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A Case for Government Enforcement: A Game Theory Analysis

David A. Medak
Whittier College

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A Case for Government Enforcement: A Game Theory Analysis

Abstract

This paper seeks to address the risks of extending credit to those without collateral through a game theory analysis. There is relatively low risk when lending to someone with collateral, such as a house or a car, however a potential borrower without collateral is seen as a much larger risk. The three major issues of lending: Moral Hazard, Adverse Selection and Enforcement are seen as the three main obstacles that must be overcome and addressed for credit to be available to those without collateral. As will be displayed throughout this paper, there are not three issues that must be addressed, but rather, one. The single issue of extending credit to the collateral-less is enforcement. By addressing the issue of enforcement, both moral hazard as well as adverse selection are addressed. The rationale behind this is that when there is full enforcement capability by the lender (Guaranteed Repayment), the issue of moral hazard is addressed and the issue of asymmetric information becomes relatively insignificant. Moral hazard is addressed in two ways: First, the borrower understands that they will be forced to repay the loan which creates incentives for the borrowers to abstain from utilizing credit for endeavors that previously they would have been limited in liability for. A good example of this is student loans; students don't take out loans with the assumption that they can default and file for bankruptcy to remedy their debts because under U.S. law they are unable to do so. Secondly, the lenders are aware of the game facing the borrowers, and therefore they can assume that any borrower attempting to utilize credit is risky due to moral hazard, which increases the borrowers' ability to extend credit. Adverse selection and asymmetric information become relatively unimportant because there cannot be negative implications from asymmetric information if there is full enforcement capability. This holds true in two ways: First off, if someone has asymmetric information that makes them likely to default on their loan, it makes no difference because they will still be forced to repay. Secondly, if they have asymmetric information which makes their payoffs higher than the lender is aware of, it is not valuable to keep this as asymmetric information because it benefits both the lender and the borrower, and therefore the potential borrower would make that information known to the lender. When comparing a government backed lending entity versus a private lending entity, as well as in comparing a corrupt government backed entity to a non-corrupt government backed entity utilizing a potential borrower without collateral, game theory allows us to draw conclusions on solutions to social dilemmas within lending. All games were three-player, multi-strategy games with expected payoffs represented in the present value of the long term. Nature was brought into each game to represent the uncertainty that is associated with all credit transactions. The four game solutions supported the hypothesis of enforcement being the singular issue when analyzing whether to or not to extend credit to a collateral-less borrower. When investigating the effects of corruption, expected payoff functions were utilized to assess the incentives to seek rents by government backed entities in comparison to a private entity. Additionally, assessing the ability of the borrower to identify rent-seeking in the market for credit was assessed to see the costs and benefits of a private entity relative to a government backed entity. After concluding these studies, it became apparent that enforcement was the key issue to collateral-less borrowing, but also, that there would be less corruption with a government backed entity than a private entity, due to the relative expected payoffs of corrupt behavior.

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A Case for Government Enforcement

Introduction:

The issue within credit markets that will be addressed is the problem of giving those without collateral access to credit. How can a system be established so that it is safe to lend to borrowers without collateral? The only way that this issue can be resolved is through a government backed lending sector. A government backed lending system increases access to credit through minimizing the risks that lenders face.

There are three issues central to constricting access to credit; moral hazard, adverse selection, and finally the issue of enforcement. Although these issues are at the helm of risks facing any lender, it is the issue of enforcement which overarches all problems. Through full enforcement and nearest to perfect information, the government could establish a lending system which deters those who are unfit from borrowing and gives credit access to those deserving of credit; those who otherwise would not have access to credit. Not only would a government backed lending sector create sustained growth in the economy, but it would also establish a more consistent credit market for those attempting to access credit. This new scenario would be especially beneficial for those attempting to secure capital for endeavors that have more societal rather than financial benefits.

Literature Review:

In developing countries, there is little-to-no credit access for a potential borrower without collateral; something which has negative implications for broadly based economic growth (De Soto, 2000). Countries with limited development, especially countries with corrupt or limited law enforcement, limit lending to potential borrowers with capital. What results from this is a scenario in which those with assets have access to

credit within formal markets, and those without assets don't. Those without collateral end up having to utilize informal or "black" market credit intermediaries such as loan sharks to have access to credit. Aside from the social issues surrounding informal credit markets, informal lending doesn't reap the full benefits of credit extension to broad based economic growth. What this implies is that there are limited increases in broad based economic growth due to collateral-less borrowers' limited access to credit.

There are three main issues with lending to the collateral-less borrower: Adverse Selection, Moral Hazard, and Enforcement (Hoff & Stiglitz, 1990). These are the issues that Hoff and Stiglitz claim must be resolved, or at least minimized before lenders will extend credit to potential borrowers. Most commonly, the way to address the issues of all three is through collateralized lending. Although, not all potential borrowers are able to provide collateral for their loans, and even when the loan is collateralized, the issues of moral hazard as well as adverse selection, although minimized, remain. Therefore other remedies to the aforementioned issues are needed to increase credit access.

When applying game theory to lending in developing nations, not only do we see that it is irrational to lend to borrowers without collateral, but also, it is irrational for the borrowers without collateral to repay their loan when faced with the choice (Wydick, 2008). This is another situation where those with collateral have access to credit in formal markets, and those without collateral are forced to utilize informal credit markets. From the games in Wydick's book, it is apparent that collateral is necessary for enforcement of credit repayment. With collateral being necessary for credit repayment, we can observe through game theory that without collateral, those who borrow have no incentive to repay. What can then be derived is that for both players involved in non-collateralized lending,

borrowers and lenders, it does not make sense to lend or to repay which eliminates incentives to extend credit.

