

The Participants in the TARP Capital Purchase Program: Failing or Healthy Banks?

Jeffrey Ng

Florin P. Vasvari

Regina Wittenberg-Moerman

CPP: Background

- The Troubled Assets Relief Program (TARP) was established in October 2008 with the goal of stabilizing the U.S. financial system.
- CPP is a program in which the U.S. Government, through the Department of the Treasury, infused capital into qualifying financial institutions.
- Treasury stressed that the CPP is a program through which the government invests in “**healthy, viable institutions.**”
- Despite the Treasury’s emphasis that the CPP is not a bailout of failing banks, the program was the subject of much controversy as it was not clear whether its participants are actually viable.

Research question

Did controversy regarding the financial health of the banks participating in the CPP cause the equity market valuation of these banks to diverge from their fundamentals?

Investor sentiment

- The public and media often characterized the capital infusion under the CPP as a government bailout of relatively weaker banks and a waste of taxpayers' money.
 - "I knew the community at first would be upset because they perceived it [the infusion] as a bailout" (McCall Wilson, president of the Bank of Fayette County in Tennessee).
 - "The public perceives [participation in the CPP] as weakness" (Stephen Wilson, chairman of LCNB National Bank).
 - The TARP program is "one of the most effective large-scale government programs that the public has vehemently decided was a bad idea" (Douglas Elliott of the Brookings Institution).

- The Treasury contributed to the controversy by not publicly revealing the criteria for capital infusion approval.

Investor sentiment: Prior literature

- **DeLong et al. (1990): low investor sentiment leads to the undervaluation of stocks and divergence from fundamental values.**
- **Tetlock (2007): high media pessimism exerts downward pressure on market prices followed by a reversion to fundamentals.**
- **Bernardo and Welch (2004): the pricing impact of investor sentiment is strengthened when investors fear future liquidity shocks.**
- **Baker and Wurgler (2006): the effect of investor sentiment on stock prices is more pronounced for firms that are more difficult to value.**
 - Participation in the CPP has significantly increased uncertainty regarding the value of CPP banks' reported assets.
 - Hoshi and Kashyap (2010): accepting the capital infusion could have signalled that the receiving banks admitted to larger future losses.
 - There was also high uncertainty with regard to the program's resolution mechanisms.

The sample of CPP banks

	Capital infusion		Repayments	
	Number	Amount (\$b)	Number	Amount (\$b)
Firms that received a capital infusion under the Capital Purchase Program	709	204.895	64	121.885
Retain bank holding companies only	571	194.657	50	117.701
After removing bank holding companies with total consolidated assets of less than \$500 million	291	169.358	43	97.675
After removing bank holding companies that did not have ordinary shares listed on NYSE, AMEX, or NASDAQ	189	184.619	39	117.602
After removing bank holding companies that did not announce their participation by March 31, 2009	186	184.557	39	117.602

The sample of non-CPP banks

Number of bank holding companies with total consolidated assets of \$500 million or more as of September 30, 2008 (including Goldman Sachs and Morgan Stanley)	977
After removing bank holding companies that did not have ordinary shares listed on NYSE, AMEX, or NASDAQ as of September 30, 2008	347
After removing the 186 bank holding companies that announced their participation in the CPP by March 31, 2009	161

