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Chapter 1

Introduction

This dissertation studies sovereign bond auctions in the euro area. Governments use auctions to refinance their outstanding stock of debt and to finance budget deficits. During these auctions, a group of financial institutions called primary dealers places bids for newly issued sovereign bonds. Given the supply, their bids determine the yield the government has to pay on its new debt. Success or failure of auctions therefore impacts governments' funding costs. The outcome of auctions is also often seen as a reflection of market confidence in the creditworthiness of governments, in particular in periods of crisis.

The analysis in this dissertation is based on a dataset of sovereign bond auctions for Germany, The Netherlands, France, Belgium, Italy and Spain. Together, these countries accounted for 90% of the outstanding sovereign debt in the euro area in 2017. The period studied can be divided into a pre-crisis period and a crisis period. We make this distinction in the dissertation, because the crisis resulted in a particularly challenging funding environment for euro area governments.

Sovereign bond auctions and the crisis

The recent financial and sovereign debt crisis resulted in bail-outs in the financial sector and substantial fiscal stimulus. Government deficits increased strongly after 2007, as is shown in Figure 1.1 for the countries studied in this dissertation. These high deficits caused a significant increase in the funding needs of euro area governments.

The crisis also led to a divergence of sovereign bond yields. Italy and Spain experienced a strong increase in secondary market yields between 2010 and 2012 (Figure 1.2). In the same period yields in Germany, The Netherlands and France trended downward, except for a mild increase in the first half of 2011. High yields increased the cost of issuing new debt, while volatile yields contributed to uncertainty about funding costs, and in some instances this led to doubts about market access. As a result sovereign bond auctions became widely followed events during the crisis, and were sometimes seen as a test for the creditworthiness of governments.

During the crisis, sovereign debt levels and annual debt issuance increased strongly after 2007 (Figure 1.3 and 1.4). Although deficits fell since, debt levels were still above their pre-crisis level in 2017 in all countries in our sample. Over time, higher debt levels lead to higher funding needs, because the outstanding debt needs to be refinanced when it matures. As a result of lower deficits and a lengthening of the maturity structure of newly issued debt, annual debt issuance has moderated since the crisis. However, it still exceeded its pre-crisis level in all countries except Germany in 2017.

The challenges faced by governments during the crisis and the crisis legacy of persistently high government debt and high funding needs illustrate the importance of gaining a better understanding of sovereign bond auctions in the euro area. This dissertation aims to contribute to this. The remainder of this introduction provides an overview of the four subsequent chapters.

Chapter 2: Cross-border auction cycle effects of sovereign bond issuance in the euro area

Earlier research (Lou *et al.* (2013), Fleming and Rosenberg (2007) and Beetsma *et al.* (2016)) finds that yields on outstanding debt show an auction cycle around sovereign debt auctions, meaning that yields increase in the days prior to an auction and decrease afterwards. Such a peak in secondary market yields can be related to the fact that primary dealers purchase a high volume of sovereign bonds during an auction, and want to be compensated for the resulting portfolio risk on their balance sheets.

In Chapter 2, we confirm the presence of such auction cycles for all countries in our sample except The Netherlands. We also show that auctions have cross-border spillover effects. We find these spillover effects in all countries in our sample. The spillovers are stronger during the pre-crisis period. We develop a model in which spillover effects are related to cross-border activity of primary dealers.

The findings in Chapter 2 suggest that it can be costly if governments hold auctions at the same date. Spillovers from the foreign auction may exacerbate the domestic cycle and increase the yield governments have to pay on their newly issued debt. The policy implication is that proper coordination of auction calendars among euro area countries may reduce issuance costs.

Chapter 3: Bid-to-cover and yield changes around public debt auctions in the euro area

The auction cycles found in Chapter 2 suggest that yields on outstanding debt decrease in the days after an auction. However, the response of yields

to an auction may depend on the success of the auction. During the crisis, the outcome of sovereign bond auctions was for example seen as a test case for the creditworthiness of governments which could affect secondary market yields.

In Chapter 3 we relate the success or failure of an auction to the yield movement on outstanding debt after the auction. To measure the success of an auction we use the bid-to-cover ratio. This is a measure of the total amount of bids placed during the auction, divided by the issuance volume. A high volume of bids relative to supply indicates a successful auction. We find that a more successful auction leads to lower secondary market yields after the auction. This effect is stronger when market volatility is higher. These results are in line with a model of primary dealers who receive private signals from their clients about the value of the newly issued bond prior to the auction.

