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Foreign-currency bonds: currency choice and the role of uncovered and covered interest parity

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Abstract

Using count-data techniques, this article studies the determinants of currency choice in the issuance of foreign-currency-denominated bonds. In particular, we investigate whether bond issuers choose their issuance currency in order to exploit the borrowing-cost savings associated with deviations from uncovered and covered interest parity. Our findings show that the choice of issuance currency is sensitive to deviations from uncovered interest parity but insensitive, in general, to deviations from covered interest parity. Furthermore, the influence of deviations from uncovered interest parity is stronger for financial issuers than for nonfinancial issuers. In as much as the issuance of foreign-currency-denominated bonds affects the relative international standing of world currencies, one implication of these findings is that monetary policy, through its

influence on nominal interest rates, has a greater impact on the internationalization of currencies than has been previously accounted for.

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Notes

[1] Foreign-currency bonds, throughout this article, are defined as hose bonds issued in a currency other than the currency of the country in which the borrower resides.

[2] Money market instruments and debt securities with a maturity of less than 1 year, are not included in the sample.

[3] For comparison purposes, an analysis of value of issuance is also undertaken, as described in Section VI

[4] See, for instance, Myers (2001).

[5] Descriptions, presented in this article, of the mechanics of standard bond-issuance procedures are informed by the relevant literature and by market participants, including brokers, underwriters and representatives of a number of major bond issuers.

[6] The assumption of independence of irrelevant alternatives implies that the relative probability of each option is independent and so does not change if other options are added or retracted. More simply, if, given a choice between the US dollar and the euro as a currency of issuance, a bond issuer prefers the US dollar, the assumption of independence of irrelevant alternatives implies that this preference for the US dollar will not change by introducing the yen as an additional option. But in practice it may well change (see Luce and Suppes, 1965; McFadden, 1980).

[7] See also Elliot et al. (2003) or Clark and Judge (2008) for comprehensive reviews of this literature.

[8] See Hull (2006) for a discussion of currency swaps.

[9] Rather surprisingly, to our knowledge, this is the only study explicitly taking into account the issue of liquidity of the underlying debt markets.

[10] For instance, Hausmann and Panizza (2003) note that all countries with high inflation are affected by 'the original sin', but this problem is also present in many countries with low inflation and low public debt.

[11] It should be noted that the market for foreign-currency bonds is dominated by issuers residing in developed economies and off-shore financial centres, whereas emerging-market issuers account for a small fraction of this market (see ECB, 2008). Therefore, the 'original sin' argument is extremely important from the point of view of emerging economies, but less relevant for the purpose of this article which attempts to explain the currency choice in the foreign currency bond market at a global level.

[12] Usually, the tax advantages are linked to the 'location' of debt issuance and not necessarily to the currency in which bonds are issued. For instance, Kim and Stulz (1988) note that US dollar-denominated bonds issued off-shore by US corporations were usually bearer bonds and not subject to withholding taxes. This made them more attractive to foreign investors compared with domestic US dollar bonds.

[13] See Sarno and Taylor (2002, Chapter 2), for a survey.

[14] In the survey, this is the fourth factor in order of importance after the 'natural hedge' motive (85% of firms), keeping the 'source of funds' close to the 'use of funds' (63%) and favourable tax treatment relative to the US (52%).

[15] It is important to remark that, according to the definition used by Cohen (2005), 'international' debt securities include not only foreign-currency debt securities, but also home-currency debt securities issued outside the borrower's market or issued in the domestic market but targeted at foreign investors.

[16] In particular, McBrady and Schill (2007) limit their sample to issuances by sovereign government and agency borrowers which have no foreign currency cash flows and no 'natural hedge' reason to issue foreign currency bonds.

[17] There is large empirical support for covered interest parity over short horizon, but less evidence over longer horizons. The available evidence, however, does not seem to support the claim by McBrady and Schill (2007) that there are outstanding profitable arbitrage opportunities using currency swaps over longer horizons. Popper (1993) notes that deviations from long-term covered interest parity are somewhat larger than those from short-term parity, but differences are small. Similarly, Fletcher and Taylor (1996) remark that deviations from swap covered interest parity diminish over time and

disappear over the long-run. In support of McBrady and Schill (2007), they note that ‘unexploited profit opportunities do exist’, since there are ‘neither rare nor short lived’ deviations from parity, net of transaction costs. However, measurement errors could, for instance, account for these outliers.

[18] See, for instance, Fisher et al. (1989) and Graham and Harvey (2001).

[19] See also McBrady and Schill (2007) and Allayanis and Weston (2001).

[20] Alternatively, it is possible to reduce borrowing costs by issuing in foreign currencies for which interest rates are relatively higher, but that ex post depreciate so much as to offset the extra cost associated with higher interest rates.

[21] Since these descriptions were first presented, in the 1990s, the swaps market has, to some extent, moved on, and covering for exchange-rate risk is no longer undertaken in precisely the same manner. Cover for an individual issue can now be acquired via a single, bespoke swap rather than a combination of standardized swaps in the manner suggested by Popper (1993). However, present-day methods of covering exchange-rate risk in the swaps market, and the pricing of this cover, are derived precisely from the underlying logic outlined by Popper (1993), and this logic is employed in this article with no known loss of accuracy.

[22] See Cameron and Trivedi (1998) for a full discussion of count-data models.

[23] Claessens (1992) studies the optimal currency composition of external debt using a utility-maximizing approach where optimal means risk-minimizing, and composition refers to currency composition by value.