The distribution of capital infusions and repayments over time

Year	Month	(1) Capital infusion by the announcement date		(3) Capital infusion by the commitment date		(5) Repayment by the repayment date		(7) Net outflow from Treasury to date
		Number of banks	Amount (\$b)	Number of banks	Amount (\$b)	Number of banks	Amount (\$b)	Amount (\$b)
2008	10	28	160.364	8	125.000	0	0.000	125.000
2008	11	59	17.681	36	35.629	0	0.000	160.629
2008	12	68	4.530	82	20.626	0	0.000	181.255
2009	1	26	1.581	46	2.562	0	0.000	183.816
2009	2	5	0.401	11	0.607	0	0.000	184.424
2009	3	0	0.000	2	0.121	3	0.218	184.327
2009	4	0	0.000	1	0.011	5	0.679	183.659
2009	5	1	0.021	2	0.040	4	0.292	183.407
2009	6	1	0.019	0	0.000	10	65.164	118.244
2009	7	0	0.000	0	0.000	1	0.042	118.202
2009	8	0	0.000	0	0.000	2	0.128	118.075
2009	9	0	0.000	0	0.000	4	0.245	117.830
2009	10	1	0.022	1	0.022	0	0.000	117.852
2009	11	0	0.000	0	0.000	3	0.149	117.703
2009	12	0	0.000	0	0.000	7	50.687	67.016
Total		189	184.619	189	184.618	39	117.602	
Total for banks that announced CPP participation in Q4 2008 or Q1 2009		186	184.557	185	184.545			

Stock performance of CPP and non-CPP banks

- ***CPP initiation period (Q4 2008 and Q1 2009):***
 - Buy-and-hold returns of both bank groups are highly negative (-41.7%).
 - The buy-and-hold return on the CPP bank portfolio is 6% lower than the return on the non-CPP bank portfolio is.
- ***Post-CPP initiation period (Q2, Q3, Q4 2009):***
 - Buy-and-hold returns of both bank groups are slightly positive (4.5%).
 - The buy-and-hold return on the CPP bank portfolio is 14.3% higher than the return on the non-CPP bank portfolio is.
- ***Reversal in returns for the CPP bank portfolio:***
 - The returns for the CPP bank portfolio change from -44.4% in the CPP infusion period to 10.8% in the post-CPP infusion period.
 - The return on the non-CPP bank portfolio is negative in both periods.

Stock performance of CPP and non-CPP banks: CPP initiation period (Q4 2008 to Q1 2009)

	(1)	(2)	(3)	(4)
Intercept	-0.310*** (-11.37)	-0.308*** (-6.33)	-0.305*** (-11.47)	-0.306*** (-11.56)
<i>CPP</i>	-0.057** (-2.10)	-0.061** (-2.31)		
<i>CPP-amount</i>			-0.028*** (-2.62)	-0.027** (-2.56)
<i>Beta</i>	-0.038*** (-2.76)	-0.040 (-1.41)	-0.038*** (-2.78)	-0.040*** (-2.88)
<i>Size</i>	-0.001 (-0.79)	-0.001 (-0.64)	-0.001 (-0.93)	-0.001 (-0.26)
<i>Book-to-market</i>	-0.026** (-2.30)	-0.026 (-1.09)	-0.026** (-2.35)	-0.026** (-2.29)
Observations	347	339	347	339
R-squared	0.0622	0.0626	0.0689	0.0665

Stock performance of CPP and non-CPP banks: Post-CPP initiation period (Q2 2009 to Q4 2010)

	(1)	(2)	(3)	(4)
Intercept	-0.078 (-1.44)	-0.079 (-1.45)	-0.075 (-1.39)	-0.072 (-1.35)
<i>CPP</i>	0.103* (1.70)	0.104* (1.71)		
<i>CPP-amount</i>			0.040* (1.68)	0.037 (1.56)
<i>Beta</i>	0.023 (0.75)	0.005 (0.18)	0.024 (0.80)	0.007 (0.23)
<i>Size</i>	0.012*** (3.06)	0.046*** (3.49)	0.012*** (3.20)	0.046*** (3.43)
<i>Book-to-market</i>	0.007 (1.03)	0.008 (1.17)	0.007 (1.02)	0.008 (1.16)
Observations	334	326	334	326
R-squared	0.0533	0.0542	0.0530	0.0528

