

**USING EMINENT DOMAIN TO  
WRITE-DOWN UNDERWATER MORTGAGES:  
AN ECONOMIC ANALYSIS**

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*Abstract:* A handful of economically distressed cities and counties are considering using their power of eminent domain to write down the principal of underwater mortgage loans. Analogous to the condemnation of tangible real estate for public use, the city would “take” intangible mortgage loans from the lenders or investors holding the loans. According to the proposed idea, the underwater mortgage loans would be acquired for less than their stated face value, and then written down, refinanced, and sold to investors. This article reviews the legal basis and economic impact of such government forced write-down and refinancing. We develop a model of negative equity mortgage default both with and without government takings to determine if the use of eminent domain is socially desirable from a policy perspective. We find a trade-off between the immediate benefits of avoiding current mortgage defaults and longer term costs of increased interest rates. The weighting of this trade-off is impacted by the determination of just compensation.

Key words: Default, eminent domain, mortgages

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## **USING EMINENT DOMAIN TO WRITE-DOWN UNDERWATER MORTGAGES: AN ECONOMIC ANALYSIS**

### **1. Introduction**

Several cities in areas that experienced significant declines in property values are considering using their power of eminent domain to address the issue of underwater mortgage loans.<sup>1</sup> Analogous to the condemnation of tangible real estate for public use, the plan consists of a city “taking” intangible mortgage loans from loan owners (portfolio lenders or securitized investors).<sup>2</sup> As required in all eminent domain cases, the city would pay the loan owners “just compensation” for the takings. The city would then write down the principal amount outstanding on the loans to bring them above-water, and then facilitate a refinancing of the new lower principal amount.<sup>3</sup>

Using eminent domain to write-down underwater mortgages has been referred to as “one of the hottest issues raised by the mortgage foreclosure crisis episode that broke in 2008.”<sup>4</sup> The issue is hot because it is controversial. On one side, advocates reason that this is an appropriate use of eminent domain, with the public purpose being the prevention of mass foreclosures, and

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<sup>1</sup> See “Governments Mull Radical Solutions to Underwater Mortgages” John W. Schoen, *NBC News*, August 16, 2012, [www.nbcnews.com](http://www.nbcnews.com). The locality to consider this plan was San Bernardino County, California, although it appears that they have decided not to pursue such action as of January 2013. See “San Bernardino County Abandons Eminent Domain Mortgage Plan” Alejandro Lazo, *LA Times*, January 24, 2013, [www.latimes.com](http://www.latimes.com). Recent other cities reported to be considering the plan are Chicago, Illinois and Brockton, Massachusetts. See “Chicago Considers Eminent Domain to Seize Underwater Mortgages” Jon Prior, *Housing Wire*, July 7, 2012, [www.housingwire.com](http://www.housingwire.com); “Eminent Domain for Mortgages: Brockton, Other Cities Consider Novel Idea” Simon Van Zuylen-Wood, *CommonWealth Magazine*, January 15, 2013, [www.commonwealthmagazine.org](http://www.commonwealthmagazine.org).

<sup>2</sup> The plan is outlined in detail at Hockett (2012a).

<sup>3</sup> The plan idea is being advocated by Mortgage Resolution Partners (MRP). The MRP website states that it is “a Community Advisory firm working to stabilize local housing markets and economies by keeping as many homeowners with underwater mortgages in their homes as possible”. The plan is that MRP would provide the money for a city or county’s eminent domain takings through a group of prearranged investors who would earn a fee for each takings transaction.

<sup>4</sup> “Experts Debate Eminent Domain to Condemn Mortgages” Robert Feinberg, *Money News*, January 11, 2013, [www.moneynews.com](http://www.moneynews.com).

the associated effects of reducing blight, maintaining property tax rolls, and reviving the economic vitality of communities.<sup>5</sup> On the other side, opponents maintain that taking mortgage loans is not a public purpose, and would create unacceptable lending risks that would have the effect of increasing mortgage interest rates and reducing mortgage credit.<sup>6</sup> Of additional concern, widespread taking of mortgage loans out of securitized pools may force investors to immediately realize underwater mortgage loan losses for accounting purposes (“mark to market”).<sup>7</sup>

This study analyzes the legal and economic issues raised by the proposed use of eminent domain in connection with mortgage loans. The next section provides an overview of the proposed plan to take, modify, and refinance underwater mortgages. Section 3 examines the proposal in light of fundamental questions related to the Takings Clause of the U.S. Constitution. Section 4 looks at the financial aspects of the takings as proposed, specifically looking at the role just compensation has on financial feasibility. In Section 5, we develop an economic model of mortgage default with and without the government takings. The model reveals that mortgage lenders will price the possibility of takings into the interest rate charged for a mortgage loan, just as they now price in the possibility of default and foreclosure, resulting in a higher interest rate for mortgages. We conclude the article with our thoughts about the viability of using eminent domain to take underwater mortgages.

## **2. Overview of Underwater Mortgage Problem and Proposed Plan**

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<sup>5</sup> See, for example, “Eminently Reasonable” David Reiss, *The National Law Journal*, September 24, 2012, [www.nlj.com](http://www.nlj.com).

<sup>6</sup> See, for example, “Taxpayers Shouldn’t Have to Pay for Underwater Mortgages” Mark A. Calabria, *U.S. News and World Report*, February 6, 2012, [www.usnews.com](http://www.usnews.com).

<sup>7</sup> Pointed out by Reiss, footnote 5, as a possible underlying reason for opposition to the takings.

