BBVA Economic Research
Department

Economic Watch

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Economic Analysis

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The end of QE2 will have a limited impact on domestic rates

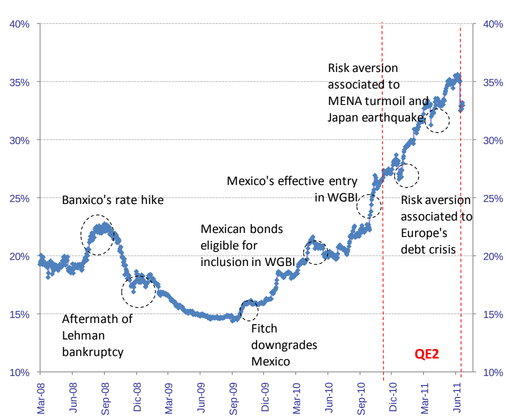
- The FED's quantitative easing increased preference for shares in emerging markets, such as Mexican public debt.
- The foreign flows to Mexican public debt can mostly be explained by the levels of inflation and growth. However, special factors, such as entry to the WGBI and QE2 are also relevant, the same as risk aversion.
- The end of QE2 will have a moderate upward impact on the Mexican 10-year bond yield of about 30 bps. This is the result of a gradual withdrawal of global liquidity and of favorable conditions to growth.

Introduction

One of the factors involved in the evolution of financial markets is the US FED's strategy of quantitative easing (henceforth, QE2), which came into force from November 2010 to June 2011. Throughout this period, the FED increased the size of its balance sheet by buying *Treasuries* in order to make securities that permit the financing of companies more attractive to the markets, and, thus, providing some support to investment and employment.[1]

Chart 1

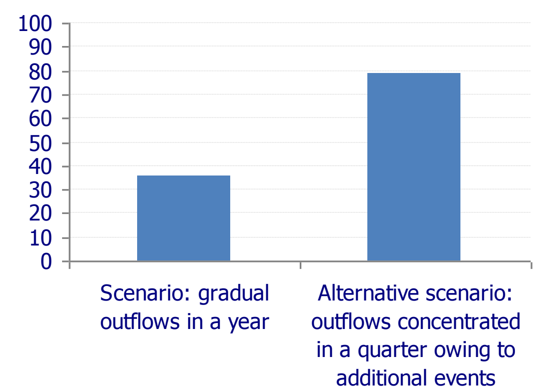
Mexican public debt held by foreigners (% of total)



Source:: Banxico and BBVA Research

Chart 2

Impact of ending QE2 on 10Y bond yield (basis points)



Source: BBVA Research

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[1] Details of the implementation of the FED program are found on: http://www.newyorkfed.org/markets/pomo_landing.html

This increase in liquidity has generated a higher demand for financial assets in emerging markets, including Mexico. This factor, along with Mexico's entry into the World Government Bond Index (WGBI) seems to have contributed to increased public debt holding by foreigners from 25 to 35% of the total between October 2010 and June 2011. Now that QE2 is ending, a relevant question is how much impact it had on foreign inflows and its effect on government interest rates. These rates are the reference value in determining the financial conditions in the rest of the economy. Answering this question is the objective of this Economic Watch.

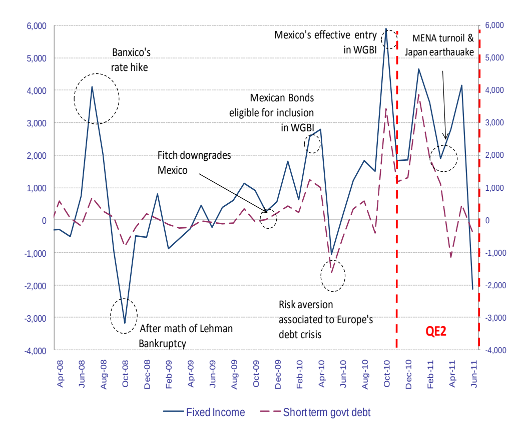
Determining factors of foreign inflows to government debt: domestic factors, global contagion and QE2

As shown in chart 1, the weight of foreign holdings on the total value of Mexican public debt has been increasing. This upturn is related to global factors, such as risk aversion, in addition to specific factors in the domestic economy. In accordance with the statistical analysis presented in column 1 of Table 1 in the Appendix, domestic economic growth (collected by the IGAE) and the spread of 10-year interest rates between Mexico and the USA are significant variables to explain the foreign inflows to fixed-rate market (Bonds).

