

Output Loss Severity across EU Countries. Evidence for the 2008 Financial Crisis

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Abstract: Financial crises are complex phenomena, in terms of the triggering factors, duration and severity, impact on both financial system and macroeconomic fundamentals and the full range of costs arising from its occurrence. The paper aims at providing an updated picture on the magnitude the 2008 financial crisis had, in terms of economic costs incurred by EU member states. It has been briefly reviewed crises' main monetary and economic effects and costs. Then it has been employed International Monetary Fund's approach for measuring crisis severity, expressed as an output loss indicator. To check the stability of the results, the basic methodology relying on a 3-year GDP trend has been complemented with a 7-year GDP trend. The output losses recorded by each EU country, under both trend assumptions, showed that Baltic states and Greece had been the most affected as they cumulated the highest losses. The lowest output losses have been registered in Western Europe countries (Austria, Belgium, France, Germany and Poland). Most EU economies' growth still hasn't entered on a robust ascending path, as they haven't reached the level of GDP trend computed for the period preceding the onset of the financial crisis.

Keywords: economic costs; financial turmoil; output loss; trend.

JEL Classification: C82; G01

1. Introduction

There is a broad literature devoted to the study of financial crises triggers, frequency, costs, severity and predictive variables. One of the research questions that preoccupy both practitioners and academia relates to the reliable estimation of crises' severity.

Commonly, the severity of financial crises has been measured in terms of the fiscal costs imposed on by crisis resolution frameworks (Demirgüç-Kunt, Detragiache 1997; Frydl, 1999), of the magnitude of output losses, of declines in stock market indexes (Caballero, Candelaria and Hale 2009), of global trade drop measured as export and import price indices (IMF Survey, 2010), of economic slowdown (Tjahjawardita, Pradono, Rinaldi 2009) computed as the difference in GDP growth rates between two successive years. However, none of these indicators reflect comprehensively the overall costs an economy is exposed to.

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In this respect, Claessens, Klingebiel and Laeven (2003) stated that it is not possible to isolate the effect of a banking crisis on GDP level from other shocks or leading factors, therefore none of output loss measures developed by economic literature correctly capture the effect of the banking crisis on GDP and the full economic costs of a banking crisis.

Most empirical studies have attempted to quantify the economic cost associated with a financial crisis by estimating the magnitude of output loss. In this respect, Angkinand (2005) believes that this measure is the most suited as it reflects the short-run adjustment of output. In addition, any policymakers' attempt to contain or tackle financial crises has to take into account the potential output losses accompanying crisis episodes (Kapp & Vega 2014).

In a study focused on empirically measuring the 2008 global financial crisis' severity, Rose and Spiegel (2011) have employed four observable variables meant to quantify crisis' severity, namely: the 2008 real GDP growth, the percentage change in a broad measure of the national stock market over 2008, the 2008 percentage change in the SDR exchange rate and the change in a country's creditworthiness rating. Finally, they chose as a measure for crisis intensity the 2008-2009 GDP growth.

The paper aims at assessing the output loss recorded by each EU member state following the onset of the 2008 financial crisis, by relying on International Monetary Fund's methodology. It is structured as follows: section two reviews briefly the main effects and costs associated to episodes of financial turbulence; section three depicts the methodology employed for computing the output losses recorded by EU member countries and presents the results obtained. The last section concludes.

2. Review of Banking Crises' Effects and Costs

In the economic literature different meanings have emerged regarding the identification and definition of financial turbulence events, while their length and severity, reflected by costs incurred, are still difficult to be accurately quantified. Generally, the effects on affected countries follow a similar pattern and produce, inevitably, a state of economic instability. In the following it has been summarized the main effects of financial crises, namely:

- *effects on monetary policy.* One monetary tool central banks have at their disposal is the lender of last resort function. By exercising it, the full economy would be exposed to the inflation tax. Inflation tax has often been perceived as a disputed, but necessary compromise, to restore the functioning of credit institutions in difficulty. Although the monetary policy primary objective is to maintain price stability, the central bank is also responsible for ensuring the robustness of the banking system, which in crisis situations materializes in the injection of liquidity. The difficulty is

to distinguish between liquidity requests coming from solvent credit institutions, but facing a temporary shortage of liquid assets, and those from inadequately capitalized institutions.

If central banks and government 's interventions provide liquidity for distressed banks, would induce a state of moral hazard, the short and medium term effects taking the form of lending expansion, interbank interest rate reductions and domestic currency depreciation. In other words, credit institutions with solvency problems will be tempted to continue lending activity, in order to improve profitability (by volume of new loans granted and / or spread of interest rates charged), without necessarily achieving a restructuring of customer selection practices and monitoring of outstanding claims, or using liquidity injections for recapitalization purposes. In this case, the central bank will have to strengthen monetary policy, through open market operations to sterilize the excess liquidity, monetary policy interest rate or reserve ratio increases, foreign currency sales etc.

