GOOD BYE LIGHT TOUCH? MACROECONOMIC RESILIENCE, BANKING REGULATION AND INSTITUTIONS

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Abstract

With the Great Crisis of 2008-2009 we have witnessed a relevant episode of macroeconomic vulnerability affecting many countries. To what extent such vulnerability has depended upon the design of light-touch (LT) banking regulation? We observe an Unpleasant Nexus (UN), i.e. that macroeconomic volatility is associated in a robust and systematic way with LT banking regulation. But the UN does not operate in a vacuum. The link between vulnerability and LT banking regulation seems representative of a more general relationship between institutional design and macroeconomic performance. Our analysis shows how various types of institutions – public, political, legal, monetary – also seem to exert an unexpected effect on resilience.

Keywords: Global Crisis, Macroeconomic Resilience, Banking Regulation, Monetary and Political Institutions

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1 Introduction

The economic and financial crisis that affected nearly every economy in the world in the years 2008-2009 (the Great Crisis) has brought to the fore again the issue of macroeconomic resilience. By macroeconomic resilience, we mean the ability of an economic system to grow in a regular fashion. In other terms, it's not only important that an economy has a good growth record on average, but it's also important that its variability − volatility and/or vulnerability − stays low.

A desirable feature for a country's economy is indeed to have stable economic growth, insofar as the two characteristics, growth and stability, are likely to reinforce each other. Growth augments available resources, while stability yields reduced uncertainty. And growth is more likely to occur, the more operators act in a context that is certain. The macro relation between certainty and growth is mediated by well-defined hypotheses on individual risk-taking.

At the individual level, it is reasonable to assume that the capacity to produce and exchange resources depends on the personal willingness to take risks. On the other hand, given a normal propensity to risk of individuals, the choices that are made to produce and exchange goods and services will be more numerous the higher the certainties are about the context in which individuals are acting. Summing up greatly, we can say that the choices of enterprising an activity are likely to produce value, ceteris paribus, depending on the expectation or degree of confidence that people have about reaping the fruits of such choices.

In recent economic analysis, starting with the importance assigned to expectations, there has been a growing emphasis on the relation between risk-taking, trust, and certainty. Also, lack of uncertainty has been associated with a system of rules understood in a general sense, as that framework that governs and orients individual economic choices. The more a system of rules produces a certainty-generating environment, in other words trust, the higher will be the propensity to undertake economic choices, and therefore growth will also be higher. As a consequence, a virtuous and dynamic relation between rules and growth has been identified. In addition to this, since the engine of growth − rules – has a structural nature, it's also logic to assume that ensuing growth is also stable.

The possibility in principle of having stable growth had seemed to be confirmed − at least until the advent of the Great Crisis − by the evolution of macroeconomic variables in advanced economies over the last two decades. These years have, not coincidentally, been defined as the period of the Great Moderation (among others, see Cecchetti 2004 and

2005, Summers 2005, Davis and Kahn 2008, Behan 2010).

During the Great Moderation, Western economies seemed to have taken an enviable economic path: growth without inflation, in tandem with a reduction in the volatility of all real and financial variables. Not only economies were growing, but instability was decreasing, too. Recession shocks diminished in their intensity and frequency. For instance, an IMF study looked at the 122 recessions, according the NBER definition, which terms recession a negative variation of GDP for at least two subsequent quarters, that had occurred in OECD countries over the 1960-2007 period. The study had ascertained a reduction in the severity of recessions, during which there was an average GDP drop of 2.7% over the entire period, but of 1.4% when only the two decades of the Great Moderation were taken into account.

Stable growth was associated with higher certainty about the general framework in which economic agents were operating, both cyclically and structurally. Cyclically, what was being underlined was a change in the management of economic policy, toward rules and away from discretion, on both the fiscal and monetary fronts (see for instance Cecchetti 2004 and 2005). At the structural level, an important role was given to improving market regulation, itself

part of a more effective system of public governance (see for example Kaufmann et al. 2002).

The paradigm was clear: regulation is better the more market-friendly it is, that is, the more it is light-touch (LT) regulation. In this view, regulation − coherently with the principles illustrated above − must foster an environment that makes individual risk-taking easier, by giving a decisive contribution to the efficient allocation of resources at the microeconomic level, which then in the aggregate leads to the result of steady growth. The relation between stable growth and well-designed rules was supported by theory and empirical research (see for example Acemoglu et al. 2005).

The quality of regulation as relevant factor for stable growth was particularly emphasized in the case of financial rule-making (Barth et al. 2004, Levine 2005a). The correlation between the two phenomena was visually supported by graphs such as those portrayed in Figures 1 and 2. By using our data base – which we will illustrate in detail further below – one can see that, considering a set of 102 countries, which is wide and heterogeneous, economic growth before the Great Crisis is positively correlated with LT regulation, whether in terms of general regulation (Figure 1), or when the focus is put on banking regulation (Figure 2).

Figure 1. Growth and LT regulation (before the crisis)

