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Institut für Volkswirtschaftslehre (ECON)

Bachelor Thesis in Macroeconomics

„US commercial banks“

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1 Introduction

2 Main part

2.1 General look at us banks

2.1.1 Assets

The following section will show some insights about the asset side of the whole us commercial banking sector. The asset side is composed of: ...

Figure 1: Asset side

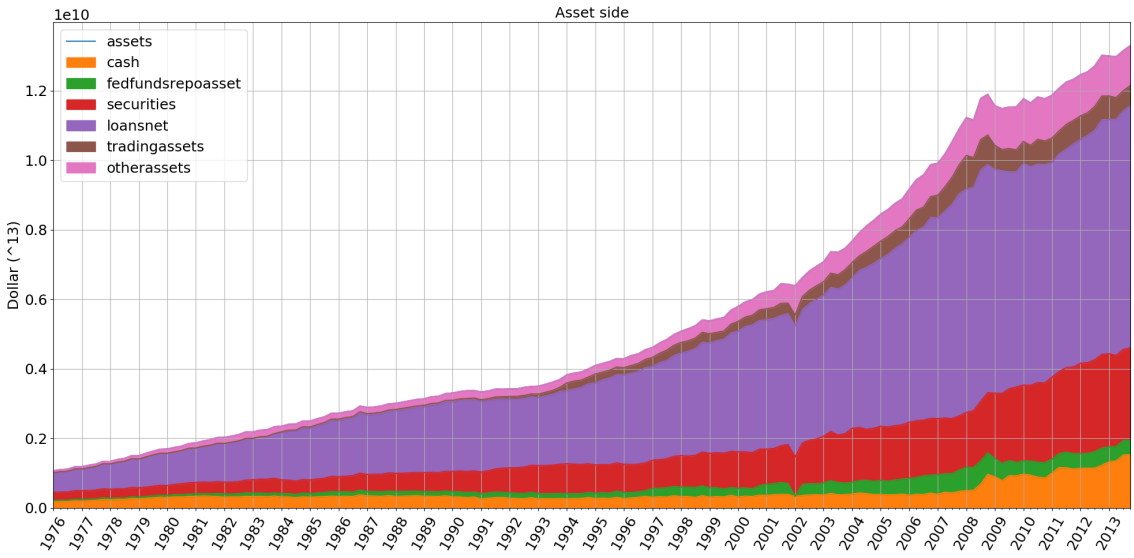
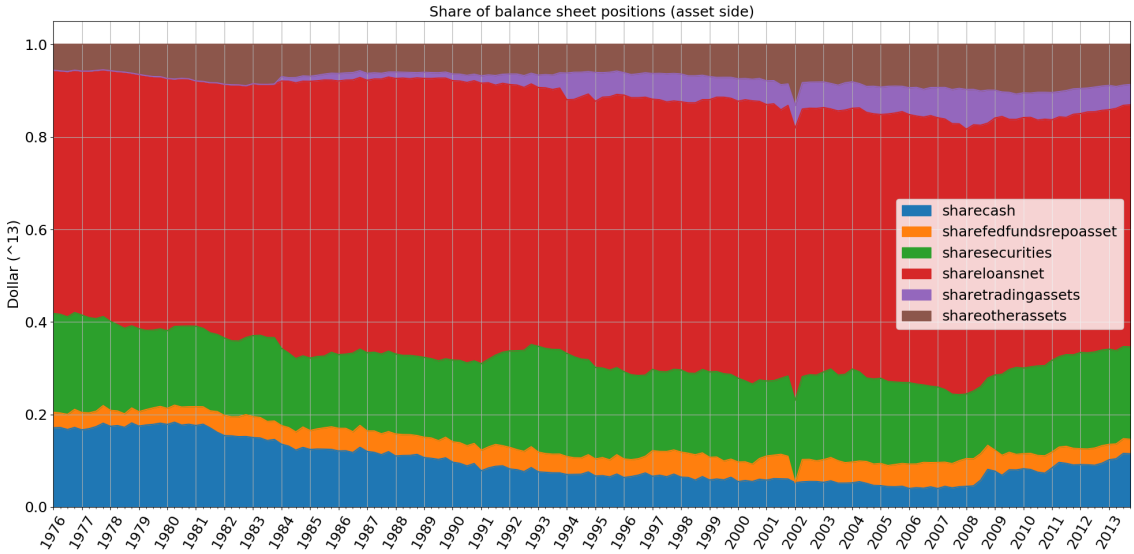


Figure 2: Share of asset positions

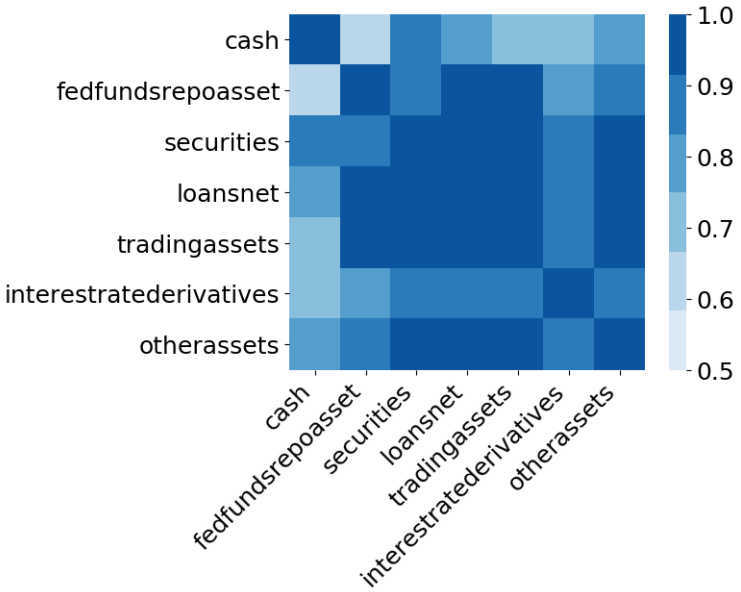


Graph description: Figure 1 shows the aggregates of the main variables from the asset side of the balance sheet over time. Figure 2 shows the share of each aggregated balance sheet position of all commercial banks over time.

Key Observations:

- loans make up the largest share of assets
- share of trading assets have risen as well as interest rate derivatives
- loans and trading assets have risen more than securities in timeframe year 2000-2009
- There is a noticeable anomaly in year 2000. Significant amounts of repo lending is transferred into other assets. Other assets are derivatives not available for sale.
- drop in assets in 2002 and 2008
- share in cash has fallen until 2008 and then increased again
- While the share of securities and loans fell 2005-2008, the share of cash and reverse repos did rise

Figure 3: Correlation of balance sheet positions (assets side)



Graph description: Figure 3 shows the Pearson Correlation Coefficient between different balance sheet positions

Key Observations:

- Cash has the weakest correlation with the rest positions
- No significant stand outs

