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Finance: Economic Lifeblood or Toxin?

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JEL Classification: G01, G18, G21, G28, H81, O16.

Keywords: Financial development, financial crisis, risk taking, market failure, political economy.

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1. Introduction

MBA or PhD students at their first asset pricing classes are typically presented with a picture of finance as an efficient allocation machine that puts capital to its best possible use and allows people to share all kinds of risks efficiently. But nowadays, when they walk out of their classroom, these same students need read no further than the front page of the *Financial Times* or the *Wall Street Journal* to see financial markets and intermediaries indicted as the culprits in an enormous misallocation of resources, as witnessed by the huge, vacant real-estate developments in the U.S., Ireland and Spain, the massive losses of the banks that funded them, and crippling tax bills for the taxpayers to bail them out. The media also routinely describe banks and security markets as the sources of risk, not efficient devices for trading and sharing the risks of production and natural events.

Such contrasting attitudes towards financial markets have been present in the writings of economists for decades, both sides fighting for the hearts and minds of generations of students and colleagues. What makes the contrast more strident today is the increased visibility of finance and the enormous scale of the current crisis (though not even these are entirely novel features, looking back at the role of finance in the Great Depression).

Economists have long seen banks and securities markets as the source of the economy's lifeblood; or, more specifically, as essential prerequisites for economic growth. For instance, John Hicks (1969) argued that what had made the industrial revolution possible was not technical progress *per se* but the development of liquid capital markets. "According to Hicks, the products manufactured during the first decades of the industrial revolution had been invented much earlier. Thus, technological innovation did not spark sustained growth. Many of the existing innovations, however, required large injections and long-run commitments of capital. The critical new ingredient that ignited growth in eighteenth-century England was capital market liquidity" (Levine, 1997, p. 692).[1] As we shall see below, the view that finance promotes growth is supported by a vast and solid body of research work.

However, more critical voices have been also raised among economists, at least since Keynes (1936), who warned that financial markets can produce inefficient investment decisions, in that they may encourage short-term speculation rather than sound investment choices based on firms' long-term prospects: "If I am allowed to appropriate the term speculation for the activity of forecasting the psychology of the market, and the term enterprise for the activity of forecasting the prospective yield of assets over their whole life, it is by no means always the case that speculation predominates over enterprise. As the organization of investment markets improves, the risk of the predominance of speculation does however increase... These tendencies are a scarcely avoidable outcome of our

[1] Rousseau and Sylla (2005) show that the same applies to the early stages of US industrialization: "establishment of the nation's modern financial structure predated by three decades the transportation improvements and widespread use of water- and steam-powered machinery that are thought to have triggered modernization" (p. 1). They provide econometric evidence that measures of banking and equity market activity preceded investment and business incorporations from 1790 to 1850, and therefore support the hypothesis of ''finance-led'' growth.

having successfully organized 'liquid' investment markets. It is usually agreed that casinos should, in the public interest, be inaccessible and expensive. And perhaps the same is true of Stock Exchanges" (pp. 158-9). Keynes' viewpoint was echoed by a platoon of later researchers, including Hyman Minsky, who argued in the 1960s and 1970s that credit markets are inherently prone to boom-bust cycles driven by the irrational expectations of bankers and investors, and Robert Shiller, who since the 1980s has argued that stock and housing prices are often propelled by fads, causing bubbles and crashes. The recurrent financial crises of recent decades, culminating in the subprime crisis in the U.S. and the euro-area debt crisis, have led an increasing number of economists to see that in some circumstances the operation of financial markets poses a severe threat to economic activity – generating massive misallocation of resources and bubble-driven expansions followed by drastic deleveraging and slumps.

Economists have generally ascribed this dysfunctional behavior of financial markets to one of two root causes. Some hold that bubbles and crashes depend on investors' being guided by irrational (or not wholly rational) beliefs. This "behavioral finance" school is essentially a derivation of the Keynes-Minsky-Shiller line of thought. Others argue that the problem has to do with the incentives to bankers, asset managers and investors resulting from their contractual relationships, and even more from misguided regulation and monetary policy. For instance, the excessive credit boom and deterioration of lending standards in the run-up to the recent crisis has been blamed on the rise of an unregulated shadow banking system via securitizations (Adrian and Shin, 2010), on very lax monetary policy (Dell'Ariccia, Igan, and Laeven, 2012, Maddaloni and Peydró, 2011), and on the expectation of government bailouts (Fahri and Tirole, 2012). Of course, this thesis raises the question of why policy makers should choose policies that work such perverse incentive effects on the financial markets. That is, it carries implications for the political economy of financial regulation.

Yet while our view may be dominated at present by instances of the dysfunctional behavior of the financial markets, we cannot forget the volumes of evidence of their positive effect on growth and the allocation of investment. What is essential, then, is to understand when and why finance may cease to be the "lifeblood" of the economy and turn into a "toxin." This paper is a first step in this direction. The thesis is that the metamorphosis will occur when finance gets "too large" in relation to the underlying economy.

In the initial phase of economic development, as in Britain during the industrial revolution and in many of today's developing countries, advances in the financial system typically benefit real economic activity. In these periods, firms are typically subject to binding financing constraints, so that removing institutional barriers to financial development makes external finance available and spurs real economic growth. For instance, reforms that improve the enforcement of credit contracts or allow the entry of better-managed banks will result in the growth of credit, output and employment. Such reforms are likely to be associated with better selection of borrowers, hence fewer insolvencies.

However, as the availability of external finance expands, the fraction of financially constrained firms decreases, so that additional improvements in access to finance produce decreasing increments to

output and employment. Indeed, when firms are no longer financially constrained, further increases in credit are unwarranted. Yet at this point financial regulation or monetary policy may still induce banks to expand credit beyond the funding needs of solvent firms and households, possibly by creating the expectation that banks will be bailed out if they become insolvent. Beyond some critical credit/GDP ratio threshold, therefore, we should find that further increases in external financing produce no significant expansion of real economic activity but cause a deterioration in credit quality and possibly even systemic instability.

Section 2 of this paper sets this idea of a non-linear relationship between financial development and real economic activity against the backdrop of the literature. After a brief summary of the extensive work on finance and growth, I review some recent inquiries into why financial markets may become both "hypertrophic" and economically dysfunctional. Section 3 presents evidence on this non-linear pattern, looking at how financial development relates first to economic growth and then to bank solvency and systemic instability. Section 4 concludes by asking why regulation should ever let the dark side of financial development emerge rather than contain it within bounds that ensure positive benefits. In other words, we venture into the political economy of financial regulatory failure.

2. A mixed record: the literature

Despite economists' notorious inability to agree on much of anything,[2] in the last two decades the idea that credit and security market development is conducive to economic growth has gained a broad and solid consensus, buttressed by an impressive body of evidence based on disparate data sets. But the recurring crises of the last decade have prompted a reconsideration, with a growing awareness that in some situations financial development may be far in excess of the needs of the real economy, producing severe misallocation of resources and needless volatility in output and employment. This section contrasts the glowing portrait of finance in most of the earlier academic literature (Section 2.1) with the darker side that has received more attention lately (Section 2.2).

2.1 The bright side

The real economic effects of financial development have been the subject of substantial research, in terms of the breadth of financial markets and their efficiency in allocating capital. This work has identified a number of sources of financial development. Liberalization may allow the entry of new, perhaps more sophisticated intermediaries, resulting in cheaper and more abundant finance. Stronger legal protection for creditors or shareholders may reduce moral hazard in lending and equity capital issuance, easing the financial constraints on firms. In these cases, financial development increases the

[2] In Winston Churchill's words: "If you put two economists in a room, you get two opinions, unless one of them is Lord Keynes, in which case you get three opinions."

amount of external funding available to firms, facilitating business start-ups and expansion. Financial development can also foster growth by allocating capital more efficiently, channeling resources to the more promising projects and thus boosting aggregate productivity.[3]

The correlation between indicators of financial development and of economic growth is well established at least since Goldsmith (1969). But of course correlation does not establish causality. To determine whether financial development is cause or effect of growth, researchers have used econometric techniques and identification strategies to control for the possible effect of growth on financial development, using three types of data: country-level, industry-level, and firm-level.

Using country-level data, King and Levine (1993a, 1993b) relate economic growth rates to measures of lagged financial development in 80 countries. All their indicators of economic performance are positively associated with the predetermined component of financial development, defined as the size of the financial sector at the beginning of the sample period. However, the use of predetermined variables to measure financial development overcomes the problem of endogeneity only in part. An omitted common variable could still determine both long-run growth and the initial level of financial development, generating a spurious correlation. Accordingly, researchers have sought instruments that are unquestionably exogenous. One choice has been type of legal system, which La Porta, Lopez-de-Silanes and Shleifer (1998) show to be correlated with the size of a country's financial market. Legal systems can be considered as exogenous because they were created centuries ago and spread mainly through occupation and colonialism. Beck, Levine and Loayza (2000a) use legal origin as instrument for financial development, and again find that the size of the financial sector is positively correlated with the growth of per capita GDP and of total factor productivity – a result corroborated and extended by other studies including Beck, Levine and Loayza (2000b) and Demirguc-Kunt and Levine (2001).