With public-to-private arrangements, there will always be an incentive to seek rents, whether by public entities or by private entities, depending on power positions (David C. Kang, 2002). Corruption related to public-to-private interactions is complex; Kang states that the government can seek rents from those it is overseeing, as well as organizations &/or individuals can seek rents from the government. Kang quantifies the two as Top-Down corruption and Bottom-Up corruption respectively. What we can observe from Kang's two types of public-to-private corruption scenarios is that top-down corruption plagues the lending industry. Kang also makes it apparent that corruption in both top-down and bottom-up forms represent an increased transaction cost. When applying this to lending, we can observe a lower expected payoff to potential borrowers, whether or not they have collateral. This is especially relevant because fear of corruption is evident when there is government backing of private entities. As Kang suggests, top-down corruption is most likely to occur, although we will observe that both external market factors as well as internal factors can address the issues of top-down corruption (Market corrections of corruption will be explained later on).

Games:

Game theory will be used to prove the efficiencies of a government backed lending facility. Through a series of games comparing private to government backed lending facilities, as well as a comparison of corrupt government backed versus non-corrupt government backed lending facilities. Game 1 represented in figure 1 depicts the

extensive form of a three player, multiple strategy game, while taking into account the effects of nature. In figure 1, the banks are unable to discern whether the borrower is a good or a bad borrower (good versus bad will be explained shortly), the two banks simply see the borrower as someone with collateral. In this game, the privately held bank has two strategies: 1) Lend or 2) Don't Lend. The government backed bank has the same two strategies: 1) Lend or 2) Don't Lend. The borrower has two strategies: 1) Borrow and Repay or 2) Borrow and Don't Repay. Although the borrower has a third strategy to "Not Borrow," for the purpose of this paper we will disregard that strategy as it has no effect on the outcome of the game. Finally, nature can produce a borrower that is either a Good Borrower, or a Bad Borrower. A good borrower is one who will succeed in their endeavors and be able to repay their debts. A bad borrower is one who will not succeed in their endeavors. These two instances that occur in nature are just this, occurrences, and therefore neither bank nor borrower will know whether or not they will be successful in their endeavors; not until after nature's effects have been revealed. Therefore because of this, part of the borrowers' strategy is unable to be decided until the effects of nature are realized and the ability or inability of the borrower to repay is identified. Keep in mind, while nature will play a key role in the borrowers ability to repay, identifying a borrower as able to repay does not guarantee repayment by the borrower. Game 2 represented in figure 2, the borrower is without collateral, therefore the game in figure 2 is exactly the same as figure 1, except the borrowers have no collateral with which to secure a loan.

Once government backed lending facilities have been proven more efficient at providing capital to borrowers without collateral, when comparing government and private lending facilities, figures 3 & 4 will analyze the effects and implications of

corruption within a government backed lending facility. In figures 3 & 4, the strategies of the borrowers and lenders will remain the same, as will the implications of nature. The players will differ in that the two banks will both be government backed, however one bank will be corrupt (Bank 1 which mandates a bribe for loans) and the other will not be corrupt (Bank 2 which doesn't require bribes). The only difference between games 3 & 4, like in figures 1 & 2, is that in game 3 the borrower will have collateral and in game 4 the borrower will be without collateral. Finally, figures 3 & 4 will prove the minimal implications of corruption, as well as the markets ability to address those implications relatively well. Most importantly, even with corruption, the games will prove that borrowers without collateral will be best served by government backed lending facilities.

When observing the following games keep in mind that the games have been structured to take into account the uncertainty that nature produces. The games account for this through the fact that before lending, the lenders are only able to view the potential borrowers as borrowers with or without collateral, they are unable to discern whether or not they are "good" or "bad" borrowers (implying success or failure in their endeavors). Only after the loan has been made will nature enter the game and depict whether or not the borrowers are successful and able to repay. If they are "good" borrowers then they will be able to repay, and will therefore have the choice to repay or to not repay. If they are "bad" borrowers, they will have no choice to repay because they will have been unsuccessful in their endeavors. This depicts a more realistic lending scenario because lenders truly are unable to identify those that will be able to repay and those that will be unable to repay. Lenders can attempt to calculate probabilities of the likelihood that a borrower will be able to repay, although no matter how well planned a business can be, in