2.1.2 Liabilities

Figure 4: Liabilities side

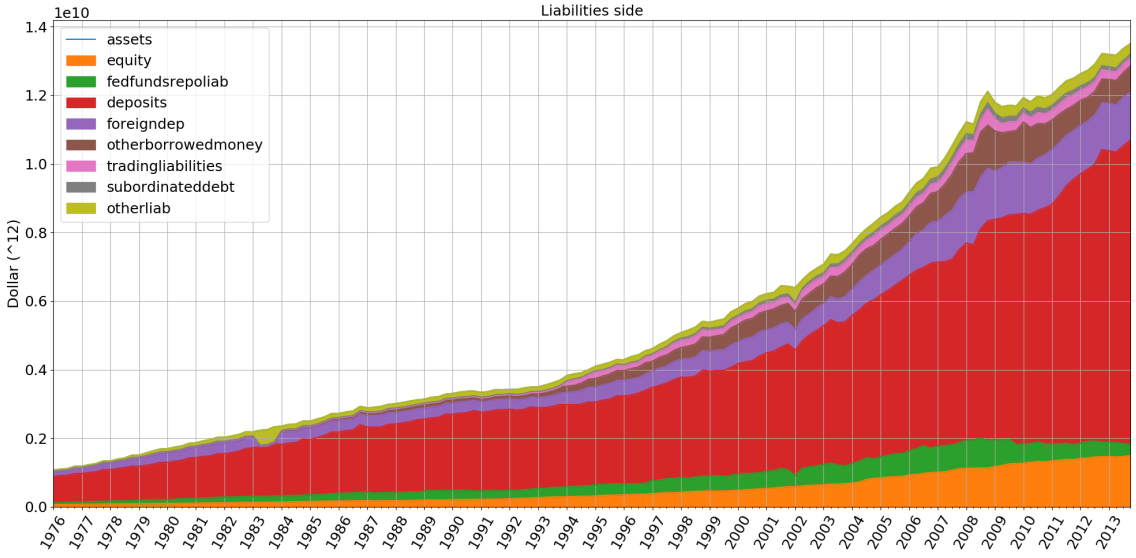


Figure 5: Share of liabilities positions

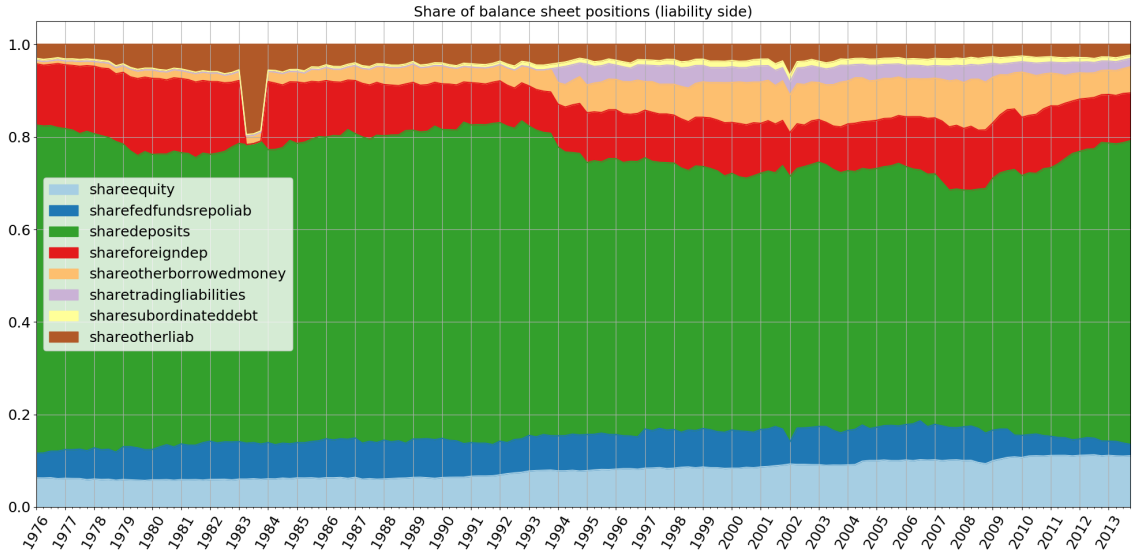
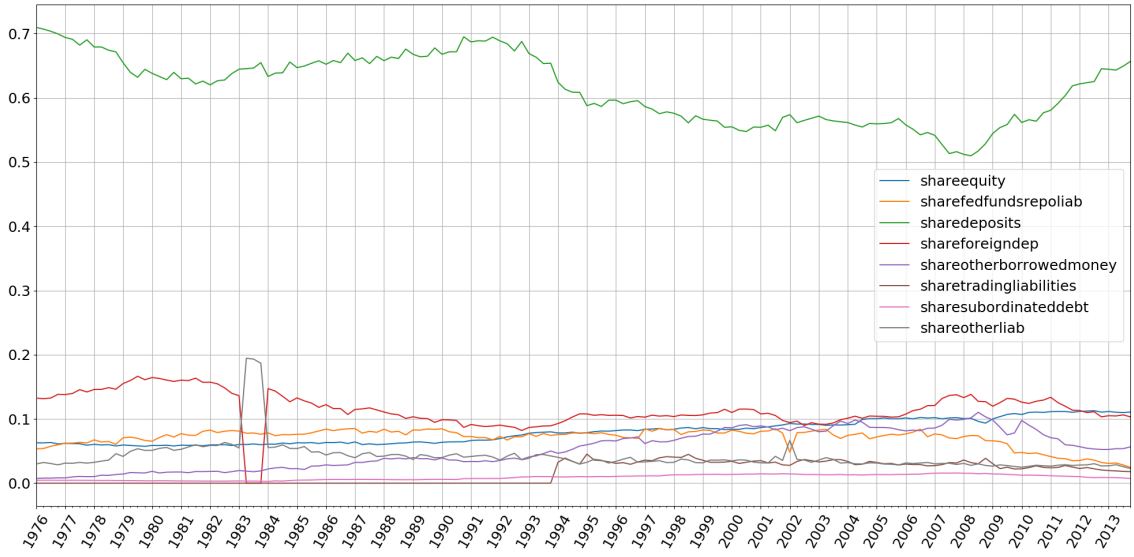


Figure 6: Share of liabilities positions



Graph description: The graph shows the aggregates of the main variables from the liabilities side of the balance sheet over time.

Key Observations:

- Deposits as main source of funding
- Irregularities in year 2002: repos drop
- Irregularity in year 1983 might be caused by measuring/reporting differences
- In 2008 share of deposits at lowest point.

2.2 Growth

Graph description: The graph shows the annual growth rate of aggregated assets of all commercial banks. Two investment banks, who did become commercial banks in 2009, are excluded.

Key Observations:

- Three negative growth rates in year 1991, 2001, 2010

Graph description: The graph shows the annual growth rate of aggregated assets of top top 1% commercial banks. Two investment banks, who did become commercial banks in 2009, are excluded.

Key Observations:

Figure 7: Correlation of balance sheet positions (liabilities side)

