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BANK CONCENTRATION: CHILE AND INTERNATIONAL COMPARISONS

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Resumen

¿Existe a nivel internacional una relación negativa entre concentración bancaria y las características del mercado bancario y financiero?. Este trabajo encuentra que la respuesta es “no”. No se observa una asociación entre el grado de concentración bancaria y resultados negativos, en términos del nivel de desarrollo del sistema financiero, del grado de competencia dentro de la industria, de la integridad del sistema legal y político, del crecimiento económico y de la fragilidad del sector bancario. Además, este estudio muestra que (1) Chile no se caracteriza internacionalmente por tener un sistema bancario concentrado y (2) el grado de concentración bancaria en Chile ha cambiado significativamente poco durante los últimos 16 años.

Abstract

Is banking sector concentration associated with negative outcomes internationally? This paper finds that the answer is “no.” Greater bank concentration is not strongly associated with negative outcomes in terms of financial sector development, industrial competition, political and legal system integrity, economic growth, or banking sector fragility. The paper also shows that (1) Chile does not stand out as having a particularly concentrated banking system, and (2) Chilean bank concentration has changed remarkably little over the last 16 year.

I would like to thank Felipe Morandé, Klaus Schmidt-Hebbel, Carlos Budnevich, Herman Bennett and the Banco Central de Chile staff for very helpful comments and data. I am especially grateful to Francisco Gallego who identified data sources and constructed the figures presented in this paper. The views expressed in this paper are mine alone. Address: Room 3-257, Carlson School of Management, 321 19th Avenue South, Minneapolis, MN 55455; rlevine@csom.umn.edu.

With the recent purchase of Banco Santiago by Banco Santander, the issue of banking sector concentration has stepped into Chile's policy spotlight. This short paper uses newly compiled data on a cross-section of countries to address the question: Is banking sector concentration associated with negative outcomes internationally? I also present information on how Chile compares internationally and the evolution of bank concentration in Chile since 1983.

In terms of international comparisons, the paper asks: do countries with more concentrated banking systems (as measured by the share of the loan market controlled by the three largest banks) have:

1. More poorly functioning financial systems, i.e.,

- Greater net interest income as a share of total assets
- Greater overhead expenses as a share of total assets
- Smaller overall banking systems
- Less liquid equity markets

2. Less competitive industrial sectors, i.e.,

- Greater market domination by a few firms
- Less effective anti-trust procedures
- Less competitive business climate

3. Less effective political and legal system, i.e.,

- Greater corruption
- Less adherence to the rule of law
- Worse tax compliance

4. Slower economic growth and Greater bank fragility

The simple answer to each of the above questions is “no.” Greater bank concentration is not strongly associated with negative outcomes in terms of financial sector development, industrial competition, political and legal system integrity, economic growth, or banking sector fragility. Looking at a broad cross-section of 66 countries over the 1980-95 period, one does not observe a strong relationship between bank concentration and many variables of interest. While one may question the accuracy of the underlying data, all of the comparisons point in the same direction. From international comparisons, it would be very difficult to argue that greater concentration per se is necessarily bad (or good) for financial development, industrial competition, political integrity, economic growth, or financial stability.

Chile does not stand out. In the 66 country data set, Chile’s level of banking sector concentration of 0.49 over the 1980-95 period is below the sample mean of 0.67 and the sample median of 0.72. Furthermore, the level of banking sector concentration in Chile has not changed much since 1983. There has been little variation in

concentration over the last 16 years. Using data available from the Banco Central de Chile, the concentration level in 1999 was slightly lower than in 1983.

The evidence in this short paper does not imply that concentration is an unimportant issue for Chilean policy makers. Banking sector concentration is influenced by many factors. Furthermore, the effects of concentration on an economy and the political system depend on many country-specific factors. This paper's message does not cover these critical relationships. Rather, this short paper simply shows that (1) there is not a simple relationship between banking concentration and financial development, industrial competition, the political and legal environment, economic growth, and financial fragility, (2) Chile does not stand out as having a particularly concentrated banking system, and (3) Chilean bank concentration has changed remarkably little over the last 16 years.

A. Data

The underlying data are taken from Beck, Demirguc-Kunt, and Levine (1999). As indicated above, I organize the data into four groups: (1) measures of financial development and concentration (2) measures of industrial competition, (3) measures of the political and legal environment, and (4) measures of economic growth and banking sector fragility. The specific variables are as follows.

A.1. Financial Development and Concentration

Concentration equals the share of total loans of the three largest banks and is the average value over the 1990-95 period. This variable captures the degree of concentration in the banking industry. I also used such measures as the number of banks per capita and the share of total assets of the single largest bank. These alternative measures produced similar results, however.

