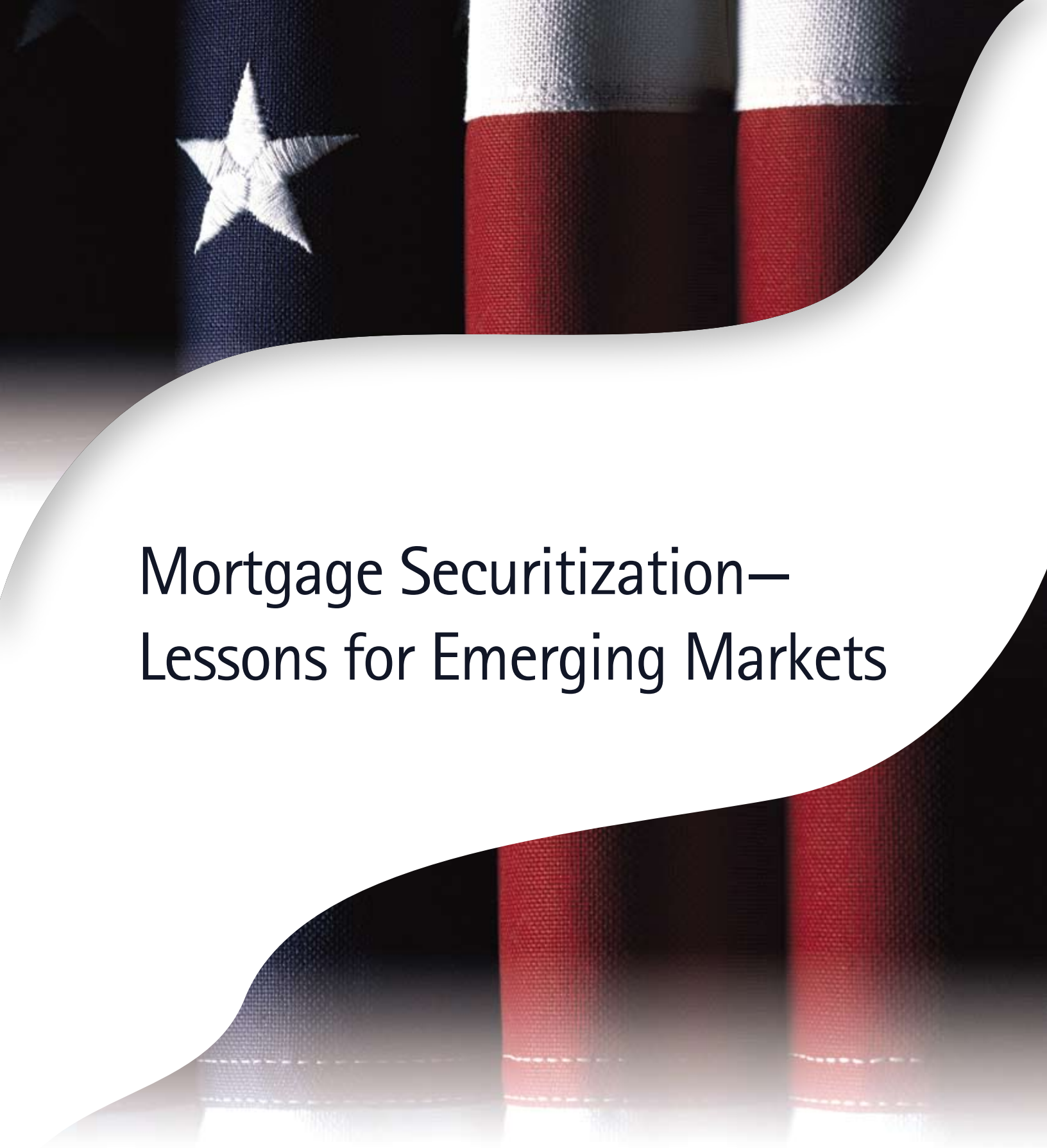

Mortgage Securitization—Lessons for Emerging Markets

U.S. Department of Housing and Urban Development
Office of Policy Development and Research

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Foreword

It is commonly accepted that a well-developed primary residential mortgage market promotes homeownership and that homeownership in turn promotes economic and political stability. Secondary mortgage markets (SMMs) serve to enhance primary mortgage markets by separating the mortgage investment and origination functions. This separation increases the number of mortgage investors and, ultimately, the amount of capital available in the market. Increased competition in the primary market leads to more choices and lowers costs for borrowers. The net effect is to expand the benefits accruing from a primary mortgage market: making homeownership cheaper and more affordable, and expanding the ability of citizens to become homeowners.

For emerging mortgage markets, the issue is when to implement a secondary market. Many of the international delegations that visit the U.S. Department of Housing and Urban Development each year ask for advice on when to do so. For this reason, the Office of Policy Development and Research, through its Office of International Affairs, has commissioned this study, "Mortgage Securitization—Lessons for Emerging Mortgage Markets." This study is intended primarily for an international audience. It identifies the essential elements that are needed for the success of a secondary market, based primarily on the experience in the United States but also referencing other countries that have SMMs and including case studies of Romania, Taiwan, and Guatemala.

The themes of this study are *predictability* and *transparency*. Participants in SMMs that rely on the extended use of mortgage securitization as the basic form of funds transfer require a regulatory and environmental framework that produces predictable results that can be relied on time after time. Furthermore, the actions of all the participants need to be transparent in order to assure the other participants of continued predictability. This study goes into detail on the major participants and the phases of the development of the SMM, and especially focuses on the potential roles of the government. In the United States, the government's role has been to create large, specialized aggregators that guarantee payments from pools of mortgages that back the mortgage securities. Ginnie Mae is a government entity that guarantees payments from securities backed by government-insured or guaranteed mortgages, and Fannie Mae and Freddie Mac are private companies that do the same for all mortgage types, although the three of them do not monopolize the U.S. secondary mortgage market. All this and the important details of the SMM are explained in this study.

I think that all those working on ways to improve housing opportunities, whether here or abroad, will find this study both enlightening and useful.

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Section 1. Introduction

Housing is one of the most fundamental of human requirements. It is also one of the main standards against which governments are judged: societies in which housing is not readily available are generally unstable politically. One of the first goals for virtually any government, therefore, is to ensure that its economy is capable of providing housing for the population.

When considering housing, governments face a fundamental choice: should the government provide housing directly to the population, or should it set up a market-based system that will allow the private sector to provide the actual housing? Economic theory and centuries of experience throughout the world demonstrate that private markets are extremely efficient at providing adequate, sustainable housing to the population. Only rarely has government providing housing directly to the population been a solid, long-term solution to a country's housing needs. Governments simply cannot respond as quickly to the needs of the population, signaled through price information, as can the private sector.

One of the great economic success stories of the 20th century was the transformation of the middle class housing market in the United States. According to the U.S. Census Bureau, in 1940, 43.6 percent of the population owned their own housing. This number rose in every subsequent decade and, by 2000, stood at 66.2 percent.[1] This was a stunning achievement perhaps made even more notable by the fact that it involved only minimal direct governmental intervention; the U.S. government recognized that the best opportunity to increase homeownership was to create a legal and regulatory environment that would allow the private market to flourish.

Without a doubt, one of the main innovations of the American system was the idea of mortgage securitization. This process, which provided a mechanism for the cheap and efficient sale of mortgage holdings, allowed primary lenders direct access to the capital markets. This access reduced their costs, which, in turn, increased the availability, affordability, and continuity of the supply of mortgages at the consumer level. This increase in the availability, affordability, and continuity of the supply of mortgages meant that a much larger percentage of the population could afford to purchase their own house.

Although the U.S. market is the most widely known and developed market, other developed countries have implemented secondary mortgage markets (SMMs). Some markets, such as the Canadian market, have structures that are largely similar to the U.S. market, with differences owing primarily to different traditions in the primary market. Others, such as the Italian market, reflect not so much a secondary market but a primary market with national scope.

In the past decade, governments of a number of emerging economies have decided to encourage the formation of SMMs. They have had various rationales for doing so and have had varying degrees of success. A consensus is emerging, however, that even in emerging markets the introduction of an SMM can result in substantial welfare improvements for the populace.

[1] U.S. Census Bureau. *Historical Census of Housing Tables* (www.census.gov/hhes/www/housing/census/historic/owner.html).

The purpose of this paper is to examine the potential benefits of SMMs in emerging markets, catalog the infrastructure needed to launch and support such markets, and examine the regulatory and governmental environments needed for their sustained success. We will begin by introducing what are generally considered to be the necessary economic, legal, and regulatory conditions for a successful SMM. We will then introduce several case studies of recent attempts to introduce secondary markets in emerging economies and assess the relative merits of governmental policies with respect to those markets. We hope this paper will be a valuable reference source for introducing and sustaining secondary markets in emerging mortgage markets.

What Is a Secondary Mortgage Market?

The overall mortgage market is usually classified into two components: the primary and secondary markets. The primary mortgage market is the retail-level loan market. That is, it is the market in which individual homeowners contract with banks (or other lenders) to borrow money to purchase (or refinance) a home. It is in this market that the primary underwriting occurs and in which the terms and conditions of individual loans are set. The SMM is one in which retail (primary) lenders sell the loans that they have originated to other entities.

The benefits of a primary mortgage market are relatively easy to see. Consumers are able to enter the home market, often with little equity, and are able to leverage their housing investment. Increased access to credit increases the pool of potential homeowners, which increases the liquidity that is available in the housing market. Lenders are able to earn returns for originating loans and, if they choose to retain ownership of the loan, for the long-term investment of capital.

Society also benefits greatly from the existence of a secondary market, although the benefits are sometimes more subtle than in the case of the primary market. Without a doubt, the most important long-term benefit of an SMM comes from the benefits of decoupling mortgage origination from mortgage investment. Financial institutions, with their extensive network of branches, are typically very well positioned to provide retail-level financial services, such as mortgage origination. Their deposit-based funding structure is not, however, particularly well suited to investment in long-lived assets such as fixed-rate mortgages (FRMs). The inherent maturity mismatch of funding mortgage investments with deposits introduces extraordinary risk into the financial system. Adjustable-rate or rollover mortgages are better suited to the asset-liability management needs of these financial institutions, but they carry inherent risks of payment shock to homeowners. FRMs would be rare without a secondary market. Thus, one benefit of having a viable SMM is the availability of long-maturity FRMs, which creates more stable housing expenses. Indeed, an SMM fosters the proliferation of mortgage choices by increasing outlets for mortgage types that a depository may not want to invest in.

The SMM allows banks to originate loans but then sell them to more appropriate long-term investors. Even if a bank wants to hold a mortgage portfolio, the liquidity provided by a secondary market makes this strategy much less risky. Should the bank ever need to raise funds, it can do so rapidly by selling the mortgages in its portfolio into the secondary market, even long after they were originated. This strategy reduces the risk to the bank of holding the loans. This lower risk means that banks can charge a lower margin on loans that they issue, thus lowering the contract rate on mortgages for borrowers.

Borrowers also benefit from the secondary market because the funds can now flow into the mortgage market that would otherwise be excluded from that market. When primary lenders sell recently issued mortgages into the secondary market, they replenish their stock of capital, allowing them to issue even more mortgages. The increased flow of capital into the mortgage market reduces the cost of borrowing for the consumer.

Also, the supply of funds from capital markets is more likely to be sustained over the business cycle. Before the secondary market became fully functional, the United States suffered episodic "credit crunches." The last such crunch was in 1974, when mortgage credit was not generally available, because lenders could not replenish their capital to make new loans. Since 1974, such credit crunches have not been observed, likely due to the ability of the SMM to supply mortgage funds.

Table 1 provides a list of secondary market benefits for borrowers, primary lenders, secondary investors, and society at large.

Table 1. Benefits of a Secondary Mortgage Market

To Consumers	• Decreased mortgage contract rates. • Increased availability of capital. • Allows mortgage bankers to flourish, passing along lower costs due to specialization and economies of size. • Allows greater competition among originators, giving consumers more choices—especially the fixed-rate mortgage—and lower costs. • Increased access to capital may reduce home purchase barriers such as high downpayment requirements. • May increase the variety of mortgage products available to consumers.
To Primary Lenders	• Reduces inherent risk of mortgage investment. • Allows focusing on originating operations (that is, underwriting and initial funding) without having to worry about long-run funding. • Increases the liquidity of mortgages held in portfolio. • May decrease capital reserves required for holding mortgages. • Have access to capital other than deposits for funding mortgage originations.
To Secondary Investors	• Allows access to new types of long-term investments. • Mortgages may be the substrata on which more complex derivatives may be based. This may allow investors to fine-tune the risks that they take on. • If foreign investors are allowed to enter the secondary market, provides liquidity to the housing market even when the national economy is in a downturn.
To Society at Large	• Increased access to capital increases opportunity for homeownership, which tends to enhance political stability. • Separation of the mortgage origination and investment functions may allow for greater stability in the banking system.

