Bank Ownership and Credit Cycle : the lower sensitivity of public bank lending to the business cycle *

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Résumé

La cyclicité du crédit a augmenté depuis le début des années 2000, mais le niveau agrégé des prêts octroyés par les banques publiques reste significativement moins cyclique par rapport à celui des banques privées. Ce fait stylisé est testé empiriquement sur 140 pays, entre 1989 et 2009, incluant 464 banques publiques et 72 privatisations. Grâce à l'utilisation de données sur les crises bancaires et les privatisations, il est possible de contrôler pour les nationalisations qui ont eu lieu pendant les crises tout en suivant l'évolution temporelle de leur structure de propriété. Toutefois, la cyclicité du volume des prêts des banques publiques reste hétérogène en fonction (i) de la zone géographique considérée – toujours procyclique dans les pays de l'OCDE, acyclique en Europe, mais contracyclique pour les pays en développement, ou en fonction (ii) de la phase du cycle économique considérée –avec une moindre réaction aux fluctuations économiques en période de récession, même en Europe, où l'expansion du crédit par les banques publiques devient alors acyclique. Par ailleurs, les banques nouvellement privatisées sont effectivement caractérisées par une politique de prêts plus procyclique. De plus, la dette de court/long term et les dépôts des particuliers contribuent significativement à une moindre cyclicité du crédit, tout particulièrement en périodes de récession. Enfin, cette variabilité n'est pas induite par des prêts forcés au gouvernement ni par des arrangements institutionnels.

Mots-clefs : cycle du crédit, procyclicité, banques publiques, privatisations.
JEL Classification : G21, G28, G32, H44.

Abstract

Overall lending cyclicality increased in the years 2000s, but public bank lending remains significantly less cyclical than their private counterparts. This stylized fact is showed to hold empirically on a dataset of 140 countries over 1989-2009 covering 464 public banks and 72 privatizations while accounting for the unbalanced feature of the panel. Using a dataset on banking crisis and records about bank privatizations, I can control for nationalizations during crisis as well as the evolution of ownership status overtime. Nevertheless the cyclical properties remain heterogeneous depending (i) on the area considered –still procyclical in OECD countries, acyclical in Europe, while countercyclical for developing countries, or on (ii) the phase of the business cycle itself –with lower reactions to economic fluctuations in periods of recession, even in Europe, where credit expansion by public banks is then acyclical. As a robustness check, I indeed observe that newly privatized banks engage in more procyclical lending. In addition, most liability item, like short/long term liabilities or customer deposits, pattern the same reduced cyclicality, especially during economic downturns. Last, I do not find evidences that this cyclical pattern is encompassed by forced loans to the government nor institutional features.

Keywords : lending cycle, procyclicality, public banking, privatizations.
JEL Classification : G21, G28, G32, H44.

1 Introduction

After the recent turmoil in the world economy, several countries decided either to nationalize ailing financial institutions or to strengthen the public banking sector in order to channel more credit to the economy. If governments have long been involved in the banking sector, supposedly to ease financial development (Gerschenkron, 1962), it is widely accepted, since the seminal paper by La Porta et al. (2002), that public banks are a source of long term inefficiency. Nevertheless, throughout the crisis, some evidences point to a positive effect of banking systems partly owned by the government (Giannone et al., 2011). In fact, even before the outbreak of the crisis, and despite a large wave of privatization in the 1980s [1], the share of banking assets defined as being owned by the government among the 20 largest banks was still 7.2% and 38.1% in 2007, respectively for developed and developing countries.

Previous research largely overlooked the potential interplay between public bank lending and business cycle fluctuations, while most efforts are now devoted to analysis focusing on the volatility of the economy rather than on its long term properties. As a result, one puzzle naturally emerges : why do public banks still exist if they are so harmful in the long run ? What could be the benefit of keeping a share of the banking sector controlled by the authorities? The potential welfare gain of public banking I focus on here is the reduction of the severity of the business cycle, through an attenuation of the lending cycle. The procyclicality of financial markets are indeed of primary concern for the regulator [2] [3] and implementing appropriate regulations to reduce the lending cycle burst is generally welfare improving (see e.g. Christensen et al., 2011).

This gain in terms of cyclicality was already indirectly suggested by studies that focused on the effect of privatization; although private banks tend to outperform public banks, it is argued that domestic financial systems gained

1. Partly induced by reform packages implemented by ailing developing countries, but recommended as well for developed countries; see for instance International Monetary Fund (2003), "Germany: Financial System Stability Assessment", Country Report, 343.

2. Trichet, J-C., President of the ECB, Monetary dialog, Brussels, 10 September 2008."What we need is not to go back to the status quo ante, but [...] to a situation where where we would have eliminated a great deal of the pro-cyclical elements that are present in global financial markets at the moment. A situation where the private sector itself, the market participants and the institution concerned would have adapted themselves." §3-026. Available at:
http://www.ecb.int/press/tvservices/parliament/pdf/080910_trichet_hearing.pdf

3. Papademos, L., Vice-President of the ECB, Speech at Frankfurt, 4 September 2009, "Policy tools must be employed – notably regulatory policy instruments – by the supervisory authorities in order to reduce procyclicality and to limit the emergence of systemic risks in the financial system", part 3. Available at:
http://www.ecb.int/press/key/date/2009/html/sp090904_3.en.html

neither in depth nor stability with the closure or sale of public banks in the 1990s (Haber, 2005). What matters more is the new ownership structure of the stakes relinquished by the government (Taboada, 2008). One can show that this lower cyclicality of public bank lending neither reflects institutional differences or financial development, nor an artificial evolution of state loans in period of crisis.

Despite an increase of the overall lending cyclicality in the years 2000s, I find that public bank lending is significantly less cyclical than their private counterparts. This stylized fact is showed to hold empirically on a dataset of 140 countries over 1989-2009 covering 464 public banks (which amounts to 5589 bank year observations) while accounting for the unbalanced feature of the panel. The coverage of my dataset is shown to be comparable to the one used in the seminal paper by La Porta et al. (2002). Using a dataset on banking crisis and records about bank privatizations, I can control for nationalizations during crisis as well as the evolution of ownership status overtime [4]. Indeed, previous studies on the efficiency of public banking may blur the real impact of public ownership by inadvertently capturing the negative effect of banks newly rescued or bailed out which appear as being publicly owned; likewise newly privatized banks appear as private but may still have a different (and inefficient) organization inherited from its former public feature. So the timing of nationalizations as well as the timing of privatizations matter for the question at hand. Moreover this result holds even for a looser definition of public banking, taken as being either a stake of more than 50% of control rights directly, or 50% indirectly, or even a share as low as 25%.

As a robustness check, thanks to the inclusion of privatization records, I indeed observe that newly privatized banks engage in more procyclical lending which confirms the main result of the paper. Likewise, all results remain if one considers banks before their privatization as public and observations after as private banks, despite the possible anticipation effect of banks about to be privatized, or the likely residual features of public ownership, both effects moving towards a reduction of the public-private difference in lending growth.

By performing a cross-country analysis, one may miss the variety of situations. So I conducted similar analysis on different subsamples and found that public bank lending is always less reactive than private banks to business cycle fluctuations, but appear to be still procyclical in OECD countries, acyclical in Europe, while countercyclical for developing countries. This finding is in line with both the development as well as the political view of public banking, which suggests a negative relation between the level of

4. To that extent, I apply a specific treatment to private banks that I identified as having been bailed out by the government over the 2008/9 crisis. See below table 6 in the appendix for the list of banks concerned.

development and the gap between public and private bank behavior.

If the lending pattern of public banking varies across the level of development and the geographical area, it varies as well across the phase of the business cycle itself; one can indeed expect an asymmetric lending pattern, whether the economy is expanding or experiencing a slowdown of its economy. Thus one would expect truly inefficient banks to fail to benefit fully from booming periods while being hurt more in times of crisis and consequently cutting more on loans; such a bank would pattern a lower cyclicality of loans in good times and a larger cyclicality in bad times. Conversely, one could say that less exuberant and safer banks should experience a lower loan growth in good times accompanied by a lower deleveraging in bad times thanks to a higher quality of the loan portfolio. So such a bank would be less cyclical all over the cycle. I find that public banks are overall in a situation between the two, featuring a reaction to positive shocks not significantly different from their private counterparts while helping to sustain the economy by providing relatively more loans than private banks in case of negative shocks. So a public bank is not *a priori* less efficient than other banks, nor necessarily more conservative than fast growing competitors.

I expect to have consistent results whether I focus on the asset or liability side. Indeed, the lower cyclicality of public bank lending is the reflection of its more stable funding sources, especially during economic downturns. Part of the lower cyclical variation of public bank lending is due to the lower cyclical movement of short term and long term funding during recessionary periods. Also I find that customer deposits (and not bank deposits) are less cyclical for public compared to private banks, which suggests a flight to safety story, at least for commercial banks over the 2008 crisis in countries that fell into recession. This more stable financing base allows public banks to reduce less their credit during economic downturns.

The next section briefly reviews the relevant literature and explains how this paper contributes to it. Section 3 describes the dataset and section 4 discusses the definition of public banking adopted here. Section 5 turns to the estimation methodology while section 6 provides the results of the paper, emphasizing the lower cyclicality property of public bank lending despite the recent increase in private bank lending cyclicity. Last, section 7 concludes.

2 Relevant literature and contribution

A large strand of the literature focused on the impact of public ownership of banks in a long term prospective. Public banks are a source of long term inefficiency (La Porta et al., 2002; Barth et al., 2004; Galindo and Micco, 2004), allocating credit non-efficiently (Megginson, 2005), often for political reasons (Shleifer and Vishny, 1994; Sapienza, 2004; Khwaja and Mian, 2005; Dinc, 2005; Micco et al., 2007). In fact one usually distinguishes public from

private banks along two dimensions; first they operate on a somewhat different segment of the market, small projects requiring more relational lending (Young and Vogel, 2005; Delgado et al., 2007; cons: Galindo and Micco, 2004). Then evidences point to the poor performance of government-owned banks; they fail to screen out good projects, which reduces profitability and squeezes interest margins (Allen et al., 2005; Sapienza, 2004; Mian, 2006; Micco and Panizza, 2006; Iannotta et al., 2007).

