Economic and Financial Growth in Europe.

Is Euro Beneficial for all Countries?

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Abstract

This study revisits the financial-economic growth nexus accounting for potentially differential effects of political and financial integration in Europe. Debt is introduced as an integral component and potential trifold endogeneity is investigated. Empirical findings highlight a dual role of Euro, which is found to magnify the benefits and the risks associated with economic and financial growth. First, it introduces confidence and allows for higher levels of borrowing, which, if utilized efficiently, allows for economic growth. This appears to be irrationally capitalized by markets, which further assist economic growth. This spiral relationship is only present when financial integration is present, while political integration seems to be insufficient in enhancing confidence. Second, Euro introduces an additional macroeconomic risk of "over-borrowing" due to "over-confidence". This reverses this spiral link by decreasing market values. Consequently, the suitability of adopting Euro should depend on the borrowing capacity of the country and its ability to balance the trade-off between the dual role of Euro. We develop an index to measure this capacity, which shows that peripheral economies where the least capable of engaging in the financial economic growth momentum.

JEL codes: F43, O11, N14

Keywords: Financial Integration, Euro, Economic Growth, Government Borrowing, GMM

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1. Introduction

Early literature (e.g., Schumpeter, 1911) reports a positive correlation between the financial and economic growth. "Open market" economies aim at reducing intermediacy costs, in order to assist economic development, while centralized economies appear to experience slower growth.[1] Four major hypotheses have been developed to describe the link between the two figures (Kose et al., 2009). The supply-leading hypothesis (e.g., McKinnon, 1973; Shaw, 1973; Fry, 1978; Diaz-Alejandro, 1985; Moore, 1986) purports that a sustainably deepening financial system is required and can increase economic growth. In contrast, the demand-following hypothesis (e.g., Patrick, 1966; Ireland, 1994; Demetriades and Hussein, 1996; Darrat, 1999) suggests that increased demand requires more intensive trading and a deeper financial system. Thus, financial growth should follow economic growth spikes. More comprehensive approaches (e.g., Greenwood & Jovanovic, 1990; Saint-Paul, 1992; Berthelemy and Varoudakis, 1996; Demetriades & Hussein, 1996; Greenwood and Smith, 1997; Blackburn and Hung, 1998; Harrison, Sussman and Zeira, 1999) suggest a bi-directional relationship, arguing that economic growth requires financial deepening, which in turn further enhances economic growth. Finally, several studies (e.g., Lucas, 1988; Stern, 1989) argue that financial deepening only occasionally supports financial growth and has a short term effect.[2]

Financial Growth and Macroeconomic Risk

Another strand of literature reports a rather negative impact of financial growth on stability. Stiglitz (2000), challenging the idea of business cycle volatility (Lucas, 1987) argues that excessive optimism, enhanced by more advanced financial systems, dramatically increases the probability of "asset bubble" creation and consequently the frequency of external macroeconomic shocks (Gibson et al. 2013). These shocks, unless efficient regulatory practices are in place (Popov and Smets, 2011), leave countries exposed and magnify the negative impact on economic growth. Kaminsky and Reinhart (1999) provide empirical evidence of significantly greater exposure to financial crises after a period of high growth, especially for countries that a parallel growth in their financial systems.

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[1] Watchel (2003) highlights that the absence of financial growth, especially before 1990 has had significant negative impact on economic growth, especially for economies that experience state intervention.

[2] Recent empirical literature (e.g., Manning, 2003; Rousseau and Wachtel, 2011) confirms that the impact of financial growth on economic development has weakened considerably after 1990.

Two sources of risk have been recognised in the literature. First, market openness (e.g., Alessi and Detken, 2011; Popov, 2011; Popov and Smets, 2011) is identified as one of the main sources of the trade-off of the contribution of financial to economic growth and macroeconomic risk. Financial growth is empirically found to maintain a boosting effect on economic development through a better allocation of resources. However, the more the economy depends on the financial sector as a risk and maturity transformation mechanism, the greater is the contribution of individual bank risk to systemic risk. Consequently, financial growth is seen as a funding and supporting mechanism for economic growth, which, though, comes at the cost of making the economy more susceptible to succumb to immaturely generated growth and to external shocks. Kindleberger (1978), Minsky (1986) and Popov and Smets (2011) highlight the importance of distinguishing between "good" and "bad" growth. Second, another source of increased macroeconomic risk is the accumulation of public debt in periods of growth, probably due to irrational optimism (Heinemann et al., 2013). Early literature (e.g., Buchanan, 1958; Meade, 1958; Modigliani, 1961) points out this negative impact in the form of reduced income or slower investment flows. Other studies (e.g., Diamond, 1965; Saint-Paul, 1992; Adam and Bevan, 2005; Aizenman et al., 2007) argue that this negative link is driven by tighter fiscal and tax policies applied during a post-borrowing period, in an effort to improve credibility. A non-linear relationship between public debt and economic growth has also been reported (e.g., Krugman, 1988; Aschauer, 2000; Clements et al., 2003; Checherita and Rother, 2010).[3]

Heinemann et al. (2013) suggest that political and financial integration might explain the dual effect of financial on economic growth and its non-linearity with debt. Political and especially monetary integration could enhance the benefits of financial growth (e.g., Edwards, 1998), but also the contaminating effects of external macroeconomic shocks (e.g., Berglof et al., 2009). The exuberance that the stability hatches increases the skewness of both tails of the distribution. Kaminsky and Schmukler (2008) argue that financial integration increases stock market volatility on the short-run, while the macroeconomic benefits become apparent on the long-run. Empirical literature appears to be inconclusive, implying that net impact is rather an empirical issue. Heinemann et al. (2013) report a positive impact of political integration, while the vast majority of literature (Gourinchas and Jeanne, 2006, 2007; Kose et al., 2009) provides empirical

[3] These studies argue that public debt increases consumption power and up to a level (e.g., below 40%, Pattillo et al., 2002) could boost economic growth. However, beyond certain thresholds (e.g., beyond 90%, Clements et al. 2003; Kumar and Woo, 2010) the impact on credibility is disproportional and thus, a negative relationship is observed.

evidence of a moderate positive net impact. Prasad et al. (2007) and Reinhart and Rogoff (2010) show that countries, that heavily depend on external financing, grow slower than countries that rely on domestic savings and revenues. In contrast, Heinemann et al. (2013), employing an industry-level data approach, similar to Rajan-Zingales (1996), show that external financing has a significant boosting effect on industries that, by nature, depend on external sources of funding.

Political and Monetary Integration in Europe

Focusing on Europe, Heinemann et al. (2013) argue that optimism and exuberance have increased confidence in the sovereign bond market, which decreased borrowing costs, especially for economies in transition. In contrast, De Grauwe (2011, 2012) and De Grauwe and Ji (2013) provide evidence that this confidence elevated fragility, due to increased borrowing levels and contagion, to the extent that a sovereign debt crisis was inevitable, since governments have no power on money supply. Beirne and Fratzscher (2012) report that increased contagion and herding contagion during the financial crisis, caused a sharp "re"-focus of financial markets on country fundamentals, which dissolved the previously beneficial impact of optimism. In parallel, several studies (Missio and Watzka, 2011; Mink and De Haan, 2012) show that countries within EU experience increased contagion effects, especially when "tangible bad" news hit the market, even if country's fundamentals do not dramatically change (Gibson et al., 2013). Consequently, joining EU appears to have a marginally beneficial impact on growth, but simultaneously increases macroeconomic risk. These studies show that markets tend to exaggerate in both tail of the distribution, creating abnormal returns.[4] However, they do not distinguish between the "over-confidence" generated by the political union, or the "over-exposure" to systematic risk because of the limited flexibility, imposed by monetary integration.

Reflections on the literature

This discussion is particularly relevant in the context of European monetary integration and the current financial instability. European policies have adopted the open market approach, aspiring improved government access to borrowing and thus, higher financial and economic growth. Euro should increase mobility of resources and further accelerate economic growth, but also

[4] Mink and De Haan (2012) and Beetsma et al. (2013) show that contagion effects generate only short term abnormal returns, since increased price sensitivity to news is harmonized with country's fundamentals. This implicitly shows that political and monetary integration generate "over-confidence" or "over-sensitivity" in capitalizing expectations and, thus, the net impact on economic growth is expected to be a balance between the two.

suppresses monetary flexibility, reducing the competitiveness of small economies. This naturally poses the question of suitability of monetary integration, without a deeper political integration. This study aims at revisiting the impact of financial growth, economic development and government borrowing levels, under the context of European political and monetary integration. Direction and potential endogeneity is further investigated accounting for differential effects in countries that have joined EU and/or Euro. Previous literature implicitly assumes that investors capitalize their expectations about future stability, without distinguishing the importance of each factor (i.e., political or monetary integration). This study also contributes to the literature by separately examining the contribution of political and monetary integration to economic development under two structurally different phases; a booming and a depression phase. Finally, we suggest a simple sensitivity measure of financial economic growth momentum.

The empirical findings highlight the importance of financial integration, which seems to contribute to both economic growth and macroeconomic risk. Markets seem to exaggerate on capitalizing their expectations about political stability and this has a significant boosting effect, even for countries with substantial borrowing levels. Euro is found to have a dual effect. First, it increases confidence. This allows for higher borrowing that is endogenous to economic growth. This leads to higher economic growth, which also increases market values. The induced confidence allows markets to further increase economic development. This link is not fully observed upon only political integration and it is absent in non-member states. Second, Euro introduces a macroeconomic risk, in the form of a "moral hazard". Some countries tend to "over-borrow" due to existing "over-confidence" and thus they are more exposed to macroeconomic shocks. This reverses the link between financial and economic growth. This shows that increased financial growth is a trade-off between excessive risk and faster economic growth. The suitability of adopting Euro depends on countries borrowing capacity and its ability to benefit from financial growth on the long term. The balance between the dual role of Euro determines whether speculation accelerates financial deepening to an extent that economy can no longer benefit from it, overcoming the associated increased macroeconomic risk. Peripheral European economies appear to be the least capable in benefiting from enhanced financial growth, even after adopting Euro. This implies that either Euro was not the optimal choice, or that European policies should focus on preventing overexposure to "bad" growth (e.g., Popov and Smets, 2011) and on supporting confidence, which in turn will sustain the spiral, positive impact of the interaction between financial deepening and economic development.