Another strand of inquiry relies on industry-level data to address causality, on the hypothesis that financial market development should be more beneficial to the growth of industries that are more dependent on external finance. Rajan and Zingales (1998) construct their test by first identifying each industry's need for external finance from U.S. data (positing that the U.S. financial system is highly developed) and then interact this industry-level "external dependence" variable with a country-level measure of financial development. This interacted variable is then included in a regression for industry-level growth, where its coefficient should capture the severity of constraints on growth due to degree of financial development, using fixed effects to control for time-invariant country and sector characteristics. Applying this approach to industry-level data for a large sample of countries in the 1980s, they find that measures of financial development do indeed affect economic growth disproportionately in externally dependent industries.

[3] Pagano (1993) provides a simple framework capturing the effects of financial development both on the rate of capital accumulation and on the efficiency of its allocation, and briefly reviews the theoretical foundations of both effects, as well as the early empirical literature on finance and growth. For a more up-to-date review of this literature, see Levine (2005).

Further evidence on the nexus between finance and growth comes from firm-level data. Guiso, Sapienza and Zingales (2004) find that in Italy local financial development, as measured by self-reported information on households' access to credit, is positively correlated with an individual's probability of starting a business, the ratio of new firms to the population, the growth rate of firms over and above internally financed growth, and per capita GDP. They control for the potential endogeneity of financial development by instrumenting their indicator with bank branch density as determined by regulation in 1936. Guiso, Jappelli, Padula and Pagano (2004) apply the Rajan-Zingales approach to data for companies in the EU and in Central and Eastern Europe, producing firm-level estimates consistent with industry-level studies and finding that financial development fosters the growth of smaller firms in particular. Firm-level data have also been used to gauge the impact of financial development on market entry for small businesses. Aghion, Fally and Scarpetta (2007), applying the Rajan-Zingales approach to firm-level data in 16 industrial and emerging economies, find that financial development encourages entry by small firms in the sectors that are most dependent on external finance. And Klapper, Laeven and Rajan (2006) show that in Europe financial development favors entry in the sectors that are relatively dependent on external finance.

A particularly convincing way of addressing the issue of causality exploits the "quasi-natural experiments" offered by specific (and arguably exogenous) changes in financial market regulation. For instance, Jayaratne and Strahan (1996) document that the relaxation of the geographical restrictions on bank expansion in the U.S. between the 1970s and the early 1990s was associated with faster local growth. Dehejia and Lleras-Muney (2007) document the same relationship with earlier data, showing that changes in state-level banking regulation between 1900 and 1940 were also associated with higher growth. Bertrand, Schoar and Thesmar (2007) find that the deregulation of the French credit market triggered by the Banking Act of 1985 was associated with greater asset and job reallocation at the industry level, and better allocation of capital across firms: banks became less willing to bail out poorly performing firms, and firms in bank-dependent sectors became more likely to restructure.

Related evidence comes from stock market liberalizations, i.e. policies relaxing restrictions on share purchases by foreign investors. These policies are associated with an increase in liquidity, a jump in stock prices, a decline in the cost of equity capital, and an increase in private investment. For instance, in a sample of 11 developing countries that liberalized their stock markets, Henry (2000) finds that the growth rate of private investment was higher than the pre-liberalization median in 9 countries one year after liberalization, in 10 countries two years after and in 8 countries three years after. The average growth rate of private investment in the three years after liberalization exceeds the mean of Henry's sample by 22 percentage points. Similarly, Bekaert, Harvey and Lundblad (2005) show that equity market liberalization is associated with a subsequent increment of about 1 percentage point in the average annual real economic growth rate, and that this effect is robust to controls for capital account liberalization and other simultaneous reforms. Effects of similar magnitude have been found at the sector level by Gupta and Yuan (2009), who show that industries that are more externally dependent and have better growth opportunities grow faster following liberalization.

2.2. The dark side

Several recent papers emphasize that in the run-up to the subprime crisis the U.S. and several European countries featured not only housing and securities market bubbles but also an abnormal growth in private credit and the leverage of financial institutions. Indeed, the two phenomena – the asset price bubble and the over-expansion of credit – appear to have fed on each other, multiplying their effects. Researchers have identified three key reasons for this hypertrophy of finance: (i) the rise of an unregulated "shadow banking system" funded by securities markets and especially securitizations; (ii) lax monetary policy both in the U.S. and in Europe, with abundant liquidity and very low interest rates, especially between 2002 and 2005; and (iii) the general expectation that in the face of widespread financial distress, government would bail out financial institutions with abundant liquidity and capital injections – as indeed is still happening in the U.S., in Europe and now in China as well.

2.2.1. Shadow banks and securitization

The shadow banking sector has developed most extensively in the U.S. A good number of intermediaries managed to secure massive funding by issuing securities rather than taking customer deposits, and so theoretically were not eligible for central bank liquidity or public sector guarantees. As is explained by Pozsar, Adrian, Ashcraft and Boesky (2010), shadow banks may be finance companies, asset-backed commercial paper conduits, structured investment vehicles, credit hedge funds, money market mutual funds, securities lenders, limited-purpose finance companies, or even government-sponsored agencies such as Fannie Mae and Freddie Mac. The establishment of these shadow banks created a more direct link between asset prices and credit than had existed in commercial banking. Adrian and Shin (2010) point out that the rise in asset prices increased these intermediaries' net worth, with very large multipliers owing to their very high leverage, thus enabling them to expand their balance sheets; this put additional upward pressure on asset prices, further increasing net worth and expanding balance sheets. In other words, in the run-up to the crisis the asset price rises and the expansion of financial intermediaries' balance sheets fed on each other, leading to a bubble. The same process operated in reverse as soon as asset prices (starting with housing) started to decline in 2007.

Greenwood and Scharfstein (2012) documented that the enormous growth of the U.S. financial industry in the last three decades – from 4.9% of GDP in 1980 to 7.9% in 2007 – was due mainly to the asset management sector and the household credit sector and was fueled precisely by the "shadow banking system" and the securitization process. This explains the results of Philippon (2008), who models the relationship between the financial sector and the real economy in an overlapping-generations setting, where people choose whether to work in banks or firms and banks can mitigate firms' financing constraints. When calibrated to U.S. data, Philippon's model is quite a good fit with

the evolution of the U.S. financial sector over a century-and-a-half, except for the last decade, when it seriously underestimates its relative size. This erroneous prediction might well be due to the model's neglect of households' demand for financial services, as well as of the recent innovations in the U.S. financial industry.

This oversizing of the U.S. financial industry is accompanied by increasing remuneration of its employees. Philippon and Reshef (2008) find that the earnings gain is concentrated in asset management and investment banking, precisely the sectors most heavily involved in the shadow banking system. In these two sectors salaries, which in the early 1980s were aligned with those of other non-farm workers, by 2007 were four times as high. Both of these phenomena – oversizing and overpay – could stem from the opacity of the relevant financial markets, as in the model of Bolton, Santos and Scheinkmann (2012). Insofar as more opaque markets attract the employees who are most skilled at evaluating deals, they manage to skim off the best deals, taking them away from more transparent markets, and – again owing to their opacity – gain high rents. This results in very high salaries in the more opaque segments of the financial industry and the allocation of too much talent to information processing.

However, while it is undeniable that the securitization process that funded the shadow banks was very opaque, it may be argued that it featured too little, rather than too much, information processing. Investors in asset-backed securities (ABS) were given very scanty information on the underlying asset pools and risk characteristics of ABS payoffs, as is witnessed by their massive underpricing in the pre-crisis years. Pagano and Volpin (2012) argue that ABS issuance was made so opaque deliberately in order to allow placement with a broad set of investors: placing large amounts of ABS meant marketing them also to unsophisticated investors, who could not process the information necessary to price them properly. In fact, if such information had been released, it would have put them at a disadvantage vis-à-vis the "smart money" that can process it. This created an incentive for ABS issuers to negotiate a low degree of transparency with credit rating agencies – that is, relatively coarse and uninformative ratings. Ironically, the elimination of some price-relevant information served to expand the market and support prices in the ABS new issue market.[4]

The extraordinary growth of shadow banking and securitizations before the crisis may have diminished the quality of financial information for two other reasons as well. First, the very growth of ABS issuance probably made it harder for credit rating agencies to resist opportunistic behavior, i.e. lowering their standards in order to attract issuers. In fact, there is evidence that the ratings actually assigned to CDOs were higher than would have resulted from the agencies' models. Griffin and Tang

[4] Di Maggio and Pagano (2012) show that issuers of complex securities may also prefer opaqueness in order to avoid giving a strategic advantage to sophisticated investors, which would depress the issue price: once information is disclosed, unsophisticated investors will worry that if the asset has not already been bought by others, it could be because more sophisticated investors, who can understand this information, have concluded that it is not worth buying. This drives down the price that unsophisticated investors are willing to pay; sophisticated investors, in turn, anticipating that the seller will have a hard time finding buyers among the unsophisticated, will offer a price below the no-disclosure level.