Only a handful of papers tackle empirical issues related to mine, by focusing on short term variations in loan supply to the economy. The results are somewhat consistent but suggest cross-country differences. First, using a cross-country dataset over the period 1995-2002, Micco and Panizza (2006) study whether state-ownership of banks is correlated with lending behavior over the business cycle and find that their lending is less responsive to macroeconomic shocks –proxied by GDP growth– than the lending of private banks. Nevertheless, two contemporaneous papers offer a conflicting view; Ianotta et al. (2011) consider public commercial bank lending, restricted to the European case, and fail to capture any significant effect of public banking on loan growth. But Bertay et al. (2012) take a cross-country approach, while using GMM estimation on log-levels instead of panel fixed effect specifications on growth rates as in the present paper, and conclude that lending by state banks is less procyclical than lending by private banks especially in countries with good governance. Lending by state banks is found to be even countercyclical in high income countries.

Then a few case studies support the idea that the effect varies across countries; Foos (2009) focuses on German banks from 1987 to 2005 and finds that public savings banks adjust less their lending volume and conditions to macroeconomic fluctuations compared to cooperatives, while private commercial banks are most responsive to changing economic conditions. In the Korean case, Leonya and Romeub (2011) report that public bank lending did offset the procyclical lending of private banks during the 2008 recession. In addition, Cull and Martinez Peria (2012) focus on credit growth before and after the 2008 crisis and find that banks in Latin America reacted in a countercyclical fashion, but not in Europe, which is consistent with the findings outlined in this paper.

The present work contributes in several ways to this recent and often overlooked literature; first the time span includes the recent financial crisis. Then the empirical strategy uses a new dataset allowing not only to capture ownership in one point in time, but to proxy the evolution of the ownership structure overtime, by including the records of privatization and nationalization in crisis, which allows to obtain a good coverage as early as 1995 compared to the seminal paper by La Porta et al. (2002). Indeed the two cross-country studies fail to take into account this source of endogeneity, with the differential impact of newly nationalized/privatized banks on lending cyclicality potentially biasing respectively downward and upward

the effect of public ownership of banks on the lending cycle. Bertay et al. (2012) implement an other strategy by compiling the different public ownership dummy as reported by the data-provider Bankscope each year, from 1999 to 2010. Nevertheless it mixes two effects, both the change of ownership, from public to private or vice-versa, as well as the evolution of the coverage of the variable. Henceforth they discard data for which no owner of more than 50 percent of the stakes is reported, while some of them may be government-owned but not covered, or privately owned but by many fragmented shareholders. For the latter, there is no reason to concentrate, as a benchmark, on private banks with block-holders of more than 50%. If anything, capturing wrongly public banks as private should underestimate the difference in lending cyclicality between public and private banks, yielding more robust results if they turn out to be significant.

Then I address two sources of asymmetry in lending cyclicality and discard one; I allow for an asymmetric reaction of government-owned banks, more likely to be used as a means to fight the crisis than a tool to cool down the economy in case of over-heating and exuberant lending. Thus Ianotta et al. (2011) likely overlooked a dimension when they claim that public banks in Europe are not significantly different from their private counterparts. Likewise, Bertay et al. (2012) maintain that public banks tamed more the leverage cycle in countries with good institutions, with a countercyclical pattern in high-income countries, like Europe. But this effect is likely driven by easier loan extensions during the recent crisis period. Then, in contrast to the previous papers, I acknowledge the fact that my panel is unbalanced and try to correct for it, at least as robustness checks; likewise, entry and exit of banks in my panel may be driven by mergers and acquisitions which I try to capture by controlling for excess asset growth. Last, contrary to Bertay et al. (2012), I do not tackle explicitly the issue of institutional differences and government effectiveness, as it is unlikely to vary much over the last 8 years for which a time-varying index is available, and most of it is captured by the fixed effects [5], which I allow to be country-year specific for the subsample over the years 2000s.

Last, I investigate the role of the different balance sheet components in the cyclical pattern of public versus private banks outlined here. Part of the lower cyclical variation of public bank lending is due to the lower cyclical movement of short term and long term funding during recessionary periods, a finding which is consistent and complementary with Bertay et al. (2012)

5. In a previous draft (Master Thesis Dissertation), the interaction between time-varying GDP growth and the time-invariant GINI suggested that higher levels of inequalities are associated with significantly less cyclical public bank lending, which is consistent with the political view of public banking. Nevertheless, the same strategy using governance and economic freedom index yield poor results. Note that a difficulty is to make sure that those index do not already capture public ownership of banks, which is often one of its many components.

outlining that short term funding is less procyclical for state banks. Also I find that customer deposits (and not bank deposits) are less cyclical for public compared to private banks, which suggests a flight to safety story, at least for commercial banks over the 2008 crisis in countries that fell into recession. This more stable financing base allows public banks to reduce less their credit during economic downturns.

3 Dataset construction

I use mainly Bankscope as well as the World Bank database on privatizations [6], the World Bank database on banking crisis [7], World Bank records on GDP [8], and some variables from La Porta et al. (2002).

Tables 2, 3 and 4 describe the variables used and report the pairwise correlations. For the precise handling of the Bankscope database and the codes associated with it, see Duprey and Le (2012).

Observations from the Privatization [9] Database are matched with the Bankscope Database using either the current or previous name of the bank; out of 703 privatization episodes [10] for financial institutions [11] over the 1988-2008 period, I obtain 195 matches (ie 30%) that occurred during or after each bank time span [12]. There is no reason to believe that this creates a selection bias in terms of lending cyclical properties of the privatised institutions, all the more since some privatisation types (liquidation or divestiture) de facto cannot be matched, and a large number of privatisations concerned real estate firms or insurance companies (113 for the former and 44 for the latter, over the sole 1989-1999 period). When privatizations are included, I do not consider the few which took the form of Joint Ventures, as it is unclear whether the control of the resulting entity is really transferred to the private sector, although including them would not change the results.

I keep unconsolidated statement and consolidated ones that do not include unconsolidated companies so that a single entity appears only once.

6. See http://go.worldbank.org/W1ET8RG1Q0

7. By Gerard Caprio, Daniela Klingebiel, Luc Laeven, and Guillermo Noguera; see http://www1.worldbank.org/finance/html/database_sfd.html

8. See http://data.worldbank.org/

9. Different deal types are reported: trade sale, competition sale, strategic sale, private sale, direct sale, block sale, share sales, GDR, IPO, public offering, employee offer, bid, auction, capital increase, tender, greenfield project, joint-venture, concession, liquidation, divestiture.

10. The same institution can undergo several waves of privatization over time, in which case each episode is recorded separately.

11. The sector defined as Financial encompasses different types of institutions which are not necessarily the focus of the Bankscope Database; the following are listed for the 1988-1999 period: banking, consumer credit, financial, financial intermediaries, financial services, insurance, industrial complex, pension funds, real estate, social security.

12. I only matched privatisation episodes of a bank that occurred after the year of the first observation that enters the dataset, so that previous years can be recoded as public.

Duplicated assets [13] potentially remain if included in different balance sheets, for instance after a merger. If this is a common issue in the Bankscope Database, this is not so much a problem here as I weight each country equally and I keep either only the 10 largest banks to compute aggregated assets at the country level, or only consolidated publications. To further solve this issue, I ran all regressions by excluding all banks which did not appear in my dataset in 2008, which almost completely removes the risk of a bank merged in the 90s or early 2000 to be still recorded as a separate entity in 2008. All results remain, but I do not use this reduced sample as my baseline result in order to keep banks which disappeared during the years I cover (bankrupt banks may not have the same cyclical properties) and to make sure my dataset encompasses most privatizations which occurred before 2008.

When ranked by asset, I drop banks in each country ranked by average asset higher than 300 [14] to keep all the relevant information for public and privatized banks, which may be small, while making regressions able to estimate all parameters despite some countries having only a few banks. I focus only on countries with at least two banks, since I sometimes have only a single couple public/private bank for the same year. Additionally I drop banks with less than 5 observations and countries with less than 10 observations over the period 1989-2009 [15]. This is not very restrictive as I want to keep public bank and privatized bank observations even in countries with a small banking sector.

Eventually, the sample size is further reduced as I use growth rates, and I set growth rates above |100|% equal to missing [16]. In addition, when dealing with balance sheet liabilities, I do not include outliers, that is to say banks for which the specific balance sheet item increased by more than 1000%. In the meantime, I keep observations that could be considered as outliers especially for two variables, namely the growth of relative bank size

13. Duplicated assets may arise as well due to the presence of multiple balance sheet statements being reported within a year. Likewise, some countries (Canada, Japan,...) usually report their financial statement in March and have to be recoded as belonging to the year n-1. Then I keep financial statements that are closest to the end of the year, but discard releases made from Mai to August which cannot really be attributed to the either year t or year t-1.

14. Results are not sensitive to this threshold, especially when I re-weight by country-year observation. Else there is a trade off between the number of banks recorded as public and the size of the banks to consider. Nevertheless, size effects are accounted for separately.

15. I stop in 2010 Q1, since I recode financial statement published during the first quarter of each year as capturing mainly t-1 data. This is the last year for which my dataset provides complete coverage of financial institutions. Also, I do not have ownership change records for the period after 2008-9.

16. The same results obtains is I set |50|% as a threshold; I do not display these results. If this increase in lending was driven by mergers and acquisitions, it would be captured when I control for the growth of relative asset size.

as well as the growth of relative market size, as it is likely to capture breaks in the reporting of banks by Bankscope or breaks driven by mergers and acquisitions. Dropping them would create holes in the time-series of bank balance sheet variables of interest.

4 Public ownership definition

I use three variables of Public ownership based on Bankscope [17] ranging from 2007 to 2010. CSH50nat is a dummy variable that takes 1 if the bank is directly owned at more than 50% by a national public authority ; GOB50nat and GOB25nat are banks that are ultimately publicly owned by the home country, potentially through an indirect ownership structure, at a threshold respectively above 50% and 25%.

In addition, I add banks before their privatization to account for the evolution of public ownership of banks from 1989 until 2008 [18].

Bank nationalizations are accounted for using both the World Bank database on banking crisis, which reports countries where the state took over troubled financial institutions over the period 1980-2003, and the nationalization during crisis dummy used by La Porta et al. (2002) [19].

I am left with at most 140 countries over the 1989-2009 period [20], including 464 public banks among which 72 privatized banks, which amounts to 51421 bank-year observations for 4773 distinct banks. Overall I obtain 263 CSH50nat public banks to which I add 85 privatized banks; see table 5. Note that public banks are of rather small size on average (Graph 2), with 90% of all public bank observations being below a threshold of 60 billion USD, while some large private banks have no public banks counterparts of the same size.

