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How Germany benefits the most from its Eurozone membership

Januj Juneja*

Department of Finance, College of Business Administration, San Diego State University, San Diego, CA 92182, United States

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ABSTRACT

Post-institutionalization, the Eurozone has seen a marked increase in the integration of its financial markets. An important outcome of this has been the elimination of exchange rate risk because of the introduction of a common currency. We study the effect of this integration through a discrete-time affine term structure model with state variables obtained from the application of two extensions of principal components analysis to the multi-country setting by focusing on seven members of the Eurozone. Our results, derived from formulating and testing three hypotheses, show that Germany has gained disparately larger benefits from its membership in the Eurozone.

1. Introduction

Scholars have shown that the Eurozone has experienced increased financial integration in its markets since its inception in 1999 (Ferrando et al., 2004; Allen and Song, 2005; Kim et al., 2005 ; Bekeart et al., 2013 ; Gebka and Karoglou, 2013). Studies have also attested that this integration results in benefits to all members of the Eurozone (e.g., Demyanyk and Volosovych, 2008; Kalemli-Ozcan et al., 2010; Schmitz and von Hagen, 2011).[1,2] Fontaine (2014) remarks that fundamentally, the creation of the euro as a single currency should reduce transactions costs across member nations and this should bolster trade, amongst other financial activities, across them. Under the same conditions and the same currency, he further claims that, any differences across countries reduce over time through the pursuit of convergence processes by all nations as regards policy decisions. Amongst policymakers, the prevailing opinion was that the implication of the implementation of these policies would result in convergence of the Maastricht criteria (Pugh and Jeffrey, 1997) leading to simpler economic coordination and eventual stabilization across countries (Fontaine, 2014). In contrast, several countries ran into constraints in the application of these policies. The single currency and affiliated monetary system imposed one common economic policy (through establishment of ECB) to different countries, i.e. countries with different economic histories. For instance, Lane (2012) plots public debt ratios (as a percentage of GDP) for seven important members of the Eurozone (Germany, France, Italy, Greece, Ireland, Portugal, and Spain) over the period 1982–2011 and concludes that they have rather distinct debt backgrounds. The uniform treatment of inherently disparate states led to enhanced dispersion in other key financial and economic variables across member states since the adoption of the common currency (Fontaine, 2014). Credit ratios (as a percentage of GDP) increased substantially for Portugal, Ireland, Italy, Greece, and Spain over the period 1998–2007.[3] The reason for this is threefold and

* Corresponding author.
E-mail address: jjuneja@mail.sdsu.edu.

[1] Please see Baldwin et al. (2008) or Mayordomo et al. (2015) for studies examining general benefits of Eurozone membersip.

[2] There is also a smaller literature that focuses on the costs to membership in the Eurozone. As the focus of our study is on the benefits to Eurozone membership, we refer the reader to Afonso and Furceri (2008) or Lane (2012) for examples of such studies.

[3] Some authors, for example, De Grauwe and Ji (2012), apply the acronym PIIGS to these five countries.

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follows the adoption of the euro: first, these countries could now raise money using a common currency, devoid of potentially adverse consequences of exchange rate risk, enjoy the benefits of lower interest rates, and experience simpler credit driven borrowing opportunities (see, e.g., Lane, 2012; Storm and Naastepad, 2016). Lane (2012) tabulates current account differences over the period of 1993–2011 for the aforementioned seven member states of the euro. Before the creation of the euro, current account imbalances were quite small, but by 2007, several countries (e.g., Portugal, Greece, and Spain) were running strong current account deficits and on the other hand, Germany was running sizeable surpluses (Lane, 2012). Between 2003 and 2007, Germany experienced very large current account surpluses, averaging around 5.1% (as a percentage of GDP) over the period (Lane, 2012). Meanwhile, at the opposite end of the spectrum, Greece and Portugal were both running large current account deficits, averaging −9.1% and −9.2% as a fraction of GDP (Lane, 2012). The commencing of the Global Financial Crisis in 2007 brought with it an exacerbation of the effects of these economic conditions. However, it was not until late 2009 that the severity of the subprime crisis began to hit Europe hard, precipitating into the European sovereign debt crisis in late 2009 (Lane, 2012; Fontaine 2014).[4,5] Lane (2012) reports that several countries began reporting unexpectedly large increases in their deficits (as a percentage of GDP). These changes caused dramatic rises in spreads on sovereign bonds between Germany and the PIIGS countries. Such spreads, which were close to zero before the crisis, experienced substantial increases over the period of October 2009-June 2012 (please see Fig. 2 of Lane (2012) for more information) which coincided with the start of the European crisis. The European crisis also brought with it a further widening of trade imbalances. From 2008–2011, Germany had experienced an increase in its current account surplus of 0.6% (as a percentage of GDP) with respect to the previous four year period, on average, in its already very big current account surplus now averaging around 5.7% (as a percentage of GDP) over the current period (Lane, 2012). Meanwhile, at the opposite end of the spectrum, Greece and Portugal were both running even larger current account deficits with respect to the previous four year period, averaging −11.1% and −10.5% (as a fraction of GDP) over the current period (Lane, 2012). Thus, it can be argued that trade imbalances are at the core of what has been driving variations in benefits across countries since the inception of the euro through the beginning of the European crisis. However, the extent to which these benefits vary across countries is raising questions in the media and among scholars. An important attribution of this disparity has been the elimination of exchange rate risk through the adoption of a common currency. In principle, the elimination of exchange rate risk would presumably lead to enhanced benefits to those members of the Eurozone whose economies are strongly driven by exports such as Germany.[6] Schweiger (2015) asserts that Germany was in favor of increasing economic and political integration because the economic benefits of a shared gathering place that enabled a major export market for finished goods manufactured in Germany outweighed its financial costs to European integration. Substantial portions of the recent trade surplus that the Eurozone has been running have been primarily driven by Germany.[7] Such surpluses “artificially” inflate the Euro because the increase in its value is just a reflection of the fact that the formation of the Eurozone has enabled Germans to increase their exports.

