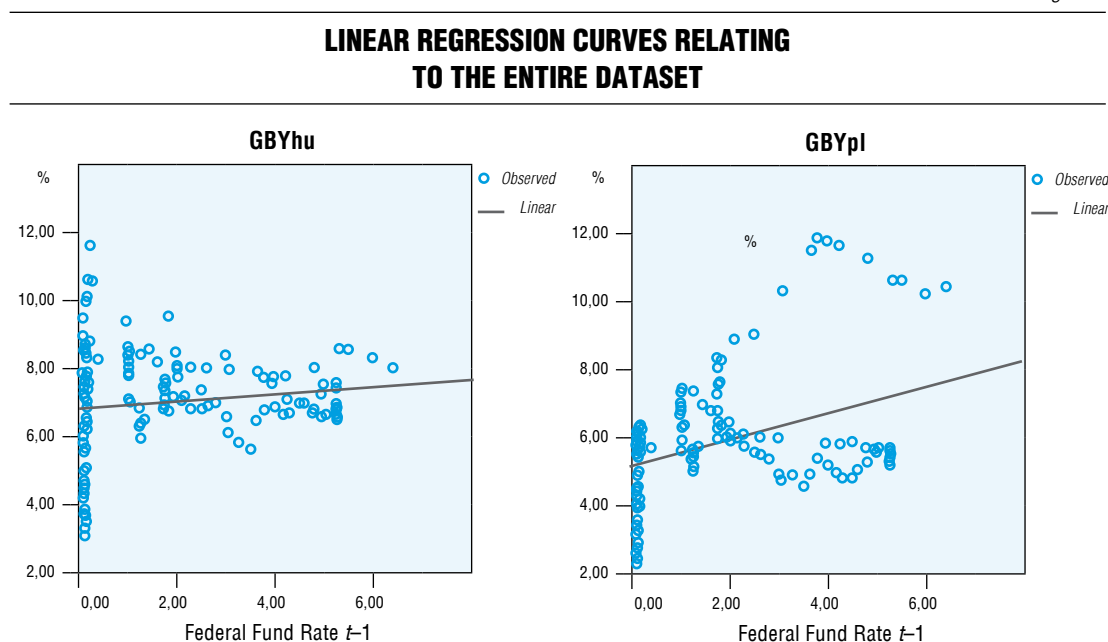
posite directions in certain cases. However, we treated with caution the fact that according to the regression analysis, the correlation between the Fed rate and the government bond rates of the countries under review had a significance level of 99 per cent in most cases.

The strength of the Fed's interest rate transmission varied in space and time. A strong correlation was found with the Turkish and Czech government bond rates. A strong Fed impact can be observed in the cases of Poland and Chile, which is best shown by the result of the logarithmic estimation. In the case of Mexico, Russia, the Republic of South Africa and Columbia the Fed strongly determines government bond rates in the long run, but in their case, the dispersion of inexplicable deviations (error term) weakening the accuracy of the estimation is more significant; in addition, the results also failed the Granger test. In the case of Hungary and Romania, the correlation under review demonstrates relatively weaker determination. No reverse movement was observed for the Croatian rates.

Performing the analysis for a shorter time horizon (October 2008 – October 2015), we found that the Fed's interest rate transmission power weakened in most countries under review. In the case of the Czech Republic, Poland, Turkey, Russia, Chile and the Republic of South Africa both the closeness of the relationship (Beta) and the estimator's goodness of fit deteriorated. Nonetheless, the picture is mixed once again. The Fed's interest rate decisions had a stronger impact on the Hungarian, Romanian, Columbian and Mexican rates beginning from the financial crisis than in the pre-crisis period. Most of these statements also satisfied the 99 percent significance level; however, based on the literature, a cause and effect relationship can be called into question; therefore, we conducted a test in this regard, studying the Granger Causality.