GDP Growth (1996-2006, average value, %)
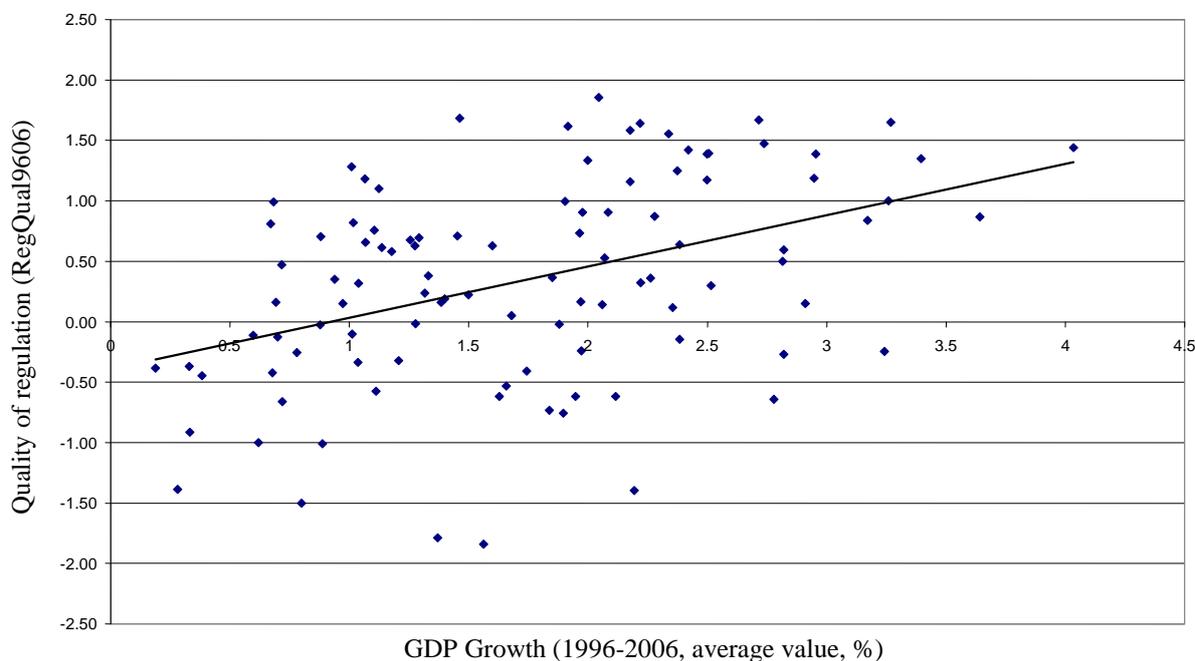
The Great Crisis of 2008-2009 shattered this ideal framework. The economic crisis has unexpectedly and severely hit most economies, with heavier effects precisely for advanced economies. Macroeconomic resilience is no longer the given, almost automatic, result of yore.

In other words, the economic and financial crisis has been a uniquely relevant shock for all economies, raising, among others, a basic question: is the relation linking stable growth to LT regulation still valid?

If the Great Crisis marks the beginning of a new period of volatility, then the design of rules that promotes and provides incentives for individual risk-

taking can no longer be assumed to produce benefits in terms of higher growth; we must take into account the unknown of higher volatility, represented by larger systemic risks. The unforeseen emergence of systemic risk has a cost in terms of GDP loss.

Figure 2. Growth and LT banking regulation (before the crisis)
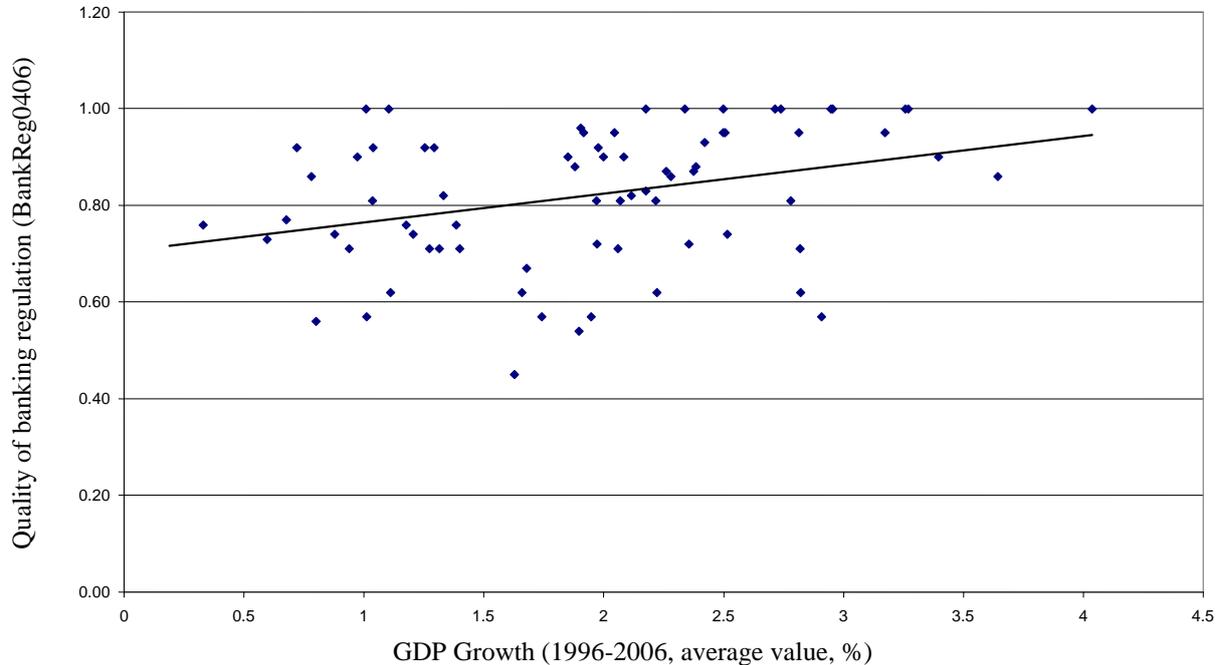
We must then consider the hypothesis that LT regulation, designed in order to optimize individual risk-taking, produces a negative externality in terms of the excessive production of systemic risk, which implies a cost in terms of the volatility of growth itself. It must then be investigated whether such externality can be considered an isolated case or not.

If there were robust clues on the existence of a correlation between LT regulation and the drop in growth, we could infer that such regulation does not automatically warrant optimal risk-taking, at least from a systemic point of view, as it had normally been assumed until 2007.

In fact, before the crisis, the idea that LT regulation could make the macroeconomic context more vulnerable to shocks had sometimes been put forward – as Giannone et al. 2010 underline – but only when looking at specific markets, contexts, and episodes, all of which could be summarized under the rubric of financial liberalization (see for example Diaz – Alejandro 1985, Hellman et al. 1997).

The Great Crisis has given the issue a much more general relevance. In this perspective, the 2008-2009 period has the characteristics of a natural experiment (Giannone et al. 2010): given an unexpected international event and the diverse resilience exhibited by the various economic systems, is it possible to link such diversity to the structural characteristics of each country's economy?

