Global Shock and Small Firm Failures: How Small Financial Cooperatives Are Reacting to Uncertainty during COVID-19

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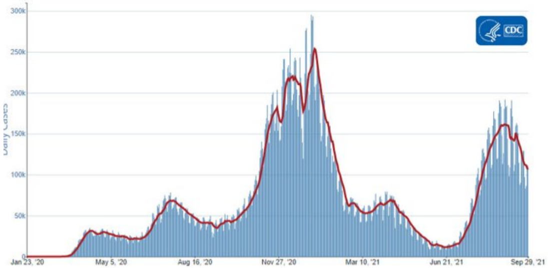
Overview

- According to World Health Organization (WHO) there have been 234 million cases of COVID-19, including 4.7 million deaths (as of October 2021).
- United States also experienced devastating impact of COVID-19, with total number of 43.7 million cases and 700 thousand deaths.
- The socioeconomic turmoil caused by the COVID-19 pandemic caused significant operational disruptions for small businesses in the United States.

COVID-19 US Timeline



Source: Centers for Disease Control and Prevention (CDC)

- First Wave: March 2020 May 2020 (Peak on April 7)
- Second Wave: June 2020 August 2020 (Peak on Jul 19, 2020)
- Third Wave: October 2020 Feb 2021 (Peak on Jan 8, 2021)
- Fourth Wave (Delta Variant): July 2021 Present (Peak on Sep 13, 2021)
- Series of government payments through rescue plans: American Rescue Plan by the Treasury Department, Small Business Tax Credit Programs, Paycheck Protection Program, and so on.
- Despite significant government payments and support, the number of small business closures increased.

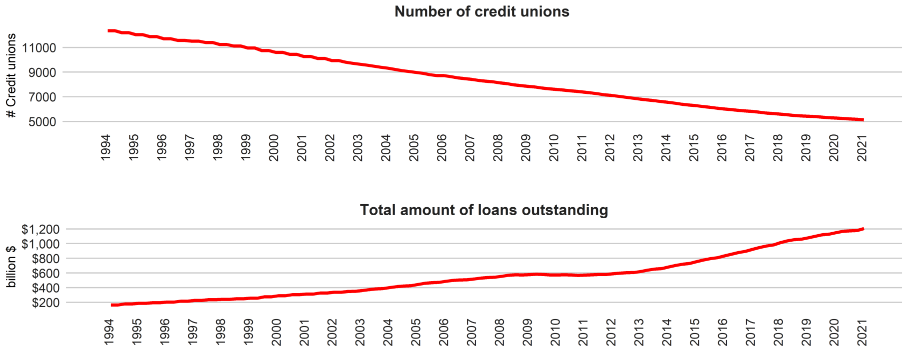
COVID-19 and Lending Institutions

- COVID-19 stands out among economic crises as the most unanticipated large and widespread exogenous shock of all time (Berger, A. N., Demirgüç-Kunt, A., 2021).
- Lending institutions loan issuance provides liquidity but also increases bankruptcy risk for the borrower.
- Small business bankruptcies occur when financial obligations are not met.
- Systematic failures of borrower's default on debt obligation also increases the operational risk for the lending institutions.
- Recent studies show that the adverse impact of the COVID-19 shock on large publicly-traded banks was pronounced (Berger, A. N., Demirgüç-Kunt, A., 2021 ; Demirgüç-Kunt, A., Pedraza, A., Ruiz-Ortega, C.,2021).
- Studies on large banking institutions show that there has been no banking crisis, but the commercial banks did not suffer noticeable financial distress (Berger, A. N., Demirgüç-Kunt, A., 2021).

Credit Unions

- Credit unions are self-help cooperative financial organizations geared to attaining the economic and social goals of members and wider local communities.
- Credit unions cannot do business with the general public due to charter limitations.
- In contrast to most other forms of financial services organizations, credit unions are not required to simultaneously satisfy shareholders' profit expectations and disparate customer needs (Fried, H. O., Lovell, C. K., Eeckaut, P. V., 1993).
- Credit unions exist to attain the economic and social goals of the local community and their members (McKillop, D., Wilson, J. O.,2011).
- Credit unions and commercial banks not only compete among their own peers, but also often engage in aggressive competitions against each other in the same markets (Anderson and Liu, 2013; Naaman et al., 2021).