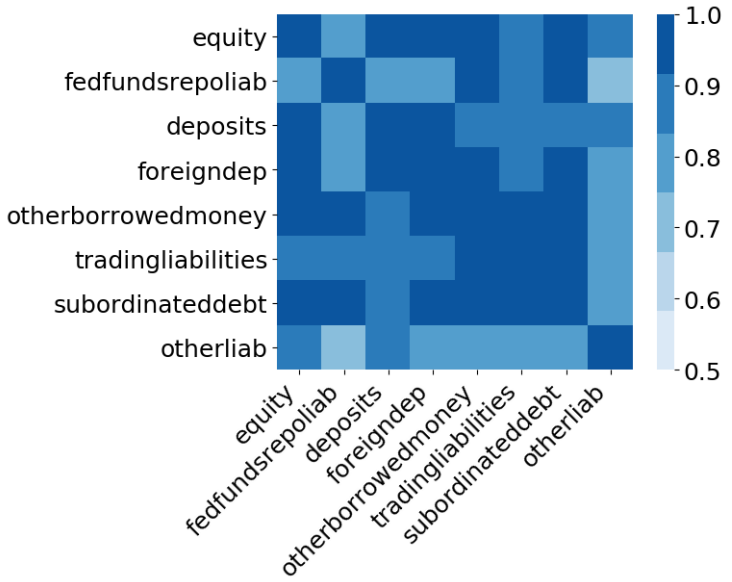


Figure 8: Growth of assets

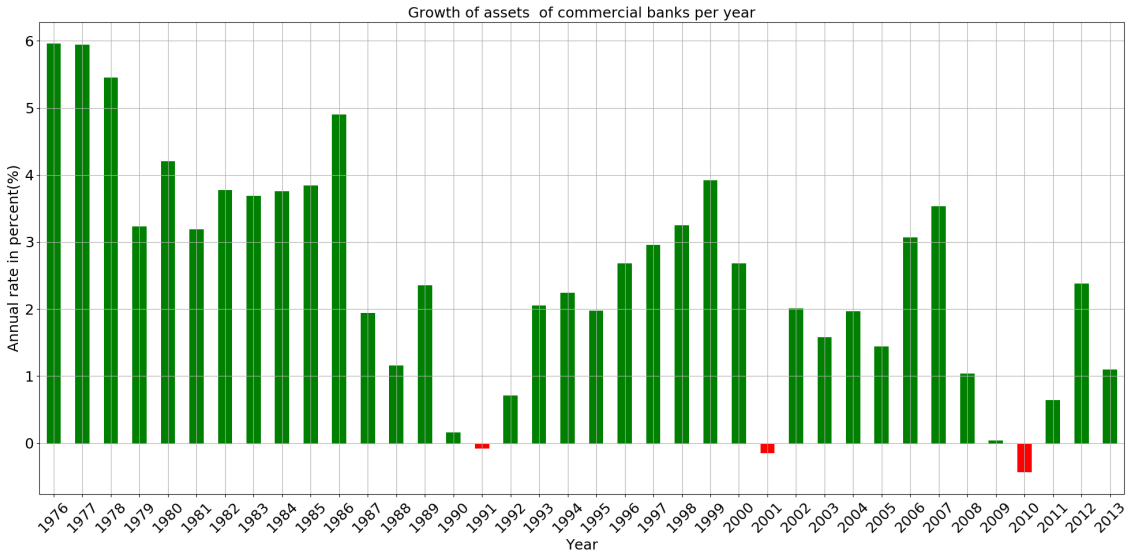
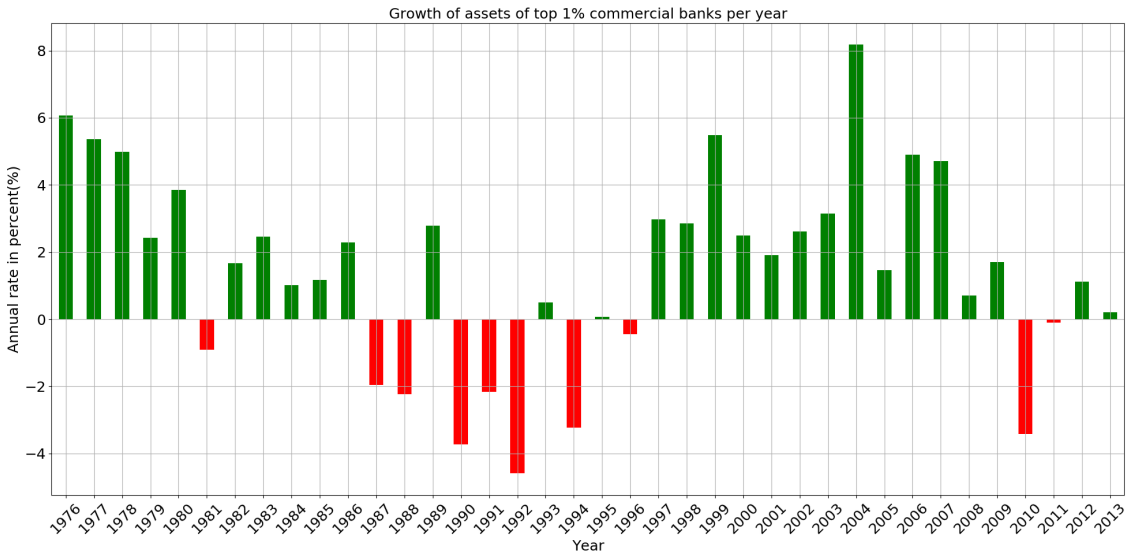


Figure 9: Growth of top 1 percent banks assets



- More negative growth rates in 1990 and 2010
- No negative growth in 2001

Key Observations:

- Top 1% growth rates are more volatile
- Pearson Correlation, Significance: (0.6371607133788253, 1.696703469447756e-05)
- 1986, 2001, 2006 almost 0,02 difference toward trend

Graph description: Annual growth rate with trend for all banks and top 1%.

Key Observations:

- time-frame 2000-2005: growth rate of top 1% rising, growth rate of all banks falling.
-

Graph description: The graph shows an estimation of how many banks have defaulted at a certain time (year,quarter). It is based on the negative equity recorded by banks. Hence, it is not exact and some banks might continue to exist in case of mergers or bailouts. Also sometimes banks are double counted, if a negative equity does not immediately result in bankruptcy.
Key Observations:

- main defaults in years 1986-1991 and 2009-2011
- long stable period from 1991-2008

Figure 10: Growth of all banks vs top 1 percent

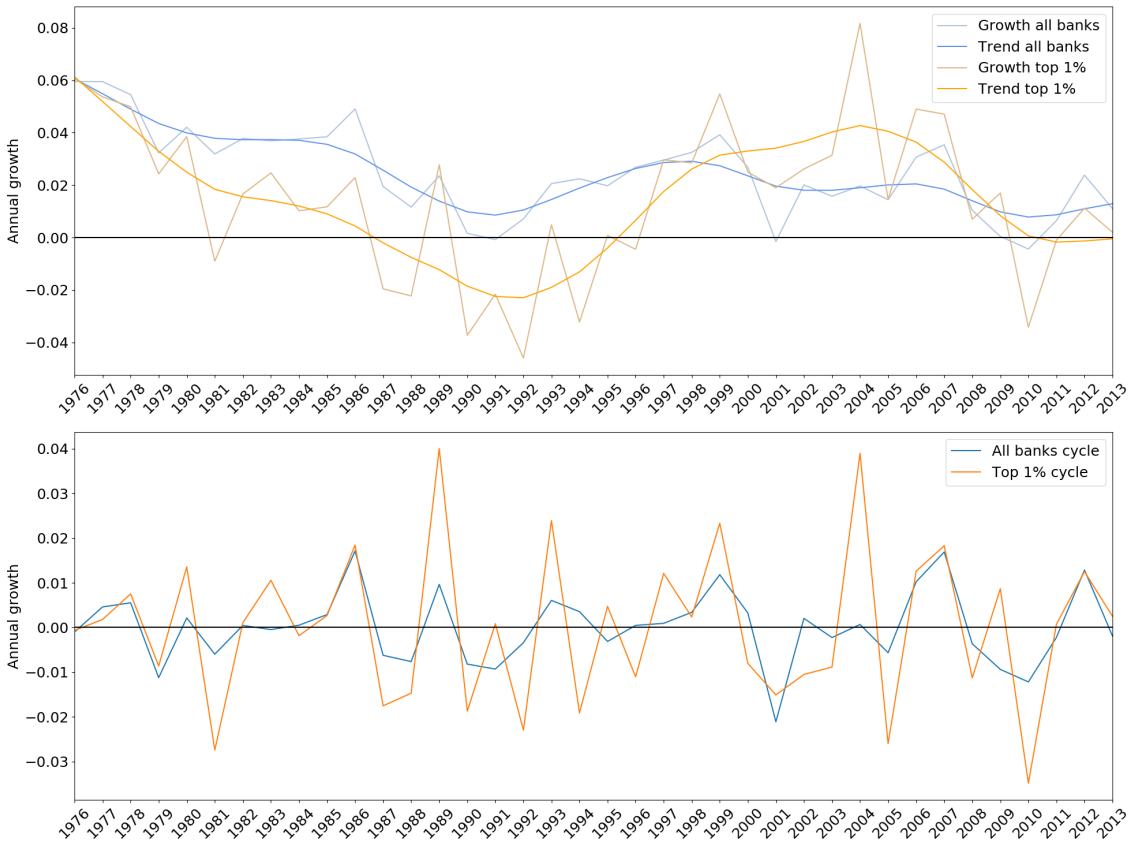
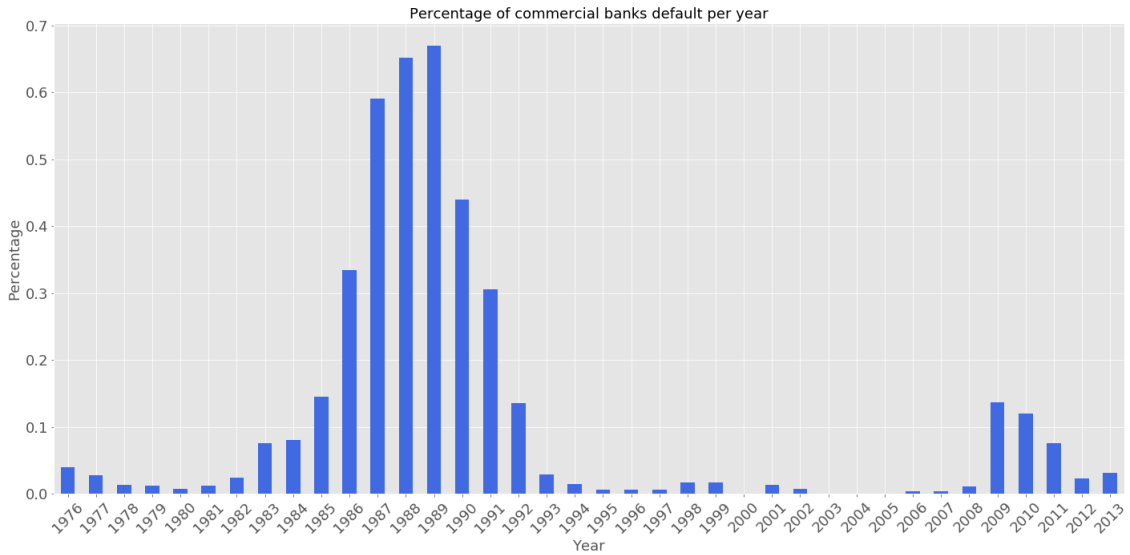