Very Concentrated equals 1 if Concentration is more than two standard deviations above the sample mean, and equals 0 otherwise. The Jaque-Berra statistics does not reject the hypothesis that Concentration is normally distributed across countries. Nonetheless, there may exist concerns that extreme concentration is particularly threatening to competition, efficiency, and economic performance.

Net Interest Margin equals net income divided by total assets and is the average value over the 1990-95 period. While recognizing that many factors influence interest rates besides the degree of efficiency of bank operations, I include this measure because of its wide use in the literature.

Overhead Costs equals overhead expenditures as a share of total bank assets and is also averaged over the 1990-95 period. Again, overhead expenditures are not necessarily a sign of inefficiency. Nonetheless, particularly large values may signal a lack of competition.

Bank Credit equals claims on the private sector by deposit money banks and as a share of GDP and is the average value over the 1980-95 period. This is a general and widely used measure of banking sector development. I also used such other measures as: (a) a broad measure of intermediary development that also includes claims by non-

deposit money banks on the private sector, (b) liquid liabilities, and (c) total assets of the commercial banking sector relative to GDP in 1997. These alternative measures do not alter any of the conclusions, however.

Total Value Traded equals the value of domestic equities traded on domestic exchanges divided by GDP. This is averaged over the 1980-95 period. Levine and Zervos (1998, June AER) show that stock market liquidity is important for economic growth. I also considered the variable **Nonbank Credits**, which equals nonbank financial institution claims on the private nonfinancial sector as a share of GDP and is the average value over the 1980-95 period. This gave the same results as total value traded.

A.2. Industrial Competition

No Market Domination is based upon a survey question in which respondents indicate the degree to which they agree with the following statement: “market domination is not common in your country.” I also examined the percentage of economic activity controlled by the 30 largest companies. This alternative measure produced similar results, however.

Effective Anti-Trust is based upon survey questions in which respondents indicate the degree to which they believe the anti-trust laws of a country operate effectively and fairly. Greater values signify that anti-trust laws are perceived to work more effectively.

Business is Competitive is based upon a survey question in which respondents indicate the degree to which they believe the business environment is free and competitive.

A.3. Political and Legal Environment

Integrity (less corruption) is an indicator of the degree of corruption in government and society at large. Greater values signify less corruption, or greater integrity.

Rule of Law is an indicator of the degree to which the country adheres to the rule of law.

Tax Compliance is an indicator of the degree to which society complies with tax laws.

A.4. Growth and Stability

Economic Growth equals real per capita GDP growth from 1980-95.

Banking Crisis equals the Caprio and Klingebiel (1999) indicator of systemic banking crises except for the following adjustment. First, I expanded it to include countries that experienced major, though perhaps not systemic, banking crises over the 1985-97 period. This results in the addition of: Canada (15 members of Canadian Deposit Insurance Company failed), Denmark (cumulative losses of 9 percent of loans), Hong Kong (9 out of 18 banks failed over the period), India (nonperforming loans estimated as 16 percent of total loans), Italy (58 banks accounting for 11 percent of total loans were forcibly merged), and the United States (estimated savings and loan clean-up costs of 3.2 percent of GDP). Second, I exclude two countries (Israel and Spain) from the Caprio/Klingebiel list of systemic banking crises because their crises occurred in the late 1970s and therefore are outside our sample period.

B. Analysis: Descriptive Statistics

Table 1 provides descriptive statistics of the data. It also lists the values of Chile.

Chilean bank concentration is below the international average. Specifically, Chile's level of banking sector concentration of 0.49 is substantially below the sample mean of 0.67 and the sample median of 0.72. Thus, bank concentration in Chile is not a defining feature in the internationally.

Chilean bank efficiency and size are close to the sample mean, while stock market trading as a share of GDP is below the sample average and bit below the sample median. While Chile is about average in terms of perceived market domination and the effectiveness of anti-trust laws, it ranks very highly in terms of the freedom to compete in the business arena. Nonetheless, corruption is more of a problem in Chile than it might hope for in the long-run.

C. Analysis: Correlations and Regressions

This section assesses the relationship between banking sector concentration and (1) measures of financial development, (2) measures of industrial competition, (3) measures of the political and legal environment, and (4) measures of economic growth and banking sector fragility. I first compiled simple correlations and evaluated the significance of these correlations. Table 2 presents the correlations. In the regressions, I control for the overall level of economic development (the logarithm of real per capita

GDP in 1980). I use heteroskedasticity-consistent standard errors. The regressions are presented in a series of appendices since they do not add much to the correlations.