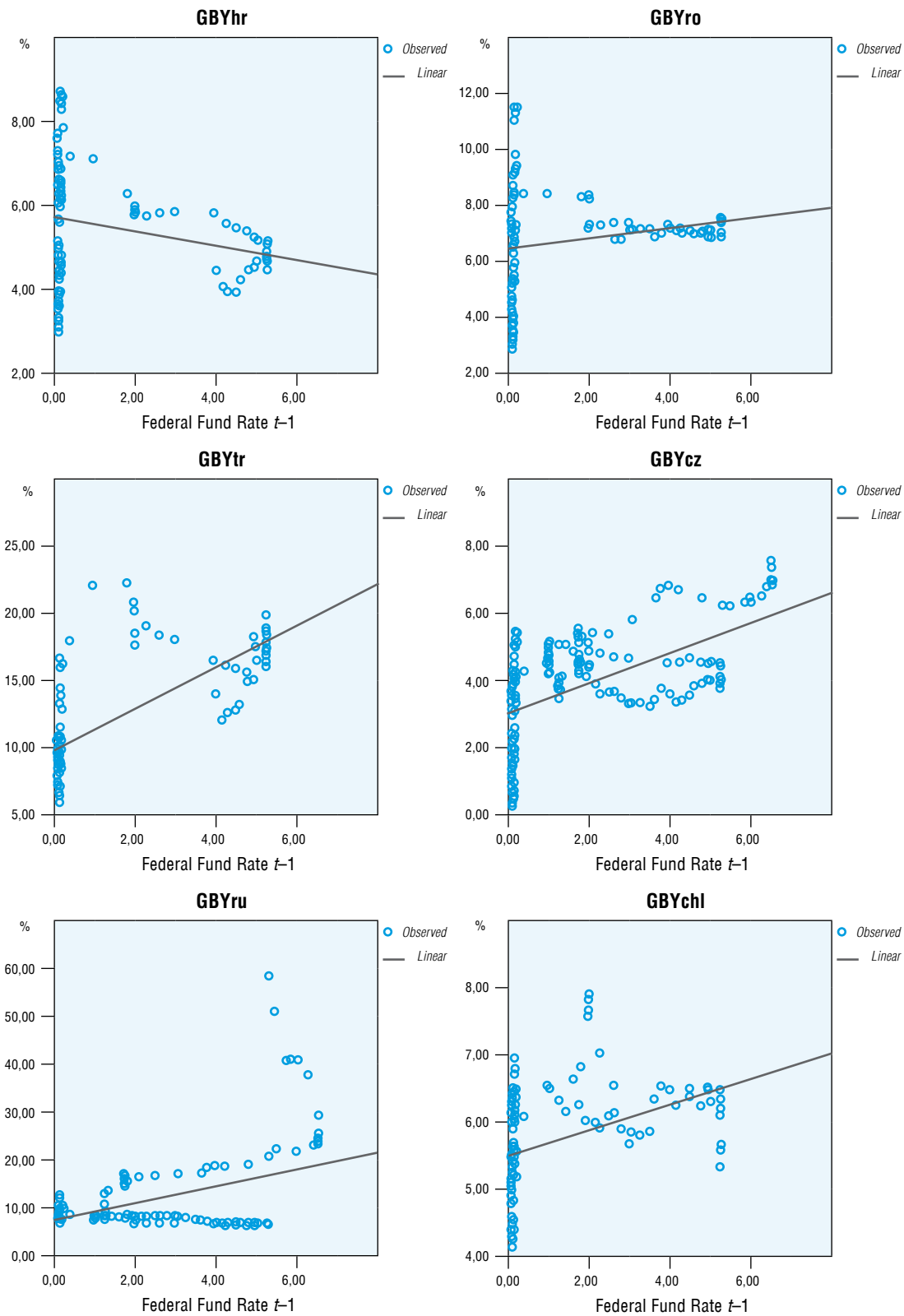
The Granger test performed on the entire dataset revealed that the correlation between the Fed rates and the government bond rates under review holds for only a limited number of countries in the given period (*Figure 1*). Con-