Difference in changes in stock liquidity: CPP initiation period (Q4 2008 to Q1 2009)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>
Intercept	93.492*** (3.94)	4.341 (0.12)	87.872*** (3.83)	1.411 (0.04)	98.660*** (4.09)	4.860 (0.13)	93.300*** (4.00)	2.200 (0.06)
<i>CPP</i>	-60.600** (-2.41)	-41.107 (-1.09)			-58.175** (-2.29)	-40.977 (-1.07)		
<i>CPP-amount</i>			-21.934** (-2.22)	-15.499 (-1.05)			-21.208** (-2.11)	-15.739 (-1.04)
<i>Size</i>	-1.025 (-1.38)	-0.007 (-0.01)	-1.167 (-1.58)	-0.101 (-0.09)	-5.250** (-2.05)	-0.503 (-0.13)	-5.089** (-1.98)	-0.370 (-0.10)
<i>Book-to-market</i>	66.114*** (6.31)	37.288** (2.37)	66.877*** (6.39)	37.714** (2.41)	65.102*** (6.16)	37.230** (2.34)	65.891*** (6.24)	37.673** (2.37)
Observations	347	347	347	347	339	339	339	339
R-squared	0.1410	0.0226	0.1389	0.0224	0.1434	0.0226	0.1415	0.0224

Difference in changes in stock liquidity: Post-CPP initiation period (Q2 2009 to Q4 2010)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>	<i>Ch-spread</i>	<i>Ch-Amihud</i>
Constant	-138.866*** (-9.11)	-37.802 (-1.23)	-130.997*** (-8.87)	-34.921 (-1.18)	-143.072*** (-9.22)	55.668* (1.79)	-135.209*** (-8.99)	-35.794 (-1.18)
<i>CPP</i>	49.323** (2.51)	39.441 (0.99)			47.459** (2.39)	-56.951 (-1.43)		
<i>CPP-amount</i>			14.536* (1.88)	14.435 (0.93)			13.809* (1.76)	14.543 (0.91)
<i>Size</i>	2.011 (1.63)	0.141 (0.06)	2.293* (1.87)	0.343 (0.14)	10.097** (2.32)	-2.493 (-0.29)	10.018** (2.29)	1.403 (0.16)
<i>Book-to-market</i>	-1.485 (-0.66)	-1.046 (-0.23)	-1.361 (-0.60)	-1.024 (-0.22)	-1.348 (-0.59)	2.263 (0.49)	-1.254 (-0.54)	-1.034 (-0.22)
Observations	334	334	334	334	326	326	326	326
R-squared	0.0306	0.0031	0.0226	0.0028	0.0361	0.0072	0.0283	0.0028

Differences in the characteristics of CPP and non-CPP banks before the launch of the CPP

	(1)	(2)	(3)	(4)
Intercept	3.994*** (2.85)	3.726*** (2.68)	4.416*** (3.05)	4.201*** (2.91)
<i>ROA-ytd</i>	37.810*** (2.93)		36.527*** (2.83)	
<i>NPL</i>	-14.794*** (-2.74)		-14.785*** (-2.73)	
<i>Book-to-market</i>		-0.615*** (-3.60)		-0.601*** (-3.55)
<i>Capital-adequacy</i>	-33.411*** (-4.56)	-26.790*** (-3.76)	-34.656*** (-4.61)	-28.022*** (-3.79)
<i>Cash-to-deposits</i>	-3.944** (-2.01)	-4.676** (-2.25)	-6.196* (-1.71)	-8.466* (-1.69)
<i>Uninsured-deposits</i>	4.164** (2.45)	3.469** (2.15)	3.432* (1.95)	2.746 (1.64)
<i>Fair-value-exposure</i>	1.394 (0.84)	0.751 (0.46)	1.556 (0.93)	0.936 (0.57)
<i>Interest-sensitivity</i>	1.463 (1.30)	1.259 (1.13)	1.307 (1.16)	1.099 (0.98)
<i>Assets</i>	0.005* (1.78)	0.007** (2.20)	0.004 (1.48)	0.006** (2.05)
<i>Population</i>	-0.000 (-0.60)	-0.000 (-0.84)	-0.000 (-0.53)	-0.000 (-0.74)
<i>GDP growth</i>	-0.093 (-0.62)	-0.091 (-0.61)	-0.114 (-0.76)	-0.115 (-0.77)
<i>Unemployment</i>	-0.103 (-0.65)	-0.091 (-0.58)	-0.106 (-0.67)	-0.096 (-0.61)
<i>Blue-state</i>	0.504* (1.68)	0.457 (1.56)	0.448 (1.48)	0.388 (1.31)
Observations	341	341	335	335
R-squared	0.1367	0.1150	0.1311	0.1213