Review of Established Secondary Mortgage Markets

Without a doubt the best-known SMM is that in the United States. This secondary market, which was established in its current form in the early 1970s, is one of the largest capital markets in the world. According to Fannie Mae, one of the major secondary market participants in the United States, the total size of the securitized mortgage market in the United States was approximately $5.37 trillion in 2005.[2] Clearly, this market is one of the largest fixed-income markets in the world.[3] Remarkably, the same Fannie Mae report notes that, even with the very large securitized secondary market, nearly $4.48 trillion in additional loans had been held as "whole loans," which are secondary market sales but are not securitized.

Although the U.S. market is perhaps the best-known SMM, other well-developed markets exist. For example, the Canada Mortgage and Housing Corporation has issued more than $30 billion (Canadian) worth of mortgage-backed securities (MBSs).[4] This established and liquid market shares many structural similarities with the U.S. market.

The development of an SMM in Europe has been uneven. In general, the larger countries of Western Europe each have some form of an SMM, although the structure and mechanics vary markedly from country to country. That said, it is certainly the case that the United Kingdom, Spain, and the Netherlands each have robust markets for securitized mortgages. Indeed, according to the European Securitization Forum, a trade association based in London, total residential mortgage securitization in Europe in 2006 was a little more than €244.6 billion. The largest single market by far was the United Kingdom, with more than half of that volume at €138 billion. Spain, the Netherlands, and Italy were the next largest markets, with 2006 volumes of €36.4, €26.5, and €16.5 billion, respectively.[5]

In the Pacific Rim region, Australia has the largest secondary market. It is a large, but relatively new, market. According to the Reserve Bank of Australia, more than $126 billion (Australian) worth of residential mortgages had been securitized and issued into the secondary market.[6]

Although considerable variation occurs in these established markets, especially with respect to the actual securitization process, several commonalities are especially important to note. First, each of these markets has a well-established, smoothly functioning banking system and a vibrant primary mortgage market. As will be discussed later, prerequisites for a strong primary market include establishing a clear and consistent set of property rights, consistent laws governing the transfer of property, a national system for credit reporting, and a high level of financial sophistication among consumers. Second, in each of these markets, a well-established legal mechanism for issuing mortgage securities into the secondary market is present. This mechanism

[2] Fannie Mae. *A Statistical Summary of Housing and Mortgage Finance Activities* (www.fanniemae.com/ir/pdf/resources/housingmortgage.pdf).
[3] The term "fixed-income," used here, is simply meant to imply debt-based instruments. Adjustable-rate mortgages are included in this figure.
[4] Canada Mortgage and Housing Corporation. *2006 Annual Report.*
[5] European Securitization Forum. *ESF Securitization Data Report* (www.europeansecuritization.com).
[6] Reserve Bank of Australia. March 2006. *The Performance of Australian Mortgage Backed Securities*.

includes having extremely well-defined legal systems for creating and administering the special purpose vehicles, which frequently are the actual issuers of the securities, as well as clear and predictable standards for what happens when a mortgage within the pool enters into default. Also important are clear laws governing the tax treatment of various securitization vehicles, as discussed in the following text.

The single most common theme across all these markets, however, is that a very high degree of transparency in the process is present. In order for an SMM to function well, investors must have access to high-quality information about the loans that underlie the security. That is, there must be enough information about the mortgages to allow investors to price them accurately. Even after the securities are issued, there must be a continuing stream of data about the cash flows from the mortgages. The investors must be convinced that they have a sufficiently strong audit trail to ensure that they receive their promised cash flows.

Similarly, consumers must feel that transparency in the securitization process is present. Their concerns are twofold. First, they want to be assured that the servicing of their loan will occur in an orderly manner and that they will always be in a position to know whom to turn to with respect to any servicing problems. Second, they will want to know that their legal position in the event of default or prepayment will not be any different than if their loan had not been sold into the secondary market.

Outline of the Paper

The purpose of this paper is to examine the operations of an SMM. We begin by examining the securitization process, at least as it is practiced within the United States. We then examine the participants in the secondary market, with special emphasis on their roles and needs. Finally, we examine the necessary economic, legal, and regulatory processes for a successful market.

Although this paper will examine a broad range of issues, two themes will become quickly apparent: predictability and transparency. In order for a secondary market to be successful, it is absolutely vital that the system be predictable to market participants and that all participants believe that everybody has equal rights under the law. For a mortgage market, what this primarily means is that property rights to the collateral, and the process that occurs when a loan goes into default, must be highly predictable and consistent. To some degree, it is the *predictability* of the rights and process that is more important that the rights and processes themselves. Markets are very resilient, and they can simply adjust prices to reflect the variations in rights and processes. Transparency, in which the actions of the participants and their regulators are make known to the public, makes their actions more predictable. Markets tend to fail when uncertainty exists as to what is being bought or how ownership is proven. Predictability and transparency are the cornerstones of a successful market.

Section 2. The Securitization Process

Individual mortgage loans are too small to warrant trading within a capital market, although single-loan sales are often the precursors of a more complete secondary market. The due diligence and transfer costs would quickly exceed the benefits of purchasing the loans. Every major secondary mortgage market (SMM), therefore, has adopted the idea of *securitization*: combining individual loans into a pool and then using them as collateral for bonds. The cash raised by the sale of the bonds is used to finance the purchase of the loans that constitute the pool. By selling bonds that are based on a pool of loans, the transaction costs associated with collecting the mortgages, performing due diligence, and issuing the bonds can be spread across many loans so that the per-mortgage transaction costs are low.

The purpose of this section is to examine the components of the securitization process and the processes that must be put in place to assure a steady supply of acceptable mortgages. This section also describes how originators and mortgage-backed security (MBS) issuers can hedge pipeline and interest-rate risk.

Coordination Between Primary and Secondary Markets

As noted in the introduction, a primary mortgage market is one in which a lender directly advances funds to a borrower for the purpose of financing a house.[7] A secondary market is one in which issued (or soon-to-be issued) loans are sold from the originator to other investors. Although it is common for observers to speak of these markets as being separate, they are clearly linked by the underlying mortgages. We also note that some entities participate in both the primary and secondary markets, although we refer to distinct primary and secondary market participants.

It is difficult for these two markets to exist and to function well without each other. At the most basic level, if primary market originators elected not to sell their loans, there would be no product flowing into the secondary market and the SMM would not exist. Similarly, if secondary market investors elected not to purchase the loans, funds would not flow back into the primary market, and that market would be greatly curtailed in terms of size and efficiency. For these markets to work together, therefore, it is imperative that they synchronize their activities. Participants in the primary market must be willing to generate products that secondary market participants are willing to purchase, and secondary market participants must be willing to pay a price that is high enough to induce primary market participants to sell the loans they originate. Insuring that these needs are met requires a significant amount of planning and infrastructure, much of which necessarily falls on primary market participants.

Participants in the two markets and national-level regulators must also develop a “culture of transparency” with respect to both markets. Without such a culture, the secondary market is unlikely to be successful, and the primary market consequently will be less successful than it otherwise would be. Basic economic theory states that markets work best when all parties have roughly equal levels of information about goods and services in the marketplace. Although in

[7] Note that this definition is expansive enough to cover the initial home purchase, refinancing, and financing of home improvements.

practice it is not realistic to assume that all participants will have exactly equal information, regulators can, by forcing the market to develop a culture of transparency, minimize information asymmetries—the bane of successful markets. The difficulty, of course, is that individual agents will always have an incentive to create, or at least attempt to create, an information asymmetry because it could give them market power. This is the reason why it is important that a culture of transparency be established within the entire market. Although in many countries the responsibility for the establishment of such a culture is given to a national-level regulator (such as the U.S. Securities and Exchange Commission in the United States), it is also possible to envision a situation in which a powerful coalition of market participants, such as those in a trade association, could establish the culture.

Transparency is also important to instill in the actions of the regulators to assure participants of fair and predictable treatment.

The Securitization Process

It is helpful to think of six distinct stages to the securitization process: secondary market genesis, preorigination, origination, secondary market transfer, MBS issuance, and post-issuance. Within each of these stages distinct roles are present for both primary and secondary market participants as well as distinct costs and benefits. Table 2 provides an overview of the six stages and the responsibilities and benefits to primary market originators and secondary market investors. We discuss each stage in detail.

Stage 1—Secondary Market Genesis

In the period of time before the opening of a secondary market, primary market lenders, potential secondary market participants and investors, and financial regulators must make a number of very significant decisions about the types of products that primary lenders will be able to sell into the secondary market and the way in which they will be able to do so. These decisions have two distinct focuses, collateral and process, but all of these decisions lead back to a common theme: standardize whenever possible, and get as much information to the market as possible. This helps establish the culture of transparency that ultimately is required for the markets to succeed.

With respect to collateral, primary lenders and secondary market participants must agree on the types of loans that can be sold into the secondary market. The key is to standardize loan terms as much as is possible. Loan features which lenders can standardize include the following:

- Loan parameters
  - Loan type (for example, fixed rate, adjustable rate).
  - Amortization type (for example, fully amortizing, balloon notes, interest only).
  - Payment frequency.
  - Maturity terms.
- Underwriting criteria
  - Minimum downpayment requirements.
  - Maximum loan-to-value ratios.
  - Minimum credit standards for borrowers.
  - Default insurance requirements.

- Types of property on which loans may be written.

- Legal issues
  - Choice of jurisdiction.
  - Rights of the lender in case of default.
  - Rights of the borrower in case of default.

By standardizing these terms, investors in the secondary market can begin to form general opinions with respect to the desirability of these loans in general and with respect to their pricing in particular.

Although the determination of the loan terms is important, the determination of the processes that the market will use is perhaps even more important. This is because the market can always adjust price to cover any nonoptimal choices with respect to the mortgage features. It is more difficult to adjust price if the processes that will transfer the loans are not well developed. With respect to process, the primary issues that have to be determined in the initial (that is, market genesis) preorigination stage are the forward sale mechanisms, legal transfer requirements, audit requirements, and information technology/data standards.

Mortgages in the primary market are almost always written as a forward contract because property sales are almost always written as forward contracts. It is also almost always the case that when a property sale is made, a time lag occurs between the time when the buyer and seller agree to the sale and when the transfer of title occurs. This time lag is necessary for a number of reasons: buyers typically need to arrange financing, buyers need to perform "due diligence" on the properties, and sellers may need time to clean up the properties for delivery. As a result, borrowers usually apply to a lender for a mortgage and the lender agrees to the mortgage some time before the origination of the loan, typically as an optional contract (for a fee).

A major problem for primary market lenders, and one that they would hope to better manage with a secondary market, is their "pipeline" risk. Pipeline risk refers to the fact that not every loan a lender commits to funding will actually come to fruition. Frequently, lenders will commit to make a loan, but then the borrower will decline to actually take the loan (reflecting the optional nature of the loan offer). This can happen for several reasons. First, the sale of the property may fall through, and the borrower simply does not need the loan. Second, especially in the case of a fixed-rate loan, interest rates may fall after the original commitment, and the borrower may go to another lender to get the lower rate. Finally (and rarely), the borrower may have some credit event happen that would render them unacceptable to the lender.

Over time, lenders develop expectations regarding the fraction of loan commitments that will eventually be funded. They plan their loan production volume based on this expected fraction. The risk for the lender is when the percentage of loans that ultimately fund exceeds this expected fraction and market interest rates have increased. This scenario challenges the lender both in terms of raising additional capital and in terms of handling the increased administrative processes. A major expectation of the secondary market by primary lenders, therefore, is for the secondary market to develop products and methods to enable better management of pipeline risk.

Another risk is the uncertainty of whether the investor will accept the loan. This risk is dealt with by the master purchase agreement, which allows primary lenders to sell any loan they originated

provided that it meets specified secondary market collateral requirements into the secondary market. Although this agreement makes clear the conditions under which a secondary market purchaser will accept a loan, it does not set the price for the loan; only the "guarantee fee" charged for the securitization services. The lender must still manage its pipeline risks.

In addition to setting up the sale and pricing mechanisms, one of the most important tasks during the genesis of the secondary market is the development of the legal infrastructure for the transference of mortgages from the original originator/lenders to the secondary market purchasers. It is an absolute requirement for the market to work that the legal system recognize the validity of loan sales, and for the purchaser of the loans to have the same ability to enforce their rights as the original lender would have. Many countries that have started or are starting SMMs, such as the United States, the United Kingdom, and Taiwan, had to change national banking or mortgage laws to permit such sales. It cannot be emphasized strongly enough, however, that legal uncertainty with respect to transferred loans will prevent the development of a successful secondary market.