Figure 1



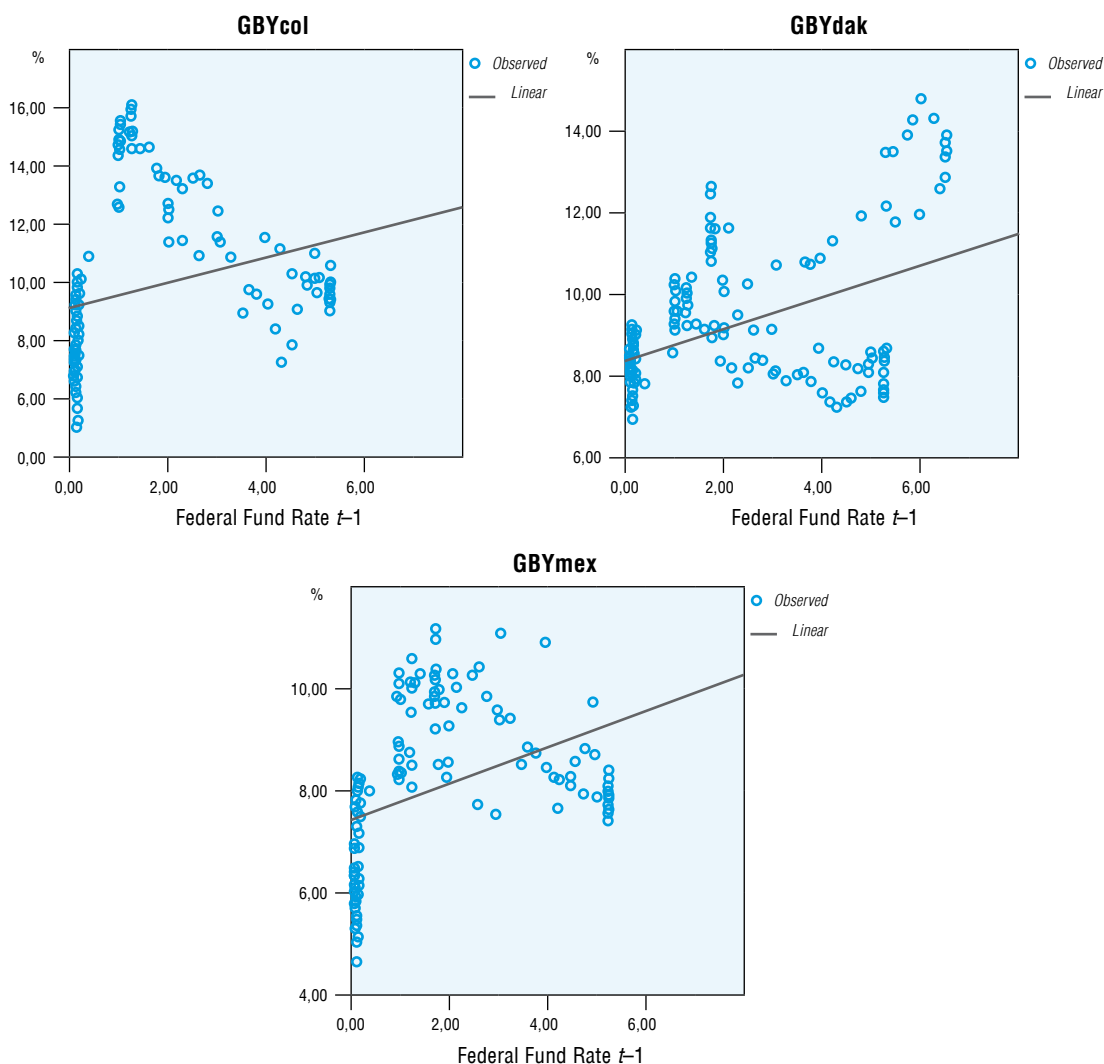


Continue Figure 1





Continue Figure 1



Source: own compilation, Eurostat, OECD, SPSS

sequently, it is only for the Turkish, Czech, Chilean and Polish time series that we can state with certainty that the Fed rates determine government bond yields. The Granger test did not confirm the significant results of the regression analysis for the rest of the countries. It is specifically for this reason that the findings of the linear regression should be treated with caution for the non-significant Granger test results, whereas our assumption

that changes in the Fed rate have an impact on the government bond market appears to be confirmed in the four cases that proved to be significant (Turkey, Czech Republic, Chile and Poland).