2. Methodology

2.1 Data

This study employs annual, cross-sectional data on financial and macroeconomic indicators for 27 European countries over the period from 1998 to 2012, summarized in the table below.[5]

Variable	Definition
MCAP	Market capitalization (% of GDP and in €).
GDP	Annual percentage growth rate of Gross Domestic Product (%)
INF	Inflation (%)
Trade	Trade (% of GDP)
REV	General government revenue (% of GDP)
EXP	General government total expenditure (% of GDP)
DEB	General government gross debt (% of GDP)
CAB	Current Account Balance (% of GDP)
SAV	Gross national savings (% of GDP)

Following Beck et al. (2000, 2008), market capitalization is employed as a proxy for financial growth. This measure has been chosen on the grounds that it accounts, not only for the quality and depth of the financial sector, but also for two other things, crucial on this analysis. First, it is a collective measure of intra-country development of economic entities. Recent literature (Imbs, 2006, 2007; Abiad et al., 2009; Heinemann et al., 2013) emphasizes the importance of micro-level data. However, due to the nature of our question, which focuses on governmental policies rather than on firm level analysis, the macro-level approach is more appropriate. Market capitalization, although in a rigid way, measures financial growth as the sum of the all entities within the economy. This way it is a measure of financial activity that does not ignore firm specific effects. Second, it accounts for investors opinions concerning unsystematic (each individual firm), as well as systematic (the economy as a whole) risk. In addition, following Levine (1997), this study measures economic growth as $\Delta\{GDP\}$ *(%)*. Other variables are also introduced in the model to account for known *GDP* determinants and, thus, reduce heteroskedasticity. Indicators include trade, fiscal and monetary policy such as government debt, savings and expenditure, inflation, trade openness and current account balance. All variables are monetary (currency) and seasonally adjusted.

[5] The data is collected from the World Bank's World Development Indicators database and International Monetary Fund source. Regression data is annual as a percentage of GDP. The 27 countries employed are in alphabetical order: Austria, Belgium, Bulgaria, Czech, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Slovenia, Slovakia, Spain, Switzerland, United Kingdom. Regional criteria have been applied alongside data availability.

2.2 Model

The model employed could be summarized into the following system of equations.

$$\begin{cases} GDP_{i,t} = a_0 + (a_1 + a_1^{EU} EU_{i,t} + a_1^{E} E_{i,t}) FG_{i,t} + (a_2 + a_2^{EU} EU_{i,t} + a_2^{E} E_{i,t} \\ \qquad + a_2^{HD} HD_{i,t}) DEB_{i,t} + \sum_{j=3}^{8} a_j CV_{j,i,t} + \varepsilon_{1,i,t} \qquad \text{Eq (1.a)} \\ FG_{i,t} = \beta_0 + (\beta_1 + \beta_1^{EU} EU_{i,t} + \beta_1^{E} E_{i,t}) GDP_{i,t} + (\beta_2 + \beta_2^{EU} EU_{i,t} + \beta_2^{E} E_{i,t} \\ \qquad + \beta_2^{HD} HD_{i,t}) DEB_{i,t} + \sum_{j=3}^{8} \beta_j CV_{j,i,t} + \varepsilon_{2,i,t} \qquad \text{Eq (1.b)} \\ DEB_{i,t} = \gamma_0 + (\gamma_1 + \gamma_1^{EU} EU_{i,t} + \gamma_1^{E} E_{i,t}) FG_{i,t} + (\gamma_2 + \gamma_2^{EU} EU_{i,t} + \gamma_2^{E} E_{i,t} \\ \qquad + \gamma_2^{HD} HD_{i,t}) GDP_{i,t} + \sum_{j=3}^{8} \gamma_j CV_{j,i,t} + \varepsilon_{3,i,t} \qquad \text{Eq (1.c)} \end{cases}$$

where, *GDP* is the annual percentage rate of change of the Gross Domestic Product of country *i*, at time *t*. *FG* is the percentage growth rate of *MCAP*, contemporaneous to *GDP* growth. *DEB* is the level of public debt, measured as a proportion of *GDP*, while E is a Dummy variable, that takes the value of 1, when country *i* uses Euro as its single currency, while it takes the value of 0, when the country *i*, uses its local currency. Equivalently *EU* is a dummy variable indicating whether country *i* has joint European Union (not necessarily Euro) and *HD* is a dummy variable distinguishing the countries that have public debt beyond the 90% level.[6]. In addition, $\mathrm{CV} = (\mathrm{EXP}, \mathrm{REV}, \mathrm{SAV}, \mathrm{INF}, \mathrm{Trade}, \mathrm{CAB})$ is a vector of control variables, all measured as % of *GDP*.[7]

Eq (1.a) investigates the impact of financial growth on economic development. Recent literature provides empirical evidence that the link has dramatically weakened after 1990s (e.g. Rousseau and Wachtel, 2011), especially for countries that are involved in financial crises. Under this scenario, coefficient α_1 would be statistically insignificant. If there is any differential effect resulting from the political, coefficient α_2^{EU}, or monetary integration, coefficient α_1^{E}, would have

[6] We acknowledge the addendum to the work of Reinhart and Rogoff (2010), but the figure of 90% has also been independently reported in the literature in other studies, such as in Prasad et al. (2007). This debt level might not signify rapid changes do *GDP* growth, but it is still a high figure that might have a statistically significant impact on how financial and economic growth interact. This is what the inclusion of the *HD* dummy intends to capture.

[7] The suggested model tries, by no means, to investigate the determinants of economic or financial growth, or public debt. The focus lies on potential endogeneity, accounting for some control variables. Please note that in 1.a, *CAB* is employed instead of *Trade* openness because the balance of imports/exports is expected to determine long term growth. In contrast in 1.b, *Trade* openness is preferred because it is a better indicator of total trading activity. In 1.c, inflation is excluded because it is expected to have a simultaneously increasing (higher monetary value) and decreasing (lower value of existing liabilities) impact on debt levels and thus, a non-significant impact.

a statistically significant impact on *GDP*. Further, coefficients a_2^{EU}, a_2^E and a_2^{HD} investigate the potentially differential effect of excessive borrowing, discussed in previous literature (e.g, Prasad et al., 2007; Reinhart and Rogoff, 2010), within the European Union.

Following relevant literature (e.g., King and Levine, 1993, Levine, 1997) potential endogeneity between financial and economic growth is also examined in equation 1.b. Coefficient β_1 measures the impact of *GDP* on financial growth. If both a_1 and β_1, are statistically significant, a bi-directional relationship would better describe the interaction within Europe. If only one of the two is significant, the supply-leading (a_1) or the demand-following (β_1) hypothesis would be confirmed. Potentially differential effects for EU or Euro are captured by a_1^E, a_1^{EU} and β_1^E, β_1^{EU}.

Furthermore, Equation 1.c explores how the afore-mentioned variables affect public borrowing levels. Coefficients γ_1 and γ_2 capture this effect, while any differential within Eurozone, would be captured by coefficients γ_1^{E} and γ_2^{E}. The inclusion of *DEBT* as an endogenous variable in this system of equations also examines the role of public borrowing on development. Direct investments on fiscal policies would have a direct impact on *GDP* and at least one of the coefficients α_2 would be significant. In contrast, insignificant α_2's, with β_2 being significant, would mean that an investment for financial growth that further increases *GDP*, would be a more appropriate strategy. If coefficients γ_1 and γ_2 are found to be significant too, this would indicate that either strategy would be a long term engaging strategy, rather than a short term approach.

This system of simultaneous equations is estimated with iterative GMM, with lags of dependent variables employed as instrumental variables, in order to account for recursive effects.[8]

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[8] This method is preferred over Maximum Likelihood because it requires less strict distributional assumptions, while it accounts for heteroskedasticity and autocerrelation of unknown form. Economic and Financial growth might follow a lead lag relationship, but since, potential endogeneity is primarily investigated, a contemporaneous, simultaneous model is preferred over a time series counterpart. We account for dynamic effects by using lags as instrumental variables. They should be highly correlated to the regressors, but un-correlated to the error terms.
Estimation follows the steps below. First, let $\beta = \left(\alpha_m^Q \beta_m^Q \gamma_m^Q\right)', m = 0, \dots, 9$ and $Q = (1, E, EU, HD)'$, be a vector of the parameters to be estimated and $v = (GDP, FG, DEB)'$ a vector of all endogenous variables and $z_r = (\mathrm{EXP}, \mathrm{REV}, \mathrm{SAV}, \mathrm{INF}, \mathrm{Trade}, \mathrm{CAB})', \mathrm{r} = 1, 2, 3$, a vector of all control variables. $e_{1,t} = GDP_{i,t} - E\left[GDP_{i,t}|H_{i,t}\right]$ is the error term in (1.a), given the information set $H_{i,t}$ of countries i up to time t, $\mathrm{e}_{2,t} = \mathrm{FG}_{\mathrm{i,t}} - \mathrm{E}\left[\mathrm{FG}_{\mathrm{i,t}}|\mathrm{H}_{\mathrm{i,t}}\right]$ is the error term in (1.b) and $\mathrm{e}_{3,t} = \mathrm{DEB}_{\mathrm{i,t}} - \mathrm{E}\left[\mathrm{DEB}_{\mathrm{i,t}}|\mathrm{H}_{\mathrm{i,t}}\right]$ is the error term in (1.c). We employ the following moment conditions. The forecasting error, $\mathrm{e}_{\mathrm{r,t}}$ is assumed to have a zero mean ($\mathrm{E}\left[\mathrm{f}_{\mathrm{r,t}}^{\mathrm{i}}(\beta, \upsilon_{\mathrm{i,t}})\right] = \mathrm{E}\left[\mathrm{e}_{\mathrm{r,t}}\right] = 0$). The forecasting errors are assumed to be independent ($\mathrm{E}\left[\mathrm{f}_{\mathrm{r,t}}^{\mathrm{k}}(\beta, \upsilon_{\mathrm{i,t}})\right] = \mathrm{E}\left[\mathrm{e}_{\mathrm{x,i,t}}\mathrm{e}_{\mathrm{y,i,t}}\right] = 0$, for $(\mathrm{x} \neq \mathrm{y}) \in \mathrm{r}$ and serially uncorrelated ($\mathrm{E}\left[\mathrm{f}_{\mathrm{r,t}}^{\mathrm{l}}(\beta, \upsilon_{\mathrm{i,t}})\right] = \mathrm{E}\left[\mathrm{e}_{\mathrm{r,i,t}}\mathrm{e}_{\mathrm{r,i,t-j}}\right] = 0$). Previous lags of all regressors are assumed to be uncorrelated with $\mathrm{e}_{\mathrm{r,t}}$