Special events, such as the bankruptcy of *Lehman Brothers* and the entry of Mexican bonds into the WGBI were also significant. In addition, the statistical analysis suggests that QE2 is relevant variable to explain the foreign inflows (see the appendix for a more detailed explanation).

Chart 3

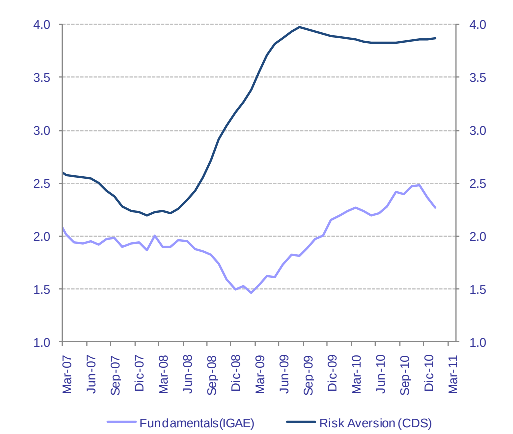
Foreign inflows to short- (Cetes) and long-term (Bonds) fixed income (USD million)



Source: Banxico and BBVA Research

Chart 4

Dependency of factors on foreign inflows to fixed income



Source: BBVA Research
NB: The measurement of dependency is calculated as the 12-month moving average of the absolute value of the estimated standard coefficient.

On the other hand, in accordance with estimates (see Table 2 in the appendix), flows entering the CETES market are explained by domestic variables (inflation and industrial production), and risk aversion (VIX index). It should be pointed out that in agreement with the evolution of foreign inflows[2], shown in chart 3, QE2 is a deciding factor.

[2] External flows are defined as the variation in the total holdings of public debt by foreigners and therefore incorporate a price effect. In all, estimations made on net flows, corrected for the impact of price changes by EPFR Global (the institution providing data of flows of funds and asset allocation to financial institutions) enables similar conclusions to be reached.

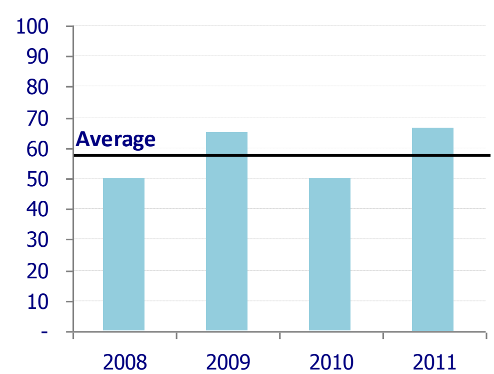
In the analysis of deciding factors in foreign inflows to Bonds, the risk aversion variable was not significant. However, when the sample was restricted to a more recent period, its significance increased. This fact can be established by a dynamic analysis. From the start of the 2008 turmoil, the size of the risk aversion coefficient on foreign inflows has increased, while the weight of domestic fundamentals decreased during the height of the turmoil, and later increased above the 2008 levels. These results partially match those obtained by the ECB (2011), which found that, for a sample of emerging economies, the weight of risk aversion grew after Lehman Brothers went bankrupt and then fell during 2009. With regards to the importance of the fundamentals, the results are similar to those obtained for Mexico.