- *effects on the payment system.* Regardless of the banking system size, the emergence of a generalized crisis contributes, inevitably, to the damage of the smooth functioning of payment systems. This situation has direct and immediate impact on all economic and financial entities, because it means stopping the clearing and settlement mechanisms, processing with difficulty all payments arising from production, distribution and consumption processes.

Reiterating the crucial role of the payment system in a country's economy, one could ask to what extent its functioning could be affected by failures of individual credit institutions or the emergence of a contagion effect across the entire banking system. In a financial stability report published by the Central Bank of Sweden (2003) it is argued that a credit institution is a systemically important one for the payment system functioning if it manages a considerable amount of payment instruments, if intermediates a significant percentage of payments in the economy or if any difficulties affecting it can spread to other financial institutions.

- *effects on economic growth.* In an early study conducted by the IMF (1998) it is shown that GDP growth rate will reach the level previously recorded after three years from crisis end. Honohan, Klingebiel (2000) argued that one of three banking crises that have affected developing countries has generated a cumulative output loss of over 20% of GDP. At a similar result arrived also Hoggarth, Reis, Saporta (2001), which revealed, in addition, that output losses due to a crisis are higher in developed than emerging countries.

In a survey of 18 financial crises that have affected OECD countries since 1970, Reinhart, Rogoff (2008) have established that, in the first year from the onset of the crisis, economic growth compressed on average by 1.25%, and in the next two years it compressed with 2.25% from the year preceding the crisis. In addition, the authors showed that in situations where the economic downturn is preceded by imbalances

in the financial sector (especially in the banking sector), the recession will be more severe and prolonged.

Empirical analyses of Angkinand (2008) showed that countries taking recourse in times of crisis to a broader deposit guarantee recorded, on average, a lower level of economic growth loss, justifying therefore the role of deposit insurance as a safety net and reiterating the function of preventing the phenomena of bank runs and protecting the payment system.

- *effects on lending activity*. During the occurrence of a crisis, credit institutions could adopt two diametrically opposite attitudes. Insolvent institutions, characterized by low profitability and liquidity, might take on excessive risks in order to improve solvency. Creditworthy, relatively stable banks, which experienced a slight deterioration in the asset portfolio, might show a pronounced aversion to risk, refusing to lend even to eligible applicants, so as to not increase the share of risky assets in total assets and to not reduce the minimum solvency ratio. The result will be a severe credit crunch, with negative effects on the real sector, consumption and investment, on production capacity and economic growth. In addition, once the credit channel fails to fulfill its function, it cannot be used anymore as a monetary policy transmission mechanism.

- *effects on consumption*. Empirical tests performed by Barrell, Davis, Pomerantz (2004) have highlighted the fact that open economies, with liberalized financial markets and a high level of household indebtedness, which were exposed to an episode of banking crisis, experienced a collapse in consumption, while reducing lending.

- *loss of public confidence* in the authorities' ability to solve the crisis and restore the status of financial and economic stability. Effects may result in capital outflows, exposing the banking system to liquidity risk (risk amplified by volatile capital flows) and currency risk, but also the discouragement of saving behavior, people preferring to hold, at least in the short term cash, a phenomenon known in economic literature as "flight to quality".

Ultimately, the implications of the financial crises have negative repercussions on financial stability, which may translate into a deterioration of the countries' rating, with prospects of a worsening investment climate.

All these adverse effects will further translate into several categories of costs, such as:

- *fiscal costs*, born by taxpayers, arise from government actions that involve an expenditure of public funds. Examples of such actions, associated to banking system's rehabilitation activities are: the provision of liquidity through the central bank lender of last resort function, recapitalization of distressed banks through capital injections, the total guarantee of deposits, search of private investors.

Studying 42 past episodes of banking crises, during the period 1970-2007, Laeven, Valencia (2008) estimated that fiscal costs, net of recoveries, associated with crisis management measures can be substantial, averaging at about 13.3 percent of GDP, and can be as high as 55.1 percent of GDP.

Analyzing the scope of government actions on the size of fiscal costs, Honohan, Klingebiel (2000) noted that if governments hadn't excessively appealed to a large number of practices to save banks in difficulty, average fiscal costs would have been limited to 1% of GDP. On the opposite, if authorities were to apply simultaneously all bailing out strategies, fiscal costs would have exceeded 60% of GDP.

