

Assessing integration of EU banking sectors using lending margins

Radu MUNTEAN

Bucharest University of Economic Studies, Romania
radu.muntean@yahoo.com

Abstract. *Banking integration is generally linked to price convergence. In addition to interest rates, we argue that lending margins provide important information regarding price setting convergence in banking sectors. House purchase and non-financial corporations (NFC) lending margins confirm that EU banking integration was affected by financial crises. There is a relatively higher convergence for NFC lending margins, while integration is deeper in the euro-area. The country specific analysis differentiates between integrated and dissimilar EU banking sectors. Besides their financial information content and direct economic impact, lending margins are useful measures of banking integration for policy decisions.*

Keywords: banking integration, financial convergence, lending margins, interest rates, contagion risk.

JEL Classification: F15, F36, G21, G28.

REL Classification: 11C, 11Z, 20B.

Introduction

The political and economic construction which is now the European Union led to significant changes on many different areas of activity. Starting from the need perceived by six countries, which were close trading partners, to improve economic cooperation, the construction moved from a purely economic union to a union which was also political. Under the rule of increasingly integrated laws, the single market enhanced the free movement of goods, services, people, and capital.

With a view on financial integration, efficiency, stability and competitiveness, the European Commission has consistently monitored developments in the EU financial sector. The “European Financial Stability and Integration Report 2012” showed that stress in the EU financial markets was reduced, in the fifth year of the financial crisis, following the steps towards building a Banking Union and the strong commitment of the European Central Bank to do whatever necessary to avoid the breakup of the euro. The subsequent developments with regard to the Banking Union, establishing the Single Supervisory Mechanism and the Single Resolution Mechanism, as well as the work done for setting up an effective network of deposit guarantee schemes emphasize the importance of financial integration for the EU, also acknowledging it as a potential source of financial contagion.

The European Central Bank (ECB) “Financial Integration in Europe (April 2014)” report showed that EU financial integration has continued to improve since mid-2012, but market fragmentations persist. The report called for effective implementation of the Banking Union and for fiscal consolidation and structural reforms. With regard to banking integration, the ECB discussed implications to monetary and macro-prudential policy of the dispersion of borrowing costs for non-financial corporations, taking into account the low level of cross-border lending to these entities.

Financial sectors have been traditionally dominated by the central role of credit institutions. Countries with developed economies tend to also have larger stock markets, insurance and private pensions sectors, as well as investment funds and other non-bank financial institutions. In other countries, where other components of the financial sectors are relatively small, the role of the banking sector is even more important in supporting the economy.

Within the EU, the presence of a large number of cross-border financial groups, mainly centered on credit institutions, strongly contributes to financial integration. These groups promote strong financial ties between home and host countries; they provide funds to non-financial corporations and households and freely move

capital from one country to another, while also providing liquidity to local financial markets. On the other hand, cross-border financial groups generate interdependencies between national financial sectors which may be an important source of contagion.

The European integration of national banking sectors is a process which is taking place in the larger context of the EU political, economic and monetary integration. As a consequence, the topic is highly important from a policy perspective, while also providing useful information with regard to the functioning of the national banking sectors.

The level of integration reached by each national banking sector may be perceived differently due to the national characteristics as well as the different measures of integration taken into account. The European Central Bank developed and updates biannually several indicators of financial integration in the main financial market segments of the euro area, such as money market, bond markets, equity markets and banking markets. National competent authorities from both euro-area and non-euro-area Member States also consider European integration when assessing the financial stability and the soundness of the banking sectors in their jurisdictions. As an example for non-euro-area Member States, the National Bank of Romania presents in its annual Financial Stability Report assessments of the Romanian banking sector which include comparisons with developments in other EU banking sectors. Indicators which are used for international comparisons in these assessments include the number of credit institutions and branches per 100,000 inhabitants, degree of financial intermediation, asset concentration, leverage ratio, non-performing loans ratio, coverage ratio and foreign liabilities. Other assessments refer to the interdependencies with other EU banking sectors, such as the market share of credit institutions of (EU) foreign capital and the on-going process of disintermediation.

