

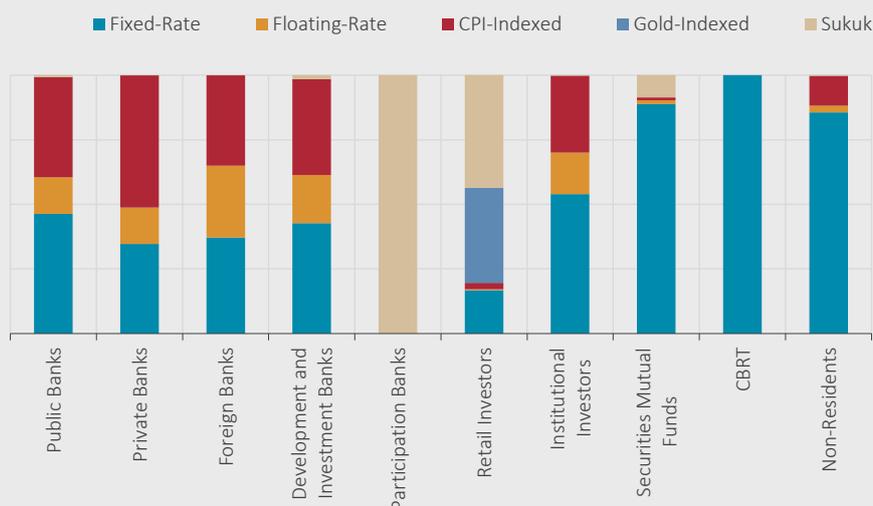
## Box 6.1

### Distribution of Domestic Debt Instruments by Investor Type

It is crucial for policymakers to identify risks posed by investors stemming from the differences in their borrowing preferences and examine the impact of a possible shock on the domestic debt stock (Arslanalp and Tsuda, 2014). In case an instrument is owned solely by a single holder, a negative shock to this holder will lower the demand for the instrument and change the structure of the debt stock. On the other hand, if the majority of the debt stock is owned by a certain investor, a negative shock to this investor creates a risk in terms of the financing of the debt stock. Against this background, this box analyzes the instrument preferences of the domestic debt stock holders.

As of end-2017, the analysis of the domestic borrowing instruments by investors suggests that borrowing preferences vary across investors, which constitute the demand side of the domestic debt stock (Chart 1). The banking sector mostly prefers a variety of tools. Particularly, a large portion of CPI-indexed bonds are held by banks, possibly to compensate for the maturity mismatch between credits and deposits.

Chart 1: Composition of Investor-Based Domestic Borrowing Instruments\*



Source: CBRT.

\* As of 29 December 2017.

Meanwhile, it is worth noting that participation banks solely invest in sukuk bonds of which they also happen to be the majority investor. Non-bank investors and non-residents mostly demand fixed-rate bonds.

Diversification of the investor base is considered to be a warranty for sustaining a robust demand for government domestic debt securities.<sup>1</sup> Low concentration ratios in terms of investors or instruments, or in other words, diversification of domestic debt stock across a wider range of investors and instruments will minimize both the investor-specific and the instrument-specific risks. Micro data on instruments by investors is crucial to measuring the resilience of the domestic debt stock against any sensitivity to be posed by changes in investors' preferences. This analysis employs a commonly accepted metric for market

<sup>1</sup> Higher share of non-residents as well as institutional investors within the domestic debt stock increases the strength of the demand side of the public debt (Jeanneau and Pérez Verdía, 2005; Sidaoui et al., 2012).

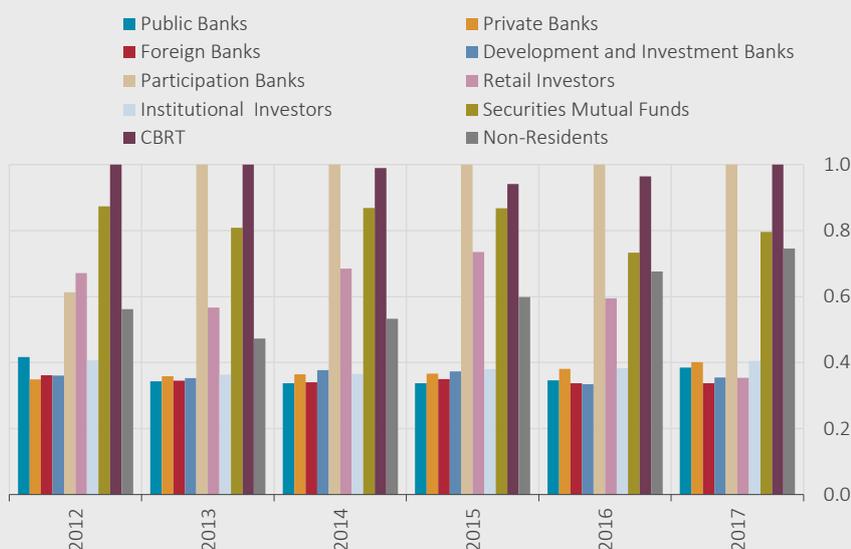
concentration and firm competition, the Herfindahl-Hirschman Index (HHI), as the resilience criterion of the domestic debt stock. This index, which is a measure of market competitiveness, is calculated by adding the squares of the shares of all domestic debt stock holders for each instrument or the share of each instrument in every investors' holdings of domestic debt stock. For  $n$  denoting the number of investors or instruments in the market and  $s_i$  representing the market share, the HHI can be measured as follows:

$$HHI = \sum_{i=1}^n s_i^2$$

Accordingly, an HHI value close to zero indicates a variety of investors or instruments in the market, which suggests a balanced distribution. If the index takes values around 1, this implies a monopolistic market structure, which therefore signals high concentration and fragility.

The concentration of investors in instruments is obtained by adding the squares of the shares of the instruments for each holder within the total debt stock, which measures the variety of instruments. During the 2012-2017 period, HHI values across the banking sector excluding participation banks is quite low, which indicates that a variety of tools was preferred by the sector (Chart 2). On the other hand, the CBRT and participation banks opted for a single tool, yet their shares remained low within the total domestic debt stock, which therefore did not hamper the resilience of the domestic debt stock.

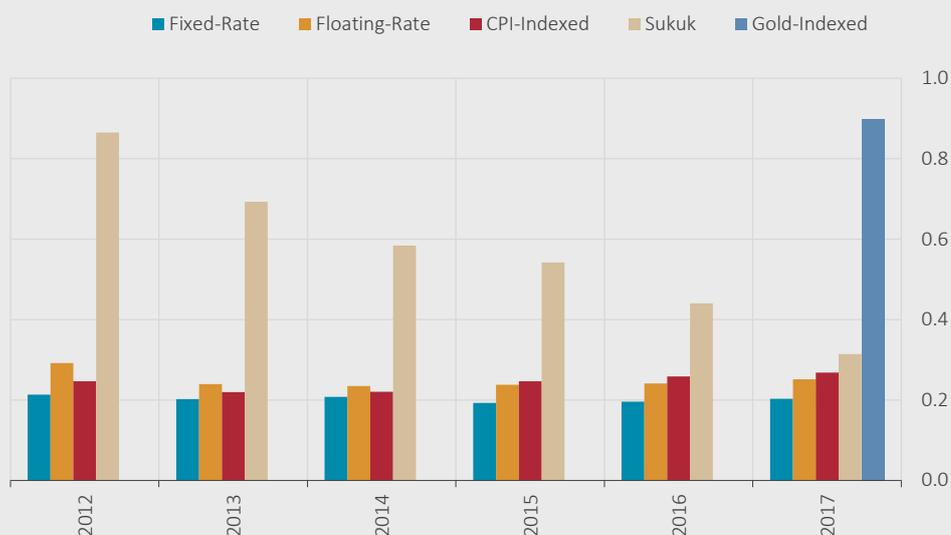
Chart 2: Instrument-Based Concentration of Investors (HHI)



Source: CBRT.

Investor-based concentration of instruments appears as another measurement to be employed in analyzing the resilience of the domestic debt stock. The breakdown of the instruments over years signals a balanced composition of fixed-rate, floating-rate rate and CPI-indexed government bonds among investors over the analyzed period (Chart 3).

Chart 3: Investor-Based Concentration of Instruments (HHI)



Source: CBRT.

In sum, the instrument preferences of the domestic debt stock holders were analyzed using the dataset developed by the CBRT Department of Statistics. This enables the measurement of the resilience of the domestic debt stock against possible shocks. Overall, the analysis suggests a balanced and diversified distribution of the domestic debt stock in terms of holders and instruments.

### References

Arslanalp, M.S. and M.T. Tsuda, 2014, Tracking Global Demand for Emerging Market Sovereign Debt, IMF Working Paper No. 14/39.

Jeanneau, S. and C. Pérez Verdia, 2005, Reducing Financial Vulnerability: The Development of the Domestic Government Bond Market in Mexico, BIS Quarterly Review (December 2005): 95-107.

Sidaoui, J., J.A. Santaella and J. Pérez, 2012, Banco de México and Recent Developments in Domestic Public Debt Markets, BIS Papers No. 67.