Finally, we suggest the following straightforward measure of the capacity of a country to engage in the financial-economic growth momentum, given its contemporaneous borrowing level.

$$S_{i,t} = \frac{(1 + GDP_{i,t})}{(1 + FG_{i,t})}(1 - DEB_{i,t}) \qquad \text{Eq (2)}$$

This index measures the sensitivity of economic growth to financial growth changes and borrowing levels. Higher economic growth would result in higher values for the index. If economic growth is faster than financial growth, this index gets values greater than one, while in the opposite case the index would get values lower than one. In the first case, small changes in market expectations and thus, *MCAP*, would result in great changes in economic growth. This is expected to be observed in small and emerging economies, where incremental changes in financial conditions might have great impact on economic growth. In the second case, lower values would indicate a low contribution of financial growth to the economy. This could be observed in oversaturated economies or in countries with underdeveloped financial markets and/or high levels of public debt. Therefore, higher values of public debt are allowed to lower the value of the index. This assumes that higher borrowing levels reduce the long term capacity of the economy to sustain economic growth caused by financial growth. Extending on the ideas of Kindleberger (1978), Minsky (1986) and Popov and Smets (2011), this index gets lower values for higher values of financial growth and public debt levels. This imposes that economic growth that is pursued through excessive market openness, fuelled by excessive borrowing is riskier on the long term and indicates "bad" growth. Consequently, this index could also indicate the riskiness of the policy of trying to benefit of the economic-financial growth momentum.

($\mathrm{E}\left[f^{z}_{r,t}(\beta, \upsilon_{r,t})\right] = \mathrm{E}\left[e_{r,t} * z_{r,t-j}\right] = 0$ and $\mathrm{E}\left[f^{\upsilon}_{r,t}(\beta, \upsilon_{r,t})\right] = \mathrm{E}\left[e_{r,t} * \upsilon_{r,t-j} * Q_{r,t-j}\right] = 0$, for $j = 0,1, \dots, T$, here j is restricted to 1.). The sample means of the GMM disturbances $(\beta, \upsilon_{i,t}) = [f^{i}_{r,t}(\beta, \upsilon_{i,t}),\ f^{k}_{r,t}(\beta, \upsilon_{i,t}),\ f^{l}_{r,t}(\beta, \upsilon_{i,t})'$ $, f^{\upsilon}_{r,t}(\beta, \upsilon_{i,t})', f^{z}_{r,t}(\beta, \upsilon_{r,t})']'$ are defined as: $g(\beta; S_{I,T}) = \frac{1}{T}\frac{1}{I}\sum_{i=1}^{I}\sum_{t=1}^{T} f(\beta, \upsilon_{i,t})$, where $S_{I,T}$ contains the observations of $\upsilon_{i,t-j}, j = 1, \dots, T$ of a sample T. The estimates for β are chosen so that the sample moments, $g(\beta; S_{I,T})$, closely approximate the population moments, $f(\beta, \upsilon_{i,t})$. When the number of moment conditions, K, is larger than the number of parameters, L, the GMM estimator can be written as; $\hat{\beta} = \underset{\beta}{\operatorname{argmin}} \left(g(\beta; S_{I,T})' * \widehat{W}_t * g(\beta; S_{I,T})\right)$, where $\widehat{W}_t$ is a KxK semi-definite "weighting" matrix, such as that $\lim_{T\to\infty} \widehat{W}_t \to W$ (population). $\hat{\beta}$ is estimated with "iterative" GMM, with a heteroskedasticity consistent covariance matrix (Newey and West, 1987). In the above specification, $K > L$ and, therefore, the model is over-identified. Hansen (1982) proposes J-statistics to test the validity of the model, i.e., whether the implied moment conditions fit the data well. H_o is that they do. J-statistic is asymptotically Chi-squared with $K - L$ degrees of freedom. $J \equiv \left(g(\beta; S_T)' * \widehat{W}_t * g(\beta; S_T)\right) \to \chi^2_{K-L}$.

3. Empirical Findings

3.1 Non-parametric Analysis

Initial Observations

Figure 1 summarizes the descriptive statistics of the variables employed. The average economic growth is positive, 2.45%, and overdispersed (std is 3.07%). This is somewhat expected since the sample includes both developing and developed countries, as well as a structural break due to the financial crisis in October 2008. Skewness is negative, -0.7136, and along with high kurtosis, 4.9828, shows that high dispersion is mainly due to strongly negative observations. After 2008, most countries experienced a significant slowdown, which in some cases resulted in low or negative growth. Furthermore, market capitalization accounts for around 67% of *GDP*, which shows that financial sector plays an important role in these economies. It is also the most highly dispersed variable employed, with a significantly long (i.e., kurtosis is 7.2706) right (i.e., skewness is 1.6440) tail. In several cases the market value of listed companies exceeds *GDP*, with a maximum of 3.23 times more, which indicates significant exuberance and excessive confidence, evidently reported in the years prior to 2008 (Shiller, 2005). The contribution of the political and financial integration to this confidence and the link with economic growth is the main focus of this study. The increased confidence might improve firms' credibility, while their increased activity should be expected to increase their market value and overall *GDP*.

DEBT accounts for around 60% of *GDP*. It has a longer right tail (i.e., skewness is 0.3285 and kurtosis is 2.5190). This shows that several countries sustain considerably higher debt levels, in some cases exceeding 100%. This should to be more prominent after 2008 where *GDP* declines without a proportional decrease on public debt. A negative figure of -0.5045 for *CAB* shows that imports exceed exports in most cases. In consistence with *Trade*, *CAB* is significantly overdispersed (i.e., std is 5.8373) with some extreme observations in both ends of the distributions. This highlights that some countries appear to be mainly exporting (e.g., Germany), while other countries are mainly importing (e.g. Greece) goods and services. Literature recognizes the combination of negative *CAB* and high debt as a major determinant of increased exposure to macroeconomic shocks. The limited flexibility induced by Euro could significantly increase macroeconomic risk. In contrast, public expenditure, revenue and savings account for around 45%, 43% and 21%, of *GDP*, respectively, and are significantly less dispersed.

Financial and Economic Growth

Figure 2 presents graphically the link between economic growth, financial growth (Panel A) and *MCAP* (Panel B). Panel A shows that financial and economic growth tend to be positively correlated, with countries exhibiting simultaneous financial and economic growth. According to panel B, this seems to be more intense in the countries that have joined Euro, since the dots seem to be more aligned to a positive correlation, unlike the countries that keep their national currencies, which exhibit more observations closer to the XX' axis. However, countries that experience negative financial growth are still associated with positive economic growth in Eurozone. Considering that most financial markets contracted rigidly after 2008, this might be a first sign that Eurozone or European Union might increase confidence, which still supports economic development.

Panel D shows an overall declining relationship between *MCAP* and economic growth. However there are several large observations close to YY' axis, which show that there are countries that achieve high market value without necessarily experiencing high economic growth (or small increases in economic activity spark high market values). The distinction becomes clearer in panels E and F. In Eurozone the link between market values and economic growth seems to be exponentially increasing. In contrast, in the countries that keep their national currencies, two sub-groups are observed. In the first group higher economic growth is not associated with high market values, while in the second, some very high figures are observed for *MCAP* in countries with low economic growth. The overall link tends to be rather negative, but with no clear trend.

Financial, Economic Growth and Public Debt Levels

Figure 3 presents the relationship between economic, financial growth and debt. It reveals that indeed economic and financial growth appear to be linked. There are two major observations. First, this link seems to strengthen over time, especially after 2008, especially in countries that have not joined €. In the period prior to 2008, panels B and C reveal that the link is relatively weaker in non-Eurozone countries. However, after 2008, the volatility of both financial and economic growth is higher for this sub-sample, indicating that € might smoothen the impact of a macroeconomic shock on the participating countries, leaving the rest more exposed. Several studies (e.g., Manning, 2003; Rousseau and Wachtel, 2011) report that the link between economic and financial growth has weaken significantly, especially after 1990. However, in the

period following 2008 both tend to move together, showing that their link most probably strengthens again. This shows that this link might either be cyclical, depending on macroeconomic cycles, or that it is the natural result of a macroeconomic shock, especially in contracting economies.[9] This should be expected, since an economic slowdown definitely affects market expectations and market values. Decreased market values are also a worrying sign of less expected stability, which results in less investments and thus, in slower economic growth. The second observation refers to the nature of the link. Panels A-E show that financial growth changes are mostly observed after economic growth sparks. Considering that *MCAP* captures expectations, this shows that *GDP* changes influence market expectations, which seem to follow with a lag. This is mainly observable in Eurozone, especially before 2008. *MCAP* in countries with national currencies seems to follow the trends of the Eurozone countries, while *GDP* does not seem to be fully in line. Furthermore, focusing on the overall trend of *MCAP* prior to 2008 it seems to be rather decreasing, with notable exceptions when *GDP* sparks are observed. This might be a sign that market was increasingly worried about inflated prices. These more conservative expectations might have been an additional factor causing the sharp decrease in *GDP* and thus, might be a sign of a longer term impact of financial on economic growth. Consequently, the dynamic structure chosen to investigate the direction of the relationship in equations 1.a, 1.b and 1.c, seems to be justified.

Furthermore, panels D and E focus on countries with public debt that exceeds 90%. During "bear" or "normal" markets economic growth is more moderate (e.g., around 5-6%) than in countries with less debt (around 6-10%), while it decreases significantly more during "bull" markets. The direct result of it is that i (% of *GDP*) increases in some cases, such as in Greece, to unacceptable levels. Panels F-H distinguish between Eurozone and non-Eurozone countries. Panel F shows that, overall, higher borrowing is associated with, exponentially, lower economic growth. According to panel H, this is consistent in non-Eurozone countries. In contrast, countries that have joined € can still achieve higher economic growth. € appears to induce confidence, which allows increased financing to further assist economic growth.

[9] In this study we investigate further the latter, without necessarily ignoring the first. We primarily focus on the relationship between financial and economic growth and how is this affected by monetary integration, especially after a macroeconomic shock. The measure of financial growth chosen directly reflects market expectations and thus, is expected to better capture potential "Euro" effects. If there are cyclical patterns, they should be reflected on market prices, assuming rational investors. Relaxing the rationality assumption or investigating the randomness of macroeconomic shocks or their independence to business cycles, would significantly deviate this study from its focus, which is to investigate potential "Euro" effects.