As a benchmark, I want to relate my dataset on public ownership of commercial banks with the one of La Porta et al. (2002). I compute the share of public banks asset in the top [21] largest banks and compare it with

17. After including banks defined as Specialized Governmental Credit Institutions and Multi-Lateral Government Banks in the "special" variable of Bankscope.

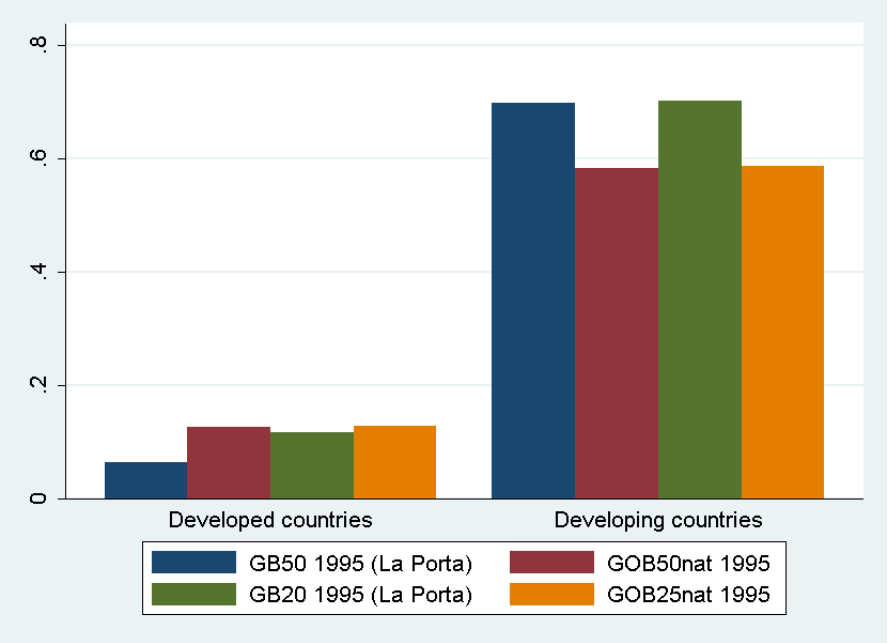
18. When several privatization programs took place for one bank, I use both the privatization with the largest proceeds and the latest one as a threshold for public ownership: type 1 if privatization date taken to be the most recent one, type 2 if one takes the largest proceeds.

19. Banks nationalized after the outbreak of the 2008 crisis are coded as private banks and I drop the 2008-9 data. See table 6.

20. I loose one year since I use growth rates rather than log-transformations

21. Up to a maximum of 20 per country per year, to account for the fact that I work on a non-consolidated dataset with potentially more small public bank units. A maximum of 10 banks ranked by assets does not sensibly modify the picture. Moreover, for many developing countries, I only have a few observations for the year 1995, so that when censoring the dataset which overlaps with La Porta et al. (2002) to countries for which I have e.g. more than 5 observations in 1995, the under-coverage of public banking assets in developing countries is reduced.

Figure 1: Share of the banking assets publicly owned



the measures GB50 and GB20 defined as the share of asset held by banks controlled by public authorities (minimal ownership of respectively 50% and 20%) in the top 10 largest financial institutions. Figure 1 displays the shares for 1995 [22] over 81 countries included in both datasets. The perimeter of public banking in the two studies appears to be quite similar, despite a somewhat smaller share of public banking assets in developing countries due to the bad coverage of Bankscope for the early years.

5 Methodology

I focus on the role of GDP and ownership status in determining the evolution of the credit distributed by banks by estimating the following model as a benchmark:

$$\begin{aligned} gLoan_{i,t} &= \alpha_i + \alpha_t + \beta_1 * gGDP_{c,t} + \beta_2 * gGDP_{c,t} * Public_i \\ &+ \beta_4 * X_{i/c,t-1} + \beta_5 * gX_{i/c,t-1} + \epsilon_{i,t} \end{aligned} \quad (1)$$

22. The latest date available in La Porta et al. (2002). In 1995, I have 263 public banks in 63 countries; also, I have 2779 bank-year observations over 93 countries in 1995 versus at most 3715 in 2004 and on average 3456 during the years 2000, which means in 1995 I have roughly 80% of the number of observations per year over the years 2000s. In the meantime, I have less than 1000 bank-year observations before 1993.

where i stands for bank, t for year and c for country. *Public* is a dummy variable which takes 1 if the bank is considered as public.

The results are indifferent to choosing gross or net loan growth as explained variable. [23]. GDP growth proxies for macroeconomic shocks [24], hence β_1 represents the impact of a one percentage point in GDP growth on the growth of loans offered by *private* banks, while $\beta_1 + \beta_2$ is the specific reaction of public bank loans to shocks. I am interested in the sign and significance of β_2 which gives me the additional effect on lending growth due to the public ownership.

I control for Size measures (bank absolute and relative size, its interaction with GDP growth, and relative market size) as well as a measure of concentration [25] (HHI and CR4) both in levels [26] at the beginning of the period and in growth rates at the end of the previous period (as previous loan growth may determine today's asset size). Moreover, I control for lagged profitability an the lagged capitalisation ratio, eventhough I do not report it in my benchmark case as evidences suggest that public banks are on average less profitable and more capitalized (here measured in non risk-weighted assets). Any non-collinear combination of regressors provide the same results.

As a baseline, I consider the following structure for the error term:

$$\upsilon_{i,t} = \alpha_i + \alpha_{c,t} + \epsilon_{i,t}$$

which includes bank fixed effects –as the result of Hausman tests suggest, which reject the hypothesis of uncorrelated individual effect– as well as

23. Also, I ran robustness checks on a subset of business and corporate loans in order to make sure the cyclical pattern of public bank lending is not driven by forced loans to the government in case of hardship. Similar results as the benchmark case are obtained; if the signs and point estimates are usually correct, the significance levels are often much lower, which is mainly due to the fact that Corporate loans variation (for banks which report is) is much less responsive to GDP growth. Hence the additional effect of public banking along the economic cycle can be hard to capture. Still, it would mean that Corporate loans are less cyclical, which is not inconsistent with acyclical public bank lending.

24. I use GDP growth rather than the growth rate of GDP per capita; if the latter is useful if one is focused on development issues related to public banking, I prefer using the former as I want the evolution along the cycle, in response to shocks: what matters is the aggregate size of bank lending in relation to the expansion of GDP, rather than the actual availability of loans to each individual and its interaction to individual wealth.

25. To be sure to match the actual size of the banking sector, I use aggregate figures of the banking sector based on the same Bankscope dataset but with only consolidate data, so that I avoid double counting assets when working with the larger, unconsolidated, dataset.

26. There is some evidence that smaller banks invest more in the collection of 'soft' information Berger et al. (2005), which may induce more stable credit policies and less cyclical long-term relationships.
In addition, the level of competition within a banking sector seems to matter, as banks tend to increase their leverage when the intensity of competition increases. See Hanson, S., Kashyap, A. and Stein, J. (2010). A Macroprudential Approach to Financial Regulation, Journal of Economic Perspectives, forthcoming.

country-year fixed effects. For the latter, it implies that I reduce the coverage of my sample to get a more balanced panel [27]. To get the largest coverage and as a result include most privatization events [28], I replace the country-year FE by year dummies to go back to 1989. As a result of my specification, I discard all institutional arrangements which are likely to be country specific and time invariant. If not time invariant, they are captured out of the regressions with country-year fixed effects which focus on the reduced 1999-2009 sample.

Eventually, in order to make sure the results are not driven by the over-representation of some countries, which is a common problem in Bankscope, I re-weight the observations at the country level. The results remain. In addition, I weight individual banks within a country by their mean asset share. I believe that it better represents the behavior of the banking sector, and it allows to exclude the effect of bank size which can interact with public banking –as suggested by graph 2–, while keeping even small banks in my dataset. Moreover, asset size and the number of banks are two critical variables that make clear the distinction of banking model, for instance between the USA and the UK: the former has many small banks while the latter has a few large banks. The present strategy takes into account this dichotomy and allows to observe the effect on a bank of average size. The weight in country c for bank i is calculated as follows:

$$TotWeight_{c,i} = \left(\frac{1}{N_c/N}\right) * s\bar{A}sset_i \tag{2}$$

6 Results: public bank lending is less cyclical than private bank lending

6.1 Stylized fact : raw data analysis

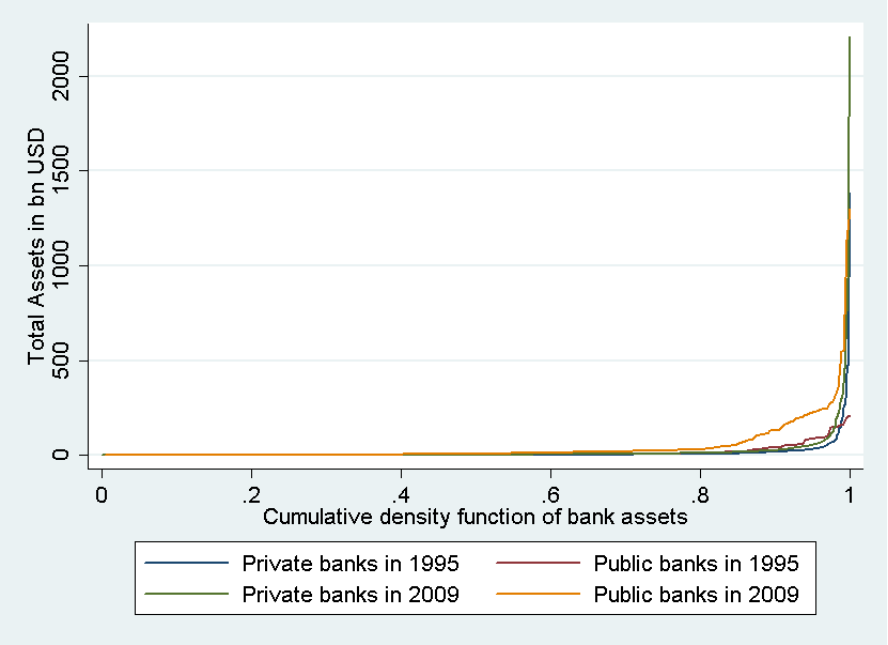
Public banks increase more their loans than private banks in periods of lower economic growth [29] (Graph 3 up), which translates into a much lower correlation of public bank lending with the economic cycle, correlation

27. Only over the period 1999-2009

28. More than half of the privatization events took place in the 1990s.

29. This effect does not seem to be driven by forced loans to the government, as the econometric results focus only on commercial banks; moreover the raw data on Corporate Loans patterns the same features (Graph 3 down), although the number of observations is reduced by one fourth. Further disaggregation using Bloomberg data over the 2004-2010 period for the few listed public banks with available data (HRVATSKA POSTANSKA BANKA DD, Croatia; OLDENBURGISCHE LANDESBANK AG, Germany; AGRICULTURAL BANK OF GREECE, Greece; STATE BANK OF INDIA, India; ABU DHABI COMMERCIAL BANK, Abu Dhabi; and others) suggests that Consumer and Commercial or Industrial Loans move the same way as Total loans

Figure 2: Cumulative distribution of public bank assets, in billion USD



In 1995, the top 10% of the 238 public banks have assets evaluated at more than 42 billion USD, while the threshold is 17 bn USD for private banks. In 2009, the top 10% of the 267 public banks (excluding the 2008 nationalisations of major european banks) have assets evaluated at more than 129 billion USD, while the threshold is 25 bn USD for private banks.