Foreign inflows: intensity and frequency affect the impact on yields

The limited explanatory power of the estimations, leads us to consider a study of events and the use of data with a higher frequency to calculate potential upward impacts of QE2 on debt yields. In particular, estimating the possible effect of the end of QE2 on the 10-year bond yield started from an analysis of weekly data on foreign inflows on 10-year fixed-rate government issues from 2008 to present. One of the first results is that, in spite of the importance of foreign inflows to the Bond market, the long-term interest rate does not necessarily rise following an exit of flows. In particular, regarding the 10-year Bond market, the exit of foreign investment only coincided with a rise in interest rates 60% of the time. Furthermore, on these occasions, the rate increase was moderate – an average of 14 basic points.

Chart 5

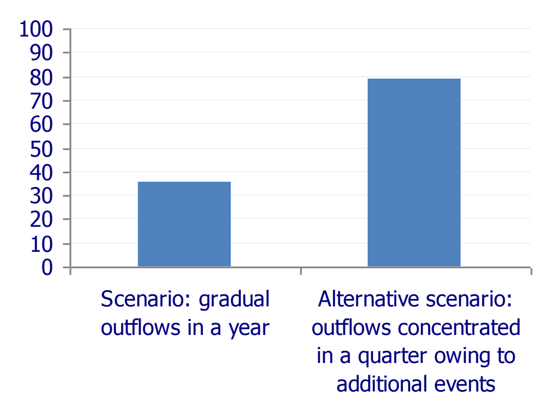
10Y BONDS: Probability of an exit of foreign investment coincides with a rise in interest rates (%)



Source: : BBVA Research

Chart 6

10Y BONDS: Rise in interest rates because of exits due to QE2 ending (basis points)



Source: BBVA Research

From the start of QE2 (November 2010) and Mexico's entry into the WGBI, Mexico received 1.5 times more foreign inflows than those received on average between 2008 and October 2010. A proportion of these flows were due to QE2. In accordance with estimates made, this proportion would be about 48% of the total excess inflows (see the end of the second paragraph in the appendix for a detailed explanation). Various analyses consider that inflows from QE2 will not make a fast and intense exit, and that a large part of them may even stay for the medium and long-term. This is because the Federal Reserve's reinvestment policy is to continue to buy bonds worth 300 billion dollars over the next 12 months. [3] This means that about half the public bonds bought

[3] Kruger and Detrixhe (2011).

through QE2 (600 billion dollars) will be kept. Based on this fact, it seems reasonable to suppose that around half the inflows to Mexico resulted from this situation would remain, and therefore, the outflows would be moderate and gradual over a year. Because of this, and given the fact that interest rates rose only on approximately 60% of occasions when there was an outflow of foreign investment, it can be calculated that the end of QE2 would generate an increase in the 10-year bond yield of about 35 basis points.[4]

However, it should be noticed that the effect on interest rates of foreign outflows depend as much on the amount of the flow as on the number of times that it occurs simultaneously. Thus, in a scenario where the exit is concentrated in only a few months, the 10-year interest rate could increase 80 basis points (see chart 6). This magnitude considers a scenario where additional events, such as an increase in the interest rate for US Treasury bonds, .occur at the same time as outflows due to the end of QE2,

In short, the results of an analysis of foreign inflows and their relationship with interest rates suggest that the end of QE2 will have a moderate effect on long-term interest rates in Mexico.

Appendix

The analysis of determining factors on foreign inflows to government debt was made from a linear regression with the flow of foreign investment to fixed-rate bonds in millions of dollars as a dependent variable. Estimation was based on monthly data from January 2000 to June 2011. Explanatory variables included the monthly rate of growth of the IGAE (as an indicator of the fundamentals of the economy), the 10-year bond yield spread between Mexico and the USA and the 5-year Mexican Credit Default Swap (CDS) as a risk aversion indicator.

In addition, three *dummy* variables are included, defined as a sequence of values 0 or 1, so that a value 1 appears in the period where the relevant situation occurs. Firstly, the variable representing *Lehman Brothers'* bankruptcy takes a value of 1 in the period from September to December 2008 and zero for the remainder, so that they capture the effects from the event on financial flows. Secondly, the *dummy* for Mexico's entry into the WGBI takes a value of 1 between March and December 2010. This period tries to reflect foreign inflows to the bond market since Citi announced that Mexican bonds were eligible for inclusion in the index. Note that this dummy variable implies a continuous increment in bond holdings by foreigners. This seems reasonable considering that investment funds require certain time to adapt to the new index weighs. Finally, another *dummy* variable was used to include the effect of the quantitative easing (QE2), which takes the value of 1 between November 2010 and June 2011. As with the variable representing the impact of the WGBI, this is equivalent to saying the QE2 has had a growing impact throughout the period it was in force, something that seems reasonable.