Bear vs Bull Market

Figure 4 presents the relationship between the edogenous variables before and after the outburst of the financial crisis in 2008. Column one focuses on the full sample and confirms previous findings. In brief, economic and financial growth seem to positively correlated, but only in Eurozone countries, which also appear to be benefited more by increased public borrowing. In the non-Eurozone countries increasing debt leads to decreased economic growth, which does not seem to be strongly linked to financial growth. However, when focusing on panels F and J, debt still limits economic development, but financial growth seems to be positively associated with economic growth. In contrast, after 2008, countries that have not joined Eurozone exhibit significantly lower growth across greater financial activity. Further, panels E and H show that the link between financial and economic growth is significantly stronger in bearish market, without though disappearing after a macroeconomic shock.

3.2 Parametric Analysis

Financial and Economic Growth

Table 1 presents the estimation results of the model presented in equations 1.a, 1.b and 1.c. Focusing on the full sample, no significant link is observed between financial and economic growth in non-Eurozone countries. The highest *t*-statistics is 1.67, in absolute value, showing that the two figures are rather independent. However, financial growth appears to have a significant boosting impact on economic growth in countries that have adopted *€* (*FG*E* is 0.0311 and t-statistic is 2.53). In parallel, a significant (2.04) coefficient of 8.8012, for the *EU* dummy in the financial growth section, shows that *GDP* has an increasing impact on financial growth for countries that have joined European Union. This effect is found to be stronger for countries that have additionally joined *€* (coefficient is 3.0153 and t-statistic is 3.13). Consequently, the link between the two figures is present in Europe and they are found to be endogenous in Eurozone, but not necessarily within European Union.

A possible explanation for this finding could depend on the existence of European Union and particularly Eurozone. European Union is significantly larger than single country and it should be expected to be more resistant to market pressure than a single entity. Consequently, increased endogeneity between market condition and fundamentals should be expected. Higher economic activity appears to have an increasing impact on financial growth, which in turn further increases

economic growth, engaging into a spiral relationship. The absence of this link in the non-EU countries leads to the conclusion that EU's contribution is significant. Given that *MCAP* is captures expectations, this contribution could be linked to increased confidence. Consequently, for a given change in *GDP* market reacts more positively if the country is a Eurozone member, probably because investors anticipate that country risk or exposure to macroeconomic risk is lower. This exuberance allows an investment flow that can further increase *GDP*.

However, this spiral effect does not seem to be consistent outside Eurozone, not even in other (non-€) member states. An EU membership would assist countries with positive *GDP* changes to further increase the total market value, but this increased market value does not have any further impact on *GDP*, unless the country has joined €. Considering that € comes with certain rights and responsibilities, discipline to European directives and further political and monetary integration is needed for Eurozone member states in order to benefit from their participation. From market's perspective, this seems to be distinctively different than the EU membership. Indeed, market participants seem to capitalize their expectations for future political stability and, thus lower macroeconomic risk, on current prices when a country joins EU. This increased confidence might be derived from their political expectations that individual countries will be supported by the larger entity in case of distress. However, this does not seem to be a sufficient condition to further increase their *GDP*. This can only happen if they join €. When they do, they abandon their monetary tools and thus, they need to have a discipline, in the sense of increasing their competitive advantages. This, in combination with a higher level of political and monetary integration, leads to higher stability expectations and confidence, which attracts further economic development. This is a first sign that € is suitable for countries, which anticipate that they can gain on the long term from the spiral relationship of financial and economic growth.

Focusing on the sub-samples, the spiral relationship between financial and economic growth seems to be strongly present before 2008 only within Eurozone. *GDP* has an increasing impact on financial growth (e.g., *GDP*E* is 3.3589 and *t*-statistics is 2.01), which in turn further increases *GDP* (e.g., *FG*E* is 0.0513 and *t*-statistics is 2.83). This shows that € could accelerate economic growth in countries that can benefit from this spiral link. Furthermore, € appears to play smoothing role too, during the period following the outburst of the financial crisis. *GDP* improvements still increase market values only within Eurozone (e.g., *GDP*E* is 0.2758 and *t*-statistics is 2.21), but now Eurozone countries seem to be less exposed to market fluctuations. In

more detail, an estimate of 0.1901 (2.6) shows that in non-Eurozone countries *GDP* changes follow market value changes. In contrast, a negative estimate for the Eurozone countries of -0.1548 (-2.09) indicates that this effect is milder for countries that have adopted €.

Considering that market changes have been mostly negative after 2008, these findings indicate two issues. First, the sharp decrease in both *GDP* and market values shows that the exuberance experienced in Europe prior to 2008, based on the confidence induced by *€*, might not have been completely rational. The general consensus is that EU was not constitutionally prepared to face macroeconomic challenges and therefore the increased confidence observed in this study might be a sign that markets have exaggerated in capitalizing their expectations about *€*. Second, it appears that non-Eurozone countries are more exposed to market volatility after a macroeconomic shock than countries that belong to a monetary union. Market seems to anticipate that members of the union will get additional support and thus, they face lower macroeconomic risk. Therefore, the negative market impact on economic development, observed in other countries is rather limited. This highlights a beneficial impact of *€*. First, it accelerates economic growth by inducing extra confidence, which seems to be capitalized into market prices, which further utilize market power to accelerate growth. In parallel, the additional confidence seems to protect the countries in periods of macroeconomic distress.

Financial, Economic Growth and Debt

The previous section highlights the importance of confidence, derived by the monetary integration, in the spiral relationship between economic and financial growth. This increased confidence should improve access to capital and this could be a major determinant of the spiral link. Equation 1.c focuses on the impact economic and financial growth on accumulation of public debt, as well as on endogeneity issues.

A first inspection of table 1 shows that member states keep higher balances , especially when they experience higher economic growth. The last section of table 1 reveals that there is a statistically significant difference in borrowing levels between member and non-member states. The impact of GDP is insignificant for countries that have not joined EU (e.g., coefficient is -1.8419 and t-statistics -0.36), but it has a rather increasing impact for member states (e.g., 1.9814 (1.94)), especially when *€* is the currency adopted (e.g., 2.3205 (5.06)). This is consistent with previous findings that highlight that *€* implicitly assumes an increased commitment from both

the union and the individual country. In contrast, no significant link appears to exist between financial growth and borrowing levels. This shows that country fundamentals are more important in improving the borrowing position of a country, rather than its financial profile. Further, any *€* effect on borrowing disappears during a "bull" market (e.g., coefficient is 0.7287 and *t*-statistics is 0.81), where financial commitments are prioritized over economic development.

Naturally, focus shifts on how the improved borrowing position affects the spiral relationship between financial and economic growth. The first observation is derived from the third panel of the first section of table 1. Debt seems to be endogenous to *GDP* growth, with different impact for member and non-member states. Higher borrowing seems to have a limiting impact on economic growth in countries that have not joined *€* (e.g., coefficient is -0.5076 and *t*-statistics is -2.08). In contrast, the higher borrowing capacity of *€* member states seems to have an overall marginally positive impact on economic growth (e.g., 0.0075 (1.95) for *Debt*E* and 0.4863 (2.01) for *Debt*EU*). Interestingly, this is not consistent before and after 2008. During the booming period prior to 2008 higher debt has a positive impact (e.g., 0.0190 (2.27)) on economic growth, even when debt exceeds 90% of GDP (e.g., 0.0380 (2.57)). Countries that have joined *€* appear to be able to borrow more and the extra funds seem to further increase economic development. In contrast, in the years following the sovereign bond crisis excessive debt seems to significantly limit growth opportunities (e.g., -0.0267 (-2.77)) in Eurozone, especially for countries with high borrowing levels (e.g., -0.0413 (-2.37)). Consequently, *€* appears to have an indirect positive impact on economic growth, which can be sourced to increased confidence. Eurozone countries seem to have increased credibility that can be used to draw more funds, which if they are utilized properly can lead to further development.

However, this increased confidence might be a double edge sword, by leaving countries significantly exposed to over-accumulated public borrowing. *€* has been found in the previous section to smoothen the exposure to financial markets' fluctuations, but the increased, probably irrational, confidence has led in some cases to unmanageably high borrowing levels. Consequently, the benefits from the endogenous relationship between debt and economic growth are not unconditional. *€* seems to protect countries from erratic market movements, but on the same time, the lack of monetary flexibility significantly restricts growth opportunities in case of distress. The *€* induced confidence is not immune and it appears to also introduce a "moral hazard" of "over-confidence" that leads to an increased macroeconomic risk of "over-

borrowing". This can lead to "bad" growth in the sense of exaggeration in capitalizing expectations. This concern seems to also be reflected on the impact of debt on financial growth. The third panel of the second section of table 1 shows that higher borrowing balances consistently lead to lower marker values. This slows down the spiral effect of the endogenous economic and financial development. However, this happens only in the Eurozone countries (e.g., -0.5756 (-4.73)) and not member states that have not joined € (e.g., 0.2582 (2.57)).

This leads to the conclusion that markets perceive € to have a dual role. First, it is found to enhance confidence. This allows countries to borrow more and it creates the necessary conditions for the additional borrowing to utilize countries' resources and thus engage the economy into a spiral endogenous acceleration of both financial and economic growth. Second, this endogeneity is bounded by the borrowing levels. During "bear" markets the additional confidence leads to further growth, while during "bull" markets it is restrictive. This might be a sign of "bad" growth drivers. Therefore, € is also considered having a limiting impact on financial and economic growth dynamics. Joining Eurozone is perceived by markets as a commitment from both the union and the individual country, which leads to increased confidence. However, it is also perceived as an increased moral hazard, in terms of over confidence, which might lead to over-borrowing. Consequently, the suitability of adopting € should depend on the ability of each country to benefit from the increased confidence by engaging on the spiral endogenous link between financial and economic growth. Excessive borrowing without engaging on this ling could lead to obviation of this confidence. This introduces an extra macroeconomic risk that could be a major determinant of the current European sovereign bond crisis.

"Good" and "Bad" Growth

Drawing on the previous findings, the riskiness of the way economic growth is achieved is further examined, focusing on the level of the sensitivity index proposed in the methodology section. Table 2 presents the ranking of the countries according to their capacity to engage to economic-financial growth momentum before the outburst of the financial crisis, during the period of the beginning of it until Greece requested for financial help and beyond this point.