- *economic costs*, due to gradual and slow government intervention. Frydl and Quintyn (2000) draw attention on the moral hazard induced by the prolonged bailing out process, by the fact that institutions benefiting from government intervention will be tempted to adopt a risk taking attitude, having the potential of an increase in the initial costs. This idea is supported also by Barrell, Davis, Pomerantz (2004), arguing that a quick resolution is more appropriate than a tolerant attitude, that would encourage moral hazard, would increase costs for taxpayers and would help to brake economic growth.

Delays in taking prompt corrective action directly affect the cost and duration of the crisis. On the other hand, studies conducted by Frydl (1999) did not reveal a significant positive correlation between crisis length and its costs. In contrast, between crisis length and the dynamics of economic growth was reported a positive correlation. Thus, for periods up to one year, economic growth is not affected; instead, crisis episodes between 2 and 7 years are correlated with significant reductions in economic growth.

Laeven, Valencia (2008) considered that output losses (measured as deviations from trend GDP) induced by systemic banking crises can be large, with an average of about 20% of GDP during the first four years of the crisis, and ranging from 0 percent to a high of 98 percent of GDP.

- *social costs*, generated by the propagation of macroeconomic and financial turmoil to the real sector. Can be represented by rising unemployment, inflation, declining real income, lower living standards due to erosion of purchasing power, the deterioration of public health and educational climate.

- *political costs*, represented by changes in government strategy, the adoption of unpopular measures, especially relative to fiscal policy and wage level, likely to erode confidence / sympathy of the electorate in the ruling party, the possible deterioration of the country rating with negative effects on capital inflows and external financing.

3. Output Loss Estimation Methodologies

The remaining part of the paper focuses on economic costs, with emphasis on measuring their amplitude by means of an output loss approach. In the economic literature there is no consensus on the most appropriate method for calculating output losses. Some studies employ the real GDP level (Hoggarth, Reis, Saporta, 2001; Mulder & Rocha, 2001; Angkinand, 2005) while others (IMF 1998; Bordo, Eichengreen, Klingebiel, Martinez-Peria, 2001; Honohan & Klingebiel, 2003; Claessens, Klingebiel, Laeven, 2003) use the real GDP growth rate.

Kapp and Vega (2014) argue that output costs generated by financial crises are very heterogeneous; consequently, they dismiss the indicator variable approach in favor of the output gap approach. By employing a broad database of financial crises covering 170 countries from 1970 until present, they uncovered the heterogeneous nature of output losses and the fact that a large number of countries hadn't succeed in recovering their pre-crisis growth rates or trends. Their results indicate that average output losses generated by debt crises are 9% higher than those generated by banking crises, while currency crises incurred the smallest losses.

To estimate the current output loss generated by the 2008 financial crisis, it had been applied the methodology described in IMF World Economic Outlook (1998), which computes it as the sum of the differences between the GDP growth rate and trend growth rates, during the period between the crisis starting year and the year in which the economy reaches its pre-crisis trend growth. The GDP growth trend is calculated as an average of GDP growth rates recorded in the three years preceding the starting year of the crisis.

It should be mentioned that the average number of years considered for computing the trend growth rate may differ from three (IMF 1998) to five (Bordo, Eichengreen, Klingebiel, Martinez-Peria 2001) or ten years (Hoggarth, Reis, Saporta 2001). However, Mulder and Rocha (2001) argued that, by emphasizing different pre-crisis periods to calculate the trend growth rate, the estimated magnitude of output loss does not change significantly.

A more recent opinion belongs to Smith (2012), claiming that the level of pre-crisis GDP trend might prove misleading when used for measuring the severity of a crisis. It is the case of crises which have been preceded by a boom and hence the economic growth is unsustainable fast and high, inflated by confidence in economic prospects. Consequently, these GDP levels are not suited for computing trend and use it as benchmark for measuring output loss. This drawback might be removed usually by considering longer time periods as a basis for computing GDP trend or by applying statistical filters such as Hodrick-Prescott.

Data on GDP growth rate has been collected from Eurostat database, covering the 2001 – 2014 years. To check the robustness and stability of the output losses to be

computed, the GDP trend has been calculated for the 3 years respectively the 7 years preceding the onset of the financial crisis. The computation algorithm for the output loss measure mimics the one proposed by IMF and detailed above.

