The Real Effects of Banking Shocks: Evidence from OECD Countries*

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- JOB MARKET PAPER -

Abstract

This paper uses a panel of 30 OECD banking systems observed over 17 years to estimate the effects of variations in bank profit, capital and reserves on the real economy. Shocks to bank profits are found to have a significant impact on GDP growth which lasts approximately two years. The effect is stronger for activities and sectors that rely more heavily on external finance, and is more pronounced in countries with a large banking sector. Bank reserves also exhibit some impact on real economic activity, though to a lesser extent than bank profit. Surprisingly, variations in bank capital do not show any significant effect on the real economy.

Keywords: bank profit, bank capital, bank reserves, business cycle, external finance, bank crisis, credit channel.

JEL Classification: C32, E32, E44, G21

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I. Introduction

The recent financial crisis has exposed the global banking system to a series of adverse shocks. The crisis started with a substantial fall in the value of mortgage-related securities which inflicted heavy losses on the banking sector. In some countries, a liquidity crisis has developed as uninsured deposits were suddenly withdrawn, which intermittently led to bank failures. Governments have made extensive efforts to provide assistance to the banking sector, as the continued weakness of this sector was perceived to have negative effects on the real economy. The present paper examines these effects and provides new evidence on the sources, magnitude and duration of the real effects of banking shocks.

The paper estimates the impact of variations in bank profits, bank capital and bank reserves on GDP growth and other real economic variables. The sample comprises a panel of 30 OECD countries observed annually for 9 to 24 years starting in 1979. While the sample includes several episodes of bank crises, about 95% of the observations refer to non-crisis years. Hence, the paper documents the real effects of banking shocks that prevail regularly in non-crisis periods. Nevertheless, the findings of this paper are also relevant for crisis episodes, where the shocks hitting the banking sector are particularly large.

The main finding is that variations in bank profits have a significant impact on GDP growth lasting approximately two years. Other things equal, one percentage point decline in bank ROA (return on assets) is expected to reduce the following year's GDP growth by 0.3 percentage points. The effect is stronger for economic activities and industrial sectors that rely more heavily on external finance, and is more pronounced in countries with a large banking sector. Bank reserves (cash) also exhibit some impact on real economic activity, though to a lesser extent than ROA. Surprisingly, variations in bank capital do not show any significant impact on the real economy. This result is consistent with recent findings of Giannetti and Simonov (2009) who showed that recapitalization of Japanese banks during the 1990s did not have significant effects on the real economic activity of their clients.

The literature on real effects of banking shocks is not large, as most existing studies estimate the effect on the supply of loans[1] and not on real economic variables. Peek and Rosengren (2000) exploit a rare exogenous shock to US bank lending caused by the burst of Japan's asset price bubble in the early 1990s and transmitted to the US through Japanese banks operating in the US. According to the authors' estimates, California, New York and Illinois have lost approximately 53% of annual construction activity as a result of a 58% decline in Japanese lending to the US real estate sector. Calomiris and Mason (2003) study a cross section of US states and counties from the early Great Depression years (1930-1932). They also find a large effect of loan contraction on the US real estate sector, stronger than the effect on total economic growth. A similar result is found in the present study where investment exhibits higher sensitivity to banking shocks than other expenditure items. The novelty of the paper is the use of a large sample of countries that goes beyond the US and spans for 17 years on average. The dataset includes annual time series of financial data on banking systems in 30 OECD countries, which have not been studied yet in the credit channel literature.

The paper is also related to the literature on bank crises[2], and particularly to Dell'Ariccia, Detragiache and Rajan (2008) and Kroszner, Laeven and Klingebiel (2007) who study the causal effects of bank crises on real economic output[3]. Dell'Ariccia et al (2008) find that financially dependent industries grow more slowly during bank crises. They interpret this result as evidence of a crisis effect on the real economy. Kroszner et al (2007) show that the (differential) effect of the crisis is stronger in countries with a dominant banking sector.

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[1] See for instance Sharpe (1995), Kashyap and Stein (2000) and a recent study by Loutskina and Strahan (2009).
[2] See Reinhart and Rogoff (2008) for a detailed analysis of bank crises in the past 200 years.
[3] See also Ashcraft (2005) who estimates the real effects of bank failures in the US. Other papers that study the relationships between bank crises and real economic activity, without necessarily establishing causality, include Reinhart and Rogoff (2009, 2008), Demirgüç-Kunt, Detragiache and Gupta (2006), Barrell, Davis and Pomerantz (2006), Davis and Stone (2004), Bordo et al (2001) and Kaminsky and Reinhart (1999).

The present paper is different from the bank crisis literature in two respects. First, it documents the real effects of banking shocks that prevail in non-crisis years, as the sample consists primarily of non-crisis periods (comprising 93%-95% of the sample). Hence, the results of this paper are mostly relevant for regular business cycles, though they also shed light on crisis episodes where the banking shocks are extremely large. Second, the paper distinguishes between various types of banking shocks, *i.e.* profit shocks, capital shocks and reserves shocks. This approach enables to explore more deeply the sources of the bank effect as different types of shocks may have different economic implications. For instance, the effects of non-performing loans which reduce bank income are not necessarily the same as liquidity drain (*e.g.* bank run) which exhausts bank reserves. Similarly, policy makers might be interested in assessing the effects of a bailout program injecting capital into the banking system compared to a policy that affects bank income (*e.g.* acquisition of bank assets). The empirical literature on bank crises does not provide answers to these questions, since all types of bank crises are treated the same[4]. The present paper contributes to the literature by differentiating between different sources of banking shocks and studying the macroeconomic consequences of each shock separately.

The analysis is split into two parts. The first part examines the effects of banking shocks on aggregate output. Simple regressions of GDP growth on bank variables such as profits, capital and reserves are obviously invalid as the bank variables are endogenous. However, the impact of banking shocks on real economic activity usually lasts more than one year. It takes some time until banks respond to their deteriorating (or improving) conditions and more time until the effects expand to the real economy through the lending channel. Hence, the effect of lagged banking shocks on current GDP growth can be estimated, under the assumption that the bank data is weakly exogenous. Since the data is annual, lags can be considered pre-determined variables due to the

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[4] The bank crisis literature makes a distinction between severe and moderate crises and between bank crises and twin crises, see Dell'ariccia et al (2008) and Bordo et al (2001).

long time length between lags and current values. Finding that deterioration in the state of the banking system in year t is followed by a decline in GDP growth in $t+1$ suggests that banking shocks affect aggregate output. Nevertheless, the same finding can be produced by a latent variable that affects the banking system first and only later the real economy. Hence, identifying causality requires a careful control of all the variables that might affect the banking system and the real economy. The regressions below include various control variables, such as stock prices, inflation, interest rate and exchange rate. Furthermore, robustness tests examine the stability of the results to sub-samples, outlier effects, alternative dependent variables and sub-components of the bank variables.

The second part of the analysis uses a different identification method by focusing on the sensitivity of various industrial sectors to banking shocks. Under the bank lending channel hypothesis, industries that are more dependent on external finance should be more sensitive to the financial state of the banking system, as Dell'Ariccia, Detragiache and Rajan (2008) and Kroszner, Laeven and Klingebiel (2007) have shown with regard to bank crises. In the present study I examine whether financially dependent industries are more affected by banking shocks compared to less dependent industries. The results support the hypothesis that banking shocks affect the real economy, as financially dependent industries are found to be more sensitive to variations in bank profits. On the other hand, bank reserves and bank capital do not show a strong differential effect on the economy, suggesting that their impact on the supply of credit is fairly weak.

The choice of the bank variables is dictated by the credit channel literature. The literature emphasizes the importance of equity capital (net worth) in the process of financial intermediation. Holmstrom and Tirole (1997) and Bernanke and Gertler (1987) argue that bank capital (net worth) alleviates moral hazard and adverse selection problems arising from information asymmetries between the bank and its depositors. Hence, banks with low equity capital face higher financing costs which affect their loan supply. Today, most countries impose legal restrictions obliging banks to hold a minimum capital-asset ratio (capital adequacy regulations). These regulations reinforce the link between bank capital and bank lending, as discussed in Chami and Cosimano (2001) and Van den Heuvel (2006).

In the present study, capital abundance is measured by two indicators: the capital-asset ratio, and the ratio of profits to total assets, *i.e.* the return on assets (ROA). The capital/asset ratio is a direct measure of the stock of bank capital (relative to its size) and fits the theoretical concept in the literature[5]. ROA, which usually measures profitability, is also related to capital abundance. Profits (the nominator of ROA) provide an important source of new capital (through retained profits), especially in periods of financial distress when external sources of capital are scarce. Hence, profits capture the flow dimension of bank capital. As we shall see, the most robust results are obtained with respect to bank ROA, while the effect of the capital/asset ratio is insignificant.

The supply of loans might depend also on bank reserves (cash assets). Bernanke and Blinder (1988) argue that high cash holdings reduce financial costs, since they enable to increase the issuance of reservable deposits, which are usually cheaper than other forms of bank liabilities. Hence, the supply of loans should be positively related to the cash of the banking system. Another channel through which reserves affect the supply of loans is their role as a cushion against sudden deposit withdrawals. When reserves decline, *e.g.* due to deposit drain, banks tend to curtail loans and increase cash assets in order to restore their reserves to the desired level. This process reduces the supply of loans and eventually affects the real economy. In this paper, I use the ratio of cash to total assets as a measure of bank reserves[6]. The results indicate that reserves have some impact on economic growth, though it is more moderate than the effect of ROA.