The first notable observation is that European peripheral economies, such as Italy, Greece and Portugal, with the exception of Spain, score very low on the capacity index. This is consistent in all periods. Greece and Italy in particular have negative values, probably due to high debt levels.

This is a first indication that the capacity of these countries to engage into the economic-financial growth momentum is rather limited and thus, € should not be expected to be the optimal policy. Ireland scores notably higher in the period prior to the financial crisis, which might be a result of increased interaction with the UK. However, consecutive negative rates of economic growth have resulted in non-manageable debt levels and thus, a negative figure in the post 2010 period. This is an example of a country, where the suitability of adopting € has been beneficial, since it could benefit from the economic-financial growth interaction. However, the loss of confidence in the post crisis era has left the country exposed to excessive market risk. Spain, in contrast, achieves a relatively high score among the Eurozone economies, even after experiencing financial pressure. This appears to be a sign of a country with high capacity to benefit from an increased market confidence. € could be considered an optimal choice. In contrast, France appears to consistently score very low. A value of 0.0381 in the post 2010 period, is probably the result of a significant market pressure and higher borrowing levels. This indicates no market confidence and a rather limited ability of the economy to benefit from a deeper financial system and thus, higher market risk. In this case the benefits of € cannot be unconditional.

Another notable observation is the difference between Eurozone and non-Eurozone countries, like Bulgaria, Norway and Switzerland. Non Eurozone countries consistently achieve higher scores, probably due to lower levels of debt, as a result of less market confidence. The value of the index in all counties is lower in the post 2010 period, but still the non-Eurozone countries score higher than their counterparts. This is a strong indication that €, especially in periods of increased pressure can have an adverse impact. However, for economies, like Austria, Germany or Spain, which can experience a strong momentum without increasing debt levels to unsustainable levels, the fall is considerably more limited. These findings are consistent with the earlier discussion about increased market exposure and the role of debt. Non-Eurozone countries experience higher exposure to market fluctuations and hold lower levels of debt. Therefore, they appear to have higher values for the index during the financial crisis period.

This is consistent with the empirical findings discussed in an earlier section, based on figure 3. Countries that have not adopted € can experience higher economic growth, but for smaller changes in financial growth they experience greater fluctuations in their *GDP*. In contrast, Eurozone members experience more limited growth during booming periods, but they are not that exposed during macroeconomic shocks.

However, this is not unconditionally consistent. For example, Bulgaria, which has not joined €, exhibits high capacity to benefit from financial growth before 2008, but it experiences a sharp deterioration after. Probably, it would be beneficial for the country to join €, which it would smoothen the exposure. Furthermore, Estonia, which has joined €, exhibits a more limited capacity of exploiting financial growth, but it experiences an improved capacity after. This could be attributed to the additional confidence induced by €. In the opposite extreme case, countries like Italy and Greece, which have also joined €, consistently exhibit remarkably low capacity to engage to the financial-economic growth momentum. Under this perspective, € appears to create a "bad" growth momentum with excessive borrowing levels, rather than increasing confidence and further economic growth potential.

Consequently, € appears to be a policy that is not unconditionally beneficial. The increased confidence can either fuel further economic growth or increase borrowing levels to unsustainable levels. The ability of each country to benefit from the enhanced financial growth appears to be crucial and could be an indication of suitability. When € allows a country to borrow more, without a simultaneous improvement in the economic-financial growth momentum, then it could be considered as the catalyst of "bad" growth. In contrast, when countries engage in the momentum, they achieve even higher "healthy" economic growth, and like in the case of Spain, do not appear to be so much exposed to market risk.

4. Concluding Remarks

We investigate the suitability of adopting €, revisiting the interaction between financial and economic growth in Europe. We introduce debt as an integral component and we investigate endogeneity among all three. We also differentiate between the impact of political (i.e., European Union) and financial (Eurozone) integration on economic and financial development.

Spiral relationship and The Euro effect; EU vs €

Financial and economic growth are found to be endogenous. Greater economic growth creates optimism, which increases market values, which further increase economic growth. This spiral link is bounded by public borrowing. Higher economic growth leads to higher borrowing capacity and this further finances economic growth, especially in a "bear" market. However, there is a trade-off with risk during "bull" markets, where macroeconomic risk might increase due to over-borrowing.

This seems to be valid only in Eurozone member states. A "*€*-effect" is observed, where the borrowing capacity of these countries increases upon higher economic growth and this further accelerates growth, especially prior to 2008. Markets appear to capitalize "stability" expectations due to financial integration and thus, market prices increase. This creates the foundations for further economic growth. However, considering an adverse impact during "bull" markets and the absence of constitutional grounds, these expectations do not seem to be fully rational.

Financial integration, i.e., *€*, is found to play a dual role. The market perception of declared commitment, from both the union and the member state, increases confidence, which allows for higher borrowing and accelerates financial and economic growth. However, market also perceives *€* as introducing a moral hazard of "over-confidence" that can lead to "over-borrowing" and thus, to greater macroeconomic risk. In contrast, EU members that have not joined *€* can still draw marginally more funds upon higher economic growth and this financing increases both *GDP* and market values. However, the lack of the common currency does not create the necessary confidence to enhance a synergetic endogeneity. This shows that the sacrifice of the monetary flexibility could under specific conditions create further growth, or it could unequally increase risk. Therefore, Eurozone members need to balance between increased confide and increased risk.

Confidence

Consequently, *€* should be seen as a long term policy built upon its induced confidence that is heavily bounded by borrowing levels. If the capacity of the country to engage in the financial-economic growth momentum is limited, the marginal impact of confidence might not exceed the marginal impact of the additional macroeconomic risk. Then the benefits of adopting *€* cannot exceed its costs. Therefore, the interaction between the dual role of *€*, which is unique for each country, should be a major determinant of the suitability of adopting the common currency. On a larger scale, European policies should focus either on distinguishing between "good" and "bad" borrowing and thus, between "good" and "bad" growth or on structural changes that will allow countries to benefit from the financial-economic growth momentum

References

Abiad, A., et al., *What's the Damage? Medium-Term Output Dynamics After Banking Crises.* IMF working papers, 2009: p. 1-37.

Abiad, A., D. Leigh, and A. Mody, *Financial integration, capital mobility, and income convergence.* Economic Policy, 2009. **24**(58): p. 241-305.

Adam, C.S. and D.L. Bevan, *Fiscal deficits and growth in developing countries.* Journal of Public Economics, 2005. **89**(4): p. 571-597.

Aizenman, J., Y. Lee, and Y. Rhee, *International reserves management and capital mobility in a volatile world: Policy considerations and a case study of Korea.* Journal of the Japanese and International Economies, 2007. **21**(1): p. 1-15.

Alessi, L. and C. Detken, *Quasi real time early warning indicators for costly asset price boom/bust cycles: A role for global liquidity.* European Journal of Political Economy, 2011. **27**(3): p. 520-533.

Aschauer, D.A., *Public capital and economic growth: issues of quantity, finance, and efficiency.* Economic Development and Cultural Change, 2000. **48**(2): p. 391-406.

Beck, T., A. Demirgüç-Kunt, and V. Maksimovic, *Financing patterns around the world: Are small firms different?* Journal of Financial Economics, 2008. **89**(3): p. 467-487.

Beck, T., R. Levine, and N. Loayza, *Finance and the Sources of Growth.* Journal of financial economics, 2000. **58**(1): p. 261-300.

Beetsma, R., et al., *Price Effects of Sovereign Debt Auctions in the Euro-zone: The Role of the Crisis.*

Beirne, J. and M. Fratzscher, *The pricing of sovereign risk and contagion during the European sovereign debt crisis.* Journal of International Money and Finance, 2012.

Berglöf, E., et al., *Understanding the crisis in emerging Europe.* European Bank for Reconstruction and Development Working Paper, 2009(109).

Berthelemy, J.-C. and A. Varoudakis, *Economic growth, convergence clubs, and the role of financial development.* Oxford Economic Papers, 1996. **48**(2): p. 300-328.

Blackburn, K. and V.T. Hung, *A theory of growth, financial development and trade.* Economica, 1998. **65**(257): p. 107-124.

Buchanan, J.M. and J.M. Buchanan, *Public principles of public debt: a defense and restatement*. 1958: RD Irwin Homewood, IL.

Checherita, C. and P. Rother, *The impact of high and growing government debt on economic growth.* An empirical investigation for the Euro Area. Frankfurt: European Central Bank Working Paper Series, 2010(1237).

Clements, B.J., R. Bhattacharya, and T.Q. Nguyen, *External debt, public investment, and growth in low-income countries*. 2003: International Monetary Fund.

Darrat, A.F., *Are financial deepening and economic growth causally related? Another look at the evidence.* International Economic Journal, 1999. **13**(3): p. 19-35.

De Grauwe, P., *The governance of a fragile Eurozone.* Revista de Economía Institucional, 2011. **13**(25): p. 33-41.

De Grauwe, P., *Economics of monetary union*. 2012: Oxford University Press.

De Grauwe, P. and Y. Ji, *Panic-driven austerity in the Eurozone and its implications.* VoxEU. org, 2013. **21**.

Demetriades, P.O. and K.A. Hussein, *Does financial development cause economic growth? Time-series evidence from 16 countries.* Journal of development Economics, 1996. **51**(2): p. 387-411.

Diamond, P.A., *National debt in a neoclassical growth model.* The American Economic Review, 1965. **55**(5): p. 1126-1150.

Diaz-Alejandro, C., *Good-bye financial repression, hello financial crash.* Journal of development Economics, 1985. **19**(1): p. 1-24.

Edwards, S., *Openness, productivity and growth: what do we really know?* The Economic Journal, 1998. **108**(447): p. 383-398.

Fry, M.J., *The permanent income hypothesis in underdeveloped economies:: Additional evidence.* Journal of Development Economics, 1978. **5**(4): p. 399-402.

Gibson, H.D., S.G. Hall, and G.S. Tavlas, *Fundamentally wrong: Market pricing of sovereigns and the Greek financial crisis.* Journal of Macroeconomics, 2013.

