

Public Policy and Secondary Mortgage Markets

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I. INTRODUCTION

The major contribution of the secondary market in the United States is that it has opened the mortgage market to long term lending in a way that the main alternative source of funds, depositories (historically, savings and loan associations, currently mainly banks), generally cannot or have not. This has allowed borrowers access to long term fixed rate loans (15 to 30 years); such loans are now over 80% of the market and carry rates of around six percent. Over half of all U.S. mortgages are now sold into the secondary market. While most of the institutions that participate in the secondary market are privately owned, the system receives considerable government support. The purpose of this paper is to discuss the workings of the U.S. secondary mortgage market, its place in the U.S. mortgage market, the benefits and costs of government support and lessons that might be learned and/or exported. The focus is on the two major secondary market institutions, the “government-sponsored enterprises” or “GSEs,” Fannie Mae and Freddie Mac, both of which are privately owned but with important government support.

¹ I am grateful to Loic Chiquier for helpful comments. What follows draws heavily on Van Order (2001) and does not necessarily represent the opinions of Freddie Mac, its Board of Directors or anyone in a position of responsibility.

Themes

The major change in mortgage markets over the past twenty years, one which has been brought on largely by the secondary markets, has been the “unbundling” of the four major aspects of mortgage-lending: origination, servicing, funding and accepting credit risks. This is most evident on the investment side. Investors in mortgages need not be involved in originating, servicing, or taking on credit risk. Pools of mortgages (mortgage-backed securities with guarantees from Fannie Mae, Freddie Mac or Ginnie Mae) and mortgage-backed debt (mainly debt of Fannie Mae and Freddie Mac) now trade in national and international markets, almost as efficiently as U.S. Treasury securities. This has opened the mortgage market to investors in long-term bonds, who might not otherwise invest because of the difficulty of assessing the credit risk of individual mortgages.

While these changes have generally increased the efficiency of the mortgage market, they have also generated some special management problems. The unbundling that has come with secondary markets has increased the dependence of the various participants in the market upon one another, and it has enhanced these risks. For instance, Fannie and Freddie have to worry about the credit quality of loans sold to them by originators who might know more about the loans than they do and can select against them. This raises *principal/agent* problems, i.e., the agent, who is supposed to act in the interest of the principal, might not have the incentive to do so. Managing these risks has been the major management problem for the secondary market. When risks are unbundled to the extent they are in the U.S. secondary market it is quite important that it be clear who is taking

the risks and that the risks be taken by those best able to handle them. Managing this unbundling requires a strong legal and regulatory framework, and it exposes the secondary market to risks that the primary market does not have. Public support of secondary market institutions that ignores these problems is not likely to work well.

From a public policy perspective the secondary market is just a vehicle for allocating capital. It should be judged on how well it does that. Opening up new sources of funds is likely to improve capital allocation, but that need not always be true. If government support distorts capital allocation by oversupplying funds to housing at the expense of other investment it can worsen economic welfare. On the other hand legal and informational problems might make it difficult for a fully private market to operate, requiring some public support. The support could be in the form of a GSE; it could be in the form of augmenting the ability of banks to attract funds; or it could take the form of a “back-up” or liquidity facility like the Federal Home Loan Banks (who make loans to banks that are (over) collateralized by mortgages on the banks’ balance sheets) in the U.S. While the details of support vary, ultimately the support involves some sort of guarantee (implicit or explicit) as a way of inducing private investors into the mortgage market.

Lessons and Policy

Can the benefits of the U.S. secondary market, primarily the ability to raise long term funding at low cost, be exported to other countries while controlling principle/agent problems? Maybe; maybe not. The lessons of the secondary market do not come from the

details of how it operates in the U.S. (e.g., the use of sophisticated capital markets instruments like CMO's, derivatives for hedging and automated underwriting systems). These details probably cannot or need not be exported. Depository-based systems can, with the right laws and regulations, do much the same thing that secondary markets do, connect mortgage borrowers with people with money, without the problems associated with selling mortgages. Indeed, about 80% of the increase in homeownership rates that took place in the U.S. from the 1940s until the present took place by 1960 with a system that was largely depository- based, primitive (relative to today's standards) in operation and with virtually no secondary market. That system worked well when interest rates were relatively stable, but because it relied on short term funding, it ran into trouble when interest rates went up sharply in the late 1970s and lenders saw costs go up while revenue remained unchanged.

Is government support of the secondary market, like that in the U.S., likely to be a good idea? Again, maybe; maybe not. The central problem facing any secondary market approach is the management of principal/agent risks. Government support should begin with a legal structure that makes it possible to manage these. This involves the ability to use the house as security for the loan and the ability of the borrower to have clear title to the property. A wide range of research has found that that default rates (and default costs) vary inversely with homeowner equity. Equity is especially important for secondary markets because the information asymmetries facing secondary market participants makes it difficult to evaluate detailed characteristics of particular borrowers and local

economies, so equity, which is to some extent measurable, is likely to be the most important control over default costs.

The more controversial question is the role of government support beyond legal support; in particular in the form of creating financial institutions like GSEs with implicit or explicit government guarantees. This is complicated, and experience in the U.S. and elsewhere is mixed, but it is certainly such as to raise concerns about implications for efficiency. In particular, the experience with the savings and loan industry in the 1980s strongly suggests that guarantees can cause “moral hazard” in the form of excessive risk-taking, leading to poor capital allocation and taxpayer bailouts. On the other hand most countries do support financial institutions, and most major financial institutions are in some way or the other *de facto* GSEs.

While it is clear from a standard welfare economics perspective that the “first best” economic solution is a proper legal system, property rights, good disclosure, good information and competitive markets, it is also clear that in many, especially evolving, markets these conditions do not apply and “second best” policies may be important. In particular asymmetric information, poor disclosure and poor or not yet credible foreclosure laws may inhibit the development of a competitive mortgage market. Hence, there is some justification for government providing support for mortgage market institutions.