(2011), based on data from one major rating agency, report that by means of "adjustments" to its ratings, the agency increased the size of AAA-rated tranches on average by 12.1%, and that the CDOs on which the "adjustments" were larger performed worse subsequently. They conclude that if the agency had actually followed its model before April 2007, 91.2% of its AAA tranches would have been rated AA.[5] Second, apart from opportunism, before the crisis the agencies may have lowered their standards because they were overburdened by work. Bar-Isaac and Shapiro (2011) observe that the agencies "lacked adequate staff, motivation, and quality personnel just at the time when their business was booming the most" (p. 1), and could not expand their staff with talented employees in the face of keen competition from highly profitable investment banks.

2.2.2. Low interest rates and the fall in credit standards

As mentioned above, in the pre-crisis period shadow banks and securitizations gained especially great prominence in the United States, but the hypertrophic growth of finance was not confined to the U.S. financial system. To some extent it also characterized Europe. In Ireland and Spain the feedback loop between house prices and credit expansion was as evident and as violent as in the U.S. This underscores another factor that was at work in the period leading up to the crisis: very abundant liquidity (and low interest rates).

A substantial body of evidence indicates that the low interest rates encouraged banks to make larger and riskier bets in the "search for yield," both in lending business and in proprietary trading. Dell'Ariccia, Igan, and Laeven (2012) document that prior to the subprime mortgage crisis the rapid expansion of credit went hand-in-hand with declining lending standards. Standards dropped most sharply in the areas that experienced larger credit booms and house price increases, and in those where mortgage securitization was most common. Maddaloni and Peydró (2011) analyze the determinants of banks' lending standards in the euro area on the basis of the Eurosystem's quarterly Bank Lending Survey, whereby central banks gather information on the terms of credit for bank customers. After controlling for the improvement of borrowers' creditworthiness resulting from cheaper credit, they show that low short-term interest rates soften lending standards for businesses and households alike, especially if rates stay "too low for too long". They also find that securitization business and weak supervision amplify the impact of low short-term interest rates on the banks' risk-taking. Of course, the great challenge empirically is to determine whether low interest rates impact on the riskiness of loans by affecting the banks' supply of credit or the demand from firms and households. Jiménez, Ongena, Peydró and Saurina (2011) address this challenge by drawing data on loan contracts and applications from Spain's credit register since 1984, and using sophisticated panel data techniques to distinguish the changes due to the composition of credit supply from those arising from changes in demand. They find that a lower overnight interest rate induces less highly capitalized

[5] See also Ashcraft, Goldsmith-Pinkham and Vickery (2010) and Griffin and Tang (2010). For a survey of the failings of credit rating agencies during the crisis, see Pagano and Volpin (2010).

banks to expand credit to riskier firms, to decrease the frequency with which they terminate loans to risky firms, and to be more likely to extend longer and larger loans to risky new applicants.[6]

The reason why low interest rates may prompt banks to relax their lending standards and offer loans to riskier customers is well captured by the model of Acharya and Naqvi (2012), where moral hazard within banks induces excess risk-taking, which is exacerbated when bank liquidity is abundant. In their model, banks face random deposit withdrawals and, in the event of a liquidity shortfall, pay a cost, possibly because they are forced to hold "fire sales" of assets or to raise funds at penalty rates. Absent moral hazard, this penalty, together with the expected profits from the funding of projects, induces banks to choose a lending rate that properly reflects the risk of the projects. But if the loan officers' effort is unobservable, then it is optimal to tie their compensation to the amount of loans they make, and randomly carry out a costly audit to determine whether they have overlent and underpriced loans. The time-consistent audit policy is to audit the loan officer only when the liquidity shortfall is sufficiently large. So in times when the bank can count on abundant liquidity, loan officers will rationally anticipate a lenient policy of infrequent audits and will accordingly engage in excessive lending, i.e. charge an interest rate that underprices credit risk.

2.2.3. Systemic bailouts, excessive lending and systemic risk

The research just discussed hypothesizes that policy affects the behavior of banks: lax monetary policy encourages over-lending and lower credit standards. Farhi and Tirole (2012) note that the causality may also be reversed. That is, policy itself may be captive to the choices of financial institutions, in that once they are collectively overexposed to risk after lending too much, the central bank has no option but to lower interest rates and expand liquidity in order to avert financial meltdown. And when they realize that policy makers are captive to their choices, banks have an incentive to engage in excessive lending, which generates systemic risk.

Consequently, Farhi and Tirole (2012) take the notion of moral hazard to the collective, or systemic, level. The incentive for excessive lending exists for banks collectively, not just individually; by the same token, each bank has the incentive to over-lend, insofar as it expects others to do so. Put another way, the policy maker's expected response generates a strategic complementarity in banks' leverage decisions, which in turn make monetary accommodation optimal, ex-post. The final outcome is undesirable monetary accommodation, too much lending and excessive risk-taking.

This model offers a number of additional insights. One is that banks have the incentive to choose risks correlated with those chosen by other banks, since in a crisis there is "safety in numbers." A crisis that involves many banks is more likely to induce an accommodating policy response than one that is narrowly circumscribed. Brown and Dinç (2011) document this "too-many-to-fail" effect in a study of

[6] Ioannidou, Ongena and Peydró (2009) also show that when the U.S. federal funds rate is low, in dollarized Bolivia banks are more likely to extend loans with a subprime credit rating or loans to borrowers with a poor solvency record.

bank failures in 21 emerging market countries in the 1990s, showing that governments are less likely to take over or close a failing bank when the entire banking system is weak, in the sense that other banks also have low capital ratios.

Another insight concerns the fact that an accommodating policy response "plants the seeds of a new crisis", by reinforcing expectations of similar responses in the future. This is reflected in the notion of "Greenspan's put": the Fed's consistently accommodating response to crises under the chairmanship of Alan Greenspan (from 1987 to 1990) was perceived as a guarantee that plunging asset prices and widespread financial distress would always prompt the Fed to lower the federal funds rate and expand liquidity, and possibly also arrange bailouts of distressed institutions. And this is precisely what the Fed did following the 1987 stock market crash, during the 1994 Mexican crisis, the 1997 Asian crisis, the 1998 LTCM crisis, the 2000-01 burst of the dotcom bubble, and then massively during the subprime crisis and continuing right down to the present, with interest rates down near zero and accommodating policy in the form of now open-ended quantitative easing.

Moreover, the single instance in which the Fed tried to break out of this accommodative pattern – the decision to let Lehman Brothers fail – bears witness to the disruptions provoked by deviating from the time-consistent equilibrium described by Farhi and Tirole (2012). That is, it highlights the great extent to which policy is hostage to banks' expectations. Of course, these insights go beyond monetary policy alone and can also apply to other accommodative policies, such as government bailouts and recapitalizations.

How can policy makers get "trapped" in an equilibrium of this kind, with excess lending by banks, recurrent systemic risk, and far too accommodating policy responses? I leave this issue for the final section. Now, I turn to some evidence on both the bright and the dark side of financial development, indicating when each tends to manifest itself.

3. The non-linear effect of financial development: some evidence

This section explores whether the evidence is consistent with non-linear real economic effects of financial development. Merging the insights from the two strands of literature surveyed in Section 2, I devise the working hypothesis that initially the expansion of the financial industry contributes to economic growth without endangering the solvency of banks and systemic stability. However, beyond a critical threshold, financial development makes no meaningful contribution to long-run growth, while it reduces bank solvency and creates systemic risk. Accordingly, I investigate two different types of evidence: one relevant to growth, the other to bank solvency and systemic stability.

