An Empirical Analysis of the Relationship between US and Colombian Long-Term Sovereign Bond Yields

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ABSTRACT

We study the relationship between US and Colombian sovereign debt interest rates between 2004 and 2013. We also evaluate the response of the Colombian long-term bond yield and other asset prices to shocks to the US long-term Treasury rate. Two empirical exercises are performed. First, we use a moving window linear regression to examine the link between sovereign bond yields. Second, we estimate a VARX-MGARCH model to compute the short-term response of local asset prices to foreign financial shocks. Our exercises consider data with daily frequency. The analysis is performed on three sample periods (i.e., before, during, and after the global financial crisis). Our findings show that the link between sovereign bond yields has changed over time. Moreover, the short-run responses of local asset prices to foreign financial shocks have been qualitatively different in the three periods. The especial role of US Treasuries as a “safe haven asset” during highly volatile time spans seems to be at the root of these changes.

1. Introduction

Consequent with the recent global financial crisis and the economic slowdown in 2008, the Federal Reserve (Fed) and central banks of the largest advanced economies1 pushed down its monetary policy rate to boost the economy and to prevent a deeper recession. Accordingly,
the short-term interest rate reached the zero lower-bound, and hence, the scope of the traditional monetary policy to raise the economy became ineffective (Doh, 2010; Chen et al., 2012). In consequence, central banks adopted instruments from unconventional monetary policy. In particular, the Fed implemented since 2008 a program of asset purchases known as Quantitative Easing (QE).

The QE policy has led to a reduction of the net supply of long-term bonds, higher security prices and lower long-term yields (Doh, 2010; Curdia and Woodford, 2011; Gagnon et al., 2011; Jones and Kulish, 2013; D’Amico and King, 2013). Nevertheless, the same measures also boosted other asset prices (e.g., commodities and stocks) and increased the market liquidity (Peersman, 2011; Joyce et al., 2011; Curdia et al., 2012; Glick and Leduc, 2012; Schenkelberg and Watzka, 2013; Cronin, 2014).

Turner (2013) and Turner (2014) highlight that the lower long-term bond yields in US and other advanced economies along with the wide market liquidity have pushed international investors into emerging markets and reduced the long-term interest rates in these economies. This process has also entailed other effects such as the appreciation of the local currency, rapid credit growth, inflationary pressures and booms on asset prices (García-Cicco, 2011; Chen et al., 2012; Glick and Leduc, 2012; Moore et al., 2013; Fratzscher et al., 2013; Londoño and Sapriza, 2014).

The shifts in the local long-term sovereign bond yield are crucial for the financial market because this yield acts as benchmark for the pricing of long-run assets. For example, a reduction in this rate encourages the lengthening in the maturity of credit obligations and the undertaking of long-run investment projects (Turner, 2014). Nevertheless, if the long-term yield stays low for a prolonged period, financial stability risks could arise. For instance, an excessive leverage could lead to credit boom episodes and the overvaluation of long-term assets (e.g. houses and stocks) (Turner, 2013; Turner, 2014).

Furthermore, Clare and Lekkos (2000) and Edwards (2010) state that in periods of financial crisis where the correlation of bond yields between distinct economies increases, the ability of the monetary authority to affect the term structure of the interest rates decreases. In those cases, the yield curve is mainly influenced by international factors.

Therefore, the analysis of the relationship between long-term bond yields of emerging and advanced countries, its evolution over time and the effects of changes in these rates are crucial issues for macroprudential policy, financial stability, government debt management, and monetary policy.

Our aim in this paper is to study the changing relationship between the United States (US) and Colombian long-term sovereign bond yield over time. Moreover, we want to analyze the response of Colombian asset prices to shocks to the US Treasury yield and how these responses changed during the global financial crisis.

This paper performs two empirical exercises. First, we employ the moving window linear regression (MWLR) to examine the link between local asset prices and the US long-term Treasury rate. Later, we also use the MWLR to study the relationship between Colombian and US bond yields controlling for the sovereign risk premium and the expected currency depreciation.

Second, we estimate a VARX-MGARCH model to compute the response of local asset prices to three distinct shocks to the US long-term Treasury yield. The source of these shocks are changes in the global volatility, the Treasury term premium and the stance of monetary policy in US. Local asset prices considered in this research are the Colombian long-term sovereign interest rate, the foreign exchange rate, Credit Default Swap (CDS) spreads and the stock market index value.

Our empirical exercises employ daily data of US and Colombian financial variables between June 2004 and November 2013. In addition, for our second exercise we divide the sample into three periods, namely before, during and after global financial crisis. The estimation is performed on each sample period. Hence, we avoid to obscure the effects derived from periods with distinct economic and financial characteristics.

We contribute to the burgeoning literature on this topic in three aspects. First, our empirical exercises are performed on daily data of financial variables. The volatility in our econometric exercises is modeled using GARCH processes. Second, our estimations and responses to shocks are computed for the pre-crisis, crisis and post-crisis periods. This analysis allows us to highlight different effects from shocks which could be associated to economic features of the period of study. Otherwise these effects could be missed. Third, our study is concentrated on the effects of three distinct shocks affecting the US long-term bond yield. The response of Colombian asset prices to surprises on the US Treasury rate could be different depending on the source of the shock.

Our findings show that the relationship between US and Colombian long-term sovereign bond yields has changed over time. In fact, the sign of this link turned negative between the second half of 2007 and the “Tapering” announcement. Our results also suggest that since 2008 the importance of the effects of movements of the US long-term Treasury rate on Colombian asset prices has increased. We also find that the short-run responses of both the Colombian interest rate and other local asset prices to shocks to the US long-term bond yield have been qualitatively different, depending on the sample period and the source of the shock. These changes seem to suggest, first, an especial role of US Treasuries as a “safe haven asset” during the global financial crisis period, and second, a subsequent differentiation of local assets.

The remainder of the paper is organized as follows. Section 2 describes the main stylized facts on the recent evolution of US and Colombia sovereign debt interest rates. In Section 3, we perform a moving window linear regression analysis to study the relationship between long-term bond yields over time. Section 4 estimates the short-run responses on local asset prices to shocks to the US Treasury rate. Finally, Section 5 concludes.

2. Stylized Facts

This section is divided into two parts. The first one illustrates the dynamics of long-term bond yields for the US, Colombia and other emerging countries. In addition, we compare the evolution of some financial variables for Colombia with net capital inflows into its economy.

In the second part, we analyze the changing relationship between US and Colombian interest rates. We divide our sample into three time spans. Moreover, we highlight the main financial facts during those periods.

2.1. Long-Term Sovereign Bond Yield Dynamics

Panel A in Figure 1 plots the 10-year US Treasury rate and the 10-year Colombian sovereign bond yield between June 2004 and November 2013. If the full sample period is examined, then both interest rates exhibit a negative trend. However, this tendency changes along the sample when shorter time spans are considered.

Between 2004 and the first half of 2007, the US Treasury yield exhibits a positive slope as a consequence of the increases in the Fed funds rate to control inflation expectations. From there, bond yields have been decreasing as a result of the expansive monetary policy adopted by the Fed (i.e. the policy rate at the zero lower-bound, the QE program and the Operation Twist) to cope with the global financial crisis. Nonetheless, there are short time spans in 2009 and 2010 when
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