Support for a secondary market in particular may hinge on the existing financial structure. In particular, banks already exist in most countries, and they are especially suited at funding short term or variable rate mortgages with short-term deposits; they have generally not been successful at funding long term fixed rate mortgages. However, banks often receive support in the form of deposit insurance and/or other guarantees, giving them an advantage over a truly “private” secondary market. Hence, a second best solution might be government support for a long term funding source; but this does not tell us the best structure (it could be best to help banks sell long term bonds). Rather there do seem to be five principles worth considering:

1. Mortgage market support, whatever the vehicle, should be set up in a way that puts most risks into the hands of private investors, who are generally best able to manage them.
2. Government ownership is unlikely to be a good idea, except as a transition device.
3. The subsidy content of support (e.g., from under-priced and/or poorly regulated guarantees) should be kept comparable across institutions, so that winners and losers are based as much as possible on underlying economics.
4. Close attention should be paid to safety and soundness, focusing on risk-taking and capital, rather than traditional balance sheet considerations. In particular, securitization should not be done solely as a device to get mortgages off balance sheet.
5. Attention needs to be paid to who gets access to the support. On the one hand having a small number of institutions can lead to monopoly power, but on the

other hand open access can create incentives toward excessive risk-taking, which can be hard to monitor.

What U.S. experience has shown, both before and after the advent of secondary markets, is that with the right legal and regulatory framework (in particular the ability to foreclose and evict and a good system for recording title to property, which make it possible for houses to act as real collateral) and a reasonably stable macro-economy you can make money in single family mortgages; linking mortgage markets with capital markets can be done with minimal (if any) subsidy. While government has provided a backup role for both the primary and secondary markets for some time, it can be argued that this role has involved rather small subsidies (when the risk has been credit risk on single family mortgages), which are largely controllable.

II. THE U.S. SECONDARY MARKET²

The secondary mortgage market in the U.S. is not a secondary market in the classic sense of a place where used mortgages are traded. Rather it is “secondary” in the sense that it is the second place that mortgages go, after origination in the “primary” market. After purchase the secondary market can fund mortgages either through “securitization,” which typically means packaging them into pools and selling shares in the pools, or through debt, or some combination. The structure of the U. S. mortgage market has changed dramatically in the last quarter century, because of the rise of the secondary markets. This rise has come about largely because of standardization of pools of mortgages brought on

² See Weicher (1999) for a discussion of some of the history of the secondary market.

by three secondary market “agencies”: the Federal National Mortgage Association (Fannie Mae), the Government National Mortgage Association (Ginnie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac). Annual sales of mortgages to these three institutions have risen from \$69 billion in 1980 to well over \$1 trillion in 2002; they now own or are responsible for about half of the outstanding stock of single family mortgages. This growth has been accompanied by a decline in the market share of the traditional lenders, thrift institutions (e.g., savings and loans).

Fannie, Freddie, and Ginnie

Fannie Mae, the oldest of the agencies, was established in the 1930s as a secondary market for newly- created Federal Housing Administration (FHA) loans, which were insured by the government, but which during of the Great Depression had trouble gaining acceptance by investors. For much of its history (until the 1980s) it operated in some ways like a national savings and loan, gathering funds by issuing its own debt (short term debt rather than deposits) and buying mortgages that were held in portfolio, but because it held government insured mortgages it accepted almost no credit risk. This was a particularly useful function during credit crunches when deposit rate ceilings limited the ability of savings and loans to raise money.

In 1968 because of budget pressures³ from the Viet Nam war Fannie Mae was moved off budget and set up as a private, government-sponsored enterprise (GSE), which in the 1970s switched its focus toward conventional (not government insured) loans, which do

³ At the time Fannie Mae’s lending counted as spending, which was offset by repayments, which were counted as negative spending. However, because it was growing it contributed, in an accounting sense, to the (at the time) high level of government spending.

have credit risk. It receives no government funding, and its operations are separate from the “on budget” parts of the government. Ginnie Mae was created as a successor to the old Fannie Mae; its purpose was to handle Fannie Mae’s policy-related tasks and to provide a secondary market for government insured loans. It is on the federal budget as a part of the U.S. Department of Housing and Urban Development.

Ginnie Mae was responsible for developing the major innovation in secondary markets, the mortgage-backed security (MBS). An MBS is a “pass-through” security. The issuer, typically a mortgage bank, passes the payments from a pool of mortgages (both principal and interest, net of its fee) through to the ultimate investors, who typically receive *pro rata* shares of the payments. The issuer also guarantees the payment of interest and principal even if the borrower defaults (the issuer is covered by the government insurance for almost all of foreclosure costs), and Ginnie Mae guarantees timely payment even if the issuer does not make the payments. Hence, its guarantee is on top of the federal insurance and the issuer’s guarantee. This has proven to be quite valuable in marketing government insured loans. Because it simply enhances other guarantees its costs are small, and it has actually made money from the relatively small (.06% per year per dollar of loan balance) fee it charges. As with most pass-through securities Ginnie Maes are subject to interest rate risk.

Freddie Mac was created in 1970 to be a secondary market for the savings and loans. At the time it dealt only with savings and loans, and Fannie Mae dealt with mortgage banks. Now both institutions deal with the same originators. Like Fannie Mae, it is a private,

government-sponsored enterprise, and it too is off budget. It initiated the first MBS program for conventional (i.e., non government insured) loans in 1971. Fannie Mae began its conventional MBS program in 1981. Both institution's MBSs are similar to Ginnie Mae's; e.g., both protect investors against credit risk but not interest rate risk. Neither Fannie nor Freddie does more than a small amount of federally insured mortgages, which almost always go into Ginnie Mae pools.

Because Ginnie Mae is on budget, its securities have a "full faith and credit" federal guarantee. Because Freddie Mac and Fannie Mae are GSEs, which are private corporations, neither has an explicit guarantee, but they both have an "implicit" or "conjectured" guarantee, because investors believe that if these institutions failed the government would protect debt-holders (though it has no *legal* obligation to do so). This allows the GSEs to borrow (or sell mortgage backed securities) at interest rates lower than they would otherwise. Both are regulated by the Department of Housing and Urban Development for their public purpose missions and by the Office of Federal Housing Enterprise Oversight (OFHEO) for safety and soundness⁴.