The level of integration of the EU banking sectors cannot be evaluated through a single measure. The common regulatory framework, such as the CRD IV package, the activity of cross-border financial groups and the European project of the Banking Union are three important factors which make the process of banking European integration more pronounced than the interdependencies between other banking sectors outside the EU. Measuring European banking integration might prove to be challenging, due to the complex nature of the relationships between EU banking sectors and the different effects they suffered in the context of the international financial crisis.

This paper aims to support a new measure for the integration of EU banking sectors and to discuss its specific results, in the context of the current literature perspectives presented in the next section. While interest rates and profitability convergence were previously considered as measures for banking integration, this paper focuses on the use of lending margins for new loans. The next section covers a literature review on the relevant issues for banking integration and the measures used to quantify it. The following sections focus on the methodology used for measuring banking integration through lending margins for new loans, the results and the conclusions derived from this quantitative approach.

Literature review

Integration of banking sectors has been discussed in the relevant literature from several different points of views. As presented by Gropp and Kashyap (2009), these views can be classified under three directions: the extent of cross-border direct retail operations of banks, cross-border mergers of banks and the study of retail interest rates.

Regarding the extent of cross-border direct retail operations of banks, Gual (2004) and Perez et al. (2005) indicate that retail flows are relatively low compared to money market flows within the euro area. However, banking integration do not necessarily imply the existence of large retail flows, therefore this indicator is useful for describing important relationships between different banking sectors, but may not be seen as an effective measure of banking integration.

Cross-border mergers of banks have also been discussed in connection to banking integration. Köhler (2010) elaborates on this approach and provides a review of the relevant literature. The number of cross-border mergers of banks has been compared to the number of domestic bank mergers, but the former has not proved to be a necessary or sufficient condition for financial integration.

The study of retail interest rates in connection with financial integration is generally focused on convergence. Adam et al. (2002) showed slow convergence on both corporate and mortgage rates, after 1999, concluding that banking sectors are not integrated and they are not likely to be on a path towards integration. Affinito and Farabulini (2006) showed that dispersion of interest rates can be reduced by taking into account national specificities of borrowers such as risk exposure, disposable income and firm size.

In addition to the three directions presented above, Gropp and Kashyap (2009) proposed a new test of integration based on convergence in bank profitability and

found that banking integration in Europe is not achieved, whereas US banks converge with regard to profitability targets. They also argued that dispersion of interest rates is an ineffective tool in analyzing bank integration, due to differentiation by national factors.

Other lines of research focused on the so-called convergence clubs. Affinito (2011) analyzed banking convergence using the ratios of deposits and loans to GDP and found that convergence is higher within clubs than in the entire sample and that euro-area convergence is supported by all methodologies. Another important result is that real convergence significantly benefits from banking convergence.

As indicated by the literature referenced above, different methodologies have been used for analyzing integration of banking sectors. Within these methodologies, the study of interest rates might prove to be well-fitted to indicate banking convergence, as they are timely visible due to data availability and have immediate consequences to the real economy. On the other hand, there are national specificities such as financial characteristics of borrowers, sovereign risk, speculative bubbles, phases of the economic cycle and the monetary policy, which affect the level of lending interest rates. As a consequence, the law of one price seems to be neither necessary nor sufficient to express integration of EU banking sectors. However, as the use of lending margins instead of simple lending interest rates may limit the impact of national specificities by capturing them in both active and passive interest rates, this paper contributes to the relevant literature by studying EU banking integration with the use of lending margins for new business for both loans to house purchases and loans to non-financial corporations.