It is also vitally important that secondary and primary market participants develop and agree to audit standards for the loans, which will eventually be transferred into the secondary market. These audit standards must be in place to provide transparency in the market. Without transparency, the market will fail. The audit standards must cover a wide range of topics, such as what data will be disclosed, how that data will be stored and accessed, and how borrower privacy will be respected. Ultimately, however, the audit standards serve the primary purpose of reassuring the secondary market investors that they are receiving the correct cash flows from the mortgages and assuring the MBS investors that the loans meet the standards that are stated in the MBS disclosure documents.

Finally, the major primary and secondary market participants must develop and agree to use a consistent set of information technology tools. This process can actually be a much larger challenge than it appears. In most cases, primary lenders will have built their inhouse systems under the assumption that they will be retaining loans (because the secondary market did not yet exist), and so the data and data distribution systems will have been geared toward inhouse users. Secondary participants will want much of the same data, but they will want to have a standard way for the data to be encoded and transferred for operational efficiency: a national secondary market participant will not want to have to build custom data feeds for each primary lender in the marketplace. Creating a common information technology infrastructure can be the major startup cost of a secondary market.

Stage 2—Preorigination Period

After the secondary market has been established, the primary market lenders can begin the process of issuing the loans, which will eventually be sold into the secondary market. The preorigination period is the time during which the lender is marketing its loans but before the loans close. This is the time period when the primary lender faces pipeline risk. It manages this risk by entering agreements with counterparties—usually Wall Street investment management firms in the United States as well as with the secondary market conduits—to sell a percentage of the mortgages and to purchase options that allow sale at a specified price (see the following text).

It would also be during the preorigination period that primary and secondary market participants would agree to any changes in the structure or mix of products available to be sold into the secondary market. During the initial operational period of the market, it is likely that both primary and secondary market participants will want to make changes in the mix of products that can be sold into the secondary market. It is likely that participants will want to make at least some operational changes for efficiency reasons. Again, any such changes will have to be made during the preorigination period.

The preorigination period is also one of the best periods during which market participants, both primary and secondary, can build transparency into their operations. It is vital that primary market lenders provide very clear information about the products they are offering to consumers, the expected performance of those loans, and the credit quality of the borrowers. Providing this information to all potential secondary market purchasers of the loans will allow for more accurate pricing and will attract a greater number of participants to the secondary market. Ultimately, this helps both primary market lenders and consumers because it will increase the capital available to the market while potentially restricting the types of mortgages sold into the secondary market. In the United States, for example, the government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, tended to avoid purchasing subprime mortgages, and eventually private issuers created MBSs backed by them. The volume was likely smaller, however, and the costs to these borrowers were higher than if the GSEs had purchased them.

Stage 3—Origination

During the origination period, the primary lender funds loans to consumers. The primary considerations at this time are to ensure that those loans do, in fact, meet the credit and legal standards of the secondary market. The challenge for primary market lenders at this stage is mainly one of efficiency. Can they market and fund loans at a cost that is less than the fees that they will receive at closing? [8]

Stage 4—Transference

After originating a sufficient volume of loans, the primary lenders will be ready to sell them into the secondary market. If the originator had previously entered into forward sale agreements, this sale will be at a price that is already determined. Indeed, the primary responsibility of the originator will be to demonstrate to the purchaser that the loans do, in fact, meet the terms of the forward sale agreement with respect to credit quality, maturity, contract rate, and so on. If the originator had not entered into a forward sale agreement, then they first have to find a buyer, determine the price for the loans, and then sell them. In the early days of a secondary market, this process could take some time and effort. After the market is well established, however, selling a group of newly originated "whole loans" (that is, nonsecuritized loans) becomes fairly routine.

Two risks exist in the transference phase. The first risk is purely operational: that the actual transaction will not occur on the settlement date or that it will not be executed properly and thus expose the purchaser to the risk that their ownership rights might not be legally enforceable.

[8] As discussed later, the originator will also usually receive some compensation for servicing the loan.

The second risk is the pipeline risk, in which the value of the mortgages can change due to changes in market interest rates before contracting for their sale. If interest rates fall, borrowers tend to walk away from their loan offer even though they have paid a nonrefundable fee, because a lower rate mortgage is available from another lender. This risk is managed by having a mix of forward commitments to sell the mortgages at a specified price (interest rate) and options to do so (in which the option requires an upfront fee). If interest rates rise, the mortgage, when it closes, will be at a discount. If forward and option contracts are insufficient to cover their pipeline, lenders suffer a loss on sale of the loan. Managing the proper mix of forward and optional contracts is the art of pipeline management.

Both of these risks can be mitigated by investment in robust "back office" operations on the part of all participants. Indeed, one of the major recent focuses of regulatory bodies in countries with highly developed financial markets has been ensuring that operational risk is minimized. This essentially requires regulators to regularly examine back office operations and make sure that they are given the same consideration and thought that "trade desk" operations are given. [9]

One issue that the primary originator will have to consider at the time of the sale is whether it wishes to be a provider of "servicing" for the loans. In the United States, the largest MBS issuers, such as Fannie Mae and Freddie Mac, have elected not to provide such services, but many private MBS issuers do service their mortgages. These servicing functions include providing monthly statements, call centers, collection services, and other retail-level services to the borrowers; preparing updated loan data to the MBS issuer; and managing foreclosure processes. The secondary market investors pay a monthly fee for these services.

Larger originators tend to retain the servicing because it can be a highly profitable stream of revenue, especially if the originator can achieve economies of scale. The difficulty is for smaller originators that typically cannot achieve sufficient economies of scale to make servicing a profitable business line. Their only option is to sell the right to service the loans. In the United States, the vast majority of smaller financial institutions sell their mortgage servicing rights at the same time that their mortgages are sold into the secondary market.

Stage 5—MBS Issuance

After the mortgages have been purchased from the originating lenders, the role of the primary market participants is over, with the exception of loan servicing, if applicable. From this point on, it is only the secondary market participants that have any control over the loans.[10] The secondary market participants have a number of decisions to make and roles to play. They must decide on the structure of the MBSs that they will issue, the amount of credit risk that investors will have to bear, what types of servicing and insurance fees to assess, and how to organize the MBS market.

[9] The term "back office" refers to the area of the financial institution that is responsible for the settling and clearing of trades and deals made by other portions of the institution. This process is primarily an administrative function. The term "trade desk" or "front office" refers to those areas of the institution that have the authority to enter into contracts or agreements to buy or sell securities with other firms.

[10] It is not uncommon, of course, for a financial institution that is a primary market lender to later purchase a mortgage-backed security. Clearly, it would then still have a role in the loans but it would be an investment role and not any special role due to its having originated the loans. In that sense, it is not any different from any other secondary market lender.

A number of ways are possible for one to potentially structure an MBS. Two relatively common ways are the mortgage passthrough (MPT) security and the mortgage-backed bond (MBB). Although a complete discussion of the financial engineering of these instruments is beyond the scope of this paper, it is useful to have at least a brief overview of their structure and how they are in turn used as the basis for mortgage derivative securities.

Mortgage Passthrough Securities

The MPT security is the primary MBS issued in the United States and Canada. The basic concept behind the security is simple: an issuer collects a pool of homogeneous mortgages, places them into a trust or other special purpose vehicle (SPV), and then sells bonds entitling investors to receive proportional shares of all cash flows the mortgages generate.

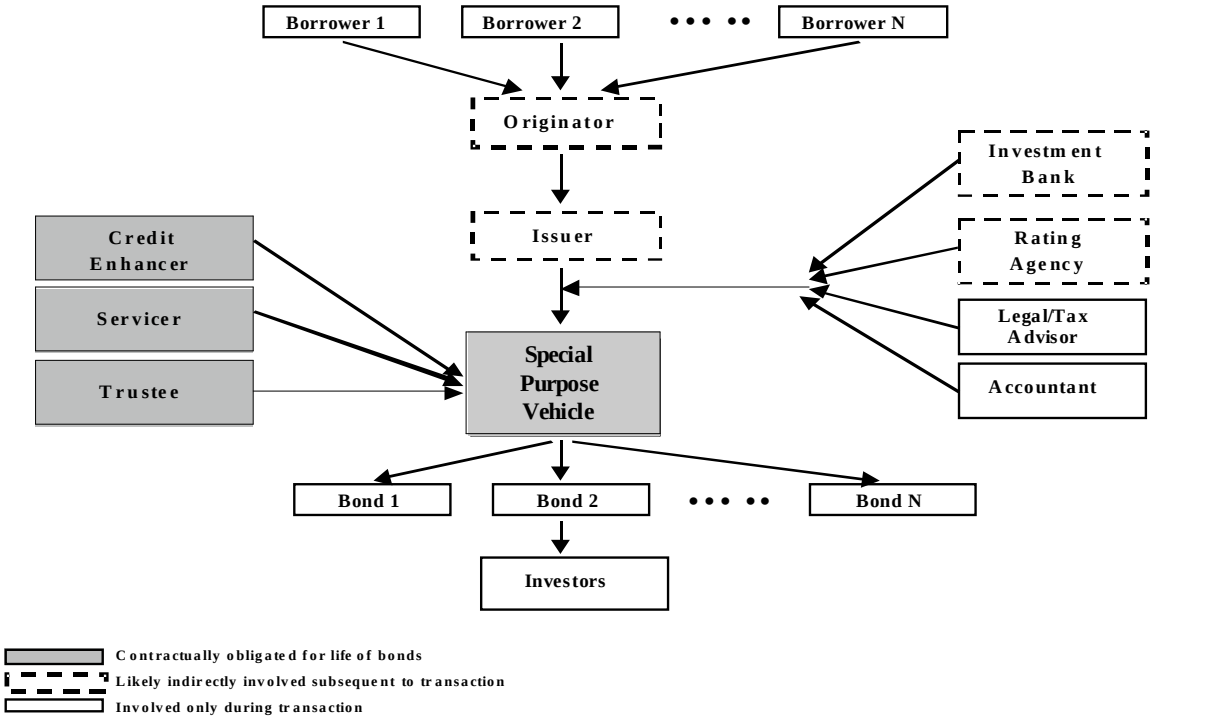
In many respects, holding an MPT security is similar to holding a position in an underlying whole mortgage. The investor receives monthly principal and interest payments as well as any prepayments.[11] The major difference is that most MPT securities are protected by various types of mortgage insurance. These credit enhancements assure the repayment of principal to the MBS bond holders, a guarantee that is normally not available to investors in "whole" (that is, unsecuritized) mortgage loans. This means that the credit risk of the individual mortgage borrowers is no longer relevant for the bond investors. This greatly reduces the due diligence costs associated with trading the MPT security; essentially, an investor only has to consider the creditworthiness of the MPT security issuer or insurer, not the individual mortgagors, which makes it possible to trade the MPT security as easily as corporate bonds.

Most MPT securities in the United States are further enhanced by the guarantee of the "timeliness" of the scheduled payments. This additional guarantee avoids the risk of a delay in receiving the payment due to the time lag of settling mortgage insurance claims. The GSEs, Fannie Mae and Freddie Mac, are the largest providers of mortgage insurance and guarantee of nongovernment MPT securities. In the government sector, the Federal Housing Administration (FHA) insurance and U.S. Department of Veterans Affairs (VA) guarantees provide the insurance against the risk of principal loss. Ginnie Mae, which is also a government agency, provides the guarantee for timely payment of the MPT securities of FHA and VA loans.

Although simple in concept, the implementation of a passthrough is complex. The schematic in Figure 1 demonstrates the various roles each participant has in the creation of the passthrough issued by a private entity.[12] From this figure, it is clear that a large number of participants are present: the original borrowers, the originating lender, servicers, guarantors, the MPT security issuer, and investors all have *direct* stakes in cash flows associated with the mortgages. Others, such as accountants, rating agencies, investment banks, and attorneys, provide services associated with the issuance of the MPT security and thus have *indirect* interests.

[11] Note that the interest payments may be reduced by guarantee and servicing fees.
[12] We discuss the roles that each of these participant play in the next section of the paper.

