Financial stability and economic performance

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A B S T R A C T

This paper aims at establishing the link between economic performance and financial stability in the European Union. We use the seminal framework of Beck and Levine (2004) – both in terms of variables and econometric method – to estimate this causal relationship, independently from but controlling for the level of financial depth. Using a panel GMM with instrumental variables, our contribution involves testing how different measures of financial instability (an institutional index, microeconomic indicators, and our own statistical index derived from a principal component analysis) affect economic performance (or components of aggregate dynamics like consumption, investment and disposable income). We find that financial instability has a negative effect on economic growth.

1. Introduction

This paper examines the causal relationship between macroeconomic performance and financial stability in the European Union (EU). Opposing views emerged from the literature on the links between finance and economic performance. On the one hand, credit is found to be determinant in the process of economic development. The literature often recalls the Schumpeterian view that entrepreneurs need credit to finance their innovations. Banks and financial markets are then viewed as facilitators. On the other hand, finance appears to respond to economic growth. With economic expansion, firms and households are more likely to demand financial services. According to both views, the finance–growth relationship is constrained by structural determinants such as the historical level of debt, the legal environment and the level of economic development. Beyond this finance–growth nexus, which has already given rise to an abundant literature, we investigate whether financial instability affects macroeconomic performance. This question matters for addressing the issue of whether policymakers should implement policies aimed at ensuring financial stability.

A focus on the financial stability issue is motivated from both an academic and a policy perspective. This topic has come to the fore in the academic debate since the crisis (Arcand et al., 2012; Beck et al., 2014; Cecchetti and Kharroubi, 2012). A major reason for addressing the question of financial stability is its nature as a public good: it is a non-rival good since its use does not prevent someone else from the same use, and it is non-excludable since no one can be deprived of its use. After financial crises, new regulations are proposed to supervise and frame the financial system to preserve its property as a public good (Cartapanis, 2011). In the case of a banking crisis at the micro-level, financial stability has to be preserved to prevent idiosyncratic shocks from generating a systemic impact through different contagion links: contractual, informational or psychological (Borio, 2003). For instance, the bankruptcy of Lehman Brothers in September 2008 affected the entire banking system through several channels. Contractually, its creditors were the first to be hit. But very quickly, bankruptcy was analyzed as a severe negative signal on the financial markets and, in particular, on interbank markets. This induced uncertainty and suspicion among banking institutions, which swiftly became reluctant to participate in the money market. These informational and psychological links were transmitted around

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the world, and extreme tensions appeared on the European and US money markets, affecting the real economy as a result. Moreover, payment systems are central to the smooth functioning of market economies, so financial instability can potentially disrupt them.

From a policy perspective, European countries included financial stability in the European Treaty as an objective of the European Central Bank (ECB). According to Article 127(2) of the Treaty on the Functioning of the EU, the ECB has to "smooth the conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system". Beyond this mandate, it is difficult to formulate the policy to be achieved because of the difficulties in defining, forecasting and measuring financial stability (Schinasi, 2004). In the absence of a consensus, it is acknowledged that these regulations should at least be implemented at the European level. The banking union is one step in this direction. The EU is thus an appropriate level to investigate the financial stability–economic performance link, particularly because, thanks to financial integration and converging prudential regulations, the European countries are relatively homogenous compared to the rest of the world.

We focus specifically on the financially integrated and homogenous economies of the EU, most of whose countries share the same central bank and are part of a single financial market. An analysis of the finance–growth nexus, or the financial stability–growth nexus when advanced and developing countries are mixed, is beyond the scope of this paper. Our study aims at providing evidence about the effects of financial stability on European aggregate dynamics.

We assess the financial stability–economic performance nexus with the dynamic panel GMM estimations methodology of Beck and Levine (2004), which we extend to the financial stability dimension. This framework relates financial depth and economic performance and has been used extensively in the literature, producing results that are comparable across a wide array of contributions. We test whether financial stability has a causal effect on economic performance and its subcomponents – consumption, investment and disposable income – on different samples of EU countries. Our benchmark time sample is 1998–2011, because of the financial stability data availability, and we use proxy data to extend the analysis from 1960 to 2011. The effect of financial stability is estimated independently of the level of financial depth, but we control for the latter in order to avoid capturing its specific effects. We also control for a potential non-linear relationship between financial depth and financial instability with interaction terms, and find that financial instability affects economic performance independently of the degree of financial depth. We use different financial instability indicators that measure the macro- and micro-dimensions of financial stability: the Composite Indicator of Systemic Stress (CISS) provided by the ECB, aggregate prudential ratios for domestic banks for each country, stock market volatility, and our own statistical index constructed from a principal component analysis (PCA). We find that financial instability, captured by the CISS and non-performing loans, has a negative effect on economic performance. This result is robust to several panel specifications and estimators. It is interesting to note that introducing financial stability in this framework does not alter the financial depth effect. While this result may seem intuitive, this paper provides quantitative evidence on the negative effect of financial instability on economic performance. Financial instability, independently of financial deepening, has a negative effect on the economy.

Moreover, we find that financial depth has no positive impact on economic performance in the EU as a whole and in the euro area, although results indicate a slightly positive impact in Central and Eastern European countries prior to the Great Recession. Results support the view of Arcand et al. (2012) that the effect of financial depth on growth depends on the level of financial development. While these results do not undermine the seminal results that financial depth has had a positive effect for developing countries, they suggest that the *level* of financial depth in the EU is so advanced that it no longer has a positive effect on economic growth.

The rest of this paper is organized as follows. Section 2 presents the literature. Section 3 describes the data. Section 4 discusses the methodology and results. Section 5 concludes.

2. Related literature

The paper is at the crossroads of two strands of the literature, one studying the link between finance and economic growth, and the other investigating the link between financial instability and growth.

2.1. Finance and economic performance

There have been different perspectives on the relationship between finance and economic performance along with theoretical and empirical controversy about the subject since the beginning of the XXth century (Ang, 2008). The debate can be summarized as follows. Advocates of a positive role of finance highlight that the development of finance induces a better allocation of resources, mobilizes savings, can reduce risks and facilitates transactions. The financial sector acts as a lubricant for the economy, ensuring a smoother allocation of resources and the emergence of innovative firms. Cons recall that stock markets have destabilizing effects and that financial liberalization leads to financial crises. These more skeptical authors believe that the link between finance and economic growth has been exaggerated (Rodrik and Subramanian, 2009; Stiglitz, 2000). De Gregorio and Guidotti (1995) argue that the link is tenuous or even non-existent in the developed countries and suggest that once a certain level of economic wealth has been reached, the financial sector makes only a marginal contribution to the efficiency of investment. It relinquishes its role as a facilitator of economic growth in favor of its own growth. Banking and financial groups thus emerge that are "too big to fail", enabling them to take excessive risk since they know it will most certainly be mutualized by the intervention of the public authorities. The fragility of these groups rapidly transmits to other financial and non-financial corporations, hence to the real economy. The subprime crisis is a good example of the magnitude of the effects of correlation and contagion on financial markets. Numerous empirical studies have investigated these questions.

However, until recently, the literature highlighted a positive relationship between financial development and economic growth (Bumann et al., 2013), drawing on cross-country, time series and panel studies.

Cross-country studies, mixing countries with different levels of development, generally found a positive effect of finance on economic performance, with the notable exception of Ram (1999). King and Levine (1993) found that financial development indicators are positively associated with capital accumulation, total factor productivity growth and GDP growth. Focusing on stock markets, Demirgüç-Kunt and Maksimovic (1998) and Levine and Zervos (1998) concluded that liquid stock markets are positively related to GDP growth. But these cross-country studies suffer from severe limitations. Most of them intend to quantify whether finance affects economic performance, neglecting the reverse causality. To deal with this endogeneity bias, they use instrumental variables, but as demonstrated by Ahmed (1998), this technique is not robust when data are averaged over decades, which is usually the case in these studies. Another limitation of cross-country analyses is the grouping of countries that are highly heterogenous. This problem was highlighted by Ram (1999), who showed that, after defining subgroups in his sample, an important parametric heterogeneity is

observed. This is due to the fact that the link between finance and economic performance is mainly determined by the financial structures, the legal environment, the preferences and the policies implemented in each country (Arestis and Demetriades, 1997; Demirgüç-Kunt and Maksimovic, 1998).

Time series studies have been developed to counter the above-mentioned limitations. Arestis and Demetriades (1997) compared the finance–GDP growth link in Germany and in the United States. In Germany they found a relationship from financial development to real GDP, whereas the reverse causal pattern held for the United States. Xu (2000) also provided evidence of heterogeneity across countries. Arestis et al. (2001) compared the influence of banks and stock markets across five developed countries. Their results showed that both promote GDP growth, and also suggested that banks contribute more than the stock markets. Moreover, they pointed out that stock market volatility has had negative effects in Japan, France and the United Kingdom. But these macro-studies suffer from small sample constraints. To preserve degrees of freedom, the variables included in the analysis are kept to a minimum, meaning that these studies might be subjected to the omitted variable bias.