Methodology

Considering the various methodologies used in the relevant literature to account for banking integration, as well as the difficulties in directly applying the law of one price to banking products in a cross-border sample, we explore the topic of banking integration with the use of lending margins for new business. Banking groups operating in the EU are facing the developing level playing field envisaged by EU regulators. While having comparable business practices, EU banks also compete with each other and have business relationships which are significantly related to funding. Therefore, although the law of one price may be ineffective to account for banking integration in the EU, a level of convergence in the practice of price setting can be expected and such convergence can be assessed by analyzing lending margins for new business.

In this paper, lending margins for new business are examined with respect to their convergence to a common average at EU level (m_t^*), while also accounting for autocorrelation (m_{it-1}). The equations estimated for lending to both households and non-financial corporations (NFC) have the following general specification:

$$\Delta m_{it} = \alpha + \beta \times \Delta m_t^* + \gamma \times \Delta m_{it-1} + \varepsilon_{it} \quad (1)$$

In order to test for a potentially different degree of banking integration within and outside the euro-area, equation (1) has been estimated for an EU overall sample of and for two samples containing data for member states within and outside of the euro area. For both house purchase and NFC loans, the analysis is focused on the statistical significance of the relationship between lending margins and the average lending margins in the sample taken into account. In the cases in which this relationship is shown to be weak, this is considered to be signaling an insufficient banking integration.

With regard to the EU integration of national banking sectors, equation (1) has also been estimated for individual member states. As a consequence, member states have been divided in three categories of banking integration as shown by the analysis of lending margins. First category contains member states for which the relationship between national and average EU lending margins holds at 95% confidence level for both households and NFC lending. Reaching this category is likely to show a high degree of banking integration. The second category contains member states for which the relationship holds at 95% confidence level for only one of the two lending margins. This category will show signs of banking integration for households or NFC lending. The third category contains member states for which the relationship does not hold at 95% confidence level for neither households nor NFC lending, which may be considered a sign of low banking integration.

The data used for this analysis is taken from the ECB Statistical Data Warehouse and contains two monthly datasets: monetary financial institutions (MFIs) lending margins on loans for house purchase and MFIs lending margins on loans to non-financial corporations (NFC). Lending margins are measured as the difference between MFIs' interest rates for new business loans to households for house purchase (or to non-financial corporations) and a weighted average rate of new deposits from households and non-financial corporations. For non-euro area member states, loans and deposits taken into account are denominated in both euro and national currency. In order to have comparable records for national banking sectors, the selected data covers monthly percentage variations from January 2007 to January 2014 for EU 27.

Results

Monthly variations of lending margins for both house purchase and non-financial corporations loans had similar developments during the analyzed 7 year period (Table 1), while the correlation coefficient between the two data series equals 21.8%.

Table 1. Descriptive statistics of the dependent variables

	House	NFC
Mean	0.0028	0.0129
Median	0.0000	0.0000
Maximum	1.1768	0.8242
Minimum	-0.9973	-0.5411
Std. Dev.	0.1684	0.1696
Skewness	0.2113	0.7503
Kurtosis	11.5668	5.8535
Observations	2295	2295

During the onset of the international financial crisis, lending margins for house purchase loans had large variations across the EU banking sectors (Chart 1). The subsequent variations were more stable until the beginning of 2012 when a relatively higher dispersion occurred. For NFC loans, lending margins had also varied significantly during the financial crisis (Chart 2). After that, the inter-quartile interval shows that the distribution of lending margins needed a longer period to return to its pre-crisis levels.