Credit Unions Number and Lending



Source: NCUA Call Reports

Research Questions

COVID-19 and Overall Performance

1. Did credit unions experience deterioration in performance, or did these institutions also fared well similar to large banking institutions?
2. Did credit unions increased their cash holdings as their safety net?

Recent literature

- While the initial impact of the COVID-19 pandemic was severe, business exits were much less severe than were expected early in the crisis, due to quick government policies (Crane et al., 2021).
- Studies on large, publicly-traded banking institutions show that the effect of COVID-19 was pronounced, both in the United States and in other countries. These early studies find that the adverse effect is more significant for undercapitalized but large banks. (Duan et al., 2021; Demirguc-Kunt, A., Pedraza, A., Ruiz-Ortega, C.,2021).
- Significant number of studies examine abnormal stock returns of publicly traded lending institutions.
- Recent study in agricultural economics shows certain factors including total asset size and equity ratio improve credit union performance measures in Canadian context (Almehdawe et al., AFR 2020).
- Credit unions promote competition in local lending market with large commercial banks, and the overall survivorship of these institutions is important (Anderson and Liu, 2013; Naaman et al., 2021).

NCUA Quarterly Call Reports

COVID-19 and Overall Performance:

- National Credit Union Administration (NCUA) Call Report Quarterly Data.
- Similar to Federal Deposit Insurance Corporation (FDIC) call reports on commercial banking institutions, NCUA provides similar call report data.
- Initial data collection starting from 1994Q1 but post 2017Q2 is used for consistency (future work will incorporate prior periods).

Methodology

$$Y_{i,t} = \alpha_i + \gamma_1 FirstWave_t + \gamma_2 SecondWave_t + \gamma_3 ThirdWave_t + \beta X_{i,t-1} + \epsilon_{i,t} \quad (1)$$

- Dependent variable (Y_{it}):
  - Safety net measure

$$\text{Cash level} = \frac{\text{Cash}}{\text{Total assets}}$$

  - Return on assets:

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}}$$

  - Bankruptcy measure:

$$\text{Z score} = \frac{\text{ROA+E/A}}{\text{SD(ROA)}}$$

E/A=equity to asset ratio
SD(ROA)= 4 quarter rolling window standard deviation

Methodology

- Variables of interest
  - First Wave: 1 if the period is 2020Q1
  - Second Wave: 1 if period is 2020Q2
  - Third Wave: 1 if period is 2020Q4 or 2021Q1
- Control variables ($X_{i,t-1}$)
  - Size: log(total assets)
  - Equity capital: equity to asset ratio
  - Expense: total interest and non-interest expense/total assets
  - Lagged liquidity, profitability and bankruptcy measures
- Separate analysis for agricultural credit unions ($>$ 25% ag loans)
- Variables were winsorized at 1% and 99% to remove outliers.

Summary Statistics

Table 1: All credit unions, 2017Q2-2021Q2

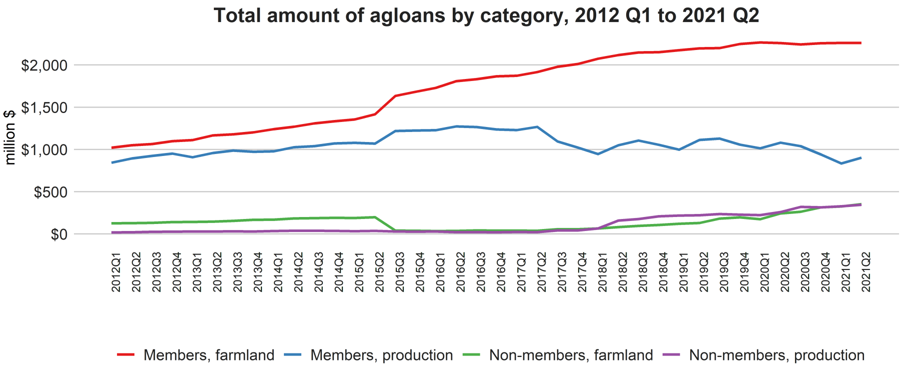
	Mean	SD	N
Total Asset	233.9 (millions)	614.2 (millions)	92515
ROA	2.5%	1.8%	92515
Z score	104.98	1,155.94	92418
Cash level	1.03%	1.59%	92515
equity	13.14%	6.16%	92515
expense	2.48%	2.94%	92515
delinquency	1.27%	2.83%	92515