To address these issues and to combine the benefits of cross-country analysis and the time dimension, the literature moved to dynamic panel estimation procedures. Most panel studies reach the conclusion that financial development has a positive effect on economic performance, e.g. Beck et al. (2000), Rioja and Valev (2004), Rousseau and Wachtel (2000), Beck and Levine (2004) and Rajan and Zingales (1998) with industry-level data. Beck and Levine (2004) used dynamic panel data estimation and developed an empirical methodology based on Arellano and Bond (1991) that intends to take care of the endogeneity bias. They explain GDP per capita growth by means of the usual variables of endogenous growth theory (i.e. the initial GDP per capita, the accumulation of human capital over the average years of education, government consumption, trade openness and inflation) and add to their model both credit to the private sector and the turnover ratio as proxies of financial depth. They found that financial development positively affects GDP growth. The turnover ratio and credit to the private sector are both significant, suggesting that they complement each other. Nevertheless, the main conclusion – that finance improves growth – needs to be moderated. Calderon and Liu (2003) also found that financial development generally boosts economic growth, but they show that the causality from economic growth to financial development coexists. They found that the finance–growth link is more active in developing countries than in developed ones, and that the longer the sample, the larger the effect of financial development. Finally, Loayza and Ranciere (2006) highlighted that financial deepening has contrasting effects. It positively influences growth in the long run but a negative effect can be identified in the short run.

In an attempt to reconcile the divergent views expressed in the literature, a nonlinear relationship between finance and economic growth has been postulated. Arcand et al. (2012) extend Beck and Levine (2004) by introducing the square of credit to the private sector in order to take account of the potential non-linearity of financial depth. They showed that the relationship between economic growth and private sector credit is positive, but the relationship between economic growth and the square of private sector credit (that is to say, the effect of credit to the private sector when it is at a high level) is negative. Taken together, these two factors indicate a concave relationship between economic growth and credit to the private sector: the relationship is positive up to a certain level of financial depth, but beyond a certain threshold, the effects of financial depth become negative. According to the different specifications estimated by Arcand et al. (2012), the threshold (as a percentage of GDP) lies between 80% and 100% of credit to the private sector. Cecchetti and Kharroubi (2012) came to similar results and make clear that these thresholds should not be viewed as targets, but more like "extrema" that might be reached only in times of crisis. In "normal" times, it would be better for private debt levels to be lower so as to give the economies some leeway in times of crisis. To explain non-linearities, Aghion et al. (2005) and Fung (2009) argued that financial development helps catch-up the productivity frontier; for countries close to the frontier, the positive effects from financial depth are limited or nonexistent.[1] Beck et al. (2012) insisted on the fact that the effect of financial growth stems from firms rather than from households. However, in developed countries, financial deepening originates from greater household lending. This may explain the weakness of the financial effect in high-income countries. It is worth acknowledging that these explanations are not mutually exclusive. They might even be mutually reinforcing and create an excess of finance that would produce financial instability.

Beyond questions of non-linearity, finance can also have its own potential negative effects. Indeed, liquidity and maturity transformation from deposit and savings to long-term investment can improve economic performance, but can also be damaging. Deregulation and information asymmetries have encouraged banks to take more risks in recent years. Combined with financial deepening, this has led to excessive lending and reinforced bubbles that give rise to financial fragility. The failure of financial institutions can have strong negative externalities. Laeven and Valencia (2012) showed that banking crises tend to have larger real effects in advanced economies. Output losses are driven by larger banking systems, which deeply impact the entire economy.

2.2. Financial stability

Financial stability relates to different aspects of finance, though it is difficult to define (e.g. Schinasi, 2004). On a micro-level, market structures (a high degree of concentration reinforces the contagion risks from one bank to another) and financial institutions themselves (depending on whether their business model requires high or low risk) impinge on financial stability. On a macro-level, monetary stability and the functioning of the payment system are important aspects of financial stability. These domains are organized and supervised by central banks, supervisory authorities and private firms that ensure the functioning of the system of payments between the financial institutions. Failures in the supervision or in the payment system may lead to financial instability.

One way to define financial stability is to take into account the ways to achieve it. Two main paradigms can be used to classify financial stability (see e.g. Borio, 2003): microprudential and macroprudential. Microprudential policies try to limit financial institutions' probability of bankruptcy and idiosyncratic shocks.[2] Financial instability is exogenous to the financial system, and risks should be managed on an individual basis. This is a bottom-up approach, and spillover effects between institutions are irrelevant. Macroprudential policies try to limit the occurrence of financial crisis in order to limit its impact on welfare. They focus on the economic system as a whole and are aimed at circumscribing shocks that may have a macro-impact.[3] Risks come from the system itself, and the spillovers between institutions are important. Financial stability is generated through a top-down perspective, guaranteed by the actions of the main financial institutions.

The complexity of defining financial stability conceptually also involves ways to quantify it. Loayza and Ranciere (2006) measure

[1] Philippon (2010) argued that the financial system grows faster than the real economy, with the consequence that young talents are more attracted by the financial sector than by the non-financial one.

[2] Their main objective is to guarantee a protection for the consumers (investors, depositors, etc.).

[3] Their main objective is to avoid economic costs in terms of GDP or unemployment stemming from financial instability.

financial fragility as the standard deviation of the private credit/GDP ratio over non-overlapping 5-year averages. The ECB has developed a Composite Indicator of Systemic Stress (CISS) for the euro area as a whole (Hollo et al., 2012), which has been available since 1999; it gives an appreciation of macroeconomic financial stability. At the micro-level, several authors capture financial stability in the banking sector through the Z-score (Fink et al., 2009; Uhde and Heimeshoff, 2009), which measures the probability of default for a bank or a banking system. This indicator suffers from several limitations (Cihák et al., 2012). Using the financial stress index developed by the IMF for thirteen industrialized economies,[4] Proano et al. (2013) analyze the extent to which the effect of the sovereign debt-to-GDP ratio on economic growth depends on financial stability. They find that the debt-to-GDP ratio impairs growth only when financial stress is high.

3. Data

To quantify the links between financial depth, financial stability and economic performance in the EU, our dataset is composed of country-variables from the 27 EU member states as of 2011.[5] We use annual data between 1998 and 2011.[6]

3.1. Economic performance

The main indicator of economic performance is the real GDP per capita growth rate, as in many papers dedicated to the real impact of finance. Following Stiglitz et al. (2009), who indicate that two other macro-aggregates are relevant to explain economic performance, we also test the real disposable income per capita growth rate and the household consumption per capita growth rate. Finally, we analyze the impact of finance on private investment growth, measured as the growth rate of real gross fixed capital formation.

3.2. Explanatory variables

In order to compare our results with the conclusions of the literature, we include the same set of explanatory variables: initial economic performance per capita, average years of education, government consumption over GDP, trade openness and inflation.[7] All these variables are expressed in log units.[8] Beyond these variables, we include measures of financial depth. Beck and Levine (2004) use total credit to the private sector from deposit banks. This measure was adequate until the 1990s, but it is now more relevant to include total credit to the private sector by deposit banks and other financial institutions. We also include the stock market turnover ratio.

To take the macroeconomic dimension of financial stability into account, we include the CISS developed by the ECB for the euro area. The CISS includes 15 raw measures, mainly of market-based financial stress, which are split equally into five categories, namely the financial intermediaries sector, money markets, equity markets, bond markets and foreign exchange markets. The CISS places relatively more weight on situations in which stress prevails simultaneously in several market segments. It is unit-free and constrained to lie within the unit interval (see Hollo et al., 2012). Unfortunately, this aggregate indicator exists neither at the country level nor for the entire EU. However, thanks to strong financial, monetary and trade integration in the EU, it is reasonable to assume that the evolution of macroeconomic financial stability in the EU is highly correlated with financial stability in the euro area, hence the relevance of the CISS.

Moreover, to capture the microeconomic dimension of financial stability, we use some aggregate prudential ratios such as the ratio of non-performing loans to gross loans, which is relevant as a warning signal for systemic banking insolvency (Cihak and Schaeck, 2010). We also test the banking Z-score and stock market volatility.

Finally, we also construct a statistical financial stability index from a principal component analysis (FSI-PCA) based on various aggregate prudential ratios.[9] The first component comprises bank capital to total assets, net interest margin, bank non-performing loans to gross loans, stock market capitalization growth rate, return on assets, return on equity and liquid assets to deposits and short-term funding. It is estimated with a principal component analysis and is therefore a linear combination of the seven preceding variables, maximizing the common variance explained between these variables. The first component captures most of the common variance and the following orthogonal components contain less and less information than the preceding components. For the 27 countries in the sample, the first component has an eigenvalue (the variance of the component) comprised between 2.75 and 4.56 (a value superior to one means that the component captures more variance than its nominal share of the total variance of variables) and explains between 0.39 and 0.65% of the common variance of the series. Measures of sampling adequacy – the Kaiser–Meyer–Olkin (which compares the partial correlations and correlations between variables) and SMC (Squared Multiple Correlations of variables with all other variables) – support the relevance of PCA on the selected variables.[10] Our index of FSI-PCA is negatively correlated with variables of financial instability, except the Z-score. In that sense, FSI-PCA must be viewed as an indicator of financial stability. When the FSI-PCA index increases, financial stability increases.

