

## Measuring European Financial Integration. Indicators and Perspectives

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**Abstract.** *The process of financial integration stimulates the development of the European financial system by influencing in a positive sense the competition, stability, expanding markets and influencing the efficiency of financial intermediaries, resulting in lower brokerage costs and a more efficient allocation of capital. A challenge for both researchers and policymakers is measuring the level of financial integration in order to assess the impact of the factors through which European financial integration has influenced economic growth and thus implement a range of policies with the goal of a sustainable economic growth.*

**Keywords:** financial integration, measurement, indicators.

**JEL classification:** G15, E43, F15, F36.

### 1. Introduction

Measuring the level of financial integration in the Member States of the European Union (EU) represents both a challenge and a continuous concern for the EU authorities as well as for researchers. Creating a single market for financial services thru the integration process contributes to the more efficient allocation of capital, better opportunities for risk sharing and risk diversification, and potential for higher growth (Baele et al., 2004a, p. 7).

The aim of this study is to highlight the most appropriate indicators for measuring European financial integration, based on reviewing the literature in the field and demonstrating their usefulness in monitoring the financial integration process.

### 2. Measurement of financial integration in the literature

#### 2.1. Indicators of quantification of European financial integration

Studies on this topic have proposed different indicators and models for measuring this phenomenon. According to a study by Adam et al. (2002), the level of financial integration can be measured by the convergence indicators beta ( $\beta$ ) and sigma ( $\sigma$ ), indicators used initially in the literature on the phenomenon of economic growth (Babecký et al., 2013, p. 31). Beta-convergence refers to a process in which poorer countries or regions grow faster than rich ones and therefore catch up on them (Monfort, 2008, p. 3), while the sigma indicator measures the tendency over time to reduce disparities between states or regions (Monfort, 2008, p. 5).

Beta convergence can be accompanied by sigma-divergence, so both concepts need to be used to determine the degree of financial integration (Adam et al., 2002, p. 15),  $\beta$ -convergence being a necessary but not sufficient condition for  $\sigma$ -convergence (Young et al., 2008, p. 1084).

Other studies, like Heichel et al. (2005) investigates also gamma convergence and delta convergence. While gamma convergence is a variant of beta convergence and tries to assess the mobility of countries in different rankings, delta convergence measures the country's distance from an reference country, usually the best performer.

Baele et al. (2004b) identifies three categories of indicators for measuring the financial integration:

- ✓ price-based indicators;
- ✓ information-based indicators;
- ✓ quantitative indicators.

The price-based indicators refer to the direct check of the law of one price on the condition that the compared assets have similar characteristics (Inziger, Haiss, 2006). Price-based measures can be quantified by means of beta and sigma convergence (Babetskii et al., 2007, p. 342). Indicators based on price are not always recommended, as the integration process may lead to increased intermediation by foreign banks (Adams et al., 2002). In this respect, the volume of foreign credits represents an important indicator of the degree of financial integration.

The information-based indicators starts from the assumption that in a financially integrated area, regional news (i.e. new economic information) will have a lower impact on prices, comparing with global news, regarded as more important; as a result, if local news will continue to influence asset prices, the financial integration is not complete.

Quantitative indicators aims the cross-border investment activities materialized in capital flows, listings, mergers and acquisitions.

Next table highlights the main indicators for financial integration used by the European Central Bank (ECB), on the different segments of the financial markets, namely money market, government bond market, corporate bond market, banking market and equity market.

**Table no.1 Indicators of financial integration**

Number	Indicator	Description	Computed/ Model-based	Source
<b>Money market indicators</b>				
1.	Cross-country standard deviation of the average overnight lending rates among euro area countries	The measure is based on average overnight rates for each of the euro area countries, as reported by EONIA banks	Computed	EBF/ECB
2.	Cross-country standard deviation of unsecured lending rates among euro area countries	The measure is based on the unsecured 1- and 12-month lending rates	Computed	EBF
3.	Cross-country standard deviation of repo rates among euro area countries	Based on the quotes reported by EUREPO panel banks for 1- and 12-month repo rates	Computed	EBF
<b>Government bond market indicators</b>				

