Slicing the Toxic Pizza,

An Analysis of FDIC's Legacy Loan Program for Receivership Assets

by

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Abstract

The Legacy Loans Program is an elaborate way of slicing the FDIC's receivership assets. At best, the financial structure is irrelevant to the FDIC's expected long-run recovery rates. Yet, it may boost short-term prices by creating bond insurance liabilities that will come due several years down the road. If the private investor can increase the value of the toxic loans through non-contractible investments, then the public equity stake and subsidized leverage may hinder the FDIC from obtaining the best recovery rates from these troubled loan portfolios.

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"Asked by a waitress whether he'd like his pizza cut into four pieces or eight, he replied, 'Better make it four. I don't think I can eat eight.'"[1]

1. The first Legacy Loans Program sale

On September 16, 2009, the FDIC announced the results of first Legacy Loans Program auction of approximately $1.3 billion of principal of residential mortgage assets. The purchase price of these assets was $856.2 million. The FDIC put up half the equity of $64.2 million. Fort Worth, Texas based Residential Credit Solutions (RCS) will put up the remaining $64.2 million in equity. RCS was the highest bidder among 12 different participants, making 19 separate bids. FDIC officials hailed the bidding process as "competitive." The remainder of the purchase price will be paid by a FDIC-guaranteed, ten-year note for $727.8 million.[2] While this was the first test of the program, the Federal Deposit Insurance Corporation (FDIC) has so far identified about $30 billion dollars of speculative real estate related assets obtained from the seizures of failed banks that need to be sold to private investors. With 94 bank failures from January

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[1] This comment is attributed to the legendary New York Yankees catcher and manager Yogi Berra. Editorial, October 1, 1989, "Topics of the Times; It's Over for Yogi," *New York Times* accessed online on September 19, 2009, at http://www.nytimes.com/1989/10/01/opinion/topics-of-the-times-it-s-over-for-yogi.html.

[2] FDIC, September 16, 2009, "Press Release: Legacy Loans Program – Winning Bidder Announced in Pilot Sale," accessed online on September 19, 2009, at http://www.fdic.gov/news/news/press/2009/pr09172.html. Karey Wutkowski, September 16, 2009, "Texas Mortgage Servicer to Test Toxic Loan Plan," *Reuters*, accessed online on September 19, 2009, at http://www.reuters.com/article/GCA-Housing/idUSTRE58F5WA20090916.

1, 2009, to September 18, 2009, the FDIC stands to hold billions more toxic assets before the recession is completed.[3]

On the conference call with reporters, the FDIC official leading the discussion argued that the bids that included no leverage had a maximum bid of 58 percent of the remaining balance of the loan portfolio.[4] Non-recourse loans allow the borrower to cede the collateral of the loans with no other adverse consequences in the event of default. Pavlov and Wachter (2002) argue that if the interest rates on non-recourse loans are too low, then such loans will lead to asset pricing bubbles. Wilson (2009) argues that only the cheap, non-recourse loans lead to overbidding for assets in Public Private Investment Program (PPIP). The Legacy Loans Program (LLP) is one part of the PPIP focused on the sale of whole loans. Yet, the winning bid, containing nearly the maximum FDIC guaranteed leverage, sold for approximately 71 percent of the of the $1.3 billion principal balance. Thus, it appears in this first test, that the below market cost of the non-recourse loan inflated prices by about 20 percent.[5]

This note argues that the financial structure of the Legacy Loans Program (LLP) at best does not ultimately affect the value of the assets and liabilities of the FDIC. Since Miller and Modigliani (1958), we have known that the size of the financial pie is not affected by how it is sliced. Using similar reasoning, the call option given to bidders may

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[3] David Enrich, September 19, 2009, "Dual Banking Failures Bring Total to 94 in 2009," *Wall Street Journal*, accessed online on September 19, 2009, at
http://online.wsj.com/article/SB125331196488624031.html.
[4] A recorded version of the conference call by the FDIC press office can be accessed at (866) 392-0223. (There are several minutes of silence or muffled speech at the beginning of the call, but about 5 minutes in the call officially starts.) The author listened to the call on September 17, 2009. The 58 cents on the dollar statement was made about 45 minutes into the call.
[5] The FDIC used this sale as a test of the funding mechanism. It offered the no leverage option and the 6-to-1 leverage option with some performance restrictions. See FDIC, "Legacy Loans Program – Test of Funding Mechanism," http://www.fdic.gov/news/news/press/2009/pr09131.html. The leverage ratio was actually 5 2/3-to-1 in the pilot sale. The debt to equity ratio was ($727.77/$128.43) = 5.67. Thus, RCS used slightly less than the maximum leverage ratio.

inflate prices in LLP auctions, but they don't affect the ultimate value of the toxic assets being sold. This means that the inflated legacy loans auction prices predicted by Krugman[6], Stiglitz[7], and Wilson (2009) and anecdotally found in the first LLP sale do not enrich the deposit insurance fund in expectation. This is because any overpayment for the assets ultimately comes back on the deposit insurance fund, which is both the seller of the asset and the guarantor of the loan used to buy the asset.