The results are shown in table 1. The first column shows that all the variables, except the CDS, are significant and have the expected signs. Note that the WGBI variable is significant and has a positive coefficient, which indicates the importance of the event on inflows. Afterwards QE2 was added as an explanatory variable, in order to test its significance together with the WGBI on foreign inflows. As can be seen in column two of table 1, the QE2 variable is statistically significant and its inclusion subtracts significance from the IGAE. This suggests that quantitative easing is certainly relevant in explaining flows to the fixed-rate bond market. As the coefficient for the QE2 *dummy* is about 48% of the combined coefficient of the extraordinary events -QE2 and WGBI -, it was decided to use this proportion as a base for calculating the final effect of QE2 on interest rates.

[4] There are other analyses that try to evaluate the effect of flows on Mexican interest rates. For example, Hernandez and Solís (2011) estimate that an inflow or outflow of billions of dollars has an effect on the curve of government bonds of 20 pbs

Explanatory variables for CETES are monthly inflation and growth of industrial production as indicators of the fundamentals of the economy. While the VIX index tries to reflect risk aversion.[5] As with the fixed-rate bonds, the significance of special events was tested. Table 2 shows that, with regards to foreign inflows to CETEs, the bankruptcy of *Lehman Brothers* was not significant, but QE2 was. It should be pointed out that, in this case, the WGBI variable was not tested, as the short-term debt is not eligible for inclusion in this index.

In the analysis of deciding factors in foreign inflows to Bonds, the risk aversion variable was not significant. However, when the sample was restricted to more recent periods, its significance increased. Following on from the above, a second exercise was carried out, which estimated the specification of table 1 via a regression model with variable coefficients, in order to decide the weight of each of the explanatory variables over time. Chart 4 shows that the absolute standardized value of the regression coefficient of risk aversion increases after the crisis, while there was no significant change in the fundamentals.

Table 1

Deciding factors for foreign flows to fixed-rate bonds

Foreing net inflows to Bonds	(1)	(2)
IGAE MoM	-34.27*	-25.82
	(20.94)	(22.43)
Interest rate diff (MX-US)	149.40***	152.87***
	(40.81)	(43.83)
CDS	-2.29*	-1.73
	(1.32)	(1.41)
Lehman Dummy	-1302.47***	-1465.57***
	(459.09)	(490.04)
WGBI Dummy	1104.20***	
	(236.25)	
QE2 Dummy		979.11***
		(373.05)
R2	0.42	0.35
Observations	98	98

*Significant at 10%, **Significant at 5%,***Significant at 1%.
Standard Error in parenthesis

Source: BBVA Research

[5] The VIX volatility index is commonly used as a risk aversion indicator, as it reflects the volatility implicit in options contracts of the S&P 500 share index.

Table 2
Deciding factors for foreign flows to CETES

Foreign inflows CETES (USD million)	
Inflation MoM	460.92***
	(158.85)
Industrial Production MoM	36.90***
	(11.33)
VIX	-6.60**
	(3.39)
QE2 Dummy	1348.05***
	250.98
R2	0.26
Observations	135

*Significant at 10%, **Significant at 5%,***Significant at 1%. samp
Standard Error in parenthesis

Source: BBVA Research

References

European Central Bank (2011), "Financial Stability Review", pp. 127-133.

Hernandez y Solís (2011), "Pausa Monetaria prolongada vs aversión al riesgo global", Panorama Renta Fija, 15 de julio de 2011.

Kruger y Detrixhe (2011), "Debt seen purchasing $300 billion in Treasuries after QE2", Bloomberg.