The rest of the paper is organized as follows. Section II describes the data and the identification strategy which builds on two sets of data: country data and industry data. Section III

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[5] It would be more desirable to normalize capital by a measure of the risk-weighted assets, as implied by the Basle Accord on capital adequacy. However, data on risk-weighted assets is not available for the entire sample.
[6] Reserves can be normalized also by total deposits. The results (not reported) remain the same.

reports the results of the country-level analysis which estimates the aggregate bank effect by regressing real economic growth on lagged bank variables. The analysis examines various indicators of economic growth, sub-samples of OECD countries, bank crisis episodes and other robustness tests. Section IV reports the differential bank effect which is estimated by using industry-level data. Section V concludes.

II. Data and Methodology

Data Description

Data on financial statements of the banking system is taken from the OECD publication *Bank Profitability: Financial Statements of Banks* (2004 edition). Despite the relatively broad and detailed coverage of this dataset, only few studies have investigated it. Vennet (1999) has used this data to study growth dynamics of banking sectors in OECD countries and Albertazzi and Gambacorta (2006) have studied the determinants of bank profitability. To my knowledge, this paper is the first to use the data to estimate the effect of banking activity on real economic outcomes.

The OECD dataset contains data aggregated into several groups: all banks, commercial banks, large commercial banks, savings banks and other groups of banks. Since the focus of this study is on the banking system as a whole, I use the broadest available aggregate which for most countries is "all banks" (see table I for details). Additional statistics are taken from the *Source OECD Statistics* with supplements from the *International Financial Statistics* published by the IMF. A detailed list of variables and their sources is given in table II. All variables are observed annually for the 30 OECD members.

(Table I)

(Table II)

Stationarity

Table III presents basic statistics by country for the following financial indices: return on assets (ROA) defined as the ratio of aggregate annual profits to aggregate assets, bank equity capital to total assets which serves as a measure of bank capital, and cash[7] to total assets standing as bank reserves. Capital and cash exhibit a clear time trend so the first difference of these series is used in the regressions below. The return on assets is more ambiguous with respect to its stationarity property. For most countries the ROA is fairly stationary, but in some countries there seems to be an upward trend.

(Table III)

The series are too short to conduct Dickie-Fuller tests for each country separately. The stationarity test suggested by Maddala and Wu (1999) (the "Fisher test") is suitable for an unbalanced panel like the one here. The test rejects the hypothesis that all series in the panel are non-stationary, but it cannot confirm that all series are stationary. In what follows I use the change in ROA, rather than the level. The first reason is to avoid spurious results in the event that some of the ROA series are non-stationary. Secondly, the regression analysis provides an indication that the variable at work is the change in ROA and not the level. When the model is estimated in levels (results not reported), the coefficients on ROA and lagged ROA are of the same magnitude but with the opposite sign, suggesting that ROA should be differenced.

Summary statistics

Table IV presents summary statistics of the three bank variables (ROA, CAPITAL and RESERVES) for the sample as a whole. The data was differenced and then demeaned using country-specific means in order to allow comparison between countries. The table provides statistics for the entire sample and for a sub-sample excluding Turkey and Mexico, as these two countries are dropped from most of the regressions for reasons explained below. The high kurtosis

[7] In Japan cash is included in interbank deposits, which are taken instead.

values suggest that the distribution of the bank variables exhibits fat tails. One reason for that is due to crisis episodes where the banking system experiences extreme volatility. This point is illustrated in figure 1, which presents the ROA of the banking system in four OECD countries that underwent bank crises: Japan, Finland, Norway and South Korea. The variance of the series is substantially larger during the crisis periods compared to the rest of the sample. It would be interesting to test whether the bank effect stems from these crisis episodes. The analysis in the next section shows that it does not. When crisis episodes are excluded from the sample, the estimated regression hardly changes (see table IX).

(Table IV)

(Table V)

Bank ROA can be decomposed into five components (presented as ratios of total assets): net interest income (interest income net of interest expense); plus, net non-interest income (fees and commissions received less paid plus other sources of income); less, operating expenses; less, provisions (deductions due to loan loss); less, taxes. The covariance matrix of the five items is shown in table V. Two items seem to co-vary strongly: net non-interest income and operating expenses[8]. When they are combined together into one item (net non-interest income less operating expenses), the new covariance matrix is much more sensible (see the bottom panel of table V).

The noisiest component of bank ROA is non-interest income. This is not surprising as this item includes capital gains or losses on tradable securities that are marked to market, or assets that are denominated in foreign currencies. Market prices and exchange rates are very volatile, and the volatility spills into bank profits through the non-interest income. A recent example is the sub-prime crisis where asset-backed securities lost substantial value inflicting a large loss on the banking

[8] Further breakdown of the data (available only for 30% of the sample) reveals that the source of this co-variation is two residual items ("other non-interest income" and "other operating expenses") that are correlated with a coefficient of 0.97. This exceptionally high correlation and the fact that it is found between two residual items may arise due to technical accounting reasons, obliging the bank to record some irregular operations both as income and expenditure simultaneously.

system (the current dataset does not include this period). Asset prices are correlated with financial variables such as interest rates, inflation, exchange rate, which may also have a direct effect on the real economy. Hence, these variables should be included in the regression to account for their correlation with the bank variables.

Country outliers

Several tests indicate that Turkey and Mexico are outliers in the current sample of OECD countries. Both strongly affect the regression results, especially with regard to the interest rate coefficient, which changes from negative to positive when Turkey and Mexico are included (see table IX). Table VI presents basic indicators showing the different economic environment of Turkey and Mexico compared to the other OECD countries. Turkey and Mexico are the poorest countries in the sample, in terms of GDP per capita (adjusted for PPP). Their inflation rates during the sample years are the highest, with an average annual inflation rate of 68% in Turkey and 15% in Mexico. The annual fluctuations in the inflation rate are also very high, as is evident in the standard deviations of the inflation rate. Hence, the sample years of these two countries reflect periods of financial instability, relative to the other countries. This may distort the structural relationships between the economic variables that prevail in regular times, and explain the dramatic effect on the regression results when these two countries are included in the sample. Finally, the size of the banking system measured by the ratio of loans to GDP, is also the smallest in Turkey and Mexico. Hence, Turkey and Mexico are excluded from all the regressions, and the sample consists of the other 28 OECD countries. The exclusion of Turkey and Mexico affects the estimated coefficients of the non-bank variables. However, it does not change the main conclusions of this paper regarding the real effects of the bank variables. On the contrary, the bank effect is stronger with these countries in the sample, as shown in table IX.

(Table VI)

Methodology

The joint endogeneity of real and financial variables is a major obstacle to identify causality between them. Finding a pure instrumental variable is a difficult task because most of the factors that affect bank balance sheets (such as interest rates, inflation, exchange rates) are also endogenous. The present study builds on two identification strategies: dynamic and cross sectional. The dynamic approach exploits the time series dimension of the dataset to estimate the aggregate bank effect. Since the bank variables are pure time series, their lags can be considered as weakly exogenous. This method enables to estimate the lagging effect of the bank variables on aggregate output.

The cross-sectional approach concentrates on the growth differences between different industries and estimates the differential bank effect. In this case, the endogeneity problem is minimized since the focus moves from aggregate variations over time to variation across industries, as done by Dell'Ariccia et al (2008) and Kroszner et al with respect to bank crises. These studies find that industries that are more dependent on external finance grow more slowly during bank crises. In the present paper, I estimate the differential effect of the three bank variables: ROA, CAPITAL and RESERVES. I find that financially dependent industries are more sensitive to variations in bank profits. Bank reserves and bank capital have a weaker and usually insignificant differential effect.

III. The Bank Effect on Aggregate Output

This section studies the effect of banking shocks on aggregate output. The estimated model has the following form:

(1) $$\Delta GDP_{jt} = \alpha \Delta GDP_{jt-1} + \beta_1 \Delta ROA_{jt-1} + \beta_2 \Delta CAPITAL_{jt-1} + \beta_3 \Delta RESERVES_{jt-1} + \Gamma X_{jt-1} + c_j + c_t + \varepsilon_{jt}$$

where GDP_{jt} denotes log GDP (or other real indicators) of country *j* at year *t*, ROA_{jt} denotes banks' return on assets[9] in country *j* at year *t*, $CAPITAL_{jt}$ denotes the ratio of equity capital to total assets and $RESERVES_{jt}$ denotes the ratio of cash to total assets. X_{jt} is a vector of other covariates for country *j* at year *t*, c_j and c_t are country and time fixed effects, respectively, and ε_{jt} is a stochastic error. Note that the country and time fixed effects control for structural differences between countries (*e.g.* high growing countries versus low growing countries), and global effects across time. Hence, we remain only with the variance arising from country-year specific shocks. The number of lags in all regressions is 1 year. Higher lags were found insignificant. The main interest is in the effect of *ROA*, *CAPITAL* and *RESERVES* on *GDP*, namely coefficients β_1, β_2 and β_3. The inclusion of lagged dependent variable in the RHS implies that the long run effect of the bank variables is $\beta/(1\text{-}\alpha)$. However, in all the results of this paper the coefficient of the lagged dependent variable is relatively small, so the difference between the short and long run effects is negligible. Since the explanatory variables are only weakly exogenous, a necessary condition for identification is that the residuals are serially uncorrelated. I report the serial correlation test developed by Arellano and Bond (1991). As shown in table I, availability of banking statistics ranges from 7 to 25 years so the panels are unbalanced.

Since the explanatory variables are only weakly exogenous (*i.e.*, they are correlated with past residuals), the simple least-square-dummy-variable estimator might suffer from the dynamic panel data bias (Nickell 1981). The bias is especially large for short panels. The current dataset has an average time length of approximately 17 years, which is quite large for panel datasets. Hence, the bias in this case is moderate. Nevertheless, Arellano and Bond (1991) provide a GMM estimator which handles the problem. The estimator is derived by differencing the main equation to remove the country fixed effect. Then the lags of the RHS variables are used as instruments of the

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[9] The return on assets is the ratio of aggregate annual profits to aggregate assets. Bank assets are calculated by averaging two end-year totals, 13-month, 12-month or daily balances. For more information see OECD (2004).

differenced explanatory variables. The tables below report the Arellano-Bond estimator. However, all the results prevail also with the OLS estimator (reported only for the regressions in table VIII).