In addition, using the standard agency theory approach dating back to Jensen and Meckling (1976), the author argues that the financial structure of the Legacy Loans Program may hurt the FDIC as the seller of toxic assets. Krugman[8] and Wilson (2009) argue that the size (in percent terms) of the government equity stake has no direct incentives on the bidding behavior of asset managers. Here the author argues that the large government stake blunts the incentives of the asset manager because they bear 100 percent of the costs of their investments but only get half the rewards in terms of profits. In addition, the leverage subsidy also blunts the desire of the asset manager to increase the value of the loan portfolio because the leverage often increases the chances that those efforts will not be rewarded in the event of default. A better structure would not subsidize high levels of leverage, and it would eliminate the government's stake entirely. Such a structure would maximize the return from the FDIC's toxic receivership assets.

Most papers addressing the sale of toxic assets have focused on the sale of toxic assets by institutions outside of receivership. This is in large part because that was how

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[6] Paul Krugman, "Geithner Plan Arithmetic," Conscience of a Liberal Blog, *New York Times*, accessed online on May 9, 2009, at http://krugman.blogs.nytimes.com/2009/03/23/geithner-plan-arithmetic/.
[7] Joseph Stiglitz, April 1, 2009, "Obama's Ersatz Capitalism," *New York Times*, accessed online on April 18, 2009 at http://www.nytimes.com/2009/04/01/opinion/01stiglitz.html.
[8] Paul Krugman, "Geithner Plan Arithmetic," Conscience of a Liberal Blog, *New York Times*, accessed online on May 9, 2009, at http://krugman.blogs.nytimes.com/2009/03/23/geithner-plan-arithmetic/.

the Emergency Economic Stabilization (EESA) legislation, which authorized the Secretary of the U.S. Treasury to buy $700 billion of troubled assets, was advertised.[9] Bebchuck (2009), Harvey (2009), Wilson (2009), and Wilson (2010) are examples. Yet, Wilson (2009) and Wilson (2010) cast serious doubts as to the wisdom of buying toxic assets outside of receivership, arguing that undercapitalized institutions will be very reluctant to sell toxic assets at anything close to fair market value. Those papers argue that troubled banks' stock prices depend greatly on the volatility of the toxic assets on the banks' balance sheets. That volatility would be lost if those troubled assets would be sold at fair market value. In turn, those banks' stock prices would suffer. This paper in contrast focuses on the sale of toxic assets held by the FDIC in receivership estates. The present paper finds that the structure of the Public Private Investment Partnership's (PPIP) Legacy Loans Program[10] (LLP) is at best irrelevant for selling toxic assets of failed institutions held by the FDIC.

2. Slicing the toxic pizza

Here we draw up a simplified model of the FDIC's legacy loan transaction in receivership. We will initially assume that the buyer of the asset cannot affect its value, but we relax that assumption in section 4. When the private investor takes leverage, she is buying half of a call option, C_0. The underlying asset of the call option is the toxic

[9] Mark Landler and Edmund L. Andrews, October 4, 2009, "For Treasury Dept., Now Comes Hard Part of Bailout," *New York Times* accessed online on September 19, 2009, at http://www.nytimes.com/2008/10/04/business/economy/04plan.html.
[10] U.S. Treasury, March 23, 2009, "Fact Sheet, Public-Private Investment Partnership," accessed online on September 19, 2009 at http://www.treas.gov/press/releases/reports/ppip_fact_sheet.pdf.

asset, which is worth M_0 in period 0. The strike price of the call option is face value of the debt, which we will denote, F. For simplicity we will assume that there are two periods, 0 and 1. The toxic asset is worth M_L in period 1 if things go poorly, where $M_L < M_0$. The toxic asset is worth M_H if things go well, where $M_H > M_0$.