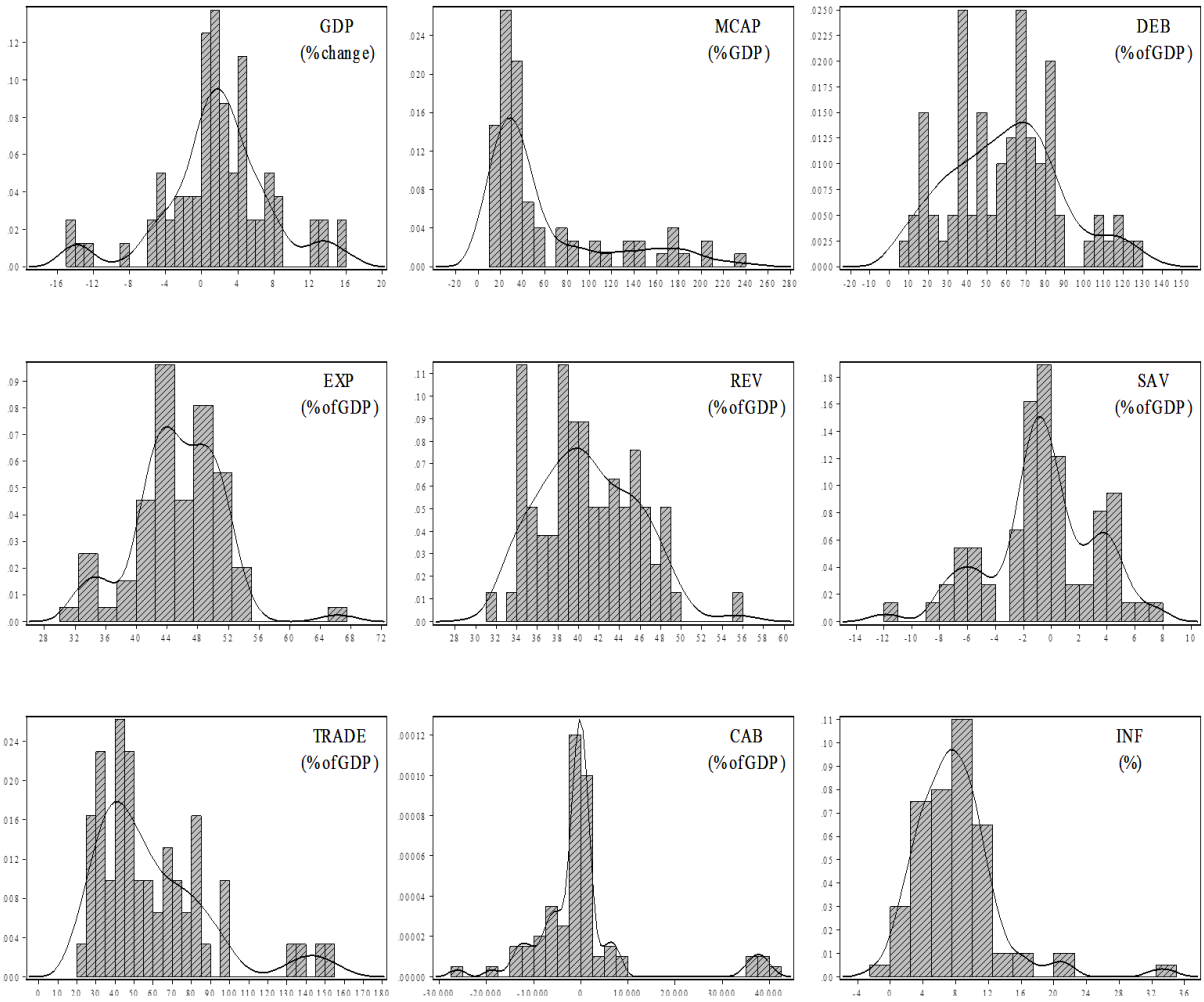
Gourinchas, P.-O. and O. Jeanne, *The elusive gains from international financial integration.* The Review of Economic Studies, 2006. **73**(3): p. 715-741.

Gourinchas, P.-O. and O. Jeanne, *Capital flows to developing countries: The allocation puzzle*, 2007, National Bureau of Economic Research.

Greenwood, J. and B. Jovanovic, *Financial Development Growth, and the Distribution of Income.* Journal of Political Economy, 1990. **98**.

Greenwood, J. and B.D. Smith, *Financial markets in development, and the development of financial markets.* Journal of Economic Dynamics and Control, 1997. **21**(1): p. 145-181.
Harrison, P., O. Sussman, and J. Zeira, *Finance and growth: Theory and new evidence.* 1999.
Heinemann, F., S. Osterloh, and A. Kalb, *Sovereign risk premia: The link between fiscal rules and stability culture.* Journal of International Money and Finance, (0).
Imbs, J., *The real effects of financial integration.* Journal of International Economics, 2006. **68**(2): p. 296-324.
Imbs, J., *Growth and volatility.* Journal of Monetary Economics, 2007. **54**(7): p. 1848-1862.
Ireland, P.R., *The policy challenge of ethnic diversity: immigrant politics in France and Switzerland*. 1994: Harvard University Press Cambridge, MA.
Kaminsky, G.L. and C.M. Reinhart, *The twin crises: the causes of banking and balance-of-payments problems.* American economic review, 1999: p. 473-500.
Kaminsky, G.L. and S.L. Schmukler, *Short-Run Pain, Long-Run Gain: Financial Liberalization and Stock Market Cycles*.* Review of Finance, 2008. **12**(2): p. 253-292.
Kindleberger, C.P. and C.P. Kindleberger, *Government and international trade*. 1978: International Finance Section, Department of Economics, Princeton University.
King, R.G. and R. Levine, *Finance and growth: Schumpeter might be right.* The quarterly journal of economics, 1993. **108**(3): p. 717-737.
Kose, A., et al., *Financial globalization and economic policies*. 2009: Centre for Economic Policy Research.
Krugman, P., *Financing vs. forgiving a debt overhang.* Journal of development Economics, 1988. **29**(3): p. 253-268.
Kumar, M. and J. Woo, *Public debt and growth.* IMF Working Papers, 2010: p. 1-47.
Levine, R., *Financial development and economic growth: views and agenda.* Journal of economic literature, 1997. **35**(2): p. 688-726.
Levine, R., *Financial development and economic growth: views and agenda.* Journal of economic literature, 1997. **35**(2): p. 688-726.
Lucas Jr, R.E., *On the mechanics of economic development.* Journal of monetary economics, 1988. **22**(1): p. 3-42.
Lucas, R.E., *Models of business cycles.* Vol. 26. 1987: Basil Blackwell Oxford.
Manning, A., *The real thin theory: monopsony in modern labour markets.* Labour Economics, 2003. **10**(2): p. 105-131.
McKinnon, R.I., *Money and capital in economic development*. 1973: Brookings Institution Press.
Meade, J.E., *Is the national debt a burden?* Oxford Economic Papers, 1958. **10**(2): p. 163-183.
Mink, M. and J. De Haan, *Contagion during the Greek sovereign debt crisis.* Journal of International Money and Finance, 2012.
Minsky, H.P., *The evolution of financial institutions and the performance of the economy.* Journal of Economic Issues, 1986. **20**(2): p. 345-353.
Missio, S. and S. Watzka, *Financial contagion and the European debt crisis*, 2011, CESifo working paper: Monetary Policy and International Finance.
Modigliani, F., *Long-run implications of alternative fiscal policies and the burden of the national debt.* The Economic Journal, 1961. **71**(284): p. 730-755.
Moore, M.C., *Elevated testosterone levels during nonbreeding-season territoriality in a fall-breeding lizard, Sceloporus jarrovi.* Journal of Comparative Physiology A, 1986. **158**(2): p. 159-163.
Patrick, H.T., *Financial development and economic growth in underdeveloped countries.* Economic development and Cultural change, 1966. **14**(2): p. 174-189.
Pattillo, C.A., H. Poirson, and L.A. Ricci, *External Debt and Growth (EPub)*. 2002: International Monetary Fund.
Popov, A., *Financial liberalization, growth, and risk.* Growth, and Risk (January 15, 2011), 2011.
Popov, A. and F. Smets, *On the tradeoff between growth and stability: The role of financial markets.* VoxEU. org, 2011. **3**.
Prasad, E.S., R.G. Rajan, and A. Subramanian, *Foreign capital and economic growth*, 2007, National Bureau of Economic Research.
Rajan, R.G. and L. Zingales, *Financial dependence and growth*, 1996, National Bureau of Economic Research.
Reinhart, C.M. and K.S. Rogoff, *Growth in a Time of Debt*, 2010, National Bureau of Economic Research.
Rousseau, P.L. and P. Wachtel, *What is happening to the impact of financial deepening on economic growth?* Economic Inquiry, 2011. **49**(1): p. 276-288.
Saint-Paul, G., *Fiscal policy in an endogenous growth model.* The Quarterly Journal of Economics, 1992. **107**(4): p. 1243-1259.
Schumpeter, J.A., *1934.* The theory of economic development, 1911.
Shaw, E.S., *Financial deepening in economic development*. Vol. 39. 1973: Oxford University Press New York.
Stern, N., *The economics of development: a survey.* The Economic Journal, 1989. **99**(397): p. 597-685.
Wachtel, P., *How much do we really know about growth and finance?* Economic review, 2003(Q1): p. 33-47.

Figure 1. Distribution and Descriptive Statistics



	GDP (% change)	*Debt (% of GDP)*	*Exp (% of GDP)*	*Rev (% of GDP)*	*Sav (% of GDP)*	*Inf (%)*	*MCAP (% of GDP)*	*TRADE (% of GDP)*	*CAB (% of GDP)*
Mean	2.4535	59.9834	45.5705	43.4161	21.9758	2.6112	67.2425	109.4270	-0.5045
Median	2.6747	58.9440	46.1635	43.7355	22.3320	2.3036	57.0716	89.0459	-0.6085
Maximum	10.8963	142.7570	65.9520	55.0890	36.3760	12.0358	323.7104	319.5540	13.2210
Minimum	-8.2045	6.0680	30.2920	32.0880	4.1030	-4.4799	3.2982	47.0882	-14.6880
Std. Dev.	3.0703	29.7813	5.9710	5.6135	5.2797	1.9822	51.0947	62.5425	5.8373
Skewness	-0.7136	0.3285	-0.2230	-0.0251	-0.6027	1.4692	1.6440	1.4551	-0.0807
Kurtosis	4.9828	2.5190	3.0244	2.0983	4.6320	8.1108	7.2706	4.9514	2.4953

Figure 1 presents the histogram of the variables employed. The bars present the frequencies while the lines are the normalized empirical distributions. The table on the bottom of this figure presents the descriptive statistics of the variables employed.

