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Bank performance and convergence during the financial crisis: Evidence from the 'old' European Union and Eurozone ☆

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ABSTRACT

This paper investigates the process of banking integration in the EU15 countries and the Eurozone by testing for convergence in bank efficiency among commercial banks. We use a two-step approach: First we estimate efficiency by applying an innovative methodological approach that treats banks' non-performing loans as an undesirable output. Second, we apply the Phillips and Sul (2007) panel convergence methodology to assess the convergence process in European banking. Our results indicate an overall decline in efficiency and no evidence of group convergence following the financial crisis. However, we find the presence of club formation with typically weak convergence. The heterogeneity displayed by the transition parameters for the individual countries and the notable decrease in competition levels post 2008 highlight the impact of the financial crisis on the integration process.

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1. Introduction

Following the introduction of the Single Market by the European Union, there have been a series of initiatives and reforms aiming to improve the integration of the European banking sector. Evidence from recent studies based on data prior to the financial crisis show that while the European banking sector has been integrating, some fragmentation are still inherent due to national characteristics (Baele, 2006; Affinito and Farabullini, 2006; Vajanne, 2007; Rughoo and Sarantis, 2012).

As widely reported, the global financial crisis (GFC) has uncovered several systemic weaknesses amongst European banks which have resulted in higher credit, refinancing and sovereign risks. A current analysis of European banking integration would provide a deeper insight into the impact of the GFC on the functioning of the single banking market. We argue that the unprecedented scale of governmental bailouts could distort the competitiveness within the Euro area and Eurozone. The competitiveness could be distorted above all by the fact that some key market players have received unfair advantages through cheaper capital and funding. For example, the UK's estimated package could reach US $1.1 trillion in order to restore confidence in the banking system. In Denmark, 13 of the country's 140 banks were bailed out by the central bank or acquired by their competitors. The expected volume of the rescue package is estimated to be EUR 593.9 billion (European Commision, 2012; Bloomberg, 2009).

This paper contributes to the ongoing empirical research on banking integration in several ways. Firstly, assuming that the integration process has been significantly undermined and to some extent undergone a reversal due to the GFC, we investigate

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whether the single market initiative for a homogenous and competitive banking market has extended to the cost structures and efficiency of banks. In particular, we examine the impact of the GFC and the ensuing Eurozone sovereign debt crisis on bank efficiency. Secondly, we analyse and estimate the convergence of the European banking system using the Phillips and Sul convergence technique which provides an empirical assessment of long-run equilibrium within a heterogeneous set-up without necessitating any assumptions about stationarity. Thirdly and finally, we estimate the competition level in European banking pre-and post- crisis by deploying the Rosse–Panzar method.

To estimate bank efficiency, we apply a parametric distance function approach using both desirable and undesirable outputs in the production process (i.e. NPLs). This novel approach of measuring bank efficiency is motivated by the fact that ignoring NPLs can bias the efficiency results (Assaf et al., 2013; Fujii et al., 2014). The inclusion of NPLs in our estimation is even reinforced by the fact that the average bank asset quality for most EU member states has plummeted significantly following the economic recession. To test bank convergence, we propose the Phillips and Sul (2007) methodology which provides important advantages over the widely used β-convergence and σ-convergence methods.[3] The β-convergence, for instance, is uninformative on the behaviour of the dispersion of the entire cross-section, while the σ-convergence does not allow for cases where individual countries may be transitionally divergent (Quah, 1996; Islam, 2003). The Phillips and Sul convergence technique, on the other hand, identifies whether group convergence is present and whether sub-clusters of countries are converging. It also enables the estimation of the relative transition parameters for each country in relation to the panel average. This gives us additional information on the speed of the convergence process over time.

Finally, to provide a full picture of bank performance and convergence, we also examine the degree of competition within the banking systems. We apply a standard non-structural approach based on the Rosse–Panzar methodological framework. The rest of this paper is organised as follows: Section 2 reviews the literature on efficiency and integration in the EU banking sector. Sections 3 and 4 describe the methods and data used. Section 5 presents the empirical results, and finally Section 6 concludes.