Fannie Mae and Freddie Mac are now, except for details, quite similar and compete in the conventional mortgage market, as buyers of mortgages, and in the securities markets as sellers of mortgage-backed securities and issuers of debt. The primary benefit of their charter is that while Fannie and Freddie would be strong companies (probably in the low AA range according to recent "stand alone" ratings by Standard and Poors) without their

⁴ While Fannie Mae and Freddie Mac are off-budget, there is a separate federal credit budget which does analyze their risks. See Budget of the United States, 1992.

federal charter, they borrow at better than AAA rates with it. This saves them between .20% and .50% (currently probably around the mid point of this range) in borrowing costs. As a result borrowing rates for loans eligible for purchase by Fannie and Freddie are lower than other rates.⁵ Both Fannie and Freddie consistently make returns on equity in excess of 20%, suggesting relatively low levels of risk. Fannie, Freddie, and Ginnie deal almost exclusively in fixed rate mortgages; adjustable rate mortgages are originated and held primarily by banks and funded with short term deposits.

The main difference between Fannie Mae and Freddie Mac and Ginnie Mae is in ownership structure. Fannie and Freddie are both owned by private shareholders (both are in the Fortune 500).⁶ Their shareholders presumably have the same motivation as other private shareholders. Hence, it is generally presumed that Fannie and Freddie's motivation is shareholder wealth maximization subject to their charters and regulations; whereas Ginnie Mae is government owned and is presumed to be more oriented toward public policy issues. The idea of the GSE charter is to combine the advantages of market-oriented private companies (e.g., cost minimization, responding to the market) with charter restrictions and regulation to pursue public interest goals. Some public policy aspects and conflicts inherent in the GSE structure are discussed below.

“Private Label MBS”

There is a growing “private label” market, which securitizes mortgages without using Fannie, Freddie or Ginnie. This market operates mostly in areas not eligible for the

⁵ For a discussion of benefits and costs etc. see Van Order (2001).

⁶ Both companies have boards of directors with eighteen members, thirteen of which are determined by shareholders and five of which are presidential appointees.

agencies, primarily loans with balance above the conforming loan limit (currently \$322,000) or which are too risky for them. It is about 10 to 20% of the market. Private label securities resemble agency MBSs except that credit is typically managed by breaking pools into two tranches: a subordinated tranche, which takes the default losses up to some amount (e.g., 5% of the pool balance) and a senior part, which takes the rest. This allows the bulk of the credit risk to be taken by specialists, with the senior part (which typically has a AA or AAA rating) open to a wide range of investors who do not want to manage the problems associated with mortgage credit risk. An alternate but less widely used credit enhancement tool is mortgage insurance on the pool, typically with limits on losses to the insurer.

Changes In Funding Mortgages

For most of the last 30 years the secondary market has relied primarily on the standard pass through security described above. But there have been important changes. Since the early 1980s secondary markets have developed beyond the “plain vanilla” pass through security and have attracted funds by partitioning MBSs into “derivative” securities. This is because a *pro rata* share in a pool of 30-year fixed-rate mortgages is not what all investors want. While agency MBSs have virtually no credit risk, they have two types of interest rate risk: the usual risk of any long-term security that its value will fall when rates rise, and a second risk that is similar to that of callable bonds, because borrowers have the option to refinance (i.e., call the mortgage) and they tend to do this when rates fall. This call risk is very difficult for many investors to evaluate because borrowers’ prepayment behavior is difficult to predict, and because some investors work much harder than others

at assessing prepayment risk (e.g., by gathering data and estimating sophisticated statistical models) there is the risk that less informed investors will be selected against and end up with the loans with the worst prepayment characteristics.

Beginning in 1983 with the first collateralized mortgage obligation (CMO), issuers and Wall Street dealers have created derivative securities, which take pools of mortgages and pass the payments through in non *pro rata* ways. The first CMOs established *tranches* that received principal payments in sequence, the first *tranche* receiving interest plus the first share of principle payments, the second *tranche* receiving the next share, etc. In this way a complicated pool of 30-year callable securities was broken into a sequence of short-, medium-, and long-term bonds, which could be sold to different types of investors. This carving up of the mortgages does not eliminate interest rate risk, but it does allow the risk to be allocated more efficiently. Since the 1980s CMOs have become quite complicated, often divided into over fifty *tranches*.

Both Fannie and Freddie also fund mortgages with debt.⁷ The share of debt financing has increased sharply for both GSEs, especially Freddie Mac, and is now around 45%. An accurate way of thinking about Fannie and Freddie's operations is that they buy mortgages that are financed with a portfolio of securities made up of pass throughs, comprising about 55% of the funding and various types of debt (and derivatives)

The debt funding is generally done by repurchasing existing pools and then issuing debt to fund the repurchase. This may seem like an odd way to hold mortgages, but there is a point to it. The point is that if Fannie or Freddie choose which loans to hold and which to sell the market will assume it is being selected against (keeping the ones with the least prepayment risk) and will be reluctant to hold the securities. When the securities are repurchased Fannie and Freddie traders purchase them with the same information (about pools) as everyone else, mitigating the selection problem.

comprising 45%. Variations in this mixture affect their exposure to interest rate risk, and both companies almost always take on credit risk regardless of the means of funding. Both companies make heavy use of futures and options contracts to hedge against the interest and prepayment risk associated with debt funding (see Jaffe (2003)).

The Economics of the Secondary Market

The evolution of the secondary market has been a product of a variety of factors, many of which are of largely historical interest. For instance, deposit rate ceilings, which limited the ability of savings and loans to raise money for mortgage loans, were a major factor in the rising importance of Fannie Mae in the 1960s and 1970s, and the creation of Freddie Mac in the 1970s, but deposit rate ceilings are no longer an issue. Similarly, the inability of banks and savings and loans to operate nationally was also important, but national deposit markets and liberalized branching rules have limited the importance of this.

The main reason, now, for the important role of secondary markets, and particularly for their rapid increase since the 1980s, is that secondary markets have for the most part been an efficient, low cost and stable way of raising money for long term loans. This is primarily because of economies both in raising money “wholesale” in the capital markets, in processing the purchase and servicing of large numbers of mortgage loans, in managing risks, through diversification, and because Fannie and Freddie have an implicit guarantee which gives them a benefit comparable to deposit insurance for depositories (and Ginnie Mae has an explicit guarantee).