The findings in Chapter 3 suggest that the cost of a failed auction are particularly high in times of crisis. This indicates that it is costly if governments set ambitious funding targets when markets are volatile. To the extent possible, it is therefore worthwhile to set lower target volumes when markets are turbulent and shift issuance towards periods with low market volatility.

Chapter 4: The maturity of sovereign bond issuance in the euro area

Through the maturity of newly issued debt governments can influence the amount of debt to be rolled over. Debt with a short maturity has to be rolled-over more frequently, which can be risky. However, the yield on long-term debt is usually higher than the yield on short-term debt, so

issuing long-term debt is more expensive. Governments therefore face a trade-off between roll-over risks and issuance costs.

In Chapter 4 we study the drivers of the average maturity of newly issued debt in the euro area. We develop a model based on Broner *et al.* (2013) and Greenwood *et al.* (2015) where investors have a preference for short-term debt due to price risk of long-term debt and because of the liquidity services that short-term debt provides. This results in the trade-off for the government between lower funding costs (due to lower price risk and more liquidity services) for issuance of short-term debt versus lower roll-over risk for long-term debt. We indeed find a negative relation between the maturity of newly issued debt and the spread between long- and short-term yields. We also find that the average maturity of newly issued debt is negatively related to the level of yields. Our results suggest that a preference for liquid short-term debt by investors influences the maturity choice of governments.

The analysis in Chapter 4 describes the reaction function of sovereign debt managers. It does not provide a direct policy implication, but the results in the chapter may be of interest to central banks because the response of governments to changes in the level and the slope of the yield curve may counteract the effect of monetary policy.

Chapter 5: Determinants of the bid-to-cover ratio in euro area public debt auctions

The results in Chapter 3 suggest that the success of an auction affects sovereign yields on outstanding debt, and that yields are more sensitive to the results of auctions when markets are volatile. The strong interest of debt managers to prevent a ‘failed’ auction raises the question in which circumstances auctions are more successful.

In Chapter 5 we study the determinants of the success of sovereign bond auctions, as measured by the bid-to-cover ratio. We find that high secondary market yields and low secondary market volatility is associated with more successful auctions. We provide some evidence of a flight towards safe short-term debt issued by Germany during the crisis. We also show a positive relationship between the outcome of the current and the previous domestic auction, as well as positive spillovers from the success of the previous foreign auctions.

Our results suggest that, where possible, governments would benefit from shifting debt issuance from periods with high market volatility to periods with low volatility. Another policy implication is that governments should take into account the outcome of previous domestic and foreign auctions when they decide on their targeted issuance volume.

Figure 1.1: Government deficit

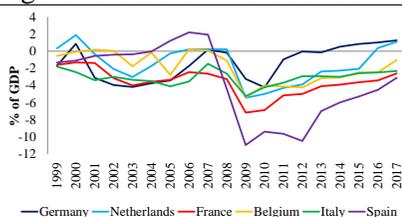


Figure 1.2: 10-year yields

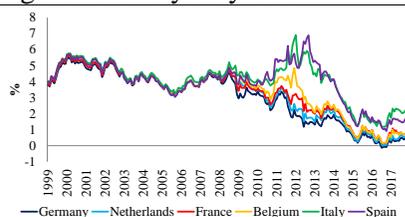


Figure 1.3: Government debt

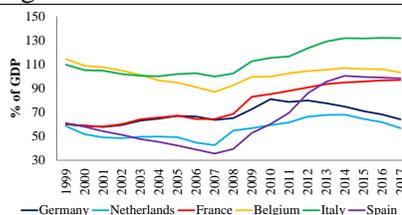
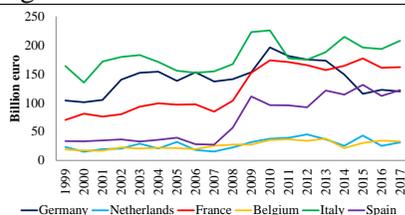


Figure 1.4: Annual debt issuance



Source: AMECO, Thomson Reuters Datastream, Bloomberg, and national sources. Debt issuance covers debt with a maturity above 1 year, and excludes inflation-linked debt and foreign currency debt.