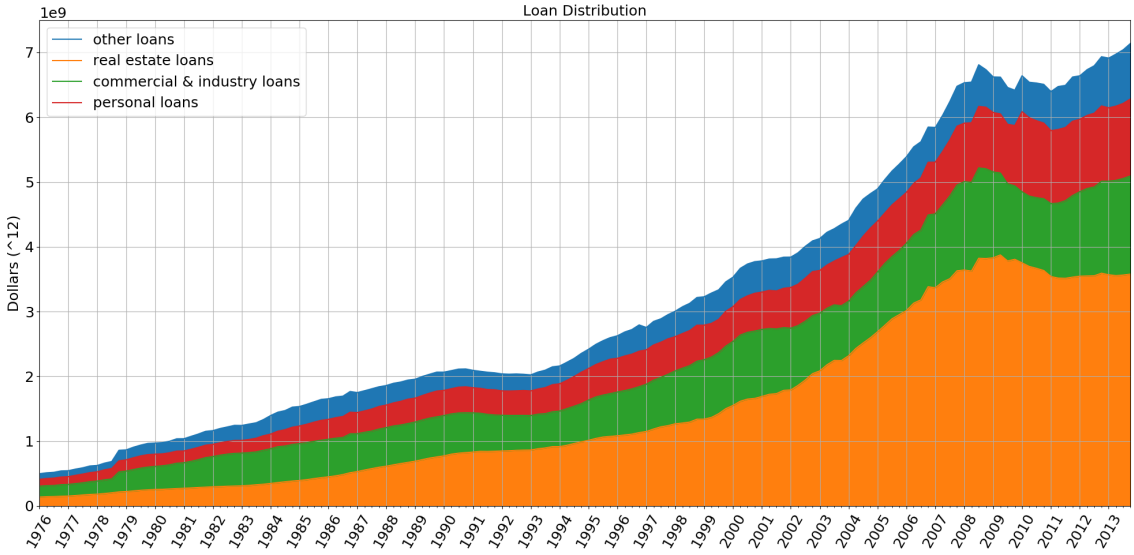
Figure 11: Banks default



- In 1990 there were many more smaller banks. Smaller banks might have a higher likelihood to fail. In 1990: 74% small banks, 2010: 35% small banks

2.3 Loans

Figure 12: Loans



Graph description: It shows the share of loan types of total loans over time.

Key Observations:

- real estate loans has largest share

Figure 13: Loans by repricing maturity

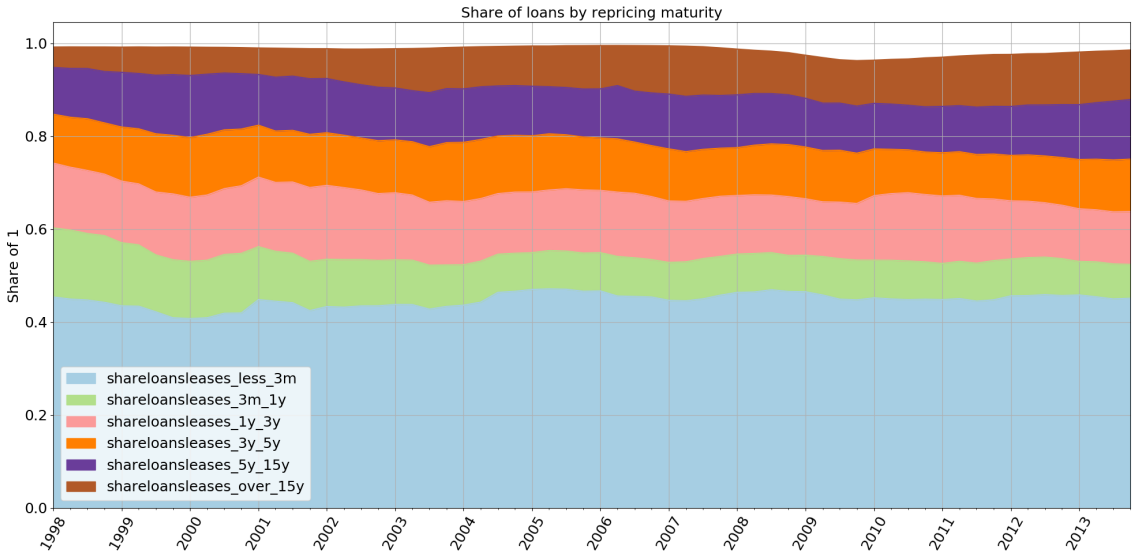
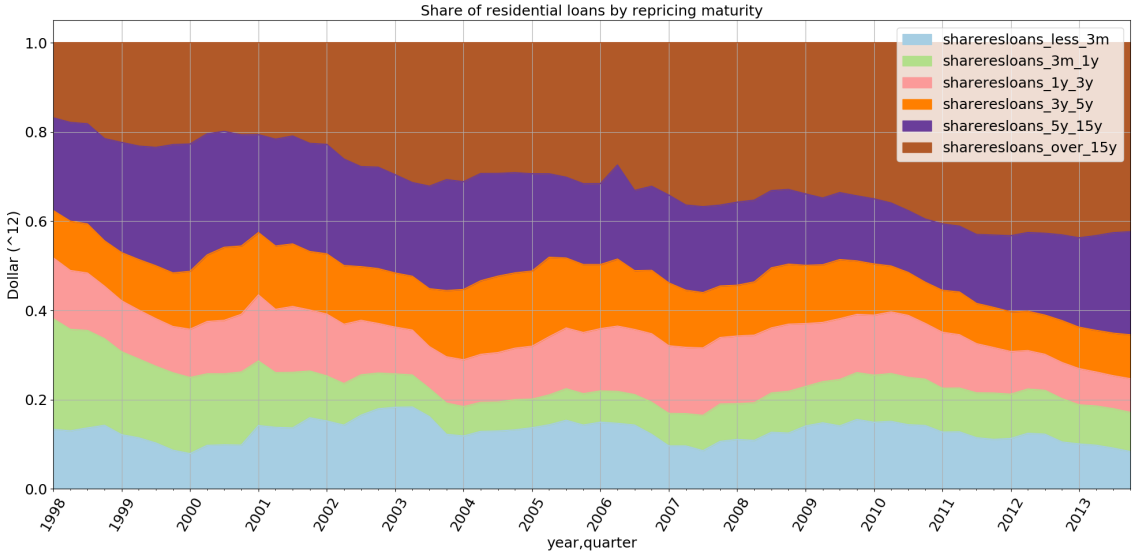