4.	Standard deviation of government bond yield spreads for 10-year maturity	Based on euro area country yields on 10-year government bonds	Computed	ECB
5.	Evolution of beta coefficients	Based on 18-months rolling regression of changes in country yields for 10-year government bonds with respect to changes in yields on the benchmark (German) 10-year government bond.	Model-based	ECB
<b>Corporate bond market indicators</b>				
6.	Proportion of cross-sectional variance explained by various factors	Based on the Merrill Lynch EMU corporate bond index. The measure is derived by running a regression of spreads relative to a set of variables including rating.	Model-based	Bloomberg
<b>Banking market indicators</b>				
7.	Cross-country standard deviation of MFI interest rates on loans to nonfinancial corporations	Based on MFI (monetary financial institutions) interest rate statistics.	Computed	ECB
8.	Cross-country standard deviation of MFI interest rates on loans to households	Based on MFI interest rate statistics.	Computed	ECB

	and deposits with agreed maturity			
9.	MFI loans to non-MFIs: outstanding amounts by residency of the counterparty as a share of total loans granted by MFIs, excluding the Eurosystem	Based on BSI (balance sheet items) statistics.	Computed	ECB
10.	MFI holdings of securities issued by non-MFIs: outstanding amounts by residency of the issuer as a share of total holdings, excluding the Eurosystem	Based on BSI statistics.	Computed	ECB
11.	Dispersion of short-term loans to enterprises	Based on the standard deviations of the short-term loan rates offered by Global Financial Data	Computed	Global Financial Data
12.	Dispersion of medium and long-term loans to enterprises	Based on standard rates deviations for medium and long-term loans offered by Global Financial Data	Computed	Global Financial Data

13.	Dispersion of consumer credit	Based on standard deviations of consumer credit rates offered by Global Financial Data	Computed	Global Financial Data
14.	The dispersion of mortgage loans	Based on the standard deviations of mortgage rates offered by Global Financial Data	Computed	Global Financial Data
15.	Dispersion of term deposits	Based on the standard deviations of time deposits rates offered by Global Financial Data	Computed	Global Financial Data
<b>Equity market indicators</b>				
16.	Filtered country and sector dispersions of euro area equity returns	Based on monthly cross-sectional Hodrick-Prescott filtered total equity returns on country and sector indexes.	Model-based	Thomson Financial Datastream
17.	Euro area and US shock spillover intensity	The indicator is derived from a model specifying euro area-wide and US (global) shocks to estimate the average sensitivities of country returns to common factors.	Model-based	Thomson Financial Datastream
18.	Proportion of variance in local equity returns explained by euro area and US shocks	The indicator is derived from a model specifying euro area-wide and US (global) shocks to estimate the proportion of total domestic equity volatility explained by common factors.	Model-based	Thomson Financial Datastream

Source: European Central Bank, *Indicators of Financial Integration in the Euro Area, 2005*, pp. 11-13.

EONIA is the overnight interest rate at which banks provide loans to each other in euro with a duration of 1 day. EURIBOR is the rate at which interbank term deposits in euro are offered by one primary bank to another in the eurozone. EONIA and EURIBOR indicators are collected by EMMI (European Money Markets Institute), with the objective of reflecting pricing on the unsecured short-term interbank market.

Moreover, according to a more recent European Commission report (EFSIR 2014), a set of 20 indicators were recommended to assess the degree of financial integration in the single market, as follows:

**Table no.2 Indicators of financial integration**

The indicator measures the effect of financial integration on:	Price-based indicators	Quantity-based indicators
A. Credit and bond markets	Interest rate differentials in the money market	Importance of foreign banks: asset shares (6) and number (7)
	(1), bond market (2), mortgage market (3), and corporate loan market (4)	Foreign assets (8) and liabilities (9) held by domestic banking sector
	Cross-border banking fees (5)	International Diversification of Bond (10) and Money Market (11) Funds
B. Stock Markets	Correlation of national stock market returns (12)	International Diversification of Equity Funds (13), Pension Funds (14), and

		Insurance Companies (15)
C.1 Household decisions	Saving-investment correlations (16)	
	Consumption correlation across countries (17)	
C.2 Corporate decisions	Cross-border M&A activity (18)	
D. Legal Institutions	Dispute Resolution Index (19), Dispute Duration Index (20)	

Source: *European Financial Stability and Integration Report 2013*, p. 204, based on Adam et al. (2002).

In this context, the same study (ESFIR, 2014) concludes:

✓ *Category A*: Price discoveries cannot be treated as such, because interest rates and economic incomes are more structured than previously assumed, competition issues (beyond the state aid issue) need to be considered more seriously, and the quality of landmarks that play an important role in price discovery must be protected as a benchmark, which may be more or less effective, and at worst, become a subject of manipulation and fraud.

✓ *Category B*: Risk sharing, insurance against idiosyncratic shocks to total consumption (and therefore well-being) is an important premise of a more integrated financial market. Shiller (1995) emphasized that individual risks remain uninsured.