3.1. Non-linear effect on long-run growth

The approach I adopt follows Rajan and Zingales (1998). The assumption is that the impact of financial development on growth should be heterogeneous across industries, depending on their technological need for external finance. Because dependence on external finance is unobservable, here – as in Rajan and Zingales (1998) – it is proxied by the reliance on external finance of U.S. listed companies in the Compustat database. The dependent variable is the average annual growth rate of real value added between 1970 and 2003, by sector and country. Denoting the dependent variable by *Y*, the baseline specification is:

$$Y_{jc} = \delta(FD_c \times ED_j) + \gamma SHARE_{jc}^{1970} + \mu_j + \mu_c + \varepsilon_{jc} \quad (1)$$

where the subscript *c* denotes countries and *j* sectors, FD_c is a country index of financial development as measured by the initial ratio of total credit and/or stock market capitalization to GDP, and ED_j is industry *j*'s external finance requirement. The variable $SHARE_{jc}^{1970}$ denotes the industry's share of manufacturing Y_{cj} in 1970. Fixed sector and country effects are denoted by μ_j and μ_c, respectively, and ε_{jc} is the residual. Fixed effects are included in order to preclude a spurious correlation between finance and real variables due to unobserved heterogeneity in country or industry characteristics.

The coefficient δ in equation (1) captures the effect of financial development on growth: it estimates the differential response of Y_{cj} to financial development in industries with different external finance requirements. A positive and significant estimate of δ is consistent with the thesis that financial development facilitates growth in the sectors that are relatively more dependent on external finance. To allow this effect to differ between countries with different degree of financial development, in Table 1 equation (1) is also estimated separately for OECD and non-OECD countries, since the data indicate that the latter are less financially developed.

The UNIDO INDSTAT3 2006 database used offers annual value added data for 28 industries (three-digit codes) from 1970 to 2003.[7] That is, the sample does not cover the 2007-09 financial crisis. Since indicators of financial development are not available for many countries, data for at most 63 countries are used. The United States is excluded, being the benchmark country. Additional observations are lost due to missing data, which reduces the final sample somewhat.

Table 1 presents the estimates, drawn from Pagano and Pica (2012). For comparability with the literature, financial development is measured by two indicators: the GDP ratios (1980–95 average) of stock market capitalization and private credit. The estimates of δ in Table 1 show that in the entire sample a higher level of financial development is associated with faster growth of value added in the sectors that depend more heavily on external finance. But the table also shows that in the subsample

[7] The 2006 release is used because later releases have more missing observations, particularly for developing countries.

of OECD countries financial development has no significant impact on value added growth: the estimates of δ are small and not significantly different from zero. For the non-OECD countries, by contrast, the estimates indicate that financial development does spur value added.[8] This suggests that the results for the whole sample are in fact driven by the non-OECD countries, where firms are more likely to be finance-constrained. The non-linearity of the effect of financial development on growth also emerges from a specification (not reported for brevity) in which both the level of financial development and its square are present: consistent with the forecast of non-linear effects, the coefficient of the linear term is positive and that of the quadratic term is negative, and both are significantly different from zero if financial development is measured by private credit/GDP (while neither one is significantly different from zero if it is measured by stock market capitalization/GDP).[9]

Hence, the evidence that financial development benefits growth appears to come exclusively from the countries where financial development is at a relatively early stage, so that an expansion of the financial industry tends to be associated with an increase in local firms' access to finance. Beyond a certain point, that is, financial development does not appear to contribute significantly to real economic activity. Indeed, some recent works show that beyond a certain threshold it actually has a negative effect on growth. Arcand, Berkes and Panizza (2012) produce country- and industry-level evidence that finance has a negative effect on output growth when credit to the private sector is more than 100% of GDP. Ductor and Grechyna (2011) find in OECD data that when financial-sector growth rate exceeds that of real-sector industries by 4.5 percentage points, the correlation turns negative and attribute this non-linearity to financial crises.

Relatedly, there is evidence that financial development increases the sensitivity of output and employment to banking crises. Extending the Rajan-Zingales approach, Kroszner, Laeven and Klingebiel (2007) find that during banking crises the sectors that depend heavily on external finance suffer sharper output contraction in countries with a higher degree of financial development, and Pagano and Pica (2012) find a similar result for employment. However, neither study covers the post-2007 recession. Accordingly, I now turn to evidence on the relationship between financial development and financial stability in which data from the recent crisis play a key role.

3.2. Non-linear effects on bank solvency and systemic stability

Besides affecting the long-run growth rate, financial development may affect the solvency of banks and the stability of the banking system. As argued above, insofar as an expansion in lending simply relieves the financial constraints on solvent firms, it need not lead to deterioration in credit quality. But if banks are awash with liquidity, they are likely to end up extending loans to bad risks or

[8] Similar results are obtained by re-estimating these regressions on the original data set used by Rajan and Zingales (1998). There too the correlation between financial development and growth obtains only for the non-OECD countries.

[9] Pagano and Pica (2012) document a similar non-linear effect on employment growth.

underpricing credit risk, as is implied by the model of Acharya and Naqvi (2012) and the evidence set out in Section 2.3. In this case, the expansion of credit will lead to bank distress, possibly even endangering systemic stability.

To explore the relationship between the creditworthiness of banks and the development of the credit market, I rely on the 2012 update of the Financial Structure Dataset constructed by Beck and Demirgüç-Kunt (2009) and Čihák, Demirgüç-Kunt, Feyen and Levine (2012). It has data for 203 countries from 1960 through 2010. Creditworthiness is measured by banks' "Z-score," i.e. the sum of return on assets (ROA) and the equity/assets ratio, divided by the standard deviation of ROA, based on underlying bank-by-bank unconsolidated data from Bankscope. Unfortunately this variable is available only since 1997, at best. Credit market development is measured by the private credit issued by deposit money banks and other financial institutions, scaled by GDP.

The simple visual inspection of the data offers revealing insights. Figure 1 shows the two variables for selected countries where the credit/GDP ratio does not exceed the 50% threshold during the 1997-2010 sample period. Almost all of the countries plotted in Figure 1 are developing countries. In most of them, the two variables are positively correlated, although in some (Burkina Faso, Ecuador, Georgia, Kazakhstan and Venezuela) the correlation is negative and in others (Ghana, Kenya, Mexico and Senegal) it is unclear. This suggests that in countries at a relatively low level of financial development, credit expansion is not necessarily correlated with a deterioration in banks' creditworthiness. The positive correlation in many countries may stem from a rise in firms' growth and profitability, calling for an expansion in credit while simultaneously enabling banks to increase profits and strengthen their capital base.

A very different picture emerges from Figure 2, which shows the same two variables for selected countries where the credit/GDP ratio exceeded the 50% threshold at least once during the sample period. In almost all of them (one clear exception being Australia) the correlation is negative. Interestingly, the correlation tends to turn negative in particular when the ratio crosses some quite high threshold (around 100% for Austria, Canada, Denmark, Germany and United Kingdom, 70%- 80% for Belgium, Finland, France and Portugal, and 90% for Korea). The countries that experience the sharpest drop in the Z-score are those where the credit/GDP ratio increases most spectacularly, often to extraordinarily high levels: from 137% to 270% in Cyprus, from 26% to over 105% in Greece, from 41% to 272% in Iceland, from 64% to 238% in Ireland, from 78% to 210% in the Netherlands, and from 44% to 186% in Portugal. Other countries offer interesting counter-examples: both the Czech Republic and Japan feature a sizable reduction in the credit/GDP ratio (respectively, from 70% to 30% between 1994 and 2003 and from over 230% to 170% between 1999 and 2010), while their banks' Z-scores improve enormously.

The visual impression is confirmed by the panel regressions of the Z-score on the previous year's credit/GDP ratio in Table 2. The explanatory variable is lagged in order to reduce potential reverse causation: in principle, lower bank creditworthiness may require an accommodating central bank

stance, leading to a credit expansion. All the regressions include fixed country effects, to control for unobserved heterogeneity, and fixed year effects, to account for worldwide fluctuations in bank profitability, especially during the crisis.

The sample includes 166 countries, all the countries (except the non-market economies of North Korea, Laos and Libya) for which the 2012 version of the Financial Structure Dataset has at least two observations for both variables. Due to missing observations for the dependent variable, the sample spans at most 1997 to 2010 (see Appendix 1 for the list of countries and number of observations). The coefficient of the credit/GDP variable is negative for the whole sample, but this result depends on the subsample of countries where the ratio is high; in the subsample of countries where it is below 50%, the coefficient is not significantly different from zero. The coefficient for the whole sample and for the subsample of more financially developed countries is economically significant. In the subsample of more financially developed countries, a one-standard-deviation increase in the credit/GDP ratio (49.6, which is not uncommon in these countries, as is shown by Figure 2) is associated with a decrease of 5.75 in the Z-score, i.e. 28.6% of its subsample mean (20.1).

