Financial integration in the euro area: Pro-cyclical effects and economic convergence ☆

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ABSTRACT

This paper investigates the role of financial integration in the macro-economic adjustment process of countries inside EMU. We employ a confidential bilateral version of the locational banking statistics granted to us by the Bank of International Settlements. We use this dataset to measure the impact of the external positions of banks in member countries on firstly, business cycle synchronization, and secondly, long-term economic convergence. To measure the impact on business cycle synchronization, we include intra-European bank capital flows in a New-Keynesian IS equation for the euro area. Second, we use the dataset on bilateral cross-border claims and liabilities to establish a long-term panel cointegration relationship between GDP, housing prices and net bank capital flows. Our results indicate that since the introduction of the euro, financial integration has negatively affected the macroeconomic adjustment process of countries within the union. Cross-border bank portfolios adversely affect business cycle synchronization as well as long-run convergence.

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1. Introduction

From the start of EMU, macro-economists have recognized that a "one size fits all" monetary policy may complicate the monetary adjustment process inside a currency union. Initially, the discussion centered on the pro-cyclical role of inflation differentials within a monetary union. As financial integration equalizes nominal risk-free interest rates within the union, real interest rates in countries with high inflation are reduced, inducing further demand-side inflationary pressures and potentially destabilizing a heterogeneous union. This argument is also known as the "Walters critique" (Walters, 1990). Until the outbreak of the crisis the Walters critique was seen as a mere theoretical issue with little policy relevance. The euro area seemed to be doing just fine. The 10th anniversary

publication of the European Commission (European Commission, 2008) noted that EMU "has secured macroeconomic stability" and that Europe has become a "pole of macroeconomic stability". Yet the same report describes how over time macroeconomic imbalances between member states had built up. These came to the surface following the collapse of Lehman.

While the original Walters critique centers on the real interest rate channel, financial integration and innovation may have exacerbated their pro-cyclical role, by making funding more easily available for booming regions within the euro area. Indeed, the European Commission (2008) notes that this combined effect has been underestimated in the first decade of the euro's existence and belatedly warns that: "a combination of integrated financial markets and inflation persistence risks divergences across countries." Recent evidence indeed points to a role for cross-border capital flows in aggravating this problem and fostering economic imbalances.

The goal of the present paper is to empirically investigate the role of international bank portfolios in the macro-economic adjustment process of EMU member countries. We use a confidential bilateral version of the BIS locational banking statistics, granted to us by the BIS, to answer two different, important questions. First of all, we investigate the impact of intra-European bank capital flows on business cycle synchronization within the euro area. On top of the traditional pro-cyclical effects of regional inflation differentials, changes in cross-border bank portfolios

are an additional channel through which business cycle divergences of individual member countries vis-à-vis the euro zone average can be amplified. To investigate this issue, we estimate a New-Keynesian IS equation for a panel of euro area members. This shows the operation of the traditional transmission channels – i.e. the real interest rate channel, the wealth channel and the real exchange rate channel – within the euro area. As a novelty, we investigate how financial integration may compound the perverse – i.e. pro-cyclical – operation of the real interest rate and wealth channel in a monetary union. Secondly, we use the bilateral nature of the confidential cross-border banking data that we have been granted access to by the BIS, to analyze the impact of cross-border bank portfolios on macroeconomic convergence in the long-run. We estimate a long-term panel cointegrating relationship between GDP, housing prices and net cross-border bank liabilities between pairs of euro area countries. We show that both housing prices and net bank capital flows work to amplify regional imbalances within the euro area. In all, our evidence confirms that since the introduction of the euro, financial integration has negatively affected the macroeconomic adjustment process of countries within the union. Cross-border bank portfolios adversely affect business cycle synchronization as well as long-run convergence.

This paper is organized as follows. In Section 2, we briefly review the literature on the role of inflation differentials in a monetary union and the effect of financial integration on business cycle synchronization and long-term economic convergence. Section 3 describes our dataset, reports preliminary statistics and includes our empirical specifications. In Section 4 we present and discuss the empirical evidence. Section 5 concludes.

2. Cross-border financial flows and the macro-economic adjustment process

Standard analysis of the macroeconomic adjustment process within a currency union focuses on the role of inflation differentials (Arnold and Kool, 2004; European Commission, 2008). When a country sets its own monetary policy, it will increase the nominal interest rate in the presence of a positive output gap and high inflationary expectations according to some version of the Taylor-rule. As a result, the real interest rate will increase. Via a range of potential transmission channels – including an effect on asset prices – this will over time lead to a reduction of economic growth, a decrease in the output gap and a reduction of inflationary expectations. The appreciation of the domestic currency in nominal and real terms will worsen a country's competitiveness and reduce its net exports. Here, the real interest rate channel and the real exchange rate channel reinforce each other in cooling down the economy.