The proposed structure for taking, writing-down, and refinancing underwater mortgage loans is being advocated by Mortgage Resolution Partners (MRP)<sup>8</sup>, and is discussed by Professor Robert Hockett in two Cornell Law School Legal Studies Research Paper Series articles (Hockett 2012a, Hockett 2012b). Hockett provides statistics showing that over 11 million homes are underwater (a quarter of US homes with mortgages outstanding), where “underwater” means that the market value of a mortgaged property is less than the mortgage loan debt that it secures. He also reports on the negative effect that these underwater mortgages are having on the national economy and specific local economies.

Hockett concludes his analysis of current mortgage statistics with the assumption that underwater mortgage write-downs need to occur.<sup>9</sup> He points out that write-downs are occurring for loans in bank portfolios since it is rational for banks to write-down underwater loans instead of letting them default. But write-downs are not happening for loans that have been securitized and are now held by securitization trusts, primarily because the pooling and servicing agreements require unanimity or supermajority voting among mortgage-backed securities holders before a loan can be modified or sold.<sup>10</sup> Additionally, in the case of all loans, second and other junior

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<sup>8</sup> See footnote 3 on what MRP. An MRP PowerPoint presentation entitled “Homeownership Protection Program: A Solution to a Critical Problem” was previously set out at the MRP website [mortgageresolution.com](http://mortgageresolution.com).

<sup>9</sup> The New York Federal Reserve recently questioned this conclusion. Reviewing data from CoreLogic, they found that the share of mortgages that are still active five years after the beginning of the subprime mortgage crisis is relatively small, and for many severely underwater mortgages the required payment on first liens has decreased. They also point out that recently increasing house prices “have kept many from drowning”, and are an important consideration in the eminent domain cost-benefit analysis. Fuster, Gorbach, and Willen, “Underwater and Drowning? Some Facts about Mortgages that Could be Targeted by Eminent Domain”, February 13, 2013. <http://libertystreeteconomics.newyorkfed.org/2013/02/underwater-and-drowning-some-facts-about-mortgages-that-could-be-targeted-by-eminent-domain.html>

<sup>10</sup> A recent study has looked at the contractual provisions governing modification of mortgages. John P. Hunt, “What Do Subprime Securitization Contracts Actually Say About Loan Modification?: Preliminary Results and Implications”; Berkeley Center for Law, Business and the Economy. He finds that, in most cases, modification may be undertaken without violating the terms of pooling and servicing agreements. He reports that about 9.3% of dollar volume of securitized mortgages have an explicit ban on material modification; 63.9% of the dollar volume requires reasonably foreseeable default; 3.3% requires imminent default.

lienholder may prevent a first lienholder from having an incentive to write-down, since first lienholders don't benefit unless junior lienholders also write-down.

Given the reasons above, Hockett advocates government collective action to solve the problem of underwater mortgages. He discusses why programs established by the federal government, in particular the Home Affordable Mortgage Program (HAMP) and Home Affordable Refinance Program (HARP), have been unsuccessful at providing a meaningful cure. He also points out that while Congress had introduced bills to deal with the issue through the Bankruptcy Code, no legislation has passed. This means that there is no relief in bankruptcy for underwater homeowners, as bankruptcy judges cannot write-down or modify mortgages secured by a borrower's primary residence, even if the secured value is less than the loan value.<sup>11</sup>

Faced with the economic burden of the underwater mortgage problem, and given the absence of meaningful collective action at the federal level, cities and counties have been working with Mortgage Resolution Partners to take action at the local level through what they refer to as the Homeownership Protection Plan ("the Plan"). The Plan basically consists of a local government (we will refer to it hereafter as a "city", though it could be a town or county)

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<sup>11</sup> Chapter 13 of the Bankruptcy Code provides for reorganization for individuals. It allows individuals to allow an individual debtor to reduce the principal balance of a secured debt to the value of the collateral (referred to as a strip-down). Most secured debt can be stripped down, including loans secured by cars, investment property, and personal property. For example, if a person owns an investment property worth \$300,000, but the loan balance is \$500,000, a bankruptcy court could allow the investment property mortgage loan to be stripped down to \$300,000. The remaining \$200,000 of the mortgage loan balance would become unsecured debt, which would be lumped together with other unsecured debt and can be reorganized and written down.

A mortgage loan on principal place of residence is not allowed to be stripped down in this manner. Section 1322(b)(2) contains an exception to the strip-downs for a mortgage loan secured only by a security interest in real property that is the debtor's primary residence. A 1993 U.S. Supreme Court case made it clear that the rights protected by this section are not limited by a lender's secured claim; in other words, an underwater mortgage loan is still considered secured and falling under this section as long as there is some remaining value in the property. *Nobleman v. American Sav. Bank*, 508 U.S. 324, 113 S. Ct. 2106, 124 L. Ed. 2d 228 (1993). In the concurring opinion, Justice Stevens wrote:

At first blush it seems somewhat strange that the Bankruptcy Code should provide less protection to an individual's interest in retaining possession of his or her home than of other assets. The anomaly is, however, explained by the legislative history indicating that favorable treatment of residential mortgagees was intended to encourage the flow of capital into the home lending market.

using its power of eminent domain to seize underwater mortgages, then writing down and refinancing the mortgages, so as to leave previously underwater homeowners above-water in their loans (Hockett 2012a and Hockett 2012b).

