



Managing markets for toxic assets

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ABSTRACT

A model in which banks trade toxic assets to raise funds for investment is analyzed. Toxic assets generate an adverse selection problem and, consequently, the interbank asset market provides insufficient liquidity. Investment is inefficiently low because acquiring funding requires banks to sell high-quality assets for less than their “fair” value. Equity injections reduce liquidity and may be counterproductive as a policy for increasing investment. Paradoxically, if it is directed to firms with the greatest liquidity needs, an equity injection will reduce investment further. Asset purchase programs, like the Public–Private Investment Program, often have favorable impacts on liquidity, investment and welfare.

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1. Introduction

How can government agencies restore liquidity in financial markets during periods of financial distress? In 2008, the U.S. Treasury Department and the Federal Reserve were confronted with exactly this question. Banks and financial intermediaries with many “toxic assets” in their portfolios found it difficult to raise funds necessary for making loans. According to market observers and commentators in the popular press, these toxic assets could not be easily valued and were therefore illiquid. The Treasury and the Federal Reserve Bank responded with a combination of policy actions including asset purchases, loan guarantees and equity injections.

This paper uses a simple model to analyze the effects of policies in markets for toxic assets. We model the market for toxic assets with an adverse selection problem. Adverse selection seems like a natural modeling assumption for two reasons. First, many market observers emphasize the problem caused by having assets that buyers could not accurately value. Second, it has been well understood since [Akerlof \(1970\)](#) that adverse selection can cause significant market failures, and, in extreme cases, can cause markets to shut down completely.

In our model, banks possess both liquid and illiquid (toxic) assets. Banks trade the illiquid assets to finance investments and satisfy their needs for liquidity. In the absence of government interventions, the interbank market for toxic assets provides insufficient liquidity for banks to efficiently finance investment projects. Investment is inefficiently low because acquiring adequate funding requires banks to sell high quality assets at prices below their “fair” market value. This illiquidity is a direct consequence of the adverse selection problem in the secondary market for toxic assets.

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We then consider whether government policies can increase liquidity in the secondary market and improve the allocation of investment. We focus our attention on equity injections and purchases of toxic assets. Equity injections do not increase liquidity in markets for toxic assets and, in some cases, may be counterproductive as a policy for increasing investment. In contrast, asset purchase programs can increase liquidity in the secondary market by driving up the price of toxic assets. In the model, under certain conditions, asset purchase programs may be more effective at increasing investment than policies that provide direct access to additional liquidity.

One counterintuitive disadvantage of equity injections is that they often allow financial institutions to fund investments directly without having to sell as many high-quality assets at unfavorable terms. While this is unambiguously good for a single financial institution at a given price, equity injections can have negative feedback effects in equilibrium. Because financial institutions can withhold high quality assets and instead rely on the new equity to fund investments, fewer of these high quality assets are traded. In such cases, equity injections have a *contamination effect* which causes the average quality (and thus the price) of toxic assets in the secondary market to drop. The reduction in price further reduces the incentive to trade, making toxic assets even less liquid. Paradoxically, if equity injections are directed to banks with the greatest needs for liquidity, the contamination effect can be so severe that investment falls in equilibrium.

Unlike equity injections, which often have a detrimental impact on the market for toxic assets, asset purchase programs – like the Public–Private Investment Program – often have favorable impacts on secondary markets, investment and welfare. Intuitively, while asset purchase plans can be designed to transfer the same amount of money to distressed financial institutions, the banks have to sell assets to obtain the funds. Asset purchases thus encourage trading in the secondary market, leading to greater liquidity and improved efficiency.

In the model, a key requirement of a successful asset purchase policy is that the government purchase assets at above-market prices. If the government buys assets at fair-market prices, the policy will have no effect. Because the government needs to purchase assets at above-market prices, successful asset purchases are costly in terms of the Federal Budget.

Modeling toxic assets with adverse selection obviously rules out other potentially important roles for such securities. For instance, in our model, the banks do not care directly about insolvency nor do they care about whether their balance sheet is sufficiently transparent for potential creditors. Other market frictions (bank runs, liquidity constraints, etc.) surely played important roles in shaping the crisis. Because available evidence does not point uniquely to adverse selection as the source of financial market failure, our results should be viewed somewhat narrowly. The paper presents one possible channel through which loan market failure may have arisen and is not meant to preclude other mechanisms.

2. Background

The Emergency Economic Stabilization Act of 2008 was signed on October 3, 2008 by President George W. Bush. The most prominent component of this legislation was the *Troubled Asset Relief Program* better known by its acronym TARP. At the time of the bill's passage, the conventional understanding was that the TARP would be used to purchase distressed assets in order to restore trading in interbank markets that were essentially frozen. Congress authorized the Treasury to purchase up to \$700 billion of troubled assets.

The preamble of the bill laid out the intentions of the legislation as follows: “(t)he Secretary is authorized to establish the Troubled Asset Relief Program to purchase [...] troubled assets from any financial institution, on such terms and conditions as are determined by the Secretary.” The term “troubled assets” is defined by the law to mean “residential or commercial mortgages and any securities, obligations, or other instruments that are based on or related to such mortgages [...] the purchase of which the Secretary determines promotes financial market stability.”¹

The purpose of the TARP was to restore liquidity to asset markets that had essentially ceased to function. In a formal press release, Secretary Henry Paulson described the problem in the asset markets and his proposed solution as follows:

When the financial system works as it should, money and capital flow to and from households and businesses to pay for home loans, school loans and investments that create jobs. As illiquid mortgage assets block the system, the clogging of our financial markets has the potential to have significant effects on our financial system and our economy. [...] The federal government must implement a program to remove these illiquid assets that are weighing down our financial institutions and threatening our economy. This troubled asset relief program must be properly designed and sufficiently large to have maximum impact, while including features that protect the taxpayer to the maximum extent possible.²

Paulson's description of the problem is exactly what we want to capture in our model.

The original design of the TARP was not greeted with unanimous support from academic economists, many of whom argued that capital injections would work better to stabilize conditions in the markets (see [Stiglitz, 2008](#); [Krugman, 2009](#); [Diamond et al., 2008](#); [Kashyap and Stein, 2008](#)).³ In addition, two other issues ultimately led to a substantial re-design of the

¹ The Emergency Economic Stabilization Act is Division A of Public Law 110–343. The terms of the TARP are included in Title I of this Act.

² Statement by Secretary Henry Paulson on Comprehensive Approach to Market Developments, hp-1149, September 19, 2008.

³ Not all economists viewed the original TARP unfavorably. Quoted by *The Wall Street Journal*, Anna Schwartz said that the problem was “exotic securities that the market does not know how to value. They are toxic because you cannot sell them, you do not know what they are worth, your balance sheet is not credible and the whole market freezes up.” In her view, purchasing such assets would be a “step in the right direction.” Also quoted in *The Wall*

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