Concentration is not significantly related to measures of financial sector development (Table 2: Panel A). Concentration is uncorrelated with net interest margins, bank overhead costs, the size of the banking system, and the degree of stock market liquidity. This finding is unchanged when using the Very Concentrated measure of concentration as shown in the Table 2: Panel A. The regressions tell the same story. Appendix A shows that banking sector concentration does not enter any of the regressions significantly at the 0.10 level after controlling for the level of economic development. While it seems natural to assume that great concentration implies less competition and less efficient banks, the international comparisons do not support this view. The degree of market contestability – along with the degree of market concentration – appear to be the realizations of complex interactions among various policy and market conditions. There is not a simple link between concentration and efficiency. In sum, banking sector concentration is not significantly related to net interest margins, overhead costs, bank credit, or stock market liquidity

Concentration is not significantly related to measures of industrial competition (Table 2: Panel B). There is little correlation between banking sector concentration and the degree of industrial market domination, the effectiveness of anti-trust laws, or the freedom to compete economically. Again, the Very Concentrated measure of bank concentration yields the same findings. The regressions in Appendix B confirm these

results after controlling for the level of economic development. Many observers note that greater bank concentration will produce greater industrial concentration, and therefore a less competitive economy, international comparisons with existing – albeit flawed data – do not validate these concerns. Banking sector concentration is not significantly related to measures of the degree of industrial competition.

Concentration is not negatively associated with the integrity of the political and legal environment (Table 2: Panel C). Countries with greater concentration do not have lower tax compliance. Countries with greater concentration do not have less efficient legal systems. Indeed, greater concentration is positively associated with integrity; i.e., more concentration is negatively associated with corruption. These findings are confirmed by the regression estimates in Appendix C that control for the level of real per capita GDP. Observers note that greater bank concentration will corrupt the political and legal environment. There is little evidence of this, however, in the international cross-section of countries. The positive relationship between integrity and concentration should not be interpreted as implying that concentration lowers corruption. Indeed, it should be used to highlight the complex nature of the relationship between concentration and the political environment. It may be that less corrupt governments are more likely to open markets internationally. A few big international banks may gobble-up a concentrated part of the financial system. These banks, however, may be subject to competitive pressures such that banking sector efficiency does not deteriorate. This argument is purely speculative and this paper offers no support for it. Rather, this paper suggests that calls to limit banking sector concentration will not find analytical support by simply looking across the

globe at the links between concentration and the integrity of the political and legal systems.

Banking sector concentration is not significantly related to economic growth (Table 2: Panel D). In terms of the growth, neither the simple correlations nor the regressions in Appendix D suggest a strong relationship between concentration and economic growth.

There is some evidence that greater banking sector concentration is significantly and negatively associated with major banking crises (Table 2: Panel D). The simple correlations indicate a negative association between concentration and whether the country experienced a major banking crisis. Using a logit regression and controlling for initial income, the results confirm that countries with more concentrated banking systems seem to have a lower probability of suffering a systemic banking crises. This result disappears, however, when controlling for a broader array of country characteristics (inflation, openness to international trade, and the size of the government). In sum there is not a confident link between concentration and financial fragility.

D. Discussion of International Comparisons

International comparisons do not suggest that banking sector concentration is negatively associated with financial development, industrial competition, integrity of the political and legal systems, overall economic growth, or banking sector fragility. Further work is surely needed. Evidently, the relationship between bank concentration and

economic development is more complex than one can obtain from simple cross-country comparisons. Nevertheless, the data certainly do not support the view that bank concentration per se is necessarily bad. Arguments for restricting bank mergers will have to be supported by something else besides broad international comparisons.

Finally, it should be emphasized that foreign banks can play an important role. Demirguc-Kunt and Levine (1998) find that greater foreign bank presence – just the number of foreign banks, not their share of the market – is negatively associated with overhead costs and financial fragility. Thus, concentrated banking system may still be in highly contestable markets that keep banks efficient and stable.

E. Chile

As noted above, Chile does not have a very concentrated banking sector. Indeed, its level of bank concentration is below the international mean. This section examines the evolution of bank concentration in Chile since the early 1980s.

Figure 1 shows that banking market concentration in Chile has been fairly constant over time. Bank concentration is measured as the percentage of loans (in value terms) issued by the three largest banks to total loans issued by the banking sector. The level of concentration is a bit lower in 1999 (0.41) than it was in 1983 (0.49). Concentration reached a low in 1995 of about 0.35 before returning to 0.42 in 1997. Thus, there is no evidence of a sharp increase in Chilean banking sector concentration.

Further note in Figures 2 – 4 that Chile has experienced considerable financial development. These Figures are taken from Francisco Gallego and Norman Loayza (2000). Bank activity as a share of GDP has grown, albeit with some variation. Bank efficiency has improved over time and past due loans fell since the early 1980s before rising slightly with the onset of the Asian financial crisis. Thus, while Chile's overall level of financial development has grown, the level of banking sector concentration has remained fairly constant. The data do not highlight the need for particular concern associated with bank concentration in Chile.

