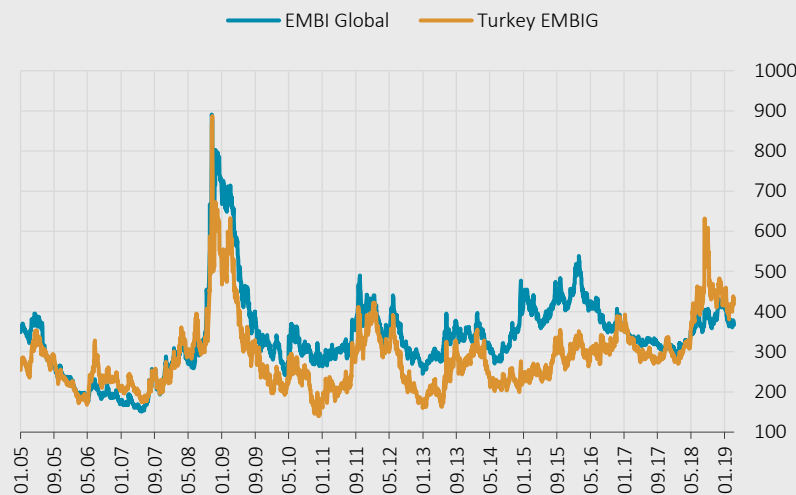


Box 5.1

Determinants of Turkey's External Borrowing Rate

In cross-country comparisons of external borrowing costs, the yield spread, which refers to the difference between the yields on bonds issued abroad and the yields on similar borrowing instruments in the same currency, provides significant information. The majority of government external borrowing by emerging market economies is in US dollars. In this regard, the interest rate spread of US dollar borrowings is obtained by subtracting the US Treasury bond yield from the yield on external debt of the related country (Hilscher and Nosbusch, 2010). When we analyze the evolution of interest rates on public external borrowings of emerging market economies and Turkey, we observe both a co-movement and a divergence of external borrowing costs from time to time. This implies that a global common factor (US Treasury bond yield, global risk appetite, etc.) and also country-specific conditions (macroeconomic variables, country risk premium, etc.) play a role in the evolution of external borrowing costs of emerging market economies (Chart 1).

Chart 1: JP Morgan Emerging Markets Bond Index (Basis Points)

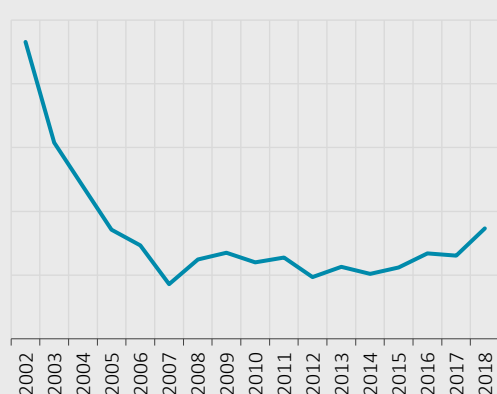


Source: Bloomberg.

Identifying the determinants of the yield on public external borrowing is an important research topic because the yield affects both the budget balance and balance of payments through external debt interest payments. In addition to the interest rate, the level of the external debt stock also plays a role in the calculation of the external borrowing interest burden. In Turkey, the relatively high level of public external debt stock declined to low levels from 2002 to 2007, and this trend continued until 2017. The ratio of public external debt stock to GDP moderately increased in 2018 (Chart 2). Currently, this ratio is slightly above the average of peer countries. Even though there is a significant surge in the yields on new external borrowings, US dollar-denominated interest payments in the current account balance are low due to the fact that the stock is predominantly composed of previously-issued long-term bonds with low interest rates. On the other hand, the depreciation trend in the Turkish lira has led to a significant increase in interest payments in the central government budget (Chart 3).