Hockett (2012b) argues that the Plan could be undertaken without any cost to local taxpayers and could be wholly funded with money from private investors. In “broad outline”, the plan is as follows. Investors would provide money to a city account or trust. The city would then use the funds to seize selected underwater mortgage loans through eminent domain. The city would work with the underwater homeowners to modify these loans. Once modified, the city would transfer the new modified loans to the original private investors. It is presumed that these investors would either hold the loans or securitize and sell them.

Hockett (2012a) provides a little more detail on the Plan that will be relevant to our analysis. First, the mortgages selected for the program would only be single family, owner-occupied residences within the city, and would have loan to value ratios of greater than 100%. Second, homeowners would need to be current on their underwater mortgage loan payments (in other words, performing loans). Third, it is assumed that the fair market value of an underwater loan is 85% or less of the value of the home itself.<sup>12</sup> Fourth, the new loan to value ratio could be as high as 95%. Whether this plan is feasible depends on legal, financial, and economic considerations. We analyze these aspects in turn.

### **3. Legal Considerations**

Eminent domain is the power of a government to take private property. The Fifth Amendment to the U.S. Constitution limits this power by requiring that the taking must be for a

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<sup>12</sup> Hockett (2012a) refers to Appendix A for technical specifications of this assumption, however, Appendix A is not developed.

“public use” and the government must pay “just compensation.”<sup>13</sup> Therefore, from a legal perspective, the first questions to be asked are as follows: (i) is a mortgage loan the type of property that can be taken? (ii) is addressing the underwater mortgage problem a public use? and (iii) how should just compensation be determined?

### 3.1 Property

Eminent domain is typically used when a government has a need to take tangible real property for the purpose of constructing roads, schools, and other public infrastructure. The courts have regularly held, however, that eminent domain is not limited to real property, and can be used to take all types of property, including personal property, partial interests in property, and intangible property. In the current context, the property to be taken would be the mortgage loan, which is a promissory note between borrower and lender, and the associated mortgage lien, which is collateral for the mortgage note. As far back as 1935, when the Great Depression caused many land owners to be underwater on their mortgages, the U.S. Supreme Court specifically recognized that eminent domain could be used to take mortgage interests from mortgagees to relieve mortgagors, as long as the public interest requires it and just compensation is paid.<sup>14</sup> There are also other court cases allowing or recognizing the taking of other types of

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<sup>13</sup> The clause in the Fifth Amendment is referred to as the "Takings Clause"; it simply states "nor shall private property be taken for public use, without just compensation." While the Fifth Amendment applies to actions by the federal government, the Fourteenth Amendment extends the Takings Clause to eminent domain actions by state and local government as well. In addition, nearly all states have similar provisions in their constitutions. See Miceli (2011) for an economic perspective on eminent domain.

<sup>14</sup> *Louisville Joint Stock Land Bank v. Radford*, 295 U.S. 555 (1935). In that case, the Court found that the Frazier-Lemke Act violated the 5<sup>th</sup> Amendment takings clause, since it had the effect of writing down a borrower's loan without paying the lender just compensation. In the case, the Court recognized that "If the public interest requires, and permits, the taking of property of individual mortgagees in order to relieve the necessities of individual mortgagors, resort must be had to proceedings by eminent domain; so that, through taxation, the burden of the relief afforded in the public interest may be borne by the public." In such a case "the Fifth Amendment commands that, however great the nation's need, private property shall not be thus taken even for a wholly public use without just compensation." 295 U.S. 555 at 602. Also see *W. Fertilizer & Cardage Co. v. City of Alliance*, 504 N.W.2d 808, 816 (1993), an inverse condemnation action where the Nebraska Supreme Court found that a lower court had erred in holding that a mortgage interest could not be taken, finding that "a mortgagee's lien on real estate is an interest

intangible contract rights<sup>15</sup>, mechanic's liens<sup>16</sup>, shares of stock<sup>17</sup>, and even sports franchises<sup>18</sup>.

Therefore, it is very likely under existing precedent that mortgage loans would be deemed property that can be taken by eminent domain.

Whether a local government has jurisdiction to seize intangible property is another question. While the collateral for a mortgage loan resides in the county, at first look it may be unclear where the intangible mortgage loan itself resides, given that the collateral, the homeowner, the mortgage loan note holders, and the mortgage loan note may all be in different locations. The U.S. Supreme Court has determined that all debts are payable everywhere, but for jurisdictional purposes, the situs of a debt is where the debtor resides.<sup>19</sup> Therefore, as long as the mortgage loan borrower still resides in the mortgage loan collateral, it is most likely that a city where the collateral is located has jurisdiction over the mortgage loan.

### 3.2 Public Use

Whether taking of underwater mortgage loans serves a Fifth Amendment "public use" is an important legal question in any eminent domain taking. The recent U.S. Supreme Court holding in *Kelo v. City of New London*, made it clear that public use did not require that property taken be literally put into use for the public (such as property taken for a road that the public can then travel on). Instead, the court confirmed previous case law that public use is a broad concept that includes economic development purposes that provide a public benefit in the form of

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that may be subjected to a taking for a public purpose and, therefore, may be the subject of an eminent domain proceeding."

<sup>15</sup> *United States Trust Company of New York v. New Jersey*, 431 U.S. 1, 19 (1977).

<sup>16</sup> *Armstrong v. United States*, 364 U.S. 40 (1960).

<sup>17</sup> *Offield v. New York, New Haven & Hartford R.R. Co.*, 203 U.S. 372 (1906).