All the variables are described in Table A in the Appendix. Descriptive statistics are presented in Table B, and the correlation matrix between all variables is shown in Table C.

4. Empirical analysis

4.1. Methodology

Following Beck and Levine (2004), we estimate the relationship between finance and GDP growth using the GMM estimator developed by Arellano and Bond (1991). The regression equation can be described in the following form:

$$y_{i,t} = \beta y_{i,\,t-1} + \gamma X_{i,t} + \delta Z_{i,t} + \varepsilon_{i,t} \quad (1)$$

where subscripts i and t represent respectively the country and time period, $y_{i,t}$ is the dependent variable of economic performance, $y_{i,t-1}$ represents its lagged value, $X_{i,t}$ is a set of explanatory variables typically used in this type of study, $Z_{i,t}$ includes explanatory variables of financial

[4] This is a composite indicator comprising information on banking-sector volatility, stock market returns, stock market volatility, sovereign debt spreads, and an exchange market pressure index, very similar in spirit to the CISS for the EU.

[5] Croatia only joined the EU in July 2013.

[6] Due to financial stability data availability constraints, our benchmark time sample begins in 1998. Nevertheless, we also test our hypothesis on a longer period (1960–2011) using the standard deviation of the private credit/GDP ratio as a proxy for financial stability. The results are reported in Table H in the Appendix and discussed in Section 4.4.

[7] We also test government expenditures instead of government consumption.

[8] To deal with zero value in inflation rates, we apply the inverse hyperbolic sine transformation used by Arcand et al. (2012): $(\dot{x} = \ln\left(x + \sqrt{x^2+1}\right)$.

[9] We have also constructed variants of this new financial stability index including, or not, some prudential ratios. The characteristics of the FSI-PCA and the estimation results remain similar.

[10] Principal component analysis estimates are available upon request.

stability, and $\varepsilon_{i,t}$ is the error term that includes country-specific and time-specific effects.

Some econometric issues arise from estimating this equation. First, variables included in $X_{i,t}$ and $Z_{i,t}$ may not be fully exogenous, and causality may run in both directions. Second, the country fixed-effects contained in the error term can be correlated with the explanatory variables. Third, the panel dataset has a relatively short time dimension and a large country dimension. These three issues can be addressed with the two-step GMM estimator proposed by Arellano and Bond (1991) in which the set of instrumental variables is constituted by the lagged values of all explanatory variables, including $y_{i,t-1}$. Moreover, Arellano and Bond (1991) rewrite Eq. (1) in first difference:

$$\Delta y_{i,t} = \beta \Delta y_{i,t-1} + \gamma \Delta X_{i,t} + \delta \Delta Z_{i,t} + \Delta \varepsilon_{i,t}. \quad (2)$$

By transforming the regressors in first difference, the country fixed-effect is removed, but a new bias is potentially introduced: the new error term can be correlated with the lagged dependent variable. Under the assumption that the error term is not serially correlated and that the explanatory variables are weakly exogenous, Arellano and Bond (1991) define the following procedure. In the first step of their GMM estimator, error terms are assumed to be homoskedastic and independent over time and across countries. Then, in the second step residuals obtained in the first step are used to build a consistent estimate of the variance–covariance matrix. Assumptions of independence and homoskedasticity are then relaxed, making the two-step estimator asymptotically more efficient than the first-step one.

We obtain robust standard errors using the Windmeijer (2005) finite sample correction. The assumption of no serial correlation in the error terms is crucial for the consistency of the GMM estimator. We report the standard specification tests. Failure to reject the null hypothesis of the serial correlation tests implies that error terms are not serially correlated.

The use of a large number of instruments may lead to over-identification. In order to avoid this, we use variables in level as instruments only up to three lags instead of using all their history. The p-value of the Sargan test is included at the bottom of each table of results. We do not reject the null hypothesis that our instruments are valid.

Our estimation strategy differs from earlier ones since we do not use average data in our dynamic panel estimations.[11] Beck and Levine (2004) and Arcand et al. (2012) use average data in order to quantify the long-term relationship between finance and economic performance. Their data are usually averaged over 5-year periods to disentangle credit cycle effects. In addition to the argument by Ahmed (1998), we do not follow this assumption for two other reasons. First, business cycles measured by the National Bureau of Economic Research (NBER) in the United States and by the Center for Economic Policy Research (CEPR) in Europe are longer than five years. Measures of financial cycles (Drehmann et al., 2012) show that financial cycles have a much lower frequency than traditional business cycles. Their average duration has increased since the 1980s and is now around 20 years, making 5-year average data unable to fit the duration of these cycles. Second, it may be worth investigating not only the long-term effects of finance on economic performance but also its short-term effects: the use of average data disregards the latter.

4.2. Preliminary results

In a first step, we replicate on our sample the seminal estimations of the literature. The overall fit of the model in column (1) of Table 1 is consistent with Beck and Levine (2004). Initial economic performance, trade openness and government consumption are significant with the usual sign. Average years of education and inflation are, on the contrary, not significant.[12] Other specifications, with non-linearity and/or other indicators of economic performance give relatively similar outcomes.

It is quite noteworthy that these first estimations show that the level of financial depth in the EU as a whole is not a significant positive determinant of economic performance. Estimations with four different economic performance measures (GDP growth per capita, household consumption growth per capita, disposable income growth per capita and investment growth) all show that when financial depth is proxied by the ratio of the amount of credit provided to the private sector by banks and other financial institutions over GDP, no improvement in economic performance should be expected from an increase in allocated credit.[13]

Moreover, this measure of financial depth sometimes has a significant negative effect. These results are consistent with recent works that have established a limit for the positive effects of financial depth (Arcand et al., 2012; Cecchetti and Kharroubi, 2012). The latter show that beyond an unobserved threshold, negative effects may start to appear. We also performed additional estimations including the squared GDP per capita or the squared ratio of credit to GDP to the benchmark model to evidence the potential non-linear effects of the levels of economic or financial development. The squared ratios are not statistically significant, and their inclusion does not affect the previous result. In the Robustness tests section, we discuss alternative measures of financial depth, but none of them undermine the results presented hereafter.

4.3. Financial stability and economic performance

We now turn to the effects of financial stability on aggregate dynamics. The effects of financial stability are estimated independently of, though controlling for, the level of financial depth so as to avoid capturing with financial stability indices the specific effects of financial depth. With the CISS index, we take into account the macroeconomic dimension of financial stability. We test two indicators of microeconomic financial stability, non-performing loans and the Z-score. We test the impact of stock market volatility and our own FSI-PCA measure. Since the microeconomic and macroeconomic dimensions of financial stability are strongly linked, we test each micro-financial stability measure individually and then jointly with the macroeconomic CISS. Estimates are reported in Table 2 for GDP growth, and in Tables D, E and F in the Appendix, for consumption growth, disposable income growth and investment, respectively.

[11] We include average data as a robustness check.

[12] If the model is specified as a panel with fixed or random effects (see Section 4.3), the theoretical "endogenous-growth model" seems to fit the data well. In contrast with FE and RE panels, the benchmark model corrects for the endogeneity bias.

[13] One may argue that the single financial market in the EU has led to large cross-border financial flows and financial integration. Traditional measures of financial depth may thus underestimate the true level of financial integration and cross-border banking. We control for the potential effect of the development of cross-border banking by using the BIS ratio of consolidated foreign claims to GDP. The inclusion of this variable does not alter our results. They are available from the authors upon request.

Table 1
Benchmark dynamic panel estimations.