The Main Results

Table VIII provides the Arellano-Bond estimator alongside the OLS estimator. The dependent variable in all the regressions is GDP growth. Column (1) presents a dynamic model with the bank variables as explanatory variables. Column (2) adds other covariates controlling for financial shocks, and column (3) includes more national account aggregates to capture a larger variety of real shocks (in addition to lagged GDP growth).

(Table VII)

(Table VIII)

Among the bank variables, ROA has the most significant effect on GDP growth. Controlling for the real interest rate[10], inflation, real exchange rate and stock prices, the effect of ROA on next year GDP growth is estimated at around 0.26. Hence, if bank ROA declines by 1 percentage point (which is equivalent to 1.7 standard errors), next year GDP growth is expected to decline by 0.26 percentage points. The model includes the lagged dependent variable as an explanatory variable suggesting that the impact of the ROA shock continues further into the future (the long-term effect is 0.38). However, the rate of decay is quite large, so the impact of ROA is practically negligible two years after the occurrence of the shock. This result appears also in the next section where industrial data is analyzed, suggesting that the real effects of banking shocks decay after two years.

The RESERVES effect is fairly small and only marginally significant. If reserves decline by 1 standard deviation (around 1.3 percents of total assets) next year GDP growth is expected to decline by approximately 0.15 percentage points. This finding indicates that in OECD countries reserve constraints on the supply of bank loans are moderate. Financial systems in these countries

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[10] Since the expected rate of inflation is unavailable for all countries, the real interest rate in period t is proxied by the nominal interest rate in t net of the inflation rate from t-1 to t.

provide an easy access to reserves through the role of the central bank as a lender of last resort. Hence, banks can obtain reserves (cash) relatively easily in times of financial distress.

The estimated effect of bank capital on GDP growth is insignificant. In fact, bank capital is found statistically insignificant in all the regressions of this study. There might be some technical reasons for that, as bank capital suffers from measurement errors making it a poor gauge of capital abundance. Note that equity capital is not measured directly, but derived from the difference between assets and debt liabilities. It is estimated on the last day of the year and thus subject to daily market fluctuations. Moreover, mergers and acquisitions or new accounting rules induce artificial changes in its size. Yet, the statistical insignificance of bank capital is robust to country sub-samples as shown in table IX. It is also robust to the exclusion of outlier observations (see column [6] in table IX) which reduces measurement errors.

The insignificant effect of variations in bank capital on economic growth found in this paper is consistent with recent findings of Giannetti and Simonov (2009). They study the effects of bailout programs that were taken in Japan during the 1990s on the bailed out banks and on their clients. They find that recapitalized banks extend more credit to their clients, but the firms receiving the credit do not create more jobs or increase their sales. Highly bank dependent firms increase investment in tangible assets, but these investments do not yield higher sales or employment. The authors conclude that capital injection may be necessary but not sufficient to stimulate economic growth. The same conclusion may be drawn from the results of this paper, which looks at this question from an aggregate point of view.

Table VIII provides estimates of the real effect of non-bank financial variables. The real interest rate and the inflation rate have a negative impact on GDP growth. The effect of the real exchange rate (defined as the value of domestic currency in terms of foreign currencies adjusted for domestic and foreign inflation rates) is also negative, while stock prices have a positive effect. Note that these variables also affect bank ROA so including them in the regression reduces the coefficient of ROA.

Robustness to country exclusions, GDP per capita, crisis episodes and outliers

Table IX examines the robustness of the bank effect. Column (1) re-estimates the model on the entire sample of 30 OECD countries, including Turkey and Mexico that were previously excluded. Column (2) excludes Turkey and Mexico, replicating column (2) in table VIII (henceforth "the benchmark regression"). As noted earlier, the bank effect is stronger with Turkey and Mexico in the sample. However, the interest rate coefficient becomes positive, which is implausible. Note that the dynamic pattern is also changed as the coefficient of lagged GDP growth becomes insignificant, and the serial correlation of the residuals increases (see the marked decline in the P value of the hypothesis that the residuals are serially uncorrelated). These effects are due to the financial instability prevailing in Turkey and Mexico during the sample years. Hence, Turkey and Mexico are excluded from the sample in all the other regressions.

(Table IX)

In columns (3) and (4) the sample is split into high and low income countries. High income countries are countries with GDP per-capita that is higher than the sample median. The bank effect prevails in each of the sub-samples, and is not significantly different than the benchmark regression (column [2]). Note that the sample consists of 28 countries (after excluding Turkey and Mexico) which are relatively homogenous in terms of GDP per capita (see table VII for details). Hence, the sample does not enable to test the dependency of the bank effect on country income in a general framework. The split into high and low income countries serves only as a robustness test of the main results.

Column (5) excludes bank crisis episodes to test whether the bank effect stems from crisis years. Data on the inception year of bank crises is taken from Dell'Ariccia, Detragiache and Rajan (2008). Out of the 28 OECD countries appearing in the benchmark sample (regression [2] in table

IX) six countries experienced a bank crisis. I follow Dell'Ariccia et al (2008) by defining the duration of a crisis to be three years (including the inception year). The only exception is Japan, where I assume that the bank crisis has lasted for 11 years (1992-2002), as is evident from the huge losses recorded up to 2002 (see figure 1). The total number of crisis observations is 26 (5.4% of the sample), including Italy (1990-1992), Norway (1987-1989), Sweden (1990-1992), Japan (1992-2002), Finland (1991-1993) and Korea (1997-1999). When these observations are excluded, the ROA coefficient remains significant. Hence, the bank effect prevails not only in crisis episodes but also in normal years. Note that the bank coefficients hardly change when crisis years are excluded. The same result is obtained also in the next section where industrial data is analyzed.

Finally, column (6) re-estimates the main regression after dropping the first and last percentiles of all the variables to control for outlier effects. Note that the ROA coefficient increases when outliers are omitted, while the other bank coefficients do not change in a significant way. Hence, the bank effect is robust also to the exclusion of outliers.

Testing the bank effect on other real variables

Table X substitutes GDP growth which was the dependent variable in the original regressions with the growth rates of the following variables: household consumption, government consumption, investment (fixed capital formation), import of goods and services and export of goods and services. The goal is to see whether the bank effect is changing across different types of economic activities. One would expect to find a stronger effect on activities that are more dependent on external finance. The results support this hypothesis. The effect of bank ROA on investment growth (INVESTMENT) is estimated at 1.4, almost five times higher than the effect on consumption growth (CONSUMPTION). Capital investment requires more external finance than private consumption, so the stronger bank effect on investment is consistent with the hypothesis that causality goes from the banking sector to the real economy. Note that the models in table X include lagged dependent variable and lagged GDP growth as explanatory variables. Hence, they allow for different dynamic structures and different degree of pro-cyclicality of the dependent variables. For instance, investment growth is evidently more pro-cyclical than consumption growth (see the higher coefficient of lagged GDP growth), while the latter exhibit higher inertia (see the higher coefficient of the lagged dependent variable). Hence, the large effect of bank ROA on investment growth, compared to consumption growth, is not a result of the higher degree of pro-cyclicality of investment, as it is already taken into account by the other covariates.

(Table X)

Table X provides more evidence on the existence of a bank effect on real economic activity. Note that economic activities that are more sensitive to bank ROA are also more sensitive to interest rates and stock prices. For example, the coefficients of ROA, the real interest rate and the stock market on investment growth are 1.40, -0.76 and 0.08, respectively. The same variables have lower effect on import growth, namely, 0.91, -0.55 and 0.06, respectively. These explanatory variables capture various aspects of financing conditions. ROA determines the financial state of the banking sector, and hence the ability of banks to lend; the interest rate determines borrowing costs in the market for loans; and stock prices reflect financing conditions in the equity market through Tobin's Q. Hence, the coefficients of these variables are expected to move in the same direction (in absolute terms) as the dependent variable changes. Namely, if investment requires more external finance than import, it should be more sensitive than import to bank ROA, to the interest rate and to stock prices. This is exactly the result obtained in table X. It verifies that the ROA coefficient captures the effect of financing conditions on real economic activity.

Does the bank effect reflect a broader balance sheet channel?

The estimated effect of bank ROA on GDP growth supports the hypothesis of a bank balance sheet channel. This channel works through the dependence of the supply of loans on banks' balance sheets. When banks have abundant capital, they are more willing to take risks and expand their lending. But the results are also consistent with a broader balance sheet channel, as in Bernanke and

Gertler (1989), working through the balance sheet of the non-bank sector. For example, during recessions banks may become more selective in supplying loans to firms and households, not necessarily because of their own financial problems, but simply because borrowers become more risky as their balance sheets deteriorate. The financial state of the banking system is obviously correlated with the state of the non-bank sector, so the estimated effect of the bank variables may reflect a non-bank balance sheet channel.

The hypothesis of the non-bank balance-sheet channel has already been taken into account by the inclusion of many economic and financial controls in the regressions above. It is hard to think of business shocks that are not correlated with the various controls that already appear in the regression, particularly stock prices and national account aggregates. Yet, the data at hand enables to control for the non-bank balance sheet channel in a more direct way. The dataset contains information on bank provisions, which are highly correlated with the financial state of the non-bank sector. Bank provisions reflect actual or anticipated loan loss. When borrowers default (or are expected to default) on their bank loans, the bank records the anticipated loss in the provisions item, which is then deducted from its income. Hence, by including provisions into the regression we can control directly for shocks to the non-bank sector.

(Table XI)

In table XI bank ROA is decomposed into five components, namely: net interest income, net non-interest income, operating expenses, provisions and tax. These variables are expressed as ratios of total bank assets, so they sum up exactly to the original ROA variable in table VIII. The decomposition of ROA enables to identify the source of the bank effect. For instance, if the effect stems from the non-bank sector we would expect to find that the provision item is significant while the other components of ROA are not.