Chart 1. Distribution quartiles for House lending margins

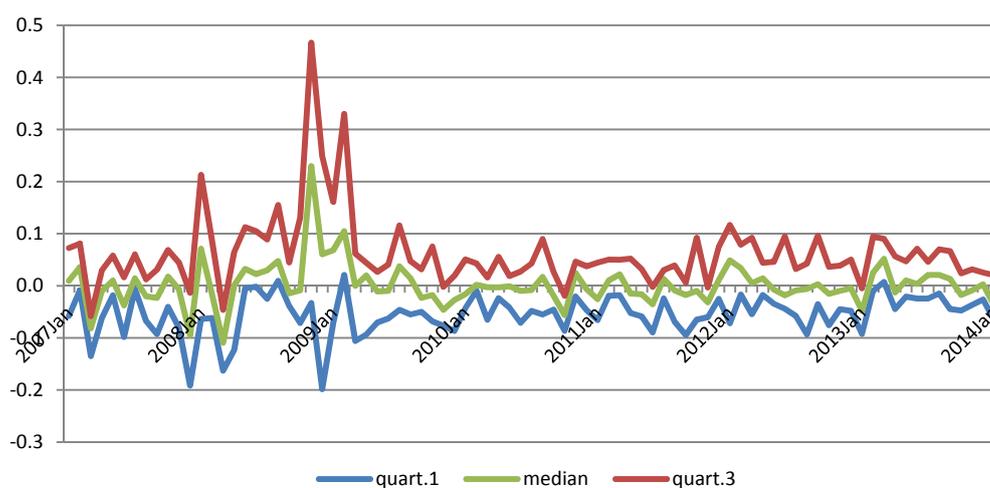
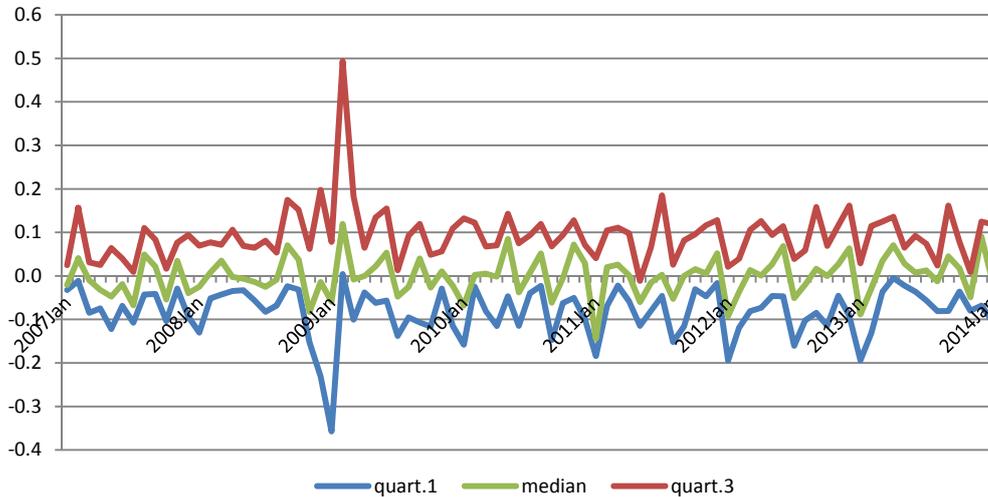


Chart 2. Distribution quartiles for NFC lending margins

Models built for house purchase (Table 2) and non-financial corporations (Table 3) lending margins at EU level include the explanatory variables accounting for both the EU average variations and the autocorrelation of the dependent variable. The relationships with the EU average variations are shown to be statistically significant at 99% confidence level, thus indicating a tendency of bank integration with respect to margins to new loans. However, as the level of the coefficient of determination is considerably lower for the model built for house purchases lending margins, the banking integration at EU level seems to be more visible with regard to NFC lending margins.

Table 2. Model for House lending margins (EU sample)

Variable	Coefficient
C	-0.0002 (0.0035)
House_m	0.6148*** (0.0850)
House(-1)	0.0616*** (0.0208)
Adjusted R-squared	0.0263

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 3. *Model for NFC lending margins (EU sample)*

Variable	Coefficient
C	0.0149*** (0.0034)
NFC_m	0.4505*** (0.0569)
NFC(-1)	-0.2950*** (0.0200)
Adjusted R-squared	0.1126

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

As also shown by the relevant literature, banking integration is likely to be deeper within the so-called convergence clubs. In this case, the euro-area delimits itself within the EU due mainly to the effects of the single currency on funding costs, intra- and inter-group funding and cross-border banking relationships. As a consequence, it is important to assess how lending margins in the EU are affected by the existence of the euro area. The models built for a specific euro-area sample also include (euro-area) average variations and the lagged lending margins. Also similar to the EU level analysis, the coefficients of the explanatory variables are statistically significant at 99% confidence level for both house purchase (Table 4) and NFC (Table 5) lending margins. However, a notable result is that house purchases lending margins for the euro-area are considerably better explained by the model than for the EU sample. Therefore, the analysis of lending margins indicates a generally higher level of banking integration in the euro-area.