Financial health during the CPP initiation period (Q4 2008 to Q1 2009)

	(1) <i>NPL</i>	(2) <i>ROA</i>	(3) <i>NPL</i>	(4) <i>ROA</i>
Constant	0.064*** (3.15)	-0.007** (-2.22)	0.065*** (3.19)	-0.007** (-2.04)
<i>CPP</i>	-0.017*** (-3.85)	0.002** (2.21)	-0.017*** (-3.82)	0.002** (2.25)
<i>Capital-adequacy</i>	-0.182** (-2.49)	0.027** (2.28)	-0.200*** (-2.69)	0.029** (2.37)
<i>Cash-to-deposits</i>	0.039** (1.99)	-0.003 (-0.93)	0.047** (2.34)	-0.004 (-1.09)
<i>Uninsured-deposits</i>	0.088*** (3.15)	-0.011** (-2.29)	0.102*** (3.52)	-0.012** (-2.54)
<i>Fair-value-exposure</i>	-0.091*** (-3.44)	0.016*** (3.71)	-0.092*** (-3.44)	0.016*** (3.49)
<i>Interest-sensitivity</i>	0.011 (0.57)	-0.002 (-0.77)	0.016 (0.80)	-0.003 (-0.91)
<i>Assets</i>	0.002 (1.42)	-0.001** (-2.51)	0.001 (0.80)	-0.001*** (-2.73)
<i>Population</i>	0.001 (0.24)	0.001 (1.11)	0.000 (0.03)	0.001 (1.18)
<i>GDP growth</i>	-0.005* (-1.83)	0.001*** (3.16)	-0.005* (-1.76)	0.001*** (3.08)
<i>Unemployment</i>	0.002 (0.67)	0.000 (0.10)	0.002 (0.59)	0.000 (0.07)
<i>Blue-state</i>	-0.003 (-0.51)	-0.001 (-0.57)	-0.002 (-0.44)	-0.001 (-0.76)
Observations	333	333	327	327
R-squared	0.1699	0.1729	0.1807	0.1790

Financial health during the post-CPP initiation period (Q2 2009 to Q4 2010)

	(1) <i>NPL</i>	(2) <i>ROA</i>	(3) <i>NPL</i>	(4) <i>ROA</i>
Constant	0.076*** (3.58)	-0.007** (-2.14)	0.080*** (3.76)	-0.008** (-2.13)
<i>CPP</i>	-0.014*** (-2.82)	0.001* (1.90)	-0.013*** (-2.79)	0.001* (1.85)
<i>Capital-adequacy</i>	-0.147* (-1.91)	0.045*** (3.59)	-0.160** (-2.05)	0.044*** (3.40)
<i>Cash-to-deposits</i>	0.023 (1.13)	-0.001 (-0.35)	0.030 (1.44)	-0.001 (-0.20)
<i>Uninsured-deposits</i>	0.080*** (2.70)	-0.015*** (-2.98)	0.093*** (2.98)	-0.014*** (-2.64)
<i>Fair-value-exposure</i>	-0.119*** (-4.30)	0.015*** (3.32)	-0.124*** (-4.47)	0.016*** (3.37)
<i>Interest-sensitivity</i>	0.006 (0.28)	0.002 (0.54)	0.011 (0.52)	0.002 (0.54)
<i>Assets</i>	0.002 (1.20)	0.000 (0.24)	0.000 (0.02)	0.000 (0.42)
<i>Population</i>	0.000 (0.01)	0.001 (1.02)	-0.001 (-0.22)	0.000 (0.95)
<i>GDP growth</i>	-0.005* (-1.70)	0.000 (1.11)	-0.005* (-1.72)	0.001 (1.15)
<i>Unemployment</i>	0.002 (0.78)	-0.000 (-1.05)	0.002 (0.66)	-0.000 (-1.06)
<i>Blue-state</i>	-0.006 (-1.16)	-0.000 (-0.34)	-0.007 (-1.22)	-0.000 (-0.24)
Observations	318	318	312	312
R-squared	0.1630	0.2385	0.1701	0.2382