Table XI shows that all the components of bank ROA affect GDP growth in the expected direction and most of them are statistically significant. Income items (interest and non-interest income) have a positive effect on GDP and expenditure items (operating expenses, provisions and tax) have a negative effect. The results reject the hypothesis that the ROA effect stems from a non-bank balance sheet channel, as provisions are not more significant than other components of ROA.

Note that the inclusion of financial controls into the regression in column (2) reduces the coefficients of non interest income and operating expenses (compared to column [1] which was estimated on the same sample), but the coefficients of interest income and provisions hardly change. This implies that asset market volatility (captured by the financial controls) affects mainly non interest income and operating expenses, while interest income and provisions are less affected by it. Interestingly, the coefficient of interest income is the largest among all income items, and is also the most statistically significant. Since interest income is the core business of the bank, any change in this item is taken more seriously by the bank than comparable changes in other items, and the bank response in terms of lending is more pronounced.

Variation of the bank effect across countries

OECD countries are relatively homogenous so the present dataset is not ideal for identifying variations of the bank effect across counties. Nevertheless, there are some differences which can be tested, especially with regard to financial development. As table VI shows, the size of the banking system, measured by loans to GDP, is heterogeneous within the OECD group of countries, ranging from 20% to 160% (in Switzerland and Luxembourg the banking sector is even larger due to highly active international banking). Hence, the dataset is suitable for testing whether the bank effect differs according to the size of the banking system. Other measures of financial development that were examined were bank concentration, the loan/deposit and loan/asset ratios, and stock market and bond market capitalization, taken from the 2008 version of Beck, Demirgüç-Kunt and Levine (1999). The results (not reported) showed no significant impact of these financial measures on the bank effect.

(Table XII)

The effect of the size of the banking sector on the transmission of banking shocks is analyzed in table XII. The table re-estimates the benchmark regression, but allows the bank coefficients to change with the size of the banking system, measured by total loans to GDP. Column (1) adds to the original equation interactions of the bank variables with the lagged ratio of loans to GDP. The results are somewhat weak, mainly due to extremely high ratios of loans to GDP in Switzerland and Luxemburg (see table VI). In column (2) the bank variables are interacted with the dummy variable HIGH indicating 1 when the lagged ratio of loan to GDP is above the sample median (which is 67%) and zero otherwise. The ROA effect is significantly higher in countries with high ratio of loans to GDP. Kroszner, Laeven and Klingebiel (2007) found a similar result with respect to bank crises, showing that the crisis effect was larger in countries with higher ratio of loans to GDP[11].

IV. The Differential Effects of Banking Shocks

The previous section estimated the bank effect on aggregate output. In this section I look at the industry level and test whether financially dependent industries are more sensitive to banking shocks. Financially constrained industries depend more heavily on bank credit, so they should be more sensitive to fluctuations in the supply of credit. Hence, if the real effects of banking shocks work through the bank lending channel, then financially dependent industries should be more sensitive to fluctuations in the bank variables. This hypothesis can be tested by estimated the differential effect of the bank variables on financially dependent versus independent industries.

Nevertheless, the existence of a differential effect may be also consistent with the reverse causality. Financially dependent sectors obtain more loans than other sectors, and when they default the effect on bank performance is larger. Hence, even if banks do not affect industrial production we expect to find higher correlation between financially dependent sectors and the banking system.

[11] While Kroszner et al (2007) used IFS data on loans from deposit money banks, I use here OECD data that includes loans from all banking institutions. The difference between the two measures might be substantial in countries with large sector of savings and loans institutions that do not issue checking accounts.

Yet this type of correlation can exist only for large industries whose share in bank assets is high enough to affect the whole banking system. Hence, the reverse causality hypothesis can be tested by splitting the sample into small and large industries and comparing the results between the two sub-samples. If the estimated differential effect is driven by reverse causality, it should be smaller in the small-industry sub-sample, since the bias caused by the reverse causality is lower in this case. The results of this exercise suggest that reverse causality is negligible in the current sample (see table XIV).

Dependence on external finance is measured by an index originally proposed by Rajan and Zingales (1998). They used financial data on publicly traded US firms during the 1980s and derived a measure of financial dependence which is the share of capital expenditures not financed by internal sources. Namely, financial dependence equals one minus the ratio of the firm cash flow to its capital expenditures. The crucial assumption is that financial dependence is part of the production technology of the industry. Hence, firms of the same industry but in different countries (or periods) are assumed to have the same external dependence. This assumption allows us to use the US data on external dependence developed by Rajan and Zingales as a general measure of external dependence also in other countries. Kroszner et al (2007) explored this assumption thoroughly. They calculated the Rajan-Zingales index for US firms in different periods, and also for firms in other countries. The correlation of their new indices with the Rajan-Zingales original index was around .8. Hence, their results support the assumption that the Rajan-Zingales financial dependence index is industry specific as it does not change much over time and across countries.

Industrial data is taken from the 2006 edition of INDSTAT3 published by the United Nations Industrial Development Organization (UNIDO). The data is classified according to the second revision of the International Standard Industrial Classification (ISIC), which is compatible with Rajan and Zingales (1998) classification. The industrial data is at the 3 digit level and the external dependence measure is taken from table A1 in Dell'Ariccia, Detragiache and Rajan (2008).

The basic model has the form:

$$(2) \qquad \Delta Y_{ijt} = \alpha \Delta Y_{ijt-1} + \beta_1 EXDEP_i * \Delta ROA_{jt} + \beta_2 EXDEP_i * \Delta CAPITAL_{jt} + \beta_3 EXDEP_i * \Delta RESERVES_{jt} + \Gamma X_{ijt} + c_{ij} + c_{it} + c_{jt} + \varepsilon_{ijt}$$

Y_{ijt} is the indicator of (log) real economic activity of industry i in country j at year t. $EXDEP_i$ denotes the Rajan-Zingales index of external dependence of industry i, and it is interacted with the bank variables. The main interest is whether these interactions have a positive effect in the regression. If they do, then banking shocks have a larger effect on industries that are more financially constrained, indicating causality from banks to the real economy. X_{ijt} stands for observable variables that are country-industry-year specific. Following Dell'Ariccia et al (2008), the model incorporates three types of fixed effects estimated by a set of dummy variables. The dummies correspond to country-industry fixed effects, country-year fixed effects and industry-year fixed effects. Hence, the regression controls for all types of unobservables, except for variables that are country-industry-year specific.

Indstat3 provides three alternative measures of industrial activity: output, value added and an index of industrial production. Output and value added are reported at current prices. They are obtained through annual census and designed to measure the level and composition of industrial activity. Output measures the value of goods produced by the industry while value added is the difference between output and input of goods and services. The industrial production index is a separate indicator designed to measure the *change* in industrial activity. It is compiled on a monthly or quarterly basis and carefully adjusts for price changes, classifications, sampling coverage and other distortions. Hence, on a time dimension the industrial production index is a better proxy for business fluctuations than the census output or value added. Table XIII presents summary statistics of the three variables, after excluding 1% from each side of the distribution due to outliers. Production growth is less volatile than output and value added growth and more correlated with GDP growth. Therefore, I take the production index as the prime measure of industrial growth, but also report the results with the other two indicators. Another advantage of the production index over output and value added is data availability which is 30% higher.

(Table XIII)

I assume that the bank variables and all the other macroeconomic variables are strictly exogenous. Recall that the regression includes country-industry, country-year and industry-year fixed effects, so the residuals contain only country-industry-year specific shocks. Hence, any correlation between the dependent variable and the explanatory variables arising from aggregate business fluctuations or world-wide industry shocks is already captured by the dummy variables. It leaves us with shocks that are unique to the industry, country and year. These shocks can affect the macroeconomic variables only if the industry is very large. In the present sample, more than 97% of the observations are small industries whose size is less than 3% of GDP. Hence, it seems plausible to assume that the residuals, which represent fairly small economic units, are not correlated with the bank variables and the other macroeconomic variables (after controlling for country-year specific shocks).

Main results

Table XIV presents the main results, after dropping the first and last percentiles of the distribution of production growth due to extreme outliers (some of them are distanced more than 10 standard deviations from the mean). All variables are treated as strictly exogenous except for the lagged dependent variable and lagged industry size. These two variables are only weakly exogenous and hence instrumented by their own lags in the Arellano-Bond estimator. Column (1) presents the main equation. The interaction of the external dependence index with bank ROA is positive and significant, indicating that financially dependent industries are more sensitive to variations in bank ROA. As in the country-level analysis, the effect of RESERVES is less significant than ROA, and the CAPITAL effect is generally insignificant.

(Table XIV)

The differential bank effect lasts for two years. It comprises a contemporaneous effect and a lagging effect. Higher lags were found insignificant, so the total length of the bank effect is two years. Note that in the country-level analysis of the previous section, the bank effect was also negligible two years after the shock, since the rate of decay was high. The same dynamics is found in Demirgüç-Kunt, Detragiache and Gupta (2006). Using data on 36 bank crises in developed and developing countries, they calculate the dynamics of GDP growth (and other variables) along the crisis. They find that GDP contraction tends to last one year in addition to the crisis inception year.

Column (2) adds interactions of financial dependence with several macroeconomic variables to control for differential effects of non-bank variables. For example, financially dependent sectors may be more sensitive to interest rates or to other financial variables that are also correlated with the bank variables. It is also possible that financially dependent sectors are more pro-cyclical than other sectors. This effect is captured by the interaction of $EXDEP_i$ with the variable $\Delta GDPREST_{ijt}$ which denotes GDP growth of country j excluding industry i (which stands as the dependent variable). The ROA effect on the production index does not change by the inclusion of these controls, confirming the robustness of the differential effect.