<sup>18</sup> *City of Oakland v. Oakland Raiders*, 3 Cal. 3d 60 (2008) (where the California Supreme Court recognized that intangible property rights could be taken by eminent domain, even though it ultimately decided that taking a football franchise did not meet the public use test).

<sup>19</sup> *Harris v. Balk*, 198 U.S. 215, 222-23, (1905). "All debts are payable everywhere, unless there be some special limitation or provision in respect to the payment; the rule being that debts as such have no locus or situs, but accompany the creditor everywhere, and authorize a demand upon the debtor everywhere."



enhanced tax revenues and jobs.<sup>20</sup> The taking of underwater mortgage loans for the public purpose of creating a healthier local economy and real estate market appears to easily fall within that definition.<sup>21</sup>

Up until the *Kelo* case, there was a question as to whether private property could be taken by a government authority for the purpose of being transferred to another private party. This impacts whether underwater mortgage loans could be taken and then transferred to a third party for refinancing. Again, the *Kelo* precedent applies here, as the concept of public use was broadly construed to allow condemned property to be transferred to a private party for development.<sup>22</sup> Note, however, that many states have revised their state constitutions after the *Kelo* case, making it harder to use eminent domain for the purpose of transferring property to a private party for purposes of economic development.<sup>23</sup> For example, California passed Proposition 99 in 2008, prohibiting state and local governments from acquiring owner-occupied homes for the purpose of conveying it to another person, with certain listed exceptions.<sup>24</sup> While this may not apply to seizing mortgage loans, the different state constitutional provisions regarding eminent domain would need to be reviewed.

An economic perspective on the public use issue takes a slightly different approach, but arrives at the same conclusion. Economists view the public use requirement as limiting the use

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<sup>20</sup> *Kelo v. City of New London*, 545 U.S. 469 (2005).

<sup>21</sup> The concurring opinion in the *Kelo* case set out a more detailed standard for judicial review of economic development takings than that found in case itself. The concurrence forwarded the idea that the purpose of government takings should only be subjected to minimal scrutiny and need only bear a rational relation to a legitimate government purpose.

<sup>22</sup> Also see *Hawaii Housing Authority v. Midkiff*, 467 U.S. 229 (1984), which allowed the state of Hawaii to condemn landlords' large tracts of real estate to convey to the property tenants for the public purpose of reducing the concentration of fee simple ownership in the state.

<sup>23</sup> The Institute for Justice reports that 43 states have passed either constitutional amendments or statutes that have reformed their state eminent domain law in response to the *Kelo* case, with 35 of those states banning takings for economic development purposes. *Five Years After Kelo: The Sweeping Backlash Against One of the Supreme Court's Most-Despised Decisions* Institute for Justice, [www.ij.org](http://www.ij.org).

<sup>24</sup> Proposition 99 amended Section 19 of Article I of the California Constitution.

of forced takings to those situations in which the market fails, thus necessitating government intervention to ensure that all mutually beneficial transactions take place.<sup>25</sup> In the case of real property, the market failure that justifies eminent domain is the holdout problem associated with land assembly. When the land in question is targeted for a public good like a highway or airport, taking of the needed land is uncontroversial because the project is literally for public use, but as noted, the *Kelo* decision extended the meaning of public use to “private” developments that serve a larger “public purpose,” such as providing jobs and tax revenues. Economists generally see this logic as problematic (because any economic development would produce such benefits), pointing instead to the underlying holdout problem as the real justification for using eminent domain to assemble the needed land. And since assembly is an issue in most redevelopment settings, including *Kelo*, the decision in that case may be right, even if the reasoning is wrong.

In the current context, a similar argument could be used to provide an economic justification for the use of eminent domain to acquire underwater mortgages, assuming that refinancing is a value-enhancing action, and a holdout problem precludes it. As noted above, the existence of a holdout problem in fact seems to be the case, given the need to obtain agreement from mortgage-backed securities holders before loan terms can be modified. As for the gains from refinancing, the model in section 5 discusses that issue.

### 3.3 Just Compensation

As discussed above, just compensation is required to be paid when private property is taken for public use. In *Louisville Joint Stock Land Bank v. Radford*, the U.S. Supreme Court specifically struck down a federal New Deal law that helped farmers write-down their

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<sup>25</sup> See Miceli (2011, chapter 2), Merrill (1986) and Kelly (2006).

underwater mortgages on the grounds that just compensation was not paid to the lenders.<sup>26</sup> As set forth in Hockett (2012a and 2012b), the Plan to take underwater mortgages does envision that owners of the mortgages will be paid just compensation. So the legal issue of whether just compensation needs to be paid is moot. What would be most vigorously debated is how much the just compensation would be.

Courts generally use “fair market value” as the measure of just compensation, reasoning that this is the amount that sellers would demand and receive in voluntary transactions.<sup>27</sup>

Evidence of fair market value is generally presented in condemnation proceedings by valuation experts. The valuation may not be seen as an exact science, and as such, experts may differ in their opinions of the value of underwater mortgages. Since much of the plan is predicated on the cost of just compensation, the valuation of mortgages will be discussed more thoroughly in the next section.

#### **4. Financial Considerations**

The financial feasibility of the Plan will rest squarely on the interrelationship between amount of the underwater mortgage loan, the measure of just compensation, and the amount of the refinanced mortgage loan. Proponents of the Plan highlight that the proposed takings will be revenue neutral. However, that assertion is not entirely clear, as much of the financial aspects of the takings hinge on the determination of just compensation.

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<sup>26</sup> See footnote 14.