[24] The EVT I distribution, also known as the Weibull distribution, has the property that the cumulative density of the difference between any two random variables with this distribution is given by the logistic function. This property makes it possible to link the random utility function with the logistic function. See Maddala (1983).

[25] See Hall et al. (1986) for a discussion of the fixed effects model in a negative binomial setting.

[26] Choice of these variables draws on the findings of other studies that account for the natural hedge, such as Cohen (2005) and Siegfried et al. (2007). Other variables, such as imports and investment in the issuance-currency region, were discarded when found to be statistically insignificant in all cases.

[27] Typically, in empirical work, there are four different approaches available for modelling expected changes in the exchange rate. One approach is to assume perfect foresight and measure expected changes in the exchange rate by observing ex post changes. That is, assume . The drawback with this approach is that when expectation horizons are lengthy, as is the case in this study, with horizons of up to 10 years, then putting aside observations to be used as ex post measures of expected changes in the exchange rate causes the sample size to become prohibitively small. Two alternative approaches are to assume static expectations, letting , and extrapolative expectations, where . The static-expectations approach is based on the idea that exchange rates follow a random walk, while extrapolative expectations assume a backward-looking behaviour. Although the theoretical basis for this seems unsound, in practice the difference in results between from an extrapolative-expectations model and a perfect-foresight model can be quite small (see, for instance, Cavaglia et al., 1993; MacDonald and Torrance, 1990). A fourth approach is to use surveys of exchange-rate expectations, letting , in an attempt to take a direct, as much as is possible, measurement of expectations.

[28] As an empirical starting point, the Gaussian model does, in fact, seem valid for the dependent variable expressed as a share variable, since there are no zero observations in the 2-year-maturity sample bracket, and just 3% of observations take the value zero in the 5-year-maturity bracket and the 10-year-maturity bracket. The standard linear Gaussian model requires that the mean of the dependent variable is high enough so as not to be characterized by a preponderance of zero observations.

[29] See Prais and Winsten (1954). An alternative estimation technique would be the application of Feasible Generalized Least Squares (FGLS). However, Beck and Katz (1995) have shown that FGLS variance-covariance estimates are unacceptably optimistic when dealing with panels where the number of heterogenous units is less than 20 and where there are 40 time periods per unit or less. The implication is that FGLS is inappropriate for the purposes of the present study.

[30] Issuer nationality is defined, in a manner consistent with the Bank for International Settlements, as the nationality of the upper-most level of corporate responsibility, which, as a definition, accommodates the possibility that the issuer may be a part of multinational company, e.g. a subsidiary or a branch plant.

[31] In order to ensure that the issuers in the sample are, in fact, able to exercise a reasonable choice among the five currencies in the sample, included are only those issuers that are observed to issue bonds in at least three of the five issuance currencies during the sample period. This sorting procedure is conducted by nationality rather than by individual issuer, so that if one issuer of a given nationality is observed to issue in three or more different currencies, then all issuers of the same nationality are included in the sample.

[32] Securities with maturities of 1 year or less are excluded because for securities with such short maturities, the forward market can provide cover for exchange-rate risk. Bonds with maturities greater than 15 years are omitted in order to reduce the scope for matching errors generated by inexact matching of maturities between bonds, swap yields and interest rates. The 2-year-maturity bracket includes all bonds with maturities greater than 1 year but less than or equal to 3 years. The 5-year-maturity bracket includes all bonds with maturities greater than 3 years but less than or equal to 7 years. The 10-year-maturity bracket includes all bonds with maturities greater than 7 years but less than or equal to 15 years.

[33] Note that percentage change in the expected number of bonds issued for a unit change in each explanatory variable, holding other variables constant, is calculated as 100 * [exp(estimated coefficient)−1].

[34] Regressions were also estimated with alternative approximations of ‘expected appreciation’ (based, for example, on backward-looking extrapolative expectations), but the results were not materially different.

[35] Expected appreciation is significant as an explanatory variable for only short-maturity bonds (Panel A), where the estimated coefficient is of the expected sign, namely negative (suggesting that issuers prefer to issue bonds in currencies that they expect, broadly, to depreciate over time), and where the magnitude of the estimated coefficient implies that a one-basis-point increase in expected appreciation (the average absolute change in during the sample period is 1.5 basis points) is associated with a 9% drop in the expected number of bonds issued in the issuance currency.

[36] Recall that variables liq, dinv, ma and rgdp are expressed as shares relative to total amounts in all issuance-currency regions. These variables are expressed as relative shares in order to facilitate comparability with results presented in subsequent

sections. Other formulations of these variables (for instance, relative rates of change), yield similar results.

[37] Note that the variables rgdp, liq, dinv and ma are expressed in terms of percentage points.

[38] The average absolute quarterly change in currency share of issuance during the sample period (for bonds that fall into the 2-year-maturity bracket) is 3 percentage points. Recall also that the average absolute change in during the sample period is 25 basis points.

[39] In tests of parameter equality, unreported, we are unable to reject the null hypothesis of equality of coefficients for ε^{u} and .

[40] Government bond yields are used to proxy borrowing costs for a number of reasons. First, as highlighted by McBrady and Schill (2007), government bond yields, unlike corporate bond yields, are free of contamination from default-risk pricing, which may otherwise affect an issuer's choice of issuance currency. Second, yields on investment-grade corporate bonds (which may could be a better proxy for the borrowing costs faced by issuers of foreign-currency bonds) are unavailable for all currencies. Government bond yields are obtained from Bloomberg.

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