Big Data sentiment analysis in the European Bond Markets

1. Introduction

The surge in the Euro area yield spreads has fueled in intense debate about their determinants and the sources of risk. Over the last months, financial markets have been concerned about the possibility that the new Italian government will not be able to undertake important economic reforms. Similarly, in 2017, financial investors were suffering from unclear economic policies perspective during French's presidential campaign. In both cases, investors sentiment about countries economic prospective deteriorate, producing an increase of national interest rates with respect to their German counterpart. Moreover, during the French election period, bad mood propagated to other European countries with not solid fiscal fundamentals (i.e. Spain and Italy). Therefore, it is clear that financial investor's sentiment plays an important role in determining interest rates dynamics within a country but also across countries.

The main contribution of this paper is threefold. First, we capture financial investor's sentiment by using textual information in newspaper. We exploit the new Big Data dataset, Global Database of Events, Language and Tone (GDELT) and construct news based sentiment and uncertainty indexes for the different Euro area countries. The aim is to test the hypothesis that an increase in political uncertainty, i.e. unclear political guidelines, may cause deterioration on domestic investor's sentiment with a consequent rise on national interest rates.

Second, we will introduce a new approach to account for possible spill over of political risks in different economies of the Euro area. In contrast to the existing literature where uncertainty measures assess domestic media perception of domestic news (Bloom, 2014), here we will study also how domestic investors, through the lens of domestic media coverage, perceive facts happening in other European countries. The objective is to understand when worries in a country may be transmitted to another European country and how this mechanism could shape the behaviour of investors and the dynamics of yield spreads in the European bond market.

Finally, following Andritzy (2012) and Gennaioli, Martin and Rossi (2014) we will evaluate to what extent interest rate dynamics determined by our new sources of risks would affect the composition of banks'sovereign bond portfolios in the Eurozone.

2. Methodology

We adopt a procedure in three steps.

In the first step, we construct sentiment indexes for three leading European countries, namely Italy, Spain and France and we use interest rate data from Bloomberg for a sample period starting in February 2015 and ending in September 2018. From the GDELT dataset we select news articles for each country which main topics are: "interest rates", "elections", "debt" and "fiscal policy". Then, we use a dictionary-based approach proposed by Loughran and McDonald's (2011) to identify the tone (positive, negative and uncertain) of the selected news. We also construct an anxiety measure according to the Regressive Imaginary Dictionary (Martindale C. (1987)).

In the second step, we analyse the impact of classical yield spreads risk components, such as credit and liquidity risks (see Beber, Brandt and Kavajecz (2009), Garcia and Gimeno (2014), Manganelli and Wolswijk (2009), Favero, Pagano and von Thadden (2010), Monfort and Renne (2011)), along with our four new sentiment measures. We use a quantile regression method introduced by Koenker and Bassett (1978). This is flexible approach which allows us to study the impact of our sentiment indexes to the whole yield spreads distribution.

Our final step is to explore how these components of yield spreads contribute to explain changes in the sovereign debt portfolios of Eurozone banks. Our analysis is the first one which studies European banks' portfolio allocations in the presence of liquidity risk, credit risk and sentiment risk. In the literature only the effects of two sources of uncertainty have been analyzed (Beber, Brandt and Kavajecz (2009)). They show that banks prefer liquidity rather than credit quality since banks hold government bonds principally for their liquidity services (Gennaioli, Martin and Rossi (2014)). This is true especially during the euro crisis (Gimeno and Garcia (2014)) where an increase in the liquidity risk of peripheral government bonds led to a significant adjustment of banks' bond portfolios swapping less liquid bonds of the periphery for more liquid bonds of the core (flight-to-liquidity). As a matter of facts, a unified study assessing, at the same time, the impact of credit, liquidity and sentiment risks on European banks' portfolios is missing and in this part of the paper we will fill this gap in the literature. We run a VAR including sovereign bond exposures, credit risk, liquidity risk and sentiment measures. This flexible methodology allows detecting the effects on bank's portfolios of a shock on each risk component of yield spreads. We estimate the impulse response function of risks shocks, identified via sign restrictions[1], to assess how they affect the exposure of domestic banks to national debt, as well as their spillover effects to bond portfolios of banks in neighbouring countries in the Eurozone. Finally, by the use of variance decomposition techniques, we aim at understanding the contribution of every single source of risk in the variations of sovereign debt portfolios of euro zone.

[1] See Lutz Kilian comment on the panel discussion of Battistini, Pagano and Simonelli (2012) paper.

3. References

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