

‘FINANCE AND ECONOMIC GROWTH IN THE AFTERMATH OF THE CRISIS’

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1. INTRODUCTION

Although the debate on the link between finance (*e.g.*, banks and other financial institutions) and long-term economic growth continues to capture the theoretical as well as empirical interest of economists and policy-makers, there is still much disagreement about its overall conclusion. While some have argued that a well-developed financial system is a key condition for industrialization (Gerschenkron, 1962), and that over the long run the contribution of financial markets to economic growth has been either “*important*” (Stiglitz, 2010), or “*pivotal*” (Schumpeter, 1912), or else “*too obvious for serious discussion*” (Miller, 1998), others have claimed that the importance of financial markets in economic development is probably overstressed in popular and academic discussions (Lucas, 1988, p.6). Still, others have recently maintained that, without proper rules, finance can become a powerful force for planting the seeds of future financial crises (Schularick and Taylor, 2012; Mian and Sufi, 2014) with adverse implications for economic growth and social welfare. Levine (2005) masterfully summarizes this lack of general consensus in the profession by claiming that: “...*We are far from definite answers to the question: Does finance cause growth, and if it does, how?*”.

The 2007 financial downturn led to huge losses for several markets, to the bankruptcy of many different banks, financial institutions and investors around the world, and to a related general, world-wide economic recession. As a consequence, governments, central banks, and policy-makers implemented a range of actions aimed to reduce the impact of the crisis and overhaul the financial system. These different actions ultimately affected not only the financial markets, but also the real economy, and all in all they changed the general perception of people towards ‘*finance*’ (Zingales, 2015). Thus, understanding the impact and the main economic implications that the financial sector may have on economic activity and welfare is still pressing, now more than ever.

The seminal empirical study into the finance-growth nexus is the paper by King and Levine (1993). They study a large cross-section of 77 countries over a long period of time (1960-1989), by controlling for a large set of country-specific indicators that in principle can affect economic growth (such as initial wealth, school enrollment, and population growth). Moreover, they use various proxies for financial development, *i.e.* liquid liabilities of the financial system normalized by GDP;

bank credit divided by bank credit plus central bank domestic assets; and credit to the private sector normalized by GDP. Neglecting causality, the authors find in the data a strong and significantly positive association between contemporaneous measures of financial development and economic growth. Then, they offer the first attempt to establish causality within the finance-growth relation. In particular, they study how much of the cross-country variation in average subsequent economic growth may be explained by the value of financial development in 1960. Their regressions indicate that the beginning-of-period financial depth is a good predictor of succeeding rates of economic growth over the next 30 years, after controlling for beginning-of-period income, education, and proxies for monetary, trade, and fiscal policies. Finally, the authors look at the possible channels that can explain the association between financial development and economic growth and discover that the beginning-of-period financial development is linked to the rate of physical capital formation and to the efficiency of resource allocation during the sample period.

While only a very few studies conclude that financial markets exert a negative impact on growth (Luintel and Khan, 1999, is an example), more recent contributions (Rousseau and Wachtel, 2011, for instance) reveal that lately the positive relationship between finance and growth has not been as strong as it was in the data for the period from 1960 to 1989, and that (Demetriades and Rousseau, 2016) financial depth is no longer a significant determinant of long-run growth (unlike sound banking regulation and supervision).¹ Moreover, a non-negligible body of empirical research has recently also cast many doubts on the claim that the effect of finance on economic growth is monotonic. In this field of research, using the original King and Levine (1993) sample, Deidda and Fattouh (2002) were among the first to show that the positive association between financial development and economic growth disappears beyond a threshold of around \$852 of initial income. Rioja and Valev (2004) also conclude that the relationship between financial development and economic growth varies according to the level of financial development,² and Shen and Lee (2006), studying the relationship between financial development and real GDP per capita growth in 48 countries, find that the association between growth and bank development is best described as a weak inverse U-shape which becomes stronger when additional stock market variables are squared.

Hence, a number of recent studies using various datasets, empirical methodologies, and time periods, have revealed robust non-linearities in the finance-growth nexus (see also Bucci *et al.*, 2018). Arcand *et al.* (2015) seek to quantify the threshold beyond which financial depth no longer has a positive effect on economic growth. To do this, they use data on 67 countries between 1970 and 2000 and employ a host of empirical approaches showing that financial depth starts having a negative impact on output growth when credit to the private sector reaches 100 percent of GDP. Beck, *et al.* (2014) find a similar threshold (around 109% of GDP, when not controlling for banking crises) after estimating dynamic panel regressions on a sample of 132 countries between 1980 and 2005.

At the moment there are three broad theory-based explanations for the non-linearities in the finance-growth nexus. The first one (Rioja and Valev, 2012) suggests that at high levels of financial development, the further deepening of financial markets can be associated with a type of financial services (such as mortgage/household credit) that have a lower growth potential than other types of finance (such as enterprise/business credit). The second has to do with the hypothesis that there can

¹ Demetriades and Rousseau (2016) employ a sample of 91 countries over the period 1973-2004.

