Deposit concentration at financial intermediaries*

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Abstract

In this paper I investigate the degree and implications of deposit concentration at Norwegian financial intermediaries. I document that deposits are highly concentrated within institutions. Moreover, there is limited movements in the degree of deposit concentration over time. In 2018, deposits at the top 5% depositors according to size corresponded to approximately 53 % of all deposits. Variation in flows at the top 5 % of depositors according to size explain approximately 88 % of total deposit flows.

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1 Introduction

The within-bank distribution of deposits plays an important role in understanding numerous issues related to banking, such as monetary policy transmission (Bianchi and Bigio, 2018), bank market power (Drechsler et al., 2017, 2018) and bank refinancing risk (Diamond and Dybvig, 1983; Corsetti et al., 2004). Understanding the shape of the distribution of deposits is important for at least three specific reasons. First, if deposits are highly concentrated, it is at sharp odds with the common assumption of atomistic depositors as commonly assumed in many theoretical models of bank runs (Diamond and Dybvig, 1983; Bhattacharya et al., 1985; Goldstein and Pauzner, 2005; Juelsrud and Nenov, 2020). Large, non-atomistic agents can fundamentally affect the strategic environment in such settings (Corsetti et al., 2004; Bjønnes et al., 2014) and thereby also potentially affect policy prescriptions aimed at curbing the scope for coordination failures. Second, if the distribution of depositors is fat-tailed, the impact of idiosyncratic deposit withdrawal shocks can affect the volatility of total deposits, despite a large number of depositors (Gabaix, 2011).[1] Third and finally, the deposits distribution is a key theoretical moment in a new strand of the literature emphasizing the role of liquidity risk for the monetary policy transmission through banks (see for instance Bianchi and Bigio (2018); Eggertsson et al. (2019)). Hence, understanding the shape of the distribution of deposits is important from both a theoretical and a practical point of view. Yet, due to data requirements, little is known empirically about the within-bank distribution of deposits.

In this paper, I use annual administrative tax data from Norway covering the universe of all deposit accounts belonging to individuals at all deposit-taking institutions to shed light on the empirical distribution of deposits. My paper contributes to the existing literature by being the first, that I know of, to establish two stylized facts regarding the deposit distribution at financial intermediaries. The two findings can be summarized as follows. First, the distribution of deposits is substantially concentrated. Despite a relatively high number of deposit accounts at the average financial intermediary, the volume of deposits are concentrated at a few depositors. In fact, looking at the aggregate level, the top quartile of depositors according to deposit size in 2018 accounts for 92 % of total deposits. The top 5 % accounts for 53.1 % of total deposits. The degree of deposit concentration is relatively similar across different sizes of the financial intermediaries and it is stable over time. Second, deposit flows at the 5 % largest deposit accounts explain approximately 88 % of institution-level deposit flows. Overall, these stylized facts suggests that financial intermediaries are subject to substantial idiosyncratic deposit withdrawal risk. Moreover, they provide key moments that can be used to discipline structural models where the distribution of deposits play a key role.

[1] See Galaasen et al. (2020) for an investigation on the implications of *borrower* concentration for bank bank outcomes.

Variable	N	Mean	Standard deviation
Deposit share	4'444'860	0.0025 %	0.086%
Deposits (USD)	4'444'860	22'000	75'000
Bank-level # of deposits	167	46'500	182'000

Table 1: Summary statistics based on 2018-data. Rounded up to nearest 500 USD, except information on N. 1 USD = 7.99 NOK (23rd of November 2020)

2 Data

I obtain annual deposit account level data from the Norwegian Tax Authorities. The data covers the period 2002 - 2018. At the end of each year, all deposit-taking institutions report outstanding deposit balances for all individuals at the account-level to the tax authorities. This reporting is for tax purposes - as Norway levies a wealth tax, such information provides a key input to the tax return filings. In addition to reporting outstanding deposit balances, the institutions also report interest paid to the depositor over time, the depositor ID, as well as outstanding debt balances and interest paid. I use the latter to restrict attention to *financial intermediaries*, defined as deposit-taking institutions that also has outstanding credit granted to at least one individual within a given year. I aggregate the data to the individual $\times$ institution $\times$ year-level.

Summary statistics based on 2018 values are presented in Table 1. The data covers approximately 4'500'000 million individuals. The average deposit at the individual $\times$ institution-level is approximately 22'000 USD, which corresponds to approximately 0.0025 % of average total institution-level deposits. My sample covers 167 financial intermediaries, with an average of 46'500 deposit accounts.