Figure 2. Economic Growth and Market Capitalization. Eurozone and National Currencies

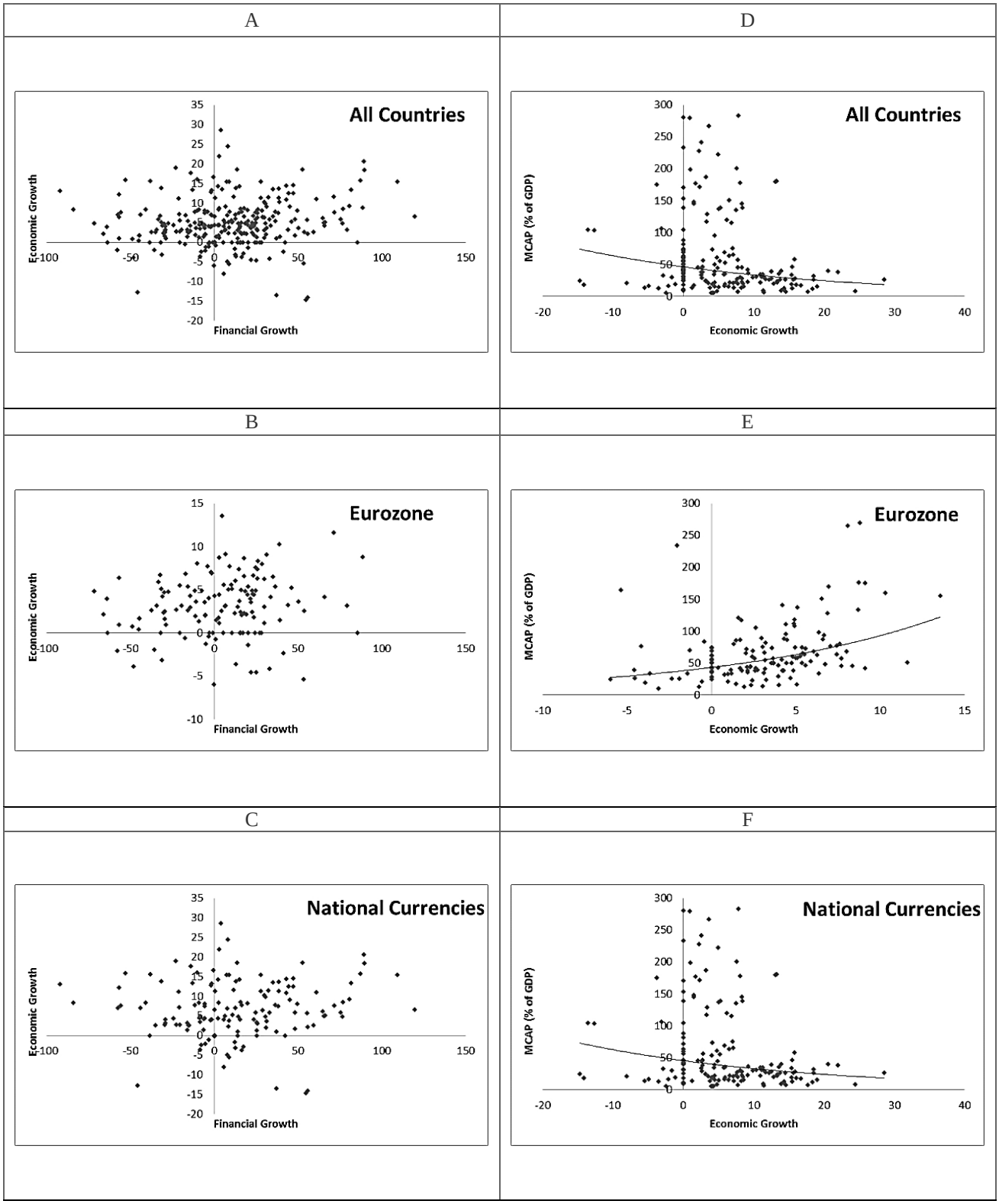
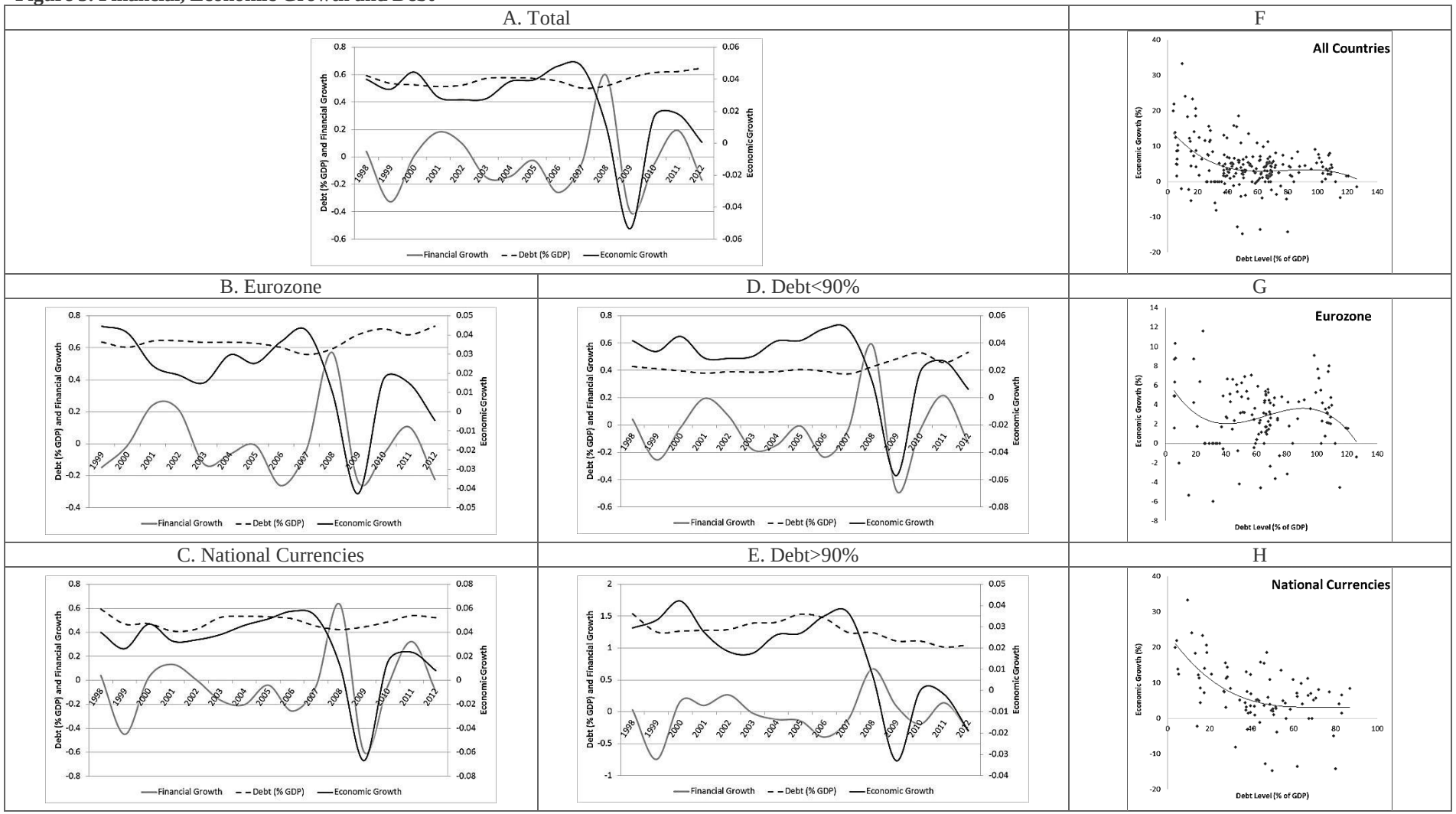


Figure 1 presents economic growth, defined as % change of GDP, over market capitalization, defined as MCAP as % of GDP, and financial growth, defined as % change of MCAP, across all countries, as well as across countries that have joined Euro and countries that keep their national currency. The last column presents the Granger causality test for GDP and MCAP.

Figure 3. Financial, Economic Growth and Debt



The first two columns of figure 2 present the average financial and economic growth, as well as the average level of depth over the sample period, dissected into two sub-samples; countries that have joined Euro and countries that have not, as well countries with debt levels higher than 90% and countries with less than 90%. The last column links economic growth and debt levels across sample, under national currencies and in the Eurozone.