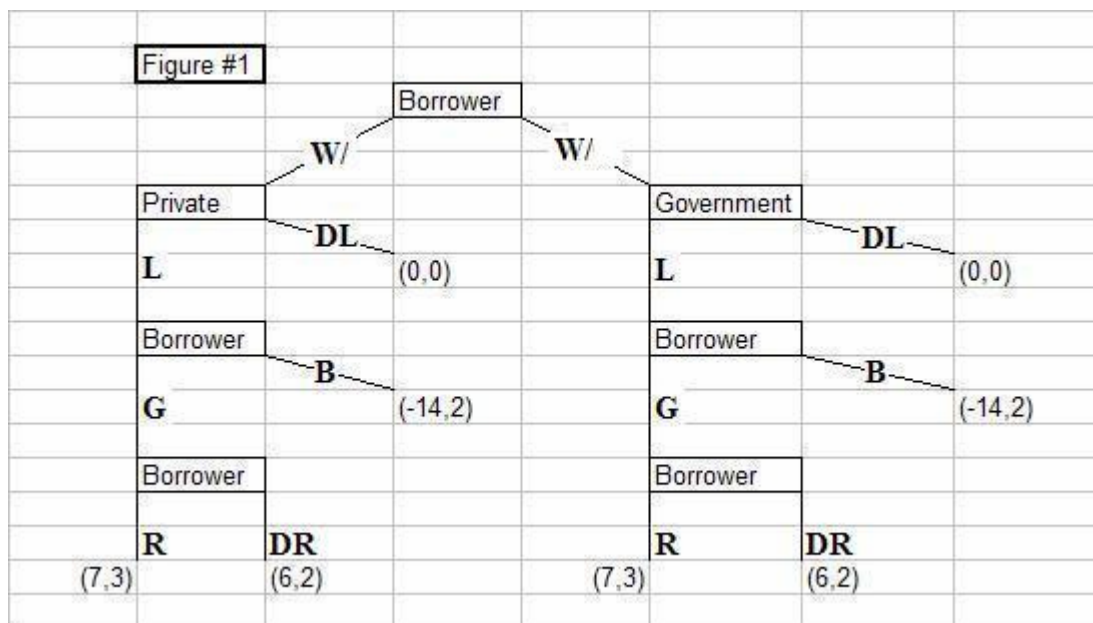
the end nature has dramatic implications on whether or not the borrower will be successful in their endeavors. Equally important is the assumption that the government has the nearest to perfect information within the lending sector. This implies that like the private lenders, the government is subject to the beneficial and/or adverse effects of nature; however the government is in the best possible position to be able to analyze the potential outcomes when lending.

Analysis:

Private Lending Vs. Government Backed Lending

We start our analysis by examining the differences between private and public lending facilities with regard to their ability to rationally provide credit access. When looking at the credit access that they provide to potential borrowers, we will observe the credit made available to borrowers both with and without collateral. Ideally, the perfect lending facility will be able to rationally provide credit to deserving potential borrowers, even if they are unable to provide collateral assets. When examining a lending facilities ability to extend credit “rationally,” we use the term “rationally” with an implied meaning that the lenders would be acting rationally to lend with the given situation. We assume that lenders could irrationally provide credit to anyone with or without collateral, but for the sake of this paper, we will assume only rational actions by both lenders as well as borrowers will occur. Finally, through utilization of the games, we will be able to identify what policies would be necessary to create a scenario in which credit can be made readily available to deserving potential borrowers in a rational manner, without regard to collateral.

Figure #1 Neutrality between Private and Government, Borrower has Collateral (W/)

Figure #1 Facts:

Loan Value	\$10	Cost of Repo. Assets	\$2
Interest	30%	Success Payoff	\$20
Assets of Borrower	\$14	Failure Payoff	\$0

Figure #1 Assumptions:

- 1) *Full Enforcement Capability* by government (Guaranteed repayment of loan)
- 2) Government has *Nearest to Perfect Information*
- 3) Private has regular information and average enforcement ability

Figure #1 displays the extensive form of borrowers with collateral; attempting to obtain capital from private as well as government backed lending facilities. After solving the game in Figure #1, many differences between private and government backed lenders become apparent. When discerning which banking entity would provide the best access to capital, there is no difference in accessibility for borrowers with capital. This occurs only with the presence of collateral because it enables private lenders to address the issues of adverse selection, moral hazard, and enforcement. Adverse selection is the issue of risky or dishonest borrowers entering the market because of their risk taking behavior. Moral hazard is the issue of borrowers being able to position themselves to not have to

repay their loan. An example of this would be the limited liability laws which can partially shield borrowers from having to repay their debts. When adverse selection and can be addressed, excessively risky borrowers are deterred, as well as prevented, from utilizing capital on risky endeavors. The issue of moral hazard can be addressed when borrowers' existing assets are at risk of being seized. Even with limited liability protection from repayment, borrowers will lose some if not all of their collateral, which is a strong remedy for the issue of moral hazard. Therefore, when analyzing a borrower with collateral's ability to access capital, the borrower stands the same chances of success with a private lender as they would a government backed lender. Therefore after observing this game, the implications of changing to a government backed lending facility would be parity to the current situation.

Both adverse selection and moral hazard are issues related to the larger issue of enforcement. Enforcement is the issue of being able to force repayment by borrowers when they are able to repay, although possibly unwilling to repay. Within all of the games, a key assumption is that the government has full enforcement capability; meaning the government can guarantee the repayment of the loans they back. We will discuss why and how the government is able to do this later on. Although in figure 1, enforcement is less of an issue when there is collateral involved, we will see the issue of enforcement grow in figure 2 as well as figure 4 when there is no collateral securing the loan, therefore making the loan that much more difficult for the banks to collect on.

Finally, a major difference in credit availability provided by the two entities is the effect of the variations in access to information. With the government having the nearest to perfect information, the government backed lending facility is better positioned to

provide a more competitively priced, as well as less risky loan. Nearest to perfect information implies that the government does not have perfect information, however it does have the best information possible; hence nearest to perfect because out of private and public institutions, the government will have the closest to perfect information. Although our analysis focuses on the role of the two facilities ability to extend credit to deserving potential borrowers, the aspect of nearest to perfect information allows for the government to better assess the risks as well as opportunities of the potential borrowers.