Table 3 uncovers a similar non-linearity in the relationship between private credit and systemic stability. The measure of systemic risk is an estimate of the capital shortfall that banks are expected to incur in a financial crisis, based on work by Brownlees and Engle (2012) and Acharya, Engle and Richardson (2012). Though produced from publicly available information, this estimate is conceptually similar to those obtained via stress tests by U.S. and European regulators, and takes into account the correlation between the value of each bank's assets and the financial sector aggregate in a crisis. The estimates are updated weekly by VLab and posted at http://vlab.stern.nyu.edu/welcome/risk. More precisely, the dependent variable is the sum of the capital shortfall of the banks in the VLab database for each country and year, scaled by their total stock market capitalization. The explanatory variables are the lagged credit/GDP ratio, country effects and year effects, as in Table 2. The maximum estimation period is 2000-11, since the VLab estimates are available for 2000-12 and credit/GDP data only until 2011 (see Appendix 2 for the list of countries and number of observations).

In the entire sample, systemic risk is positively correlated with the credit/GDP ratio, jibing with the results of Table 2: a credit expansion is associated not only with less sound banks but also with a more unstable system. Again, however, the relationship is statistically significant only for the countries with high credit/GDP ratios. Interestingly, for this subsample the estimate in Table 3 predicts that a 1-standard-deviation increase in the ratio is associated with an increase in systemic risk of 0.362, which is 88% of its subsample mean (0.412). In other words, it almost doubles systemic risk.[10]

[10] Some of the countries in the regressions of Table 2 and 3 are offshore financial centers, which naturally tend to feature higher credit/GDP ratios. In principle, these countries may display a different relationship between the credit/GDP ratio and bank soundness or systemic stability. So for both Table 2 and Table 3 I have estimated specifications that include an interaction variable allowing the slope coefficient of credit/GDP to differ between the countries classified by the IMF as offshore centers and the others. The results are qualitatively unchanged and are accordingly not reported. To test whether

4. Why didn't regulation prevent financial hypertrophy?

As we saw in Section 2.2, a good deal of recent research has cited flaws in financial regulation and monetary policy as the cause of the excessive expansion of the financial sector in developed countries. Poor regulation is blamed chiefly for the unfettered growth of the shadow banking system, lax and accommodative monetary policy for banks' over-expansion of credit and watered-down lending standards.

4.1. "Sins of omission": neglecting financial innovation and changing incentives

Many of the regulatory failures are "sins of omission," lack of adaptation to fast-paced financial innovation with the growth of shadow banking and securitization. Some of the "sins" consisted in passive retention on tools that had once been effective but now, in the new market setting, were dysfunctional. An example is regulators' heavy reliance on credit ratings, which had been a reasonably good gauge of credit risk in corporate bond markets but were unsuited to the much more complex securities created by securitization. Nevertheless, prudential regulators simply reproduced the delegation of power to the rating agencies, as in the corporate bond sector.

Another example is LIBOR, the reference rate set by London-based banks in the unregulated Eurodollar market since the 1950s. Over the years, LIBOR eventually came to be the reference for an enormous volume of financial contracts and the derivative markets; thus the banks that took part in determining the rate were often parties to contracts indexed to LIBOR –a clear conflict of interest. Yet policy-makers neglected the need to oversee the rate-setting process, until in June 2012 criminal investigations uncovered significant fraud and collusion in the banks' rate submissions.

The similarity between the two examples is that an indicator (be it a credit rating or a LIBOR rate submission) that is reliable in the context of a specific market does not serve in new, much broader and more sophisticated markets, because the enormously higher stakes make conflicts of interest and fraudulent behavior far more likely – essentially, an incentive-based version of Goodhart's Law.[11] If regulation is not revised as the growth of the financial markets alters incentives and thus threatens the reliability of the indicator, then regulation itself ends up contributing to the dysfunctional behavior of the markets.

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systemic stability is endangered not only by the level of credit but also by the speed at which it grows, I have also estimated specifications that include the lagged growth of credit/GDP among the explanatory variables; however, the coefficient of this variable is not statistically significant.

[11] According to Goodhart's Law, when an economic indicator becomes an economic policy target it loses the information content that would qualify it to play that role.

4.2. "Sins of commission": the role of politics

However, regulators have also made "sins of commission" to assist the over-expansion of the financial sector. In some cases, the flaws stemmed from regulations to correct some inefficiency. A prime example is the explicit and implicit guarantees provided to banks. Deposit insurance, for instance, was introduced to prevent bank runs but ultimately fostered excessive risk-taking by bank managers and more generally created an implicit subsidy to banks. The result was excess capacity (overbanking), which in turn induced banks to compete too aggressively in the search for yield.

Many regulatory "sins of commission" have been prompted by politics, whose role in planting the seeds of the recent crises has not been sufficiently recognized. For instance, in the U.S., the political determination to support widespread homeownership induced government-sponsored agencies such as Fanny Mae, Freddie Mac and AIG to guarantee low-quality loans in the securitization process, which contributed enormously to the subprime mortgage boom and the house price bubble. The same can be said of the 2001 decision by the Federal Deposit Insurance Corporation (FDIC) to lower – drastically, from 8% to 1.6% – the capital requirement on banks in respect of MBSs and most private sector CDOs (compared with the 4% requirement against mortgage loans and lower-rated mortgage securities), as well as of the 2004 SEC decision to exempt investment banks from capital regulations and entrust their risk monitoring to their own internal risk models. These decisions provided a huge inducement for banks both to securitize their loans and to invest in high-rated asset-backed and mortgage-backed securities. Similarly, in Europe, the decision by the EU Commission to exploit the "carve-out option" of Basel II regarding prudential ratios on sovereign debt permitted the assignment of zero risk weight to all euro-area sovereign debt. This encouraged EU banks to buy euro-area government bonds, especially those featuring high yields and high risk. While this undoubtedly facilitated national Treasuries in placing risky public debt, it also certainly increased the riskiness of euro-area banks (Acharya and Steffen, 2012).

One of the most spectacular cases of the role of politics in the over-expansion of finance before the bursting of the subprime bubble was that of Iceland. Benediktsdottir, Danielsson and Zoega (2011) describe how politicians provided essential support to the incredible transformation of a tiny fishing and aluminum-producing economy into an international banking platform, just in time to be a protagonist in the debt expansion and asset price bubble of 2003-07 and the subsequent catastrophic collapse. They explain how politicians first privatized the banks by selling them to their cronies in business (who bought their stakes using funds borrowed from those very banks) and then together with these cronies dreamt up the plan to make Iceland an international financial marketplace. A crucial ingredient was the implicit sovereign support that the government gave to the banks' record borrowing in 2004-05, which enabled them to access cheap, abundant international funding. No less important was the politicians' failure to equip their fledgling financial center with adequate supervisory authorities: the banks dwarfed the agencies that supposedly supervised them.

Another case in which regulators' failings were largely rooted in politics is that of Spain. The huge capital inflow into Spain prior to the crisis was mediated by a power bloc of managers of the savings banks (*cajas*), regional politicians and real estate developers, reciprocally supporting each other with favors and easy credit. They channeled massive amounts of credit into real estate, generating the housing bubble and substantial bad loans. Cuñat and Garicano (2009) show that the *cajas* whose chief executives had no banking experience and no graduate education but did have strong political connections extended more loans to real estate developers and fared substantially worse both before and during the crisis. The close connection between politicians and the bank managers was also a factor in the slow and ineffective response of Spanish prudential supervisors to the crisis, and the protracted forbearance on bad loans to developers. As Luis Garicano (2012) puts it, "the main explanation for the supervisory failure of the Banco de España has to do with the political control of the *cajas* … [T]he supervisor, confronted with powerful and well-connected ex-politicians decided to look the other way in the face of obvious building trouble. Indeed the political connection of the managers of the entities was a good predictor of brewing trouble."

The experience of Iceland and Spain underscores another important point: namely, that credit-fuelled asset bubbles can easily produce broad political consensus, well beyond the circle of politicians and financiers. Once the bubble has started, the consensus tends to stretch throughout the population –a feature common to other countries as well in the run-up to the crisis. Most of society seemed to profit from the bubble, not only bankers earning huge profits and bonuses, but also households reaping high returns on their assets and firms gaining from the boom in business – and of course politicians at the helm of governments basking in popularity. In 2008, Iceland ranked fourth in the world in per capita GDP!

What these patterns show is that politics is indeed a root cause of the hypertrophy of finance, and not just because of the capture of politicians by the banking lobby. The euphoria associated with the bubble creates vast political support, while the few who question its sustainability are seen as "spoil-sports" and "party-poopers", gadflies to be ignored – in the banks, in the political parties, and most likely even inside households. This is a point that applies to economy-wide bubbles very much in general. Once a bubble gets under way there is no constituency to stop it, because everyone simply tries to grab as much profit as possible as long as it lasts. The unfortunate implication is that the "dark side" of finance is entangled with a "dark side" of politics and society.