Let's keep in mind that the shock was particularly sizable: in over 50 countries the drop in growth surpassed 4 percentage points, with respect to average GDP levels attained over the 1990-2007 period (Lane and Milesi-Ferretti 2010). Considering the 102 countries of our data set, the annual average growth rate and its variability (as measured by standard deviation) are equal to 5.36 and 2.63, respectively, in the 2004-2006 period; during the period of the Great Crisis (2008-2009) the corresponding measures were 1.08 and 3.75, respectively.

The issue of the search for structural drivers of the crisis is clearly very wide and complex; research on the topic has just started. In spite of this, what strikes us is the fact that – as we shall see – the very role of LT regulation has emerged – at least until now – as a determining factor. It then becomes interesting to inquire whether LT regulation can be linked to instability, in a way that could have not been predictable before the onset of the Great Crisis. It even seems that it's the very countries with the best forms of regulation which have suffered the most (Giannone et al. , 2010).

As a matter of fact – in order to provide a first description of the phenomenon to be studied – if we take the same set of countries we have just considered and we measure their macroeconomic stability in terms of variability of growth during the Great Crisis, we now find there exists an inverse correlation both with general regulation (Figure 3) and banking regulation (Figure 4).

Figure 3. Resilience and LT regulation

GDP Growth (1996-2006, average value, %)
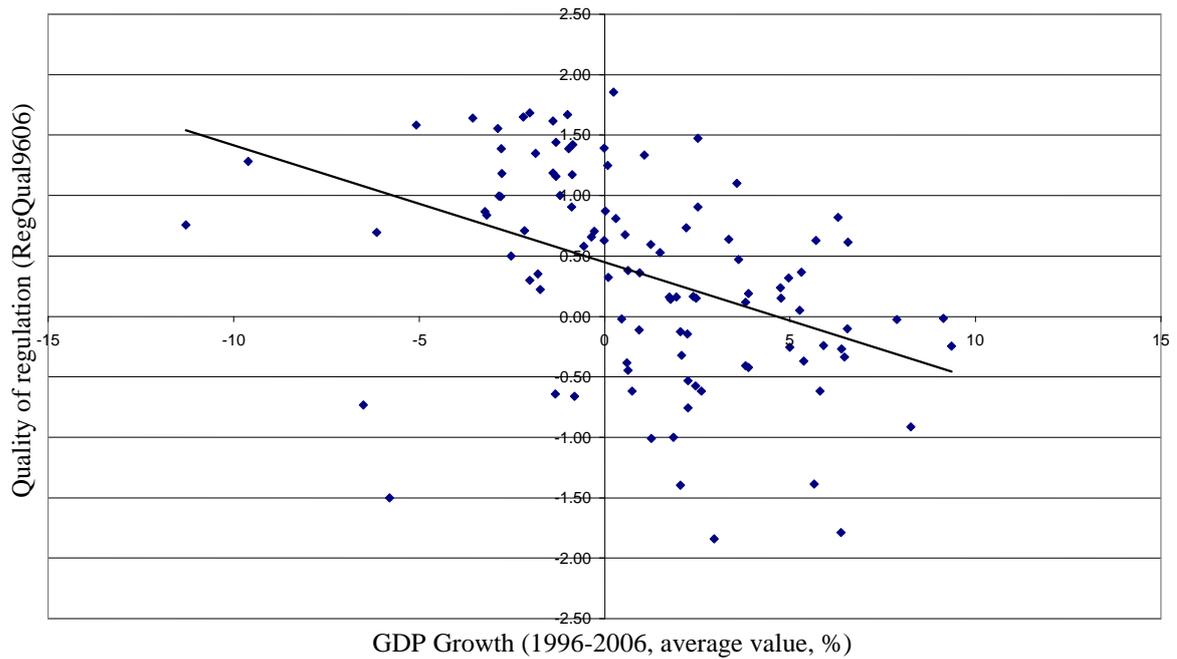
Figure 4. Resilience and LT banking regulation

GDP Growth (1996-2006, average value, %)
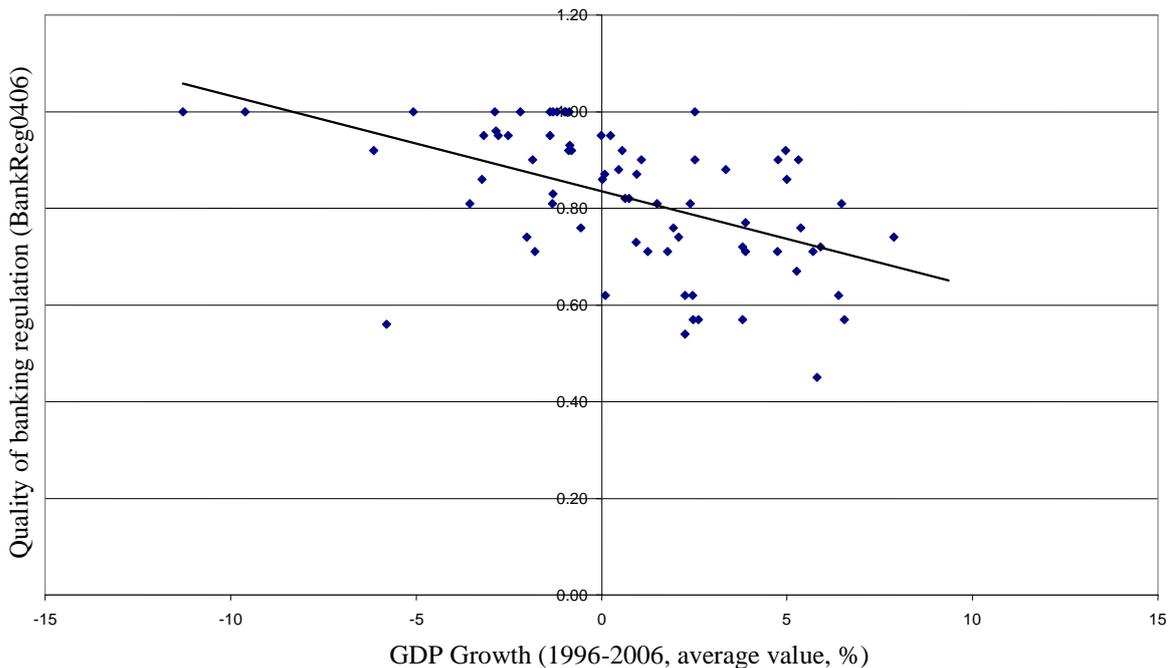
A more in-depth analysis can then provide interesting, yet not definitive, results. In other words, if we exclude the hypothesis that the Great Crisis is a purely random event, it is worth returning to the question of the relation that exists between regulation and the economic cycle.