Wilson (2009) shows that there are only overbidding incentives if the face value of the obligation exceeds the value of the toxic assets in the worst case scenario. $F > M_L$. (If the $F \geq M_H$, the private investor has no hope for profit.) Let us focus on the interesting case where $M_H > F > M_L$.

The toxic asset is sliced up into four pieces when it uses the PPIP financial structure: the present value of the debt obligation, $PV(F)$; the private investor's stake, ½ C_0; the government's stake, ½ C_0; and the guarantee for the bond investors, $-P_0$.

$$M_0 = PV(F) + \frac{1}{2}C_0 + \frac{1}{2}C_0 - P_0 \tag{1}$$

The FDIC receives the present value of the debt obligation, $PV(F)$; the payments for equity, C_0; and the liability for insuring the non-recourse debt, $-P_0$. The liability for insuring the non-recourse debt is a put option with a strike price equal to F. If the underlying toxic assets are worth less than the debt in period one, then the FDIC must pay bond investors the difference between the value of toxic assets in period 1 and the amount promised. The bond insurance is worth the following at maturity:

$$P_1 = \max\{F - M_1, 0\} = \begin{cases} F - M_L, & \text{if } M_1 = M_L \\ 0, & \text{if } M_1 = M_H \end{cases} \tag{2}$$

Black and Scholes (1973) argued that a European call option, which cannot be exercised until the expiration date, is a function of a put option, the underlying asset, and a risk-free bond. This put-call parity equation says that the value of the call option is equal to the value of the underlying asset, less the present value of the strike price, plus a put option. That is,

$$C_0 = M_0 - PV(F) + P_0 \tag{3}$$

Inserting equation (3) into equation (1), the reader can easily see that the right-hand side of the equation equals the left-hand side. That is, $M_0 = M_0$. Thus, the FDIC is made no more or less rich by selling toxic assets that it owns through the Legacy Loans Program.

Proposition 1

If the buyer of the asset cannot affect the asset's value, the FDIC is no better or worse off in expectation either if it sells through the Legacy Loans Program or if it retains assets that it owns in receivership.

This follows from the discussion above. It is an application of the well known theory of Modigliani and Miller (1958). While some people would find this news depressing, the author argues that it could have been worse. Both Wilson (2009) and Wilson (2010) argue that the government will be much worse off it tries to buy assets from banks

outside of receivership using the Legacy Loans Program! Thus, at least when employing the PPIP on receivership assets, taxpayers and the FDIC are no worse off.

While the pie slicing doesn't make the pie bigger, it may make the FDIC look better to the bean counters in the short run. Since the guarantee, the put, will not be exercised for many years down the road, the FDIC can use the inflated sales price of $\bar{M} = M_0 + P_0$ to convince Congress of their prudent stewardship of the deposit insurance fund. Yet, the hidden liability of $-P_0$ lurks at some point in the future. Since the FDIC needs a loan to cover shortfalls in the deposit insurance fund, it may find the prospect of these inflated prices somewhat attractive. As of mid-September 2009, the FDIC had a $500 billion line of credit with the U.S. Treasury and is exploring other funding mechanisms such as a special assessment, or tax on member banks, or issuing its own debt.[11] Yet, it could reduce its shortfall by selling these derivatives, loan guarantees, which are not unlike credit default swaps. Given the American public's introduction to credit default swaps with the failed insurer, which was undid by its credit default swap exposure, American International Group (AIG), lawmakers and FDIC officials might be wary of the credit default swaps by another name that are boosting the prices in Legacy Loan Program auctions.

3.   **Cutting your losses or going long**

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[11] Alison Vekshin, September 18, 2009, "FDIC May Tap Treasury Line to Bolster Fund, Bair Says (Update1)," *Bloomberg.com* accessed online on September 19, 2009, at http://www.bloomberg.com/apps/news?pid=newsarchive&sid=anA40Xh8bco4.

While in expectation the FDIC is no better or worse off from the sales of the toxic assets, it may do better by trading its assets for cash if things go badly. Alternatively, if things go well it could be better off it maintains a long position in the toxic assets. One of the longest positions that the FDIC could have would involve not selling slices of the toxic pizza. If the FDIC keeps all the slices for itself, it has the most to gain if the mortgages perform better than expected. A bearish FDIC would prefer to sell the equity stakes to third parties, the private investor and the U.S. Treasury. That would allow it to pocket the cash from the equity sales and the sale of the guaranteed note. Yet, it is still exposed to the guarantee for the note if things go badly. In this bad scenario, at least the FDIC keeps the equity that the private investor and taxpayers wished that they still had.