Figure 14: Residential Loans by repricing maturity



2.4 Distribution of asset sizes among banks

Figure 15: Count of banks by percentiles

	Top 0.1%	01Share	Top 1%	1PercentShare	Top 10%	10PercentShare	Top 50%	50PercentShare	Total all banks
1976	14	0.324922	144	0.558099	1442	0.780650	7210	0.946214	14419
1980	14	0.340622	144	0.581818	1442	0.793497	7208	0.948957	14417
1984	14	0.288709	144	0.556493	1439	0.790446	7194	0.948429	14389
1988	13	0.240856	130	0.546860	1298	0.811423	6491	0.954550	12982
1992	11	0.228150	114	0.539679	1136	0.811301	5682	0.954310	11363
1996	9	0.273671	95	0.609738	946	0.850118	4732	0.964386	9464
2000	8	0.348473	83	0.701729	825	0.881838	4126	0.972520	8252
2004	8	0.452258	76	0.741929	757	0.891446	3784	0.975372	7567
2008	7	0.510510	70	0.794367	702	0.910356	3511	0.980069	7022
2012	6	0.506170	60	0.801828	604	0.916754	3018	0.980764	6035

2.5 Median banks by asset size

In Figure 15, we have in the left column the asset interval size and in the corresponding row the number of banks per year.

Typical small/medium/large bank

Banks are assigned three different buckets (small/medium/large) depending on asset size.

Small bank: $0 <$ assets $<= 10^5$

Figure 16: Aggregate assets by percentiles

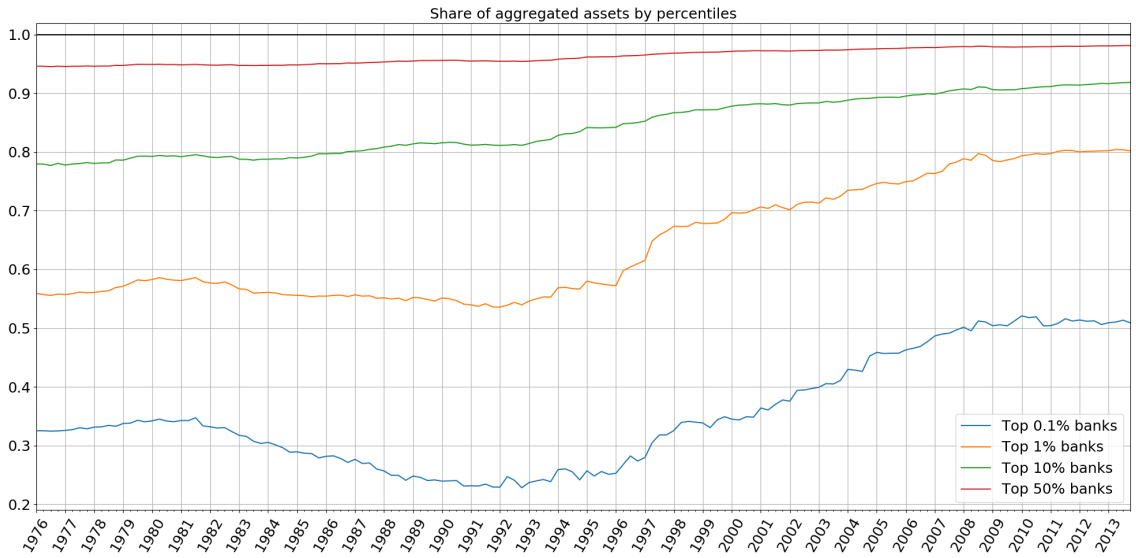


Figure 17: Banks count by asset size

	1980	1985	1990	1995	2000	2005	2010
(-0.001, 100000.0]	12717.0	11674.0	9145.0	6613.0	4810.0	3435.0	2313.0
(100000.0, 1000000.0]	1507.0	2287.0	2693.0	2843.0	3055.0	3562.0	3670.0
(1000000.0, 10000000.0]	174.0	287.0	325.0	342.0	307.0	381.0	413.0
(10000000.0, 10000000000.0]	18.0	27.0	49.0	75.0	80.0	80.0	83.0