Table 1: Correlation of loan growth with GDP growth

	CSH50nat	**GOB50nat**	**GOB25nat**
Whole sample			
Private banks	.77	.76	.76
Public banks	.10	.25	.29
Commercial banks only			
Private banks	.89	.89	.89
Public banks	.30	.47	.49

Note : sample of countries with both national public and private bank institutions.

which gets somewhat closer to the one featured by private banks when public ownership gets looser (Table 1).

6.2 Increased lending cyclicality in the years 2000s

Since the 1990s, the growing role of banks outside their traditional line of business as well as the policy changes towards a more flexible banking regulation in some countries would suggest that the reaction of bank finance to the cycle likely increased. Figure 4 displays the evolution of the reaction of private bank lending to a 1% shock on GDP, using an 8-years rolling window. The reaction of private bank lending in developed countries to a shock on the aggregate economy increased in about a decade until a year before the outbreak of the crisis. This result is in accordance with the evidences on increased financial instability : the graph pictures the build-up of a lending bubble where each additional percentage points of GDP was associated with more than a 1% growth in gross loans by private commercial banks. On the contrary, the reaction of private bank lending in developing countries remained below 1%, but with an upward trend, which likely represents the movement of liberalisation and privatisation of the 1990s. Figure 5 displays the same picture for total public bank lending and clearly shows that at the agregate, public bank loans are acyclical.

Figure 3: Average Total Lending Growth (up) and Average Lending Growth to Corporations (down) over the Cycle

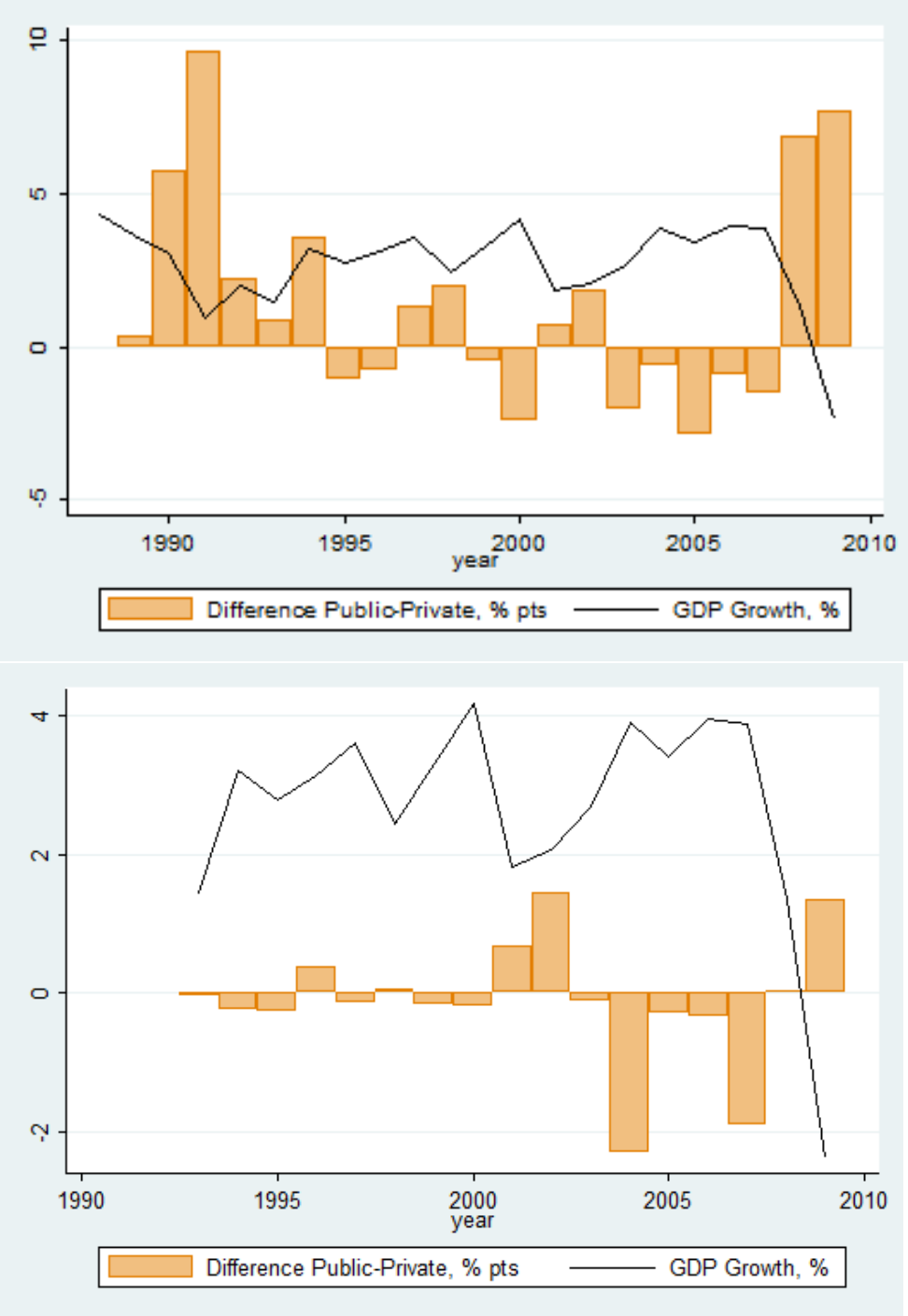
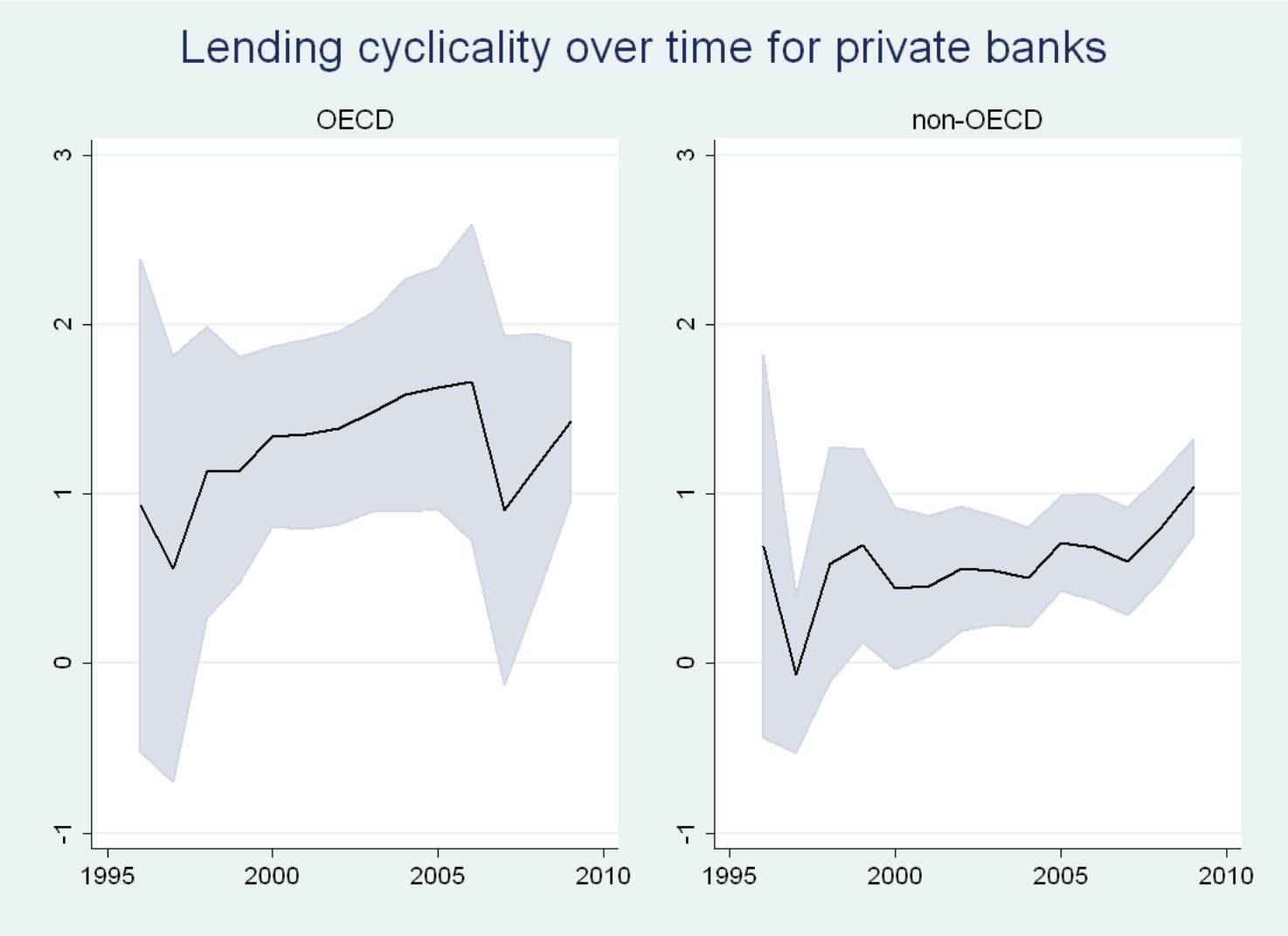
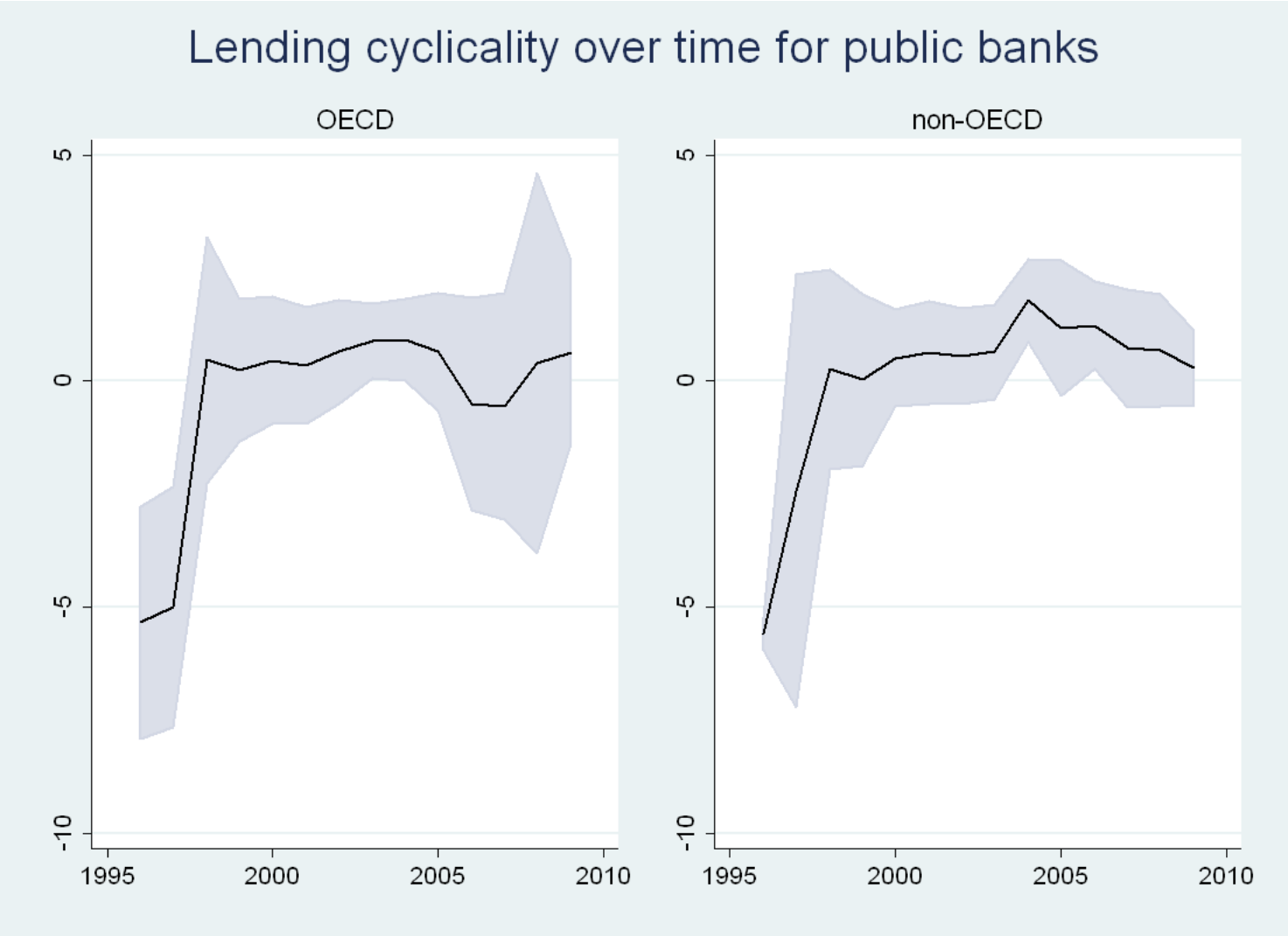


