



## Currency composition of international bonds: The EMU effect<sup>☆</sup>

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### ARTICLE INFO

#### Article history:

Received 28 November 2009  
Received in revised form 19 January 2012  
Accepted 28 January 2012  
Available online 4 February 2012

#### JEL classification:

F34  
F36

#### Keywords:

Bond markets  
Monetary union  
Currency risk  
Original sin  
Liquidity

### ABSTRACT

We analyze the impact that the launch of the EMU had on the currency denomination of private international bond issues in 1990–2006 using micro-level data. Our stylized model predicts that the introduction of the euro would lead to an increase in the share of euro-denominated debt and a decline in the share of dollar-denominated debt issued by firms located in countries outside both the United States and the euro area. Moreover, our model predicts that the euro effect would be particularly pronounced for nonfinancial firms. Our empirical results are consistent with these predictions. In addition, we find that among nonfinancial firms, the impact on new issuers is larger than on seasoned issuers. Extending the model to allow for differences in issuance volumes across future monetary union countries prior to integration, we also predict larger increases in euro-denominated issuance among firms from smaller monetary union countries. We confirm this prediction for international bond issues by euro-area firms.

Published by Elsevier B.V.

### 1. Introduction

Firms issuing bonds in international bond markets face a choice of a currency in which to denominate their issues. Transaction costs may differ across currencies due to differences in the size of markets for bonds denominated in different currencies combined with scale economies that exist because larger markets enjoy greater analyst coverage, hedging opportunities, and a larger set of potential creditors. On their own, these scale economies would tend to push firms issuing in foreign currencies towards the dominant international currency, the U.S. dollar. Individual firms, however, may have idiosyncratic advantages of issuing in certain currencies. For example, issuing in the currency that matches a firm's revenue stream may avoid currency mismatch problems.

<sup>☆</sup> An earlier version of this paper was circulated as “Who drove the boom in euro-denominated bond issues?” Helpful comments were received from Roc Armenter, Stijn Claessens, Giancarlo Corsetti, Patrick Honohan, Oscar Jorda, Philip Lane, Philippe Martin, Andy Rose, Diego Valderrama, Frank Warnock, and Jie Zhang, as well as two anonymous referees and participants at seminars in UC Davis, UC Santa Cruz, USC, UW-Seattle, Federal Reserve Banks of New York and San Francisco, the 2008 AEA meetings, the Darden International Finance Conference, the NORFACE seminar at Trinity College, the China International Conference in Finance, and the Australasian Finance and Banking Conference. Anita Todd and Elliot Marks helped prepare the draft. All errors are ours. All views presented in this paper are those of authors and do not represent the views of the Federal Reserve Bank of San Francisco or Federal Reserve Board of Governors.

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The choice of invoice currency in international goods transactions has been studied extensively. Early studies (Swoboda, 1968) emphasized choosing a currency to reduce transactions costs, while more recent studies have stressed minimizing exposure to macroeconomic volatility (Giovannini, 1988) and network effects (Rey, 2001; Goldberg and Tille, 2008). Similar concerns should arise in the currency-denomination decision for bond issuance. For example, issuing bonds in U.S. dollars versus the euro has different implications for the dynamics of the liability side of a firm's balance sheet because of the dollar-euro exchange rate fluctuations.

In this paper, we investigate the determinants of foreign firms' decisions regarding currency denomination of bonds by examining the impact the launch of the euro had on such decisions, using theoretical arguments and empirical analysis of micro-level data. The introduction of the euro has been shown to lead to a reduction in the cost of bond issuance in euros relative to the cost of bond issuance in pre-monetary union national currencies (Santos and Tsatsaronis, 2006; Melnik and Nissim, 2006). Similarly, Coeurdacier and Martin (2009) find that the advent of the euro has resulted in a 14% to 17% reduction in transactions costs. These reductions in the cost of issuance in euros, holding all else equal, should make issuing euro-denominated debt more attractive to foreign firms.

Our micro-level data set allows us to differentiate between the firms that switched to euro issuance from issuance in other currencies from firms that already issued debt denominated in currencies of future EMU members and increased the share of that debt in their overall bond issuance after the introduction of the euro. We refer to the first effect of the euro introduction as occurring on the

“extensive” margin and the second as occurring on the “intensive” margin.

Of course, there is substantial evidence that the launch of the EMU also coincided with increased financial market integration in European stock and bond markets (Kim et al., 2006). Kalemli-Ozcan et al. (2010) find that the elimination of currency risk and legislative-regulatory convergence played a role in the financial integration of the euro area. However, we cannot follow issuance decisions by individual European firms because we do not have complete data on domestic bond issuance at the firm level. For that reason, we concentrate our study on the issuance decisions by firms from countries outside both the euro area and the United States, determining how the launch of the euro affected their propensity to either issue in euros in greater volume or to switch from dollar-denominated to euro-denominated issuance.

To understand the impact of the launch of the euro on currency denomination of international bonds, we construct a model containing two large areas: a financial center that can be interpreted as the United States and a collection of identical countries that form a monetary union and can be interpreted as the euro area. Firms in these areas have heterogeneous propensities to issue debt denominated in the foreign currency. The main tension of the model is between the transaction costs associated with issuing in a given currency, which we assume to be decreasing with market size due to scale economies, and currency risk premia or other costs specific to issuing in foreign currency. We model the advent of the euro as a switch from many individual currency markets to a single currency market. Our model predicts an increase in the share of euro issuance and a decline in the share of dollar issuance for firms in both the monetary union and in the large financial center.