After a country joins a monetary union, the real interest rate channel changes face. The central bank of the monetary union conducts a uniform monetary policy using an interest rate rule, now using the output gap and expected inflation in the union as a whole. Asymmetric shocks within the currency union may cause divergences between business cycles and inflation patterns in the member states. In the neutral case where the area-wide output gap is zero and expected inflation for the union is sufficiently low, the monetary authorities will have no reason to change the nominal interest rate. A member country that at that time enjoys a business cycle upturn (relative to the union) will have an above-average economic growth rate, output gap and inflation rate. Depending on the degree of inflation persistence, residents will also have higher inflationary expectations. With a uniform nominal interest rate, the domestic real interest rate will be lower than in the rest of the union. Lower real interest rates discourage savings and stimulate consumption and investment. Now, the real interest rate channel no longer acts as a brake on the cycle but instead accelerates regional economic developments. Within the union, the real exchange rate channel remains intact. A booming regional economy still leads to a real appreciation, not via changes in the nominal exchange rate but via a change in relative prices between the domestic economy and the rest of the union. Again, the regional inflation differentials take care of the adjustment process. The elimination of adjustment through the nominal exchange

rate will, however, reduce the size and speed with which the real exchange rate adjusts. Finally, regional inflation differentials may lead to direct or indirect wealth effects with macro-economic implications. The direct channel involves the effect of inflation on nominal asset prices for e.g. stocks and real estate. Indirectly, inflation may induce changes in wealth through its effect on real interest rates.

The channels described here can be modeled using the IS-curve from a small New Keynesian macro-economic model (see e.g. Ball, 1998; Goodhart and Hofmann, 2005; Smets, 1997; Svensson, 1997):

$$y_{t+1} = \alpha_1 y_t - \alpha_2(i_t - \pi_t) + \alpha_3 q_t + \alpha_4 h_t + \eta_{t+1}. \tag{1}$$

The extended IS curve in Eq. (1) relates the output gap (y) to its own lagged value, the lagged ex-post real rate of interest, defined as the nominal interest rate (i) minus inflation (π), the lagged values of two other financial variables: the real exchange rate (q) and real housing wealth (h), and an error term (η).

Prior to EMU, most analyses assumed that the real exchange channel would dominate the real interest rate channel and that macro-economic stabilization and convergence within a currency union would occur automatically. This was the period in which the idea of an endogenous optimal currency area became in vogue (Frankel and Rose, 1998). Since then, however, several empirical studies have found that inflation differentials are quite persistent (Angeloni and Ehrmann 2004; Beck et al., 2009) and that the real interest channel may be more important than the real exchange channel (Arnold and Kool, 2004; International Monetary Fund, 2004). A number of studies discuss the real interest rate effect for individual countries, see Honohan and Leddin (2006) for Ireland and López-Salido et al. (2005) for Spain. Roubini et al. (2007) argue that pro-cyclical real interest rate effect may have been at work in Spain, Portugal, The Netherlands, Greece and possibly Italy. In contrast, Hofmann and Remsperger (2005) confirm the equilibrating effect of the real exchange rate effect and downplay the pro-cyclicality due to the real interest rate effect.

Still Enderlein (2006 p. 1139) concludes that "the key mechanism behind welfare distribution in a currency union is the primacy of the real interest rate effect over the real exchange rate effect". The overall support for the primacy of the real interest rate channel adds to the mixed evidence in support of business cycle synchronization in the euro area (Inklaar et al., 2008). These findings have thrown into doubt the supposedly endogenous nature of the optimal currency area criteria, according to which, as De Grauwe and Mongelli (2005 p. 24) note, the common currency "precludes future competitive devaluations, facilities foreign direct investment and the building of long-term relationships, and may over time encourage forms of political integration. This will promote reciprocal trade, economic and financial integration and it will foster business cycle synchronization among the countries sharing a single currency". In the midst of the euro crisis, this vision of an endogenous currency area seems to be a long way off and the competing Walters critique seems to be validated.

Prior to starting EMU, little attention was paid to the effects of financial integration on the synchronization of business cycles and macroeconomic convergence in the euro area. The deregulation of financial markets in recent decades and the strong cyclical movements in asset prices in several countries have, however, led to a stronger emphasis on the macroeconomic importance of capital flows and asset prices. While financial integration may help absorb macroeconomic disturbances by providing risk-sharing opportunities and by fostering an efficient reallocation of resources, it can also, if not accompanied by appropriate policies, amplify divergences among participating countries. Further, it can result in asset booms. In the absence of currency risk, their funding through an integrated financial market may be sustained for too long.

Recently, a number of papers have explored the increase of financial integration in the euro area and its effects. An analysis of bilateral foreign assets and liabilities of banks by the European Commission (2008) and Spiegel (2009) shows a positive and significant impact of