Medium bank: $10^5 <$ assets $<= 10^6$

Large bank: $10^6 <$ assets

Figure 18: Asset size by bank

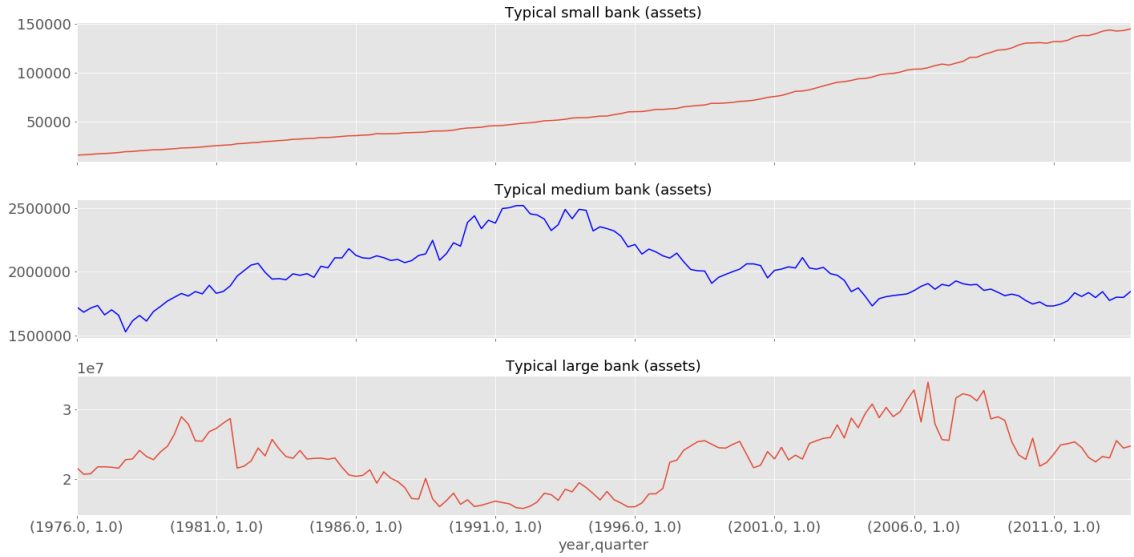


Figure 19: Medium vs large bank by asset size

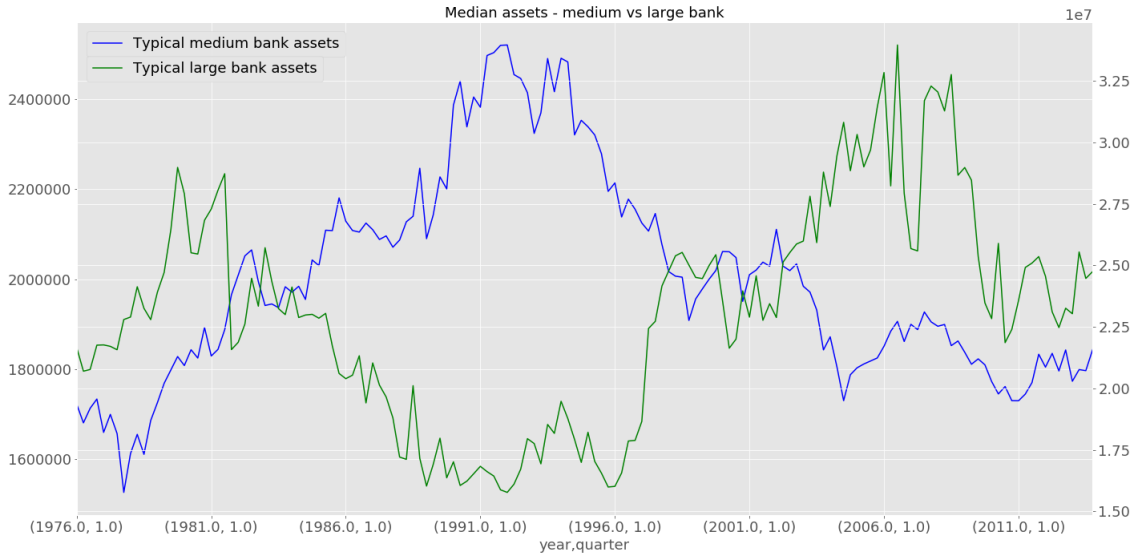


Figure 20: Small bank: liability side

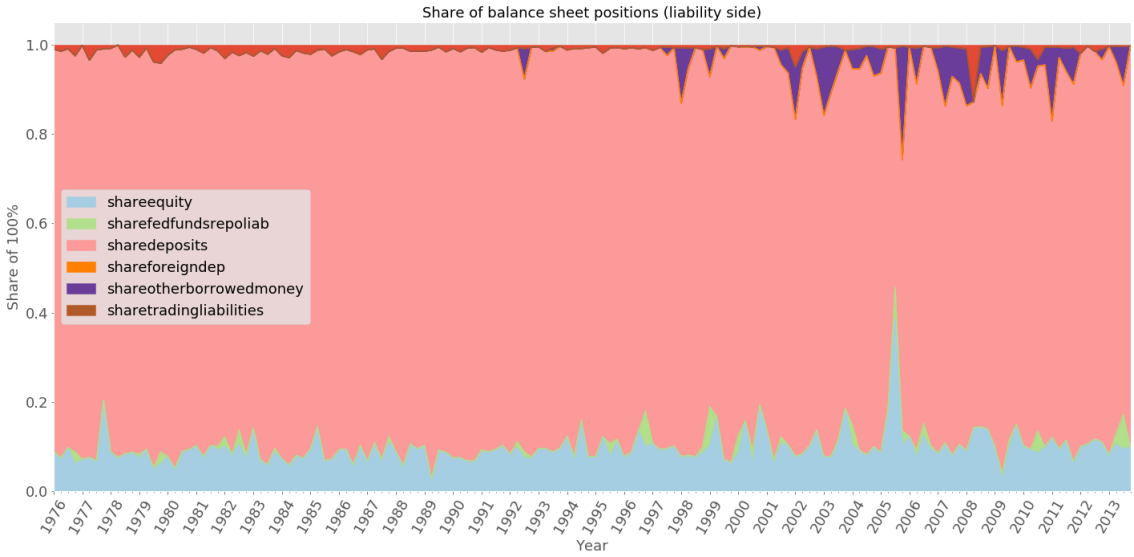


Figure 21: Medium bank: liability side

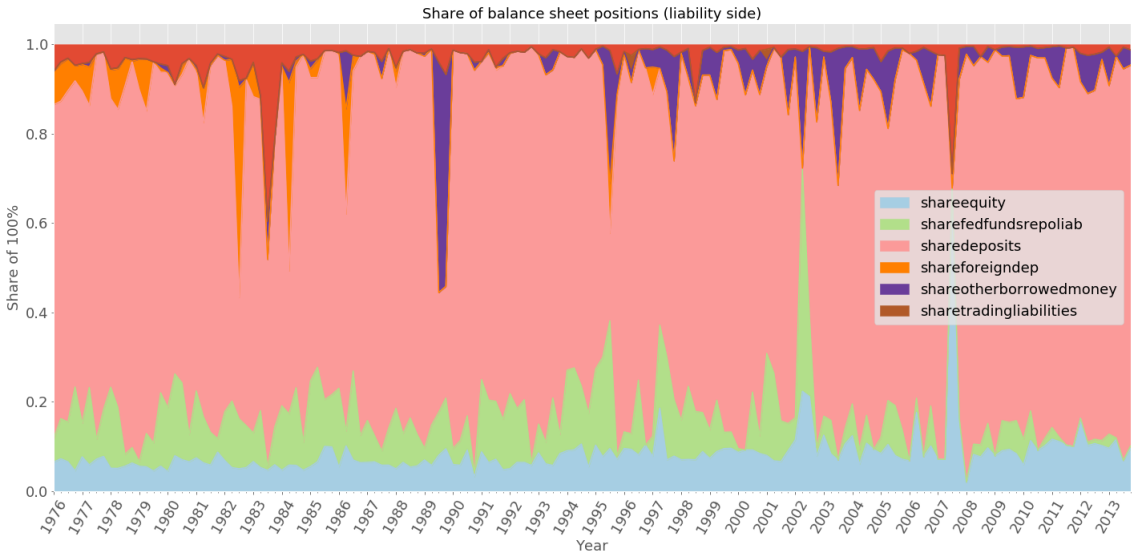
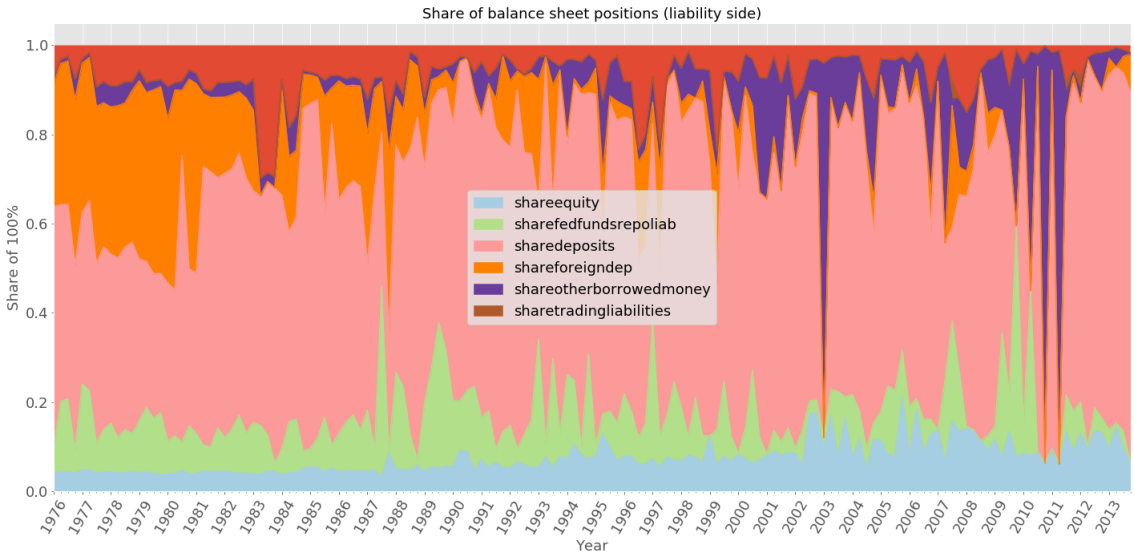