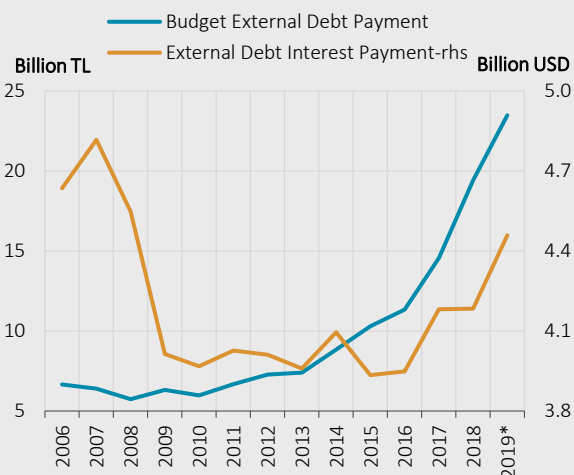
In addition, determining the impact of the factors affecting the yield on external borrowing is important to guide policy makers on the conditions under which external borrowing would be more optimal.

Chart 2: Public Sector Gross External Debt Stock/GDP (%)



Source: Republic of Turkey Ministry of Treasury and Finance.

Chart 3: Budget External Debt Payments and External Debt Interest Payment (Billion TL, Billion USD)



Source: Republic of Turkey Ministry of Treasury and Finance. (*) Forecast for 2019.

Against this background, this box seeks to explain “the realized yield in US dollar-denominated eurobond auctions” since the external borrowing cost affects both the government budget balance and the balance of payments through interest burden. In the economic literature, country-specific factors and variables such as US interest rates and risk premium indicators are largely used as the determinants of the yield on external borrowing. In emerging market economies such as Turkey, there are many academic studies that emphasize the importance of global factors.¹ These studies generally use the 10-year US Treasury bond yield, the implied volatility of the S&P 500 index (VIX), and the difference between the 3-month Libor rate and the 3-month US Treasury bond rate (Hilscher and Nosbusch, 2010). In addition, according to the findings of Bellas et al. (2010), the global risk appetite (VIX) and the US Treasury bond rate stand out as the two prominent determinants of external borrowing costs of emerging market economies in the short term. In the long run, in addition to countries’ debt payment capacities and political risks, macroeconomic factors also play a determining role in the external borrowing cost.

As a country-specific risk criterion, Credit Default Swap (CDS) premiums are used in general (Akçelik and Fendoğlu, 2019). Akçelik and Fendoğlu (2019) feature reserve adequacy, current account deficit, foreign currency indebtedness level, and budget balance as the determinants of the CDS premium in emerging market economies.

On the other hand, JP Morgan EMBI spread indices are generally used as the indicators of external borrowing costs (Hilscher and Nosbusch, 2010). The EMBI indices provide information on the current interest rate and do not provide sufficient information on the external debt burden as there is no external borrowing on a daily basis. Therefore, the analysis of the external borrowing interest rate in the Treasury’s eurobond auctions is significant as it determines the interest payment to be made in the future periods depending on the maturity of the borrowing instrument.

¹ For a detailed discussion, see Calvo et al. (1993), Calvo (2002), Herrera and Perry (2002), Diaz Weigel and Gemmill (2006), García-Herrero and Ortiz (2006), Longstaff et al. (2007), González-Rozada and Levy Yeyati (2008).

In accordance with the literature, we have employed the maturity of the external debt instrument, the US dollar Libor rate, Turkey's CDS premium, 10-year US Treasury bond yield and the VIX index as potential variables to explain the yield on the Treasury's eurobond issuance in international capital markets. As explained before, the CDS premium is closely related to country-specific macro variables such as reserve adequacy, external debt level and current account deficit. Accordingly, the CDS premium has been employed in this study both for direct control of the country-specific risk premium and as a reflection of other macro variables. The US Treasury bond yield and the VIX index represent the global factors.

Determinants of the Yield on Turkey's External Borrowing

The complete form of our regression equation to be estimated is as follows:

$$\Delta dbf_t = \alpha_1 + \alpha_2 * \Delta USTR_t + \alpha_3 * \Delta CDS_t + \alpha_4 * \Delta libor_t + \alpha_5 * \Delta VIX_t + \alpha_5 * \Delta term_t + \varepsilon_t \quad (1)$$

Here, dbf_t is the yield on Treasury's external bond issuance at time t , $USTR_t$ is US Treasury bond yield; $libor_t$ is US dollar Libor rate, CDS_t is Turkey's CDS premium, VIX_t is the volatility index derived from S&P 500 index options, and finally $term_t$ is the maturity of Treasury's US dollar-denominated eurobonds. The symbol Δ shows the logarithmic difference between the value of the relevant variable at time t and its value on the day of the previous auction.