Table 4. *Model for House lending margins (euro-area sample)*

Variable	Coefficient
C	-0.0022 (0.0042)
House_m	0.8260*** (0.0740)
House(-1)	0.0708*** (0.0247)
Adjusted R-squared	0.0812

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 5. *Model for NFC lending margins (euro-area sample)*

Variable	Coefficient
C	0.0147*** (0.0040)
NFC_m	0.5305*** (0.0619)
NFC(-1)	-0.2631*** (0.0246)
Adjusted R-squared	0.1169

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Continuing the analysis within the segments of the EU sample, models built for non-euro-area show different results for house purchase (Table 6) and NFC (Table 7) lending margins. Firstly, house purchase lending margins cannot be easily explained by the average variations in non-euro member states and the coefficient of the lagged variable is not statistical significant at 90% confidence level. Secondly, the NFC lending margins seem to converge even more for these countries than for the EU or the euro-area sample, as the model performs better in this case.

Table 6. *Model for House lending margins (non-euro-area sample)*

Variable	Coefficient
C	0.0016 (0.0060)
House_m	0.2377*** (0.0867)
House(-1)	0.0343 (0.0365)

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 7. *Model for NFC lending margins (non-euro-area sample)*

Adjusted R-squared	0.0090
Variable	Coefficient
C	0.0132** (0.0061)
NFC_m	0.4073*** (0.0698)
NFC(-1)	-0.3322*** (0.0336)
Adjusted R-squared	0.1492

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

For the time period under review, models built for individual member states (Table 8) indicate different degrees of banking integration, with regard to the convergence of house purchase and NFC lending margins. Member states are classified into three categories of banking integration, as provided in the methodological section.

The first category covers member states with lending margins models which have statistically significant coefficients (at 95% confidence level) for the explanatory variables of EU average variations. This category is designed to signal convergence on both house purchase and NFC lending margins. It is also notable that models built for these countries are generally well-performing.

The second category contains countries with signals of convergence on only one of the two lending margins. The third category highlights countries for which convergence is not observed for the time period under review either for house purchase or NFC lending margins. It is notable that the member states in this category contain some of the countries which were most deeply affected by the financial crisis or the sovereign debt crisis (e.g. Greece, Lithuania and Spain) and also countries that have national specificities that can explain a different behavior of their banking sectors (e.g. Poland and Sweden).

Table 8. *Main results of individual models (country level)*

Category	Country	House model			NFC model		
		House_m	Prob.	R2	NFC_m	Prob.	R2
I	Bulgaria	0.5598	***	0.1411	1.5356	***	0.3249
	Czech Rep.	0.5161	***	0.1875	0.5649	**	0.0884
	Denmark	1.0386	***	0.1603	1.4280	***	0.1653
	Estonia	2.5173	***	0.3125	0.8809	***	0.2482
	Germany	0.8559	***	0.3475	0.3583	***	0.1301
	Ireland	1.2400	***	0.2063	0.6565	***	0.1720
	Italy	0.9677	***	0.1287	0.5759	**	0.0723
	Netherlands	1.7220	***	0.2767	2.4536	***	0.2494
II	Austria	0.7165	**	0.0704	-0.2185		0.1627
	Belgium	0.5315	**	0.2383	0.0136		0.0387
	Cyprus	3.2968	***	0.2363	0.7937		0.0391
	Finland	0.7800	**	0.1251	0.2751		0.0636
	France	1.5094	***	0.1279	0.3107		0.2853
	Hungary	2.9615	***	0.2383	1.2870		0.0730
	Latvia	-1.2115		0.0049	2.8083	***	0.2327
	Luxembourg	0.8652	***	0.0972	0.3910		0.1553
	Malta	0.2081		0.1155	1.6837	***	0.2943
	Romania	1.9698		0.0418	0.9315	**	0.1805
	Slovenia	0.1877		0.0143	0.8647	***	0.2250
	UK	1.4269	**	0.0785	0.0585		0.0512