Figure 4: Evolution of lending cyclicality with 8 years rolling window



The estimates correspond to the coefficient β_1 in the equation (1). Each point estimates the benchmark model over the last 8 years with country weights. The solid line is the reaction of loan (in %) after a 1% shock on GDP. The shaded area displays the 95% confidence bands.

Figure 5: Evolution of lending cyclicality with 8 years rolling window



The estimates correspond to the linear combination of $\beta_1 + \beta_2$ in the equation (1). Each point estimates the benchmark model over the last 8 years with country weights. The solid line is the reaction of loan (in %) after a 1% shock on GDP. The shaded area displays the 95% confidence bands.

6.3 Overall, public bank lending is acyclical during recessions

The main results are displayed in Table 7.

Whether I keep [30] or drop non-commercial banks, public bank lending appears to be significantly less cyclical than private bank lending (regressions 1 to 3). Nevertheless, it hides an heterogeneous reaction depending on the sign of the shock. The effect of public ownership is strongly significant only in periods of recessions (regressions 4 to 9), defined as years with a negative growth rate; public commercial banks have an asymmetric reaction with acyclical lending in bad times while procyclical and not significantly different from private commercial banks in good times [31]. The results remain if one takes a looser definition of public banks, indirectly owned, or with a 25% threshold instead (see regressions 8 and 9).

The other cross country paper that tackled this issue overlooked this heterogeneity and only concentrated on the overall cyclical properties; moreover, they faced a sampling bias as the over-representation of some (rich) countries was not expressively taken into account (see regressions 1 to 6). When one re-weights so that each country has an equal contribution, and further carefully considers the banking sector organization, the aggregate acyclical effect of publicly owned banks remains but the additional effect of public banking in periods of recession increases and the overall effect becomes even countercyclical in periods of macroeconomic downturn.

Nevertheless, some ailing banks may have been nationalized during a crisis precisely to avoid a lending freeze, which could be captured by my dummy on public banks. Regression (7) removes countries which experienced nationalizations during a crisis, and the cyclical property of public bank lending in recessions appears to be even more countercyclical.

Table 8 considers a more balanced subset of my sample in order to include country-year fixed effects, with on average 8 observations per banks [32]. Over all countries for a dataset including all types of banks [33], the acyclical property of public banking remains whatever the definition of public banking (regressions 1 to 3).

30. Not reported for sake of space.

31. The conclusions are not altered if one considers other time periods, e.g. by excluding the 2008 events; hence results are not driven by a potential different exposure to toxic assets, which would have resulted from a lower risk profile of public banks.

32. For a sample covering the year 2000-2009, taking into account that I regress growth rates, I can have at most 9 observations per bank.

33. Excluding central banks and clearing institutions.

6.4 Public commercial bank lending is heterogeneous across the stage of development : procyclical in OECD countries while countercyclical for non-OECD.

In Table 8, I take a closer look at differences between OECD and non-OECD countries when country-year fixed effects are included; for OECD countries, public commercial banks indeed present the pattern outlined above (regression 5), while overall banks rather tend to pattern a lower cyclicality of lending in periods of booms. This makes sense as the sample includes investment banks, cooperatives or savings banks, where public owners may limit the lending spree/risk taking for the former, and public ownership is more likely to occur in the latter, where lending is potentially limited by the availability of deposits or by regulatory/contractual constraints.

As for non-OECD countries, two effects explain the results of regressions (6) to (8); first lending in periods of booms is less cyclical for public banks (commercial or not) because some important countries regularly face an issue of overheating of their economies, hence ration lending. Then banking crisis occurred more frequently in non-OECD countries, and the state often had to intervene to bail out private banks; de facto those nationalized banks could not soften their credit policy to support the local economies because they were themselves being restructured. By excluding those countries where the state nationalized banks during a banking crisis, the benchmark result is obtained and reported in regression (8).

6.5 Public bank lending is heterogeneous across the phase of the business cycle : when a shock hits, it is acyclical in Europe and South East Asia but countercyclical in South America

Table 9 focuses on Europe, South America and South-East Asia, for which enough observations are available. I report results for GOB50nat with privatizations in order to include a maximum of observations for the regions considered. Results remain whether I include country and/or asset weights.

In the European case, Ianotta et al. (2011) focus on large European commercial banks by excluding Investment, trust, and mortgage banks; if I obtain the same aggregate results with my larger dataset including privatizations –that is to say government owned banks lending behavior across the economic cycle is not significantly different from the one of private banks (regression 2)– this result overlooks asymmetric behaviors, with an acyclical lending behavior in periods of recession, whether one controls for nationalizations in crisis[34] or not (regressions 3 and 4).

34. Other than the ones of 2008, excluded in the whole study; see table 6

In the South American case, government owned banks lending behavior has a strong asymmetric lending property (regressions 6); in periods of expansions, it takes the lead over private banks by engaging in a lending spree, reacting twice as much to a positive macroeconomic shock. It is in line with evidences on the mismanagement of public institutions which engaged in excessive risky lending during booms. In the meantime, public banks still had a strong countercyclical impact in case of bad shock by continuing their lenient lending practices. Such a behavior over the cycle can only come as a result of a strong support by the public authorities. But during strong recessionary events, the involvement of the government in the banking sector likely did not take only the form of credit easing. Indeed the nationalization in crisis effect discussed above is particularly strong, especially over the period considered with endemic banking crisis in Latin America. The data patterns an even stronger countercyclical effect of public banking for those countries which did not bear additional toxic assets by nationalizing part of their private banking sector (regression 7).

For South-East Asia, if the overall public banking sector is significantly less cyclical in periods of booms (regression 8), it is significantly acyclical for commercial banks whether one considers recessionary event separately or not (regression 9 and 10).

6.6 Privatized bank lending activities are more cyclical

I now turn to the effect of privatization on lending cyclicality, shown in table 10. I either include privatized banks as public before their privatization, and private afterward (regression 1 to 3), while controlling for the year during which part of their capital was sold, or I consider separately public banks and public banks privatized (regression 4 to 6).

Regressions (1) to (3) act as a robustness check because the distinction between public and private banks is no longer so clear cut due to the inclusion of privatized banks[35], which should reduce the difference of behavior between the two types of institutions; results remain and are of comparable magnitude.

Regressions (4) to (6) show that when the state reduces its influence on the banking sector, the newly privatized bank patterns a higher cyclicality of lending, whatever the type of coding for privatization event I adopt. Regression (7) considers privatized banks that are reported as being ultimately owned by a foreign entity in 2008-10. Results show that the effect occurs mainly as a result of privatizations to foreign actors, more likely to reorganize the bank towards more efficiency and/or more cyclicality, thanks to the financial support of the parent company.