2. Literature review on bank efficiency and convergence in the EU

Brouwer (2005) defines financial market integration as a process whereby financial markets become increasingly integrated through the linkages created by prices and returns on financial assets. As discussed by Stavárek et al. (2012), one crucial conduit for financial integration is the integration of financial infrastructure which consists of a set of inter-connected systems such as payment systems[4] and credit registers that facilitate financial market operations. Consequently, the integration of financial infrastructure should lead to cost savings and create a more efficient financial market. Empirical research focusing on the efficiency of European banks has attracted considerable attention over the last decade. Studies have linked the efficiency of the banking industry to several interesting hypotheses such as integration and convergence, competitiveness and systemic stability within the European Union. In general, there is support that greater competition, faster technologies, financial innovations, economic and financial freedom have driven banks to minimize costs and improve their efficiencies (Fiordelisi and Molyneux, 2010; Chortareas et al., 2013).

The link between efficiency and integration in the European banking sector has been widely investigated (Molyneux et al., 1997; Goddard et al., 2007; Brissimis et al., 2010; Fiordelisi et al., 2011, among others). Berger (2003) examines the potential efficiency effects of a single market for financial services in Europe, but does not find support for a positive effect on efficiency. He attributes this finding to the consolidation of the banking sector which disrupted the supply of relationship credit and led to the loss of relationship information. Casu and Molyneux (2003) do not find support either for the integration of the banking sector across several European countries.

Some mixed findings are however reported in other related studies (Altunbas et al., 2001; Lozano-Vivas et al., 2001; Casu and Girardone, 2010; Carbó Valverde et al., 2007; Maudos and De Guevara, 2007; Weill, 2009). Using the β- and σ convergence tests[5] on cost efficiency scores for the period 1994–2005, the study by Weill (2009), for example finds evidence of convergence[6]. Supporting this, Casu and Girardone (2010), who also apply the β- and σ convergence tests on estimated cost efficiency for the EU 15 countries during 1997–2003, find evidence for efficiency convergence. However, they do not support that the hypothesis that the introduction of the single currency had an effect on convergence and improvement in efficiency levels.

Our study aims to provide additional evidence on the above using a more robust efficiency measure that accounts for NPLs, and also a more robust test of convergence. Furthermore we focus on the impact of the GFC which has largely been ignored in existing studies, and estimate the competition level in European banking pre- and post- crisis using the Rosse–Panzar method. We elaborate on these contributions in the remaining sections of this paper.

3. Methodology

3.1. Bank efficiency with undesirable outputs: a parametric distance function

Several studies have provided evidence that ignoring NPLs as an undesirable output in the production process can bias and potentially inflate the efficiency results (Fernandez et al., 2002; Atkinson and Dorfman, 2005; Park and Weber, 2006; Assaf et al., 2013; Fujii et al., 2014). The famous framework proposed by Berger and DeYoung (1997) also suggests a strong relationship between loan quality and efficiency in both directions. A bank with low NPLs for example, might seem to be low performing in comparison to another bank with high NPLs just because the production process did not clearly differentiate between good and undesirable outputs.

Hence, we combine here both bad and good outputs in the estimation of bank efficiency. The methodology we use relies on Cuesta et al. (2009) and is well explained in their paper; hence we don't repeat it here.

3.2. Phillips and Sul convergence methodology

The main view we adopt in this paper is that integration is beneficial to the EU banking markets as in theory; it should improve efficiency and competition by affecting the cost structures of

[3] See Adam et al. (2002), Vajanne (2007) and Weill (2009).

[4] In the Euro area, the Single Euro Payments Area (SEPA) which aims to provide an integrated payment system was rolled out between 2006–2008 and in 2011, the SEPA started processing card payments.

[5] The β-convergence is drawn from the growth literature and models the "catch-up effects" by regressing the growth rate of a variable on the initial level while σ-convergence looks at the dispersion of the cross-section. Convergence is evident is the dispersion decreases over time.

[6] These findings are also subject to robustness checks including two other frontier techniques namely, a time-varying WITHIN model and a distribution free approach (DFA) model as well as the use of the production approach instead of the intermediation approach in the event that the specifications of inputs and outputs have biased the results.

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