As in the previous section, I examine in column (3) whether the differential effect of ROA remains significant when crisis episodes are excluded. Since the data now is at the industry level, the number of observations relating to bank crises is larger amounting to 786 observations (7.4% of the sample). The exclusion of these observations does not change the result in a significant way. The coefficients of current and lag EXDEP*ROA change by half a standard deviation at the most, and the sum of the two coefficient stays almost the same. Hence, the estimated differential effect does not stem from crisis episodes. It reflects causal relationships between banking shocks and real economic activity prevailing generally in crisis and non-crisis years. This result complements Dell'Ariccia, Detragiache and Rajan (2008) and Kroszner, Laeven and Klingebiel (2007) who found that financially dependent industries are more sensitive to bank crises.

The identification of the differential effect depends on the assumption that there is no reverse causality. As already mentioned, the reverse causality bias should be more severe in a sample of large industries, as it hinges on the assumption that shocks at the industry level (that are not correlated with shocks at the country level captured by the country-year fixed effects) affect the whole banking system. Small industries, even if they are financially constrained, have negligible impact on the banking system, so reverse causality is less plausible in that case. Hence, we can test the existence of reverse causality by estimating the differential effect in a sample of small and large industries separately. Since the bias should be smaller in the small-industry sample, the estimated differential effect should be lower if it is driven by reverse causality. This is done in columns (4) and (5) where the sample is divided into industries that are smaller than the sample median (0.45% of GDP) and larger industries. The differential effect in the former sample is larger and more significant than the latter, contradicting the hypothesis that the results stem from reverse causality.

Finally, table XV reports the results of the main regressions with different indices of industrial growth, namely, real output growth and real value added growth (the GDP deflator is used to obtain real growth rates). These variables are noisier than the original production growth, since they do not adjust for price changes, classification, sampling coverage and other distortions. This is evident especially in the value-added regressions (columns IV-VI), where the two lags of the dependent variable are negative. In the output regressions (columns I-III) the first lag is positive but the second is negative. This finding suggests that some type of error correction dynamics resulting from measurement errors exists in the dependent variable. Nevertheless, the contemporaneous differential effect is still significantly positive, though the lagging effect is not significant.

(Table XV)

V. Summary

This paper estimates the effect of bank profits, bank capital and bank reserves on economic growth. The focus is on short term banking shocks and their impact on the business cycle. The first section estimates the lagging effect of banking shocks on GDP growth. Shocks to bank profit are found to have a significant effect on GDP growth. The effect is stronger for economic activities that require higher amount of finance, such as capital investment, compared to less financially constrained activities (*e.g.* private or government consumption). Furthermore, activities that are more affected by banking shocks, also exhibit higher sensitivity to interest rate shocks and stock market shocks. These results suggest that the estimated bank effect is indeed related to financing conditions.

The second section exploits industry-level data and shows that industries that are more financially constrained are also more sensitive to variations in bank profits. The differential effect of bank profits comprises a contemporaneous effect and a lagging effect, approximately of the same magnitude. Hence, the real effects of profit shocks seem to last for two years. This finding is consistent with the country-level analysis and the stylized facts on bank crises found by Demirgüç-Kunt, Detragiache and Gupta (2006).

Among the bank variables tested in this paper, bank profit has the most significant impact on the real economy, while bank reserves exhibit a weaker effect. On the other hand, bank capital is found insignificant in almost all the regressions of this paper, over different specifications, dependent variables, and samples. A similar result was found recently by Giannetti and Simonov (2009) who showed that recapitalization of Japanese banks during the 1990s, as part of the government bailout program, did not have significant effects on the real economic activity of the bank clients.

References

Albertazzi, Ugo, and Leonardo Gambacorta, "Bank Profitability and the Business Cycle," Banca D'Italia Temi di discussione No. 601, 2006.

Arellano, Manuel, and Stephen Bond, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58 (1991), 277-297.

Ashcraft, Adam B., "Are Banks Really Special? New Evidence from the FDIC-Induced Failure of Healthy Banks," *The American Economic Review*, 95 (2005), 1712-1730.

Barrell, Ray, Philip E. Davis, and Olga Pomerantz, “Costs of financial instability, household-sector balance sheets and consumption,” *Journal of Financial Stability*, 2 (2006), 194–216.

Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine, "A New Database on Financial Development and Structure," World Bank Policy Research Working Paper No. 2146, 1999.

Bernanke, Ben S., and Alan Blinder, "Credit, Money and Aggregate Demand," *The American Economic Review*, 78 (1988), 435-439.

Bernanke, Ben S., and Mark Gertler, "Banking and macroeconomic equilibrium," in *New approaches to monetary economics*, William A. Barnett and Kenneth J. Singleton, eds. (Cambridge: Cambridge University Press, 1987).

Bernanke, Ben S. and Mark Gertler, “Agency Costs, Net Worth, and Business Fluctuations,” *The American Economic Review*, 79 (1989), 14-31.

Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, and Maria S. Martinez-Peria, “Is the crisis problem growing more severe?,” *Economic Policy*, 32 (2001), 51–82.

Calomiris, Charles W. and Joseph R. Mason, "Consequences of Bank Distress during the Great Depression," *The American Economic Review*, 93 (2003), 937-947.

Chami, Ralph and Thomas F. Cosimano, “Monetary Policy with a Touch of Basel,” IMF Working Paper No. WP/01/151, 2001.

Davis, Philip E., and Mark R. Stone, "Corporate financial structure and financial stability," *Journal of Financial Stability*, 1 (2004), 65–91.

Dell’Ariccia, Giovanni, Enrica Detragiache, and Raghuram Rajan, “The real effect of banking crises,” *Journal of Financial Intermediation*, 17 (2008), 89–112.

Demirgüç-Kunt, Asli, Enrica Detragiache, and Poonam Gupta, “Inside the crisis: An empirical analysis of banking systems in distress,” *Journal of International Money and Finance*, 25 (2006), 702-718.

Giannetti, Mariassunta and Andrei Simonov, "On the Real Effects of Bank Bailouts: Micro-Evidence from Japan", mimeo, 2009.

Holmstrom, Bengt, and Jean Tirole, “Financial intermediation, loanable funds and the real sector,” *Quarterly Journal of Economics*, 112 (1997), 663–691.

Kaminsky, Graciela L. and Carmen M. Reinhart, "The Twin Crises: The Causes of Banking and Balance-Of-Payments Problems," *The American Economic Review*, 89 (1999), 473-500.

Kashyap, Anil K., and Jeremy C. Stein, “What Do a Million Observations on Banks Say about the Transmission of Monetary Policy?,” *The American Economic Review*, 90 (2000), 407-428.

Kroszner, Randall S., Luc Laeven, and Daniela Klingebiel, “Banking crises, financial dependence, and growth,” *Journal of Financial Economics*, 84 (2007), 187–228.

Loutskina, Elena, and Philip E. Strahan, "Securitization and the Declining Impact of Bank Finance on Loan Supply: Evidence from Mortgage Originations," *The Journal of Finance*, 64 (2009), 861-889.

Maddala , Gangadharrao S., and Shaowen Wu, "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test," *Oxford Bulletin of Economics and Statistics*, 61 (1999), 631-52.

Nickell, Stephen, "Biases in Dynamic Models with Fixed Effects," *Econometrica*, 49 (1981), 1417-1426.

OECD, *Bank Profitability Methodological Country Notes 2004*, (OECD Publishing).

Peek, Joe and Eric S. Rosengren, “Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States,” *The American Economic Review*, 90 (2000), 30–45.

Rajan, Raghuram G., and Luigi Zingales, "Financial Dependence and Growth," *The American Economic Review*, 88 (1998), 559-586.

Reinhart, Carmen M. and Kenneth S. Rogoff, "The Aftermath of Financial Crises," *The American Economic Review: Papers & Proceedings*, 99 (2009), 466-472.

Reinhart, Carmen M. and Kenneth S. Rogoff, "Banking Crises: An Equal Opportunity Menace," National Bureau of Economic Research Working Paper 14587 (2008).

Sharpe, Steven A., “Bank Capitalization, Regulation, and the Credit Crunch: A Critical Review of the Research Findings,” Federal Reserve Board Finance and Economic Discussion Series no. 95-20, 1995.

Van den Heuvel, Skander J., “The Bank Capital Channel of Monetary Policy,” Society for Economic Dynamics 2006 Meeting Papers No. 512, 2006.

Vennet, Rudi V., The law of proportionate effect and OECD bank sectors, Unpublished Manuscript, 1999.