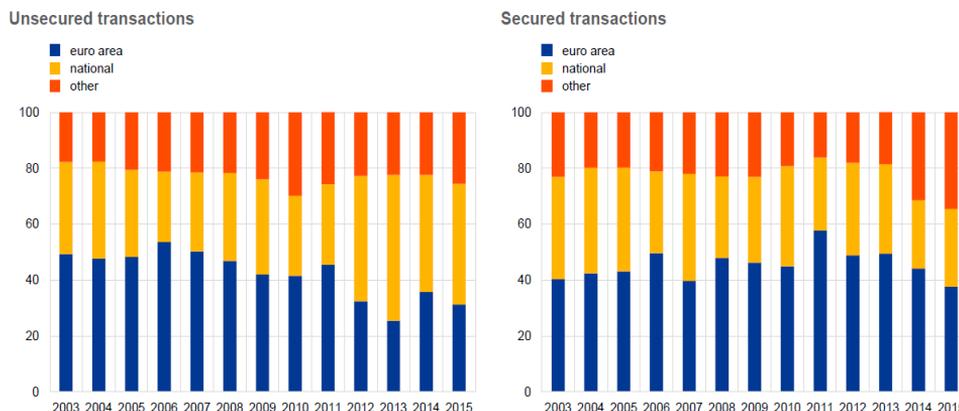
✓ *Category C*: Delivering better and less discriminatory access to funding for the entire period when the EU is out of the crisis is a major desirable feature that we must expect, so an integrated financial market can provide a higher degree of access than a conglomerate segmented by national markets. However, measurement problems abound because the effects of supply and demand are difficult to understand.

Financial indicators are an essential category of the global price discovery process. Their significance for the day-to-day conclusion of financial contracts reveals the importance of transaction costs even in highly developed financial systems. A key place in recent EU regulations has been the reliability of these benchmarks. The Financial Constraints Indicator (FIC) proposed by Whited and Wu (2006) is a possible indicator that highlights the financial choices of businesses in the single market. According to European Commission, these additional indicators would be complementary to a key price-based indicator, such as interest rate or spreads, for corporate loans, which benefited from high attention from the crisis, being considered one of the main indicators of financial fragmentation in the single market and in the Eurozone.

### 2.2. Evolutions of the European Financial Integration indicators

Regarding the money market, as can be seen from Figure 1, the counterparty structure of the different segments of the money market experienced a limited change in 2015, suggesting a decline in market activity for all trading partner groups. Although money market turnover declined considerably, the share of counterparties remained the same, i.e. 40% on the unsecured market, to 25% on the secured market.

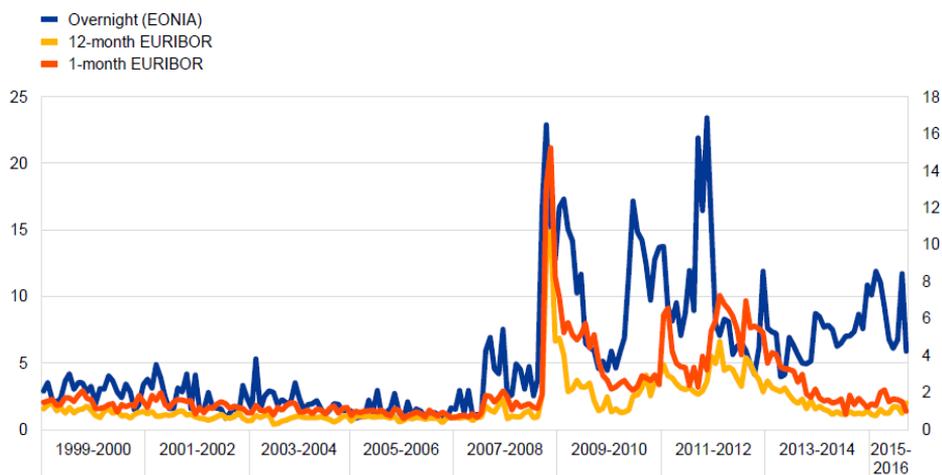
**Fig. 1 Counterparty structure of money market transactions**



Source: ECB, *Financial integration in Europe, 2016, p. 15.*

Figure 2 shows the dispersion of interbank non-guaranteed interbank rates between countries and for different maturities. If, during the sovereign debt crisis and the financial crisis, interest rate dispersion has reached a high level due to financial tensions in certain jurisdictions in 2012, after tensions have slowed down, dispersal measures have declined and market access has improved for banks.