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Table 1. Financial development and output growth

The dependent variable is the percentage growth rate of value added in the relevant country and industry. The estimation period is 1970-2004. Industry's share in 1970 refers to total value added. Robust standard errors are reported in parentheses. One, two and three asterisks denote coefficients significant at the 10%, 5% and 1% level, respectively. The estimates are drawn from Table 1 in Pagano and Pica (2012).

Explanatory variable	*All countries*		*OECD countries*		*Non-OECD countries*	
Industry's share in 1970	-0.156***	−0.204***	−0.212***	−0.212***	−0.161***	−0.213***
	(0.030)	(0.027)	(0.054)	(0.055)	(0.032)	(0.030)
External dependence × stock market capitalization (80-95)	0.026*		−0.022		0.037**	
	(0.014)		(0.018)		(0.016)	
External dependence × claims of banks and other fin. inst. (80-95)		0.034**		−0.011		0.091**
		(0.016)		(0.011)		(0.036)
Observations	1533	1637	628	628	905	1009
R^2	0.32	0.33	0.48	0.48	0.30	0.32

Table 2. Credit market size and creditworthiness of banks

The dependent variable is the Z-score, estimated as the sum of banks' ROA and equity/assets ratio, divided by the standard deviation of ROA. Credit/GDP is the ratio to GDP of the private credit granted by deposit money banks and other financial institutions. All regressions include fixed country effects and calendar year effects. The maximum estimation period is 1997-2010 in all three regressions. One, two and three asterisks denote coefficients significant at the 10%, 5% and 1% level, respectively.

Explanatory variable	*All countries*	*Countries with credit/GDP <50%*	*Countries with credit/GDP >50%*
Credit/GDP	-0.111***	-0.055	-0.116***
	(0.014)	(0.055)	(0.014)
Observations	2,048	1073	975
Countries	166	88	78
R^2	0.61	0.51	0.64

Table 3. Credit market size and systemic risk

The dependent variable is an estimate of the capital shortfall that all the banks in a given country and year are expected to incur in a financial crisis, scaled by their total market capitalization. The estimate of the capital shortfall is based on Brownlees and Engle (2011) and Acharya, Engle and Richardson (2012). The country-level values were produced by VLab at NYU and kindly provided by Viral Acharya and Robert Capellini. Credit/GDP is the ratio to GDP of private credit granted by deposit money banks and other financial institutions. All regressions include fixed country effects and calendar year effects. The maximum estimation period is 2000-2011 in all three regressions. One, two and three asterisks denote coefficients significant at the 10%, 5% and 1% level, respectively.

Explanatory variable	*All countries*	*Countries with credit/GDP <50%*	*Countries with credit/GDP >50%*
Credit/GDP	0.009***	-0.024	0.0078**
	(0.003)	(0.033)	(0.002)
Observations	353	51	302
Countries	46	10	36
R^2	0.44	0.46	0.52

Figure 1. Bank creditworthiness and credit/GDP in selected countries with credit/GDP < 50%

Panel A

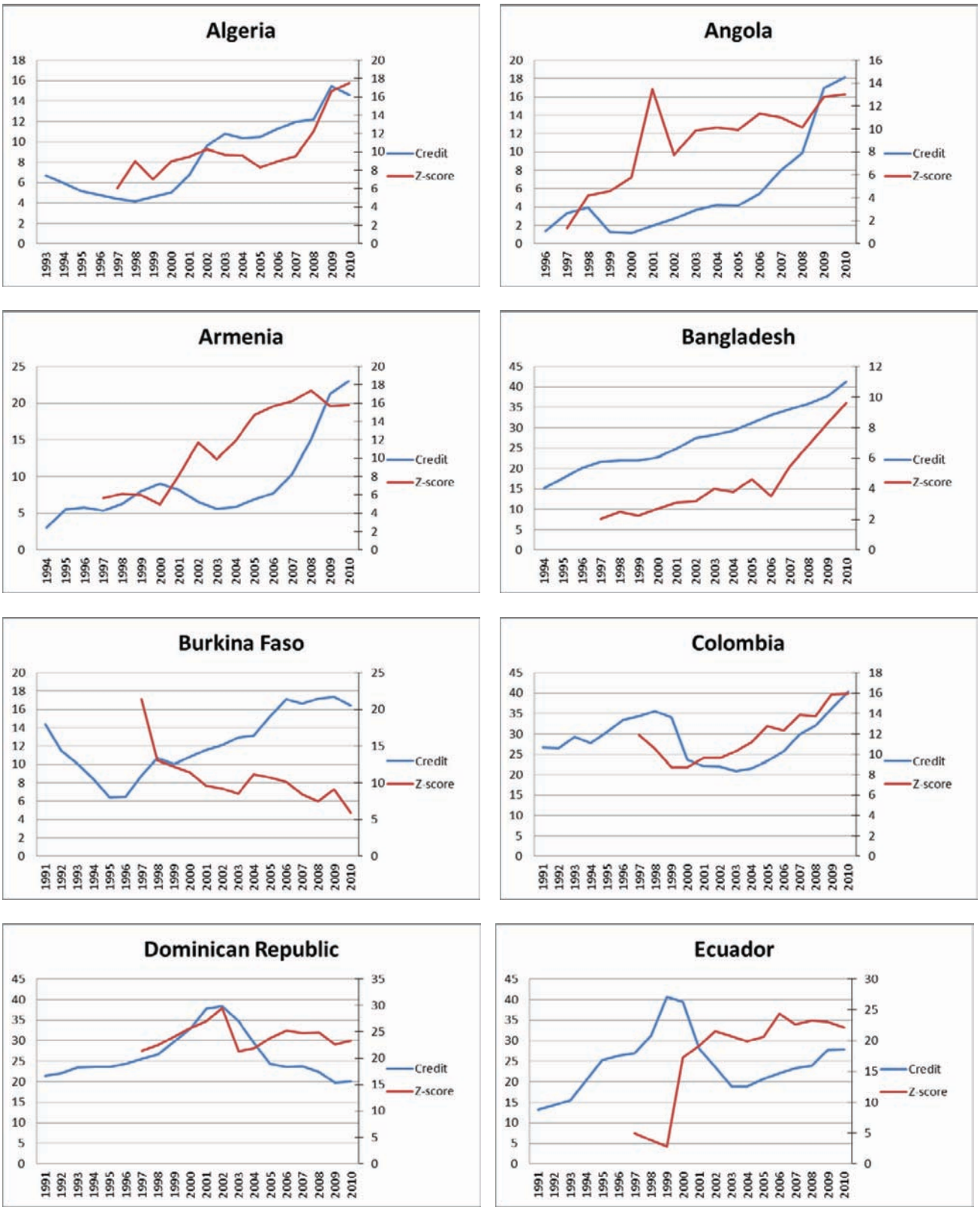


Figure 1. Bank creditworthiness and credit/GDP in selected countries with credit/GDP < 50%

