Replicating Financial Distribution in US Banking

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Abstract

The replication project provides an analytical review of asset and liability distributions across US banking institutions, as delineated by the original work. Emphasis is placed on comparing small banks with Global Systemically Important Banks (GSIBs) to understand the structural differences and potential risk profiles.

1 Project Overview

The objective of the project was to replicate the findings of a prior study that detailed the financial distributions of US banks. We aimed to validate the original data's reliability and assess the consistency of financial distribution patterns across different bank categories.

2 Data Sources

The study relied on data from regulatory filings by the Federal Deposit Insurance Corporation (FDIC) and securities filings available through the Federal Reserve's reporting systems. These filings provide comprehensive data sets, including but not limited to, total assets, various loan types, and deposit information across a spectrum of banking institutions.

3 Replication Process

The replication involved recreating the original study's tables and figures to compare the distribution of assets and liabilities. This process required meticulous data collection, normalization, and graphical representation. We successfully replicated the original study's results, with our graphical representations highlighting similar trends and distributions. The replication confirmed the robustness of the original study's findings, suggesting a stable pattern in the financial structuring of the institutions analyzed.

4 Challenges

Some challenges encountered included aligning the reported data with different reporting standards and ensuring the data's comprehensiveness across time frames. Discrepancies in reporting methodologies required us to make informed estimations to fill gaps and align the data with the original study's format.

5 Results and Discussion

The replicated data illustrates the concentration of asset classes and liabilities, highlighting the different risk exposures and capitalization strategies between small banks and GSIBs. Our findings are indicative of the broader trends within the US banking system, with implications for understanding systemic risks and financial stability.

The charts represent the distribution of various financial categories, such as real estate loans, consumer loans, and insured versus uninsured deposits. These visualizations serve as a diagnostic tool to compare the original study's outcomes with our replicated results, demonstrating the efficacy of our methodology.

In conclusion, the replication project has reaffirmed the key findings of the original study and provided further insights into the financial health of banking institutions. This exercise has reinforced the necessity for stringent data accuracy and the value of replication in empirical research.

Here is our replication of the Table A1 and Figure A1:

	Aggregate	Full sample(mean)	Full sample(sd)	small(mean)	small(sd)	large(mean)	large(sd)	GSIB(mean)	GSIB(sd)
Total Asset $	24.0T	5.0B	74.7B	0.4B	0.3B	14.9B	50.5B	356.2B	808.4B
Number of Bank	4844	4844		4082		725		37	
Cash	14.1	13.1	9.9	13.6	10.1	9.7	7.1	40.0	31.1
Securities	25.5	23.6	15.6	24.1	16.0	21.2	12.1	13.7	16.6
Treasury	6.1	2.6	4.1	2.7	4.2	2.0	2.9	5.5	9.3
RMBS	10.8	5.5	6.7	5.7	6.9	4.7	5.5	4.3	6.4
CMBS	2.2	0.9	1.6	0.7	1.4	1.8	2.3	0.8	1.6
ABS	0.7	0.1	0.4	0.1	0.2	0.5	1.0	0.1	0.3
Other Security	1.5	0.6	1.1	0.5	1.1	0.8	1.1	0.8	2.4
Total Loan	47.3	56.5	15.7	55.5	15.7	63.1	13.1	32.9	28.8
Real Estate Loan	22.5	46.5	17.3	46.8	17.0	45.7	18.3	13.8	19.2
Residential Mortgage	13.4	22.8	12.6	23.4	12.5	19.5	12.3	10.6	16.3
Commercial Mortgage	7.0	14.3	10.2	13.5	9.9	19.0	9.9	2.5	6.1
Other Real Estate Loan	1.7	3.7	3.4	3.6	3.4	4.7	3.3	0.5	1.0
Agricultural Loan	0.3	2.6	4.2	3.0	4.5	0.5	1.1	0.1	0.3
Commercial & Industrial Loan	10.0	7.0	5.3	6.5	4.7	9.7	7.1	5.3	8.2
Consumer Loan	9.9	2.2	2.5	2.1	2.2	3.1	5.3	7.0	14.5
Loan to Non-Depository	7.1	0.3	0.7	0.1	0.3	1.3	2.4	7.4	11.4
Fed Funds Sold	0.1	1.4	3.1	1.7	3.5	0.1	0.3	0.0	0.1
Reverse Repo	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.2	3.6

Figure 1: Replication of Table A1 (Total Assets)

	Aggregate	Full sample(mean)	Full sample(sd)	small(mean)	small(sd)	large(mean)	large(sd)	GSIB(mean)	GSIB(sd)
Total Liability	90.5	89.9	3.2	89.8	3.3	90.1	2.3	65.8	36.9
Domestic Deposit	76.6	86.9	5.2	87.1	5.1	85.8	5.1	55.2	36.6
Insured Deposit	7.6	1.2	2.7	0.7	1.9	3.8	5.8	13.8	19.2
Uninsured Deposit	69.0	85.2	7.4	86.0	6.5	81.4	10.0	41.4	30.0
Uninsured Time Deposits	1.8	3.6	3.0	3.8	3.1	2.9	2.4	2.6	6.9
Uninsured Long-Term Time Deposits	0.4	0.8	1.0	0.9	1.0	0.5	0.5	0.3	1.0
Uninsured Short-Term Time Deposits	1.3	2.7	2.4	2.7	2.4	2.2	2.0	1.8	4.5
Foreign Deposit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fed Fund Purchase	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
Repo	0.6	0.3	0.8	0.2	0.6	0.7	1.3	0.6	1.2
Other Liability	2.3	0.6	0.5	0.5	0.5	1.0	0.6	4.0	6.8
Total Equity	9.5	10.2	3.2	10.2	3.3	9.9	2.3	34.2	36.9
Common Stock	0.2	0.4	0.6	0.4	0.6	0.2	0.4	2.5	7.5
Preferred Stock	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
Retained Earning	4.0	6.8	4.0	7.0	4.2	5.6	2.8	14.2	22.4

Figure 2: Replication of Table A1 (Total Liability)

Total Assets (Trillion)

Cash | Security | Real Estate Loan | Other Loan | Other Asset

0   5   10   15   20

Trillion ($)

Figure 3: Replication of Figure A1 (Assets)

Total Liability (Trillion)

Insured Deposit | Uninsured Deposit | Total Equity | Other

0   5   10   15   20
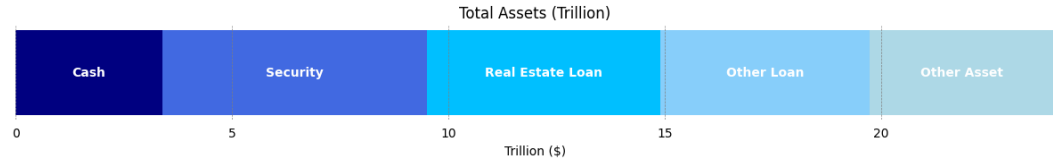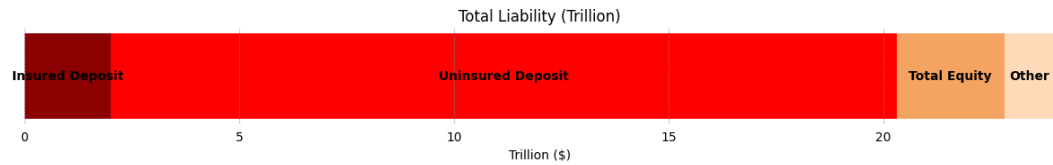
Trillion ($)

Figure 4: Replication of Figure A1 (Liability)