3 Results

3.1 Concentration of deposit distribution

Figure 1 plot the Lorenz curve of the distribution of deposits at different levels of aggregation. Starting in the left panel, I plot the Lorenz-curve derived from the aggregate distribution for two years in my sample, namely 2002 (beginning of sample) and 2018 (end of sample). The 2002 deposits distribution is slightly more concentrated than the 2018 deposits distribution, but the differences over time are small. Overall, both distributions are relatively concentrated, with a Gini-coefficient of .85 and .83, respectively. In the 2002 distribution, the top quartile holds roughly 93.2 % of the deposits while the top 5 % holds 58.7 % of deposits. For 2018, the corresponding numbers are 92 % and 53.1 % respectively. These numbers roughly reflect the distribution of wealth in Norway, where the top 5% held approximately 40% of total wealth in 2018.

A natural question is whether this high degree of concentration is driven by a few institutions, such as small wealth management firms, or whether it is common across all financial intermediaries. To investigate whether this is the case, I focus on the 2018 distribution of de-

posits and split the financial intermediaries into four quartiles based on the overall sum of household lending. I then plot the Lorenz curves and report the associated Gini-coefficients for the within-bin deposit distributions.

The reports are reported in the right panel of Figure 1. While the fourth quartile of financial intermediaries according to size have a lower degree of concentration, it remains relatively high at a Gini of around .82 compared to .88 for the first quartile. This reflects that deposit concentration is not something that is primarily driven by financial intermediaries with relatively low credit provision, but occurs more generally across different types of intermediaries.

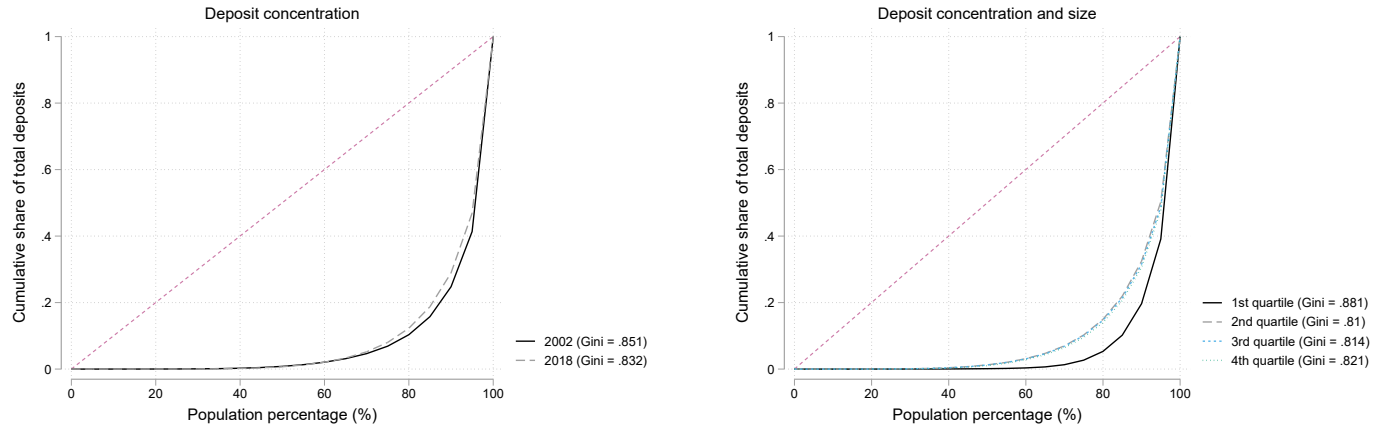

Figure 1: Lorenz curves for the aggregate deposit distribution

Notes: This figure shows Lorenz-curves estimated on the full sample of deposit-accounts for 2002 and 2018 (left panel) and by size quartile (right panel) for 2018. Financial intermediaries are grouped into different size quartiles based on the intermediaries' total household loans.

3.2 Deposit flows and large depositors

Given the high degree of deposit concentration documented above, a natural implication is that large depositors are most likely disproportionately important in terms of understanding institution-level deposit flows.

To quantify the extent to which deposit flows are driven by deposit flows from the largest depositors, I define a depositor as large relative to an institution if his/her amount of deposits is within the 95 - 100 percentile of deposits of that institution. I then sum deposits across all large depositors within a given year t and compute the (symmetric) percentage change in deposits from large depositors from year $t-1$ to t.[2] I then compare it to the symmetric change in total deposits at the institutional level.