Putting it differently, we can say that we are going back to the question if the nature of shocks – including the Great Crisis – is either exogenous or endogenous with respect to the structural features of the economy, regulation included. In particular, it's

crucial to understand to what extent LT regulation has had an impact on growth and its stability.

The chapter is organized as follows. In the second section, we look at the state of art by surveying the economic literature that has explored the possible determinants of economic resilience recorded in various countries. We highlight the fact that much attention is devoted on the role played by banking regulation. The hypothesis of a relation between the design of banking rules and macroeconomic stability is further explored in the third section, with an

empirical analysis that sheds light on the likely role of institutional variables that are different from banking regulation strictu sensu. The possible influence of public, legal, and monetary institutions is then discussed. The fifth section draws the conclusions of our analysis.

2 Macroeconomic resilience and banking regulation: the state of the art

As far as we know, the issue of macroeconomic stability in the various countries hit by the Great Crisis has only recently started to be a topic of economic analysis and until now at a purely empirical level. The general question is: what can explain differences in macroeconomic vulnerability for countries affected by the same relevant shock?

A cross-section study covering a large number of economies is a necessary step – although not conclusive – considered that a dynamic, time-series analysis of the causes of the Great Crisis, even if limited to a single country, is source of additional complexity (Rose and Spiegel 2010), because one must distinguish between the onset and evolution of the crisis from the reactions to its unfolding, particularly in the area of economic policy.

Each of the studies that have until now been produced can be classified according to a series of characteristics. Firstly, what is meant by macroeconomic resilience. Secondly, what are the relevant phenomena explaining resilience. Thirdly, what are the other factors that could provide an alternative account of macroeconomic resilience (control variables). It must be noted, also, that in all the studies thus far considered, as well as in the present analysis, explanatory variables are calculated from data sets that are antecedent to the Great Crisis (i.e. prior to 2008), also to reduce the risks of faulty identification of the causality nexus existing among the variables being studied.

Fourthly, both data and techniques can differ significantly. From this point of view, our analysis exclusively focuses on studies that have considered sets of countries that are heterogeneous under all aspects. Thus we have refrained from considering those studies that have a narrower scope, either from a geographic point of view or in terms of the degree of economic development of the countries covered (see for example Blanchard et al. 2011).

The analysis of the existing literature is performed by focusing on the role of regulation in explaining the instability recorded during the Great Crisis. Thus comparative discussion of various empirical analyses uses as benchmark the work (Giannone et al. 2010) which first highlighted the potential relevance of such perspective.

Giannone et. al. choose average GDP growth over the 2008-2009 period as a dependent variable. The same variable was chosen both by Lane et al. 2010 and by Masciandaro et al. 2011.

Lane et al. 2010 also add the difference between growth in that time span and that recorded in the immediately preceding two-year period (2005-2007). The same authors also consider the average trend of aggregate demand, as well as its components (consumption, investment, exports and imports). Also Rose and Spiegel 2010 use data from the 2008-2009 period, adding fluctuations in the stock exchange, exchange rates, and of ratings on government bonds. Berkmen et al. 2009 instead employ only the growth forecasts for the single year 2009.

Caprio et. al. 2010 choose a completely different dependent variable. By using a sample of 83 countries, they look at financial resilience, that is, the probability of a country to fall into crisis in 2008 (as calculated by Laeven and Valencia 2010). Financial variables are also considered by Allen et al. 2011, who employ a sample of 69 countries. Their question is to what extent a country is able to absorb a crisis along its long-term financial growth path (1970-2009).

Turning to the independent variable, in Giannone et al. 2010 it is represented by country risk, as measured by aggregating a series of indicators produced by various international organizations. Their work uses as indicator of regulation the specific index released by the World Bank on regulation quality, which measures to what extent, on a country-by-country basis, regulation promotes and protects private enterprises (Kaufmann et al. 2002). Translating the meaning of those indicators in terms of the present analysis, we can say that the World Bank index tells us, for a given country, how much regulation promotes and protects individual risk-taking.

Within the domain of regulation indexes, a whole string of market-friendly industry regulations are considered in Giannone et al. 2010, who use the "market freedom" indicators elaborated by Frazer Institute (2010). Among them, banking regulation emerges as particularly significant, and it appears to be inversely correlated to resilience: the more banking rules are LT, the higher the vulnerability. We can label this the Unpleasant Nexus (UN), because it forces us to reconsider the paradigm that has guided theory and practice over the last two decades.

With the aim of checking for the robustness of the UN, Giannone et al. 2010 employ twenty-seven control variables, either separately or combined. To this end, both standard and Bayesian regression techniques are used on a heterogeneous sample of 102 countries. Lane et al. 2010, instead, use a sample of 142 countries, and apply standard econometric tools. Rose and Spiegel 2010 start with a sample of 107 countries, use standard econometric techniques, but apply MIMIC (Multiple Indicator Multiple Cause) model, with which they analyze over a hundred possible explanatory variables of resilience.

The main result of Giannone et al. 2010 is that LT banking regulation is in general correlated with resilience. The crisis hit hardest where the rules that regulate banking were most market oriented.

The same result is confirmed by Rose and Spiegel 2010, who find that regulation is the variable associated with resilience in the most robust way, controlling for all other factors. Two of the results obtained by Caprio et. al. 2010 can also be read under the same light: instability was less likely where most binding were the structural constraints on banking activities – i.e. the opposite of LT regulation – and highest the degree of transparency (private monitoring) of regulation itself. No relevance to banking regulation is conversely given by Allen et. al. 2011, who however pose a different research question, at least as the time horizon of the analysis is concerned.