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Table 1: Descriptive Statistics

	CONCENTRATION	NET INTEREST MARGIN	OVERHEAD COST	BANK CREDIT	TOTAL VALUE TRADED
Mean	0.67	0.04	0.04	0.43	0.12
Median	0.72	0.03	0.03	0.41	0.06
Maximum	1.00	0.12	0.12	1.44	0.98
Minimum	0.18	0.01	0.00	0.03	0.00
Chile	0.49	0.05	0.03	0.45	0.04

Table 1: Descriptive Statistics (continued)

	NO MARKET DOMINATION	EFFECTIVE ANTI-TRUST	BUSINESS IS COMPETITIVE	INTEGRITY (LESS CORRUPT)	RULE OF LAW	ECONOMIC GROWTH	BANKING CRISIS
Mean	3.45	4.13	7.23	3.97	3.90	1.72	0.54
Median	3.44	4.19	7.5	3.76	3.80	1.70	1
Maximum	4.77	5.47	10	6	6	7.50	1
Minimum	2.17	2.13	2.5	1.18	1.14	-4.42	0
Chile	3.62	4.71	10	3.18	4.21	3.73	1

TABLE 2: CORRELATIONS

Panel A: Financial Intermediary Development and Concentration

	CONCENTRATION	VERY CONCENTRATED (CONCENTRATION > 0.885)	N
NET INTEREST MARGIN	0.01	0.05	59
OVERHEAD COST	-0.04	-0.06	59
BANK CREDIT	-0.15	-0.22	59
TOTAL VALUE TRADED	-0.10	-0.12	54

Panel B: Industrial Competition and Bank Concentration

NO MARKET DOMINATION	0.04	-0.16	43
EFFECTIVE ANTI-TRUST	0.16	0.11	43
BUSINESS IS COMPETITIVE	0.18	0.20	43

Note: None of these correlations is significant at the 0.10 level.

TABLE 2: CORRELATIONS (continued)

Panel C: Political and Legal Environment and Bank Concentration

	CONCENTRATION	VERY CONCENTRATED (CONCENTRATION > 0.885)	N
Integrity (Less Corruption)	0.34	0.04	42
Rule of Law	0.09	-0.02	42
Tax Compliance	0.17	0.00	42

Note: None of these correlations is significant at the 0.10 level.

Panel D: Growth, Crises, and Bank Concentration

Economic Growth	-0.19	-0.20	57
Major Banking Crisis	-0.35	-0.28	57

Note The two crises correlations are significant at the 0.05 level.

Note: The two growth correlations are not significant at the 0.10 level.

Appendix A: Regressions of Financial Development on Bank Concentration

Dependent Variable: NET INTEREST MARGIN

Included observations: 59

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.119362	0.026397	4.521703	0
LRGDPSH	-0.00902	0.002594	-3.476793	0.001
CONC	-0.00618	0.010717	-0.576994	0.5663
R-squared	0.119082			
Adjusted R-squared	0.08762			

Dependent Variable: OVERHEAD

Included observations: 59

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.097897	0.027745	3.52838	0.0008
LRGDPSH	-0.00618	0.002858	-2.162834	0.0348
CONC	-0.0097	0.011491	-0.843758	0.4024
R-squared	0.047733			
Adjusted R-squared	0.013724			

Appendix A (continued): Financial Development on Bank Concentration

Dependent Variable: BANK CREDIT

Included observations: 59

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.38551	0.337187	-4.109032	0.0001
LRGDPSH	0.216572	0.036502	5.933134	0
CONC	-0.02524	0.136902	-0.184368	0.8544
R-squared	0.390197			
Adjusted R-squared	0.368418			

Dependent Variable: Total Value Traded

Included observations: 54

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.5312	0.263512	-2.015824	0.0491
LRGDPSH	0.080667	0.028874	2.793806	0.0073
CONC	-0.06164	0.092976	-0.662971	0.5103
R-squared	0.153608			
Adjusted R-squared	0.120416			

Appendix B: Industrial Competition and Bank Concentration

Dependent Variable: No Market Domination

Included observations: 43

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.300525	1.101642	-0.272797	0.7864
LRGDPSH	0.464264	0.122644	3.785454	0.0005
CONC	-0.48226	0.479351	-1.006068	0.3204
R-squared	0.240415			
Adjusted R-squared	0.202436			

Dependent Variable: Effective Anti-Trust

Included observations: 43

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.15387	1.176589	-1.830606	0.0746
LRGDPSH	0.737413	0.129802	5.681054	0
CONC	-0.214199	0.521811	-0.410492	0.6836
R-squared	0.459516			
Adjusted R-squared	0.432492			

Dependent Variable: Business is Competitive

Included observations: 43

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.931737	2.661066	-2.980661	0.0049
LRGDPSH	1.803212	0.291666	6.182451	0
CONC	-0.200827	0.963201	-0.2085	0.8359
R-squared	0.531564			
Adjusted R-squared	0.508142			