<sup>27</sup> Also, each state’s laws must be reviewed to see if state law has another specific definition of just compensation. For example, California’s Eminent Domain Law generally defines fair market value as:

The fair market value of the property taken is the highest price on the date of valuation that would be agreed to by the seller, being willing to sell but under no particular or urgent necessity for doing, nor obliged to sell, and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available.

The Plan contemplates that the value of an underwater performing loan is less than 85% of the value of the collateral that secures it. For purposes of an example, we'll assume that less than 85% is 80%. Suppose that a homeowner bought a property for \$625,000 and took out a \$500,000 mortgage loan, but the home has decreased in value and is now worth \$400,000. If the fair market value of the loan is 80% of the value of the collateral, then the \$500,000 loan is now only worth \$320,000. According to the Plan as outlined above, the city would then pay just compensation of \$320,000 for the loan. The city would then modify the loan by reducing the loan principal to an amount not exceed 97.5% of the current value of the collateral, \$390,000, and then refinance the old mortgage loan and sell the new loan. The loan would then be transferred to the original investor.<sup>28</sup> Theoretically, there would be no cost to the city. The homeowner would have a principal reduction of \$110,000 (\$500,000 – \$390,000). The \$70,000 difference between the just compensation of \$320,000 and the refinanced balance of \$390,000 would theoretically cover the condemnation costs, refinance costs, and profit to the investor.

There are three primary issues with these financial assumptions. First, it is unclear why counties don't just buy the mortgages and refinance them instead of using eminent domain to avoid the market place. (The holdout problem described above provides one reason.) The fact that an underwater mortgage could be refinanced and sold for \$390,000 may be evidence that the fair market value of the underwater mortgage is actually \$390,000, not \$320,000. If so, the takings may not work financially as planned.

Second, the fair market value of a loan is based on the loan note and risk of default, not necessarily the value of the underlying loan collateral. Valuing a loan requires projecting its future cash flows and discounting them to a present value. So to value an underwater mortgage

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<sup>28</sup> Mortgage Resolution Partners is an entity currently set up to be the eminent domain investor to acquire and refinance underwater mortgage loans - see <http://mortgageresolutionpartners.com> .

to find just compensation in a condemnation proceeding, the court would need testimony on future cash flows and the appropriate discount rate. Forecasts for default probabilities for a performing loan, even a loan that is underwater, would be less than for a non-performing loan.

Expanding on the above example of a \$500,000 performing loan, let's assume the loan interest rate is 7%, which has not been recently refinanced at a lower rate given it is underwater. Also, assume a 30 year term with 25 years remaining. That means monthly loan payments are \$3,326.51. Given a current interest rate of less than 4%, and taking into account default risks associated with underwater mortgages, we assume for illustrative purposes a discount rate of 6%. The present value of future cash flows is \$516,297.57. Note that the loan is actually worth more than its face value, because the interest rate is higher than can be currently obtained in the market, and the loan is performing but can't be refinanced because it is underwater. It takes an 11.8% discount rate to bring the present value \$320,000.

Third, loans are regularly sold in the secondary market. Therefore, a court should be able to estimate the value of performing mortgage loans using the market value of performing loans sold on the secondary market. It goes without saying that the market values of performing loans sold on the secondary market are most likely greater than the market value of nonperforming loans.

As an aside, it should be recognized that, from a non- eminent domain perspective, the taking and refinancing of first mortgages could affect second mortgages and other liens. Typically when a homeowner refinances a first mortgage and there's also a second mortgage outstanding, the second mortgage lender has to agree to subordinate its loan to the new first mortgage. Otherwise, the priority of the loans will reverse, and the refinanced first mortgage lender will end up being behind the second mortgage lender in the event of foreclosure.

To conclude these two sections, we find that there is reason to believe that the Plan is legally permissible, but its financial feasibility will depend on the judicial determination of just compensation. We now turn to a more formal economic analysis of the Plan, which will also allow us to evaluate its likely impact on the primary mortgage market.

## **5. An Economic Model**

We use a basic model of mortgage default that is similar to one developed in Brueckner (2000). In the model, a borrower obtains a mortgage in amount  $L$  in order to purchase a house.<sup>29</sup> After one period, repayment of the mortgage in the amount  $B$  is required. The difference  $B-L$  thus represents the net return to the lender, which must be sufficient to induce lenders to enter the market. Thus, it must cover the lenders' opportunity cost of funds, including any risk of default, or, in the current context, any costs associated with the threat of government taking of underwater loans. (We will discuss the determination of  $B$  in more detail below.) The market value of the house at the time of repayment is a random variable whose realization,  $V$ , is publicly observed at that time. Let  $f(V)$  be the density of  $V$ . The possibility of default arises because the realized value of the house may be less than the required repayment, or  $B > V$ . In this case, the mortgage is under water, and default may be a value-maximizing strategy of the borrower.

Another important factor, however, will enter the borrower's default decision. That is the borrower's *subjective value* of retaining the house, denoted  $S$ , which we assume is private information of the borrower. Subjective value represents the borrower's valuation of the house in excess of its market value, reflecting, for example, attachment to the neighborhood or the community. Thus,  $V+S$  represents the minimum amount the borrower would willingly accept to sell the house. Let  $g(S)$  be the density function of  $S$ . (For simplicity, we will assume that  $V$  and

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<sup>29</sup> The amount of the purchase price is unimportant for our purposes.