Also Masciandaro et al. 2011 – using a sample of 90 countries – find a direct correlation between LT regulation and instability, and enlarge the analysis to include banking supervision. The relevant aspects they consider for financial and banking supervision are essentially three: the architecture of banking oversight, the role of the central bank, and supervisory governance. Also for supervision it's possible to identify a type of LT regulation, with a tendency toward the consolidation of the powers of oversight outside the central bank, associated with an increase in the quality of governance. Masciandaro et al. 2011 find that instability is higher when the degree of consolidation of supervision and the quality of governance grow.

Trying to read all this through the lenses of the relationship between regulation and risk-taking, it seems that the crucial hypothesis the current literature has brought onto the stage is the following: LT banking regulation has provoked excessive growth in systemic risk, which has translated itself in higher instability.

Where the market-friendly approach has been tempered – either by direct constraints or higher transparency – negative effects have been lessened. Such hypothesis should be valid only for the present crisis, considered that in past episodes of instability the estimated effect had the opposite sign: stronger direct constraints heightened a country's probability of entering a full-blown banking crisis (Barth et al. 2004).

Turning to the systematic analysis of control variables, in order to assess the robustness of the UN, one must first of all exclude the effect that structural macroeconomic features might have on the level of growth being observed, such as the stage of development, on the one hand, or overall economic size, on the other. Both effects are excluded in Giannone et al. 2010.

The role of the levels of development – in the short term (2005-2007) and in the longer term (1990-2007) – is also taken into account by Lane et al. 2010, who find a correlation between high levels of income per capita and instability. The same result is obtained by Rose and Spiegel 2010, who find a positive correlation between 2006 income per capita and macroeconomic instability; they also take into account past income levels in the short run (2005-2007) and in the long run (1990-2007), in addition to the revisions of growth forecasts.

Secondly, the literature has posed the question whether instability is actually associated with trade openness and the degree of internationalization of an economy. In principle, the degree of internationalization can have a direct link with the instability recorded during the Great Crisis: since the transmission of recessionary shocks occurred by way of international real and financial channels, openness can be associated with higher vulnerability.

In financial terms, it is possible to suppose that the more a country is dependent on international financial flows, the more vulnerable it is. In real terms, it is possible to hypothesize that a country characterized by high openness to foreign trade – which was heavily affected by the Great Crisis – is more likely to be vulnerable. Internationalization can then turn into a crisis catalyst.

At the same time, however, one cannot exclude that higher internationalization enables better risk management through economies of diversification; so that we could also have an inverse relation between internationalization and instability. In this case, internationalization acts as a shock-absorber of the effects of crisis.

Internationalization can occur in real terms – as usually measured by the trade balance or the sum of exports and imports – or in financial terms – typically in the form of assets held abroad and domestic assets held by foreigners, and through foreign direct investment. Also by including into the analysis the degree of internationalization, the negative effect of LT banking regulation stays significant (Giannone et al. 2010).

Among the variables that measure openness only a negative trade balance exhibits a direct association with instability (Giannone et al. 2010). The relevance of the trade balance is confirmed both by Lane et al. 2010 and Rose and Spiegel 2010. Real internationalization can be also measured by the overall degree of economic openness (imports plus exports) and by the share of domestic product attributable to manufacturing (Lane et al. 2010); neither variable turns out to be significant. Financial internationalization, instead, can be appraised by looking at the net balance of payments and the overall size of international financial exchanges (Lane et al. 2010).

Thirdly, instability has been linked to characteristics of the financial structure, in terms of size and efficiency. Also in this case, the relation between the features of the financial industry and instability cannot be a priori determined. A sizable and efficient financial sector favors individual risk-taking; but – as we have already stressed – it cannot be concluded that such risk-taking is optimal in the

aggregate, in the sense that it minimizes the possibility of systemic risk.

By the same token, not even the relation between the structure of the financial industry – as summarized by the classic dichotomy between bank-oriented systems and market-oriented systems – and instability can be taken for granted. Until now, no systematic relationship between the structure of the financial industry and risk-taking has been found: in bank-oriented systems intertemporal allocation of risk seems to be more efficient, while in market-oriented systems the intersectoral allocation of risk seems to be more effective. (Allen and Gale 2000).

The results obtained by Giannone et al. 2010 show that, also when introducing the characteristics of the financial industry, the effect of LT banking regulation stays relevant. In addition to this, instability is lower where the financial system is wider. It would then seem that, given excessive risk-taking caused by LT banking regulation, the negative effects are lower the more the financial sector is developed. For a contrary result, see Rose and Spiegel 2010, for whom macroeconomic instability is associated with high stock-market capitalization.

Lastly, efficiency indicators – interest revenues and ratios between costs and earnings – have a direct association with stability in Giannone et. al 2010. Hence, as the share of receipts on interest margins and of the cost-to-earnings ration grow, instability also grows. Such result is diametrically opposed to that obtained by Caprio et al. 2010, who conversely find that as receipts on interest margins grow, the probability for a country to have entered the crisis decreases.

It should be reminded that the two studies measure instability in completely different ways. In addition to this, in Giannone et. al. 2010 instability seems to grow in parallel with growth of the share of private and foreign banks in the system of banking governance. In Caprio et al. 2010 what seems to be most relevant is the degree of market concentration.

Since the association between LT banking regulation and instability seems to be transmitted through risk-taking, many of the cited works investigate the role played by the level of indebtedness present in various countries. As a consequence, researchers have checked whether instability may depend on a list of indicators pointing to excessive risk-taking, such ad bad quality of credit, the level of financial leverage in banks, and in general the amount of financial leverage among private actors.

By introducing these indicators, Giannone et al. 2010 find the relevance of LT banking regulation confirmed. At the same time, financial leverage turns out to be associated with higher instability. The importance of bank leverage – the ratio of credit to private agents over GDP – to explain instability is also detected by Lane and Milesi-Ferretti 2010, as well as by Rose and Spiegel 2010. The relevance of bank leverage – here measured as the credit-deposit ratio – is also highlighted in Caprio et al. 2010.