² For countries with extremely low levels of financial development, additional improvements have an uncertain effect on growth; in the intermediate region, having more financial development induces a large positive effect on growth; in very financially developed countries, the effect of increasing financial development on economic growth is positive, but small.

be a trade-off between economic growth and fragility that is exacerbated by financial development.³ The third one, instead, reveals that financial development yields a sort of brain-drain away from the real into the financial sector, so depleting the stock of human capital available for pro-growth activities such as innovation.⁴

Besides investigating the sign and the possible (channels behind the) non-linearities in the relationship between finance and long-term economic growth, an important branch of the literature has also tried to examine the potential consequences that a country's financial structure –namely, the mix of financial markets and intermediaries operating in the same economy– may have on growth. In words, the basic questions that this field of research has tried to answer can be summarized as follows: Are market-based (as opposed to bank-based) financial systems better at promoting economic growth? Does their own contribution to economic growth vary with the country's degree of economic and/or financial development? Early research supported the view that, conditional on the quality of a country's legal, regulatory and institutional frame, financial structure (*i.e.*, bank-based or market-based financial systems) is not that important for economic development (see, among others, and using different approaches, Arestis *et al.*, 2001; Levine, 2002; Beck and Levine, 2002 and 2004; Demirgüç-Kunt and Maksimovic, 2002). More recent research, by looking mainly at the post-recent financial crisis experience, provides instead a rather different view. While, for example, Shen and Lee (2006) find evidence that only stock market development has a positive effect on growth (with banking development having an unfavorable impact), Langfield and Pagano (2016), analyzing the European countries, document a negative association between economic growth and the ratio of bank- to market-based intermediation. Concerning the comparative contribution to economic growth provided by bank-based *vs.* market-based financial systems in relation to the extent of a country's economic and/or financial development, Demirgüç-Kunt *et al.* (2013) show that as countries develop economically, the association between an increase in economic output and an increase in bank development becomes smaller, whereas the association between an increase in economic output and an increase in securities-market development becomes larger. A similar conclusion is also shared by Gambacorta *et al.* (2014). Other papers (among these, there is Hsu *et al.*, 2014) also find that capital markets induce greater productivity gains and faster technological innovation than banking markets. Overall, the empirical findings of the literature on the real effects of financial structures support the view that, as an economy develops, the marginal contribution of banks to economic growth declines while that of capital markets increases. Hence, countries' financial structures tend to move towards non-bank financing when per capita income rises. This seems to occur mainly because market-based finance has a kind of comparative advantage (with respect to bank-based finance) in promoting innovation, technological change and productivity enhancements, and in financing possibly new sources of long-term economic growth.

Related to this, another topic that the finance-growth literature has in recent times started exploring concerns the (indirect) effects that finance and financial development may have on economic growth through a bunch of related, but still different, channels. Two of these are certainly income inequality/distribution and human capital investment. In this regard, starting from the seminal papers by Galor and Zeira (1993) and Banerjee and Newman (1993), it is now clear that the

³ Rancière *et al.* (2008) study the link between financial liberalization, growth, and crises. In their model, in a financially-liberalized economy systemic-risk-taking reduces the effective cost of capital and relaxes borrowing constraints, which allows greater investment and higher long-term growth. However, it also raises the probability of a sudden collapse in financial intermediation when a crash occurs. The authors test empirically this theoretical mechanism in large cross-country data and find a strong positive link between long-term growth and financial fragility.

⁴ Philippon and Reshef (2012) document the transformation of the U.S. financial sector into a high-skill/high-wage industry and the emergence of economic rents in this sector since the 1980s.

presence of possible borrowing constraints may contribute, among others, to slow down the accumulation of human capital which, in turn, has an impact on the distribution of income and the rate of long-term economic growth. It is therefore plausible (Jerzmanowski, 2017; Bucci and Marsiglio, 2018) that financial development may indirectly affect economic growth and income inequality via the human capital-channel.⁵ Recent evidence, indeed, already points to the fact that the demand for higher education increased in financially deregulated states as private student loans from banks became cheaper and more readily available (Sun and Yannelis, 2016).