$S$  are independently distributed.) At the time the mortgage balance is due, individual borrowers privately observe their values of  $S$ . If, at that time, the borrower chooses to pay off the mortgage, she receives a net return of  $V+S-B$ , while the lender receives  $B-L$ . However, if the borrower defaults and the lender forecloses, the borrower receives a return of zero and the lender receives  $V-k_L-L$ , where  $k_L$  is the lender's transaction cost of reselling the house. Default therefore involves two social costs: the lender's cost of default,  $k_L$ , and the borrower's loss of his or her subjective value,  $S$ .<sup>30</sup>

### 5.1 The Model without Takings

As a benchmark, we first derive the outcome of the above model when there is no possibility of the government taking the mortgage. The extensive form of this game is shown in Figure 1, where at each of the two terminal nodes, the borrower's return, the lenders' return, and the joint return are shown. After observing  $V$  and  $S$ , the borrower chooses to pay off the mortgage if and only if<sup>31</sup>

$$V + S \geq B. \tag{1}$$

Given (1), Figure 2 shows the regions where default and payoff occur in  $(S, V)$  space. Note that borrowers with high realizations of  $V$  and/or  $S$  choose to pay off the mortgage, while those with low  $V$  and  $S$  default.<sup>32</sup>

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<sup>30</sup> Brueckner (2000) does not consider  $S$ , but assumes that borrowers incur another cost of default, representing the cost of impaired credit plus any psychic costs resulting from failure to repay the loan. We ignore these costs here.

<sup>31</sup> We assume that when indifferent, the borrower pays off the mortgage.

<sup>32</sup> We ignore the possibility of refinancing by the original lender, given the contention by advocates of government-forced refinancing that write-downs of underwater loans are not happening voluntarily because of restrictions in pooling and servicing agreements for securitized loans. If we allowed a refinancing stage before default, it would significantly complicate the model without adding any real insights, provided that some default would occur even after voluntary refinancing. In the current model, such residual default would likely arise occur because of the unobservability of subjective value by lenders. Suppose, in particular, that when faced with a non-performing borrower, the lender made a single take-it-or-leave-it refinancing offer that could not be conditioned on  $S$ . Given this offer, borrowers with high  $S$  would accept and borrowers with low  $S$  would refuse and default.

The only decision by lenders in this model is to set the amount of the required payoff amount,  $B$ , given the initial loan,  $L$ . Assuming a competitive mortgage market and risk-neutral lenders, all loan contracts  $(B, L)$  promising non-negative profit will be available. Based on Figure 2, the lender's expected profit, as of the origination point before either  $V$  or  $S$  has been realized, is given by

$$\pi_0 = \int_0^B \int_0^{B-S} (V - k_L) f(V) g(S) dV dS + \int_0^B \int_{B-S}^{\infty} B f(V) g(S) dV dS, \\ \int_B^{\infty} \int_0^{\infty} B f(V) g(S) dV dS - L, \quad (2)$$

where the first term is the return in the “default” state, and the next two are the returns in the “payoff” state. Feasibility requires that  $\pi \geq 0$ .<sup>33</sup> Thus, because the maximum possible return in the default state is  $B - k_L$ , it must be true that  $B > L$  so that the lender expects to recover his default costs.

## 5.2 The Model with Takings

Now suppose that the government announces a policy of using eminent domain to take any underwater mortgages and arrange to refinance them. Let  $C$  be the amount of compensation paid to the original lender in fulfillment of the Fifth Amendment “just compensation” requirement, and let  $R$  be the repayment amount owed by the borrower under the refinanced loan. (Note that neither  $C$  nor  $R$  can depend on the realized value of  $S$  since it is private information of the borrower, but they can depend on  $V$ .) We impose three conditions on this forced refinancing scheme, all of which can be characterized as “participation constraints.”

First, we assume that compensation of the original lender is set at the “market value” of the underwater loan, reflecting the maximum amount that a rational buyer would be willing to pay for the loan. Since resale of the underlying collateral involves transaction costs of  $k_L$ , we set

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<sup>33</sup> If the lender has a positive opportunity cost of funds, then the expression in (2) must at least equal that return.



$$C(V) = V - k_L, \tag{3}$$

which is clearly less than the market value of the underlying collateral.<sup>34</sup> It is important to note that not all of these underwater mortgages would have in fact defaulted. Recall, in particular, that borrowers with high subjective values would have performed, as shown in Figure 1. However, because it is not possible to distinguish those borrowers who would have performed from those who would not have, all underwater loans must be treated the same—that is, all are taken with compensation determined by (3).

Second, borrowers whose loans are taken must be no worse off under the refinancing scheme. Again, since  $S$  is not observable, the benchmark is the borrower's return under default, which is zero. Thus, we set

$$R(V) = V. \tag{4}$$

Given (4), all borrowers, whether or not they would have in fact defaulted, are better off because their loan balances are written down (i.e.,  $V < B$ ). In addition, those borrowers who would have defaulted keep their houses and therefore retain their subjective values.

Finally, we require the scheme to be self-financing, or  $R - C \geq 0$ . (Note that in our simple model, there is no risk of default on the renegotiated loan by assumption.) Given (3) and (4), we have

$$R(V) - C(V) = k_L, \tag{5}$$

which clearly meets the requirement. Thus, the new loan is financially feasible. This assumes, of course, that there are no transaction costs associated with the government's taking of

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<sup>34</sup> As discussed in Section 4, there is some debate about what constitutes “just compensation” of lenders. The value in (3) ensures full compensation relative to the alternative of default and foreclosure, but as we will see, any deviation from that value will ultimately be reflected in the market return at the origination point. In other words, the market will ensure full compensation of lenders in expected terms regardless of the value of  $C$ . (But see the comment regarding  $C$  in footnote 35 below.)

defaulting mortgages. Thus, the argument here represents the best case scenario for the proposed policy.<sup>35</sup>

### 5.3 Assessment of the Policy

The preceding assumptions ensure that all underwater loans can be refinanced by the use of eminent domain; that is, the policy is feasible. The next question is whether it is also socially desirable. It is not enough to have shown that all parties participate willingly at the taking stage; in addition, we need to ask what the effect of the policy would be on the original mortgage market.