Summing up, we can agree with the claim – Rose and Spiegel 2010 – that the instability of the Great Crisis, as measured in terms of macroeconomic volatility in the 2008-2009 two-year period, has most heavily hit those countries characterized by LT banking regulation and current account deficits, given the level of income per capita. The effect of other variables seems weak and/or erratic.

However, the three critical factors explaining the differential outcomes of the crisis must be considered under an analytical perspective that is limited to the Great Crisis, given that they have no significance in explaining other cases of macroeconomic instability, such as the drops in GPD recorded in 1991 and 2001 (Rose and Spiegel 2010). Also, results can sometimes change since, depending on data availability, the sample varies in terms of the number of countries considered. So caution is highly advisable.

3 Not only about LT regulation? Macroeconomic instability and institutions

After the review of the recent economic literature on the topic, let's summarize the terms of our research question. On the one hand, in the 2008-2009 period there was all over the world, but with varied country-by-country intensity, an unexpected fall in income, which we interpret as a sign of lack of resilience. On the other hand, such fall is robustly linked to the presence of so-called light touch (LT) banking regulation, thereby exposing an Unpleasant Nexus (UN).

How to economically explain the UN? The peculiarity of LT banking regulation is to be constituted by rules which promote individual risk-taking, which in turn can be a factor of economic growth. Therefore the link between economic crisis and LT banking regulation can be described as a relation in which the design of rules for banking activities has given widespread and penetrating incentives for individual risk-taking; the aggregate and unforeseen effect has been an excess of systemic risk, whose correspondent economic cost is precisely represented by the fall in GDP.

If this is the economic explanation, a question naturally follows: did the widespread and systematic increase in risk-taking depend only on the form of banking regulation? The answer is clearly no. An economic agent takes on risk more easily, if he/she operates within an institutional context of global LT regulation, of which banking regulation is just a part.

Institutions impinge upon individual risk-taking, by influencing the aggregate characteristics of financial and banking structures. The relationship between institutional design and its effects on risk-taking has been explored by recent literature from at least four points of view.

First of all, economic analysis has shown that the public institutions that matter are those sets of rules determining the public governance of a country, markets included (see for example Kaufmann et al. 2010). The activities of citizens depend from a system of authority defining and disciplining the various domains, including the economic and financial realms. Many are the aspects of a system of public institutions that together contribute to create an environment that is favorable or not to risk-taking.

Of such aspects, the role of political institutions has been explored with particular attention (for its effects on financial variables, see for instance Rajan and Zingales 2003). In our case, such political view can be so outlined: if political institutions generate stability, stability is a factor of certainty with gives incentives to risk-taking. Hence it has been explored the link between political stability and the development of the financial industry (Roe and Siegel 2010).

In addition to this, if attention is focused on the long-term profile of institutions, the possible role of legal institutions has been much stressed (see for example La Porta et. al 1997). Here the application of the legal view can be thus summarized: risk-taking is higher where the rights of creditors are more strongly protected, so that it's easier to trigger the dynamic between growth of debt – in its various forms, but overall thanks to the development of capital markets – and economic development. As the protection of rights increases, we shall have faster economic development. Rights protection in turn varies according to the law-historical legacy of each country.

Lastly, it's interesting to analyze the effect that the design of monetary institutions can play. Rules governing the dynamics of the fundamental variables in a monetary market economy – i.e. prices, monetary aggregates, and interest rates – have taken a growing importance over the last three decades for the explanation of macroeconomic trends. The institutions overseeing the evolution of such variables are determinant to explain under which conditions a country can attain and maintain conditions of monetary stability. Also, monetary stability can be considered a relevant factor in providing incentives for higher risk-taking, so that also monetary institutions are potentially important.

Institutions presiding over monetary stability can be domestic; from this point of view, the relevant architecture is that represented by the design of the relationships between the central bank, the political system, and the market, summarized under the rubric of the independence of monetary authorities (see for example Alesina and Stella 2010). But monetary stability can also be the objective of a system of fixed exchange rates (see for example Cukierman 2008); the rules disciplining the system of exchange rates can be defined as external monetary institutions. The existing literature has explored the relations of both substitutability and complementarity between domestic and external monetary institutions – in both theoretical and empirical or institutional terms (see for example Bodea 2011).

Thus there are at least four institutional factors – regulatory, legal, political, monetary – whose quality can contribute to explain the UN. The four factors are more general with respect to LT banking regulation, and can also be complementary, both between them and with market-friendly regulation.

An empirical exploration of the likely role of the four institutional factors in providing a better explanation for the UN can be done by using a heterogeneous sample of 102 countries. All the variables used in this section are described in detail in Table 1, along with the relevant descriptive statistics.

Let us start with our basic specification of the relationship linking resilience – still measured by average GDP growth in the 2008-2009 period – to LT banking regulation, measured by means of the index selected by Giannone et al. 2010. Also, we add as standard control variables the two variables which have so far emerged as most significant (in addition to regulation): income per capita and the net trade balance.

The regression of the basic specification of the equation conducted on our sample of countries confirms the UN (Table 2, first column). In addition, the two standard control variables have the expected sign – resilience is inversely correlated to development and directly correlated with the net trade balance – although the corresponding values are not significant.

In order to check for robustness of the basic specification, we change the independent variable. Instead of the index used by Giannone et al. 2010 we use – as suggested in Masciandaro et al. 2011 – the index proposed by Abiad et al. 2008, which, with respect to the former, has the double advantage of considering a larger number of aspects of banking regulation on a longer time span (1973-2005), thereby offsetting the disadvantage of being calculated for a smaller number of countries. Also with the new independent variable the UN is confirmed (Table 2, second column), with an increase in overall statistical significance.