Appendix C: Political/Legal Environment and Bank Concentration

Dependent Variable: Integrity (Less Corruption)

Included observations: 42

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.468589	1.519614	-6.230915	0
LRGDPSH	1.492369	0.173488	8.602153	0
CONC	1.446893	0.502605	2.878788	0.0064
R-squared	0.756657			
Adjusted R-squared	0.744177			

Dependent Variable: Rule of Law

Included observations: 42

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.77879	1.802814	-5.978871	0
LRGDPSH	1.772391	0.190135	9.321774	0
CONC	-0.470314	0.569616	-0.825669	0.414
R-squared	0.731781			
Adjusted R-squared	0.718026			

Dependent Variable: Tax Compliance

Included observations: 42

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.316578	1.251107	-1.851623	0.0717
LRGDPSH	0.605854	0.157478	3.847225	0.0004
CONC	0.533168	0.716856	0.74376	0.4615
R-squared	0.220763			
Adjusted R-squared	0.180802			

Appendix D: Growth, Crises, and Bank Concentration

Dependent Variable: GROWTH

Included observations: 57

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.245654	4.293045	0.988961	0.3272
LRGDPSH	-0.269073	0.629524	-0.427422	0.6708
LSCHOOL80	0.628577	0.988573	0.635843	0.5276
CONC	-1.91123	1.382368	-1.382577	0.1726
R-squared	0.044946			
Adjusted R-squared	-0.009114			

Dependent Variable: GROWTH

Included observations: 53

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.70521	4.709893	2.485238	0.0169
LRGDPSH	-0.781706	0.623713	-1.253311	0.2169
LSCHOOL80	0.076753	0.988675	0.077633	0.9385
ASSASS	-0.331624	0.425229	-0.77987	0.4397
REVC	-1.018606	1.369343	-0.743865	0.461
CIVIL	-0.445974	0.215055	-2.073773	0.0441
TRADE	0.009816	0.00552	1.778443	0.0824
GOV	-0.115538	0.05753	-2.0083	0.0509
PI	-0.016564	0.007572	-2.187579	0.0342
CONC	-0.93967	1.608478	-0.584198	0.5621
R-squared	0.365541			
Adjusted R-squared	0.232747			

Appendix D (continued): Growth, Crises, and Bank Concentration

Dependent Variable: MAJOR CRISIS

Method: ML - Binary Logit

Included observations: 57

QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	8.365588	3.664442	2.282909	0.0224
LRGDPSH	-0.625657	0.377425	-1.657699	0.0974
CONC	-4.308125	1.502555	-2.8672	0.0041
Probability(LR stat)	0.004885			
Obs with Dep=1	26			
Obs with Dep=0	31			

Dependent Variable: MAJOR CRISIS

Method: ML - Binary Logit

Included observations: 56

QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	4.631972	3.801539	1.218447	0.2231
LRGDPSH	-0.211837	0.380968	-0.55605	0.5782
GOV	-0.080145	0.069353	-1.155601	0.2478
PI	0.047906	0.02439	1.964189	0.0495
TRADE	-0.00438	0.005853	-0.748306	0.4543
CONC	-2.549007	1.908537	-1.335582	0.1817
Probability(LR stat)	0.002164			
Obs with Dep=1	25			
Obs with Dep=0	31			