To answer that question, we need to reconsider the initial payoff decision of the borrower, as depicted in Figure 1. Note first that with  $R=V$ , the borrower's payoff from the "default" option (which now means, "default and refinance through the government's refinancing plan") is  $V+S-R=S$ . Thus, the borrower will choose to pay off the mortgage rather than default if and only if  $V+S-B \geq S$ , or if and only if

$$V \geq B. \tag{6}$$

Thus, only those borrowers with positive equity will pay off their mortgages. Note that, in comparison to the payoff condition in the model without takings (condition (1)), the borrower's decision here is independent of  $S$ . This is true because default no longer results in the borrowers' losing their homes. Instead, it involves refinancing of the loans, which allows them to remain in their houses. Figure 3 shows the resulting payoff and default regions. Note that, in relation to Figure 2, the region of payoff is smaller, holding  $B$  fixed. The reason is that borrowers with underwater mortgages but high subjective values no longer need to pay off their mortgages to

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<sup>35</sup> Of course there will always be legal expenses when eminent domain is allowed, but the fact that we have specified  $C$  and  $R$  so that all parties willingly participate in the plan will lessen opposition. This is one reason for setting  $C$  at the value in (3) rather than some lesser amount.

avoid losing their houses. Rather, with government-forced refinancing, they can stay in their houses while lowering their loan balances.

The avoidance of actual default, with the resulting cost savings of  $k_L+S$ , represents an important social benefit of the refinancing plan proposed here. However, the impact on the original loan market will depend on the expected return of the original lender under the refinancing scheme. Given the behavior of borrowers as shown in Figure 3, and with compensation of the lender set at  $C=V-k_L$ , the expected return from the initial loan, as of the origination date, is

$$\pi_T = \int_0^B (V - k_L) f(V) dV + \int_B^\infty B f(V) dV - L. \quad (7)$$

In this expression, the first term represents the return in the taking state and the second is the return in the payoff state. Subtracting (7) from (2) we obtain

$$\pi_0 - \pi_T = \int_0^B \int_{B-S}^B [B - (V - k_L)] f(V) g(S) dV dS + \int_B^\infty \int_0^B [B - (V - k_L)] f(V) g(S) dV dS, \quad (8)$$

which is positive. Thus, for a given  $B$ , the return is lower under the refinancing scheme. It follows that  $B$ , the required repayment amount, must be increased in (7) in order to maintain equal returns.<sup>36</sup> This implies a shrinking of the loan market because of the higher required interest rate.

It is important to recognize that the contraction of the market arises here from the unobservability of  $S$  in this context. Recall, in particular, that the inability of the government to condition the refinancing of underwater loans on  $S$  required that  $R=V$ , rather than  $V+S$ , which is

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<sup>36</sup> This is true assuming that  $\pi_T$  is increasing in  $B$ , meaning that the lender's profit is increasing in the required interest rate. A larger  $B$  in (7) actually has an ambiguous effect because, although higher  $B$  yields greater profit per borrower, it marginally increases the risk of default with resulting costs of  $k_L$ . We assume that in the relevant region, the first effect dominates (Brueckner, 2000, p. 257).

the maximum amount that a borrower would have been willing to pay to stay in the house. In this sense, high  $S$  borrowers earn a kind of rent from the refinancing scheme, which, as we saw, altered their payoff decision. Specifically, those borrowers with underwater mortgages but a high  $S$  who would have paid off the mortgage in the absence of a taking threat are now induced to take advantage of the forced renegotiation. This in turn necessitates a higher interest rate (higher  $B$ ) for all borrowers in order for lenders to maintain a competitive return.

One possible solution to this problem would be to increase the compensation of lenders above  $V - k_L$ , which would have the effect of lowering  $B$ . If the self-financing requirement that  $R \geq C$  remains in effect, however, the highest amount  $C$  can be raised to, given (4), is  $V$ . In that case, we compute

$$\begin{aligned} \pi_0 - \pi_T = & \int_0^B \int_0^{B-S} (-k_L) f(V) g(S) dV dS + \int_0^B \int_{B-S}^B (B - V) f(V) g(S) dV dS \\ & + \int_B^\infty \int_0^B (B - V) f(V) g(S) dV dS. \end{aligned} \quad (9)$$

Note that the first term of this expression is negative while the second two are positive. The ambiguity of (9) arises from the compensation of lenders for the transaction costs of foreclosure for all taken mortgages, including those that would have defaulted in the absence of takings.

This represents a net gain to lenders. However, it must be balanced against the lower return from those mortgages that default under the forced refinancing plan that would not have defaulted in its absence. Which of these effects dominates is an empirical question that depends on the magnitude of  $k_L$  and the distribution of borrower types. Absent some sort of subsidy, therefore, a trade-off likely remains between avoiding default, with the consequent costs, on the back side of the mortgage market, and reducing the market for mortgages up front.