Table 2: All credit unions, 2020Q1-2021Q2

	Mean	SD	N
Total Asset	280.7(millions)	734.0 (millions)	31344
ROA	1.9%	1.0%	31344
Z score	109.6	1,632.5	31318
cash level	1.12%	1.76%	31344
equity	12.7%	6.06%	31344
expense	2.04%	1.75%	31344
delinquency	1.12%	2.81%	31344

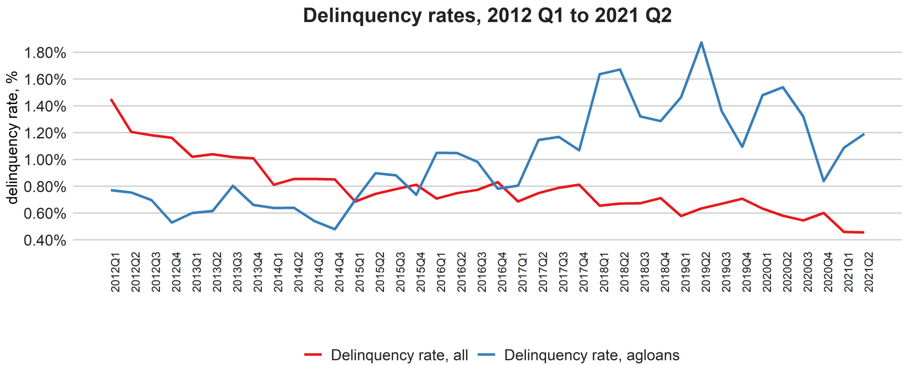
- Mean asset size has been increasing since 2017
- Even after the COVID-19 pandemic, we do not observe drastic changes or deterioration in performance measures, including ROA and Z-Score
- We do observe an increase in cash level but a decrease in overall equity level.
- Expense ratio and delinquency rates both decreased after 2020Q1

Agricultural loans



Source: NCUA Call Reports

Agricultural loans



Source: NCUA

Cash level

Table 3: Cash on hand

	(1) All CU (FE)	(2) AG CU (FE)	(3) All CU (RE)	(4) AG CU (RE)
log(Asset)	0.00401	0.00161	0.000451	-0.00409**
	(0.00258)	(0.00352)	(0.000305)	(0.00160)
Efficiency	-0.00474	-0.00449	0.0127	0.0328
	(0.0107)	(0.00920)	(0.00860)	(0.0323)
Equity/Asset	0.0505	0.0159	0.00778	-0.0483***
	(0.0572)	(0.0147)	(0.0289)	(0.0113)
Deliquency rate	0.00402	0.0265	0.00324	-0.00131
	(0.00492)	(0.0266)	(0.00472)	(0.0261)
Z score	-1.31e-08**	-0.00000256	-2.55e-08*	-0.00000161
	(6.26e-09)	(0.00000249)	(1.44e-08)	(0.00000396)
ROA	-0.0148	-0.00582	0.00186	0.0137***
	(0.0203)	(0.00424)	(0.0115)	(0.00520)
Wave 1	0.00287***	0.00193	0.00275***	0.00148
	(0.000298)	(0.00127)	(0.000212)	(0.00139)
Wave 2	0.000934*	-0.000889	0.00144***	0.00113
	(0.000562)	(0.00136)	(0.000379)	(0.00103)
Wave 3	0.000401*	0.000347	0.000459***	0.0000843
	(0.000231)	(0.000788)	(0.000164)	(0.000937)
Constant	-0.0664	-0.0192	0.000932	0.0897***
	(0.0511)	(0.0624)	(0.00874)	(0.0303)
Observations	92321	143	92321	143
R^2	0.008	0.062		