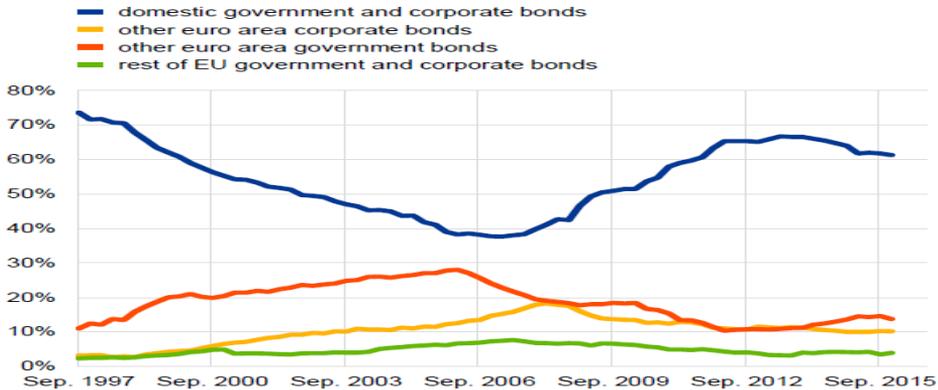
**Fig. 2 Interquartile range of euro area countries average unsecured interbank lending rates**



Source: ECB, *Financial integration in Europe, 2016, p. 16.*

With regard to the bond market, data on MFI holdings of euro area debt securities are more limited, but shows that euro area MFIs have significantly reduced portfolio allocations to government bonds in other euro countries between early 2010 (18%) and early 2012 (10%) and corporate bonds declined at the beginning of 2008, with the main beneficiaries of these developments being credit card holdings.

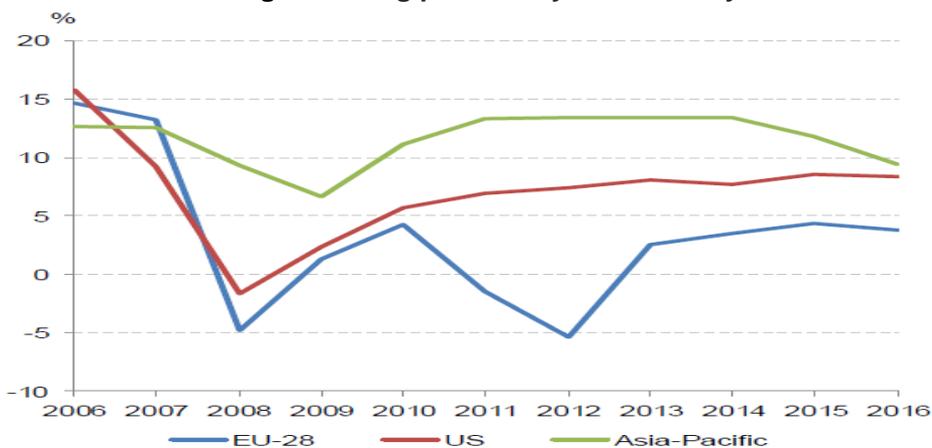
**Fig. 3 Holdings by euro area MFIs of debt securities issued by EU corporates and sovereigns**



Source: ECB, *Financial integration in Europe*, 2016, p.26.

In the banking sector, the ECB identified the largest contributor to the decline in ROE in the euro area, both in Member States heavily affected by the crisis and in other countries, net interest income. The low profitability was determined by a series of cyclical and structural factors, such as a low-interest rate prolonged rate that erodes bank profitability by compressing net interest margins, the positive impact of monetary policy, high cost-income ratios, business models dependent on interest income, increased competition from financial technology companies.

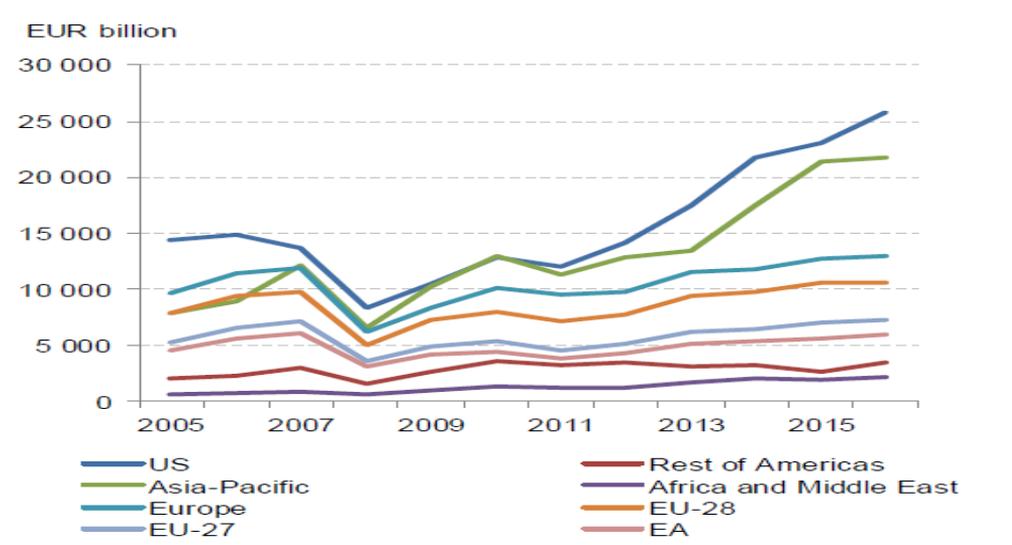
**Fig.4 Banking profitability measured by ROE**