**Figure 1:
Banking Market Concentration: Loans**

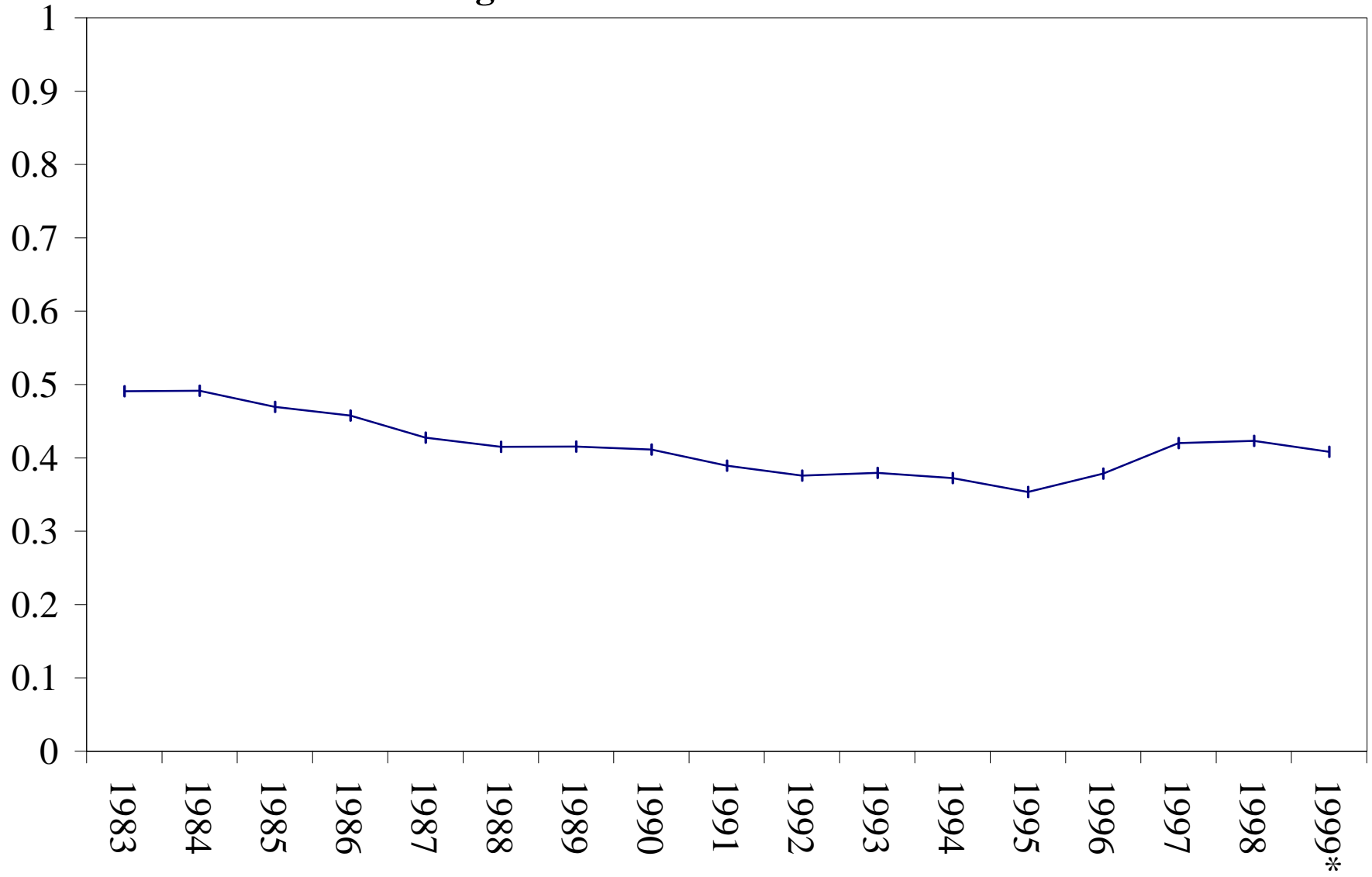