The main alternative to the secondary market is the portfolio lending of banks. Banks have a low cost source of funds in the form of insured deposits, but that has not been as elastic a source of funds as the one coming from capital markets in general, which can be tapped quickly by the secondary market. As a result banks sometimes have trouble raising money quickly, especially relative to Fannie and Freddie. This is especially true for fixed rate mortgages because secondary markets have excellent access to long term funds, through long term debt, MBSs and hedging, whereas depositories have traditionally (there have been some changes in this recently) been confined to the deposit market, which is primarily short term, making it more difficult to hold FRMs without exposure to interest rate risk

Unbundling

The traditional savings and loan performed all aspects of the mortgage bundle: it originated the mortgage, serviced it, took the risk of default (perhaps along with a private or government insurer) and raised money in the deposit market to fund it. The secondary market evolved largely by unbundling this package. The major contribution of Ginnie Mae, Fannie Mae, and Freddie Mac has been to facilitate the money-raising part of the bundle by taking on credit risk and packaging mortgages, so that mortgages could be sold as relatively homogenous securities or financed with homogenous debt in the capital markets. This has allowed separation of the funding part of the bundle from the other three parts and has helped to lower mortgage rates.

All four aspects of the mortgage bundle can now be unbundled. The U.S. secondary market is now composed primarily of: (1) mortgage originators, who are large in number and sometimes small in scale, who (depositories or mortgage bankers) sell the loans themselves or who (mortgage brokers) act as agents for mortgage bankers or depositories, who sell the loans;⁸ (2) mortgage servicers (depositories or mortgage banks) who sell the mortgages into the secondary market and either keep the servicing or sell the servicing rights to other mortgage servicers; (3) secondary market institutions and mortgage insurers,⁹ who usually take on credit risk; and (4) investors who buy mortgage-backed securities or GSE debt. Indeed, the last function has become further unbundled with the advent of derivative securities (e.g., CMOs).

Principal/Agent Problems

Unbundling takes advantage of scale economies and division of labor and promotes competition among the suppliers of the various bundles, but it occurs with a cost. The cost is that the players that focus on one part of the bundle depend on players in the other parts of the unbundling to perform services for them as expected (e.g., sell them good loans) when it is not always in their interest to do so. That is, there is a “principal/agent” problem: the principals (e.g., ultimate investors) depend on agents (e.g., the institutions originating and servicing the loans) to perform as promised, even though it may not be profitable for them to do so.

⁸ In 2002 over half of the loans originated were done through mortgage brokers.

⁹ It is typically the case that loans with downpayments of less than 20% have private mortgage insurance. The insurance typically covers the first 20 to 25 cents on the dollar of loss.

For the secondary market the major principal-agent issue has come from the reliance on originators and servicers to originate good loans and service them properly. The major risks are that sellers, with superior information about loans, will select against them, keeping good loans and selling the ones that are riskier than they appear to be, relaxing monitoring, underwriting poorly, etc., or making loans that are of low quality either deliberately (occasionally this involves actual fraud) or through sloppy underwriting.

The problem is that mortgage originators make money based largely on their volume of business. They may have little direct financial stake (they do have an interest in their reputation) in the quality of the loans they originate once they are sold. This is particularly true for institutions that are in danger of bankruptcy, for which reputation is less valuable. Hence, to control credit risk, Fannie Mae and Freddie Mac need to do things that align the incentives of originators and servicers with their own.

Operating a secondary market on a large scale has historically required that Fannie and Freddie not spend a lot of resources monitoring the credit risk of individual loans.

Hence, the burden of controlling credit costs has largely fallen on: the performance of mortgage insurers, who insure loans with down payments of 20% or less; underwriting guidelines, which attempt to define the parameters of an acceptable mortgage; the ability to provide incentives to induce originators to make good loans and monitor agents in order to make sure that they perform as expected; and ultimately the ability to foreclose on borrowers who do not make their payments.

This is all in contrast with the traditional, bundled bank, which had all the elements of the bundle under its control and was less worried that the part of the firm that originates mortgages would take advantage of the part of the firm that evaluates credit risk¹⁰.

The balance between the role of the secondary markets and the role of banks has largely depended on the balance between economies of scale and fundraising that the secondary market brings with the advantages of control over some important risks that the traditional portfolio lender brings (see Van Order (2000a) for a more formal discussion). That this balance has been favorable to the secondary market for single family mortgages has been due primarily to advantageous circumstances in the market for single family houses that make it easier to control principal-agent conflicts and may not be easily replicable for other types of loans or in other countries.

Credit Risk

The most important of the favorable circumstances is the ability to use a house as collateral (this comes from foreclosure laws and property registration) and the relatively good information that exists about house values (because houses trade frequently and are relatively (though still imperfectly) easy to appraise). These two factors mean that lenders have a good idea of homeowner equity at loan origination and can foreclose and thereby minimize losses, so that homeowner equity is both a good deterrent to default (homeowners will be reluctant to default and lose their equity) and cuts costs in the event of default. An important element of this is the ability to foreclose quickly. Lost interest

¹⁰ That is not to say that there is no risk. Compensation schemes could induce conflicts of interest inside the firm. The point is that conflicts inside the firm are easier to resolve.

during the foreclosure period (which in some countries can be 10 years) can easily overcome equity previously built up.

As a result the major concern of institutions that accept credit risk is the probability of equity becoming negative. The ability to treat houses and mortgages almost like commodities and default risk almost like a financial option (i.e., a “put” option, which gives the borrower the right to exchange the house for the mortgage) is a major factor in the success of the secondary market.¹¹ To the extent that this is all that matters (or is all that can be measured) information asymmetries become much less important. Expected default costs then depend primarily on the initial loan to value ratio, which is known to everyone, and on the probability of house value falling by enough to trigger default, which is not known equally well by everyone, but which can generally be estimated reasonably well by the secondary market, and on other factors that can be diversified away.¹²

An important part of the framework is the right of mortgage originators to sell mortgages without notifying the borrower and with minimal tax and transfer costs. Indeed, most borrowers do not know (or care) if their mortgage has been sold. Similarly servicing rights can be sold or transferred without the borrower’s permission, notification only happening because the borrower needs to know where to send payments.

¹¹ On applications of option-based models to default models see Hendershott and Van Order (1987) and Kau and Keenan (1995).

¹² An alternative to use of equity is strong borrower liability. For instance in some civil code countries borrowers remain liable for residual liability after foreclosure.

These advantages are not common to many other markets. For instance, lending for rental housing is quite different. It is much more difficult to evaluate apartment building property values (these properties are much more heterogeneous, they trade less frequently, and incentives for inaccurate appraisals are greater), and incentives to take care of the property are weaker when owners are not also occupants.¹³ Also many countries do not have a legal framework that facilitates low (transaction) cost mortgage sales.