35. Since I do not know the initial level of the public ownership of the privatized banks.

6.7 Liabilities over the business cycle

A natural counterpart to the study of the public bank lending cycle is to look at the evolution of its financing sources over the cycle. The results presented here show that both move in a similar fashion. Table 11 replicates the previous analysis with liability items, over the 1999-2009 period which allows to include country-year fixed effects [36].

Regressions (1) and (2) present two measures of short term financing, respectively as reported in banks balance sheets and reconstructed by including the item "Other Liabilities", while regression (3) and (4) focus on long term liabilities. The pattern is very similar to the one of public bank lending with short as well as long term financing sources being less volatile in periods of recession. Without distinguishing for the phase of the business fluctuations, only long term liabilities move significantly less over the cycle for public banks compared to private ones (regression (3)). Regression (8) shows that reserves tend to accumulate more slowly in good times for public banks.

Now turning to the evolution of deposits, one has to distinguish between the evolution of bank deposits from the evolution of customer deposits, which may not respond to the same motives. If the former in regression (7) do not move in a different way between public and private banks, customer deposits tend to move less cyclically, especially by responding less to adverse economic shocks (regression (5) and (6)). In addition, graph 6 shows a simple before/after the great recession analysis of the evolution of the share of customer deposits in total liabilities for commercial banks. The picture suggests that the acyclical pattern of public bank lending compared to its private counterparts is probably partly supported by a flight to quality in terms of customer deposits, or rather a flight to safety in terms of households assets; that is to say a movement towards directly insured deposits via public ownership of banks, more than towards ailing private banks, despite bank deposit insurance schemes. Then this more stable deposit base likely contributed to the lower reduction in loan growth of public bank loans [37].

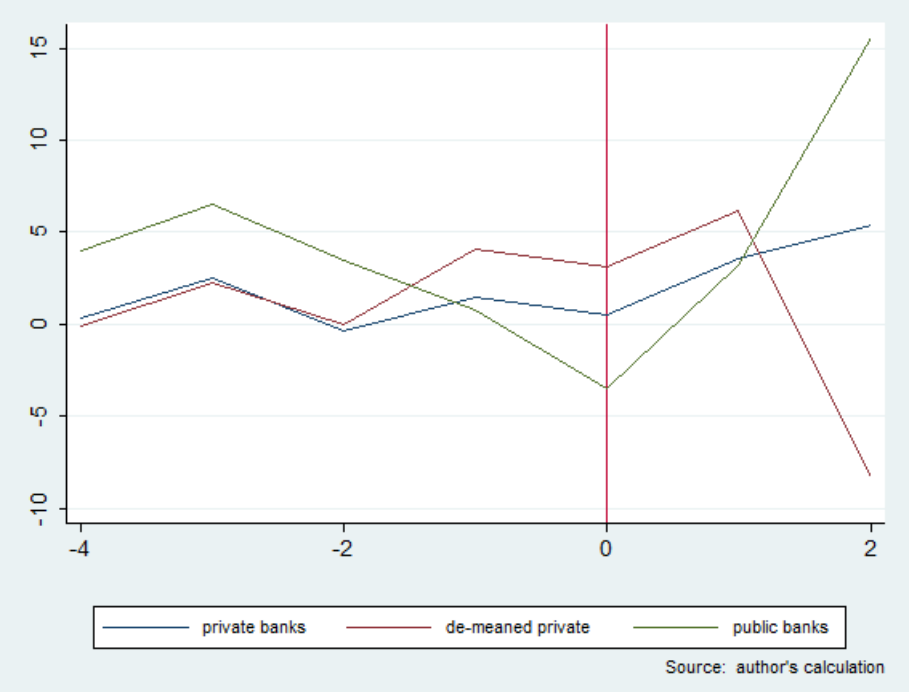
7 Conclusion

Using a dataset on individual banks which reconstructs the evolution of public ownership of banks overtime, I find that public banks have a lending

36. I also report the Wooldridge test for autocorrelation in panel data, and I fail to reject the null hypothesis of no autocorrelation in fitted residuals, except in the case of deposits.

37. It is performed here only on yearly observations around the 2008 crisis for countries that fell into a recession with recorded public commercial banks. Since I focus on customer deposits, the effect is most relevant for banks recorded as commercial banks. In my yearly dataset, this pattern is not observed around other major crisis event like the 1997 Asian crisis.

Figure 6: Evolution of Customer Deposits as a share of Liabilities around the 2008 recession.



The graph shows the yearly evolution of deposits as a share of total liabilites averaged over 15 countries (AT, BG, BR, CA, CH, CZ, DE, GB, GE, HR, IE, LU, NL, RS, ZA) for which the yearly output growth patterns a recession and for which I have at least one commercial public bank (a total of 24 public commercial banks, that is to say 143 public bank observations). The origin is the year of the start of the recession, which may vary across countries; the graph pictures 4 years before and 2 years after the start of the recession. The de-meaned line corresponds to: $\forall i \in \{private\}$, $j \in \{public\}$: $\bar{gsDep}_{i,t} = gsDep_{i,t} - \left[\frac{\sum_t^T \sum_j^m \sum_i^n (gsDep_{i,c,t} - gsDep_{j,c,t})}{Tnm}\right]_{t<0}$ with $gsDep$ refering to the growth rate of the share of Deposits in Total Liabilities for private banks. So the red line pictures $\bar{gsDep}$, that is to say the growth of the deposit share for private banks while substracting the average gap in the growth rate between public and private banks before the crisis.

policy which is less responsive to macroeconomic fluctuations and tend to cut less on their lending activities in case of bad shock, a result overlooked by the few previous work. Overall government-owned banks pattern an acyclical behavior only during recessionary events. Moreover, I can control for public banks which were nationalized during a crisis, which is potentially a major source of endogeneity, since nationalizations during crisis are likely to artificially darken the effect of having a fringe of government owned banks. This endogeneity is particularly relevant in South American countries in the 1980s and 1990s as public authorities stepped in in order to rescue a collapsing banking sector.

Over the business fluctuations, one would expect truly inefficient banks to fail to benefit fully from booming periods while being hurt more in times of crisis and consequently cutting more on loans; conversely for less exuberant and safer banks which should pattern a lower loan growth in good times accompanied by a lower deleveraging in bad times. I find that public banks are overall in a situation between the two, featuring a reaction to positive shocks not significantly different from their private counterparts while helping to sustain the economy by providing relatively more loans than private banks in case of negative shocks. So a public bank is not *a priori* less efficient than other banks, nor necessarily more conservative than fast growing competitors.

Nevertheless, the cyclical pattern of public bank lending is heterogeneous across the business cycle as well as across geographical areas; it is significantly less cyclical for public commercial banks in periods of recession in developed countries, as well as developing countries once nationalizations in crisis are taken out. Else, other non-commercial banks tend to grow at a somewhat lower pace during periods of expansion. More precisely, public European commercial banks do not significantly differ from their private counterparts in normal time, suggesting they may not be managed differently absent government support in extreme situations. While South American public commercial banks tend to favor credit expansion more than private banks both in normal times and crisis periods, suggesting either strong political involvement or particularly inefficient private banks. Last, in the case of South-East Asia, public bank lending, whether specialized or commercial, tend to be less responsive to the cycle as well as less expansionary during booming periods, maybe as governments may use public banks to try to avoid an overheating of the economy.

I perform two robustness checks. First, thanks to the inclusion of privatization records I indeed observe that newly privatized banks engage in more procyclical lending which confirms the main result of the paper. Likewise, all results remain if one considers banks before their privatization as public and observations after as private banks, despite the possible anticipation effect of banks about to be privatized, or the likely residual features of public ownership which remains if the government remains a minority shareholder,

both effects moving towards a reduction of the public-private difference in lending growth. Second, results should be consistent whether one focuses on the evolution of asset or liability side over the business cycle. Indeed, for public banks, short term finance and wholesale funding react less to negative shocks compared to their private bank counterparts. Moreover, the deposit base is usually more stable for public banks, whether commercial or not, than it is for private banks. This pattern is due to customer deposits rather than bank deposits; this may reflect a flight to safety story, which is particularly exacerbated during extreme events where standard deposit insurance schemes may not be considered high or credible enough by some market participants.

Last this lower cyclicality of public bank lending neither merely reflects institutional differences or financial development, which I believe are completely captured by country-year fixed effects, nor an artificial evolution of state loans in period of crisis, as this is less likely to be the case for banks recorded as commercial, and the segment of business loans seems less cyclical as well.

An implication of my results concerns the timing of privatizations when the state is willing to reduce its participation to the banking sector; as it significantly increases lending cyclicality, privatization should occur, whenever possible, in periods of relative financial stability, rather than in periods of stress. But if financial stability matters much more today, especially since the reaction of aggregate bank lending by private banks seem to have increased, fostering public banking may not be the appropriate reform. Still, public banks are more likely to be subject to inefficient political pressures or moral hazard issues, absent a sufficiently robust institutional framework, leading to a possible missallocation of resources. Hence the difference in the cyclical pattern of public versus private banks lending may reflect a difference in the scope of action as well as the type of loans provided by public banks, which could focus on different customers. Henceforth the allocation of loans by public banks may not be irrelevant for its cyclical pattern, but may not lead to an efficient outcome. This is an approach I tackle in a separate paper (Duprey, 2012). If some developing countries clearly benefited from their public banking sector in order to weather the Great Recession, it may not be an advantage in normal times. So in order to tame the lending cycle and prevent excessive volatility, other macroprudential instruments should be called for.