Table 2. EU member states' output loss after the 2008 financial crisis

Country	3 year trend	7 year trend	3 year output loss	7 year output loss
EU(28 countries)	2.83	2.24	-19.13	-15.00
Euro area (19 countries)	2.70	1.97	-19.60	-14.50
Belgium	2.50	2.00	-13.60	-10.10
Bulgaria	6.47	5.76	-38.47	-33.50
Czech Rep.	6.27	4.53	-41.17	-29.00
Denmark	2.33	1.60	-19.53	-14.40
Germany	2.57	1.34	-12.67	-4.10
Estonia	9.27	8.17	-65.67	-58.00
Ireland	5.37	5.13	-39.37	-37.70
Greece	3.40	4.20	-52.60	-58.20
Spain	3.90	3.49	-32.30	-29.40
France	2.13	1.81	-12.53	-10.30
Croatia	4.73	4.64	-43.93	-43.30
Italy	1.47	1.21	-19.37	-17.60
Cyprus	4.43	3.80	-37.83	-33.40
Latvia	10.53	9.09	-77.63	-67.50
Lithuania	8.77	8.21	-55.87	-52.00
Luxembourg	5.17	4.03	-28.27	-20.30
Hungary	2.93	3.61	Trend reached in 2014	Trend reached in 2014
Malta	3.20	1.93	Trend reached in 2014	Trend reached in 2014
Netherlands	3.43	2.07	-23.83	-14.30
Austria	3.03	2.10	-17.13	-10.60
Poland	5.63	4.03	-17.63	-6.40
Portugal	1.63	1.21	-17.93	-15.00
Romania	6.40	6.27	-36.20	-35.30
Slovenia	5.53	4.37	-42.43	-34.30
Slovakia	8.50	6.31	-46.50	-31.20
Finland	4.03	3.16	-33.03	-26.90
Sweden	3.63	3.06	-19.43	-15.40
UK	2.80	2.83	Trend reached in 2014	Trend reached in 2014

As it can be noted from table 1, Hungary, Malta and United Kingdom reached their growth trend in 2014, while most of the sample still records an ongoing output loss.

For the EU 27, the average GDP growth rate in the three years previous the financial crisis onset was of 2.83% and 2.24% in the 7 previous years, while countries in euro zone recorded an average GDP growth of 2.7% and respectively 1.97%.

Although the national authorities have promptly implemented monetary and fiscal measures, to contain crisis propagation across countries and stabilize financial systems, its adverse effects still last and economic growth is still in a recovery process.

The cost of the financial crisis, expressed in terms of output loss, had recorded the highest levels in Baltic countries (Estonia, Latvia and Lithuania) and Greece, ranging between 77.6% in Latvia and 52.6% in Greece (in the assumption of a 3 year trend), respectively between 67.5% and 52% (in the assumption of a 7 year trend). At the opposite are Austria, Belgium, France, Germany and Poland, with the smallest output losses ranging between 13 – 18% (in the assumption of a 3 year trend), respectively 4 – 11% (in the assumption of a 7 year trend).

The results obtained confirm the forecast made by Atoyan, Cerutti, Ramakrishnan (2009), which empirically modeled the probability of crisis exit for a number of emerging countries in Europe, indicating that they are likely to experience a longer period of economic imbalances, until they overcome the crisis. According to their analysis, for emerging countries in Europe the average probability of exit from the crisis at the end of 2010 is of only 30%. Of these countries, those which initially showed a high level of external debt and current account deficit are likely to face a prolonged crisis episode. Kondor and Staehr (2011) too, found out that the Baltic States recorded the widest output contractions, and hence output losses during the global financial crisis. Ball (2014)'s empirical study stated that the global financial crisis triggered national recessions of varying severity, but in most cases losses in potential output are large. The hardest-hit OECD countries were those in the periphery of the euro area, which experienced severe banking and debt crises.

After having investigating the evolution of real per capita GDP for 100 systemic banking crises, Reinhart and Rogoff (2014) have found that on average, it takes around eight years until reach the pre-crisis level of income, while the median is about 6 years and a half.

4. Conclusions

The purpose of this study has been to yield a snapshot of economic costs associated to the global financial crisis, from its onset until present. The indicator chosen had been the output loss, which varied widely across EU countries during this crisis. Although there is a large number of intrinsic or external factors that contribute to the differences in output losses recorded by the financial crisis-hit countries,

undoubtedly the initial macroeconomic conditions and domestic policy responses of monetary decision makers and government heavily influenced the path of output costs following the crisis onset. This reasoning has also been outlined in a study published as part of the IMF World Economic Outlook 2009. According to the study, while there is a strong relationship between the initial economic conditions and the size of the ultimate output loss, short-run macroeconomic stimulus and sustained structural reform efforts may help reduce output losses over the medium run. As the European Economic Forecast (2011, p.8) stated, differences in the speed of recovery among EU countries are related to the degree to which economies were hit by the shock (regardless of the transmission channel: housing and real-estate bubble burst, financial sector or trade links) and the number of challenges faced. In addition, it should be taken into account the specificity of EU, which is built on the framework of a regional development. As Davidescu and Strat (2014) mentioned, regional development gravitates around the broad desideratum of mitigating economic and financial disparities across countries and regions.

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