The unconditional relationship between deposit flows from large depositors and total deposit flows are shown in Figure 2. There is a very tight link between the two, suggesting

[2]Symmetric changes of a variable x are computed as $\frac{x_t - x_{t-1}}{0.5 \times (x_t + x_{t-1})}$. An advantage of using this measure rather than simple percentage changes is that the growth rate for an entrying institution is well-defined and that it is bounded between -2 and 2.

that deposit flows from large depositors are crucial for understanding overall deposit flows.

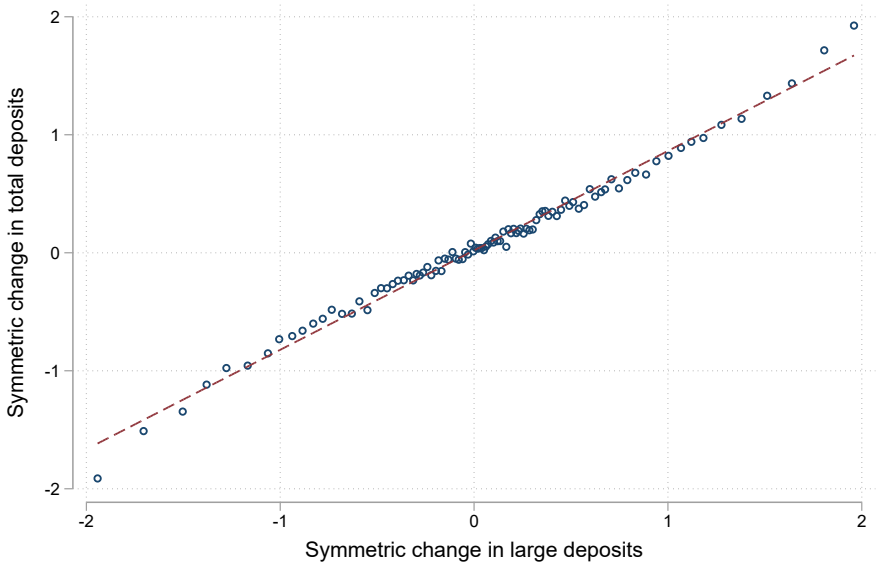

Figure 2: Deposit flows at largest depositors and total deposit flows

Notes: This figure shows a binned scatterplot of the symmetric change in institution-level deposits (left panel) against the symmetric change in deposits to the 5 percent largest depositor in a given year (right panel). Symmetric changes are computed as $\frac{x_t - x_{t-1}}{0.5 \times (x_t + x_{t-1})}$. Number of bins are set to 100.

To further quantify the importance of large depositors, I run a panel regression of the form

$$\Delta\text{Deposits}_{i,t} = \alpha_i + \alpha_t + \beta \times \Delta\text{Deposits, large depositors}_{i,t} + \epsilon_{i,t} \tag{1}$$

where i denotes an institution, t denotes time, α_i is an intermediary-specific slope and α_t is a time-fixed effects. The standard error $\epsilon_{i,t}$ is clustered at the institution-level. Armed with this regression equation, I am interested in understanding how much of the variation in $\Delta\text{Deposits}_{i,t}$ is captured by $\Delta\text{Deposits, large depositors}_{i,t}$. The reports from estimating equation (1) is reported in Table 2. In Column (1) I omit bank and time fixed effects, whereas I include them in the specification of Column (2).

Overall, a 1 percentage point growth of deposits at the largest depositors is associated with an approximately 80 basis points growth in overall deposits. According to the adjusted R^2, flows at the top 5 % of deposits explains around 88 % of total deposit flows across specifications.

Overall, these results suggest that deposit flows at a handful of depositors explain the lion's share of the variation in overall deposit flows at financial institutions.

	(1) $\Delta\text{Deposits}_{i,t}$	(2) $\Delta\text{Deposits}_{i,t}$
ΔDeposits, large depositors$_{i,t}$	0.814***	0.799***
	(0.0340)	(0.0310)
N	2845	2802
No. of clusters	306	263
Bank FE	No	Yes
Year FE	No	Yes
Adjusted R^2	88.7%	88.3%

Table 2: **Deposit flows at large depositors and total deposits**

Notes: This table reports the results from estimating equation (1). In Column (1) I omit bank and time fixed effects, whereas I include it in Column (2). The sample period runs from 2002 - 2018. Standard errors are clustered at the level of the financial intermediary in parenthesis.

4 Conclusion

In this paper, I have used administrative tax data on the universe of household deposit accounts in Norway for the period of 2002 - 2018 to investigate the degree and implications of deposit concentration at Norwegian financial intermediaries. I documented a substantial degree of deposit concentration both across time and across institutions. Deposit flows at the 5 % largest depositors explain approximately 88 percent of flows in deposit flows for financial institutions.

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