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Table 2: Variables definition

Variable	Label	Source
gGDP	Growth of GDP, constant 2005 USD	UNSTAT
gLoan	Growth of gross loans	Bankscope
Size	Log of Asset	Bankscope
SizeRel	Asset of one bank relative to top 20	Bankscope
gSizeRel	Growth of SizeRel	Bankscope
SizeMarket	Asset top 20 banks of one banking sector relative top 20 world	Bankscope
gSizeMarket	Growth of SizeMarket	Bankscope
HHI	Hirschman Herfindal Index	Bankscope
CR4	Concentration ratio of top 4 banks over top 10	Bankscope
ROAA	Return on Average Asset	Bankscope
CapOvAssets	Capital funds over total assets	Bankscope
CSH50nat	National Public Controlling Shareholder 50%, 2008-10	Bankscope (and Bloomberg)
GOB50nat	National Public Ultimate Owner 50% + National Public Controlling Shareholder 50%, 2008-10	Bankscope
GOB25nat	National Public Ultimate Owner 25% + National Public Controlling Shareholder 50%, 2008-10	Bankscope
Foreign	Foreign Ultimate Owner > 25% + Foreign Controlling Shareholder > 50%, 2008-10	Bankscope
Privatized	Dummy for full/partial privatization, 1988-2008	World Bank Privatization
b4Privatised	Dummy years before latest privatization wave	World Bank Privatization
b4Privatised2	Dummy years before largest privatization wave	World Bank Privatization
GB50	Share public bank asset (> 50% owned) in top 10, 1995	La Porta et al. (2002)
GB20	Share public banks asset (> 20% owned) in top 10, 1995	La Porta et al. (2002)
nat_cr	Dummy nationalization during crisis, 1970-1995	La Porta et al. (2002)
nat_cr_wb	Dummy nationalization during crisis, 1980-2003	World Bank Banking crisis
gMMF	Growth of Money Market Funds	Bankscope
gMMF2	Growth of short term liabilities defined as DepositsAndSTfunding-TotDeposits	Bankscope
gMMF3	Growth of short term liabilities defined as TotLiabilities-TotDeposits-LTfunding-Reserves	Bankscope
gTotDep	Growth of total deposits (customer+bank)	Bankscope
gCustDep	Growth of customer deposits	Bankscope
gBkDep	Growth of bank deposits	Bankscope
gReserves	Growth of total reserves	Bankscope
gLTfunding	Growth of Long Term Liabilities	Bankscope

Table 3: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
[4pt] gGDP	3	3.41	-24.79	34.45	54046
gLoan	10.6	24.77	-100	100	54046
L.Size	8.93	3	0	19.64	47783
L.SizeRel	2.5	6.18	0	99.88	47783
L.gSizeRel	-1.26	34.96	-99.91	995.45	47783
L.SizeMarket	2.27	8.06	0	98.11	47783
L.gSizeMarket	3.73	37.2	-90.47	918.09	47783
L.HHI	15.44	10.16	6.2	99.77	47783
L.CR4	0.70	0.12	0.48	1	47783
L.ROAA	0.87	5.24	-540.48	83.84	47435
L.CapOvAssets	11.37	15.55	-897.20	99.8	35918
CSH50nat	0.05	0.22	0	1	54046
GOB50nat	0.08	0.27	0	1	54046
GOB25nat	0.09	0.28	0	1	54046
Foreign	0.26	0.44	0	1	54046
Privatised	0.02	0.13	0	1	54046
b4Privatised	0.01	0.08	0	1	54046
b4Privatised2	0.01	0.08	0	1	54046
gb50_g	0.3	0.28	0	1	49400
gb20_c	0.33	0.3	0	1	49400
nat_cr	0.07	0.26	0	1	32611
nat_cr_wb	0.21	0.41	0	1	41208
gMMF	-3.63	43.3	-100	100	22133
gMMF3	2.97	34.82	-100	100	23974
gTotDep	9.87	24.09	-100	100	50883
gCustDep	9.80	24.56	-99.92	100	49149
gBkDep	-1.83	41.7	-100	100	36477
gReserves	1.07	34.43	-100	100	26823
gLTfunding	2.05	32.04	-99.99	100	29928

Table 4: Cross-correlation

Variable																					
gGDP	1																				
gLoan	0.24	1																			
L.Size	0.01	0.03	1																		
L.SizeRel	0.13	0.07	0.22	1																	
L.gSizeRel	0.01	0.09	0.04	0.04	1																
L.SizeMarket	-0.08	-0.07	0.53	-0.06	-0.00	1															
L.gSizeMarket	0.05	0.07	-0.03	-0.00	-0.40	-0.06	1														
L.HHI	0.13	0.11	-0.16	0.22	0.03	-0.13	0.16	1													
L.CR4	0.13	0.11	-0.17	0.25	0.03	-0.14	0.11	0.84	1												
L.ROAA	0.04	0.08	-0.01	0.02	0.02	-0.04	0.01	0.05	0.05	1											
L.CapOvAsset	0.03	0.02	-0.10	-0.05	-0.01	-0.04	0.01	0.07	0.08	0.39	1										
CSH50nat	0.02	-0.01	0.07	0.07	-0.02	-0.02	-0.00	0.06	0.06	0.00	0.03	1									
GOB50nat	0.07	0.01	0.13	0.12	-0.01	-0.02	0.00	0.04	0.06	-0.00	0.01	0.81	1								
GOB25nat	0.09	0.02	0.13	0.13	-0.00	-0.03	0.01	0.05	0.06	0.00	0.01	0.75	0.93	1							
Foreign	0.08	0.05	-0.03	0.09	0.05	-0.11	0.03	0.08	0.06	0.04	0.09	-0.14	-0.17	-0.18	1						
Privatized	0.07	0.05	0.08	0.12	0.02	-0.01	0.01	0.03	0.05	0.01	-0.01	-0.02	0.00	0.02	0.05	1					
gMMF	0.08	0.18	-0.01	0.02	0.01	-0.03	0.02	0.01	-0.01	0.02	-0.02	0.00	0.01	0.00	-0.01	-0.02	1				
gMMF3	0.11	0.21	0.01	0.03	0.04	-0.05	-0.00	0.04	0.04	0.05	0.09	0.00	0.02	0.02	0.02	0.00	0.70	1			
gCustDep	0.15	0.42	0.03	0.05	0.07	-0.05	0.05	0.09	0.09	0.07	0.02	-0.02	0.01	0.02	0.05	0.04	0.05	0.11	1		
gBkDep	0.06	0.23	-0.02	0.03	0.01	-0.08	0.00	-0.04	-0.04	0.03	-0.04	-0.00	0.01	0.02	-0.02	0.00	0.03	0.07	0.05	1	
gReserves	0.04	0.10	0.01	0.01	0.01	-0.01	-0.01	-0.05	-0.08	0.01	-0.04	0.01	0.00	0.00	0.00	-0.00	0.07	0.06	0.05	0.06	1
gLTfunding	0.09	0.21	0.05	0.04	0.04	-0.01	0.01	0.02	-0.00	0.03	0.01	0.01	0.03	0.03	-0.01	-0.00	0.03	0.04	0.07	0.04	0.05

Table 5: Ownership Statistics

Variable	**Nber Obs**	**Nber Banks**
CSH50nat	2742	232
Public Commercial	429	37
GOB50nat	4108	338
Public Commercial	1588	126
GOB25nat	4724	392
Public Commercial	2047	166
Privatised	865	72
Foreign	361	29
before Privatised type 1	359	68
before Privatised type 2	338	66

Public banks indicators are 2008-10 data; privatizations took place over 1988-2008.

Table 6: Nationalized Banks over the 2008 crisis in the dataset

Country	Bank Name	Details
BE	Fortis Bank SA/ NV-BNP Paribas Fortis	nationalized in 2008 by the Belgian government, sold in 2009 to BNP (75%)
GB	Adam & Company Group Plc	owned by RBS Group
GB	Fortis Commercial Finance Limited	partial nationalization of Fortis in the Benelux in 2008
GB	Heritable Bank Plc	subsidiary of National Bank of Iceland, under administration since 2008
GB	Isle of Man Bank Limited	owned by Natwest
GB	National Westminster Bank Plc	owned by RBS Group
GB	Northern Rock (Asset Management) Plc	nationalized in 2008 through UK Financial Investments Limited (100%).
GB	Royal Bank of Scotland Plc (The)	nationalized in 2008 by the British government
GB	Ulster Bank Limited	owned by RBS Group
IE	DePfa ACS Bank	subsidiary 100% owned by Hypo Real Estate Holding AG
IS	Glitnir Bank	nationalized in 2008 by the Icelandic government (75%)
IS	Landsbanki Islands	under government receivership since 2008
LU	ABN Amro Bank (Luxembourg) SA	subsidiary 100% owned by ABN AMRO, nationalised in 2008 by the Dutch state
NL	Fortis Bank (Nederland) N.V.	nationalized in 2008 by the Dutch State

Table 7: Main results on lending cyclicality, 1989-2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				CSH50nat				GOB50nat	GOB25nat
gGDP	1.057***	0.907***	0.851***	1.058***	0.910***	0.857***	0.714***	0.929***	0.936***
	(0.072)	(0.099)	(0.138)	(0.072)	(0.099)	(0.139)	(0.146)	(0.100)	(0.103)
gGDP*Public	-0.659***	-0.661***	-0.647**						
	(0.227)	(0.239)	(0.260)						
gGDP*NoRecession*Public				-0.354	-0.273	-0.195	-0.086	-0.508	-0.403
				(0.431)	(0.539)	(0.513)	(0.527)	(0.442)	(0.310)
gGDP*Recession*Public				-1.075***	-1.141***	-1.242***	-1.147***	-0.873***	-0.878***
				(0.239)	(0.209)	(0.214)	(0.221)	(0.291)	(0.268)
L.SizeMarket	-0.055**	0.061	0.041	-0.055**	0.060	0.034	-0.093	0.061	0.060
	(0.024)	(0.046)	(0.073)	(0.024)	(0.046)	(0.074)	(0.972)	(0.046)	(0.046)
L.SizeRel	-0.385***	-0.433***	-0.373***	-0.387***	-0.436***	-0.370***	-0.399***	-0.436***	-0.439***
	(0.065)	(0.094)	(0.124)	(0.066)	(0.097)	(0.125)	(0.146)	(0.095)	(0.096)
L.CR4	8.897***	3.663	-5.590	8.863***	3.590	-6.039	1.182	3.678	3.732
	(3.380)	(4.475)	(9.521)	(3.381)	(4.468)	(9.496)	(9.994)	(4.470)	(4.465)
L.gSizeRel	0.017***	0.020***	0.051***	0.017***	0.020***	0.051***	0.067***	0.020***	0.021***
	(0.006)	(0.006)	(0.015)	(0.006)	(0.006)	(0.015)	(0.021)	(0.006)	(0.006)
L.gSizeMarket	0.024***	0.012*	0.024	0.024***	0.012*	0.025	0.028	0.012*	0.012*
	(0.005)	(0.006)	(0.017)	(0.005)	(0.006)	(0.017)	(0.020)	(0.006)	(0.006)
Total Public	0.397	0.247	0.204						
	(0.219)	(0.222)	(0.231)						
Total NoRecession				0.703	0.637	0.662	0.628	0.420	0.533
				(0.429)	(0.537)	(0.514)	(0.529)	(0.437)	(0.300)
Total Recession				-0.017	-0.231	-0.384*	-0.433**	0.056	0.058
				(0.227)	(0.178)	(0.159)	(0.163)	(0.272)	(0.248)
Drop Nationalization	no	no	no	no	no	no	yes	no	no
Weights	no	Cntry	Ctry+Asset	no	Cntry	Ctry+Asset	Ctry+Asset	Ctry+Asset	Ctry+Asset
Nber Countries	130	130	130	130	130	130	110	130	130
Nber Banks	2628	2628	2628	2628	2628	2628	2092	2628	2628
Nber Obs	25846	25846	25846	25846	25846	25846	20290	25846	25846
r2	0.06	0.07	0.08	0.06	0.07	0.08	0.09	0.07	0.07