4.   Private investors have better incentives

It seems a safe bet that a private investor will be more motivated to maximize the value of the loan portfolio than FDIC officials. Thus, the toxic asset sale is more than slicing the pie. It may be making the pie bigger. In this section, we will lean on some of the basic insights of managerial motivation and financial structure laid out by Jensen and Meckling (1976). We assume that the manager can make some non-contractible investments in period 0 just after winning the bidding for the asset. An FDIC official managing the portfolio has no direct financial stake in its success. Thus, he would put forth the minimal effort to increase the toxic assets' value from M_0. Suppose that the manager can exert some effort to work out the loan portfolio prior to its value's being revealed. Thus, the value of the loan portfolio can be raised by $\alpha m > 0$ with certainty at a

cost to the manager of $\frac{1}{2} m^2$. Alpha, α, reflects the skill that the manager has in working out the toxic assets and raising the value of the portfolio. If $M_L + \alpha m < F$ the manager only gets paid for her efforts the fraction of the time, $0 < q < 1$, that the loan portfolio does well. That is when $M_1 = M_H$. Alternatively, all the benefits from her efforts go to the FDIC—the guarantor of the debt—if she defaults on the non-recourse debt. Further, since the asset manager must split the equity with the government, she only gets rewarded for half her efforts when the loans perform better than expected. In that case, the manager chooses the effort according to the following program:

$$\max \quad \frac{1}{2} q \alpha m - \frac{1}{2} m^2 \qquad (4)$$

This clearly has a maximum value implied by the first order condition with respect to m. This maximum is $\hat{m} = \frac{1}{2} \alpha q$. If the manager could have bought 100 percent of the equity in the toxic asset, then she would maximize $q \alpha m - \frac{1}{2} m^2$, and the resulting optimal level of effort would be $m' = q\alpha$. Thus, the 50/50 equity structure of the PPIP actually prevents the asset manager from maximizing the value of portfolio.[12] With the 50/50 equity split, the value of the toxic asset rose from M_0 to $M_0 + \frac{1}{2} q\alpha$. In the second case, where the asset manager had a 100 percent equity stake, the toxic asset has risen to $M_0 + q\alpha$. We can do even better if the winning bidder chooses a level of leverage F such that $F \le M_L + \alpha m$. In that case, the manager is always rewarded for her efforts, and she maximizes $\alpha m - \frac{1}{2} m^2$. The resulting optimal level of effort is $m^* = \alpha$.

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[12] U.S. Treasury, March 23, 2009, "Fact Sheet, Public-Private Investment Partnership," accessed online on September 19, 2009 at http://www.treas.gov/press/releases/reports/ppip_fact_sheet.pdf.

$1 > q > 0.5q$. Thus, the value of the loan portfolio would be maximized at $M_0 + \alpha$ if both the maximum level of leverage was $F \le M_L + \alpha$ and the manager buys a 100 percent equity stake.

The loan guarantee may be worth more than the increase in value due to managerial investments. Suppose that the toxic asset manager chooses the maximum leverage and use her efforts to increase the value of the loans by $\hat{m}$. In this case, her call option is worth ½ $q(M_H + \hat{m} - F)$. Let us denote the purchase price as $\hat{M}$ in this case. Thus, her call option is also worth $(1/14)\hat{M}$. The debt obligation $\hat{F} = (6/7)\hat{M}$ with the maximum leverage and half government ownership. Further, $\hat{m} = 0.5\alpha q$. We can substitute in the third and fourth equations into the first. The first equation must equal the second, ½ $q(M_H + 0.5\alpha q - (6/7)\hat{M}) = (1/14)\hat{M}$. We can solve for the resulting purchase price as the following:

$$\hat{M} = \frac{q\left(M_H + \frac{1}{2}\alpha q\right)}{\frac{6}{7}q + \frac{1}{7}} \tag{5}$$

If $\hat{M} > M_0 + m^*$, then the highest bidder will not maximize the value of the loan portfolio. That is because the loan guarantee, which we will denote as $\hat{P}_0$, inflates the highly levered bidder's purchase price. With this maximum leverage, the loan guarantee is worth

$$\hat{P}_0 = q\left(\frac{q\left(M_H + \frac{1}{2}\alpha q\right)}{q + \frac{1}{6}} - M_L - \frac{1}{2}\alpha q\right). \tag{6}$$

If $\hat{P}_0 > m^* - \hat{m} = \alpha(1 - 0.5q)$, then the manager that wins the bidding will take on too much leverage to maximize the value of the loan portfolio. Too much leverage causes the toxic asset manager to exert less effort when working out the troubled loans. This is because she is only rewarded for her efforts when times are good if she chooses leverage to maximize the value of the loan guarantee. Yet, she defaults when times are bad and thus none of her efforts are rewarded. Thus, the perverse result of the loan guarantees being offered is that the winning bidder may have less incentive to maximize the value of the loan portfolio.