Figure #2 Government creates Increased Credit Accessibility, Borrower without Collateral (W/O)

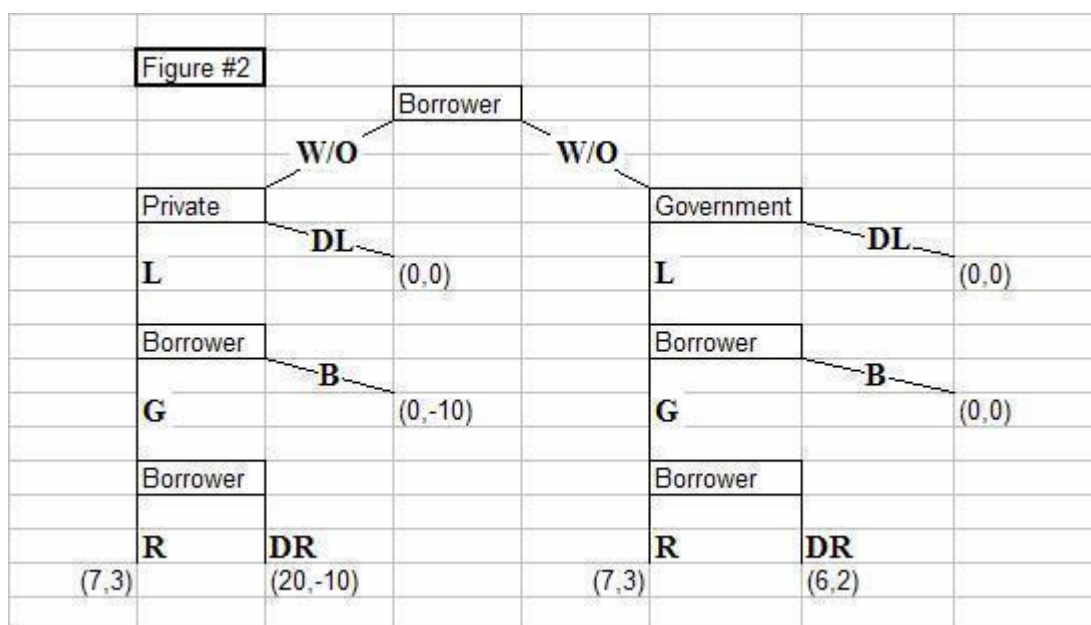


Figure #2 Facts:

Loan Value	\$10	Cost of Repo. Assets	\$2
Interest	30%	Success Payoff	\$20
Assets of Borrower	\$0	Failure Payoff	\$0

Figure #2 Assumptions:

- 1) *Full Enforcement Capability* by government (Guaranteed repayment of loan)
- 2) Government has *Nearest to Perfect Information*
- 3) Private has average information and average enforcement ability

Figure #2 displays the extensive form of borrowers without collateral; attempting to obtain capital from private as well as government backed lending facilities. This game exposes the inability of the private lending facility to lend to those without credit. When solving the game in figure #2, it becomes apparent that not only will private lenders be unlikely to lend to potential borrowers without capital, but it would be irrational for them to lend to potential borrowers without capital. As you can see from the game, should the collateral-less borrower be successful in their endeavors and be able to repay the lender, it would not be their best response in the situation to repay the borrowers. What we can also observe is that the rational action for both the private lender as well as the collateral-less borrower is to not lend, and to not repay. The problem with this is that outside of theory, there are many collateral-less borrowers who would repay if they were successful and given the opportunity to borrow. Although, due to the rationality of private lenders, as well as their perceived rationality of borrowers (the assumption that they will not repay a loan), potential borrowers without collateral won't have access to capital.

This game exposes the largest lesson that can be taken away from all of the games; there is only one problem with lending, not three. Originally, economists such as Hoff and Stiglitz argue that adverse selection, moral hazard, and enforcement were the three problems of lending. Contrary to Hoff and Stiglitz's beliefs, through observing this game as well as looking at the rational at each node of the game, it becomes apparent that there is really only one problem. This single issue is enforcement; adverse selection and moral hazard are symptoms of the enforcement problem. When there is not full enforcement capability, adverse selection and moral hazard become risks to lenders because they need to understand the motives of their lenders, as well as their ability to succeed in their

endeavors. When looking at lending through an institution that has full enforcement capability (such as the government) the issues of adverse selection and moral hazard are near-perfectly addressed. When looking at the potential payoffs for a borrower without collateral lending from the view of a government institution with full enforcement capability, there is no need to worry about adverse selection or moral hazard. Adverse selection is irrelevant with full enforcement. Risky or dishonest borrowers would have a minimal effect on the market if at all. Risky borrowers would be deterred from attempting to borrow because they know that they would be forced to repay, whether or not their gamble paid off. The issue of moral hazard would be addressed in the same way; borrowers wouldn't have the ability to shield themselves from repayment. The whole idea of limited liability laws shielding them in default would be eliminated. In the United States, this is partially in effect; current bankruptcy law mandates that debtors are unable to alleviate their debts to the government through bankruptcy. This means that even if an individual or business were to enter into bankruptcy, their debts to the government would still be owed. Taking into account the effects of full enforcement and combining them with the assumption of the governments nearest to perfect information, adverse selection and moral hazard are more than adequately addressed. The unfit borrowers wouldn't be leant to, and the fit borrowers could fail and repayment would still be secured.