Figure 1. Participants in Private-Entity MPT Security Issuance



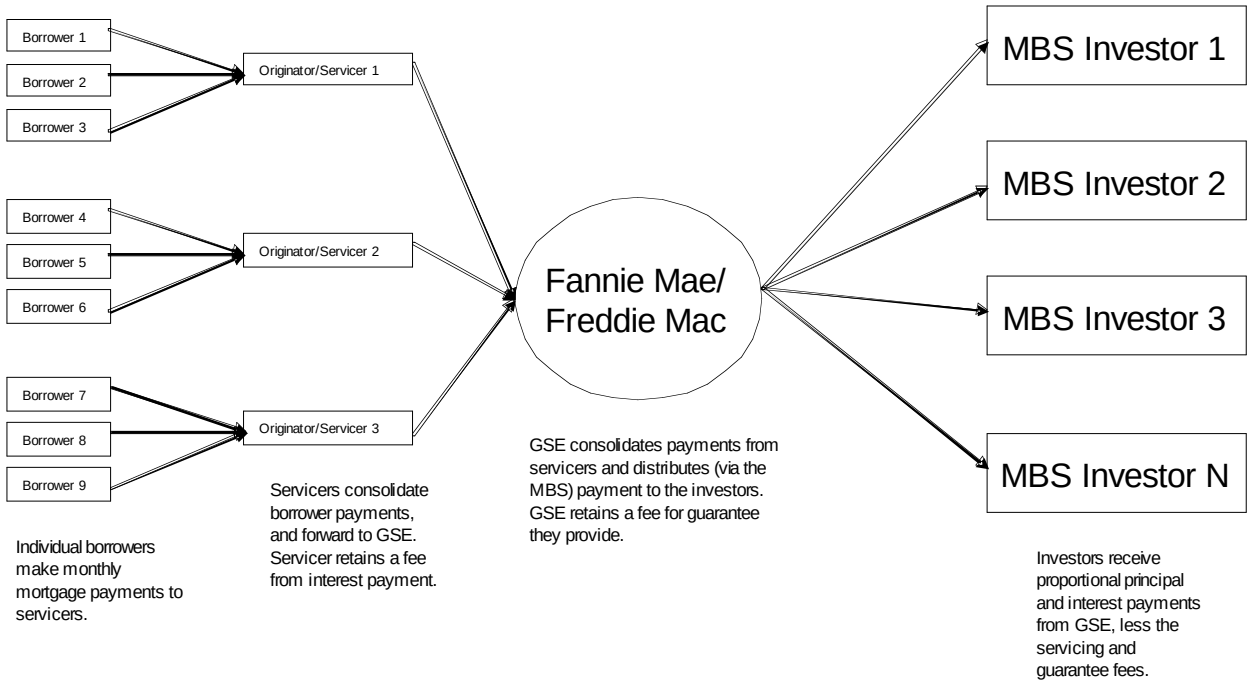
MPT = mortgage passthrough.

The MPT security issuer cumulates many hundreds or even thousands of loans, places them in a trust or SPV, and offers the MPT security for sale to the investing public in the form of bonds, collectively the MPT security. The investors that purchase the MPT security make a lump-sum payment and, in return, receive the rights to all cash flows generated by the underlying mortgages, less servicing and guarantee fees.

An MPT security has the same primary investment characteristics as an investment in an underlying mortgage. Without credit enhancements, the MPT security would pass the credit risk and all of the interest-rate risk inherent in the mortgages to the investor. This is in contrast to the other major type of MBS, the MBB, which is discussed in the following text.

Figure 2 demonstrates the flow of funds in an MPT security created by the GSEs. During the preissuance period, retail lenders underwrite and originate individual mortgage loans. At origination, the borrower receives a lump-sum cash distribution from the loan and, in return, agrees to make periodic mortgage payments to the originating lender or its assignee. The originating lender sells its rights to receive those periodic payments to the MPT security issuer in return for a lump-sum payment. The originating lender may elect to sell its servicing rights to a third party in exchange for a lump-sum payment.

Figure 2. Flow of Monthly Funds in a Fannie Mae/Freddie Mac MBS



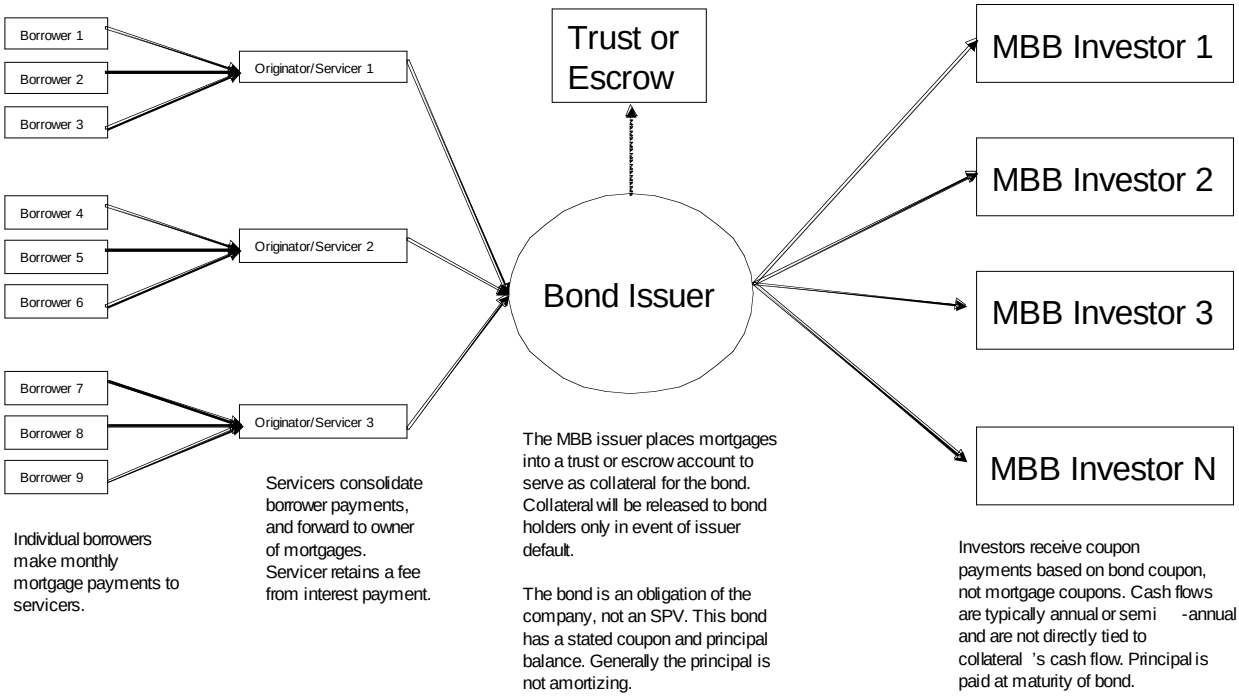
GSE = government-sponsored enterprise.
MBS = mortgage-backed security.

Mortgage-Backed Bonds

An MBB is simply a type of secured corporate bond. Under this arrangement, the bond issuer acquires a pool of mortgages and then issues a regular corporate bond. The mortgages are pledged as collateral in the event the issuer defaults on the bond. If such a default does not happen, the mortgages, and their cash flows, remain the property of the MBB issuer. Because the bond has collateral pledged against it, the MBB issuer is able to pay a lower yield on the bond than it otherwise would have paid if it were not collateralized. MBBs usually apply overcollateralization to enhance the credit quality. That is, the size of the underlying mortgage pool is greater than the size of the MBB being issued. Often, the MBB contains insurance from a bond insurer or from mortgage insurers.

Figure 3 shows the cash flows associated with an MBB. Note that, as was the case with the MPT security, the mortgages are initially issued by a primary lender who then sells its right to receive the monthly cash flows to the MBB issuer. The primary lender typically retains the right to service the loan and can sell that right should it choose to do so. The key difference in the MBB and the passthrough security is that the cash flows generated by the mortgage are not directly tied to the cash flows of the bond. The bond has a stated principal amount, term, and coupon rate (which might be a floating rate), and these items strongly influence the cash flows owed by the issuer under the bond. Only in the event that the issuer defaulted on the bond would the MBB investors take possession of the mortgages and receive the mortgage cash flows.

Figure 3. Flow of Monthly Funds in a Typical MBB



MBB = mortgage-backed bond.
SPV = special purpose vehicle.

Unlike an MPT security issuer, an MBB issuer retains both the interest rate and credit risk of the underlying mortgages. Indeed, depending on how it structures the bond portion of the MBB, the issuer could actually take on additional interest-rate risk by issuing the MBB. To see this, consider if the bond had a fixed coupon associated with it, and if the underlying mortgages were fixed-rate mortgages in which the borrowers had the right to prepay the loans at any time. Under such a system, if interest rates decreased, the value of the bond (a liability for the issuer) would increase while the value of the mortgages would not increase much because the loans would tend to be prepaid. Under such a scenario, the issuer could lose wealth on both the asset (mortgage) and liability (bond) side of the deal.

Mortgage Derivatives

The generally accepted definition of a derivative security is that it is "a financial instrument whose value depends on (or derives from) the values of other, more basic underlying variables."[13] From this definition, it clearly follows that an MPT security, and even an MBB, can, in some sense, be considered a mortgage derivative. In the mortgage markets, however, the term "mortgage derivative" generally refers to an instrument that is based on an MPT security.

Two mortgage derivatives are in widespread use today: interest only (IOs) and principal only (POs) and multiclass securities (MCSs). Both of these types of instruments take the cash flows generated by a pool of mortgages and redirect them. This redirection results in investors bearing

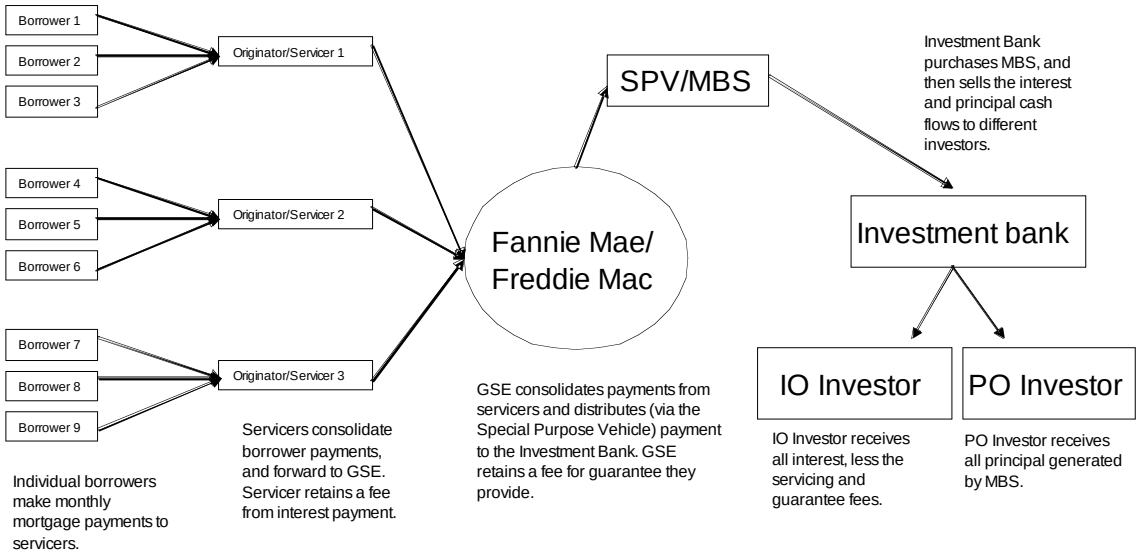
[13] Hull, John C. 2003. *Options, Futures, and Other Derivatives*, 5th ed. New Jersey: Prentice Hall. p. 1.

different types and levels of interest-rate, prepayment and/or credit risks. Although a complete discussion of the financial engineering behind IOs and POs and MCSs is beyond the scope of this paper, we now discuss their general structure and economics.

Interest Only and Principal Only

IO and PO "strips" are mortgage derivatives that are formed by taking an MBS and issuing two new bonds. The first bond, called the IO strip, entitles its holder to receive a proportional share of the interest payments from the underlying mortgages (less the guarantee and servicing fees.) The second bond, called the PO strip, entitles its holder to receive the entire principal, including prepayments, generated by the underlying collateral. Figure 4 illustrates the cash flows from the underlying mortgages to the IO and PO investors.

Figure 4. Flow of Monthly Funds in a Typical IO/PO Combination



GSE = government-sponsored enterprise.
IO = interest only.
MBS = mortgage-backed security.
PO = principal only.

Although this scenario may at first appear to be a relatively minor rearrangement of the cash flows, it has profound effects on the type and level of risks taken by the bond holders. To see this, consider first the position of the PO holder. It is entitled only to the principal generated by the mortgage. Because it cannot earn any coupon interest, it must price the PO bond as a pure discount bond and is made monotonically better off by recovering its principal as rapidly as possible (and it gains in value if the prepayments are faster than market expectations). The return, therefore, is enhanced when prepayments increase, which, for fixed-rate and even adjustable-rate mortgages, will tend to happen when the general level of mortgage rates falls. In contrast, the IO holder receives the interest generated by the mortgages, but nothing else. The IO holder, therefore, wishes for the mortgages to generate the maximum amount of interest that they can.

This scenario would occur when prepayments in the pool of underlying mortgages were minimized, which would normally be the case when mortgage rates stayed flat or rose.

The IO and PO holders have diametrically opposed interests: the PO holder wants the underlying mortgages to prepay as rapidly as possible, while the IO holder wants the mortgages never to prepay. Because what largely drive prepayments are declines in mortgage interest rates, the IO and PO instruments are really interest-rate derivatives. The IO benefits if rates (relative to the original mortgage rate) stay flat or increase while the PO benefits if rates fall.

This seemingly simple transformation, therefore, has transformed the mortgage pool from a long-term investment vehicle into a way of taking carefully selected positions in interest rates. This increases the number of investors that potentially would want to invest in these instruments. This incremental interest increases the amount of capital flowing into the mortgage markets, which ultimately reduces the cost of mortgage borrowing for consumers.