Table I: Aggregation groups and availability of bank statistics

Country	**Banking Group**	**Availability**
Australia	All banks	1986-2003
Austria	All banks	1987-2003
Belgium	All banks	1981-2003
Canada	Commercial banks	1982-2003
Czech republic	All banks	1994-2003
Denmark	Commercial banks and savings banks	1980-2003
Finland	All banks	1979-2003
France	All banks	1988-2003
Germany	All banks	1979-2003
Greece	Commercial banks from 1989 and large commercial banks up to 1988 (chained backwards)	1979-2003
Hungary	Commercial banks	1994-2003
Iceland	Commercial banks and savings banks	1979-2003
Ireland	All banks	1995-2003
Italy	All banks	1984-2003
Japan	All banks from 1989 and commercial banks up to 1988 (chained backwards)	1979-2003
Korea	Commercial banks	1990-2001
Luxemburg	Commercial banks	1979-2003
Mexico	Commercial banks	1989-2003
Netherlands	All banks	1987-2003
New Zealand	All banks	1990-2003
Norway	All banks	1980-2003
Poland	All banks	1994-2003
Portugal	Commercial banks	1980-2003
Slovak republic	All banks	1997-2003
Spain	All banks	1979-2003
Sweden	Commercial banks	1979-2003
Switzerland	All banks	1980-2003
Turkey	Commercial banks	1983-2003
United kingdom	Commercial banks	1984-2003
United states	Commercial banks	1979-2003

Table II: Variables and their sources

Variable	Source
Bank Statistics	OECD – Bank Profitability
National accounts, CPI, Real exchange rate	Source OECD, IFS
Interest rates	
Bond yields, 10 years to maturity; or	Source OECD
Mortgage interest rates; or	IFS
Interbank interest rate (Turkey only)	IFS
Stock prices	
All sectors	Source OECD, IFS
Industrial (Norway only)	Source OECD
Industrial statistics	INDSTAT3

Table III: Summary Statistics of Bank Financial Indicators, by Country

		Return on Assets (%)				Capital to Assets (%)				Cash to Assets (%)			
		Level	First Difference			Level	First Difference			Level	First Difference		
	Obs	Mean	Mean	Max	Min	Mean	Mean	Max	Min	Mean	Mean	Max	Min
Australia	18	0.93	0.08	1.81	-0.73	9.2	0.05	2.48	-4.41	1.1	-0.13	0.30	-0.56
Austria	17	0.39	-0.01	0.14	-0.28	4.6	0.10	0.43	-0.55	1.6	-0.04	0.66	-0.65
Belgium	23	0.26	0.01	0.21	-0.17	3.0	0.07	0.48	-1.41	0.4	0.04	0.89	-0.36
Canada	22	0.63	0.02	0.32	-0.40	5.1	0.09	0.55	-0.42	1.0	-0.09	0.09	-0.29
Czech Republic	10	-0.01	0.12	2.03	-0.81	9.1	-0.49	3.25	-2.19	12.2	1.51	7.34	-1.01
Denmark	24	0.62	-0.01	2.25	-3.11	7.5	-0.14	1.07	-1.41	3.4	0.18	3.03	-2.41
Finland	25	0.20	0.06	1.83	-2.13	6.1	0.17	5.91	-1.74	3.1	-0.09	1.74	-2.17
France	16	0.27	0.01	0.19	-0.15	4.2	0.14	0.55	-0.30	0.7	-0.02	0.37	-0.38
Germany	25	0.22	-0.01	0.13	-0.19	3.8	0.05	0.34	-0.17	2.1	-0.13	0.25	-0.87
Greece	25	0.77	0.00	1.65	-1.02	5.1	0.07	3.91	-2.67	15.2	-0.18	5.19	-5.38
Hungary	10	0.56	0.12	2.75	-3.05	9.5	0.26	0.90	-0.61	16.7	-1.32	9.29	-6.26
Iceland	25	0.67	-0.01	1.08	-1.47	7.3	0.08	1.11	-1.40	8.8	-0.76	1.42	-3.68
Ireland	9	0.93	-0.05	0.08	-0.18	6.1	-0.19	0.33	-0.99	0.7	0.03	0.35	-0.14
Italy	20	0.45	0.00	0.39	-0.22	6.1	0.18	0.85	-0.24	4.3	-0.35	0.67	-2.17
Japan	25	0.00	0.00	1.15	-0.76	3.2	0.05	1.60	-0.69	11.4	-0.26	2.07	-2.83
Korea	12	-0.11	0.00	1.73	-2.10	6.5	-0.43	0.97	-2.15	9.2	-1.48	0.19	-3.48
Luxembourg	25	0.27	0.01	0.15	-0.09	3.1	0.05	1.44	-1.21	0.4	0.04	0.71	-0.53
Mexico	15	0.93	0.00	0.97	-1.22	7.7	0.35	2.02	-1.10	3.3	-0.01	4.81	-3.42
Netherlands	17	0.50	-0.01	0.14	-0.26	4.1	-0.04	0.49	-0.38	1.5	0.03	1.47	-1.36
New Zealand	14	0.92	0.05	0.46	-0.28	5.3	0.11	1.20	-1.44	0.9	0.05	0.46	-0.30
Norway	24	0.44	0.00	2.79	-2.37	5.4	0.06	2.26	-0.96	1.3	0.05	2.62	-2.16
Poland	10	1.14	0.05	2.07	-1.38	8.8	0.09	1.05	-1.64	6.4	-0.56	2.35	-3.27
Portugal	24	0.64	0.01	0.34	-0.34	8.9	0.35	2.05	-1.40	6.9	-0.09	7.48	-3.55
Slovak Republic	7	-0.11	0.22	4.53	-3.54	8.8	-0.29	3.72	-4.45	12.2	0.30	2.20	-3.69
Spain	25	0.72	0.00	0.48	-0.70	8.5	0.04	1.24	-0.83	5.8	-0.21	3.15	-2.16
Sweden	25	0.51	0.01	1.84	-1.79	5.4	0.15	2.32	-0.98	1.8	-0.12	0.68	-1.29
Switzerland	24	0.48	0.00	0.50	-0.44	6.0	-0.02	1.45	-0.84	1.8	-0.14	0.79	-1.73
Turkey	21	1.49	0.08	9.11	-3.79	6.0	0.40	4.67	-3.27	5.6	-0.32	1.46	-1.87
United Kingdom	20	0.60	0.02	0.87	-0.87	4.6	0.03	0.90	-0.80	1.0	-0.08	0.15	-0.52
United States	25	0.89	0.02	0.63	-0.54	7.2	0.14	0.76	-0.21	4.4	-0.22	0.46	-1.05

Table IV: Summary Statistics of Bank Financial Indicators

	Total Sample			Excluding Turkey and Mexico		
	ROA	CAPITAL	RESERVES	ROA	CAPITAL	RESERVES
Mean	0.00	0.00	0.00	0.00	0.00	0.00
1^{st} percentile	-3.10	-1.92	-3.57	-2.19	-1.73	-3.57
99^{th} percentile	2.02	3.52	4.52	1.97	2.20	3.77
Sd	0.76	0.79	1.31	0.60	0.73	1.30
Kurtosis	44.86	16.42	15.25	17.80	19.22	16.10
Obs	552	552	552	518	518	518

* Data is differenced and then demeaned using country-specific means.

Table V. Covariance Matrix of ROA Components*

	Interest Income (Net)	Non Interest Income (Net)	Operating Expenses	Provisions	Tax
Interest Income (Net)	0.55				
Non Interest Income (Net)	-0.39	1.73			
Operating Expenses	0.08	1.07	1.28		
Provisions	0.17	-0.24	-0.09	0.29	
Tax	0.02	0.06	-0.01	0.00	0.04

	Interest Income (Net)	Other net income**	Provisions	Tax
Interest Income (Net)	0.55			
Other net income**	-0.47	0.87		
Provisions	0.17	-0.15	0.29	
Tax	0.02	0.07	0.00	0.04

* Data is in percents of average assets. It was differenced and then demeaned using country-specific means.
** "Other net income" comprises net non interest income less operating expenses.

Table VI. OECD Countries, Economic Indicators
(Sorted by GDP per capita)

	GDP per capita*	Inflation (%)		Loans to GDP (%)	Sample years**
	mean	mean	SD	mean	
Turkey	6.0	67.5	19.5	20.2	1988-2003
Mexico	8.4	15.0	10.5	21.9	1992-2003
Poland	9.9	11.0	8.8	23.2	1995-2003
Slovak Republic	11.4	8.0	3.1	35.0	1998-2003
Hungary	11.8	13.7	8.2	31.2	1995-2003
Korea	13.9	5.0	2.3	37.9	1991-2001
Czech Republic	14.9	5.5	3.8	48.0	1995-2003
Portugal	15.1	5.8	3.8	78.5	1989-2003
Greece	16.6	10.6	6.7	25.9	1986-2003
Spain	16.9	6.6	4.2	70.5	1980-2003
New Zealand	19.7	1.9	1.0	95.8	1991-2003
Finland	21.2	4.2	3.4	65.7	1980-2003
Germany	22.0	2.5	1.8	91.0	1980-2003
United Kingdom	22.2	3.2	2.1	69.3	1985-2003
Japan	22.3	1.5	2.0	96.6	1980-2003
Italy	22.9	4.4	2.0	61.4	1985-2003
France	23.3	2.0	0.9	88.8	1989-2003
Sweden	23.5	5.0	4.0	37.7	1980-2003
Belgium	23.5	2.9	2.1	98.3	1982-2003
Denmark	24.3	3.8	2.7	50.4	1981-2003
Australia	24.4	3.7	2.6	61.7	1987-2003
Canada	24.6	3.0	1.6	65.5	1983-2003
Netherlands	25.7	2.4	0.8	163.7	1988-2003
Austria	26.9	2.2	1.1	120.1	1991-2003
Ireland	27.0	3.2	1.6	160.8	1996-2003
Iceland	27.1	3.1	1.8	68.1	1994-2003
United States	28.7	4.0	2.8	38.9	1980-2003
Switzerland	28.9	2.4	2.0	194.2	1981-2003
Norway	29.3	4.6	3.3	60.5	1981-2003
Luxembourg	39.3	3.2	2.6	717.6	1981-2003

* Sample average of GDP per capita in thousands of US dollars, 2000 prices, adjusted for PPP.
** Sample years correspond to regression II in table VIII.