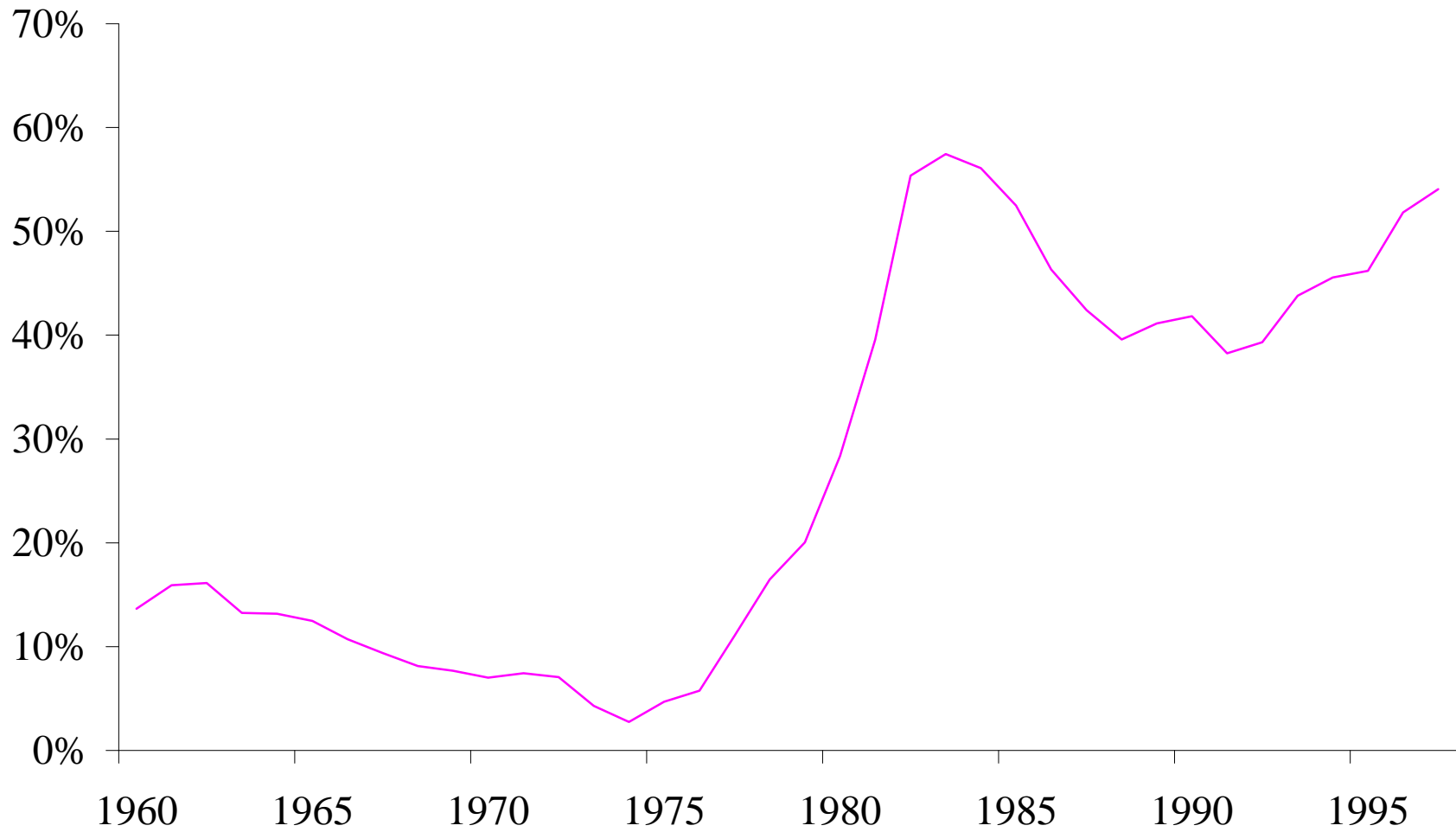
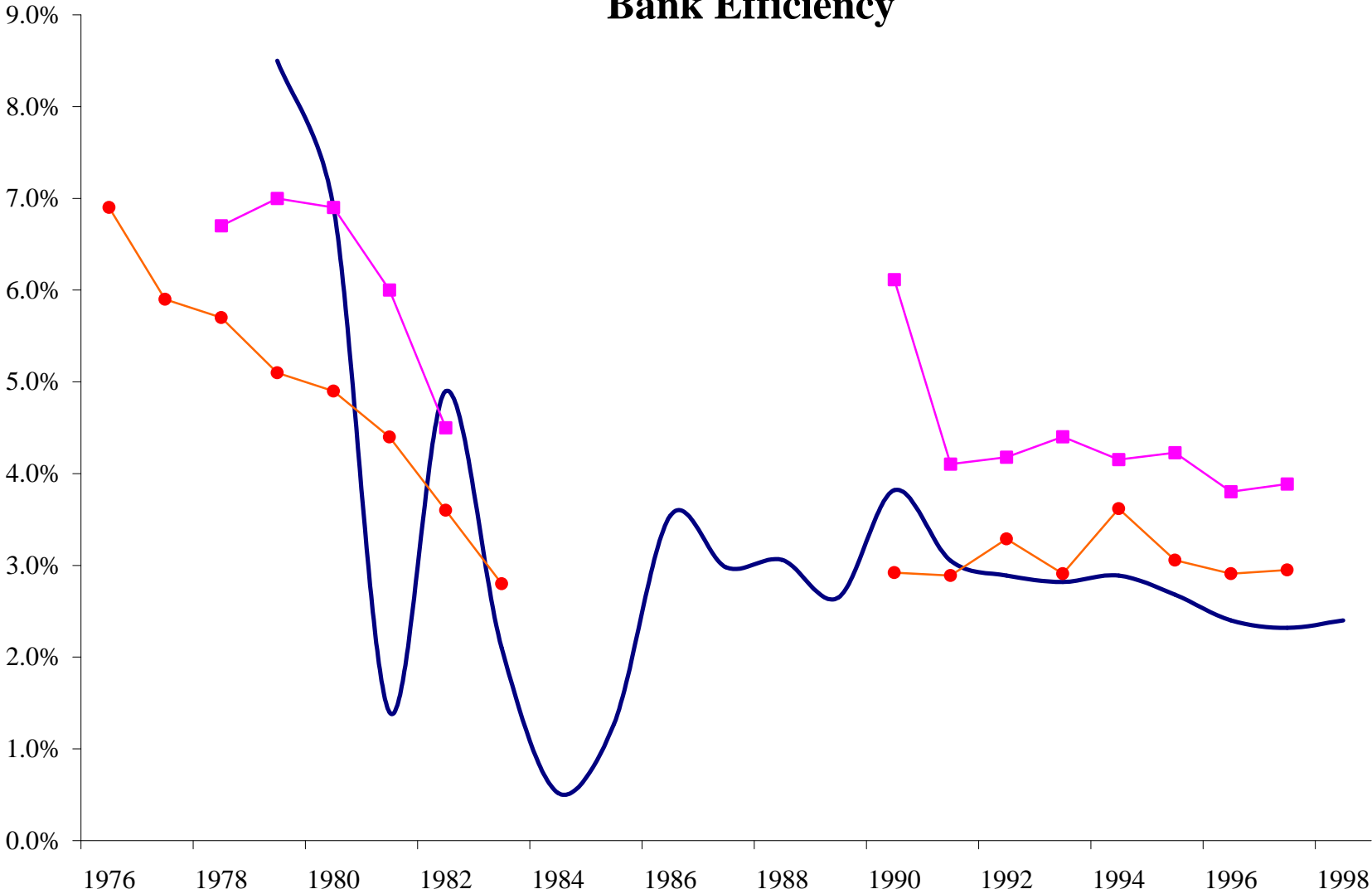