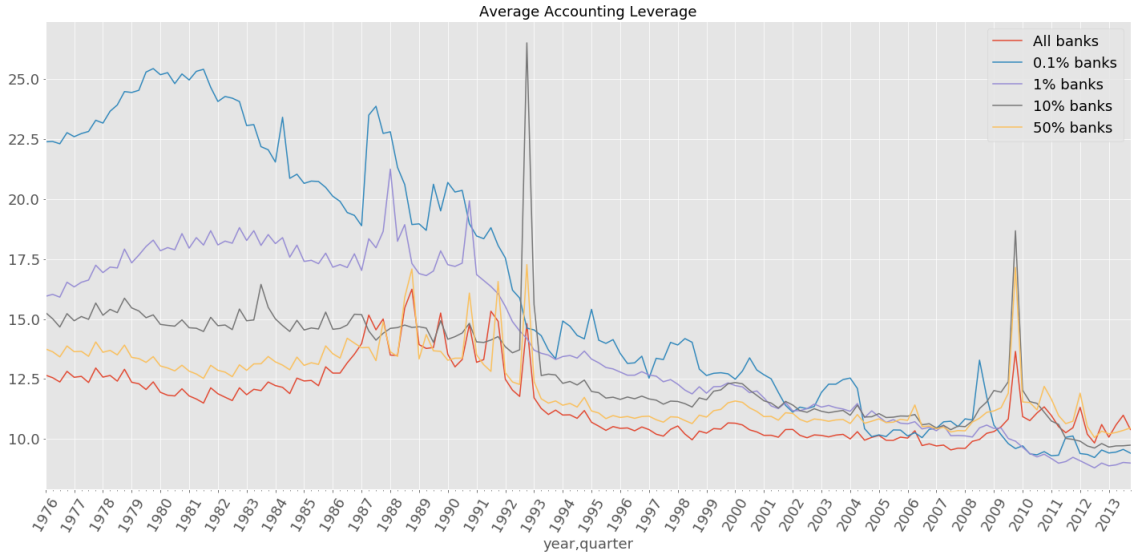
Figure 22: Large bank: liability side



2.6 Leverage

Throughout the analysis the definition of accounting leverage (assets/equity) is used. Equity is calculated by total assets minus total liabilities. In addition, for risk analysis banks belonging a bank holding company were aggregated. Hence, the dataset which was used contained bhcs and independent banks.

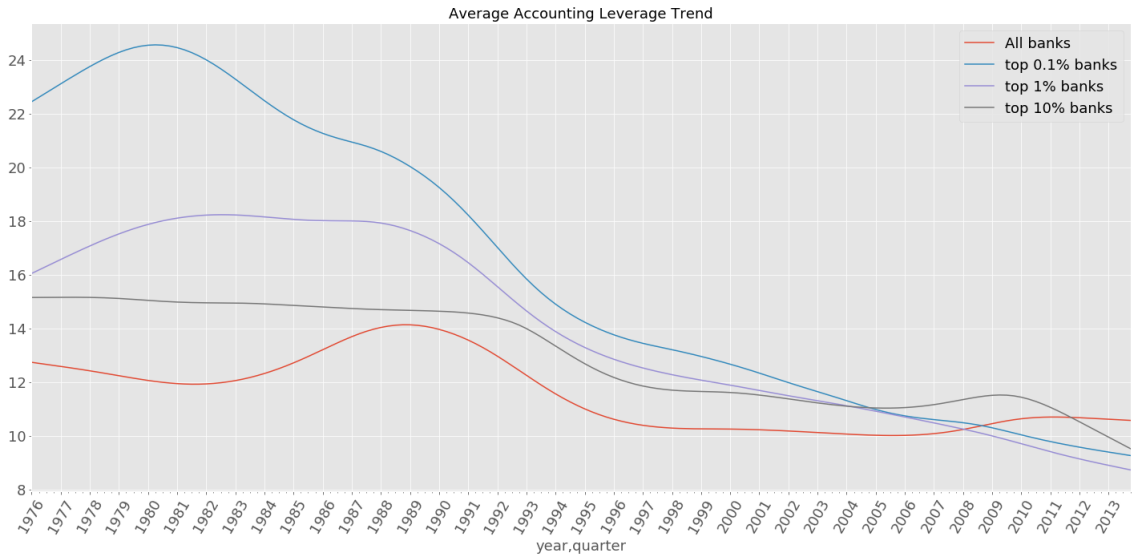
Figure 23: Average leverage over time (1976/1-2013/4)



Graph description: The graph shows the average leverage (assets/equity) for every year over all banks. Banks with equity or assets below zero are excluded.
Key Observations:

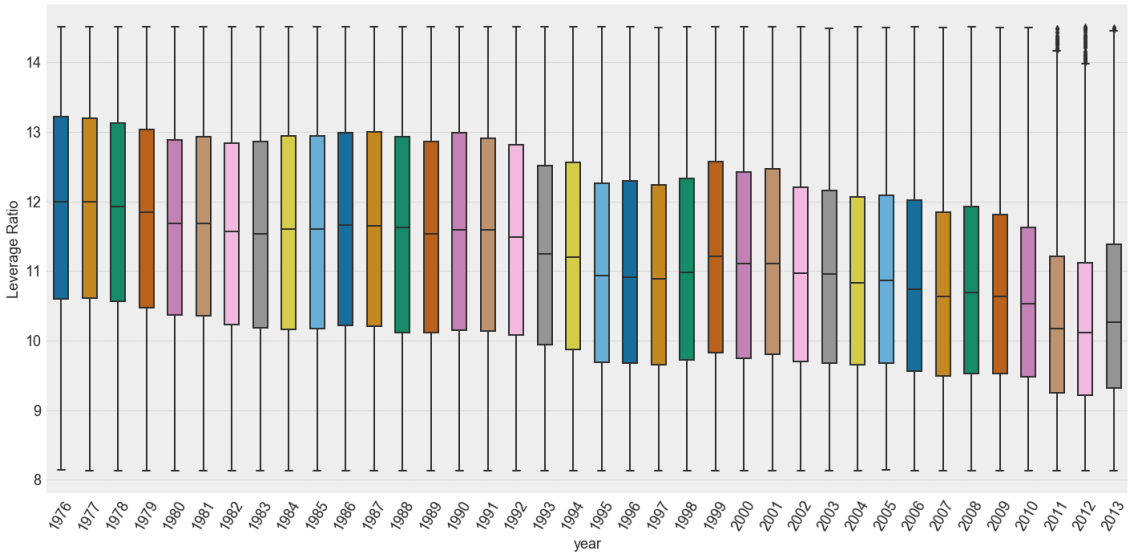
- Overall Leverage did fall over time

Figure 24: Average leverage trends over time (1976/1-2013/4)



- Spike in leverage in year 2008/2009
- Leverage lowest in 2007
- Small spike in year 1999
- Introduction of Basel 1 in 1988 might have lead to continuously decrease in leverage

Figure 25: Boxplots (1976-2013)