The deposit insurance fund as the owner of the toxic assets in receivership only can receive the value of the toxic assets it is selling. We know the inflated price due to the loan guarantee is offset by an equal liability to the deposit insurance fund. Yet, the increase in value of the loan portfolio due to the private investor's higher level of effort managing the asset does increase the value of the asset to the FDIC. If the FDIC sets up a bidding process where the highest bidder will not maximize the value of the toxic asset, then it is the FDIC that ultimately suffers because it only receives $M_0 + \frac{1}{2}q\alpha$ from its toxic asset sales in the long-run. This is clearly less than the value it could have received, $M_0 + \alpha$, without offering loan guarantees and forcing the asset manager to accept less than 100 percent of the project's equity.

This discussion leads us to the following proposition:

Proposition 2

i. *When the asset manager can increase the value of the loan portfolio with effort, the public equity stake decreases the value of the toxic asset being sold and ultimately hurts the deposit insurance fund.*

ii. *When the value of the loan guarantee exceeds the gains from maximum effort, then the loan guarantee decreases the value of the toxic asset and hurts the deposit insurance fund.*

5. A worked out example

5.1 Slices don't affect the pie's size

Suppose that the following values characterize the value of the loan portfolio:

$$
\begin{aligned}
M_H &= \$84 \\
M_0 &= \$56 \\
M_L &= \$28 \\
q &= 0.5
\end{aligned}
\tag{7}
$$

The expected value of the loan portfolio is \$56, but there is a fifty-fifty chance that the portfolio will be worth \$28 when things go bad and \$84 when things go well. Further, for simplicity we will assume that the risk-free rate of interest is 0.

The maximum amount that the asset manager is willing to bid is $\overline{M}$. The asset manager is buying half the call option, $\frac{1}{2}C_0$. With 6-to-1 leverage and a 50 percent government equity stake, this call option is worth $(\frac{1}{2})(1/7)$ or one-fourteenth of the purchase price, $\frac{1}{2}C_0 = (1/14)\overline{M}$. Further, when the non-recourse debt, F, exceeds the value of the portfolio in the low demand state, the call option is only exercised in the high demand scenario. Thus, $C_0 = q(M_H - F)$. This debt is a function of the purchase price. In particular, $(6/7)\overline{M}$. We can simplify the relationship, $\frac{1}{2}C_0 = \frac{1}{2}q(M_H - (6/7)\overline{M}) = (1/14)\overline{M}$. Namely, the maximum price that the asset manager is willing to pay in a competitive auction is

$$\overline{M} = \frac{qM_H}{\dfrac{6}{7}q + \dfrac{1}{7}} \tag{8}$$

In this example, plugging in the parameters in equation (7),

$$\begin{aligned} \overline{M} &= \$73.50 \\ F &= \$63 \\ C_0 &= \$10.50 \\ P_0 &= \$17.50 \end{aligned} \tag{9}$$

The loan guarantee put in period 0 is worth $q(F - M_L) = 0.5*(\$63 - \$28) = \$17.50$. The government's equity and the private investor's equity is worth $\frac{1}{2}q(M_H - F) = (0.5)(0.5)(\$84 - \$63) = \$5.25$. If we plug these values into the put call parity equation in

(3), then $5.25 + $5.25 + $63 – $17.50 = $56 = M_0. Thus, as proposition 1 predicted, the size of the pie is unrelated to how it is sliced.

Clearly, if the toxic assets perform well, the FDIC would be best off not selling them at all and having an asset worth $84. Yet, if the assets perform poorly, the FDIC would do the best if both the U.S. Treasury and the investor put up equity stakes of $5.25 each. The FDIC would be stuck with an asset worth $28 dollars because of the loan guarantee, but it would at least have $10.50 in cash or $38.50 in total in the low demand state. If the FDIC took the half equity stake, they would have assets worth $10.50 + $5.25 + $63 = $78.75 if the mortgage returns are high, and $5.25 + $28 = $33.25 if the mortgages perform poorly. Selling off some of the toxic asset is better than the low value of the asset of $28 in period 1.