Figure 4. Economic, Financial Growth and Debt Levels. Inter-relations

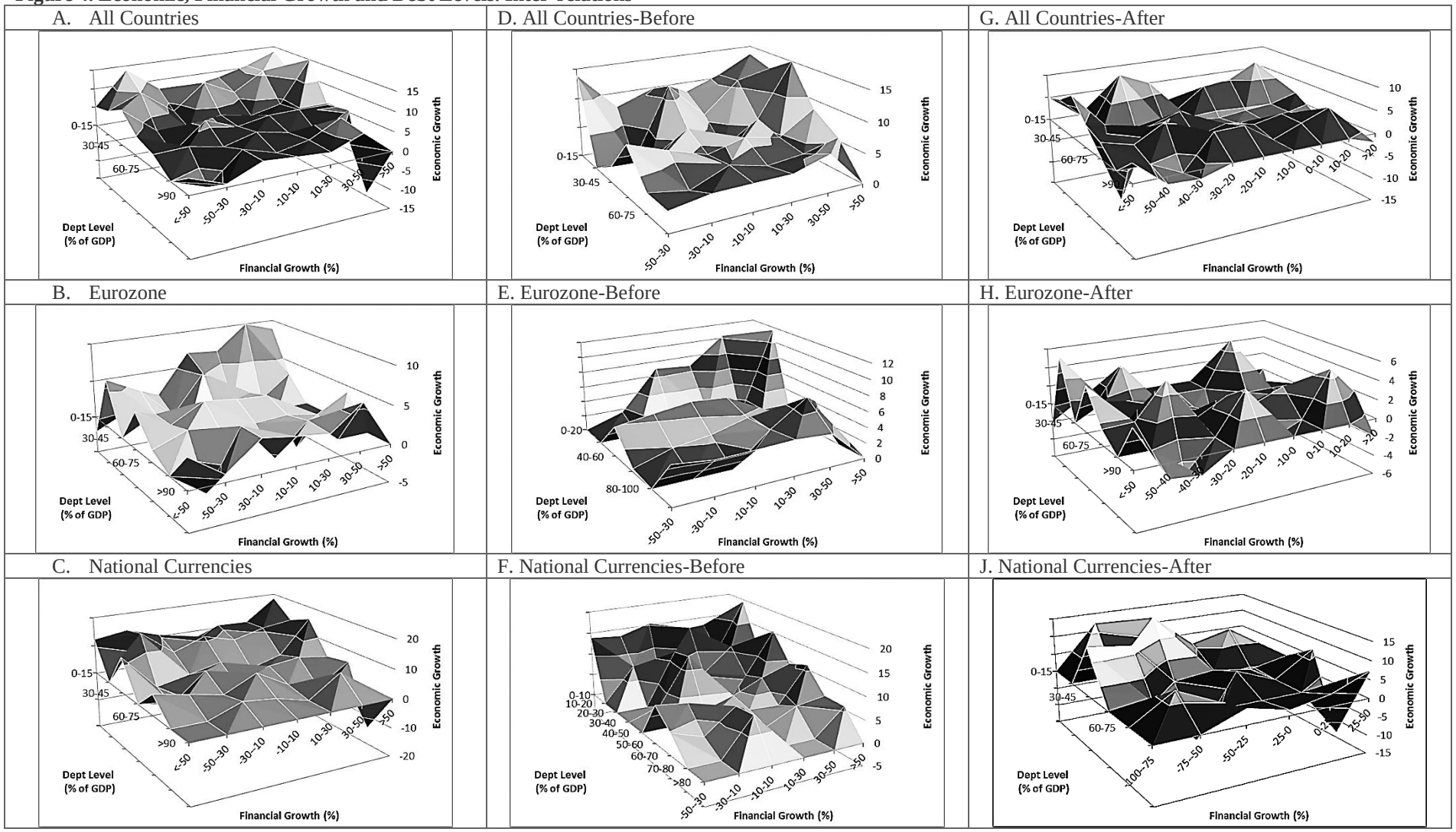


Figure 3 presents the average economic growth across different levels of debt and financial growth for all countries, Eurozone and countries with national currencies. The subsamples are further dissected into the period prior to and after 2008.

Table 1. Estimation Results

	GDP					Financial Growth					Debt				
	Total		Before		After	Total		Before		After	Total		Before		After
Interc	17.2547	17.9161	13.0200	13.5238	25.4790	-59.9285	-41.9834	-67.4995	-62.4380	12.4026	20.6024	23.4248	40.0831	32.8673	-17.7554
	(4.76)	(4.74)	(4.29)	(4.09)	(3.17)	(-2.32)	(-1.56)	(-2.09)	(-1.82)	(0.31)	(1.49)	(1.64)	(2.44)	(1.9)	(-0.61)
FG	-1.1301	0.0057	-0.7675	-0.0195	0.1901						-0.5576	0.1033	-0.2874	0.0769	0.1134
	(-1.67)	(0.34)	(-1.56)	(-1.51)	(2.6)						(-0.74)	(1.71)	(-0.37)	(1.17)	(0.45)
*FG*E*	0.0311	0.0313	0.0551	0.0513	-0.1548						-0.1450	-0.1325	-0.0280	-0.0531	-0.1838
	(2.53)	(2.46)	(3.33)	(2.83)	(-2.09)						(-1.88)	(-1.67)	(-0.29)	(-0.54)	(-0.75)
*FG*EU*	1.1544		0.7484								0.6883		0.3971		
	(1.7)		(1.52)								(0.91)		(0.51)		
GDP						-7.0069	0.7946	-8.4822	0.7171	0.9850	-1.8419	-0.0348	-3.3240	-0.4537	0.5095
						-(0.84)	(1.52)	-(0.94)	(0.79)	(1.37)	(-0.36)	(-0.12)	(-0.64)	(-0.92)	(0.96)
*GDP*E*						3.0153	3.4359	2.7495	3.3589	0.2758	2.3205	2.3449	2.5287	2.5777	0.7287
						(3.13)	(3.39)	(2.75)	(2.01)	(2.21)	(5.06)	(4.96)	(4.21)	(4.15)	(0.81)
*GDP*EU*						8.8012		9.3777			1.9814		2.4088		
						(2.04)		(2.03)			(1.94)		(2.05)		
Debt	-0.5076	-0.0251	-0.4615	-0.0709	0.0464	0.5008	0.6366	0.6839	0.9190	0.2404					
	(-2.08)	(-1.76)	(-2.61)	(-2.32)	(0.69)	(1.06)	(2.96)	(1.29)	(3.09)	(0.77)					
*Debt*E*	0.0075	0.0070	0.0190	0.0116	-0.0267	-0.5756	-0.5875	-0.4435	-0.4553	-0.4978					
	(1.95)	(1.94)	(2.27)	(2.72)	(-2.77)	(-4.73)	(-4.69)	(-2.22)	(-2.18)	(-3.33)					
*Debt*EU*	0.4863		0.3844			0.2582		0.4242							
	(2.01)		(2.18)			(2.57)		(2.89)							
*Debt*HD*	0.0221	0.0203	0.0380	0.0378	-0.0413	0.0268	0.0617	-0.2092	-0.1903	0.1920					
	(1.34)	(1.17)	(2.57)	(2.33)	(-2.37)	(0.24)	(0.53)	(-1.35)	(-1.17)	(1.22)					
Exp	-0.4183	-0.3956	0.2029	0.1915	-0.9926	4.8946	4.3789	5.1859	5.0339	2.1062	-1.8032	-1.8246	-0.7870	-0.6478	-2.0757
	(-1.51)	(-1.37)	(0.69)	(0.59)	(-2.1)	(2.63)	(2.26)	(1.77)	(1.61)	(0.94)	(-1.83)	(-1.79)	(-0.5)	(-0.39)	(-1.44)
Rev	0.0839	0.0475	-0.3812	-0.4064	0.4025	-4.5996	-4.2407	-5.3611	-4.9835	-3.0220	3.1516	3.1146	1.6272	1.6549	4.4626
	(0.31)	(0.17)	(-1.36)	(-1.32)	(0.81)	(-2.59)	(-2.3)	(-1.91)	(-1.67)	(-1.33)	(3.43)	(3.28)	(1.07)	(1.04)	(3.47)
Sav	0.3908	0.3262	0.3989	0.3884	0.1937	3.8035	3.6334	5.5319	4.7665	-1.3794	-6.7771	-6.6556	-5.7671	-5.8793	-6.1765
	(1.26)	(1.01)	(1.32)	(1.18)	(0.34)	(1.82)	(1.69)	(1.81)	(1.49)	(-0.52)	(-6.98)	(-6.67)	(-3.73)	(-3.66)	(-4.46)
Trade						0.1946	0.1432	0.3977	0.3209	0.2193	-0.2560	-0.2554	-0.2640	-0.2555	-0.2855
						(1.93)	(1.38)	(2.63)	(2.05)	(1.54)	(-4.92)	(-4.81)	(-3.75)	(-3.54)	(-3.1)
CAB	0.0178	0.0124	0.0251	0.0160	0.0120										
	(1.21)	(0.81)	(1.73)	(1.03)	(0.39)										
Inf	0.5111	0.4794	0.7033	0.6902	0.3609	-2.5221	-2.0912	-2.1698	-2.0748	-1.5887					
	(6.51)	(5.82)	(9.21)	(8.24)	(2.29)	(-4.46)	(-3.56)	(-2.25)	(-2.06)	(-2.42)					
J	3.08	5.76	7.14	6.07	4.55										
p	(0.38)	(0.12)	(0.07)	(0.11)	(0.21)										

Table 1 presents the estimation results for the model in equations 1.a, 1.b and 1.c. Total refers to the full sample, while before and after include the estimation results for the periods prior to and after 2008. An additional column is added in the "Total" and "Before" sections, where the same models are estimated, excluding the EU dummy variable. All countries in the sample have joined Eurozone by 2012, independently of their decision to join €. In order to avoid estimation problems, EU was excluded.. *J*-statistics is reported in pairs for the total, before and after period.

Table 2: Ranking According to Growth Capacity

Before 2008		2008-2010		After 2010	
Bulgaria	1.3016	Estonia	4.2016	Estonia	1.1534
Luxembourg	1.1659	Hungary	2.8417	Bulgaria	0.7866
Slovenia	1.0682	Luxembourg	1.8788	Norway	0.7775
Lithuania	1.0397	Lithuania	1.4447	Switzerland	0.7658
Latvia	0.9624	Poland	1.2323	Luxembourg	0.7359
Czech Republic	0.9505	United Kingdom	1.0474	Finland	0.6328
Estonia	0.8827	Denmark	0.9454	Slovak Republic	0.5646
Norway	0.7874	Latvia	0.8991	Czech Republic	0.5646
Switzerland	0.7748	Switzerland	0.7944	Denmark	0.5165
Poland	0.7412	Bulgaria	0.7200	Slovenia	0.5040
Germany	0.6452	Spain	0.6944	Poland	0.4985
Slovak Republic	0.6378	Czech Republic	0.6657	Latvia	0.4619
Ireland	0.6322	Slovenia	0.6024	Lithuania	0.4607
Denmark	0.5816	Netherlands	0.5843	Austria	0.3345
Spain	0.5687	Slovak Republic	0.5497	Netherlands	0.3294
United Kingdom	0.5514	Germany	0.5458	Spain	0.3207
Netherlands	0.4860	Finland	0.5152	Germany	0.3156
Austria	0.4325	Ireland	0.3493	Hungary	0.2061
Portugal	0.3823	Austria	0.2642	Malta	0.1923
France	0.3778	Belgium	0.1954	Belgium	0.1045
Hungary	0.3626	France	0.1880	Portugal	0.0651
Finland	0.2310	Malta	0.1694	United Kingdom	0.0636
Cyprus	0.0880	Portugal	0.1324	Cyprus	0.0391
Belgium	0.0280	Cyprus	-0.0923	France	0.0381
Italy	-0.1638	Italy	-0.1228	Ireland	-0.1261
Greece	-0.2035	Greece	-0.3281	Italy	-0.1956
Malta	-0.5427	Norway	-0.7412	Greece	-0.2129