Multiclass Securities

An MCS is a mortgage derivative that, like the IOs and POs, is formed by rearranging the cash flows generated from MBSs. The MCS rearranges the underlying MBS (or mortgage) cash flows in primarily two ways (although the inventiveness of Wall Street to produce variants and extensions seems to be unlimited): by the timing of the cash flows or by the degree to which investors are exposed to the credit risk of the underlying mortgages.

To form an MCS, the issuer first purchases an MPT security or series of MPT securities. For the first type of MCS, the issuer then creates a series of sequential-payment bonds issued against that underlying collateral. Each of the sequential-payment bonds (called tranches) has its own stated principal and coupon rate, and each tranche normally receives monthly interest payments based on its outstanding principal balance and coupon rate. Principal payments, however, are made sequentially. Initially, only the most senior tranche receives principal; after the most senior tranche has its principal completely paid, then the second most senior tranche begins to receive principal payments. This process continues until the most junior bond is paid its principal and the MCS is retired. Note that the tranche principal payments are made from the principal (including prepayment) cash flows from the underlying mortgages, and the interest payments are made from the interest cash flows of the underlying mortgages.

By creating the different tranches, the MCS issuer fundamentally alters the risks and returns that investors face. For example, by definition, the more senior tranches receive their principal first. As a result, the expected maturity of the tranche is shorter, which, under a normal upward-sloping yield curve, implies that the senior tranche holders should earn a lower yield than the later-paying tranche holders. The senior tranche holders also have less exposure to prepayment risk than do the more junior tranche holders because their maturities are usually rather short.

The sequential-payment MCS was initially issued as a collateralized mortgage obligation (CMO) in the early 1980s. The CMO was not a pure passthrough, but it obligated the issuer to make promised tranche payments should the underlying cash flow fall short. This gave rise to a contingent liability to the issuer and also gave rise to tax issues for the investor. A more popular MCS called the real estate mortgage investment conduit, which was a pure passthrough except

for the possibility of guarantees due to mortgage defaults, generally replaced the CMO and carried a more favorable tax treatment.

Although the sequential-payment MCS is the "standard" MCS discussed in the literature, numerous variations on their structure occur. For example, it is now common for CMO issuers to create special tranches that either guarantee or nearly guarantee a specific set of cash flows. These special tranches, usually called planned amortization class (PAC) tranches, are usually custom-designed for specific investors.[14] The investors in these classes specifically trade yield for greater certainty in the timing of their cash flows. (Note also that these tranches usually pay down simultaneously with "standard" sequential-payment tranches.)

Another variant is the "accrual tranche." Although this tranche has an initial balance and coupon rate like other tranches, the accrual tranche does not receive any interest until it begins to receive principal. Instead, the interest that it is owed each period is capitalized into the balance of the tranche. In this way, its balance grows every period until it reaches its turn to begin receiving principal. At that point, it ceases to accrue interest and the investor is paid cash for both principal and current interest each month. These bonds are usually sequenced as the most junior tranche in the MCS. During the tranche's accrual period, the cash from the underlying mortgages that would have been used to pay the periodic interest is usually used either to pay down the principal on more senior tranches or to pay the special payments on a PAC tranche.

The second type of MCS allocates the credit risk of the underlying MBSs or mortgages. The MBSs are typically issued by a private company; thus, it could be the case that investors would be exposed to losses if the individual borrowers defaulted because the issuer in this case does not guarantee the cash flows: they are supported solely by the underlying mortgages. These are popular in sectors of the market in which the GSEs do not participate at all or extensively, including the "jumbo" market (beyond the loan size allowed by law that they are allowed to purchase), the subprime market (which has lower credit-quality mortgages), and the "Alt_A" market (in which borrowers are permitted to qualify with no or little documentation of income and/or assets, for example, and/or with poor credit).

Investors will normally require this type of MCS to incorporate several credit-risk protection features. The senior investors will require that any credit losses be applied against the principal of the junior tranches first. The junior tranches will, of course, command higher yields for bearing this risk. The MCS issuer often is required to retain the residual principal and interest that is left over after all of the tranches have been satisfied.[15] This overcollateralization helps protect the tranche holders from both types of credit risk.

The investors may demand that coupons on the tranches be structured so that *excess spread* is present. The term "excess spread" means that the MCS must be configured so that the total interest owed on all of the tranches must be less than the total interest generated by the underlying collateral. Because frequently the most junior tranches will have a higher coupon rate

[14] Similar tranches include the targeted amortization class and very accurately defined maturity tranches. Although some differences are present in the structure and degree of cash flow certainty, in general, all these tranches provide the investor with greater certainty with respect to the timing and scale of the cash flows it will receive.
[15] Sometimes, though, multiclass security issuers sell the residual interest—frequently to hedge funds.

than the underlying collateral, normally, the only way to maintain excess spread throughout the life of the CMO is to have overcollateralization initially.

Stage 6—Post Issuance

After the MBS has been issued, much less activity occurs. The servicer provides information on the loans' performance to secondary market investors, and the investors in the secondary market continue to receive cash flows and earn their investment returns. The trustee (for privately issued MBSs) is responsible for ensuring that monthly cash flows are distributed to the investors and that investors are given complete information about what is happening with the pool of underlying mortgages.

Indeed, it this last activity, providing information about the underlying mortgages, that will ultimately determine whether the market is successful. If secondary market investors believe that they do not have full information about the mortgages or that information is not equally available, then they will likely either exit the market or will demand very high yields as to render the market infeasible. The MBS originators, in conjunction with the mortgage servicers, must make every effort to make loan origination and ongoing performance information available as cheaply and widely as possible. Only by doing this will enough transparency be achieved to allow the market to function fully and efficiently.

The purpose of this section was to provide an overview of the securitization process from the pregenesis stage of the market through to the post-MBS issuance phase, as summarized in Table 2. In this discussion, we talked about primary and secondary market participants without fully defining those participants. We fully define the participants in the next section.

Table 2. The Six Stages of the Securitization Process

	Primary Market Originator		Secondary Market Makers/Investors	
Stage	**Responsibility**	**Benefit**	**Responsibility**	**Benefit**
Premarket Genesis	• Put in place systems to use standardized loan terms needed by the secondary market. • Enter into forward-sale agreements with secondary market participants.	• Participating in market genesis process ensures that primary lender needs and concerns are considered.	• Ensure that the legal system will allow loan transfers and that rights are enforceable. • Define minimum standards for loans that are saleable into secondary market. • Define audit standards. • Define data and IT standards for loans and minimum legal protections required.	• Ensures that the market, after it begins, will meet the needs of both secondary market investors and primary lenders.
Preorigination	• Develop prequalification screens that will reduce time and effort spent on nonqualifying loans. • Develop efficient methods for underwriting and processing loan applications. • Ensure back office operations are in place, especially for managing pipeline risk.	• Pipeline risk can be managed more effectively with forward-sale contracts. • With pipeline risk at least partially hedged, interest-rate risk can be further hedged via optional commitments and specialized derivatives.	• Stand ready to provide price quotes and technical assistance to primary market lenders.	• Helps establish relationship with primary market lenders.
Origination	• Issue loans with agreed-to standardized loan terms. • Originate loans that meet credit standards for the secondary market. •	• Originator knows that loans are saleable in the secondary market. • Standardized product allows for efficient processing of applications.	• Be prepared to ensure liquidity for primary originators. • Enter into "TBA" or forward-contract agreements to issue MBSs from currently originating loans. • Enforce agreed-to standards for loan quality and contracts.	• Standards will ensure that originators issue the correct types of loans. • Liquidity in primary market will ensure a dependable stream of mortgages from which to create MBSs. This stream will ensure liquidity in secondary market.
Transfer of Mortgages to Secondary Market	• Develop efficient "back office" operations to transfer loans.	• Efficiency in transfer allows faster capital replenishment and faster throughput on	• Create national infrastructure for rapid loan transference. • Ensure that mortgages meet all	• Transfer of mortgages into secondary market provides the raw materials for the

	• Invest in IT infrastructure. • Ensure loans meet legal requirements. • Ensure that transfer meets all legal requirements.	future origination fees.	legal requirements for sale. • Ensure that IT infrastructure can be accessed at low cost by relatively small originators. • Build into infrastructure "due diligence" systems such as audit trails and fraud checks.	creation of mortgage derivatives.
MBS Issuance			• Choose form of MBS to issue. • Create MBS and sell it. • Put in place a system to mitigate credit risk to MBS investors. • Issue initial disclosures.	• Earn return for creating the MBS and selling it into marketplace. • Earn continuing fees for credit-risk mitigation.
Post-Issuance	• Potentially provide monthly servicing for the mortgages in the MBS. • Potentially provide "special" servicing in the event of default.	• Can allow for a continuing stream of cash flow for originator/servicer.	• Provide ongoing credit guarantee to MBS investors or structure MBS to manage credit risk. • Potentially issue structured MBSs based on underlying MBS. • Provide information to investors on loan performance, with as much detail as possible.	• Continue to earn fees for providing credit guarantees. • Potential (if applicable) to earn additional revenues from creation and sale of MBS variants. •

IT = information technology.
MBS = mortgage-backed security.
TBA = to be announced.

Section 3. Participants

To be successful, a secondary mortgage market (SMM) requires that a country have a fairly sophisticated financial system with a relatively broad infrastructure. Clearly, the country must have in place a national system of primary mortgage lending, and it must also have in place a sufficient investor base to absorb the mortgage-backed security (MBS) production. The country must also have many other resources, however. For example, it must have accounting and legal professionals that understand and can advance secondary market operations. It must have regulatory bodies with expertise in structured and securitized products, and it must also have a consumer class that has the financial sophistication to accept both the benefits and costs of securitized mortgages.

The purpose of this section is to examine the various economic agents who participate in a secondary market and their specific roles in that market. When examining these agents, it is useful to classify them into three groups: those that directly participate in the market, those that indirectly participate in the market by providing services to direct participants, and the regulatory bodies. We now examine each of these agents.

Direct Market Participants

Direct market participants are those that in some way either owe or are owed cash flows that are explicitly tied to the underlying mortgages. Borrowers, mortgage brokers, primary lenders, MBS originators, servicers, guarantors, and, of course, MBS investors, are the direct market participants. Each of these direct participants has a unique role and function within the marketplace. We discuss each of these in the following text.

Borrowers

Countries develop individual cultures with respect to land and debt, and these cultures greatly influence the way in which mortgage markets, both primary and secondary, develop. For example, in the United States and Canada, homeownership is ingrained into the national fabric. The majority of adults own the housing in which they live and housing is widely viewed as being as much an investment as a consumption good. Indeed, it is almost the case that, in those two cultures, the purchase of a home is viewed as the final rite of passage from childhood into adulthood and symbolizes full financial independence from one's parents. As such, it is generally assumed that homeowners will use debt to finance their housing purchases. No stigma is associated with using debt, and the tax code rewards the use of debt for housing purchases.

In contrast, many Asian countries, such as Taiwan and Japan, have cultures that esteem homeownership but eschew debt, including mortgage debt. In those cultures, consumers typically purchase housing later in life and use extended families to help raise capital to purchase housing. Although mortgage debt does exist, there is almost a stigma associated with it.[16]

In Europe, the situation is much less easy to classify. Certainly in some countries the norm is to

[16] In both the cases of Japan and Taiwan, the use of mortgage debt has become much wider in recent years and the stigma associated with it has lessened, especially among younger households.

own housing. For example, Aalbers shows that, in general, the countries in Europe with the highest homeownership rates—Hungary, Slovenia, Lithuania, Greece, Estonia, and Italy—also have some of the lowest average mortgage debt levels.[17] In contrast, some of the countries with the largest mortgage markets—Germany, the Netherlands, and France—have relatively low homeownership rates. Indeed, only the United Kingdom and Spain appear to have high levels of homeownership coupled with large mortgage markets, even on a *per capita* basis.[18] From this observation, we can reasonably infer that the degree to which housing is a priority to consumers and the degree to which consumers will agree to take on mortgage debt vary considerably across Europe.

Cultural attitudes toward homeownership and mortgage debt will greatly affect the viability of an SMM. If consumers are unwilling to take on mortgage debt in general, then little need exists for a secondary market at all. By definition, a secondary market cannot precede the primary market from which it emanates, so, if no established primary market exists, no secondary market will exist.

Cultural attitudes toward the repayment of debt also affect the viability of a secondary market. Mortgage pricing theory shows that one reason for repaying debt is to avoid the reputation costs associated with default (that is, the loss of credit standing for future purchases). It would not be surprising if in a newly developed economy, or one that did not have functioning capital markets, consumers would not fully internalize those reputation costs. That is, their expectations might well be that the capital market will not endure and, as such, their perception might be that defaulting today has no measurable future cost. This type of reaction could be expected in a country in which life expectancy was not particularly high.