## **6. Conclusion**

Many local governments are struggling with economic issues related to underwater home loans in their jurisdictions, including widespread foreclosure, dislocated homeowners, decaying neighborhoods, and decreased property tax revenue. Some cities and counties have begun to explore the novel idea of forcing write-downs and refinancing of negative equity loans using their power of eminent domain. We have argued that the taking of mortgage loans would most likely withstand judicial review as long as just compensation is paid to the original mortgage lenders. The question as to the actual amount of just compensation, however, is not clear. In order for the eminent domain taking plan to be revenue neutral, an underwater mortgage loan would need to be valued at less than what the loan could be refinanced for, so there is pressure to keep just compensation to a minimum. Our economic analysis revealed, however, that this provision of the plan could lead to an increase in the required interest rate for mortgages as lenders adjust to maintain a competitive return.

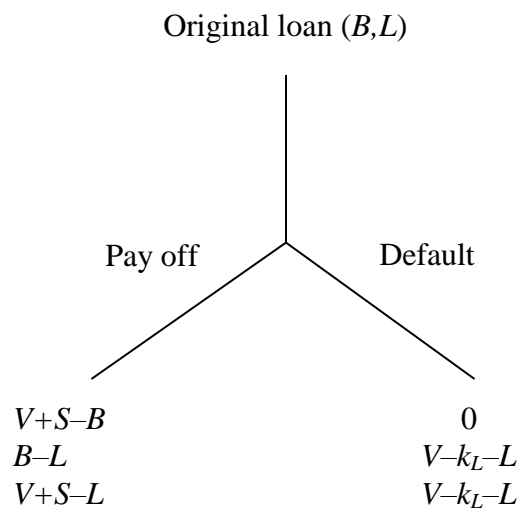
The problem stems from the unobservability of borrowers' subjective values, which precludes tailoring refinancing amounts to the actual willingness to pay of borrowers to remain in their homes. As a result, all underwater mortgages are taken rather than only those that would have actually defaulted, which raises the default rate compared to a world without takings. And given market value compensation for taken loans, lenders would have to increase interest rates in the future to maintain a competitive return. This would have a contractionary effect on mortgage markets.

The negative impact on mortgage markets could be avoided if the amount of compensation paid to lenders were suitably increased. However, as recognized, the higher the required compensation, the lower is the likelihood that the plan will be financially feasible. Also, it may not be possible to ever correctly price just compensation so that there are no adverse

effects in the marketplace. Therefore, all players in this proposed scheme should recognize that there is an economic trade-off between the benefits of curing underwater mortgage loans now and the costs of affecting the market for mortgages in the future.

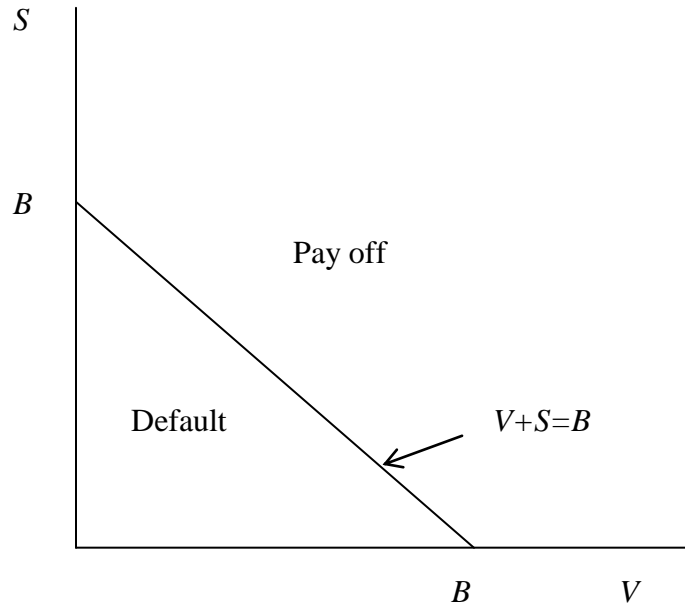
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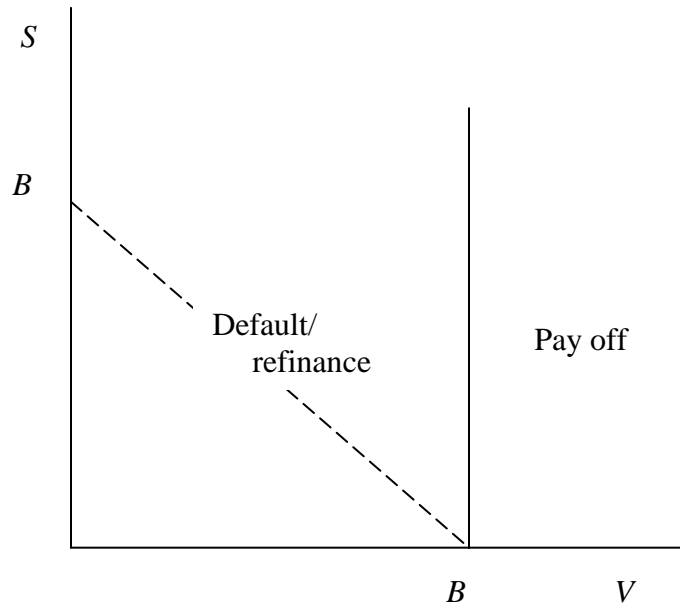


**Figure 1.** Extensive form of game without takings.





**Figure 2.** Regions where borrower pays off and defaults on the mortgage.



**Figure 3.** Regions where borrower pays off and defaults on mortgage with takings.