Table VII: Abbreviations

Abbreviation	Interpretation	Notes
GDP	log(GDP at constant prices)	
ROA	bank profits / bank assets	Annual average
CAPITAL	bank equity capital / bank assets	Year end
RESERVES	bank cash / bank assets	Year end
REAL INTEREST	interest rate - ΔCPI/lagged CPI	Annual average
INFLATION	Δlog(CPI)	Annual average
RER	log(real exchange rate)	Annual average
STOCKS	log(stock prices / CPI)	Annual average
INVESTMENT	log(fixed capital formation at constant prices)	
CONSUMPTION	log(household consumption at constant prices)	
GOVERNMENT	log(government consumption at constant prices)	
IMPORT	log(import of goods and services at constant prices)	
EXPORT	log(export of goods and services at constant prices)	
PRODUCTION	log(industrial production at constant prices)	
EXDEP	Rajan-Zingales index of external finance dependency	
SIZE	Industry value added to total GDP	
ΔGDPREST	(ΔGDP - SIZE*ΔPRODUCTION)/(1- SIZE)	

Table VIII: The effect of bank ROA, CAPITAL and RESERVES on GDP growth

Dependent Variable: ΔGDP_t						
	Arellano-Bond			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
ΔGDP_{t-1}	0.264***	0.310***	0.217**	0.340***	0.320***	0.219**
	(0.062)	(0.071)	(0.102)	(0.078)	(0.082)	(0.090)
ΔROA_{t-1}	0.366***	0.261***	0.258***	0.376**	0.261**	0.260**
	(0.101)	(0.092)	(0.095)	(0.152)	(0.131)	(0.131)
$\Delta CAPITAL_{t-1}$	-0.019	-0.048	-0.032	0.024	-0.053	-0.042
	(0.137)	(0.100)	(0.102)	(0.119)	(0.116)	(0.116)
$\Delta RESERVES_{t-1}$	0.186**	0.119	0.136	0.142**	0.119*	0.134*
	(0.086)	(0.078)	(0.083)	(0.066)	(0.066)	(0.072)
ΔREAL INTEREST$_{t-1}$		-0.180***	-0.207***		-0.160*	-0.154*
		(0.066)	(0.069)		(0.083)	(0.085)
$\Delta INFLATION_{t-1}$		-0.225***	-0.196***		-0.184**	-0.157*
		(0.050)	(0.065)		(0.085)	(0.088)
ΔRER_{t-1}		-0.049**	-0.057**		-0.051***	-0.059***
		(0.023)	(0.024)		(0.019)	(0.019)
$\Delta STOCKS_{t-1}$		0.024***	0.023***		0.025***	0.025***
		(0.004)	(0.004)		(0.005)	(0.005)
$\Delta INVESTMENT_{t-1}$			0.024			0.022
			(0.028)			(0.024)
$\Delta CONSUMPTION_{t-1}$			0.039			0.046
			(0.048)			(0.043)
$\Delta GOVERNMENT_{t-1}$			0.046			0.032
			(0.074)			(0.087)
H_0: Residuals are serially uncorrelated (P value)	0.43	0.56	0.56			
No. of observations	518	485	484	518	485	484
No. of countries	28	28	28	28	28	28

Models include time and country fixed effects.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.

Table IX: Robustness tests of the main equation

	Dependent Variable: ΔGDP_t					
	Arellano-Bond					
	(1)	(2)	(3)	(4)	(5)	(6)
ΔGDP_{t-1}	0.126	0.310***	0.232***	0.383***	0.347***	0.264***
	(0.113)	(0.071)	(0.072)	(0.099)	(0.060)	(0.054)
ΔROA_{t-1}	0.471***	0.261***	0.195*	0.235	0.232***	0.464**
	(0.130)	(0.092)	(0.102)	(0.169)	(0.089)	(0.199)
$\Delta CAPITAL_{t-1}$	0.051	-0.048	-0.020	-0.048	-0.120	0.064
	(0.117)	(0.100)	(0.102)	(0.157)	(0.089)	(0.152)
$\Delta RESERVES_{t-1}$	0.093	0.119	0.135	0.128**	0.059	0.089
	(0.070)	(0.078)	(0.134)	(0.063)	(0.068)	(0.092)
ΔREAL INTEREST$_{t-1}$	0.036***	-0.180***	0.007	-0.248***	-0.195***	-0.101
	(0.012)	(0.066)	(0.132)	(0.088)	(0.069)	(0.089)
$\Delta INFLATION_{t-1}$	-0.043	-0.225***	-0.153	-0.216***	-0.243***	-0.226***
	(0.058)	(0.050)	(0.125)	(0.060)	(0.058)	(0.070)
ΔRER_{t-1}	-0.071**	-0.049**	-0.059***	-0.060*	-0.033*	-0.040*
	(0.030)	(0.023)	(0.027)	(0.031)	(0.018)	(0.022)
$\Delta STOCKS_{t-1}$	0.016*	0.024***	0.019***	0.023***	0.022***	0.026***
	(0.009)	(0.004)	(0.009)	(0.003)	(0.004)	(0.007)
H_0: Residuals are serially uncorrelated (P value)	0.20	0.56	0.32	0.24	0.69	0.78
Notes:	All OECD countries	Turkey and Mexico excluded	High income countries	Low income countries	Crisis episodes excluded	Outliers excluded
No. of observations	513	485	261	224	459	431
No. of countries	30	28	14	14	28	28

Models include time and country fixed effects.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
Crisis episodes include Italy (1990-1992), Norway (1987-1989), Sweden (1990-1992), Japan (1992-2000), Finland (1991-1993) and Korea (1997-1999).
Outliers defined as the first and last percentiles of each variable in the regression.
See variable definitions in table VII.

Table X: The effect of the bank variables on other national accounts
Arellano-Bond estimator

	Dependent Variable:				
	ΔINVESTMENT$_t$	ΔIMPORT$_t$	ΔEXPORT$_t$	ΔCONSUMPTION$_t$	ΔGOVERNMENT$_t$
Lag dependent variable	-0.028	-0.061	0.031	0.176*	0.038
	(0.101)	(0.076)	(0.052)	(0.105)	(0.078)
ΔGDP$_{t-1}$	0.890**	0.306	0.036	0.205**	0.234***
	(0.359)	(0.266)	(0.109)	(0.094)	(0.058)
ΔROA$_{t-1}$	1.368***	0.906*	0.526*	0.322*	-0.049
	(0.347)	(0.506)	(0.298)	(0.185)	(0.173)
ΔCAPITAL$_{t-1}$	-0.271	0.088	-0.162	0.078	0.231
	(0.433)	(0.275)	(0.248)	(0.162)	(0.273)
ΔRESERVES$_{t-1}$	0.172	0.158	0.074	0.174	0.025
	(0.258)	(0.207)	(0.148)	(0.151)	(0.107)
ΔREAL INTEREST$_{t-1}$	-0.758**	-0.549	0.035	-0.215**	-0.325**
	(0.337)	(0.380)	(0.256)	(0.109)	(0.139)
ΔINFLATION$_{t-1}$	-0.633**	-0.922***	-0.214	-0.231***	-0.179
	(0.262)	(0.233)	(0.202)	(0.079)	(0.174)
ΔRER$_{t-1}$	-0.005	-0.046	-0.279***	0.009	0.049***
	(0.086)	(0.077)	(0.039)	(0.023)	(0.019)
ΔSTOCKS$_{t-1}$	0.075***	0.059***	0.016	0.015***	0.001
	(0.020)	(0.016)	(0.011)	(0.005)	(0.006)
H_0: Residuals are serially uncorrelated (P value)	0.50	0.45	0.14	0.31	0.21
No. of observations	462	462	462	462	462
No. of countries	28	28	28	28	28

Models include time and country fixed effects.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.

Table XI: Breakdown of ROA into five components

Dependent Variable: ΔGDP_t	Arellano-Bond		
	(1)	(2)	(3)
ΔGDP_{t-1}	0.302***	0.313***	0.208**
	(0.066)	(0.071)	(0.095)
ΔInterest $Income_{t-1}$	0.711***	0.698**	0.649**
	(0.231)	(0.274)	(0.302)
ΔNon Interest $Income_{t-1}$	0.379***	0.204	0.236
	(0.119)	(0.143)	(0.128)
ΔOperating $Expenses_{t-1}$	-0.402***	-0.255*	-0.293*
	(0.120)	(0.143)	(0.140)
$\Delta Provisions_{t-1}$	-0.234	-0.220*	-0.213
	(0.176)	(0.124)	(0.132)
ΔTax_{t-1}	-0.508	-0.322	-0.355
	(0.346)	(0.348)	(0.366)
$\Delta CAPITAL_{t-1}$	-0.005	-0.026	-0.028
	(0.121)	(0.107)	(0.049)
$\Delta RESERVES_{t-1}$	0.130**	0.113	0.079
	(0.068)	(0.077)	0.208
Financial Controls	No	Yes	Yes
Real Controls	No	No	Yes
H_0: Residuals are serially uncorrelated (P value)	0.68	0.51	0.53
No. of observations	485	485	484
No. of countries	28	28	28

Models include time and country fixed effects.
Financial controls are the changes in REAL $INTEREST_{t-1}$, $INFLATION_{t-1}$, RER_{t-1} and $STOCKS_{t-1}$.
Real controls are the changes in $INVESTMENT_{t-1}$, $CONSUMPTION_{t-1}$ and $GOVERNMENT_{t-1}$.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.

Table XII: The bank effect and the size of the banking system

Dependent variable: ΔGDP_t	Arellano-Bond	
	(1)	(2)
ΔGDP_{t-1}	0.332***	0.330***
	(0.070)	(0.069)
ΔROA_{t-1}	0.126	0.205**
	(0.227)	(0.097)
ΔROA_{t-1}*$LOAN_{t-1}/GDP_{t-1}$	0.280	
	(0.390)	
ΔROA_{t-1}*$HIGH_{t-1}$		0.569***
		(0.178)
$\Delta CAPITAL_{t-1}$	0.031	-0.002
	(0.118)	(0.130)
$\Delta CAPITAL_{t-1}$*$LOAN_{t-1}/GDP_{t-1}$	-0.110	
	(0.088)	
$\Delta CAPITAL_{t-1}$*$HIGH_{t-1}$		-0.125
		(0.248)
$\Delta RESERVES_{t-1}$	0.130	0.116
	(0.090)	(0.085)
$\Delta RESERVES_{t-1}$*$LOAN_{t-1}/GDP_{t-1}$	-0.029	
	(0.121)	
$\Delta RESERVES_{t-1}$*$HIGH_{t-1}$		0.032
		(0.135)
$LOAN_{t-1}/GDP_{t-1}$	-0.001	
	(0.001)	
$HIGH_{t-1}$		0.000
		(0.003)
Financial Controls	Yes	Yes
H_0: Residuals are serially uncorrelated (P value)	0.67	0.69
No. of observations	485	485
No. of countries	28	28

Models include time and country fixed effects.
Financial controls are the changes in REAL $INTEREST_{t-1}$, $INFLATION_{t-1}$, RER_{t-1} and $STOCKS_{t-1}$.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.