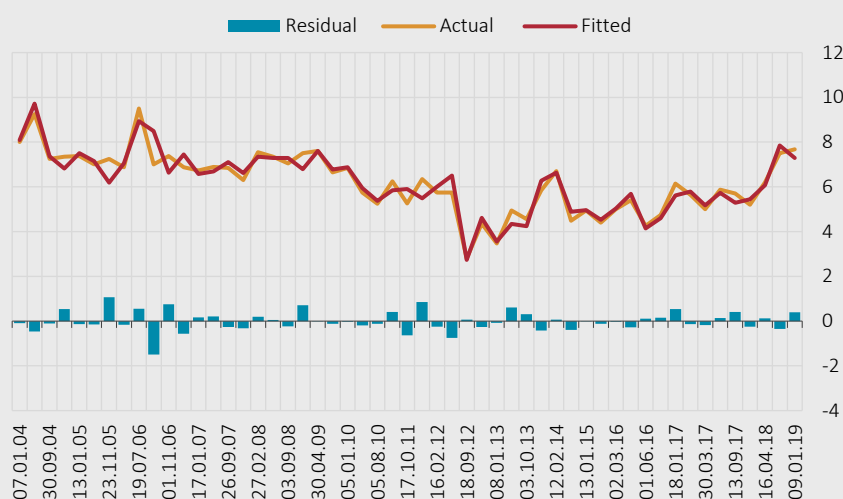
The equation is estimated using the least squares (OLS) method for the days when the auction was held between 17.09.2003 and 09.01.2019, and four different sets of variables by adding the other variables to the US Treasury bond yields and CDS variables sequentially. Estimation results are presented in Table 1.

Table 1: OLS Regression Results

| Dependent Variable: Δdbf | Coefficients | | | |
|--|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| <i>Constant</i> | 0.0029 (0.0066) | 0.0025 (0.0067) | 0.0020 (0.0068) | 0.0016 (0.0068) |
| $\Delta USTR$ | 0.3976** (0.0203) | 0.3984** (0.0214) | 0.4030** (0.0247) | 0.3615** (0.0463) |
| ΔCDS | 0.3496** (0.0305) | 0.3460** (0.0346) | 0.3197** (0.0427) | 0.3468** (0.0568) |
| $\Delta libor$ | | 0.0239 (0.0577) | 0.0316 (0.0511) | 0.0515 (0.0454) |
| ΔVIX | | | 0.0638 (0.0788) | 0.0484 (0.0818) |
| $\Delta term$ | | | | 0.0254 (0.0203) |
| <i>Adj. R²</i> | 0.8648 | 0.8626 | 0.8650 | 0.8678 |
| Number of Observations: 52 | | | | |
| * and ** denote statistical significance of 10% and 5%, respectively. Standard deviations are indicated in parentheses. | | | | |

The regression results reveal that the US Treasury bond yield and the CDS premium are statistically significant and the signs of these coefficients are in the expected direction. According to the equation in the fourth column, a one-percentage point rise in the 10-year US Treasury bond yield and Turkey’s CDS premium increases the yield on external borrowing by 0.36 and 0.35 percentage points, respectively. Chart 4 demonstrates the actual interest rates and the estimated rates from the equation in the fourth column of Table 1. It can be seen that the equation predicts the auction yields quite well in most of the periods. According to these results, the 2-2.5 points of surge in the external borrowing costs in 2018 was mainly due to the increase of CDS premium to 370 basis points from the historical average of 220 basis points.

Chart 4: Actual and Estimated Yield on Turkey’s External Borrowing



Source: Authors’ calculations.

To sum up, the US Treasury bond yields and Turkey’s CDS premium are found to be the main determinants of external borrowing costs in Turkey. In this context, considering the recent fall in US Treasury bond yields, an expected gradual decline in Turkey’s CDS premium due to the decline in financial volatility and a more favorable macroeconomic outlook will reduce external borrowing costs, and thus contribute positively to Turkey’s balance of payments and budget balance in the upcoming period.

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