In this paper, we show that the creation of the Eurozone has led Germany to benefit the most from its Eurozone membership. We provide empirical evidence through the postulation of three hypotheses surrounding the link between the creation of the Eurozone and the substantial increase in the strength of the German macro economy following the initiation of the Eurozone. The benefits are assessed using the term structure model of Adrian et al. (2013) (hereafter, ACM), using risk factors extracted from the application of principal components analysis (hereafter, PCA) over the period January 1999 through July 2013. The period of our study starts from the institutionalization of the euro because we desire to understand how member countries have fared since the zone’s full inauguration. For this reason, we study member countries within the group setting and not in the individual setting. Our sample consists of all Euro members for which enough reliable bond data are available. This list includes Germany, France, Italy, Portugal, the Netherlands, Austria, and Belgium. We chose to employ the term structure model of ACM due to its simplicity and ease of application of PCA in the multi-country setting. In our implementation of the model of ACM, we employ two extensions of PCA to the multi-country setting. In one extension, we simply pool all the data into a single dataset and use ordinary PCA to extract factors for all members of the Euro treating it as a single group. The other application is a multivariate extension to PCA developed by Flury (1984, 1988) called common principal components analysis. The motivation behind our usage of PCA to extract factors stems from its wide usage, popularity, and ease of implementation. For these reasons, scholars (e.g., Litterman and Scheinkman, 1991; Ludvigson and Ng, 2009; Egorov et al., 2011) have applied PCA to the term structure of interest rates for decades. Additionally, its application as a method for extracting factors for use as the state vector to model term structure dynamics has recently begun to gain popularity (e.g., Ang and Piazzesi, 2003; Adrian et al., 2013; Joslin et al., 2014).

Few studies examining the extent to which Germany benefits from its Eurozone membership exist in the extant literature. Mattern et al. (2012) find that all countries in the Eurozone benefit from their membership, but none to the extent of Germany. The authors conclude that Germany received half the total benefits from the first decade of the existence of the Euro, which were assessed using competitiveness and trade within the European Monetary Union. The authors reached their conclusions by informally examining several economic variables. Petersen et al. (2013) assess economic consequences of the euro membership to Germany. The authors focus on the development of a number of imaginary scenarios focusing on the GDP of Germany within the context of these scenarios.

[4] Please see Fontaine (2014) for more information and in particular for more information regarding how the subprime crisis contributed to the sovereign debt crisis.

[5] Juneja (2016), who studies patterns in volatility across term premium dynamics across the US and its main trading partners during crisis periods, finds that the similarity in the aforementioned patterns was the strongest during the global financial crisis. Moreover, although across the Eurozone and the US, these were especially similar in 2013 during the ongoing Eurozone crisis, the magnitude of the impact was stronger on the Eurozone than the US. These findings are consistent with Fontaine (2014) who provides a description of the extent of the severity of the negative effects of the subprime crisis on European nations leading to the explosion of European real-estate bubbles and financial bubbles and becoming the Eurozone crisis.

[6] http://www.thelocal.de/20150202/german-exports-overshadow-imports-by-220-billion-economy.

[7] http://www.businessinsider.com/eurozone-trade-balance-surplus-jan-2015-2015-2.