Category	Country	House model			NFC model		
		House_m	Prob.	R2	NFC_m	Prob.	R2
III	Greece	4.2054		0.0467	0.7120	*	0.0787
	Lithuania	-0.9500		0.0066	0.6868		0.0228
	Poland	0.0880		0.0300	0.1929		0.1235
	Portugal	2.6488		0.0427	0.3362		0.1262
	Slovakia	0.2118		0.1414	0.3808		0.1177
	Spain	-0.4444		0.0881	0.2080		0.1307
	Sweden	0.0199		0.0436	-0.2185		0.1572

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

The analysis of lending margins shows that there are different degrees of banking integration in the EU, in the euro-area and in non-euro member states. Banking sectors also behaved differently with regard to loans for house purchases as opposed to lending to non-financial corporations. The results presented in this section are dependent on the quality of the aggregated data reported for each national banking sector. Moreover, analyzing lending margins at a more detailed level, including the distribution of lending margins values within national banking sectors, may provide further information with regard to banking integration in the EU. The average values which are reported for each member state have the potential to indicate existing EU banking integration, but their respective underlying distributions would complement this overview by highlighting the banking convergence which takes place at national level.

Conclusions

The integration of the EU banking sectors is an on-going process which leads to benefits for credit institutions and customers, while also responding to requirements derived from the design of the EU single market. However, in times of crisis, banking integration can be a contributing factor to financial contagion. In this context, national and European institutions, such as central banks, supervisory and macro-prudential authorities, perform their duties taking into consideration the EU banking integration. The lack of a single framework for assessing banking integration has led to a continued search for appropriate measures and instruments. In this paper we argue that such a measure may result from the analysis of lending margins, as these indicators have similar benefits with the more commonly used lending interest rates, while also overcoming some of their inconveniences.

Lending margins for new loans recorded a higher dispersion during the onset of the international financial crisis and, at times, during the EU sovereign debt crisis.

Models built for house purchase and NFC lending margins showed that these indicators can be explained by the peer average variations and by the lagged values of the indicators. Therefore, house purchase and NFC lending margins provide useful information with regard to the banking integration in the EU.

For house purchase loans, lending margins variations are more easily explained for euro-area member states, while at the EU level and outside the euro-area banking integration seems to be less apparent. For NFC loans, the higher performance of the statistical models indicates a higher degree of convergence with regard to the price setting of new loans to the real economy.

The results of the country specific analysis show that lending margins in banking sectors of more stable and developed economies tend to converge to the developments at EU level. On the other hand, lending margins follow a separate path in banking sectors of countries more deeply affected by financial crises or countries with specificities that may limit financial contagion.

While the EU economy is becoming increasingly integrated, financial convergence can be assessed by a multitude of measures. Both house purchase and NFC lending margins are useful in describing the reactions of credit institutions to changes in their operating environment. These indicators have thus a threefold importance. Firstly, they help in measuring profitability of main banking activities, which benefits micro-prudential supervisors, credit institutions and other financial stakeholders. Secondly, they are price-setting factors which significantly impact customers and, implicitly, real national economies. And thirdly, as argued in this paper, lending margins have the potential to highlight existing banking integration and, as a consequence, to be used as measures of financial convergence by national or European authorities while taking the policy decisions needed to fulfill their monetary or supervisory responsibilities.

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