Corrupt Lending Vs. Non-Corrupt Lending

After observing games in both figure 1 & 2, it is apparent that utilizing a government backed lending facility would address the issue of providing credit access to those without collateral. More importantly from observing games 1 & 2, it is apparent that with the government's ability to fully enforce their contracts, making their lending

much less risky can increase the availability of credit. Although this would seem like the perfect answer to the problem of credit access, a major obstacle that arises when implementing a government backed lending system is the problem of corruption. When observing the effects of corruption with regard to providing access to credit, it becomes apparent that corruption is likely, although it is also relatively mundane in its effects as we will see. David C Kang argues that there are two forms of corruption when looking at the relationship between private and public entities: “top-down” and “bottom-up.” “Top-down” corruption refers to government officials having the ability to be “predatory” and seek rents such as bribes. Kang explains “bottom-up” corruption as the instance when social actors have excessive and widespread power, enabling them to manipulate policy for their own benefit. This manipulation of policy would also be a form of rent seeking, although in a less financially quantifiable way. As Kang explains, with a situation like a government backed lending facility, the likely corruption to occur would be “top-down” corruption. “Top-down” corruption would occur because of the governments’ enforcement capabilities and nearest to perfect information, which would enable it to seek rents from businesses through bribes. While this corruption is likely within some branches of a government backed lending facility, assuming a relatively functioning democratic society and corruption that doesn’t engulf the entire marketplace, non-corrupt banks would secure the majority of lending.

Interestingly, for the government backed lending to work, our theory relies on the free market ideology that borrowers will seek the best possible price for their product, which in this case is a loan. Much like mortgage brokers who charge higher fee’s in the private lending (relative to competition), when we look at “top-down” corruption in a

lending system, it is seen as an increased cost to the consumer. The absolute cost implications to the borrower are the same whether it is a rent seeking private facility or a corrupt government lending facility. Therefore, assuming that the cost of corruption is the same as rent-seeking by private lending facilities, this problem of corruption is something that's corrected by the market. As long as the underlying assumption of less than 100% corruption holds true, borrowers will seek out the lowest absolute cost loan, meaning the corrupt government lenders will lose the business of potential borrowers. This forecasted "market correction" will be evident from the games in both figures 3 & 4.

Figure #3 With Corruption <100%, Markets can Correct Much of Corruptions Implications (W/)

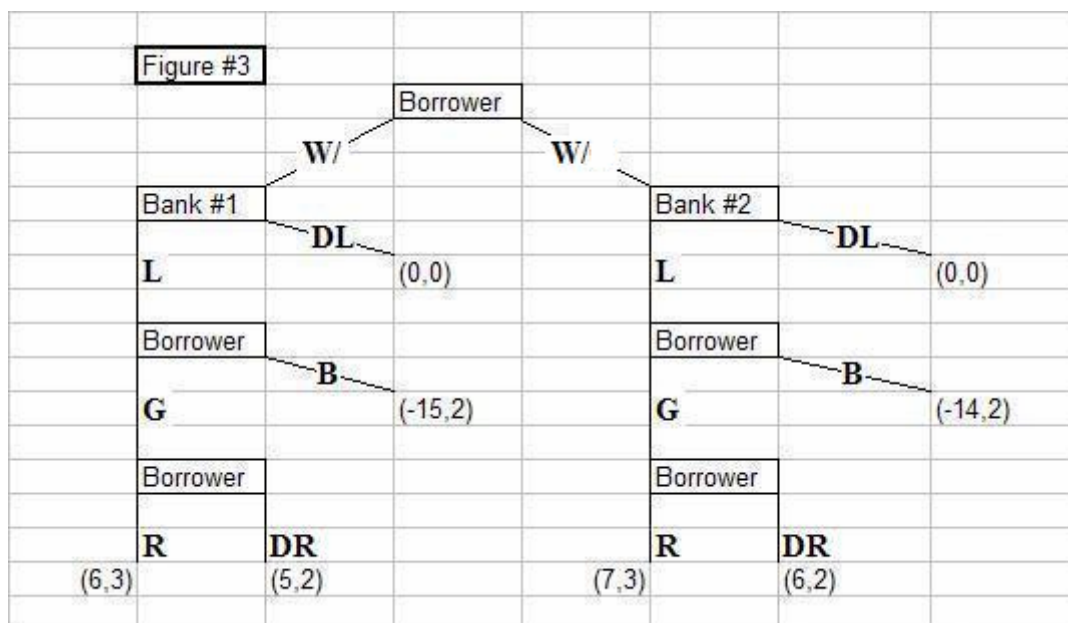


Figure #3 Facts:

Loan Value	\$10	Cost of Repo. Assets	\$2	Bribe	\$1
Interest	30%	Success Payoff	\$20		
Assets of Borrower	\$14	Failure Payoff	\$0		

Figure #3 Assumptions:

- 1) Bank #1 is Corrupt (Requires a Bribe)
- 2) Bank #2 is Not Corrupt
- 3) *Full Enforcement Capability* by government (Guaranteed repayment of loan)

- 4) Government has *Nearest to Perfect Information*
- 5) Multiple Government backed banks
- 6) Corruption <100%
- 7) Borrowers are aware of all rates in market