	GDP/cap. growth rate			Consumption/cap. growth rate			Disp. income/cap. growth rate			Investment growth rate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Private credit	−0.066*	−0.046	0.052	−0.044	−0.057*	0.160	−0.057	−0.104**	0.092	−0.196***	−0.203***	−0.399***
	[0.04]	[0.00]	[0.15]	[0.04]	[0.03]	[0.16]	[0.06]	[0.05]	[0.16]	[0.04]	[0.08]	[0.23]
Turnover ratio	−0.001	−0.003	0.000	−0.013	−0.016	−0.015	0.001	0.009	0.004	0.019	0.000	0.000
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.00]	[0.00]
School	0.094	0.113	0.05	0.035	0.092	0.035	0.021	0.138	−0.003	0.552*	0.793**	0.551*
	[0.10]	[0.22]	[0.07]	[0.07]	[0.08]	[0.08]	[0.15]	[0.11]	[0.10]	[0.32]	[0.31]	[0.33]
Gov. consump.	−0.384***	−0.377	−0.419***	−0.139	−0.169	−0.158	−0.321***	−0.394***	−0.281***	−0.791***	−0.729***	−0.692**
	[0.12]	[0.44]	[0.11]	[0.15]	[0.15]	[0.13]	[0.12]	[0.10]	[0.10]	[0.17]	[0.15]	[0.29]
Inflation rate	0.001	0.001	0.004	0.006	0.009	0.008	0.009**	0.010**	0.006	0.009	0.006	0.005
	[0.01]	[0.01]	[0.00]	[0.01]	[0.01]	[0.01]	[0.00]	[0.00]	[0.01]	[0.01]	[0.01]	[0.01]
Trade openness	0.279*	0.295	0.205	0.301***	0.243**	0.250**	0.224*	0.117	0.270*	0.213	0.356**	0.283
	[0.14]	[0.20]	[0.14]	[0.12]	[0.12]	[0.13]	[0.13]	[0.17]	[0.16]	[0.16]	[0.23]	[0.22]
Initial econ. perf.	−0.101*	0.288	−0.08	−0.122**	−0.341**	−0.191***	−0.082	−0.583	−0.162**	−0.000***	−0.000**	−0.000***
	[0.05]	[1.85]	[0.08]	[0.05]	[0.14]	[0.06]	[0.07]	[0.69]	[0.07]	[0.00]	[0.00]	[0.00]
Squared GDP/cap.		−0.023			0.013			0.03			−0.008*	
		[0.10]			[0.01]			[0.04]			[0.00]	
Squared priv. credit			−0.032			−0.054			−0.049			0.061
			[0.04]			[0.05]			[0.05]			[0.06]
Constant	0.995*	−0.754	1.306*	0.419	1.411*	1.181*	0.964	3.39	1.416*	0.611	0.048	0.166
	[0.53]	[10.06]	[0.79]	[0.54]	[0.85]	[0.63]	[0.70]	[3.23]	[0.80]	[0.82]	[0.87]	[1.59]
Sargan test *p*-val.	0.99	0.99	1.00	0.99	0.99	0.99	0.99	0.99	1.00	0.99	0.99	0.989
AR1	0.02	0.05	0.08	0.04	0.06	0.05	0.02	0.08	0.11	0.09	0.11	0.0466
AR2	0.23	0.24	0.24	0.45	0.4	0.46	0.01	0.01	0.00	0.1	0.01	0.1441
Countries	27	27	27	27	27	27	26	26	26	27	27	27
Obs	246	246	246	243	243	243	223	223	223	240	240	240

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth on four economic performances. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Malta is the missing country in regressions 7, 8 and 9. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

First, the introduction of financial stability measures in the model does not affect the impact of financial depth: it remains nil when economic performance is proxied by GDP growth per capita, and it remains often negative when economic performance is proxied by investment growth. Second, macroeconomic financial stability, proxied by the CISS, appears negatively related to GDP and investment growth. Non-performing loans also have a negative impact on GDP, consumption and disposable income growth. Consistently with the limits of the Z-score evoked by Cihak et al. (2013), we do not find that this variable affects economic performance. The inclusion of stock market volatility is only significant in the investment growth equation, and still with a negative sign. We finally include the FSI-PCA that we constructed with aggregate prudential ratios. This variable has a significant and positive effect on all the dependent variables. Because the FSI-PCA measures financial stability rather than instability, the effect means that the deterioration of banks' aggregate prudential ratios negatively impacts economic performance, in accordance with previous outcomes. In addition, in order to control for potential non-linearity between financial stability and financial depth, we include an interaction term between these two variables. These terms are not significant; hence, financial instability affects economic performance independently of the degree of financial depth.[14]

To sum up, there is a clear pattern in these estimates of a negative relationship between financial instability and economic performance. This relationship is robust to different measures of financial stability, and to different measures of economic performance.

4.4. Robustness tests

To assess the sensitivity of our results to data or econometric choices further, we present several robustness tests.[15] First, we include other variables to proxy financial depth, making a distinction among the institutions that provide financial services to the economy. Data disentangle the total assets of deposit banks from those of the other financial institutions.

Second, we test the robustness of Arellano–Bond's estimator. We estimate the equivalent empirical model with both fixed- and random-effects. Hausman tests indicate that the individual effects and the set of explanatory variables are systematically related, so that the fixed effects (FE, also called the "within group") estimator is the most appropriate choice. The FE estimator, which allows for varying intercept terms across countries, deals efficiently with unobserved heterogeneity, as time-invariant omitted variables do not bias the regression results. This proves especially important when unobservable variables, such as financial markets and banking industry characteristics, and regulatory rules and institutions, may be important in explaining the effects of financial stability on economic performance. An FE estimator has the advantage of controlling for different national effects of stable unobserved variables, and over our short sample we may assume those unobservable variables are stable. The appropriateness of our FE estimation was also confirmed by an F-test for the significance of fixed effects. However,

[14] These results are available upon request.

[15] We only present here results for GDP growth. Results for other measures of economic performance are available upon request to the authors.

Table 2
Dynamic panel estimations — GDP per capita growth rate and financial stability.

GDP	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private Credit	−0.021	−0.031	−0.054	−0.038	−0.029	0.012	−0.036	−0.037	−0.005
	[0.05]	[0.05]	[0.04]	[0.05]	[0.06]	[0.05]	[0.05]	[0.05]	[0.06]
Turnover Ratio	−0.006	−0.017	−0.003	−0.008	−0.005	−0.020*	−0.005	−0.007	−0.012
	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
School	0.039	0.162	0.059	0.121	0.155	0.166	0.07	0.099	0.124
	[0.10]	[0.16]	[0.10]	[0.11]	[0.13]	[0.17]	[0.11]	[0.13]	[0.13]
Gov. Consump.	−0.349**	−0.399**	−0.388***	−0.399***	−0.452***	−0.447***	−0.368***	−0.371***	−0.424***
	[0.14]	[0.17]	[0.15]	[0.14]	[0.11]	[0.10]	[0.11]	[0.11]	[0.12]
Inflation rate	0.002	0.003	0.001	0.005	0.004	0.007	0.003	0.004	0.003
	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.00]
Trade Openness	0.316***	0.21	0.322**	0.239**	0.205	0.159	0.282***	0.268*	0.296**
	[0.11]	[0.17]	[0.16]	[0.11]	[0.18]	[0.19]	[0.10]	[0.16]	[0.13]
Initial Econ. Perf.	−0.112***	−0.139***	−0.123**	−0.099*	−0.114*	−0.126**	−0.114***	−0.089*	−0.135***
	[0.04]	[0.05]	[0.05]	[0.04]	[0.07]	[0.06]	[0.04]	[0.05]	[0.04]
CISS	−0.054**					−0.043**	−0.040	−0.044	−0.034
	[0.03]					[0.02]	[0.03]	[0.03]	[0.03]
Non Perf. Loans		−0.011***				−0.010**			
		[0.00]				[0.00]			
Z-score			0.001				0.000		
			[0.00]				[0.00]		
Volatility				0.000				0.000	
				[0.00]				[0.00]	
FSI-PCA					0.003*				0.003*
					[0.00]				[0.00]
Constant	0.926	1.502**	1.107*	1.054*	1.406**	1.669***	1.064*	0.829	1.214*
	[0.70]	[0.73]	[0.62]	[0.61]	[0.58]	[0.48]	[0.55]	[0.62]	[0.68]
Sargan test *p-val.*	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
AR1	0.02	0.04	0.03	0.02	0.01	0.03	0.04	0.02	0.02
AR2	0.08	0.19	0.24	0.00	0.29	0.16	0.10	0.01	0.07
Countries	27	27	27	26	27	27	27	26	27
Obs	246	219	245	206	214	219	245	206	214

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on GDP per capita growth. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the p-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. We also introduced interaction terms between private credit and financial stability variables. The present results are robust and the interaction terms are not significant. Austria is the missing country in regressions 4 and 8. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

it also often makes sense to treat the unobserved effects as random draws from the population, and this approach is appropriate from an omitted variables or heterogeneity perspective. Therefore, we also estimate the panel with random-effects (RE). Last, the Wooldridge test for autocorrelation in panel data indicated a first-order correlation, and we therefore use both FE and RE estimators robust to an AR disturbance term.

Third, we take into account the long-term effects pointed out by Beck and Levine (2004) and estimate regressions with average variables. To take into account the fact that credit growth is cyclical, we split our sample of 14 years into 7 non-overlapping 2-year periods and into 3 non-overlapping 5-year periods.