Figure 2
Bank Activity



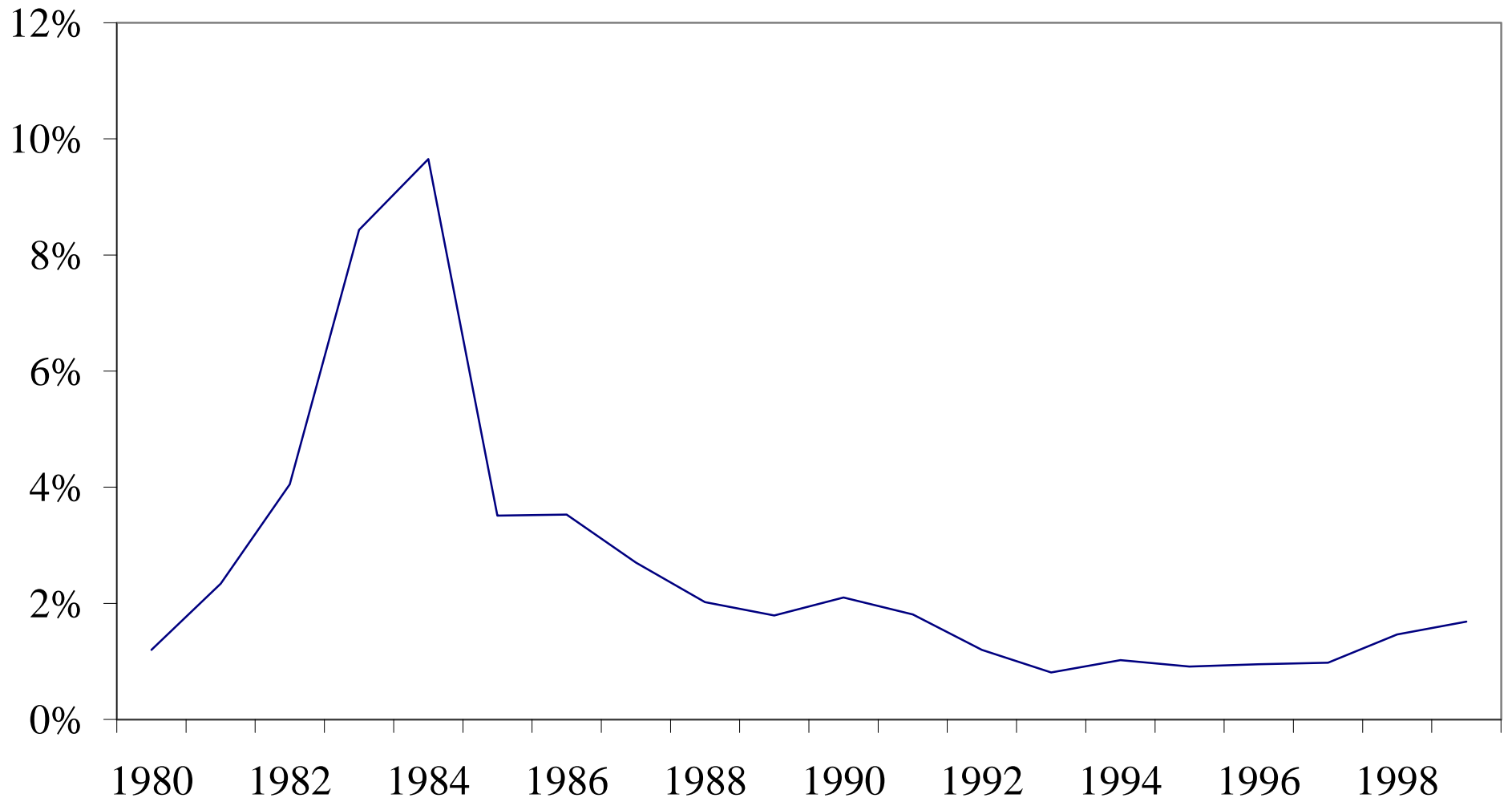
— Private Credit by Money Banks

Figure 3
Bank Efficiency



— Spread — Net Interest Margin — Overhead costs

Figure 4
Past Due Loans to Total Loans



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