Analysis of the frequency of delisting

	Number of banks	Number of delistings by 31 December 2009	Percentage delisted
<u>All delistings</u>			
Non-CPP banks	161	30	18.63%
CPP banks	186	2	1.08%
Difference in the delisting t-statistic for the difference			17.55%*** <u>5.64</u>
<u>Performance-related delistings</u>			
Non-CPP banks	161	22	13.66%
CPP banks	186	1	0.54%
Difference in the delisting t-statistic for the difference			13.12%*** <u>4.9</u>

Analysis of taxpayers' return from the CPP

Taxpayer's return as of 31 Mar 2010

	Amounts are in \$ billions							Taxpayers' return (with capital gain)		Taxpayers' return (without capital gain)	
	Capital infusion	Repayment	Loss	Balance	Gains			ROI1	ROI2	ROI1	ROI2
					Dividends	Warrants	Capital gain				
Our sample of CPP banks (186 firms)	184.56	128.22	0.00	56.34	8.23	4.00	6.15	9.96%	15.26%	6.62%	10.15%
All firms participating in CPP (709 firms)	204.89	135.83	2.33	66.73	8.98	4.38	6.15	8.38%	12.65%	5.38%	8.12%

Overview of main results

- **Relative to non-participating banks, CPP banks had a stronger financial performance both prior to and following the CPP capital infusions.**
- **CPP participation had a significant negative effect on the banks' equity valuation during the program's initiation period.**
- **The equity market adjusted the undervaluation of the CPP banks as investor sentiment changed in the post-CPP infusion period.**
- **The capital infusions generated significant and positive returns to taxpayers.**

Conclusions

Low investor sentiment led to a temporary undervaluation of the CPP banks with a subsequent reversal of their market valuation to fundamentals.

Number of media articles by category - WSJ: CPP initiation period (Q4 2008 to Q1 2009)

	Negative	Neutral	Positive	Total
October 2008	21 (63.6%)	6 (18.2%)	6 (18.2%)	33
November 2008	35 (66.0%)	14 (26.4%)	4 (7.6%)	53
December 2008	32 (84.2%)	6 (15.8%)	0 (0%)	38
January 2009	39 (92.9%)	3 (7.1%)	0 (0%)	42
February 2009	64 (73.6%)	17 (19.5%)	6 (6.9%)	87
March 2009	57 (70.4%)	18 (22.2%)	6 (7.4%)	81
Total	248 (74.3%)	64 (19.2%)	22 (6.6%)	334

Contribution to Literature

- **On the role of investor sentiment in firm valuation:**
 - By demonstrating that government intervention can lead to low investor sentiment and thus negatively affect the valuation of the entities that received government funds.
 - By highlighting the importance of investor sentiment in the valuation of bank assets when financial markets are under stress.

- **On government bailouts (Bayazitova and Shivdasani [2009], Duchin and Sosyura [2010], Veronesi and Zingales [2010], Taliaferro [2009]):**
 - By providing evidence that the program's participants were viable banks with strong fundamentals but low levels of regulatory capital and liquidity.
 - By showing that the CPP generated significantly positive returns to taxpayers.