In order to gain a better understanding on these (and other related) issues, and on the new role played by finance and financial institutions in the real economy and in economic growth following the Great Financial Crisis of 2007-2009, the Department of Economics, Management and Quantitative Methods at the University of Milan (Italy) decided to host in 2017 a three-day academic conference on “*Finance and Economic Growth in the Aftermath of the Crisis*”. The conference gathered a huge number of economists and policy-makers from all over the world who presented papers having as the main objective to re-examine the effects of finance on the real side of the economy and to discuss how finance (defined in a very broad sense) could have shaped the (old and new) sources of sustainable economic development in the near future. Another theme of the conference was the analysis of which policies (fiscal, monetary, trade, R&D/innovation policies) could have actually been adopted by governments and policy-makers in order to achieve, along with a higher rate of per-capita output growth, also such goals as a more stable financial system and a more equitable income distribution. The conference took place on September 11-12-13, was open to different methodologies and approaches (theoretical/empirical; mainstream/non-mainstream; aggregative/agent-based), and saw the two of us serving as members of a scientific committee including also Guido Cozzi (University of St. Gallen, Switzerland), Herbert Dawid (University of Bielefeld, Germany), Domenico Delli Gatti (University of the Sacred Heart, Italy), Mauro Gallegati (Polytechnic University of Ancona), Stefano Neri (Bank of Italy), and Alberto Russo (Polytechnic University of Ancona).

The *Journal of Macroeconomics* had, in the meantime, generously agreed to publish those papers that survived its usual, rigorous editorial review process as part of this special issue. The contributions contained in this special issue are, therefore, among the latest efforts that try to evaluate the overall bearing of the recent theoretical and empirical debate on the long-run relation between finance and economic growth, and on the changing weight that, due to the recent Great Financial Crisis, old and new sources of economic development (such as, R&D and human capital investments; financial development; inequality and income distribution; governments’ and central banks’ policies) may have on future growth prospects worldwide. It is clear that many more years of work will be required to address in a definitive way all of the issues raised by the articles included here, and compactly outlined above. However, all the contributors to the special issue have definitely taken an important steps towards this important goal.

The papers included into this special issue are divided into two groups. The first group deals with some “*Real aspects of economic growth*” (and contains contributions by Bellettini *et al.*; Bucci, Eraydin, and Müller; Fukuda; Bishnu, Guo, and Kumru), while the second group of papers deals with “*Finance, Money, and Growth*” (and contains papers by Neri and Gerali; Fiorelli and

⁵ Bucci and Marsiglio (2018), in particular, find conditions under which human capital-based economic growth and financial development turn out to be non-monotonically related. Specifically, since in their framework financial development affects simultaneously the productivity of skill acquisition and the obsolescence rate of human capital, their analysis suggests that the human-capital-channel may represent an important starting point to shed some light on why in some countries there may be too much finance while in others too little.

Meliciani; Batini, Melina, and Villa; Benczur, Karagiannis, and Kvedaras; Ketteni and Kottaridi; Maruta; Marszk and Lechman; Saibene; Tura-Gawron).

The special issue, however, opens with two contributions. In the first one (titled: *Dynamic Monetary Equilibrium with a Non-Observed Economy and Shapley and Shubik's Price Mechanism*), Labib Shami builds a general equilibrium model with inside and outside money, heterogeneous tax-evading households, a government and a central bank, with the objective of demonstrating the dynamic nature of the relationship between inflation rate and the size of the Non-Observed Economy. Using the Shapley and Shubik's (1977) price mechanism, it is showed that fiat money has a positive value and monetary policy has real effects in an equilibrium where formal and informal markets do co-exist. Moreover, interest rates, price levels and commodity allocations are determinate, and the tractable dynamic model has a unique monetary equilibrium that can be computed analytically. In this model (with forward-looking agents and a government that has a long-term budget constraint) inflation is not only a tax but also a debt, revealing yet another interpretation of the Ricardian effect. According to the model, as long as the change in the inflation rate leads to an increase in price levels, the size of the Non-Observed Economy is reduced. Thus, the model is capable of producing the same effect on the size of the Non-Observed Economy either under an increase or a decrease in the inflation rate. In this setting, the Non-Observed Economy plays a role of a "friction", allowing monetary policy to have real effects, as commodity allocation between government and private consumption depends on the inflation path.

In the second contribution (titled: *Growth Effects and Welfare Costs in an Innovation-Driven Growth Model of Money and Banking*), Sheng-Zhi Mao, Chien-Yu Huang, and Juin-Jen Chang analyze the effects of three distinctive monetary instruments, namely, the money growth rate, the required reserve ratio, and the leverage ratio, on growth and welfare in an R&D growth model with an active banking sector and financial frictions. Their analytical results show that increasing the money growth rate, the required reserve ratio, and the leverage ratio requirement has negative effects on the balanced growth rate. The relative magnitudes of the impacts depend on the components of the banking capital structure that the monetary instruments can regulate and influence. The calibration results of the authors make clear that the required reserve ratio gives rise to the most pronounced effect on economic growth and welfare costs, while the money growth rate has the least pronounced effect on both of them. Nevertheless, the extended analysis shows that the growth effects and welfare costs of the leverage ratio requirement may reach a peak if the costs arising from converting loans to production are substantially large. This implies that the choice of the best monetary instrument relies on banking efficiency. Specifically, while a strict leverage ratio requirement is favorable to developed countries, it may be unfavorable to developing countries due to a less efficient banking system. Moreover, the welfare costs generated by the money growth rate turn out to be larger in the presence of financial frictions in the banking sector.

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