Central banks and bond dealers can divert or intensify the Fed's interest rate transmission by using numerous tools. This may partly explain the weakness or the strength of the cause and effect correlation. However, this factor was



not tested in the course of the analysis. (For instance, the central bank's foreign exchange reserves, communication, central bank bills, the required reserve ratio, commercial bank regulations, public debt management with its portfolio strategy aimed at reducing or increasing – at a slower pace – gross public debt, currency composition, the efficient hedging of exchange rate risk, the use of hedged interest

rate arbitrage, market/investor sentiment, taking advantage of the abundance of liquidity in international money markets, secondary bond market transactions; i.e., swaps or redemption of bonds before maturity, targeted selection of domestic and international income groups using marketing campaigns and roadshows, setting optimum terms for investors with a finite time horizon).

## NOTES

- <sup>1</sup> Gábor Kutasi's research was supported by KÖFOP-2.1.2-VEKOP-15.
- <sup>2</sup> No logarithmic calculations were made for the crisis period, because with the near-zero Fed rates the method would significantly distort the data towards minus infinity.

## REFERENCES

- BORENSZTEIN, E. – ZETTELMEYER, J. – PHILIPPON, T. (2001): Monetary Independence in Emerging Markets. Does the Exchange Rate Regime Make a Difference? *IMF Working Paper*, WP01/1, pp. 3–48
- BORIO, C. – DISYATAT, P. (2011): Global Imbalances and the Financial Crisis: Link or no Link? *BIS Working Papers*, 346 pp. 3–29
- EDWARDS, S. (2010): The international transmission of interest rate shocks: The Federal Reserve and emerging markets in Latin America and Asia. *Journal of International Money and Finance*, 29/4, pp. 685–703
- FIDRMUC, J. – IWATSUBO, K. – IKEDA, T. (2010): Financial Integration and International Transmission of Business Cycles: Evidence from Dynamic Correlations. Graduate School of Economics Kobe University *Discussion Papers*, No. 1007, pp. 1–9
- FINK, F. – SCHÜLER, Y. S. (2013): The Transmission of US Financial Stress: Evidence for Emerging Market Economies. Department of Economics. University of Konstanz. *Working Paper Series*, 2013/01, pp. 2–28
- HOFFMANN, A. – LÖFFLER, A. (2014): Low interest rate policy and the use of reserve requirements in emerging markets. *The Quarterly Review of Economics and Finance*, 54/3, pp. 307–314
- KOCSIS, Z. (2013): Global, Regional and Country-Specific Components of Financial Market Indicators: An Extraction Method and Applications. *MNB Working Papers*, 2013/3
- KUTASI, G. (2010): US interest rate policy in the 2007–2009 crisis. *Public Finance Quarterly*, Vol. 55, Issue 1, pp. 84–100
- LŐRINCSE ISTVÁNFY, H. (2001): Pénzügyi integráció Európában (Financial integration in Europe). KJK-Kerszöv, Budapest
- MCKINNON, R. I. (2011): Beggar-Thy-Neighbor In-



terest Rate Policies. *Journal of Policy Modeling*, Vol. 33, Issue 5, pp. 759–775

NEELY, C. J. (2010): Unconventional Monetary Policy Had Large International Effects. Federal Reserve Bank of St. Louis. Research Division. *Working Paper Series*, 2010-018G, pp. 1–51

PALÁNKAI, T. (2004): *Az európai integráció gazdaságtana (Economics of European integration)*. Aula, Budapest

ZHANG, G. – YAU, J. – FUNG, H. (2010): Do credit default swaps predict currency values? *Applied Financial Economics*, Vol. 20, Issue 6, pp. 439–458