Panel B

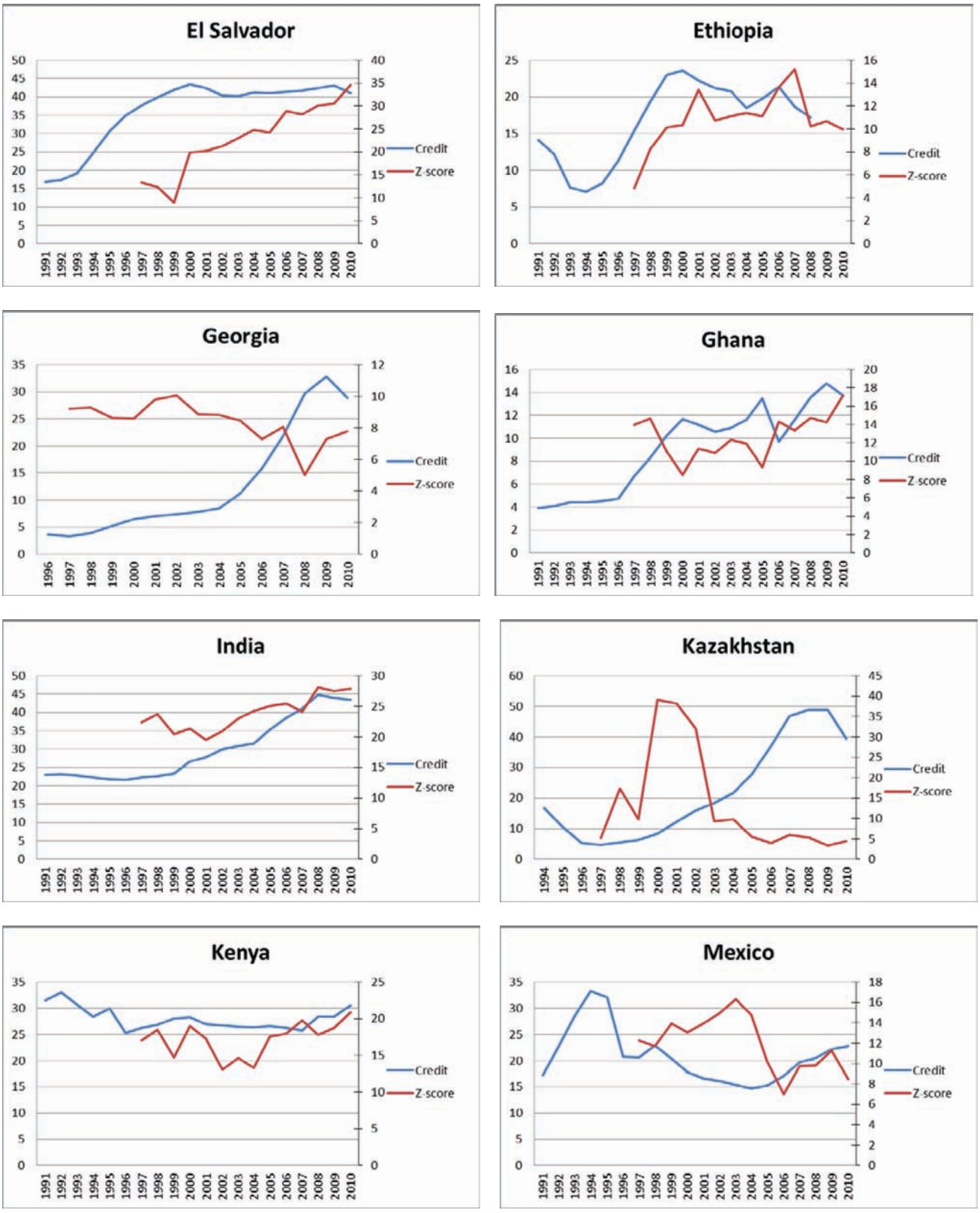


Figure 1. Bank creditworthiness and credit/GDP in selected countries with credit/GDP < 50%

Panel C

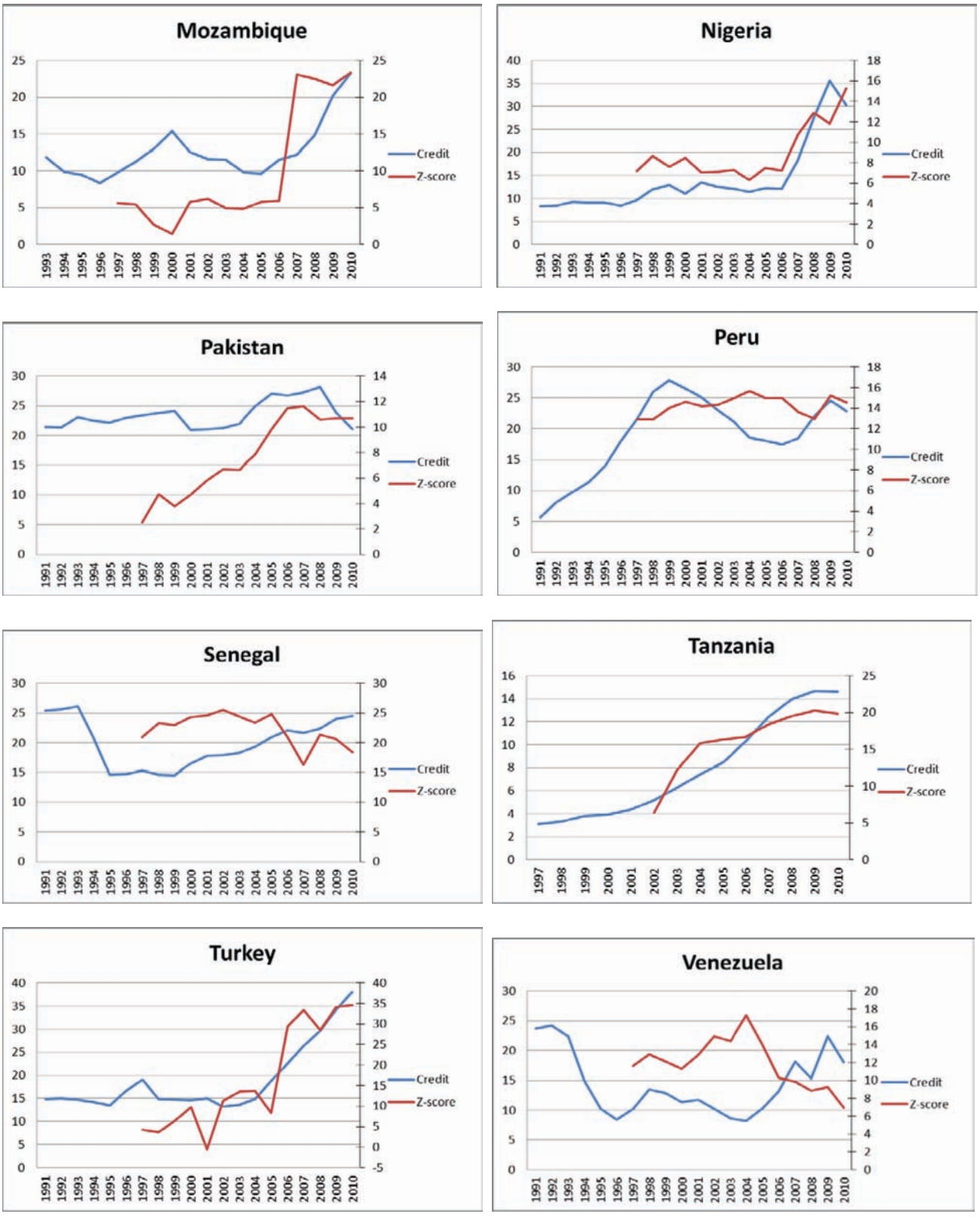


Figure 2. Bank creditworthiness and credit/GDP in selected countries with credit/GDP > 50%

Panel A

Figure 2. Bank creditworthiness and credit/GDP in selected countries with credit/GDP > 50%