In order for any mortgage market to work, borrowers must be willing to both take on mortgage debt and repay it in accordance with the expectations of the market.[19] They must also have the financial sophistication to understand the implications of mortgage debt, the risks and benefits it entails, and the responsibilities that it brings.

Primary Lenders

If borrowers are the first prerequisite for a successful secondary market, primary market lenders are the second. Primary lenders are those lenders dealing directly with the origination and funding of mortgages to the consumer. Primary lending is mostly a retail activity, and, as a result, the most successful primary lenders will have multiple retail outlets. Clearly, financial institutions such as banks are typically positioned to have multiple outlets. Their branch networks have the retail footprint needed to cover the marketplace, borrowers are used to sharing

[17] Aalbers, M.B. 2006. *The Geography of Mortgage Markets.* Working paper, University of Amsterdam.
[18] Ibid.
[19] Note that this does not necessarily mean that debts must be repaid in exact accordance with the letter of the contracts. What matters is that all parties to the contract must have similar expectations as to which cash flows will be made and when they are made; given this, the marketplace can price the contracts. In emerging economies, this process may require lenders to have extensive knowledge about what to realistically expect that borrowers will pay as opposed to what is agreed to in the debt contract.

financial information with them, and they have the funding and operational expertise for issuing the loans.

Financial institutions are not the only potential primary lenders. Large retailers could potentially use their brand recognition, reputation, and retail footprint to effectively provide mortgage lending services. During the 1980s and early 1990s in the United States, for example, Sears, a multiproduct consumer retail chain, provided mortgage origination services through an acquired bank and used its retail outlets to interact with potential borrowers.[20] Recently, Wal-Mart considered moving into retail mortgage lending but dropped the idea when banking regulators expressed concerns. Indeed, many banks in the United States have set up "mini branches" in grocery and retail stores, where consumers can apply for mortgage loans.

An institution that may serve emerging markets well is the mortgage broker. Brokers do not directly issue loans, but they represent lenders that do. Brokers work directly with consumers to accept mortgage applications and provide a preliminary screening of their creditworthiness. Brokers then shop the application to the various primary lenders that they represent. After they find a lender that is willing to fund the loan, they work with the borrower to close the loan (that is, complete the legal documents). Although brokers do not fund the loan to the consumers themselves, the difference is negligible. For all intents and purposes, to the borrower, the broker is the originator.

This type of arrangement is fairly common in the United States and may be ideal in an emerging market. Because brokers are focused only on the origination portion of the transaction, they do not have to have economies of scale to be successful. This means that even a one-person mortgage brokerage can be profitable and sustainable. Indeed, in the United States, most mortgage brokers are small, single-location operations. In an emerging market, especially if it is one in which retail banking services are underserved, using small mortgage brokers may be a quick way for primary lenders to build a national mortgage origination business.

Regardless of whether lenders decide to use their own retail networks or broker-based systems, a cornerstone of their operation will be the underwriter. Underwriting is the process through which a lender determines whether a borrower meets its credit standards and determines the terms of the mortgage (for example, how much downpayment is needed). Normally, underwriting is an inhouse function for a primary lender: deciding which loan applications to accept is too important a decision to outsource. In some cases, a vested third party, the insurer of the mortgage or the main purchaser in the secondary market, may carry out this function to ensure that the loans that they will insure or purchase are of adequate quality.

The underwriter is literally the last person who can prevent the institution from making a bad loan. As a result, it is crucial that the lender ensure that no incentive, either explicit or implicit, exists for the underwriter to accept loans that do not fully meet the credit standards of the lender. To ensure that this is the case, the reporting structure, compensation scheme, and career

[20]According to *The New York Times* (April 23, 1986), Sears had a mortgage portfolio of more than $6.5 billion.

advancement path for underwriting must be clearly and definitively separated from the mortgage approval process.[21]

MBS Originators

Most emerging mortgage markets begin with the primary lenders holding the mortgages in their portfolios. A secondary market begins when these lenders begin to sell the loans individually at first and then in MBSs. After a primary lender, or group of primary lenders, has issued a sufficient volume of mortgages, they will either deliver them into a previously negotiated forward sale agreement or they will sell them on the spot market. Often, the loans will be purchased by an MBS originator, which performs the functions of aggregating the loans into pools, securitizing them, and selling the resulting MBSs into the secondary market.

Countries that are considering beginning an MBS market should consider very carefully the types of entities that they want issuing MBSs. In both the United States and Canada, government-sponsored or owned corporations are the largest residential MBS originators. Indeed, the two U.S. government-sponsored enterprises, Fannie Mae and Freddie Mac, are the largest originators of residential MBSs in the world, and a government corporation, Ginnie Mae issues MBSs backed by government-guaranteed or insured mortgages. It is tempting to infer from this that MBS originators should have some government connection. Before drawing this conclusion, however, one must consider the unique circumstances surrounding their founding in the United States and their subsequent growth.

First, Fannie Mae, Freddie Mac, and Ginnie Mae were established at a time when securitization in general, and mortgage securitization in particular, were not established practices. At that time, significant doubt existed as to whether the securitization of mortgages would work. The U.S. federal government established Fannie Mae, Freddie Mac, and Ginnie Mae at least partially because it was believed that purely private entities would not take the risk of establishing this type of market or that they would not be successful. In addition, U.S. securities and banking laws would have made it very difficult for private firms to establish these types of operations at that time.

Today, of course, securitization is a proven method that is widely accepted in a number of countries. Because of this acceptance, some doubt exists that government subsidization is required to prompt the development of an SMM, provided that a supportive legal and regulatory framework exists within which private firms can operate. Even in the United States, the number of privately issued residential MBSs has increased over time. An active and liquid market for residential MBSs consisting of loans that do not meet Fannie Mae or Freddie Mac guidelines and the entire U.S. commercial MBS market has been developed by the private sector.

One downside of the government sponsorship of MBS issuers is the contingent liability the government has should the issuer encounter financial distress. Another downside is that government sponsorship puts potential private issuers at a competitive disadvantage. Private firms, with competition among them, are more likely to provide services more continually

[21] Note that this specification means that the underwriter should not have a financial or career advancement incentive to accept bad loans *or* a financial incentive to reject good loans.

attuned to borrower and investor interests. On the other hand, securitization may come sooner and with a higher volume with government sponsorship.

Servicer

The servicer is an intermediary between individual mortgage borrowers and the MBS issuer. When the MBS issuer purchases the loans from originating primary market lenders, they may take responsibility for providing all the customer service functions that borrowers need. These services include customer support functions such as balance inquiries, periodic statements, payment verification, and tax statement preparation. Because most MBS issuers are capital-market oriented, they typically have not made the investment in customer support infrastructure that providing these services requires. Also, there appears to be significant economies of scale in servicing. The practice in the United States is that the primary lender retains the right to service the loans it originates. This practice creates a source of revenue for the originator in addition to the origination fees it earned. The originator can sell that right (called mortgage servicing rights, or MSRs) to other servicers, subject to the MBS issuer's approval. The MBS issuer typically has the right to force the transfer of servicing to some other entity if the current servicer fails to perform adequately. As a result, the ability to sell MSRs has led to a highly concentrated servicing sector in the United States due to the economies of scale to conduct servicing efficiently.

Although to mortgage holders it appears that the primary function of the servicer is to provide customer support services, in reality it typically provides a number of other services. For example, the servicer usually acts as a payment consolidator for the issuer. That is, the servicer will collect all of the monthly payments from the individual mortgage borrowers throughout the month and then remit them to the MBS issuer in a single payment.[22] Common additional duties of the servicer include confirming that hazard insurance is maintained on the property, confirming that property and other taxes are paid on the property, and even ensuring that the property is being reasonably maintained. Finally, the servicer is expected to perform foreclosure functions should the borrower become delinquent or default on the loan.

For performing these tasks, the servicer is paid a periodic (usually monthly) fee. This fee is normally set as a rate per unit of outstanding principal and is typically paid from the interest that is received from the underlying mortgages.[23] The servicer is also usually able to earn the "float" on payments that have been collected but not yet disbursed to the MBS issuer. Of particular interest is that the servicers normally retain any late fees assessed for late payments.

Arrangements have also evolved in which a primary or "master" servicer is ultimately responsible for all servicing functions but arranges for some or all of the functions to be carried

[22] Indeed, in the United States, the servicer is responsible for making a monthly payment to the issuer that is based on the *expected* monthly collections, not the actual monthly collections. If a borrower is delinquent on their payment, the servicer must still make the payment to the issuer. The servicer then attempts to reclaim payment from the delinquent borrower. Only if the borrower is ultimately unable or unwilling to make the payments current will the servicer be refunded the payment by the issuer.

[23] In the United States, servicers typically are paid a rate of between 20 and 25 basis points per year on the outstanding principal balance for loans in a Fannie Mae/Freddie Mac pool. For Ginnie Mae pools, servicers typically earn closer to 45 basis points per year.

out by other firms. These firms, called "subservicers," usually specialize in various servicing functions and provide more efficient operations than the master servicer. For example, subprime mortgages, which have a higher expected default rate than prime mortgages, may be assigned to servicers that have the loss-mitigation expertise and size of staff to deal with the higher level of defaults.

Guarantor

As the name implies, the guarantor/insurer is an entity that guarantees that the investors will receive all of the cash flows they are owed under the MBS, even in the event that the MBS issuer is unable to meet its obligations under the bond. Most MBSs are organized as "passthrough" securities. The issuer purchases a large number of mortgages, places them into a trust, and then sells to investors proportional rights to receive the cash flows. To make the bonds palatable to investors, they are typically structured so as to reduce the credit risk in the event of default of the underlying mortgages, at least for a specified portion of the MBS.

As discussed previously, credit risk for investors is managed in a number of ways. One approach is through the structure of the MBS itself. For example, the investors might demand that the issuers place more mortgages into the trust than are promised to the bondholders, a process known as overcollateralization. A second approach is for a third party to "guarantee" or insure the performance of the MBS. In the United States, private mortgage insurance companies and bond insurers perform this function. The guarantor/insurer is paid a monthly fee for providing this service. Fannie Mae and Freddie Mac act as their own guarantor.

Under the Ginnie Mae system, private companies, such as banks, mortgage companies, and even home builders, create passthrough MBSs that are made up of Federal Housing Administration-guaranteed and U.S. Department of Veterans Affairs-insured mortgages. Ginnie Mae guarantees the investors timely repayment of principal and interest. Ginnie Mae requires that the MBS issuer advance principal and interest payments to the investors even if the borrowers do not make their payments. If the issuer fails to do so, this failure constitutes a default by the issuer, and Ginnie Mae will take over the servicing of its entire portfolio.[24]

Most guarantors rely on the integrity of the issuer. The guarantor has the option of negating the guarantee if fraud is involved in the issuance of the mortgage. Then, the originator or servicer is obligated to make good the guarantee stated in the MBS documents. Because the guarantor would otherwise be in the first-loss position, it has a strong incentive to inspect and evaluate the issuers for fraud risk. Fannie Mae and Freddie Mac typically honor their guarantee to MBS investors and then look to the lender/servicer to recoup their MBS payments when they find fraud. They can, and often do, pull performing loans from pools and force a sale back to the lender/servicer if they discover fraud.

The guarantor is usually paid a periodic fee for insuring the MBS. This fee is usually based on

[24] We note that even Fannie Mae and Freddie Mac have an implicit guarantor: the U.S. federal government. Although not a legal obligation of the U.S. government, a *political* (implicit) guarantee exists. Should Fannie Mae or Freddie Mac be unable to meet mortgage-backed security obligations, the federal government is authorized to lend them funds to do so, although the size of that authorization is small relative to the total obligations of Fannie Mae and Freddie Mac.

the balance of the mortgage pool at the beginning of the period and is set as a rate per unit of principal outstanding. This payment is normally paid from the interest generated by the mortgages. As the balance of the loans decrease, either through amortization or through prepayments, the guarantee fee will decrease but so will the guarantor's liability for defaults. Although this arrangement at first appears to be a reasonable way of setting the guarantor's fees, it is worth noting that the fees do not exactly match the guarantor's risk time profile.

The majority of amortizing mortgages have the highest probability of default between 3 and 7 years after origination. After the 7th year, the probability of default tends to decline rapidly for two reasons. First, the homeowner has revealed that they are willing to make payments. Second, homeowners most often by then have built equity in the property. This equity places the homeowner in a "first-loss" position and greatly reduces the guarantor's risk of payout on default.

The guarantor, however, earns a fixed rate per dollar of principal insured, and this rate normally does not change over the life of the MBS. This creates a significant pricing challenge. If the guarantor sets the rate to be equal to the average risk per unit of principal, then it is assured of undercharging during the early years of the security and overcharging during the later years of the security. If, however, it sets the rate to be equal to the highest risk per unit of principal it faces, then it will certainly overcharge for the majority of the life of the MBS.