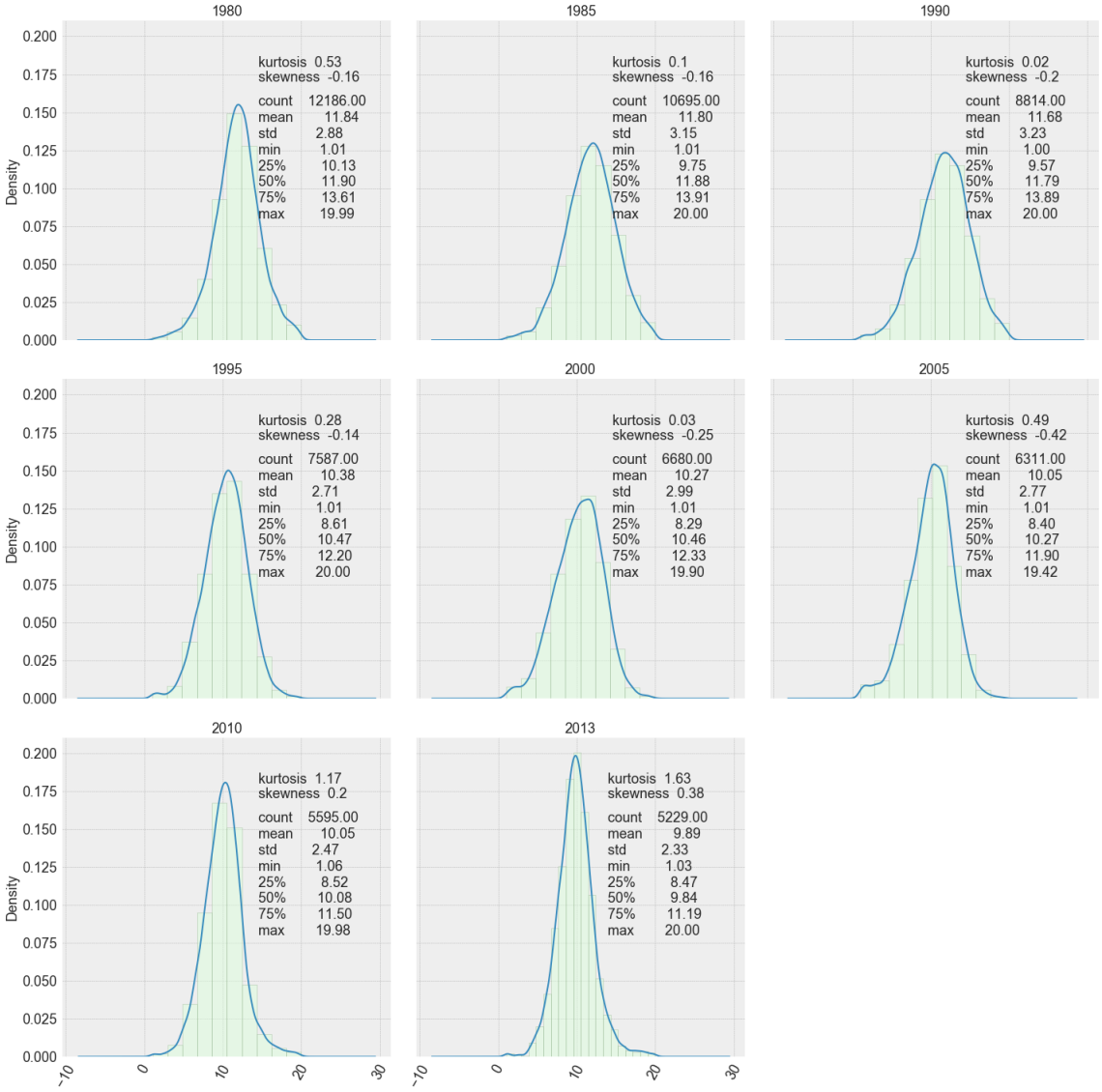
Graph description: Boxplots of all leverage ratios by banks by year.

Key Observations:

- large standard deviation in year 2010 with 18.82
- less and higher bars in 2013 indicate higher homogeneity in 2013 compared to the years before.

A look into the distribution of leverage

Figure 26: Distribution 1980-2013

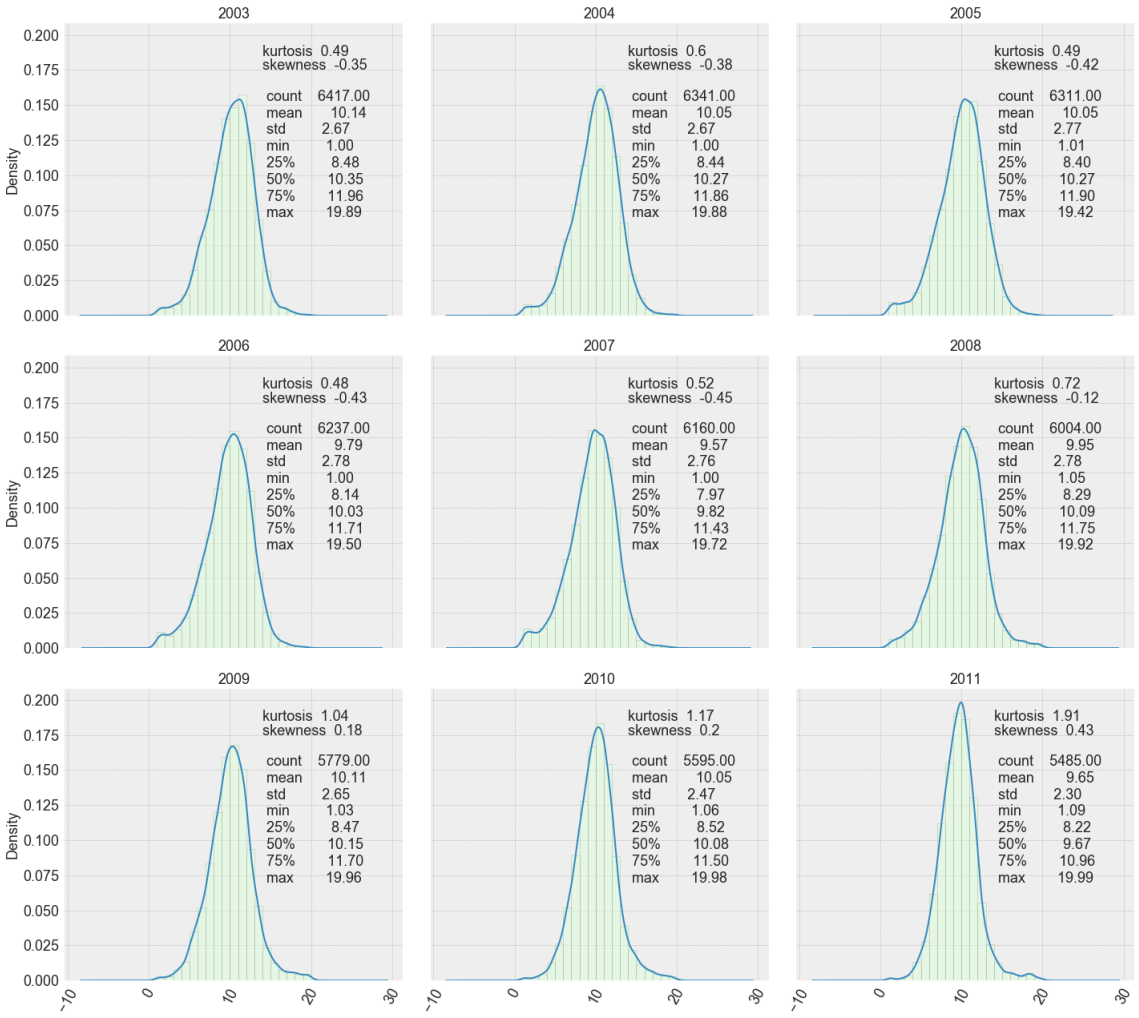


Graph description: Counts are normed to 1. Only leverage ratios between 0-20 are accounted for. The small amount of banks above with leverage above 20 are seen as outliers.As you can see 50% of banks are within a range of 8-14. Leverage ratios are always from quarter 4.

Key Observations:

- large standard deviation in year 2010 with 18.82
- less and higher bars in 2013 indicate higher homogeneity in 2013 compared to the years before.

Figure 27: Distribution in crisis 2003-2011



Graph description: Counts are normed to 1. Only leverage ratios between 0-20 are accounted for. The others are seen as outliers. As you can see 50% of banks are within a range of 8-12. Leverage ratios are always from quarter 4.
Key Observations:

- Increasing homogenity over time.

3 Conclusion