Let's now try to change the dependent variable, by using for each country – as suggested by Lane et al. 2010 – the difference between average growth during the crisis and that recorded in the immediately preceding period. We use the 2004-2006 three-year period, given that 2007 is considered a year of turbulence in several analyses. The UN maintains its relevance (Table 2, third column), even if its overall significance is lowered.

Let's now pose the question whether the effect of the LT banking regulation depends on the general setup of public institutions, of which banking regulation is only a specific and limited part. To this end, we have chosen two different indicators for the quality of public governance, using the most credited

data base, put out by the World Bank, which measures the perception of six different aspects of the system of public governance in each country. Institutional indicators are calculated as averages of 1996-2006 values.

Table 1. Descriptive Statistics

Variables	Description (source)	Observations	Average	Std. Dev.	Min	Max
GDP0809	GDP growth rate p.a. (average, 2008-2009, World Development Indicators, World Bank)	102	1.080	3.754	-11.28	9.35
Log GDP/POP	Log of income per capita (average, 1996-2006, World Development Indicators, World Bank)	102	0.618	0.819	-1.41	2.82
CurrAcc0406	Current Account Surplus (average, 2004-2006, World Development Indicators, World Bank)	97	-0.630	8.804	-16.71	29.01
BankReg0406	Quality of banking regulation (average, 2004-2006, Fraser Institute, Economic Freedom Network, 2010)	97	8.405	1.032	5.1	9.9
RegQual9606	Quality of regulation (average,1996-2006, Worldwide Governance Indexes, Kaufmann et al. 2008, World Bank)	102	0.344	0.843	-1.84	1.85
FinReg7305	Quality of financial regulation (average, 1973-2005, Abiad et al. 2007, IMF)	73	0.821	0.142	0.45	1
CBI	Quality of domestic monetary institutions = independence of central bank (year 2006, Arnone et al. 2007, IMF)	100	0.651	0.193	0.25	1
ERR de jure	Quality of domestic monetary institutions = de jure stability of exchange rate (year 2006, IMF 2006)	102	0.346	0.318	0.12	1
ERR de facto	Quality of domestic monetary institutions = de facto stability of exchange rate (year 2006, IMF 2006)	102	0.348	0.296	0.14	1
PolFragility	Quality of political institutions = fragility of political institutions (anno 2006, Polity IV Data Base, Michigan University)	98	5.826	5.252	0	18
Gov9606	Quality of public governance (average, 1996-2006, Worldwide Governance Indexes, Kaufmann et al. 2008, World Bank)	102	0.2660	0.9017	-1.43	1.86
Colonists' Mortality	Indicator of Climate Quality = Mortality rate of early colonists (Beck et al. 2003)	40	109.90	134.19	8.55	668
GeoLatitude	Indicator of Climate Quality = Latitude (normalized value: absolute value in degrees divided by 90 – source: CIA World FactBook)	102	0.360	0.193	0.01	0.72
CommonLaw	Indicator of Quality of Legal System = Common Law (binary variable, Beck et. al. 2003)	102	0.2254	0.4199	0	1

Firstly, we control for the effect of the overall quality of regulation – as suggested in Giannone et al 2010. But, secondly, we verify the total effect of the quality of public governance with an index that groups all six aspects. Introducing the overall quality of regulation (Table 3, first column), the UN is confirmed. Also the overall quality of regulation is inversely and significantly correlated with stability, contrary to the result obtained by Giannone et. al. 2010. We obtain an identical result using the aggregate index of public governance (Table 3, second column). Thus higher macroeconomic vulnerability seems to be associated with an overall arrangement of public institutions which favors individual risk-taking.

Let's now consider the effect of political institutions, by using the indicator of their quality the index which is most credited, that is the State Fragility Index of the Polity Database, constructed at the University of Maryland (Table 3, third column). The UN is confirmed, and political fragility is significantly inversely correlated with stability. Also overall statistical significance is improved. Higher political stability is likely to increase the individual propensity to take risks, but this does not provide guarantees for systemic stability, quite the contrary.

We have then assessed the effect of legal institutions. The literature of reference (see for example La Porta et al. 2008, Beck et al. 2003, Levine 2005b) links the quality of institutions, in terms of rights protection which is relevant for financial markets, to the historical-legal legacy. But what

determines in particular a higher as opposed to a lower   quality of such institutions?

Table 2. Resilience and LT Regulation

	GDP 0809		delta GDP[a]
	I	II	III
log GDP/POP	-0.252	0.073	0.196
	-0.55	-0.14	-0.37
BankReg0406	-2.063**		-1.506**
	(4.94)		(3.07)
FinReg7305		-15.662**	
		(5.88)	
CurrAcc0406	0.055	0.068	0.018
	-1.26	-1.39	-0.36
Constant	18.634**	13.784**	8.196
	(5.04)	(5.79)	-1.89
Observations	92	71	92
R2	0.25	0.36	0.13
t-statistics in parentheses			
* 5% significance; ** 1% significance			
[a] difference between average growth during the crisis and that recorded in the immediately preceding period (2004-2006).			

Table 3. Resilience, LT regulation, governance and political institutions

	GDP 0809		
	I	II	III
RegQual9606	-1.856**		
	(3.77)		
Gov9606		-1.645**	
		(3.94)	
PolFragility			0.349**
			(5.02)
log GDP/POP	-0.119	-0.164	-0.265
	-0.28	-0.39	-0.62
BankReg0406	-1.361**	-1.317**	-1.125**
	(3.15)	(3.06)	(2.68)
CurrAcc0406	0.081	0.08	0.065
	-1.98	-1.95	-1.57
Constant	13.5**	12.882**	8.888*
	(3.64)	(3.46)	(2.31)
Observations	92	92	88
R2	0.35	0.36	0.41
t-statistics in parentheses			
* 5% significance; ** 1% significance			

On one side, the protection of rights is linked to the major legal tradition to which each country is part of, which is often the byproduct of either colonization or domination (the so-called law and finance approach). Since such protection is deemed to be most forceful in countries belonging to the common law tradition, in our analysis we have therefore distinguished countries depending on whether they have adopted or not a legal system based on common law (Table 4, first column). While the UN is confirmed, the legal tradition of reference does not turn out to be relevant (the same result is obtained using either together or separately all the various forms of legal tradition).