But equity is not all that matters in default. Recent research at Freddie Mac and other places has shown that, given borrower equity, there is large variation in default across borrowers, which is associated with characteristics of the borrower rather than the property, and which may be well known to the loan originator but until recently has been difficult for the secondary market to acquire. Furthermore, much of the risk associated with property (e.g., local market conditions) is not well known by the secondary market. Hence, even with good foreclosure laws the secondary market has to worry about principal-agent conflicts, and knowledge of downpayment is not enough to control the conflicts. Fannie and Freddie have traditionally published guidelines that specify what is clearly all right, and the guidelines allow lenders to use their judgment to go outside the guidelines if there is some compensating factor such that credit risk is unchanged (i.e., that the loans still be “investment quality”). For instance, a high down payment may be enough to compensate for a bad credit history or high mortgage payment relative to borrower income.

¹³ It is the case that it is relatively easier to foreclose on a rental unit because it does require moving the occupant. On the other hand it is difficult in many countries to evict tenants, which increases the risk of lending on rental units.

However, guidelines do not clearly specify exactly what the tradeoffs are; lenders are meant to exercise their own judgment subject to occasional review. If the lenders are conservative, the guidelines can be a series of hoops through which borrowers must pass rather than a set of tradeoffs. The potential punishment to lenders who go outside the bounds and deliver excessively risky loans is that the GSEs do quality control sampling of loans at time of purchase and intense analysis of loans that default, and can make sellers repurchase some or all the loans, which is costly. If sellers deliver too many low quality loans, they may not be allowed to sell more mortgages to the GSEs. Hence, the choice problem for the lender who wants to sell mortgages has been that it can sell standard loans, which it will almost certainly not have to repurchase and/or sell nonstandard mortgages for which there is some risk of repurchase. Not selling (or not originating) non-standard loans is safer but at the cost of missing some profitable business.

There is something inevitable about all this. The secondary market needs to be flexible, but it needs to protect itself, and as a result, it needs to have a way to punish lenders who exploit their superior information. Lenders, especially non-portfolio lenders (who are not in the business of holding mortgages and will probably have to sell loans that are sent back to them at a loss), need to worry about repurchase risk. For the secondary market to survive and to take advantage of the economies it has, it has had to confront the principal-agent problem, which means that has had to be more conservative in the types of loans it accepts than do local portfolio lenders like savings and loans and more concerned with

quantifying risks. Competition between Fannie and Freddie for the purchase of new mortgages tends to keep both institutions at some sort of margin between the benefits from volume and the costs of adverse selection.

Recent changes in information technology are bringing about important changes in how risks are managed and on competition in the industry. The major innovation has been the use of technology to evaluate credit risk. In particular, Fannie and Freddie (and many other lenders and insurers) have both developed statistical automated underwriting systems that allow rapid decisions about what they want to purchase and what they do not want; the decision to accept can be made in five minutes,¹⁴ and loans can be closed in five days, all at lower costs than before. This has reduced principle/agent problems; however, it is unlikely to be easily replicated in developing markets. Automation can be characterized as a form of “rebundling.”

Interest Rate Risk

Both Fannie Mae and Freddie Mac finance about half their purchases with pass-through securities. Securitization avoids almost all interest rate risk.¹⁵ This is a marked change from the way mortgages were financed in the past. As was discussed above savings and loans were traditionally short funded, which exposed them to considerable interest rate risk. It is also the case that Fannie Mae, before it introduced its pass-through securities in

¹⁴ Automated underwriting systems do not generally reject loans; rather they refer them back to the lender for more work, perhaps with a signal that the loan looks bad and there is serious repurchase risk.

¹⁵ I say almost all because there are some remaining risks that come from the inability to predict borrower prepayments. For instance, prepayments are not passed through immediately, which expose Fannie Mae or Freddie Mac to losses from “float”.

the early 1980s, was short funded, and it suffered from interest rate increases as well.

Securitization passes interest rate risk on to investors, who must then manage it.

While both Fannie and Freddie also have sizable holdings of mortgages that are funded by debt, rather than mortgage-backed securities, they have learned the interest rate risk lessons from the early 1980s, and neither company is short-funded; both rely largely on long term, callable debt or its equivalent (e.g., short term debt and derivatives like interest rate futures and options) to finance long term mortgages.

The advantage of debt funding is that debt is more transparent to investors than pass-through securities because: (1) if the debt is not callable Fannie and Freddie take the call risk (and hedge it at lower cost than most investors have) and the cash flows are known by investors with little uncertainty, and (2) even if it is callable the circumstances under which it will be called are more transparent than the circumstances under which borrowers will prepay. Hence, Fannie and Freddie can raise money at lower cost by issuing debt, even after adjusting for option costs. The disadvantage is that Fannie and Freddie run the risk that the models they use to estimate when borrowers will prepay will be inaccurate and/or their hedges won't work. For instance, it was the case in the 1990s that borrowers often prepaid faster than expected when interest rates fell, leaving Fannie and Freddie with the risk that they will have to reinvest at lower rates before they can call their debt.¹⁶ While properly hedged debt funding is not much different in an economic

¹⁶ Callable debt is usually issued with the provision that it cannot be called before some future date. Fannie and Freddie try to issue portfolios of callable debt with different call dates in a way that matches the way mortgage borrowers prepay, so they run the risk that the call dates will not be soon enough to match prepayments.

sense from pass through funding, it is a definite step away from what is commonly known as securitization.

There is a need for balance on the liability side. There is more money to be made, on average, by financing mortgages with debt, and debt is more transparent to investors (well over half Fannie Mae's and Freddie Mac's profits come from the income from the 45% of their portfolios that are debt-financed), but there is also risk. This risk is not just from the imprecision of using debt to finance mortgages, but also because of management risks from controlling a large portfolio of debt and other hedging devices. Debt also provides flexibility. For instance, in 1994 when the CMO market fell apart and in 1998 when some hedge funds were dumping MBSs it was useful to have debt financing as an alternative (e.g., see Capital Economics (2000)).