Figure 3 displays the extensive form of a borrower with collateral attempting to obtain capital from both a corrupt as well as a non-corrupt government lending facilities. It is obvious from the game that both lenders are willing to extend credit to the borrower. Although, the real lesson from this game is which lender the borrower will choose. It is always the public's worry that government backed lending would lead to corruption, although when solving the game in figure 3, you can see that the borrower has access to either lending facilities capital, with the borrower choosing the non-corrupt lending facility. The non-corrupt lending facility provides higher payoffs for the borrower because they don't have the increased cost to the borrower of corruption (usually a bribe in the lending industry) meaning the non-corrupt lender would be the lender of choice. Therefore as long as the existence of corruption doesn't cover the entire marketplace (there isn't 100% corruption in the industry); those accessing credit will utilize non-corrupt lenders. This theory holds true when looking at business investment in Asia. When looking at manufacturing areas of Asia as a market, over the past five years there has been a dramatic influx of investment into countries like Vietnam. What is most interesting about this phenomenon is not the investment buy businesses into a poor Asian country, but rather the fact that much of this investment is coming to Vietnam by means of China. Many businesses are moving manufacturing from China to places like Thailand and Vietnam due to the high costs of corruption in China. This example, like the game in figure 3, displays the fact that as long as the entire marketplace isn't completely corrupt,

those in the market as well as entering the market will utilize the non-corrupt facilities. Much like business investment in Asia, flowing from heavily corrupt to less corrupt regions due to lesser transaction costs, borrowers will utilize lending facilities which are non-corrupt due to their lower transaction costs.

Figure #4 Collateral- Less Borrowers have Access to Capital (W/O)

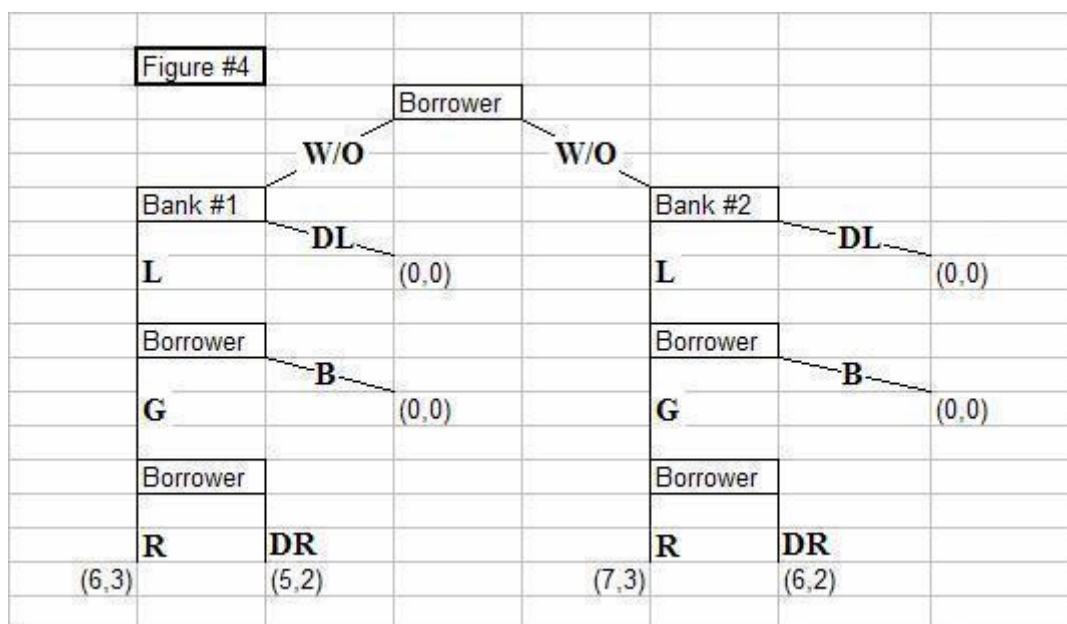


Figure #4 Facts:

Loan Value	\$10	Cost of Repo. Assets	\$2	Bribe	\$1
Interest	30%	Success Payoff	\$20		
Assets of Borrower	\$0	Failure Payoff	\$0		

Figure #4 Assumptions:

- 1) Bank #1 is Corrupt (Requires a Bribe)
- 2) Bank #2 is Not Corrupt
- 3) *Full Enforcement Capability* by government (Guaranteed repayment of loan)
- 4) Government has *Nearest to Perfect Information*
- 5) Multiple Government backed banks
- 6) Corruption <100%
- 7) Borrowers are aware of all rates in market

Figure 4 displays the extensive form of a borrower without collateral attempting to obtain capital from both a corrupt as well as non-corrupt government lending facilities.

The conclusions found in the game in figure 3 are mimicked in figure 4's game. The major relevance of the game from figure 4 is the implications of a non-corrupt bank retaining its ability to lend to borrowers without collateral, as well as the borrowers maintaining their best response in choosing the non-corrupt lending facility.

Corruption: Implications

When looking at corruptions implications on lending within games, it is apparent that corruption will likely occur, although it is also likely to not have a negative effect large enough to rationalize abstaining from a government backed lending sector. What is more important to take away from the games in figures 3 & 4 is that corruptions negative effects are minimal and can be address relatively easy with policy, especially in developed economies. Therefore, for the sake of this paper, we will assume that corruption is evident although its implications are minimal in their effect on providing access to credit. We will observe why corruption is not a huge factor both from the games, as well from analysis performed by David C. Kang.