On the other side, one can think that the effectiveness of any legal tradition depends on its historical rootedness, which in turn depends on how much either colonization or domination has had time to stabilize, given either favorable or adverse geographic and meteorological conditions. So that the

relation is one between the quality of institutions and the quality – structural and/or historical – of climate (the so-called geography and finance approach). Following the existing literature, we have used two typical indicators of the geography and finance approach: latitude and the mortality rate among early colonists. Latitude captures the hypothesis that the quality of institutions grows as you get farther from the Equator. The results (Table 4, second column) show that the UN is confirmed, and also that the quality of institutions is significantly inversely correlated with macroeconomic stability. Countries with more established legal institutions seem to exhibit higher vulnerability to the crisis. Using the data – available for a very narrow sample of countries – on the mortality of early colonists (Table 4, third column) only the UN stays relevant.

Table 4. Resilience, LT regulation and law institutions

	GDP 0809		
	I	II	III
Common Law	1.191		
	-1.52		
GeoLatitude		-8.408**	
		(5.08)	
Colonists' Mortality			0.006*
			(2.16)
log GDP/POP	-0.272	-0.116	0.182
	-0.6	-0.29	-0.4
BankReg0406	-2.098**	-1.286**	-1.689**
	(5.05)	(3.22)	(4.12)
CurrAcc0406	0.051	0.026	0.009
	-1.17	-0.67	-0.18
Constant	18.638**	14.950**	15.543**
	(5.08)	(4.47)	(4.34)
Observations	92	92	39
R2	0.26	0.42	0.49
t-statistics in parentheses * 5% significance; ** 1% significance			

Table 5. Resilience, LT regulation and monetary institutions

	GDP 0809		
	I	II	III
CBI	-6.805**		
	(3.99)		
ERR de facto		-2.090	
		-1.9	
ERR de jure			-1.930
			-1.88
log GDP/POP	-0.169	-0.165	-0.214
	-0.4	-0.37	-0.48
BankReg0406	-1.779**	-1.961**	-1.953**
	(4.51)	(4.72)	(4.69)
CurrAcc0406	0.032	0.055	0.052
	-0.78	-1.28	-1.21
Constant	20.652**	18.460**	18.362**
	(5.94)	(5.06)	(5.03)
Observations	91	92	92
R2	0.36	0.28	0.27
t-statistics in parentheses * 5% significance; ** 1% significance			

Lastly, we evaluate the likely effect of monetary institutions. To consider the influence of central banking regimes, we use the index of central bank independence calculated by Grilli et. al. 1991, extended to 2007 by Arnone et al (Table 5, first column). By introducing the independence of the central bank, we not only obtain that the UN is confirmed, but that independence itself is inversely and significantly correlated with macroeconomic stability. The interpretation is that, if we consider that higher independence of the central bank is a better guarantee of monetary stability, this reduces uncertainty and augments incentives for individual risk-taking, but it worsens macroeconomic vulnerability.

To analyze the effect of external monetary institutions, we use the index of de facto exchange rate regimes calculated by the IMF extended to 2007 (IMF 2007). With the sole aim of making the result more easily interpretable – so that the index grows as the degree of exchange rate stability grows – we calculated for each country exchange rate index Y as equal to 1/X, where X is the IMF de facto exchange rate (Table 5, second column). Again, not only the UN is confirmed, but also the stability of the exchange rate is inversely and significantly correlated with macroeconomic instability. Vice versa, higher exchange rate flexibility is associated with less vulnerability (as found by Berkmen et al. 2009, Lane et al. 2010). Similar results (Table 5, third column) are obtained by using de jure, rather than de facto, exchange rates.

Finally, it must be stressed that the link between monetary institutions – domestic and/or external – and macroeconomic vulnerability can also be explained through mechanisms that bypass the effects of risk-taking (for instance, by considering monetary institutions as a factor of rigidity of the economy system under consideration).

4 Conclusions

With the Great Crisis of 2008-2009 we have witnessed a relevant episode of macroeconomic vulnerability affecting many countries, occurring after the years of stable growth which had characterized the two decades of the Great Moderation. To what extent such vulnerability has depended upon the design of banking rules, hitherto shaped by the principle of LT regulation? And to what extent other institutional factors, different from as well as complementary to banking regulation, have contributed to the Great Crisis? The present work offers two contributions: a systematic analysis of the existing literature on the subject; an econometric study conducted on a sample of 102 countries.

The 2008-2009 crisis is an all too recent and complex phenomenon for a complete analysis to be possibly done at this point in time. Vulnerability – as measured by the drop in production and income – that

many countries – although not all – have experienced, and with differences in intensity, can either be a relevant but isolated episode or the start of a period characterized by higher volatility. What we can observe today is that such volatility is associated in a robust and systematic way with LT banking regulation.

Such association is what we call the UN, insofar as it raises questions on the effects of a design of rules, whose efficacy – in terms of being a engine for stable growth – seemed well-established. If the UN were shown to hold in time, we should reconsider the cost-benefit analysis linked to such approach. Consequently, we should ask ourselves which and how many aspects of that approach need to be reformed, in order to have better guarantees in terms of both growth and resilience.

The UN does not operate in a vacuum. The link between vulnerability and LT banking regulation seems to signal a more general relationship between institutional design and macroeconomic performance. Our analysis has shown how various types of institutions – public, political, legal, monetary – also seem to exert an unexpected effect on vulnerability. The quality of institutions – as measured in terms of being effective tools to provide incentives for risk-taking choices aimed at creating economic value – seems to increase vulnerability.

Until now, the aggregate outcome of stable growth was considered to be the consequence of a system of rules that created a favorable environment for individual risk-taking. The Great Crisis has shown that the development of such institutions does not automatically warrant the reduction of systemic risk to acceptable levels. Analogously to what has just been said about banking regulation, it will be interesting to continue studying the macroeconomic effects of institutions, in order to assess their effective relevance, as well as the paths of possible reforms.

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