One alternative might be to set up a guarantee fee structure that changed over time. That is, at the initiation of the MBS put in place, a guarantee fee structure that would decline over time as the probability of default declined. Today in the United States, mortgage insurance premiums paid by borrowers cease after 5 years or earlier, based on a good payment history and the value of the house.

Investment Bank

After the MBS issuer has created the security, it will have to be placed into the secondary market. This typically requires the services of an investment bank. If the MBS issuer happens to be an investment bank, then it will underwrite the security and place it into the market. If the issuer is primarily a mortgage company, then in all likelihood it will hire an investment bank to actually place the security.

Normally, this is done in one of two ways. The most common way is for the investment bank to underwrite the issuance of the security.[25] In this system, the investment bank essentially purchases the MBS from the issuer and then sells it (at a higher price) to its clients. The MBS issuer is guaranteed its price and volume; the investment bank bears the risk that it may misjudge the market price of the security, but, in return for bearing this risk, it is able to earn the "bid/ask" spread, the difference between the price at which it sells the security in the market and the price that it paid the issuer.

In some countries, such as Taiwan, if the security is to be placed privately, an investment bank is not allowed to underwrite the security that it helped package. Instead, the particular investment bank may only take on the role of an "arranger." In this system, the arranger simply advises the

[25] Note that this is not the same as the underwriting that is done when the underlying mortgages are underwritten.

issuer of how to select the underlying mortgage pool and how to structure the security to best meet the market demand. The actual sale of the securities is done either directly between the issuer and the investor or is placed/underwritten by other independent investment banks. The arranger is paid a fee (either hourly or for a fixed price) for the technical advisory. It does not bear any price risk with respect to the sale, which is carried out by the underwriter.

In an emerging market, investment banks, and especially the major international investment banks, play a role that is larger than that of underwriter or arranger. To some degree, they help legitimize the market and tacitly endorse the underlying systems and institutions. The market expects and assumes that before an investment bank will enter a new market it will perform extensive due diligence on that market. Due diligence means that the investment bank will extensively examine the legal and financial systems, the mortgage system, and the consumer credit system to ensure that it is on par with international norms.

Trustee

As discussed previously, the two most common MBSs are the mortgage passthrough security and the mortgage-backed bond. With both instruments, a pool of mortgages is pledged as collateral against a bond that is then sold to investors. To reassure the investors that the collateral is in place and secure, the MBS issuer will place the mortgages into a trust. Although the issuer will typically retain legal title to the mortgages, it will give up all control over the mortgages to a third party, the trustee.

The trustee is responsible for administering the MBS. This means that it is responsible for determining the cash flows that the underlying mortgages have generated and for calculating and making payments based on that cash flow to the investors. Typically, the trustee is the first arbiter of any disputes relating to ownership of the bonds or of the status of loans. Should the security allow the issuer to "buy out" or "swap out" loans from the pool, the trustee will have responsibility for ensuring that the issuer follows the bond covenants with respect to this process. Trustees are typically also responsible for disseminating tax information to the bond holders. Trustees are typically paid a flat annual (or monthly) fee for providing their services.

The trustee may also take on a second role, that of document custodian. The document custodian is the entity that is responsible for collecting and maintaining the paper or electronic documents that establish the mortgage and are needed to protect the interests of the lender/investor. Although the trustee may take on this role, it is not required that it does so. The MBS issuer may elect to have a third party be the document custodian. The custodian is normally paid a flat fee for its services.

Indirect Market Participants

Each of the market participants in the preceding section has a direct role in the creation or operation of the MBS. Nevertheless, a host of other roles must be filled to ensure that the market is able to function smoothly and is able to attract investors. These functions are largely advisory in nature; they serve to provide independent views on the status of the MBS and to reassure investors that they are receiving the full value of their investments. We discuss six of those

entities in this section: rating agencies, auditors, tax accountants, attorneys, independent valuation providers (IVPs), and market data providers.

Rating Agencies

Rating agencies provide opinions as to the creditworthiness of publicly available investments, including mortgage securities. They usually develop these opinions by first building highly detailed models of the securities and then examining how the securities would react under a wide variety of simulated economic scenarios, in particular, nearly worst-case scenarios. The agencies will, to a limited degree, work with MBS issuers during the preissuance phase to help them develop security structures that will be able to earn top credit ratings. The rating agencies also provide investors with ongoing analysis of the creditworthiness of the MBS after it has been issued.

The opinions about specific securities are the most visible service provided by the rating agencies, yet, in many ways, this is not where they add the most value to the economy. They significantly add value by interacting with investment bankers who structure multiclass MBSs. Investment bankers structure MBSs to maximize the value of the MBS and rating agencies need to understand and model the risks to investors of each class. This expertise eventually becomes known to the more sophisticated MBS issuers, who can interact more effectively with the investment bankers and the rating agencies.

Auditors

Mortgage securities are, by their very nature, extremely complex. They are both structurally complex and, due to the number of hands through which they pass, organizationally complex. As a result, auditors have a very important role to play in the success of the marketplace. They provide the external assurance to investors, originators, servicers, and others that they are receiving the cash flows that they are owed and that other participants fulfill their obligations. For an emerging mortgage market, it is important that there be access to independent auditors with expertise in the nuances of mortgages and mortgage accounting.

The primary responsibility for ensuring that mortgage investors receive their cash flows and that other market participants fulfill their obligations lies with accounting and auditing systems put in place by the primary market participants, most notably the lenders, MBS issuers, and servicers. External auditors are primarily concerned with examining whether those systems are sufficiently robust to prevent fraud or abuse and whether they are being operated correctly and safely.

Audit firms have typically run into difficulties in interpreting the appropriate accounting treatment for mortgages and mortgage derivatives. The Generally Accepted Accounting Principles (GAAP) surrounding mortgage securities, and especially relating to the hedging of mortgage securities, is complex and difficult to interpret. The Financial Accounting Standards Board makes ongoing attempts to improve the accounting processes for mortgages and mortgage hedging.

Tax Accountants

Tax policy and tax law is highly country specific, and frequently both mortgages and securitized investments are given special status in the tax code. As a result, tax accountants play a major role in the development of the market. In fact, they frequently play two very distinct roles: one during the development of the market and the other after the market becomes operational.

Because securities and tax codes usually do not anticipate mortgage securitization, governments typically must pass enabling legislation before these markets can become operational. This enabling legislation provides the legal and tax framework within which the secondary market can operate. During the drafting of the tax portion of this legislation, the main tax accounting firms of the country provide expert advice to the legislature. They help to ensure that the tax code will not inadvertently hinder the development of the market.[26]

After the market becomes operational, tax accountants help security issuers structure their products to minimize their tax burdens. Similarly, they help investors structure their own financial portfolios to minimize the tax effects, subject to meeting other investment criteria.

Because tax codes are highly country specific, it is almost always going to be the case that the tax accountants will be local firms or at least local subsidiaries of international firms.

Attorneys

Attorneys play a major role in the development and operation of an SMM. Each step of the mortgage origination and securitization process involves contracts, and, as such, prudent participants will either retain or have attorneys on staff. Attorneys will also be deeply involved in the drafting of any enabling legislation that a country might have to pass to create the secondary market.

As was the case with the tax code, the legal environment of the market tends to be highly country specific. As a result, law firms involved in the mortgage market tend to be local in nature, although occasionally an international firm might enter a country for the purpose of providing securities law expertise.

Independent Valuation Providers

Investors in mortgages and MBSs need to estimate their values for risk management, evaluation of potential trades, and accounting purposes. Even in highly developed markets, mortgage securities are notoriously difficult to price. This difficulty is due to the fact that various embedded options are present in the mortgage contract, the interaction of which can be very difficult to model. Furthermore, current MBS prices are highly dependent on the future evolution of interest rates, and this evolution, too, can be difficult to model well. Large firms such as investment banks and very large commercial banks are able to retain sufficient inhouse expertise to value these investments. Most other firms, however, tend to rely on internal value estimates

[26] We note that it is possible that a government may, as a matter of policy, seek to use the tax code to discourage a secondary market.

that are then confirmed against values provided by third parties. These third parties we refer to as IVPs.

Three basic variants of IVPs exist. The first type is simply the various securities brokers and dealers that make markets in the mortgage securities. They are generally able and willing to provide quotes for current mortgage securities. Eventually, however, most mortgage securities will end up in a long-term portfolio. As a result, the dealers and brokers will not have current quotes on these older securities.

The second type of IVP is the valuation software provider. Typically, this type of software allows the user to describe the security and the underlying collateral and then specify the current economic environment, including the current term structure of interest rates. The software will then apply a pricing algorithm and return a "price" of the security. The only difficulty with this type of system is that it can be difficult to determine the optimal parameterization of the model for less liquid mortgages, such as those that have been issued some time ago.

The third type of IVP is essentially a consulting firm that provides independent valuation services. These firms will examine a security and apply a proprietary algorithm to determine the value of the security. They will then issue a report explaining their value, the method they used to generate that value, and any caveats that they may have about the security. An advantage of these firms is that they can amortize the cost of hiring and retaining experts across a number of clients. They are also able to provide a broad view of the market to their clients. That is, they are able to tell their clients about trends and concerns that they see across the entire marketplace. This can be especially valuable in a smaller or less liquid marketplace.

The disadvantage of this third type of IVP is that they may be unwilling to fully disclose their proprietary valuation methodologies. They are also usually not on site, so they may have slower turnaround than the other two methods. Furthermore, because they are usually engaged in custom model-building, they tend to be expensive. In the U.S. market, most investors use either the first or second type of IVP when evaluating "standard" MBS and only use this third type of IVP for exceptionally complex securities.

Market Data Providers

Pricing MBSs is a data intensive process. Any reasonable pricing algorithm will require a model of the term structure of interest rates and a model of mortgage prepayments and default. Data providers such as Bloomberg or Reuters can provide real-time term structure information; that is, information on the current yield curve and interest rate volatility. Prepayment and default modeling, however, is more esoteric. As a result, this tends to be the provenance of boutique institutions with highly specialized econometric models of prepayments. Such a function has been served by centralized credit data depositories, specialized technical consulting firms, or other objective nonprofit organizations.

Regulatory Entities

Market participants, both direct and indirect, have the primary responsibility for ensuring the smooth and efficient operation of the market. They have the most to gain from the market

operating well and the most to lose should the market fail. Government does have a role to play as well. In most countries, the government will have to pass enabling legislation allowing the creation and trading of mortgage securities. Because financial institutions will likely be both mortgage originators and MBS investors, it will have to incorporate them into the current regulatory structure. Courts will have to arbitrate disputes among participants and between participants and regulators. Finally, the government will have to decide the degree to which it wishes to have the markets conform to international standards such as GAAP accounting and the Basel II regulatory capital accords.

There can always be debate between reasonable people about the degree to which government should be involved in a capital market. The generally accepted view among financial economists, however, is that government intervention should be minimal in the absence of externalities. That said, the government of virtually every developed nation has significant regulatory and policy interventions in markets, and this scenario is likely to happen in emerging markets as well.

The key is to craft government involvement in such a way as to minimize the negative effects it could potentially have on the smooth operation of the marketplace. It is important to remember that the biggest winners by far in a smoothly operating SMM are consumers. They have increased access to capital, which means that they can borrow at lower rates, which in turn means that more consumers can own housing. When analyzing any proposed government intervention, one must explicitly consider what the impact of that intervention is likely to be on consumers.

One issue on which virtually every financial economist would agree is that government, especially when dealing with capital markets, must have an honest and transparent role. The development of a reputation for governmental corruption in capital markets is the death knell of a country's capital market system. The government must do all that it can to develop and maintain a culture of transparency for its own operations as well as to promote the transparency of operations in the capital markets.

In the sections that follow, we examine the role that various entities play, including the legislature, national securities regulator, national banking regulator, and transnational regulatory bodies.

Legislature

As previously mentioned, in virtually every country that has established a secondary market, the national legislature has first had to revise the securities or banking laws of the country. Typically, the legislature has had to pass new laws in at least one of four areas: authorizing the securitization of mortgages, specifying property rights in the event the borrower defaults, clarifying the tax status of passthrough payments, and determining how MBS investments held by banks are regulated. Certainly not every country has had to amend its laws in each of these areas, but these are common areas of amendment.

In many countries, the laws governing mortgage finance were originally written under the assumption that local lenders would make mortgage loans to individuals and would then hold them until the loans terminated. The usual assumption was that mortgage lien holders would be

local financial institutions. Indeed, for many years, the banking and securities laws in the United States were explicitly designed to prevent the emergence of national lenders, and these laws effectively prevented the rise of a true national SMM. The federal government had to specifically authorize the creation of Fannie Mae and Freddie Mac, and exempt them from state-level banking laws, before the secondary market fully developed.