As discussed above, we cannot take these predictions directly to the data as firm-level data on issuance in domestic currencies are lacking a complete set of domestically placed issues. We therefore extend our model to consider its predictions for currency-of-issuance decisions of firms located in small outsider countries, i.e., countries other than the U.S. or the euro-area member countries. Our model predicts that the composition of foreign-currency issues by firms located in the outsider countries will also be tilted by the global changes in issuance volumes towards issuing debt in euros and away from issuing debt in dollars. Moreover, our model predicts that the impact of the launch of the union will be greater for firms that are more sensitive to changes in transaction costs, as we would expect to be the case for nonfinancial firms.

We take these last predictions to a large data set of individual bond issues of firms from countries that are outside the United States or the euro area. We do this to make sure that our results are not driven by the omission of domestic bond markets, for which our data source is incomplete (Burger and Warnock, 2006). Our data come from Dealogic DCM Analytics data base, a.k.a Bondware, and include all bonds issued in international bond markets by private firms with nationality of operations in one of nine countries active in international bond markets between 1990 and 2006.<sup>1</sup> To our knowledge, our paper is the first to bring a large micro-level data set to bear on the question of currency denomination of bonds.<sup>2</sup> The use of micro-level data allows us to control for the currency of each bond issue, its size, maturity, governing law, and the issuer's nationality of operations. The latter is especially important because it allows us to

control for country-specific factors and because, as Warnock and Cleaver (2003) point out, analysis based on aggregate data is subject to a bias due to bond issuance through offshore financial centers. Finally, aggregate data are reported as either debt outstanding or issuance net of repayments, which are noisy measures of issuer's behavior, unlike the issuance data.

We first examine the impact of the advent of the euro on the currency denomination of international bond issues in a multinomial logit specification, separately for financial and nonfinancial firms. Firms choose their currency of issue between U.S. dollars, euros, or another currency. Our results are consistent with the predictions of our model in that they show an economically and statistically significant increase in the probability of issuing in euros after the advent of the EMU for nonfinancial firms, but not for financial firms. Our point estimates indicate that, other things being equal, the probability that a nonfinancial firm's international bond issue was denominated in euros was 17 percentage points higher after the advent of the EMU, while the probability that it was denominated in U.S. dollars was 13 percentage points lower. This indicates that most of the increase in euro-denominated issuance was at the expense of U.S. dollar issuance. We find no significant impact of the EMU on the currency denomination of bonds issued by financial firms.

We next split our sample into seasoned and unseasoned issuers, to allow for heterogeneity in the EMU effect across these two groups. Seasoned firms may have paid fixed costs associated with issuing in a given currency for the first time, or may have established relationships with underwriters or important customers in a certain currency bond market.<sup>3</sup> Unseasoned firms, on the other hand, do not have a connection to a specific currency market. Repeating our analysis for new issuers and for seasoned issuers separately, we find that the effects of the EMU are larger for new issuers than for those firms that issued both before and after the introduction of the euro, as we expected. Again, financial firms remain largely unaffected.

These results are important because over time the decisions made by unseasoned issuers are likely to drive the global pattern of currency denomination, as some seasoned issuers will eventually exit the market. Moreover, the forces tying issuers to a specific currency, such as informational asymmetries across markets, are also likely to diminish with time. Therefore, if unseasoned firms are systematically more sensitive to changes in market volumes, such as those associated with the advent of the euro, aggregate studies of the initial response to the launch of the EMU are likely to underestimate the magnitude of the longer-run impact of the EMU.

To further isolate the extensive and the intensive margins of the overall increase in euro-denominated issues, we compare the changes in volumes of debt issued in euros and other currencies by new and seasoned firms. We find a positive, but insignificant, impact of the launch of the euro on the volume of euro-denominated issues by firms that issued both in future euro-area national currencies prior to the launch of the EMU and in euros afterwards. Among the full set of seasoned firms we find a positive statistically and economically significant impact. This provides indirect evidence that the euro effect among seasoned firms was stronger among those that had previously not issued in euro. We also find that the impact of the EMU launch on unseasoned issuers was higher than for the full sample. This would be expected, as both unseasoned issuers and those that had not previously issued in euro would be more likely to respond to the increased scale economies presented by the launch of the euro.

Finally, to focus on the impact the advent of the euro may have had on euro-area issuers, we extend the model to allow future

<sup>1</sup> We restricted our sample to bond issues with market type not explicitly labeled as “Domestic.” Formally, this corresponds in Bondware to excluding all issues with designation D (domestic market public issue), DA (Domestic auction), DG (Domestic government debt), DP (Domestic market private placement), or DS (Domestic market secondary offering).

<sup>2</sup> Melnik and Nissim (2006) do look at a smaller sample of 316 eurobond issues, but the focus of their study is on changes in the terms of borrowing, rather than volumes. Santos and Tsatsaronis (2006) show that the arrival of the euro led to a reduction in the underwriting fees of corporate bonds issued in the new currency due to increased competition.

<sup>3</sup> The literature supports the existence of such fixed costs. Cai et al. (2007) find that IPO bonds are subject to more underpricing, while Gande et al. (1999) find that IPO bonds carry higher spreads than bonds of seasoned issuers, and Hale and Santos (2009) find that firms pay higher spreads on their IPO bonds than on subsequent issues.

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