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

ROA

Table 4: Return on Assets

	(1) All CU (FE)	(2) AG CU (FE)	(3) All CU (RE)	(4) AG CU (RE)
log(Asset)	-0.000445	-0.00821	0.000984**	0.00252
	(0.00384)	(0.00923)	(0.000450)	(0.00176)
Efficiency	-0.0838*	-0.181**	-0.0922*	-0.275***
	(0.0482)	(0.0741)	(0.0550)	(0.0757)
Equity/Asset	0.0162	0.0806***	-0.00418	0.00777
	(0.0697)	(0.0220)	(0.0482)	(0.00986)
Cash level	-0.00679	0.0511	-0.00546	0.0361
	(0.00935)	(0.0792)	(0.00797)	(0.125)
Deliquency rate	-0.0175**	-0.0225	-0.0180**	-0.0550**
	(0.00761)	(0.0365)	(0.00750)	(0.0222)
Z score	1.89e-08	0.00000688	1.70e-08	0.0000102
	(1.81e-08)	(0.00000797)	(1.66e-08)	(0.0000115)
Wave 1	-0.000765	0.000693	-0.000415	0.00359
	(0.00136)	(0.00262)	(0.00141)	(0.00348)
Wave 2	-0.00275***	-0.00380**	-0.00276***	-0.00464***
	(0.000430)	(0.00152)	(0.000489)	(0.00173)
Wave 3	-0.0000999	0.000939	-0.000219	-0.0000380
	(0.000590)	(0.00125)	(0.000478)	(0.00116)
Constant	0.0106	0.134	-0.0120	-0.0357
	(0.0718)	(0.162)	(0.0146)	(0.0328)
Observations	92321	143	92321	143
R^2	0.009	0.541		

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Z-score

Table 5: Z-score

	(1)	(2)	(3)	(4)
	All CU (FE)	AG CU (FE)	All CU (RE)	AG CU (RE)
log(Asset)	-94.51**	-124.2	-18.95**	-36.52***
	(40.78)	(80.31)	(8.526)	(10.76)
Efficiency	-130.3**	257.8	-351.1***	680.3*
	(52.39)	(306.6)	(51.14)	(359.8)
Equity/Asset	-422.4	-507.5**	204.8**	-332.7***
	(355.0)	(207.9)	(85.12)	(97.35)
Cash level	-115.2	-1562.8	-371.2**	746.1
	(87.48)	(1713.1)	(144.7)	(1478.8)
Deliquency rate	108.8	73.16	-162.2**	381.4
	(132.7)	(884.1)	(67.15)	(320.5)
ROA	84.47	109.6*	-221.0***	98.77**
	(152.3)	(57.80)	(69.25)	(43.98)
Wave 1	28.83	-19.01	30.58	-25.44
	(32.13)	(22.25)	(32.81)	(23.08)
Wave 2	16.24	-8.233	9.516	-18.66
	(32.56)	(12.32)	(32.54)	(14.01)
Wave 3	36.48***	1.255	33.44***	-12.26
	(8.882)	(14.36)	(6.960)	(19.94)
Constant	1801.9**	2318.6	415.5**	746.2***
	(744.4)	(1417.8)	(164.3)	(200.7)
Observations	92418	143	92418	143
R^2	0.000	0.037		

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusions and Future Work

- Conclusions
  - While cash on hand for CUs increased, profitability have declined during Covid.
  - Cash on hand for agricultural credit unions did not change significantly, while their profitability declined.
  - Credit unions face less bankruptcy risk during this period.
- Future work
  - Data on voluntary/involuntary liquidation will be incorporated.
  - Government policies as explanatory variables.
  - County level Covid statistics.