5.2   Slices affect the asset manager's incentives

Personally, the author thinks that the whole rationale for selling the receivership assets to private investors is that the FDIC is not really skilled at managing them. (I don't think officials at the FDIC would disagree with this assessment.) Thus, the asset manager brings some skills or manpower that the FDIC lacks or is poorly motivated to employ.

Suppose the manager has a skill parameter of $\alpha = \$10$. Thus, the asset manager is motivated to raise the value of the portfolio by $\hat{m} = 0.5q\alpha = \$2.50$ if she has a fifty percent stake and chooses the maximum leverage. This is the structure proposed by the U.S. Treasury, which was used in the first LLP auction. Yet, if there is still subsidized leverage but no government equity stake, then the asset manager will raise the value of

the portfolio by $m' = q\alpha = \$5$. Alternatively, if the manger is neither accepting a

government equity stake nor receiving a debt guarantee from the FDIC, she would take

on debt less than or equal to $M_L = \$28$, and she would raise the value of the loan portfolio

by $m^* = \$10$. Thus, the loan portfolio could be worth $M_0 + m^* = \$66$ in period zero. That

extra \$10 in long-run value could be pocketed by the FDIC in a competitive auction

process, because it is the owner of the receivership assets.

Yet, the financial structure of the PPIP makes the winning bidder choose

maximum leverage. Thus, plugging in the parameter values into equation (5), the

winning bidder would be willing to pay $\hat{M} = \$75.6875$. That is \$9.6875 more than what

the asset manager could bid if she would have incentive to maximize the value of the

toxic loans. Yet, she only has incentives to maximize the value of the loans if she does

not choose the maximum leverage. The price of $\hat{M} = \$75.6875$ is misleading because,

according to equation (6), it is attached to a liability of $-P_0 = -\$17.1875$ to the FDIC.

While the FDIC collects \$75.6875 in period 0 with the 6-to-1 leverage, it can only expect

to have \$75.6875 – \$17.1875 = \$58.50 in period 1. In contrast, with no leverage subsidy

and no government ownership stake, the FDIC could expect to collect \$66 in period 0 and

keep all that money in period 1. In short, the Public Private Investment Partnership's

financial structure leads to an inefficient allocation of receivership assets. It awards loan

portfolios to managers who have the least incentive to maximize the toxic assets' value.

6.   Conclusion

This paper has argued that the structure of the Legacy Loans Program (LLP) auctions of toxic assets in receivership at best does not matter. The auction prices will be boosted by the subsidized leverage, but the FDIC incurs an offsetting loan guarantee liability that cancels out any gain from the increased purchase price. At worst, the current structure of subsidized leverage discourages the winning bidder from maximizing the value of the loan portfolios. Thus, the FDIC may benefit from ending the loan guarantees. The excessive leverage brought by subsidized loan guarantees coupled with the public's ownership stake, may be discouraging the ultimate buyers from maximizing the value of toxic asset portfolios. This paper finds that abandoning subsidized government financing may benefit the deposit insurance fund in the long run even if it leads to lower sale prices of receivership assets in the short-run.

References

Black, Fischer, and Myron Scholes (1973), "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, *81*, 637–654.

Bebchuck, Lucian A., (2009), "Buying Troubled Assets," *forthcoming Yale Journal of Regulation*, *26*.

Harvey, Campbell R., (2008), "The Financial Crisis of 2008: What Needs to Happen After TARP," Working Paper, Duke University.

Jensen, J. & Meckling, W. (1976). "Theory of The Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, Vol. 3, No. 3 (October), 305-306.

Modigliani, F. & Miller, M. (1958), "The Cost of Capital, Corporate Finance, and the Theory of Investment," *American Economic Review*, Vol. 48, No. 3. (June, 1958), 261-297.

Pavlov, Andrei D., and Susan M. Wachter, (2002), "Robbing the Bank: Non-recourse Lending and Asset Prices," *Journal of Real Estate Finance and Economics*, *28*, 147-160.

Wilson, Linus, (2009), "A Binomial Model of Geithner's Toxic Asset Plan," *SSRN Working Paper*, accessed online on September 19, 2009 at http://ssrn.com/abstract=1428666.

Wilson, Linus, (2010), "The Put Problem with Buying Toxic Assets," *forthcoming Applied Financial Economics*.