An implication of the broader liability structure is that Fannie and Freddie are less like a conduit (i.e., a mutual fund with a credit guarantee) than a traditional financial intermediary (like a bank), providing a range of financial services by performing the traditional financial intermediation function of transforming heterogeneous assets into homogeneous liabilities. From an economic point of view MBS and debt funding are not much different, and the traditional distinction between primary and secondary markets is becoming less important than the distinction between raising funds in the deposit market through banks and raising funds in the bond market through GSEs.

However, from an accounting point of view MBS and debt are different because MBS takes the loans off the lenders balance sheet.¹⁷ This advantage is more apparent than real if the lender keeps the credit risk (for instance by selling with recourse or taking a subordinated position in the pool) and may simply be a way of avoiding capital regulations. There is no problem if the banks sells the risk along with loans, but U.S. experience suggests that investors want some sort of credit enhancement.¹⁸ It is important that the bank continue to hold capital if it has kept the risk. Securitization that is driven by regulatory and accounting rules rather than optimal risk management can lead to poor allocation of risk.

Capital and Risk

The safety and soundness of Fannie and Freddie (as well as banks) has been a major public policy concern for some time. This has been because of the potential disruption from a collapse of these institutions and ensuing spillover effects and/or because an implicit guarantee and the implicit benefits that go with it can lead to misallocation of capital and/or bailout costs. A major concern has been whether or not GSEs (like depositories in the past) take on too much risk.

At some level most risks can be managed, particularly in the sense of keeping the risks from bankrupting the company. One way to achieve the latter is for the company to

¹⁷ This is done through a “special purpose vehicle” (SPV; in the U.S. this is via a “grantor trust”), which buys the mortgages and manages the cash flows. A real advantage of this is that assures MBS holders access to mortgages in the event of problems, in a way than on balance sheet activities cannot.

¹⁸ For instance, until the late 1980s it was possible for savings and loans to sell loans with recourse and not have to hold capital. The regulations have been changed to force them to hold capital against the risk they retain.

finance a large share of its investments with equity rather than debt. But capital decisions also involve principal-agent conflicts among the government (and/or taxpayers), shareholders and debt holders. Both depositories and the GSEs have an incentive to put up as little of their own money as possible, so that they can leverage their guarantee without paying higher borrowing costs as risk increases. This is because shareholders get all the benefits from the upside of risk-taking, but can pass the costs of the downside to the guarantor. Furthermore, having to make regular interest payments forces discipline on management, which also benefits shareholders, and in the U.S. corporate interest expenses are tax-deductible but dividends are not, which provides a tax incentive to issue debt rather than equity.

Hence, there is a potential conflict between a guarantor's needs for safety and the shareholders' profit motive. The conflict is not inevitable. Because Fannie Mae and Freddie Mac have valuable charters, they have incentives not to take on too much risk and not to be undercapitalized, lest they lose the franchise that comes from their charters. A major factor in the risk-taking by the thrifts in the 1980s was the fact that free entry, competition from the rest of the capital markets and bad luck greatly diminished the value of the thrift franchise and left them with little to lose and much to gain from increased risk-taking (see e.g., White (1991)).

Nonetheless, the potential for risk-taking is real, particularly if either company starts to lose money and loses franchise value. This means that the government has to worry about safety and soundness, particularly about whether the institution has enough capital

relative to its risk both because of the risk of taxpayer bailout and (perhaps more important to economists) because excessive risk-taking that comes from ignoring the downside of risk will lead to poor capital allocation.

Progress was made along these lines with respect to Fannie Mae and Freddie Mac in 1992 when legislation set up new capital standards, but safety and soundness is still a controversial issue. The centerpiece of the standards is the use of stress tests, as well as minimum capital ratios, which simulate the companies' performance through stressful environments that are taken to represent scenarios when risks have taken a particularly bad turn. The 1992 legislation requires that both companies have enough capital to survive ten years of stress, in different scenarios that involve both serious interest rate risk and credit risk, and prescribes actions to be taken if capital is insufficient. The minimum standards apply even if the stress test requires no, or little, capital.¹⁹

Stress tests represent a major improvement in capital regulation compared with the historic tendency to rely on accounting capital ratios such as those associated with the Basle Accord of 1987 (e.g., hold 4% capital against single family mortgages and 8% against commercial loans, where capital is measured by book rather than market value; see Basle (1987)), which were only loosely related to risk. Such ratios can hide more than they reveal. Because they rely on book rather than market values they can give the appearance of capital adequacy when an institution is really in trouble, and, as was the case with these savings and loans in the 1980s, they can be "gamed" by firms who

¹⁹ For recent reports see Congressional Budget Office (1996) and United States Treasury Department (1996). The safety and soundness regulator of Fannie and Freddie, the Office of Federal Housing Enterprise (OFHEO) puts out annual reports (Its website is OFHEO.gov)

inevitably have better information than regulators and can hide risk (e.g., by moving it off balance sheet). Stress tests can differentiate among subtle differences in risk (e.g., all single family mortgages are not of equal risk, loans with low downpayments are much riskier) and cannot take account of some kinds of diversification benefits (some types of assets might systematically do well when others are doing poorly). Capital regulation in the U.S. is moving beyond stress tests and looking at more sophisticated, probabilistic models that estimate, for instance, the amount of capital necessary to be, say, 99% sure that an institution won't fail over some period of time. It is apparently the case that the new version of the Basle Accord will have a wider range of capital ratios than the old version and use of fancy models to estimate failure probabilities, albeit for a relatively small number of large banks.²⁰

Stress test-based capital requirements also present important management problems. Because traditional capital standards specify required ratios of accounting capital to book value of assets, it is relatively easy to see how the ratios are moving, and they generally move slowly, giving management time to adjust to change. Stress test standards are more realistic, but stress test results can be quite volatile. Hence, management in its planning must estimate the probability of the stress test results becoming bad, and will want to build a cushion against unforeseen changes.

III. GOVERNMENT ROLE

²⁰ For some analysis of the role of stress tests in analyzing risk see Buckley *et. al.* (2000).

Many countries do not currently have effective ways of linking mortgage markets with capital markets. Secondary markets are a way of tapping international capital markets, particularly for long-term loans. This can be a significant contribution to developing countries. One of the things that has characterized financial breakdowns, like the one in Asia in the late 1990s, has been reliance on short term international borrowing, which can be cut off rapidly if there a loss of confidence in the country(s) in question. A reason that foreign investors want short-term investment is lack long term information, in particular knowledge that they have good collateral. As a result they want a chance to reevaluate their position to get out fast if they need to (which, of course, they can't do if they all try to at once). Housing is potentially very good collateral and can be expected to be a way of getting more long-term foreign money, decreasing the dependence on hot money, *if* it really can be effective collateral. Moreover, a well-run secondary mortgage market can provide stimulus to bond market development in general.