Fourth, one may argue that our sample is too large on the country dimension and composed of small economies that are highly dependent on their financial sector, such as Luxembourg and Cyprus. Another issue is that new EU member countries with different levels of financial market development and integration may have different results from the original EU countries. To take these issues into account, we estimate our benchmark equation first for the 12 first member states of the euro area, leaving aside Luxembourg, and, second, for the Central and Eastern European countries (CEECs).[16]

Fifth, we test and provide evidence that our results are robust to a longer sample period starting in 1960 with or without the recent crisis period. Because of the absence before 1998 of the financial stability data that we used up to here, we estimate the effect of financial stability on growth following Loayza and Ranciere (2006) and proxy financial stability with the standard deviation of the private credit/GDP ratio. It is worth stressing that estimating the effects of financial instability in periods during which there is less financial instability might mechanically generate less effect.

The results are reported in Tables 3 and 4 for the robustness to financial depth indicators and to alternative estimators, respectively. Table G in the Appendix provides estimates for 2-year and 5-year averages. Table H in the Appendix provides estimates for country sub-samples, and Table I for a longer time sample and for a sample excluding the Great Recession. All robustness checks using our financial stability data confirm our main result that financial instability harms economic performance, both for the euro area and CEECs. Using the proxy variable of Loayza and Ranciere (2006) on a longer sample, we found that financial instability has damaging effects on growth for advanced economies, even without the Great Recession, which is the main source of financial instability. For CEECs, the results are more contrasted. All these results suggest that the link between financial stability and economic growth might depend on the financial integration and market structures of countries.

5. Conclusion

This paper examines the relationship between macroeconomic performance and financial stability. We use the framework of Beck

[16] Because of constraints on the number of degrees of freedom, we estimate our equation with a panel GMM using the same instrumental variables defined previously.

Table 3
Robustness — financial depth.

GDP	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Private credit	0.012									
	[0.09]									
Deposit bank's assets	−0.069	−0.003			−0.003	0.002	−0.017	−0.015	−0.042	−0.001
	[0.11]	[0.03]			[0.03]	[0.04]	[0.03]	[0.02]	[0.06]	[0.05]
Non-bank's assets	0.008	0.01			0.003	0.001	0.009	−0.01	0.005	−0.002
	[0.01]	[0.01]			[0.02]	[0.01]	[0.01]	[0.02]	[0.01]	[0.04]
Financial assets			0.005	0.029						
			[0.01]	[0.03]						
Squared fin. assets				−0.004						
				[0.00]						
Turnover ratio	0.002	−0.018	−0.016	−0.015	−0.02	−0.02	0.001	−0.029	−0.005	−0.013
	[0.01]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.02]	[0.02]	[0.01]	[0.04]
School	0.101	0.055	0.089	0.016	0.084	0.057	0.043	−0.052	0.224	0.121
	[0.07]	[0.25]	[0.24]	[0.18]	[0.16]	[0.14]	[0.17]	[0.30]	[0.16]	[0.14]
Gov. consump.	−0.373**	−0.433***	−0.446***	−0.429***	−0.335**	−0.496***	−0.387***	−0.349***	−0.415***	−0.455***
	[0.18]	[0.14]	[0.16]	[0.13]	[0.15]	[0.13]	[0.14]	[0.13]	[0.14]	[0.17]
Inflation rate	0.005	0.003	0.003	−0.001	0.005	0.003	0.002	0	0.002	0.008
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Trade openness	0.258	0.476	0.471	0.528	0.439*	0.302*	0.486*	0.476**	0.277	0.109
	[0.17]	[0.32]	[0.30]	[0.33]	[0.26]	[0.18]	[0.27]	[0.21]	[0.18]	[0.14]
Initial econ. perf.	−0.106	−0.289***	−0.294***	−0.313***	−0.255**	−0.199***	−0.264***	−0.199***	−0.135**	−0.074
	[0.07]	[0.10]	[0.09]	[0.11]	[0.10]	[0.06]	[0.08]	[0.07]	[0.06]	[0.09]
CISS					−0.057**					−0.024
					[0.03]					[0.05]
Non-perf. loans						−0.013***				−0.010*
						[0.00]				[0.01]
Z-score							0.001			0.001
							[0.00]			[0.00]
Volatility								−0.002***		0.000
								[0.00]		[0.00]
FSI-PCA									0.003	0.000
									[0.00]	[0.00]
Constant	1.054	2.175***	2.210***	2.297***	1.654***	2.227***	1.842***	1.381***	1.059*	1.478**
	[0.65]	[0.58]	[0.62]	[0.43]	[0.58]	[0.46]	[0.60]	[0.48]	[0.56]	[0.73]
Sargan test *p*-val.	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.00
AR1	0.10	0.03	0.02	0.04	0.00	0.06	0.03	0.01	0.02	0.08
AR2	0.27	0.07	0.07	0.08	0.06	0.38	0.08	0.07	0.18	0.13
Countries	26	26	26	26	26	26	26	25	26	25
Obs	225	249	249	249	249	229	248	208	202	174

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on GDP growth per capita. We test in particular various indicators of financial depth. We include deposit money bank assets to GDP (%). We also include the sum of the pension fund assets to GDP + mutual fund assets to GDP + insurance assets to GDP. This sum is called "non-bank's assets". Financial assets are the sum of the deposit bank's assets and non-bank's assets. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Malta is missing in all regressions and Austria is missing in regressions 8 and 10. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

and Levine (2004) who developed a dynamic panel estimation methodology dealing with endogeneity. We test whether financial stability affects economic performance. We use several types of indicators that measure the macro- and micro-dimensions of financial stability. One is calculated by the ECB, two are based on banking aggregate prudential ratios, one is market-related (it measures stock market volatility), and finally we construct one with a principal component analysis. In most cases, the use of these indicators shows that financial instability has a negative effect on economic performance, and their inclusion does not affect the financial depth effect. Financial instability – independently from financial deepening – has a negative effect on the economy.

We also found that financial depth does not have a positive effect in the euro area. It therefore appears that financial depth in the euro area has reached a level such that finance effects are not favorable to economic performance. Moreover, this also suggests that the argument by the banking lobbies, i.e. that regulating the size and growth of the financial sector would negatively impact the growth of the economies in question, is not supported by EU data.

Although our sample already makes it possible to identify the effects of financial instability, further insights can be gained once larger datasets become available. Many dimensions of financial stability data need to be improved to understand this issue more thoroughly. Most of the series have been available only recently and at the aggregated level, and better knowledge could be obtained from longer and finer financial stability data. Moreover, although this study controls for country fixed effects, incorporating and focusing on the impact of institutions, financial market structures and regulations would also provide further insights into the link between financial stability and economic performance. Finally, another avenue for future research relates to the policy implications of our main result. It will be interesting to assess the regulatory and policy tools that policymakers will use in order to tackle the effect of financial instability.

Table 4
Robustness — alternative estimators.

GDP	Fixed effect							Random effect						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Private credit	−0.027	−0.002	−0.071***	−0.023	−0.001	−0.060***	0.015	−0.036***	−0.013	−0.027***	−0.036***	−0.024**	−0.025**	−0.009
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Turnover ratio	−0.009	−0.014	−0.012	−0.010	−0.021	−0.005	−0.024*	0.017*	0.007	0.006	0.017*	0.006	0.011	−0.006
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
School	0.214***	0.255***	0.343***	0.207**	0.181*	0.323***	0.291***	0.036	0.069**	0.058*	0.034	0.032	0.04	0.078**
	[0.08]	[0.08]	[0.08]	[0.08]	[0.09]	[0.08]	[0.09]	[0.04]	[0.03]	[0.03]	[0.04]	[0.03]	[0.03]	[0.03]
Gov. consump.	−0.379***	−0.323***	−0.178***	−0.381***	−0.379***	−0.220***	−0.238***	−0.154***	−0.092***	−0.145***	−0.153***	−0.096***	−0.137***	−0.098***
	[0.07]	[0.07]	[0.05]	[0.07]	[0.08]	[0.06]	[0.06]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]
Inflation rate	0.011**	0.013***	0.014***	0.011**	0.008	0.013***	0.015***	0.015***	0.016***	0.016***	0.015***	0.013***	0.016***	0.017***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Trade openness	0.238***	0.208***	0.255***	0.243***	0.231***	0.241***	0.213***	0.030**	0.021*	0.003	0.029**	0.017	0.012	−0.004
	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Initial econ. perf.	−0.167***	−0.135***	−0.121***	−0.168***	−0.153***	−0.111***	−0.097***	−0.017**	−0.017***	−0.035***	−0.016**	−0.021***	−0.016**	−0.029***
	[0.03]	[0.02]	[0.02]	[0.03]	[0.03]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
CISS		−0.084***					−0.125***		−0.133***					−0.095***
		[0.02]					[0.03]		[0.02]					[0.02]
Non-perf. loans			−0.005***				−0.005**			−0.006***				−0.005***
			[0.00]				[0.00]			[0.00]				[0.00]
Z-score				0.001			0.001				0.000			0.000
				[0.00]			[0.00]				[0.00]			[0.00]
Volatility					−0.001***		0.000					−0.002***		−0.001***
					[0.00]		[0.00]					[0.00]		[0.00]
FSI-PCA						0.004***	0.000						0.005***	0.000
						[0.00]	[0.00]						[0.00]	[0.00]
Constant	1.370***	0.913***	0.016	1.379***	1.362***	0.118***	0.189**	0.479***	0.254**	0.713***	0.480***	0.457***	0.480***	0.510***
	[0.20]	[0.22]	[0.06]	[0.21]	[0.25]	[0.04]	[0.08]	[0.13]	[0.11]	[0.12]	[0.13]	[0.12]	[0.12]	[0.12]
R^2 adj.	0.37	0.39	0.35	0.37	0.41	0.35	0.47	–	–	–	–	–	–	–
R^2 within	0.45	0.47	0.44	0.45	0.49	0.44	0.56	0.28	0.34	0.41	0.28	0.39	0.38	0.52
R^2 between	0.69	0.66	0.65	0.69	0.65	0.68	0.56	0.59	0.73	0.76	0.60	0.73	0.73	0.85
Obs.	293	293	264	291	237	257	215	320	320	291	318	263	284	241