Explained variable: gross Loan Growth. Explanatory variable: lagged relative size; lagged growth of the relative size; lagged market size; lagged growth of the market size; lagged concentration ratio CR4. Sample of commercial banks only excluding privatisations. Bank clustered robust standard errors in parenthesis; all regressions include: bank fixed effects, year dummies.
* p<0.10, ** p<0.05, *** p<0.01

Table 8: Lending cyclicality with country-year fixed effects, 1999-2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Whole			OECD		non-OECD		
	GOB50nat		CSH50nat	GOB50nat		GOB50nat		
GrowthGDP*Public	-0.765***							
	(0.220)							
L.SizeRel	-0.894***	-0.892***	-0.883***	-0.804***	-1.177***	-0.929***	-1.466***	-1.431***
	(0.274)	(0.274)	(0.273)	(0.256)	(0.329)	(0.330)	(0.218)	(0.189)
L.gSizeRel	0.119***	0.119***	0.119***	0.023	-0.047	0.143***	0.145***	0.104***
	(0.023)	(0.023)	(0.023)	(0.034)	(0.037)	(0.028)	(0.027)	(0.025)
GrowthGDP*NoRecession*Public		-0.666**	-0.426	-2.951*	0.407	-0.553*	-0.513*	-0.312
		(0.323)	(0.438)	(1.705)	(1.181)	(0.328)	(0.310)	(0.355)
GrowthGDP*Recession*Public		-1.084**	-1.570***	-1.652	-3.574***	-0.911**	-1.094	-7.657*
		(0.430)	(0.447)	(1.134)	(1.295)	(0.447)	(0.723)	(4.225)
Sample	All	All	All	All	Com	All	Com	Com
Drop Nationalizations	No	No	No	No	No	No	No	Yes
Nber Countries	69	69	69	24	17	45	36	26
Nber Banks	3249	3249	3249	2129	717	1120	824	599
Nber Obs	25005	25005	25005	16654	5737	8351	6221	4526
r2	0.39	0.39	0.39	0.25	0.39	0.42	0.45	0.43

Explained variable: gross Loan Growth. Explanatory variable: the public dummy includes privatizations type 2. Bank clustered robust standard errors in parenthesis; all regressions include: bank fixed effects, year dummies, country-year fixed effects, re-weighted observations at the country level, observations within country re-weighted by asset share.
* p<0.10, ** p<0.05, *** p<0.01

Table 9: Lending cyclicality for subsamples, 1989-2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Europe				South America			South-East Asia		
GrowthGDP	1.351***	1.077***	1.081***	0.735	1.572***	1.742***	2.056***	0.882***	0.793***	0.804***
	(0.255)	(0.329)	(0.331)	(0.447)	(0.422)	(0.445)	(0.678)	(0.234)	(0.217)	(0.225)
GrowthGDP*Public	-0.980**	-0.141			0.928				-0.532**	
	(0.455)	(0.592)			(0.901)				(0.209)	
GrowthGDP*NoRecession*Public			0.191	-0.542		2.775**	2.848***	-0.537**		-0.446*
			(0.765)	(0.540)		(1.100)	(0.943)	(0.214)		(0.255)
GrowthGDP*Recession*Public			-1.397**	-1.447**		-8.654***	-17.390***	-2.378**		-3.221**
			(0.703)	(0.646)		(2.828)	(2.660)	(1.100)		(1.314)
Total Recession			-0.316	-0.712		-6.911*	-15.335***	-1.497		-2.417
			(0.630)	(0.542)		(2.678)	(2.949)	(1.053)		(1.284)
Sample	All	Com	Com	Com	Com	Com	Com	All	Com	Com
Drop Nationalization	no	no	no	yes	no	no	yes	no	no	no
Nber Countries	40	36	36	30	12	12	5	15	15	15
Nber Banks	2451	1029	1029	928	325	325	148	794	513	513
Nber Obs	24433	10122	10122	9155	3034	3034	1409	8251	5651	5651
r2	0.16	0.19	0.20	0.20	0.32	0.34	0.57	0.46	0.44	0.44

Explained variable: gross Loan Growth. Explanatory variable: the public dummy is GOB50nat (indirectly owned banks by the home government at the 50% threshold) and includes privatizations type 2; lagged size ; lagged relative size; lagged growth of the relative size; lagged growth of the market size; lagged concentration ratio CR4. Bank clustered robust standard errors in parenthesis; all regressions include: bank fixed effects, year dummies, re-weighted observations at the country level, observations within country re-weighted by asset share.
* p<0.10, ** p<0.05, *** p<0.01

Table 10: Privatisation and lending cyclicality, 1989-2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CSH50nat include privatised			CSH50nat privatised separate			CSH50
GrowthGDP	0.946***	0.957***	0.957***	0.939***	0.948***	0.948***	0.948***
	(0.135)	(0.136)	(0.136)	(0.136)	(0.137)	(0.137)	(0.137)
GrowthGDP*Public	-0.486*			-0.487*			
	(0.280)			(0.286)			
GrowthGDP*NoRecession*Public		0.015	0.022		0.027	0.027	0.040
		(0.462)	(0.461)		(0.486)	(0.486)	(0.469)
GrowthGDP*Recession*Public		-1.261***	-1.263***		-1.252***	-1.253***	-1.257***
		(0.238)	(0.238)		(0.240)	(0.240)	(0.238)
GrowthGDP*b4Privatised				0.134	0.175	0.262	
				(0.637)	(0.637)	(0.615)	
GrowthGDP*YearPrivatised	-0.023	0.144	0.378	0.418	0.436	0.681	0.362
	(0.920)	(0.926)	(0.816)	(1.001)	(1.004)	(0.896)	(0.920)
GrowthGDP*AfterPrivatised				0.563**	0.564**	0.539**	
				(0.234)	(0.236)	(0.231)	
GrowthGDP*AfterPrivatised*(Foreign=0)							0.197
							(0.379)
GrowthGDP*AfterPrivatised*(Foreign=1)							0.689**
							(0.316)
Privatization type	2	2	1	2	2	1	2
Nber Countries	140	140	140	140	140	140	140
Nber Banks	4901	4901	4901	4901	4901	4901	4901
Nber Obs	48007	48007	48007	48007	48007	48007	48007
r2	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Explained variable: gross Loan Growth. Explanatory variable: lagged relative size; lagged growth of the relative size; lagged market size; lagged growth of the market size; lagged concentration ratio CR4. Privatization type refer to the way I recode banks with several rounds of public authorities disengagement; type 1 if the privatization date corresponds to the most recent one; type 2 if the privatization date corresponds to the round with the largest proceeds. Sample of banks excluding central banks and clearing institutions. Bank clustered robust standard errors in parenthesis; all regressions include: bank fixed effects, year dummies, re-weighted observations at the country level, observations within country re-weighted by asset share.
* p<0.10, ** p<0.05, *** p<0.01

Table 11: Lending cyclicality and financing sources, 1999-2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Short term funding		Long term funding		Deposits			Reserves
GrowthGDP*Public			-0.827**		-0.577**			
			(0.371)		(0.268)			
GrowthGDP*Recession*Public	-3.874**	-1.785*		-1.994**		-1.105*	1.271	2.118
	(1.593)	(1.052)		(0.887)		(0.601)	(0.824)	(1.323)
GrowthGDP*NoRecession*Public	-0.040	-0.238		-0.208		-0.356	-0.553	-1.778**
	(0.852)	(0.745)		(0.570)		(0.369)	(0.702)	(0.860)
YearPrivatised	-0.706	23.689	4.588	6.152	5.564	6.036	15.394	-26.567*
	(20.830)	(14.753)	(9.380)	(9.196)	(5.077)	(5.047)	(12.652)	(15.138)
L.SizeRel	-0.455	-0.603	-0.849**	-0.847**	-1.447***	-1.445***	-0.848*	-0.709
	(0.555)	(0.480)	(0.392)	(0.392)	(0.241)	(0.241)	(0.513)	(0.462)
L.gSizeRel	-0.055	-0.027	0.037	0.037	0.005	0.005	0.024	0.039
	(0.041)	(0.030)	(0.025)	(0.025)	(0.017)	(0.017)	(0.030)	(0.031)
Nber Countries	63	66	69	69	69	69	65	60
Nber Banks	2049	2824	2455	2455	3056	3056	2679	2207
Nber Obs	11474	18356	15712	15712	24753	24753	17949	14566
Woolridge panel AR test	0.07	0.63	0.53	0.53	0.01	0.01	0.49	0.05
r2	0.16	0.13	0.13	0.13	0.13	0.13	0.10	0.14

Explained variable: expressed in growth rate; regression (1) uses Money Market Funds *gMMF* as reported by Bankscope; regression (2) uses a measure of short term funding *gMMF3* including the item otherLiabilities; regression (3) and (4) use customer deposits *gCustDeposits* while (3) uses bank deposits *gBkDeposits*. Explanatory variable: the public dummy is GOB50nat (indirectly owned banks by the home government at the 50% threshold) and includes privatizations type 2 (date of the largest proceeds if several rounds); also I control for lagged ROAA and lagged capital over deposits ratio. Bank clustered robust standard errors in parenthesis; all regressions include: bank fixed effects, country-year fixed effects, control for privatization year, re-weighted observations at the country level.
* p<0.10, ** p<0.05, *** p<0.01