Issues

A key problem for secondary markets in developing markets is that the principal/agent issues are likely to be more formidable in developing markets, where asymmetric information is likely to be a bigger problem, because mortgage originators will have access to local information and perhaps access to credit history. Underwriting will be left to originators who will inevitably be able to select the best loans for themselves. The problem is worse if foreclosure costs are high, in which case a house is not good security, and/or where borrower liability ends with foreclosure. Pushing secondary markets backed

by implicit or explicit government guarantees in such circumstances invites distortions and bail out costs.

Strong foreclosure laws have been absolutely essential to the development of the U.S. secondary market (In the U.S. it is generally not possible to extract money from foreclosed borrowers). *If you want people to have good housing, you have to be able to take it away from them.* Absent such laws it is probably better to develop a market based on debt-funded local institutions (e.g., banks) with good local knowledge, underwriting mortgages as if they are consumer credit rather than secured loans, than it is to develop secondary markets.

There is no reason in principle for not simply equipping the private sector with a legal framework that will let it evolve and securitize as it chooses, competing with banks, perhaps in the form of specialized mortgage lenders, letting them sink or swim on their own. Specialized portfolio lenders do not appear to be the direction in which mortgage markets around the world are moving. For instance, the distinction between savings and loans and banks in the U.S. has faded, and the building societies in the U.K. have basically become full service banks. Fully private securitizers (e.g., investment banks and mortgage banks) have not been very successful in most countries, but there is no reason in principle for opposing them.

A problem, though, is that financial institutions might have *implicit* GSE status anyway. Hence, new institutions will have the potential to require future bailouts and/or require

new regulatory regimes, even if that is not the original intention. In that case explicitly chartered GSEs with accompanying regulation might be preferable. Even without a guarantee failure of financial institutions can have real social costs.

There may well be an important role for government support, but it need not be in the form of creating a secondary market, or at least not one that looks like the one in the U.S. New systems, even with the best legal structure might lack credibility, e.g., because of unforeseen legal rulings or lack of political will to enforce laws when the system is under pressure. In those circumstances a compromise between the risks induced by guarantees and the need for credibility is to set up a system where private investors take normal or market risk but the government takes on the more systemic risks. Hence, some form of government guarantee directed toward systemic (rather than market) risk might be useful, particularly in attracting long-term foreign investment.

For instance a nonsecondary market solution is to put the banks in a position to take the first loss on mortgages, according to estimates of a reasonable level for normal, market, losses (assuming the foreclosure laws work) with the government taking the risk beyond that, which the government is better prepared to accept, by covering losses due to unenforceability of the foreclosure laws and other catastrophic losses. Because of their first loss positions banks would have incentives to underwrite loans properly.

There is no simple recipe for government support, via GSEs or otherwise; but if there is to be support U.S. experience suggests five important issues:

1. *Risk Allocation.* A key element in setting any framework is the principle that what is most important is getting capital to flow to its most valuable use and that a key tool in this is balancing risk and return. Hence, it is important to set up structures where those who best understand risks are the ones who take the risk. Because the government is less likely to understand risks than are private companies, it is probably a good idea that it stand at the end of the queue, taking on systemic type risks, which it is better able to handle. The central problem in the savings and loans collapse in the 1980s was that the government took too much risk that could have been taken privately.
2. *Ownership:* A GSE structure with private ownership and value-maximizing incentives is likely to be a more efficient long run way of providing guarantees and supporting a mortgage market than is a state-owned corporation. State ownership of financial institutions provides few incentives for cost minimization or moving with market forces. In the short run government ownership may be useful in limiting government liabilities that could come from private owners exploiting a guarantee and where the institution might need to perform some regulatory functions. A key question, then, will be the transition to private ownership (“sunset” provisions). Clearly a concern with any GSE type setup, or any government intervention, is the details of the charter, responsibilities, incentives, etc., which will be filtered through a political process that may not get everything right.

3. *Subsidy content.* A rationale for GSEs has been that support is needed either to equate social and private returns to housing or to offset guarantees of other (depositories) financial institutions.²¹ If that is the case then the subsidy content of GSEs should be kept in line with subsidies to other mortgage market institutions (e.g., banks), so that outcomes are more likely determined by underlying economics than subsidy differences.
4. *Risk.* Safety and soundness concerns are important, as a way of keeping subsidies under control and limiting risk-taking, so as to achieve the right risk-return balance in allocating capital.
5. *Participation.* Government support of financial institutions in the U.S. has been of two types: *restricted* (to two institutions in the mortgage market) with the GSEs and *open* with banks (there are on the order of 10,000 depository institutions in the U.S.). On the one hand restricting institutional participation raises question of monopoly and political power, but on the other hand experience with the savings and loans suggests that having too many institutions with little franchise value can lead to excessive risk taking and/or a lot of pressure on safety and soundness regulation, which can be hard to monitor if there is a large number of firms.

Some Important Lessons

1. It is the *function*, connecting mortgage and capital markets, especially the long term market, rather than institutional (e.g., charter) details, that is important, and there are several different ways of getting the function done, securitization being

²¹ In the U.S. I have referred to this as “Dueling Charters” (see Van Order (2000a) and (2000b) and argued that there are comparable subsidies for both banks and GSEs. Not everyone agrees with this.

one, but banks selling bonds is another. Creating a GSE is not the same thing as securitizing and *vice versa*.

2. While working on the “back end,” e.g., doing some deals and getting some mortgages off banks’ balance sheets may be a good idea, it is the getting the “front end” right that is the *sine qua non* of developing good mortgage markets. It is even more important to have proper registration, foreclosure and eviction procedures in setting up secondary markets because of the potentially severe selection problems.
3. Controlling safety and soundness requires serious consideration of risk-based capital, not like the old accounting capital ratios, but really risk-based standards that make companies hold more capital if they do things that increase risk to the company (and taxpayer stakeholders). The old Basle model cannot do this. The stress test-based standards currently being put onto Freddie and Fannie as well as the internal models approach being used to analyze capital requirements of banks are major improvements. It is important to stay away from simple accounting ratios and arbitrary balance sheet distinctions. Frequent audits and prompt response are also important. Securitization should sink or swim on its economic benefits and costs.
4. An important component of safety and soundness is not taking interest rate risk. Interest rate risk, particularly in the form of short funding a long term portfolio is a very good way of getting into trouble quickly, as was seen in the beginning of the savings and loan problem in the late 1970s and Fannie Mae in the early 1980s.