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on GDP growth per capita. All regressions are with annual data from 1998 to 2011 fixed or random effects. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Appendix A

Table A
Data description and sources.

Data	Frequency	Description	Source
Economic performance (i.e. dependent variable)			
GDP growth rate per capita	Annual	Real GDP per capita (log first difference)	Eurostat
Disposable income growth per capita	Annual	Real disposable income (log first difference)	Eurostat
Consumption growth rate per capita	Annual	Households consumption in volume (log first difference)	Eurostat
Private investment growth rate	Annual	Gross fixed capital formation, millions of euros (log first difference)	Eurostat
Seminal independent variables			
Inflation	Annual	Annual growth rate of harmonized Index of Consumer Prices	Eurostat
Trade openness	Annual	Average of total trade (i.e. the sum of exports and imports of goods and services) relative to GDP	Eurostat
Government consumption	Annual	Value of goods and services purchased or produced by general government and directly supplied to private households for consumption purposes relative to GDP.	Eurostat
School	Annual	Average year of schooling	United Nations
Financial depth indicators			
Private credit to GDP	Annual	Financial resources provided to the private sector by domestic money banks as a share of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.	World Bank
Turnover ratio	Annual	Stock market turnover ratio: Total value of shares traded during the period divided by the average market capitalization for the period.	World Bank
Financial stability indicators			
National banking stability (Z score)	Annual	The Z-score combines in one single indicator the banks' profitability (l), capital ratio (k) and return volatility (r). Obviously, the Z-score will increase with the banks' profitability and capital ratio, and decrease with increasing return volatility. Thus, from an economic viewpoint the Z-score initially measures the probability of a bank to become insolvent when the value of assets becomes lower than the value of debt. Hence, a higher (lower) Z-score implies a lower (higher) probability of insolvency risk.	World Bank
Non-performing loans	Annual	Ratio of defaulting loans (payments of interest and principal past due by 90 days or more) to total gross loans (total value of loan portfolio). The loan amount recorded as nonperforming includes the gross value of the loan as on the balance sheet, not just the amount that is overdue.	World Bank
FSI-PCA	Annual	Financial stability indicator estimated through a principal component analysis based on banking aggregate prudential ratios	Own calculations
Composite indicator of systemic stress	Weekly extrapolated annually	It comprises the five arguably most important segments of an economy's financial system: the sector of bank and non-bank financial intermediaries, money markets, securities (equities and bonds) markets as well as foreign exchange markets.	ECB
Volatility of stock price index	Annual	Volatility of stock price index is the 360-day standard deviation of the return on the national stock market index.	(Bloomberg) World Bank

Table B
Summary descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Economic performance (i.e. dependent variable)					
GDP growth rate per capita	378	0.054	0.067	−0.200	0.288
Consumption growth rate per capita	375	0.053	0.064	−0.217	0.288
Disposable income growth per capita	355	0.053	0.070	−0.214	0.270
Investment growth rate	372	0.025	0.109	−0.503	0.479
Seminal independent variables					
School	378	2.302	0.141	1.792	2.573
Inflation	378	1.703	0.784	−1.301	4.772
Trade openness	374	3.995	0.459	3.202	5.223
Government consumption	378	2.995	0.145	2.542	3.395
Financial depth indicators					
Private credit to GDP	344	0.931	0.576	0.063	2.881
Turnover ratio	378	0.618	0.529	0.001	2.596
Financial stability indicators					
Composite indicator of systemic stress	351	0.214	0.160	0.066	0.560
Z-score	376	12.500	7.768	−3.449	40.862
Non-performing loans	343	4.746	5.011	0.100	31.600
Stock markets volatility	295	26.104	10.410	11.503	65.187
FSI-PCA	332	0.159	3.783	−29.396	8.147

Table C
Correlation coefficients.

	GDP/cap.	Cons./cap.	Disp. income/cap.	Invest.	School	Inflation	Trade open.	Gov. cons.	Private credit	Turnover ratio	CISS	Z-score	Non-perform. loans	Volat.	FSI-PCA
GDP/cap.	1														
Consumption/cap.	0.94***	1													
Disposable income/cap.	0.95***	0.91***	1												
Investment	0.66***	0.59***	0.64***	1											
School	0.03	0.01	0.02	0.11**	1										
Inflation	0.39***	0.41***	0.43***	0.26***	0.05	1									
Trade openness	0.15***	0.11*	0.12**	0.03	0.52***	0.08	1								
Govern. consumption	−0.31***	−0.27***	−0.28***	−0.2***	0.17***	−0.32***	−0.16***	1							
Private credit	−0.48***	−0.47***	−0.48***	−0.36***	−0.04***	−0.39***	0.02	0.15***	1						
Turnover ratio	−0.23***	−0.22***	−0.24***	−0.04	−0.07	−0.16***	−0.46***	0.34***	0.28***	1					
CISS	−0.46***	−0.36***	−0.44***	−0.53***	0.26***	−0.1*	0.11**	0.17***	0.34***	0.00	1				
Z-score	−0.07	−0.10*	−0.10*	0.07	−0.17***	−0.15***	0.02	0.02	0.08	0.14***	−0.09*	1			
Non-performing loans	−0.13***	−0.13**	−0.13**	−0.22***	0.00	0.08	−0.10*	−0.10*	−0.23***	−0.18***	0.09	−0.27***	1		
Volatility	−0.40***	−0.35***	−0.4***	−0.45***	0.08	−0.07	−0.05	0.17***	0.03	−0.02	0.55***	−0.07	0.24***	1	
FSI-PCA	0.47***	0.46***	0.46***	0.42***	0.05	0.28***	0.15***	−0.11*	−0.32***	−0.11***	−0.26***	0.15**	−0.60***	−0.24***	1

This table reports the correlation coefficients between the main variables used in this paper. Data source: World Bank, United Nations, ECB & Eurostat.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table D
Dynamic panel estimations — consumption per capita growth and financial stability.

Consumption	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private credit	−0.052	0.018	−0.023	−0.044	0.010	−0.027	−0.052	−0.061	0.002
	[0.05]	[0.06]	[0.07]	[0.08]	[0.07]	[0.04]	[0.05]	[0.04]	[0.06]
Turnover ratio	−0.015	−0.015	−0.014	−0.011	−0.016	−0.023	−0.012	−0.014	−0.02
	[0.01]	[0.01]	[0.02]	[0.03]	[0.01]	[0.02]	[0.01]	[0.02]	[0.01]
School	0.051	0.049	0.061	−0.102	0.12	0.054	0.046	−0.002	0.111
	[0.07]	[0.11]	[0.09]	[0.14]	[0.12]	[0.08]	[0.05]	[0.10]	[0.09]
Gov. consump.	−0.198*	−0.172*	−0.17	−0.114	−0.229	−0.161	−0.205	−0.208	−0.287**
	[0.12]	[0.10]	[0.30]	[0.21]	[0.32]	[0.12]	[0.14]	[0.13]	[0.13]
Inflation rate	0.009*	0.018**	0.008	0.014**	0.01	0.015***	0.011*	0.014***	0.014***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]
Trade openness	0.235**	0.164*	0.303	0.241	0.272	0.179*	0.210**	0.098	0.177
	[0.10]	[0.09]	[0.20]	[0.18]	[0.23]	[0.11]	[0.10]	[0.13]	[0.12]
Initial econ. perf.	−0.109***	−0.115**	−0.148***	−0.044	−0.152***	−0.109**	−0.101***	−0.023	−0.126**
	[0.04]	[0.05]	[0.05]	[0.08]	[0.05]	[0.05]	[0.04]	[0.07]	[0.05]
CISS	0.030					0.030	0.026	0.049	0.018
	[0.03]					[0.04]	[0.03]	[0.03]	[0.03]
Non-perf. loans		−0.007***				−0.008			
		[0.00]				[0.01]			
Z-score			0.001				0.001		
			[0.00]				[0.00]		
Volatility				0.000				−0.001	
				[0.00]				[0.00]	
FSI-PCA					0.003*				0.003
					[0.00]				[0.00]
Constant	0.668	0.893*	0.622	0.175	0.811	0.776	0.725	0.617	1.124*
	[0.51]	[0.51]	[1.17]	[1.14]	[1.42]	[0.58]	[0.55]	[0.55]	[0.64]
Sargan test *p*-val.	0.99	0.99	0.98	0.99	0.98	0.99	0.99	0.99	0.99
AR1	0.03	0.04	0.03	0.03	0.02	0.03	0.07	0.07	0.02
AR2	0.26	0.21	0.38	0.49	0.20	0.19	0.60	0.44	0.38
Countries	27	27	27	26	27	27	27	26	27
Obs	243	216	243	205	212	216	243	205	212

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on consumption growth per capita. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Austria is the missing country in regressions 4 and 8. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table E
Dynamic panel estimations — disposable income per capita growth and financial stability.