Table XIII: Summary statistics of various industrial growth indices

Growth rates* (%)

	Production index	Real output	Real value added
Mean	1.5	1.2	0.8
SD	7.1	10.7	12.6
Min	-21.6	-35.8	-48.2
Max	25.7	51.6	56.4

Correlation matrix of industrial growth rates* and total GDP growth rate

	Production index	Real output	Real value added	GDP
Production index	1.00			
Real output	0.39	1.00		
Real value added	0.33	0.72	1.00	
GDP	0.35	0.25	0.22	1.00

* The 1% highest and 1% lowest observations dropped from each industrial variable.
Output and value-added are deflated by the GDP deflator. Production index is originally in real terms.
Growth rates are calculated by log differences.

Table XIV: Estimating the differential effect of banking shocks on industrial growth

Dependent variable: $\Delta PRODUCTION_t$

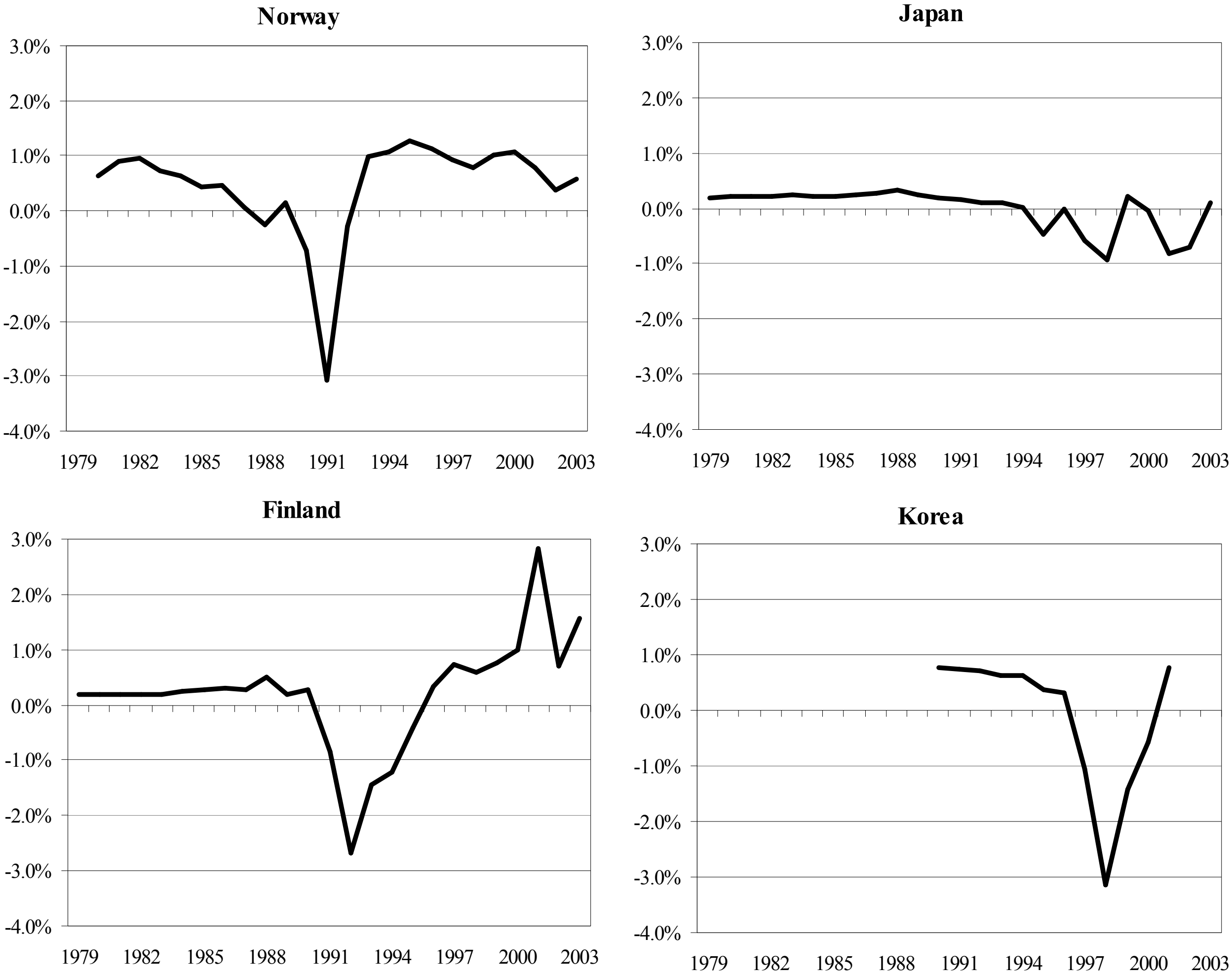
	Arellano-Bond				
	(1)	(2)	(3)	(4)	(5)
$\Delta PRODUCTION_{t-1}$	0.052***	0.063***	0.051**	0.060**	0.033
	(0.019)	(0.019)	(0.021)	(0.026)	(0.029)
EXDEP*ΔROA_t	1.054***	0.954***	0.837**	1.122**	0.465
	(0.348)	(0.352)	(0.395)	(0.488)	(0.525)
EXDEP*ΔROA_{t-1}	0.998**	0.982**	1.287***	0.992*	1.158**
	(0.399)	(0.417)	(0.455)	(0.553)	(0.592)
EXDEP*$\Delta CAPITAL_t$	0.453	0.451	0.399	0.733*	0.117
	(0.281)	(0.294)	(0.300)	(0.441)	(0.337)
EXDEP*$\Delta CAPITAL_{t-1}$	0.316	0.332	0.378	0.510	-0.281
	(0.332)	(0.358)	(0.368)	(0.497)	(0.376)
EXDEP*$\Delta RESERVES_t$	0.080	0.101	0.038	-0.122	0.153
	(0.161)	(0.201)	(0.203)	(0.289)	(0.265)
EXDEP*$\Delta RESERVES_{t-1}$	0.350*	0.272	0.107	0.074	0.101
	(0.189)	(0.197)	(0.188)	(0.321)	(0.226)
INDUSTRY $SIZE_{t-1}$	-0.696	-0.230	-0.518	-5.013	-0.526
	(0.695)	(0.738)	(0.946)	(4.295)	(0.759)
Interactions of EXDEP with current and lagged: ΔGDPREST, ΔREAL INTEREST, ΔRER, ΔINF, ΔSTOCKS.	No	Yes	Yes	Yes	Yes
H_0: Residuals are serially uncorrelated (P value)	0.60	0.58	0.96	0.72	0.11
Industry size	All	All	All, crisis years excluded	Smaller than 0.45% of GDP	Larger than 0.45% of GDP
No. of observations	11,114	10,635	9846	5,317	5,318

Models include country-industry, country-year and industry-year fixed effects.
The sample excludes 1% from each side of the distribution of the dependent variable due to outliers.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.

Table XV: Estimating the differential effect on output and value added growth

	Arellano-Bond Estimator					
Dependent variable:	Real Output Growth			Real Value Added Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable$_{t-1}$	0.046**	0.036	0.044*	-0.047**	-0.024	-0.033
	(0.020)	(0.024)	(0.024)	(0.020)	(0.023)	(0.024)
Dependent Variable$_{t-2}$		-0.035*	-0.030		-0.034*	-0.029
		(0.019)	(0.019)		(0.020)	(0.022)
EXDEP*ΔROA$_t$	1.064**	1.022*	0.954	1.623***	1.616***	0.921
	(0.529)	(0.527)	(0.715)	(0.549)	(0.566)	(0.718)
EXDEP*ΔROA$_{t-1}$			0.375			-1.290*
			(0.701)			(0.756)
EXDEP*ΔCAPITAL$_t$	0.023	0.146	0.112	-0.602	-0.544	-0.235
	(0.601)	(0.607)	(0.641)	(0.729)	(0.748)	(0.807)
EXDEP*ΔCAPITAL$_{t-1}$			-0.203			0.534
			(0.800)			(0.963)
EXDEP*ΔRESERVES$_t$	0.519**	0.488*	0.076	0.265	0.220	-0.180
	(0.251)	(0.271)	(0.313)	(0.317)	(0.352)	(0.376)
EXDEP*ΔRESERVES$_{t-1}$			-0.584			-0.416
			(0.358)			(0.377)
SHARE$_{t-1}$	-2.277	-2.222	-2.590	-4.965	-4.572*	-4.639*
	(1.767)	(2.085)	(2.110)	(3.059)	(2.729)	(2.804)
Interactions of EXDEP with current and lagged: ΔGDPREST, ΔREAL INTEREST, ΔRER, ΔINF, ΔSTOCKS	Current	Current	Current and lags	Current	Current	Current and lags
H_0: Residuals are serially uncorrelated (P value)	0.01	0.42	0.52	0.12	0.32	0.98
No. of observations	8,647	8,376	7,838	8,538	8,246	7,712

Models include country-industry, country-year and industry-year fixed effects.
The sample excludes 1% from each side of the distribution of the dependent variable due to outliers.
Heteroskedasticity robust standard errors in parentheses.
***, **, * denote significant at 1%, 5% and 10%, respectively.
Arellano-Bond instruments include second to fourth lags of the explanatory variables.
See variable definitions in table VII.



* The figure presents the level of ROA.

Figure 1: Bank return on assets (ROA*) in countries that underwent substantial bank crises