The reason that we are able to make this large assumption that corruption will have a minimal effect on access to credit is proved through examples in the private markets for credit currently. When comparing a corrupt government lending facility to a privately run lending facility, the payoffs will likely be very similar. If you consider corruption within a government lending facility to be an increased cost to the borrower, you can use this same rational when analyzing the effects of increased bonuses. What is the difference between a government loan officer who will only lend when bribed, and a private mortgage company whose officers charge additional points on a mortgage? Although corrupt behavior is illegal, and hopefully the incentive structure for the

privately held company is legal, when looking at the two scenarios, they represent the same absolute cost increases to the borrower. For example, what would be the difference between a borrower subject to usury by a private lending company, versus that same borrower being forced to bribe to be able to access a loan? Mortgage brokerages are notorious for adding points to residential mortgages, especially to less knowledgeable consumers.

Assuming that the same less knowledgeable consumer had to choose between a corrupt government lender whom offered them a loan at a net present value cost of \$10 (including bribe), versus a private brokerage that offered a loan at a net present value cost of \$10 (including excessive points), the borrowers options would be a parity. Taking that same rationale a step further, if we assume that the borrower is an intelligent and well informed borrower, as we were able to see from the game in figure 4, the borrower will not succumb to increased transaction costs such as points or bribes, they will utilize the lending source with the least transaction costs. Also, looking at this issue from an individual's moral and ethical perspective, it is much easier for even the least knowledgeable person to identify that a bribe is illegal; where as that same person is far less likely to question the additional points on their mortgage. This displays the difference in an individuals' ability to identify rent-seeking in the private versus public sector, something which is crucial to addressing corruption as well as market inefficiencies.

Now that we can assume that corruption has the same absolute costs to the borrower as rent-seeking in the private sector, we will assume that corruption will be evident, whether it's in the public sector form of corruption or the private sector form of

excessive transaction costs. Although both inefficiencies will be evident, market corrections will be made to minimize (although not completely eradicate) inefficiencies. However while assuming the existence of corruption, it is far easier to combat rent-seeking inefficiencies, whether public or private, when even the least knowledgeable within our society are able to understand what is and is not in their interests. Corruption within the government might be more frightening to address, but it is much more easily identified and corrected than excessive rent-seeking in the private sector.

As we have seen with recent developments in our domestic economy (Mortgage Crisis, Credit Crisis, Etc.), we cannot fully rely on the government to identify issues within our system. It is a cooperative oversight by individuals using the credit markets and businesses operating within credit markets, in addition to government oversight of those markets. An extremely important aspect of this cooperation is the ability of the public to identify inefficiencies within the credit markets. With the public's participation being crucial in eliminating inefficient behavior, as well as illegal behavior, we must look at what scenario the public is most able to identify wrong-doing within the credit markets. Observing credit market transactions from a borrowers perspective (I.E. Mortgages, Auto Loans Etc.), it is obvious that it is very difficult for an average or below average consumer to identify wrong-doing within private credit markets. When a broker adds six points to a mortgage for a borrower with an education level of high school graduate, it is difficult for the borrower to see that they are being taken advantage of. However, take that same borrower trying to secure a loan from a government official who requires a bribe (equivalent to six points on a mortgage in net present value terms); the borrower is more able to identify wrong doing. More importantly, because of the publics ability to

identify corruption (within the government) more easily than excessive rent seeking (within the private sector), government officials are less likely than private individuals to attempt to seek-rents. This is because of their higher costs of being found corrupt, which translates into lower expected payoffs. Therefore the externality of the government backed lending facility is the added benefit of public ability to identify and expose market inefficiencies, which inversely deters corruption to begin with. Meaning, from a borrowers perspective, with a government lending facility it is much easier to identify and avoid market inefficiencies such as corruption and rent seeking; inefficiencies which add to the cost of the borrower's loan.

Now looking at the payoffs for a rent seeking private lender or a corrupt government backed lender, assume their expected payoff is calculated by use of the following equation:

$$(B*Ps) - (F*Pf) = \text{Expected Payoff of Lender}$$

B = {(Bribe for Government official) or (Rent for Private lender)}

F = {(Cost of Failure for Government or Private individual)}

Ps = {(Probability of Success)} – Success is receiving rent or bribe without being found corrupt or losing business.

Pf = {(Probability of Failure)} – Failure is prosecution for being corrupt which translates into prison and or fines for the government backed lender. Failure for the private lender is the risk of losing the business altogether.

When looking at the above equation, it is obvious that the government lender will have a much lower payoff due to the fact that a bribe is illegal meaning a higher F value for government backed lenders, and excessive rent seeking is not, meaning a minimal F value for private lenders. Both have the risk of losing the business because of excessive rent seeking or bribes, but only the government backed lender faces criminal charges,

finer, as well as prison time. Because of this, the government lender will have a much higher F value. Also, the government lender will have a much higher P_f value (If not a value of one, very close to it) because bribes are more easily identifiable by the public, as discussed in the previous paragraph. Therefore, when looking at this equation, it becomes apparent that the government lender is far less likely to require bribes, versus the private lender requiring excessive rents. The rationale behind this is based off the simple idea of expected value, with the government having a much higher likelihood of failure, a harsher negative value for failure, and therefore a much lower expected payoff.