Disposable income	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private credit	−0.03	0.004	−0.050	−0.059	0.011	−0.014	−0.049	−0.039	0.003
	[0.06]	[0.06]	[0.06]	[0.08]	[0.07]	[0.07]	[0.06]	[0.05]	[0.06]
Turnover ratio	−0.004	−0.012	−0.004	−0.004	−0.005	−0.006	0.001	−0.001	−0.004
	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
School	−0.008	0.04	0.051	−0.033	0.061	−0.002	−0.021	−0.049	0.03
	[0.13]	[0.16]	[0.16]	[0.19]	[0.18]	[0.14]	[0.12]	[0.12]	[0.10]
Gov. consump.	−0.288***	−0.352***	−0.362***	−0.253	−0.444***	−0.292***	−0.281**	−0.299***	−0.397***
	[0.11]	[0.11]	[0.13]	[0.19]	[0.08]	[0.10]	[0.12]	[0.11]	[0.10]
Inflation rate	0.009**	0.009	0.009*	0.007	0.01	0.011**	0.008	0.014	0.01
	[0.00]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Trade openness	0.279**	0.259*	0.22	0.428	0.224*	0.248	0.27	0.216	0.242
	[0.12]	[0.16]	[0.18]	[0.34]	[0.13]	[0.16]	[0.19]	[0.19]	[0.17]
Initial econ. perf.	−0.118**	−0.157***	−0.096	−0.135	−0.122***	−0.123***	−0.102	−0.06	−0.124**
	[0.05]	[0.05]	[0.07]	[0.12]	[0.04]	[0.05]	[0.07]	[0.07]	[0.05]
CISS	−0.028					−0.029	−0.031	−0.019	−0.036
	[0.03]					[0.04]	[0.03]	[0.04]	[0.04]
Non-perf. loans		−0.007				−0.006**			
		[0.00]				[0.00]			
Z-score			0.001				0.000		
			[0.00]				[0.00]		

Table E (*continued*)

Disposable income	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Volatility				0.000				0.000	
				[0.00]				[0.00]	
FSI-PCA					0.003***				0.003***
					[0.00]				[0.00]
Constant	1.028**	1.566***	1.137	0.57	1.538***	1.226**	0.957*	0.87	1.452**
	[0.46]	[0.57]	[0.70]	[1.02]	[0.56]	[0.54]	[0.53]	[0.67]	[0.59]
Sargan test *p*-val.	0.99	0.99	0.99	0.96	0.99	0.99	0.99	1.00	1.00
AR1	0.02	0.02	0.03	0.00	0.03	0.02	0.05	0.03	0.04
AR2	0.00	0.00	0.02	0.16	0.01	0.00	0.01	0.05	0.01
Countries	26	26	26	24	26	26	26	24	26
Obs	223	199	223	187	195	199	223	187	195

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on disposable income per capita growth. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Malta is missing in all regressions and Austria and Luxembourg are missing in regressions 3 and 8. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table F
Dynamic panel estimations — investment growth and financial stability.

Investment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private credit	−0.079*	−0.183***	−0.202***	−0.064	−0.192***	−0.094	−0.092	−0.035	−0.09
	[0.05]	[0.06]	[0.04]	[0.05]	[0.06]	[0.06]	[0.06]	[0.05]	[0.09]
Turnover ratio	0.001	0.015	0.012	0.035	0.025	0.015	−0.009	0.024	0.02
	[0.04]	[0.03]	[0.02]	[0.03]	[0.03]	[0.03]	[0.04]	[0.03]	[0.04]
School	0.268	0.478	0.624***	0.335	0.728**	0.245	0.454	0.313	0.266
	[0.27]	[0.30]	[0.22]	[0.26]	[0.30]	[0.21]	[0.28]	[0.30]	[0.26]
Gov. consump.	−0.630**	−0.846***	−0.813***	−0.748***	−0.825***	−0.573***	−0.741***	−0.525	−0.626***
	[0.25]	[0.17]	[0.18]	[0.20]	[0.14]	[0.22]	[0.28]	[0.38]	[0.23]
Inflation rate	0.017*	0.008	0.014***	0.01	0.01	0.020**	0.015	0.019	0.012
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]
Trade openness	0.207	0.022	0.203	0.016	0.067	0.17	0.16	0.149	0.186
	[0.19]	[0.18]	[0.13]	[0.16]	[0.12]	[0.19]	[0.21]	[0.20]	[0.22]
Initial econ. perf.	0	−0.000**	−0.000***	−0.000**	−0.000***	0.000	0.000	−0.000*	0.000
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
CISS	−0.214***					−0.188***	−0.204***	−0.178*	−0.160**
	[0.06]					[0.06]	[0.05]	[0.10]	[0.07]
Non-perf. loans		−0.009				−0.007			
		[0.01]				[0.00]			
Z-score			0.001				0.000		
			[0.00]				[0.00]		
Volatility				−0.002***				−0.001	
				[0.00]				[0.00]	
FSI-PCA					0.007***				0.006*
					[0.00]				[0.00]
Constant	0.612	1.712**	0.548	1.644	0.931*	0.684	0.734	0.411	0.72
	[1.04]	[0.76]	[0.77]	[1.20]	[0.55]	[1.17]	[1.02]	[1.54]	[1.00]
Sargan test *p*-val.	0.99	0.97	1.00	0.98	0.99	0.99	0.99	0.98	0.98
AR1	0.01	0.02	0.11	0.03	0.03	0.00	0.03	0.01	0.02
AR2	0.40	0.16	0.08	0.17	0.01	0.08	0.48	0.18	0.19
Countries	27	27	27	26	27	27	27	26	27
Obs	240	216	240	202	212	216	240	202	212

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on investment. All regressions are estimated with annual data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Austria is the missing country in regressions 4 and 8. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table G
Robustness tests — 2-year and 5-year averages.