- A thing that we have learned is that interest rate risk is relatively easy to measure (via stress tests), and so it should be controllable.
5. There is likely to be a conflict between the private ownership of GSEs and demands for “social housing.” This conflict can be at two levels: between private owners and government policy and between policy-makers concerned with safety and soundness and policy-makers concerned with social housing. For most economists the answer is to support social housing with direct subsidies like vouchers, but in some countries political and budget pressures may lead to demand for implicit taxes on GSEs.²²
 6. Finally, there is the lesson of diversification and insurance. Fannie and Freddie have benefited because they have been able to spread their risks across a variety of local economies, which are often larger than those of some countries. To illustrate this look at the attached figure, which depicts the incidence of default and house price appreciation in the U. S. across states from Freddie data on 80% LTV loans. What the figure shows is that most of the time for most states default rates are low, but every once in a while they are huge, huge enough to generate bankruptcy for institutions with low capital levels concentrated in those states. On the other hand, consider the dark squares, which depict national experience. These squares are within the range of state experience, but they are much more closely bunched; the national rate has not come close to the worst experience of the states. This provides an important warning for small countries developing mortgage markets, particularly if they are extending guarantees to newly formed

²² Fannie and Freddie both have required shares of purchases that must come from low income borrowers and “underserved” areas. For instance half (by number not dollars) of their loans must go to borrowers with below median incomes. Banks have requirements, largely through the Community Reinvestment Act.

institutions. Emerging mortgage markets should be willing to place part of their risks with large international banks and/or reinsurance companies who are more diversified. Note, however, that this too involves principal/agent problems because third party insurers risk being selected against, and insurance does not make risk go away, it simply relocates it.

Ideal Structures?

There is no single structure that is always best at accomplishing the function of linking mortgage markets with long term financial markets. There are, however, two archetypes that are worth focusing on:

1. *Banks and Bonds.* Banks can simply originate mortgages and hold them, funding them by issuing long-term deposits or bonds. With bonds the banks can attract funds by over-collateralizing the bonds, for instance by pledging \$125 in mortgages as collateral for \$100 in bonds. This makes the bond holders happy, but it requires the banks to raise \$25 either in capital or in deposits. Alternately, the bonds can simply be general liabilities of the banks. Government support can take the form of a guarantee on the bonds after the collateral has been used for instance in the form of a liquidity facility.
2. *SPVs and Securitization.* In this case the bank can set up a special purpose vehicle (SPV) into which loans are sold (and taken off the banks balance sheet). The bank can set up as a senior/subordinated structure, with the bank retaining the subordinated part, which acts like the excess collateral above, with the bond market buying the senior part. Government support can take the form of a

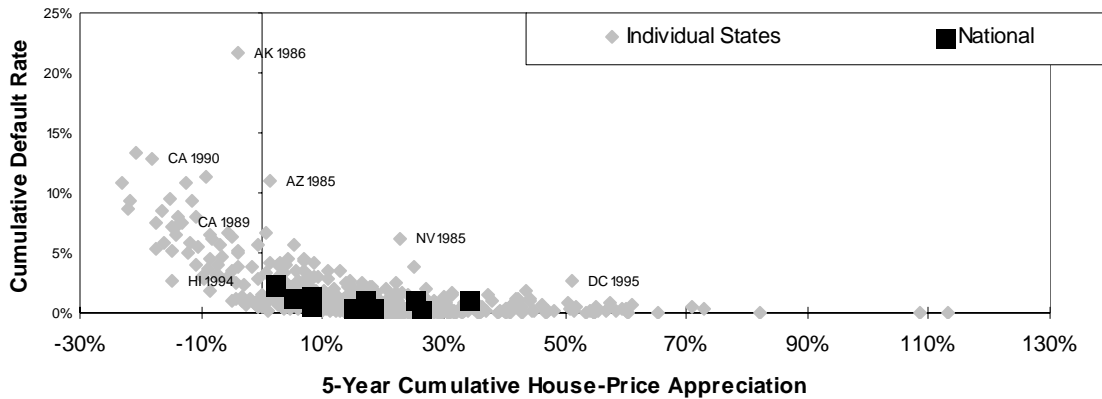
guarantee of the senior part *after* it has taken on some risk, so that bond-holder losses are limited.

Both structures do much the same thing. They both have the advantage that they put the government at the end of the queue, so that its role is more like protecting against systemic risk or promoting the creditability of the underlying legal structure. An advantage of the securitization structure is that it guarantees the investors access to the mortgages (bankruptcy remoteness) in a way that on balance sheet over-collateralizing might not. Both structures allow the institution that originates and manages the loans to take on the initial credit risk and pass through the interest rate risk to bond market investors. Neither requires the government guaranteeing individual loans, and both allow risk to be controlled by capital and stress tests.

The U.S. GSE system is like the securitization model with the implicit guarantee being at the end of the queue, but to the extent that the GSEs have increased debt funding the system is also like the banks and bonds model. On the other hand U.S. banks with deposit insurance are more like the banks and bonds model, and the ability to use derivatives makes it easier to do this with little interest rate risk. The Federal Home Loan Banks provide a liquidity type facility. Note though that the ability of banks to use the private label MBS market and keep the subordinated part of a senior/subordinated deal (using deposit insurance to fund the sub part) allows the banks employ something like the securitization model.

There is no reason to favor any of these variations in principle. To a large extent success of particular of particular structures depends on regulatory and perhaps tax issues that are not especially relevant to other countries. Banks and Bonds has some appeal in emerging markets because it is less likely to require new laws, and because banks are more likely to be the best at credit risk, and so can manage the principle/agent problem better (at first) than a securitization structure can.

Default Probability vs. House-Price Appreciation
State/Origination Year and National/Origination Year Cohorts (1985-1995)
80% Loan-to-Value, 30-Year Fixed-Rate Home-Purchase Mortgage



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