Market Disasters

Coming back to the idea of nature, there is always the risk that even with enforcement, and nearest to perfect information, unforeseen issues can occur causing mass defaults in loans. Examples of this would be terrorism, natural disasters, etc. This raises the question of how to minimize costs when “Disasters” occur. When looking at the costs to society, disasters always create losses, especially losses in positive externalities. However, when looking at the financial losses to address the disaster, we will assume that the costs are limited to the money spent by the government, funded from tax-payers. When doing so, we can assume that the same, if not less, amount of money would be spent by the government to stabilize the credit markets if they were government backed. We can assume this because if the government is not backing the lending sector, it would need to subsidize or nationalize parts, if not all of the credit markets to stabilize them, similar to today. A good example of this would be the governments’ involvement with the fledgling financial institutions Bank of America and Citigroup. These were private entities that needed to be artificially supported by the government to survive. Now had they been

backed by the government to begin with, they would likely have had less losses (due to the governments nearest to perfect information). But for arguments sake, assuming they had the same losses when backed by the government, as they have had while private, the government would have spent the same amount of money to stabilize the credit markets. Therefore we can draw the conclusion that the costs to the tax-payer from government backed lending facilities, in the event of a “market disaster” would either minimize or remain equivalent to that which the government would spend to stabilize a private entity in the same situation.

Policy & Implications:

The thesis of this paper was not to make an argument for a nationalized lending system, but rather, an argument for the governments’ support of our existing lending system. Ideally, the government support would come from two avenues, through information support as well as enforcement support. Both of the aforementioned government abilities are something that cannot be mimicked by the private sector. More importantly, both are aspects of the current lending sector which are hazards to private lenders, and reasons for the stricken of credit. Therefore with the issues of government backed lending, as well as the issues of private lending being addressed in this paper, there are many policy changes that can be enacted to not only stabilize the lending sector and credit markets, but also expand credit to those who deserve credit and are currently underserved.

Policy 1 Government Enforcement Capability and Information Sharing

Through legislation, between private entities and government institutions, the ability to utilize the governments' enforcement capabilities needs to be passed along to those in the lending sector. With legislation, the government has the ability to pass laws that can allow for lenders to utilize the government similarly to a collection agency. This would be favor to both the lender as well as the government because the governments' involvement would increase access to those deserving credit. Additionally the lenders would have a much larger incentive to lend, knowing that the government is backing them. The first step to establishing this type of public-private relationship between the government and lenders would be to eliminate the limited liability laws which can prevent borrowers from being forced to repay. Through the utilization of enforcement by the government, as well as legislation making enforcement less of an issue for existing lenders, both government and private entities benefit.

In addition to providing government enforcement capabilities, providing lending facilities with government information is also necessary. Information sharing would enable the private lenders to have much closer to perfect information. An easy way to implement this information sharing is by partnering the government information sources with institutions such as credit rating agencies. By doing so, the existing method of estimating the credit worthiness of borrowers (their credit rating) is improved. This added source of information can make lenders better able to assess the risks of lending as well as become more competitive when pricing the loans for their customers. This better information, leading to better pricing and structuring of loans would lead to more competition, and therefore lower costs for borrowers. Enforcement capabilities of the government and provision of nearest to perfect information will dramatically decrease the

risks to lenders, lowering transaction costs and in-turn allow for greater access to credit. Oversight of the private organizations by the government is extremely important because the issue of moral hazard arises, which directs us to the second half of necessary policy changes: Government Oversight of Lenders.

Policy 2 Government Oversight of Lenders

A combination of legislature attacking predatory lending as well as “top-down” corruption is necessary. As proven within figures 3 & 4, the market will correct many inefficiencies, although when lenders are able to guarantee repayment through government enforcement, they will be enticed to pressure loans upon those who are unlikely to repay, especially when credit is vast. This conundrum is similar to the predatory refinancing boom we saw during the housing bubble. Although, differing from recent events, with the ability to fully enforce and nearest to perfect information, the issues of adverse selection and moral hazard from the borrowers’ side of the transaction will be addressed. This is why it is necessary for extreme oversight of the lenders with government backing.

Extreme oversight refers to the harsh deterrents that the government must establish to reduce the moral hazard on behalf of the lenders. A direct way to address the moral hazard of the lenders, abusing their ability to ensure repayment, is to punish predatory lenders and those who partake in rent-seeking by relinquishing their government enforcement backing. Legislation must be passed ensuring that any lender found to be abusing their government enforcement and information benefits will lose their ability to utilize government enforcement on all of their loans. For example, if lender A was found to be predatory, not only would the loans that were predatory not be

enforced by the government, but also, any loans made by lender A would need to be enforced solely by the ability of lender A. Additionally, predatory lending practices (although not rent-seeking practices) will also fall subject to criminal investigation as well as incarceration. Therefore predatory and rent-seeking lending would cost the lender their government backing, but also, lending found to be predatory would be subject to criminal charges. Although harsh and dramatic, it would deter predatory and rent-seeking activities from occurring.

Conclusion:

There will always be market inefficiencies and market risks, but with government support of private institutions, there can be a minimization of both of the aforementioned issues. Government enforcement capabilities in the hands of private entities will not guarantee a zero percent default rate, however with government support of private institutions, default rates can be nearest to zero. Additionally, with government information accessible to private lenders, they can more competitively, as well as safely, provide credit products to those without capital. Although these goals are attainable solely through government legislature and policy; oversight by the government is crucial to addressing the issues of moral hazard that will arise on the side of private lenders. The problems of corruption will be minimized both through market as well as government forces. With strict accountability and lending transparency between the government and private lenders, government enforcement and information can attain a near perfect lending environment. Finally, what this translates into is a credit market in which those without collateral will finally be able to secure financing.

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