GDP/cap. growth rate	2-year average							5-year average						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Private credit	−0.039	−0.019	−0.049	−0.033	0.001	−0.045	−0.019	−0.018	−0.018	−0.001	−0.020	−0.015	−0.015	−0.009
	[0.04]	[0.04]	[0.03]	[0.04]	[0.03]	[0.05]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.01]
Turnover ratio	−0.016	−0.019	−0.012	−0.015	−0.025	0.004	−0.016	−0.043*	−0.046**	−0.028*	−0.039**	−0.041*	−0.028	−0.025*
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]
School	0.411*	0.511*	0.407**	0.434*	0.416*	0.408**	0.522***	0.141	0.146	0.141*	0.124	0.145*	0.098	0.027
	[0.23]	[0.27]	[0.18]	[0.23]	[0.23]	[0.18]	[0.16]	[0.10]	[0.09]	[0.08]	[0.08]	[0.08]	[0.10]	[0.07]
Gov. consump.	−0.376***	−0.346***	−0.283*	−0.339***	−0.317**	−0.276*	−0.263**	−0.181**	−0.187**	−0.237***	−0.165**	−0.162***	−0.177*	−0.201**
	[0.14]	[0.12]	[0.15]	[0.11]	[0.13]	[0.16]	[0.12]	[0.08]	[0.08]	[0.08]	[0.07]	[0.06]	[0.10]	[0.09]
Inflation rate	−0.001	−0.005	0.003	0.003	−0.002	0.005	−0.015	0.007	0.006	−0.003	0.002	0.006	0.000	0.001
	[0.02]	[0.02]	[0.01]	[0.02]	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]
Trade openness	0.148	0.142	0.065	0.145	0.136	0.077	−0.07	0.166*	0.171**	0.06	0.190**	0.164	0.169**	0.05
	[0.11]	[0.11]	[0.08]	[0.11]	[0.12]	[0.14]	[0.09]	[0.09]	[0.08]	[0.08]	[0.08]	[0.10]	[0.08]	[0.08]
Initial econ. perf.	−0.232***	−0.201***	−0.167***	−0.249***	−0.182***	−0.155***	−0.036	−0.124***	−0.127***	−0.100***	−0.127***	−0.126***	−0.137***	−0.102**
	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.06]	[0.06]	[0.02]	[0.02]	[0.02]	[0.01]	[0.02]	[0.03]	[0.04]
CISS		−0.082					−0.016		0.006					0.083
		[0.05]					[0.06]		[0.04]					[0.12]
Non-perf. loans			−0.008***				−0.010**			−0.004***				−0.003
			[0.00]				[0.00]			[0.00]				[0.00]
Z-score				0.001			−0.001				−0.001			−0.001
				[0.00]			[0.00]				[0.00]			[0.00]
Volatility					−0.002**		−0.002*					0.000		−0.001
					[0.00]		[0.00]					[0.00]		[0.00]
FSI-PCA						0.005**	0						−0.002	−0.001
						[0.00]	[0.00]						[0.00]	[0.00]
Constant	1.969***	1.374**	1.436**	1.948***	1.377**	1.215***	0.483	0.829	0.844*	1.194***	0.781	0.791*	1.044**	1.443**
	[0.53]	[0.54]	[0.61]	[0.49]	[0.60]	[0.29]	[0.84]	[0.53]	[0.46]	[0.41]	[0.49]	[0.48]	[0.48]	[0.58]
Sargan test *p*-val.	0.21	0.12	0.28	0.23	0.17	0.25	0.91	0.05	0.12	0.27	0.15	0.09	0.09	0.62
AR1	0.09	0.04	0.11	0.06	0.05	0.00	0.01	0.29	0.31	0.07	0.38	0.26	0.30	0.12
AR2	0.67	0.62	0.31	0.98	0.51	0.08	0.07	–	–	–	–	–	–	–
Countries	27	27	27	27	27	26	25	27	27	27	27	27	27	26
Obs	73	73	67	73	70	65	62	53	53	52	53	49	52	49

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial depth and financial instability on GDP growth per capita. All regressions are estimated using 2-year non-overlapping average data from 1998 to 2011 using the first-differenced GMM estimator. The bottom of the table reports the *p*-values of standard specification tests. Robust (Windmeijer) standard errors are in brackets. Austria is missing in regressions 6 and 7 and Cyprus in 7. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table H
Robustness tests — country sub-samples.

GDP/cap. growth rate	1998–2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EZ				Newcomers			
Private credit	−0.032***	−0.021***	−0.029***	−0.030***	−0.071	−0.059	−0.009	−0.042
	[0.01]	[0.00]	[0.01]	[0.01]	[0.05]	[0.05]	[0.05]	[0.05]
Turnover ratio	0.016***	0.012***	0.003	0.008**	0.041*	0.041	0.032	0.002
	[0.00]	[0.00]	[0.00]	[0.00]	[0.02]	[0.03]	[0.02]	[0.03]
School	−0.022	0.000	0.017	−0.006	−0.012	−0.11	0.273**	0.363**
	[0.02]	[0.02]	[0.02]	[0.02]	[0.13]	[0.13]	[0.13]	[0.17]
Gov. consump.	−0.045***	−0.030**	−0.063***	−0.053***	−0.283***	−0.306***	−0.231***	−0.224***
	[0.02]	[0.01]	[0.02]	[0.02]	[0.08]	[0.08]	[0.07]	[0.07]
Inflation rate	0.018***	0.018***	0.017***	0.018***	−0.001	0.006	0.016**	0.015*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.01]	[0.01]	[0.01]
Trade openness	0.032***	0.024***	0.010	0.019***	0.062*	0.078**	−0.066**	−0.071
	[0.01]	[0.01]	[0.01]	[0.01]	[0.03]	[0.03]	[0.03]	[0.04]
Initial econ. perf.	−0.016	−0.016	−0.017	−0.006	−0.042**	−0.031	−0.083***	−0.076***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.02]	[0.03]
CISS		−0.065***				−0.09		
		[0.01]				[0.06]		
Non-perf. loans			−0.003***				−0.006***	
			[0.00]				[0.00]	
FSI-PCA				0.003***				0.008***
				[0.00]				[0.00]
Constant	0.251***	0.190**	0.335***	0.195*	1.104***	1.234***	1.141***	0.838***
	[0.09]	[0.08]	[0.09]	[0.10]	[0.35]	[0.34]	[0.30]	[0.31]
Obs	127	127	118	116	93	93	82	77
R^2	0.56	0.65	0.60	0.62	0.24	0.29	0.45	0.42

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial instability on GDP growth per capita. Estimations are realized with a panel GMM using the same instrumental variables as before from 1998 to 2011. Note that the 12 first countries minus Luxembourg compose the euro area and that the newcomers' group is composed of Central and East European Countries. Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table I
Robustness tests — country sub-samples & longer period.

GDP/cap. growth rate	1960–2011 (starts in 1993 for newcomers)						Excluding the Great Recession					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All	EZ	Newcomers	All	EZ	Newcomers	All	EZ	Newcomers	All	EZ	Newcomers
Private credit	−0.863***	−0.915***	0.184	−0.877***	−0.859***	0.373	−0.871***	−0.693***	1.299*	−0.791***	−0.622***	0.142
	[0.24]	[0.19]	[0.44]	[0.24]	[0.19]	[0.53]	[0.27]	[0.21]	[0.73]	[0.25]	[0.20]	[1.11]
School	0.468	0.064	6.878***	0.531*	0.087	7.138***	0.395	−0.091	5.011***	0.449	−0.113	3.397*
	[0.34]	[0.39]	[2.24]	[0.32]	[0.37]	[2.37]	[0.36]	[0.44]	[1.76]	[0.34]	[0.42]	[2.06]
Gov. consump.	−0.322*	−0.599***	0.013	−0.335*	−0.571***	0.278	−0.446**	−0.674***	0.230	−0.433*	−0.660***	0.287
	[0.19]	[0.17]	[0.46]	[0.20]	[0.17]	[0.50]	[0.22]	[0.17]	[0.40]	[0.23]	[0.17]	[0.42]
Inflation rate	−1.073***	−1.052***	−1.348*	−1.053***	−1.072***	−1.317	−1.140***	−1.100***	−1.904**	−1.154***	−1.094***	−1.682**
	[0.21]	[0.20]	[0.77]	[0.21]	[0.19]	[0.89]	[0.24]	[0.20]	[0.80]	[0.24]	[0.18]	[0.80]
Trade openness	0.633**	0.703**	0.479	0.624**	0.759**	0.424	0.792**	0.493*	0.140	0.854***	0.558**	−0.866
	[0.26]	[0.33]	[0.55]	[0.25]	[0.33]	[0.62]	[0.31]	[0.27]	[0.57]	[0.31]	[0.27]	[0.74]
Initial econ. perf.	−2.101***	−1.555***	−3.933***	−2.095***	−1.673***	−4.322***	−1.873***	−1.198**	−1.303**	−2.069***	−1.258***	−1.375*
	[0.44]	[0.43]	[0.67]	[0.43]	[0.41]	[0.64]	[0.50]	[0.51]	[0.60]	[0.47]	[0.47]	[0.83]
FSI-Sd				−0.288	−0.846*	2.769				−0.109	−0.783*	4.388
				[0.68]	[0.48]	[2.21]				[0.72]	[0.44]	[2.70]
Constant	2.058***	2.220***	−5.440**	2.121***	2.362***	−6.588***	2.263***	2.421***	−0.770	2.253***	2.550***	−0.469
	[0.19]	[0.17]	[2.52]	[0.23]	[0.16]	[2.33]	[0.20]	[0.19]	[2.08]	[0.24]	[0.21]	[2.38]
Obs	167	87	27	164	87	26	140	76	18	138	76	21
R^2	0.57	0.70	0.52	0.57	0.71	0.60	0.47	0.64	0.52	0.47	0.65	0.55

This table reports the results of a set of dynamic panel estimations aimed at estimating the effect of financial instability on GDP growth per capita. Estimations are realized with a panel GMM using the same instrumental variables as before. Results are presented for two longer periods and for three country sub-sample. The sample for all the EU countries and the Eurozone (EZ) starts in 1960 and ends in 2011 whereas the newcomers' sample only starts in 1993. These estimations are based on non-overlapping 5-year average. The sample Excluding the Great Recession is also based on non-overlapping 5-year average data. It goes from 1960 to 2008 for the EU and the EZ and begins in 1993 for newcomers. Note that the 12 first countries minus Luxembourg compose the EZ and that the newcomers' group is composed of Central and East European Countries. Due to the absence of financial stability variables before 1998, we use as a financial stability variable the standard deviation of private credit/GDP (FSI-Sd). Data source: World Bank, United Nations, ECB & Eurostat.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

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