Panel B

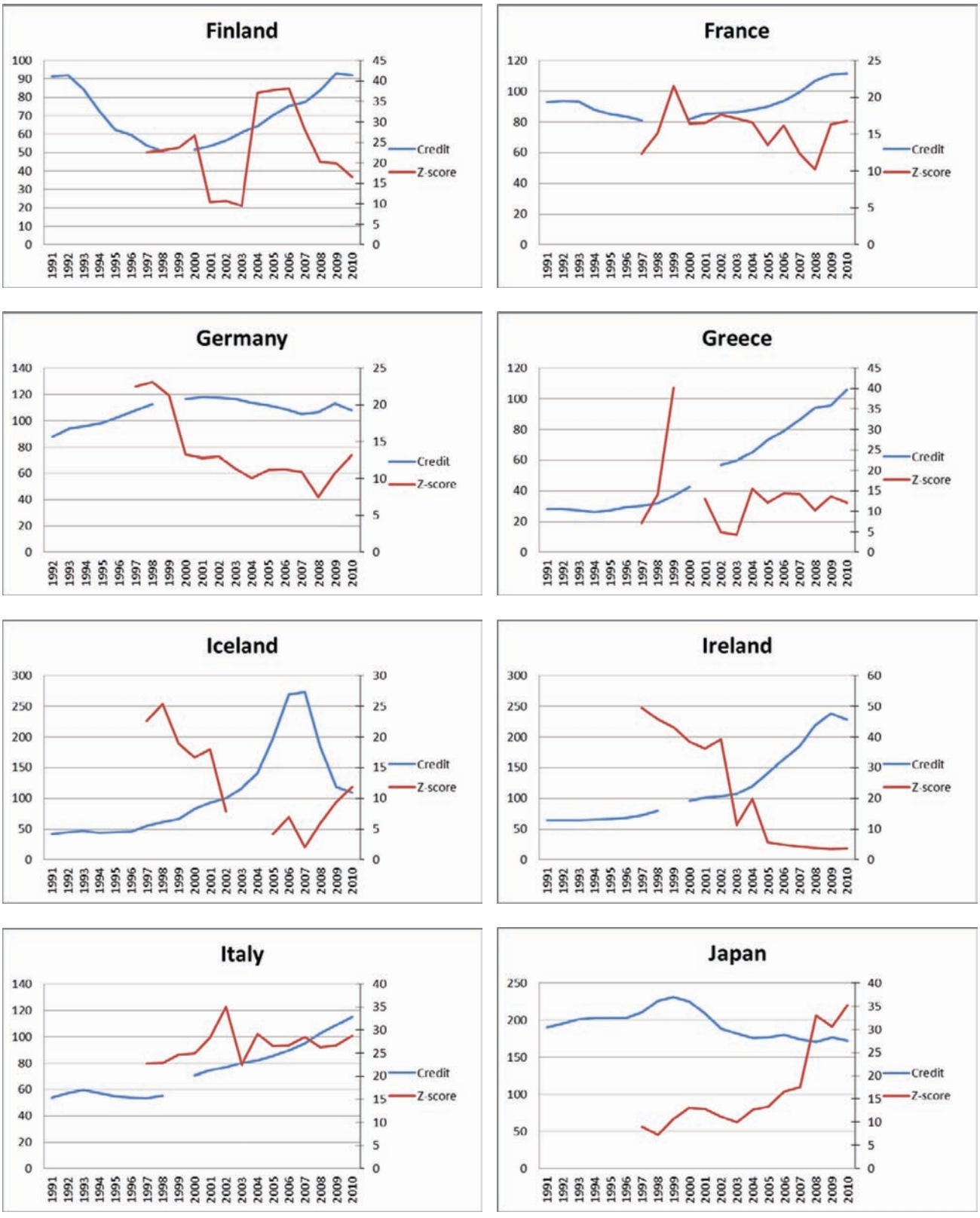
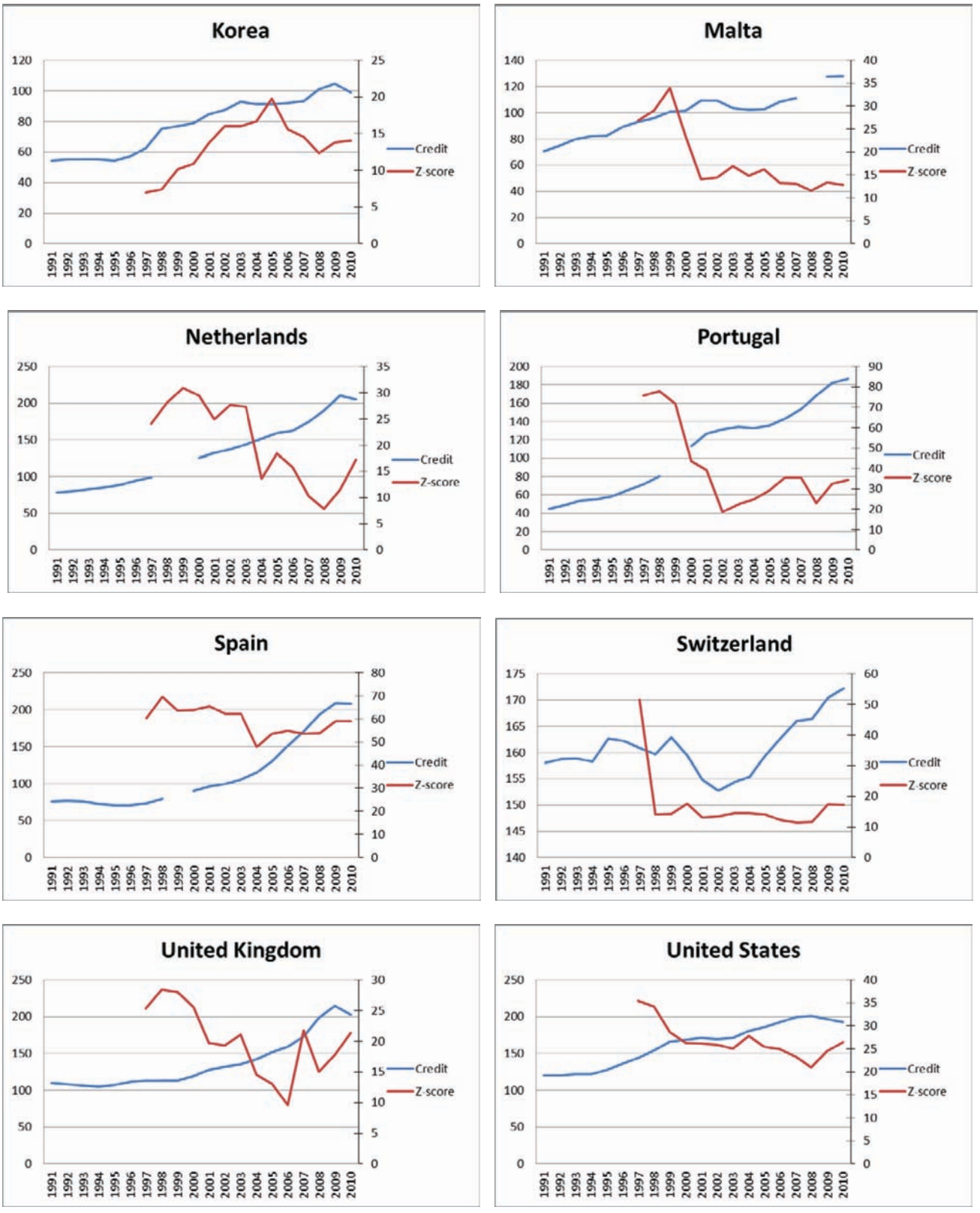


Figure 2. Bank creditworthiness and credit/GDP in selected countries with credit/GDP > 50%

Panel C



Appendix 1. Countries included in the regressions of Table 2

Countries with credit/GDP <50%			
Country	**Number of observations**	**Country**	**Number of observations**
Afghanistan	3	Macedonia, FYR	14
Albania	14	Madagascar	14
Algeria	14	Malawi	14
Angola	14	Mali	14
Argentina	14	Mauritania	5
Armenia	14	Mexico	14
Azerbaijan	14	Moldova	14
Bangladesh	14	Mongolia	12
Belarus	14	Mozambique	14
Benin	14	Myanmar	12
Bhutan	14	Namibia	8
Botswana	14	Nepal	14
Burkina Faso	14	Nicaragua	10
Burundi	14	Niger	14
Cambodia	11	Nigeria	14
Cameroon	14	Oman	8
Central African Republic	12	Pakistan	14
Chad	12	Papua New Guinea	12
Colombia	14	Paraguay	14
Congo, Dem. Rep.	9	Peru	14
Congo, Rep.	4	Poland	13
Costa Rica	14	Romania	14
Cote d'Ivoire	14	Russian Federation	14
Djibouti	10	Rwanda	10
Dominica	6	Samoa	14
Dominican Republic	14	Senegal	14
Ecuador	14	Serbia	12
El Salvador	14	Seychelles	8
Equatorial Guinea	7	Sierra Leone	14
Ethiopia	13	Sri Lanka	14
Gabon	14	St. Vincent and the Grenadines	3
Gambia, The	13	Sudan	14
Georgia	14	Suriname	14
Ghana	14	Swaziland	14
Guatemala	14	Syrian Arab Republic	12
Haiti	14	Tajikistan	6
India	14	Tanzania	9
Iraq	2	Togo	14
Jamaica	13	Trinidad and Tobago	14
Kazakhstan	14	Turkey	14
Kenya	14	Uganda	14
Kyrgyz Republic	9	Venezuela, RB	14
Lesotho	12	Yemen, Rep.	9
Liberia	4	Zambia	14

Appendix 1. Countries included in the regressions of Tables 2

Countries with credit/GDP >50%			
Country	**Number of observations**	**Country**	**Number of observations**
Antigua and Barbuda	8	Jordan	14
Aruba	7	Korea, Rep.	14
Australia	14	Kuwait	14
Austria	12	Latvia	13
Bahamas, The	14	Lithuania	14
Bahrain	7	Luxembourg	12
Barbados	14	Macao SAR, China	14
Belgium	12	Malaysia	14
Belize	12	Maldives	4
Bolivia	14	Malta	13
Bosnia and Herzegovina	3	Mauritius	14
Brazil	14	Montenegro	4
Brunei Darussalam	9	Morocco	14
Bulgaria	13	Netherlands	12
Canada	13	New Zealand	14
Cape Verde	11	Norway	11
Chile	13	Panama	14
China	14	Philippines	14
Croatia	14	Portugal	13
Cyprus	13	San Marino	6
Czech Republic	13	Saudi Arabia	14
Denmark	13	Singapore	14
Egypt, Arab Rep.	14	Slovak Republic	13
Estonia	14	Slovenia	13
Finland	13	South Africa	14
France	12	Spain	13
Germany	13	St. Kitts and Nevis	14
Greece	12	St. Lucia	14
Grenada	14	Sweden	13
Guyana	14	Switzerland	14
Honduras	14	Thailand	14
Hong Kong SAR, China	14	Tunisia	14
Hungary	13	Ukraine	14
Iceland	12	United Kingdom	14
Indonesia	14	United States	14
Ireland	13	Uruguay	14
Israel	14	Vanuatu	9
Italy	13	Vietnam	14
Japan	14	Zimbabwe	6