Source: EFSIR 2017, p.33.

If we look at developments in capital markets, we can see that the relevance of European stock markets has declined over the last decade, with declines becoming more pronounced in 2013, with EU-28 declining from 82% to 55%.

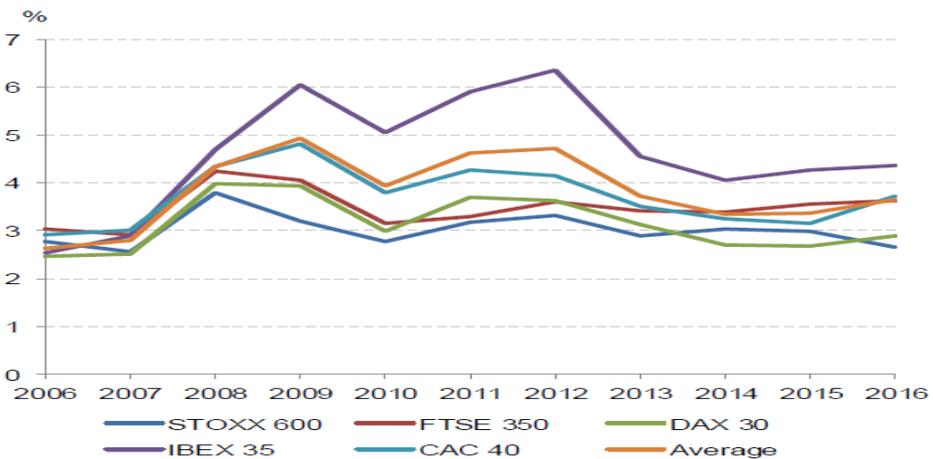
**Fig. 5 Market capitalization**



Source: EFSIR 2017, p.50.

Also, dividend returns on equity markets declined in 2016, but remained much higher than yields on fixed-income securities. The return on dividends from the STOXX600 index, covering large, medium and small firms in 17 EU countries, began to decline since 2008, the main reason for the fall in yields was the increase in stock prices due to low-interest rates.

**Fig. 6 Dividend yields**



Source: EFSIR 2017, p.51.

Especially in the domestic markets, non-financial corporation occupies an important part of the total equity issuances, the other side being representing by banks and other financial corporations. The positive influence of the ongoing economic recovery and the search for yield by investors are negatively stimulated by the small corporate profits and political uncertainty.

### 3. Conclusions

The dilemmas of the financial integration phenomenon have persisted over time in the literature, researchers trying to find the most appropriate tools to quantify and highlight integration in all the segments of the financial market, in order to assess the impact of factors through which European financial integration has influenced economic growth.

In addition to macro-prudential policy, fiscal policy, competition policy, financial regulation policies and crisis management policies interact with each other, with the aim of creating a more sustainable and robust financial system that can deliver vital services to the real economy. The interaction between these policies needs to be monitored and evaluated, because all these can increase or reduce systemic risk.

Also, the indicators used by the European Central Bank (ECB, 2005), serve as the basis for quantifying and assessing the progress of European financial integration in different financial markets.

Quantitative indicators allow the identification of the underlying factors of general developments over time, beyond a series of static results, such as the fact that the debt securities market is more integrated than the capital market. These indicators mainly help to highlight the deterioration in the financial integration of the euro area credit market observed before mid-2012, a phenomenon known as (financial) disintegration in the literature, and having as a main reason the major fall down of cross-border investments in public debt issued by countries in the Euro area, being affected by sovereign debt crises. The phenomenon of disintegration occurred mainly during the financial crisis, when, according to the above statistics, the financial integration indicators registered significant decreases.

In the euro area, the strong financial fragmentation following the financial crisis had important negative influences on the economic system. However, referring to the depth of financial integration, the main achievements were obtained after the introduction of the euro.

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