One area of concern when dealing with national or international MBS investors is what happens in the event of borrower default. In countries with a tradition of using housing as collateral for mortgage loans, the lender begins legal action against the homeowner. Ultimately, the lender may be able to sell, or force the homeowner to sell, the house to pay off the debt. The court system either conducts or oversees this process to ensure that the property owner's rights are protected.

In countries in which this tradition is already in place, the primary task of the legislature is to ensure that investors in MBSs have the same rights in the event of default that the original lenders did and that the investors can delegate the task of foreclosure to their servicer. In some countries, however, lenders may not have had the right to foreclose on homes, even if those homes had been pledged as collateral for a mortgage loan. In those countries, the enabling legislation will have to be more far reaching because lenders need to have recourse against borrowers that do not repay the loans.

Without such recourse, the cost of default becomes so low that borrowers would have little or no incentive to repay their loans, and it is virtually impossible to foresee significant capital flowing into that market. The legislative body would have to alter the fundamental laws governing the relationship between mortgage lenders and borrowers, a change that is likely to be politically unpopular. The key to its acceptance by the population would be their recognition that the benefits, in the form of vastly cheaper and more available mortgage financing, would outweigh the costs to those that default.

The enabling legislation would also likely have to address the tax status of the MBS. Usually the mortgages that are placed into the trust for the MBS remain the nominal property of the MBS issuer. Although the issuer would have sold away its rights to receive the cash flows and would have placed them in a trust that would severely limit its control over the loans, the title to the mortgages would still rest with the MBS issuer. This scenario could create a problem if the cash flows from the mortgage were taxed at the MBS issuer level and then were taxed again at the MBS investor level. In countries whose SMMs use passthrough securities, normally the passthrough cash flows are not taxed at the MBS issuer level.

A final issue that the national legislature may have to consider is how it will allow regulated financial institutions to treat investments in MBSs. In most countries with developed SMMs, financial institutions are allowed to treat MBS investments as a less risky investment than unsecured "whole" loans. The logic of this treatment is that because they are securitized, MBS investments are easier to sell rapidly and with a lower liquidity premium. Depending on the legal and regulatory traditions of the country, this may be an area that the legislature will task various regulatory bodies with monitoring.

National Securities and Banking Regulators

Although the national legislative body will create the legal infrastructure and the policy environment for the SMM, national regulatory bodies will have the responsibility for their day-to-day implementation. Because the specific regulatory structures of various countries differ, it is not possible to say exactly which body will have what task in a given country. What we do know, of course, is that virtually every country has an entity, or set of entities, that act as a national securities regulator, the equivalent of the U.S. Securities and Exchange Commission in the United States. Similarly, every country has an entity, or set of entities, that will be charged with regulating the banking system, the equivalent of the Federal Reserve in the United States.[27] For ease of exposition, we will refer to these entities as the National Securities Regulator (NSR) and the National Banking Regulator (NBR) while acknowledging that, for any specific country, these entities may actually be a series of regulatory agencies.[28]

The NSR will be responsible for promulgating regulations for the issuance and trading of MBSs. It will also set standards for information reporting about the securities and for the accounting practices required of issuers. In setting the initial rules of the MBS marketplace, the NSR has a unique opportunity to create a marketwide culture of transparency by fostering an environment in which data about MBSs and their underlying mortgages are readily available to investors and potential investors. Maximizing the information that is available to the investing public is the single most effective way to encourage competition, reduce fraud, and prevent market failure.

The NBR will be responsible for promulgating standards in two distinct areas. The first area relates to the creation of the mortgages which will eventually form the MBS. Because this will normally be written by a financial institution, it will have to meet national standards for consumer loans. Furthermore, the NBR will require that financial institutions have operational safeguards in place to prevent fraud. The second area relates to the relative treatment of nonsecuritized mortgages and MBSs. Because of its increased liquidity, the national banking regulator may elect to treat MBSs as a lower risk asset class than "whole" mortgage loans that have not been securitized. Treating MBSs as a lower risk asset class results in a lower risk-based capital charge, making it cheaper for the financial institution to hold MBSs and increasing the demand for MBSs relative to whole loans.

A challenge for both securities and banking regulators will be keeping staff members up to date on the most recent innovations and problems in the MBS marketplace, both domestically and internationally. Mortgage securitization and investment tend to be highly technical and innovations occur frequently. It is especially important that regulatory bodies establish formal training programs to ensure that their staffs have both the depth and breadth of understanding needed to make informed regulatory decisions.

Transnational Bodies

A number of transnational bodies, such as the World Bank, International Monetary Fund, and

[27] Although we note that, even in the United States, other entities, such as the Office of the Comptroller of the Currency and the Office of Thrift Supervision, also have regulatory oversight in banking.
[28] We also note that it is entirely possible that a country could have a single regulator for both securities and banking.

Bank of International Settlements, could potentially play some role in the development of an emerging secondary market. Their role would primarily be advisory in nature and would focus on two distinct areas. The first area relates to ensuring that an emerging MBS market meets generally accepted international standards with respect to security design, legal status, and transparency. The second area relates to ensuring that the banking and regulations of the country follow international best practices with respect to mortgage investing.

Of particular current interest to the regulatory bodies of many countries is the implementation of the Basel II accords. These accords are designed to develop an international standard for quantifying and measuring credit and operational risk in financial institutions. Mortgage securitization necessarily involves both credit risk and operational risk. Although joining the accords is a voluntary decision by a nation, doing so sends a clear signal that the country's regulatory bodies intend to establish a market that is consistent with international standards.

Any securities market will tend to have a fairly broad number of participants. When, as is the case with the SMM, it is built on top of a primary market, the number of participants can be quite large. We have classified these participants into three categories: direct market participants, indirect market participants, and regulatory bodies. Regardless of how they are classified, however, the secondary market participants must work within established economic, legal, and regulatory environments. We examine those environments in the next section.

Section 4. The Legal, Economic, and Regulatory Environment

A secondary mortgage market (SMM) is a highly complex institution that draws on the full range of a country's legal, economic, and regulatory infrastructure. For this secondary market to succeed, the overall economic environment of the country must be transparent, stable, and predictable. Although many specific ways in which a country can generate those conditions probably exist, we believe that any such system will necessarily have certain traits. The purpose of this section is to discuss those traits as they relate to legal, economic, and regulatory systems.

Legal Environment

As previously mentioned, most countries have to pass specific enabling legislation to allow the development of an SMM. This legislation, however, is really the culmination of the legal process that begins with fundamental legal issues. In particular, three primary ideas must be incorporated in the legal system, and must be widely accepted by the citizenry, before any mortgage system can develop. These ideas are the right of citizens to own private property, the right of lenders to foreclose on the collateral of loans that go into default, and the right of investors to earn returns on their investments. We examine each of these issues in the following text.

Private Property

A mortgage market only makes sense within the context of privately owned property. If the citizens of a country cannot own their own property, then they have neither the incentive nor the means to repay mortgage loans. Indeed, if private property ownership is not allowed, then lenders cannot treat mortgages as "secured" lending and cannot provide mortgage loans at the favorable rates generally seen throughout the world.

Most countries, of course, do allow some form of private property ownership, although the completeness of ownership can vary quite remarkably. Some countries, especially those with legal systems based on English common law, generally presume that individuals own the land completely. That is, they own the land, the mineral and water rights below the land, and even the air rights above the land. Other countries, notably many Asian countries, view ownership as primarily a surface right. That is, property owners have the right to use the surface of the land and the right to build on the land but do not necessarily own the mineral, water, or air rights.

Obviously, the more rights held by the homeowner, the more valuable the property is as collateral. That said, the only fundamental requirement for a mortgage market is that the property owner must have the right to possess the home, must have the right to prevent others from possessing it or otherwise using it, and must have the right to transfer that ownership.[29] If the homeowner has these rights, then, in general, they are sufficient to be used as collateral for a mortgage loan. What the lender primarily cares about is that, should the borrower default on the loan, the lender can sell the borrower's interest in the property to satisfy the debt.

A related, but distinct, issue is the need for a system to accurately and fairly record ownership

[29] Indeed, in many markets, renters with sufficiently long leases and sufficiently strong property rights are able to pledge their leasehold interests as collateral for a mortgage.

and a way of recording when a property has been pledged as collateral for a loan. It is vital to the development of a mortgage market that potential lenders be able to tell, at a relatively low cost, whether a property has a "clean and clear" title associated with it or whether "clouds" exist on the title. Such clouds would include restrictions on the property's use, outstanding liens on the property, or competing ownership claims. Similarly, it is of extreme interest to homeowners that there exists a dependable way of ensuring that claims are released when the loan in paid in full.

In virtually every country with a developed mortgage market, the recording of title and the recording of mortgage loans against title is done through a governmental agency, most commonly at the local level. To work, such a system must be free from any suspicion of corruption or favoritism and must be transparent both during the transfer of title and during the recording of any mortgages. Although it is possible to envision a nongovernmental system that could provide a transparent, inexpensive method for recording ownership, the prevalence of government-run systems tends to argue in favor of this being a task for government to manage.

Foreclosure

The defining feature of a mortgage loan is the pledging of the property being financed as collateral. The security provided by the collateral allows the lender to provide funding at an interest rate that is far below what is normally available for unsecured consumer loans. It also permits the lender to make loans with downpayment requirements that are manageable for a large portion of households. The key to this system is the notion that, should the borrower default, the lender can sell the pledged property to satisfy the debt. If the lender cannot foreclose on the property, the security interest has no value, and the lender is really just making an unsecured loan.

Foreclosure, however, can be a highly charged political issue, especially in countries that do not have a tradition of mortgage finance. The concern among the citizenry is that lenders will make loans for the purpose of "stealing" or otherwise misappropriating housing. To alleviate these fears, the legal system must have multiple checks within it to ensure that homeowners' rights are fully respected. That is, there must exist legal mechanisms specifically designed to ensure that the homeowner is informed of the consequences of nonpayment on accepting the loan, that they have ample opportunity to "cure" default should it occur, that foreclosure happens within a judicial setting, and that any proceeds from the sale in excess of the loan balance should revert to the borrower.[30]

A very large body of academic research shows that consumers consider mortgage default as an option to be exercised if the benefits of defaulting outweigh the costs.[31] As shown by Ambrose, Buttimer, and Capone (1997), increasing the time it takes to remove a borrower from a house through the foreclosure process increases the likelihood of default in the first place. As a result, lawmakers have to carefully weigh the balance between providing enough consumer protections against foreclosure to convince the population that their rights will be respected versus creating a system in which foreclosure is not a real consequence of default. If foreclosure is not a predictable outcome of default, or if the time or costs of foreclosure are too high, then consumers

[30] We note that, in the event of default, the loan balance may include accrued interest, penalties, and foreclosure costs in addition to the outstanding balance of the loan.

[31] See Kau, Keenan, Muller, and Epperson (1992), Ambrose, Buttimer, and Capone (1997), or Ambrose and Buttimer (2000).

will have a stronger incentive to default and lenders will have little incentive to provide mortgage loans as secured loans, with the consequent higher interest rate and downpayment requirements.

Of particular importance to the formation of an SMM is the notion that secondary market investors have the same right to foreclose on defaulted loans as do the original loan issuers. The secondary market investors must have these same rights, or they will be unwilling to invest in mortgage-backed securities (MBSs). This can be of particular concern if a country wishes to attract international investment. Many countries place limits on ownership of land by foreign nationals, and some countries even ban foreign nationals from owning land. If the country wishes to attract mortgage funding from the international capital markets, then it must put in place some system through which foreclosure can occur in which the international investor can receive the same market value for the foreclosed property as would a domestic investor; otherwise, foreign investors will be at such a competitive disadvantage that they will not enter the market.

Earning Returns

Lenders bear risk when making mortgage loans. These risks include the risk that interest rates will move in an unfavorable direction, the borrower will not repay the loan, and the lender will not be able to recover the value of the loan in the event of default. It is generally accepted in developed markets that lenders are entitled to earn a rate of return for bearing this risk. Normally, this rate of return is expressed in the form of a contracted interest rate on the mortgage loan.

Modern financial theory demonstrates that, in a competitive economy, lenders earn a rate of return that is determined by the rate of return that is available on investments with comparable levels of risk. Competition in the marketplace prevents lenders from charging “excessive” interest rates on loans. Even so, many countries, including many countries with market-oriented economies, place some limits on the maximum interest rate that any lender can charge a borrower. The logic behind these usury laws is that they protect financially unsophisticated or distressed borrowers from agreeing to disproportionately unfavorable terms.

The difficulty with usury laws is that no generally accepted method exists for determining what constitutes a rate that is usurious: what may seem like usury when the general level of interest rats is say 5 percent might appear to be just a normal rate of return when the general level of rates are 15 percent. If the rate that is defined to be usurious is set too low, it will prevent adequate capital from flowing into the market and will create a credit crunch; when market rates rise sufficiently, mortgage funds dry up. The manner in which the concern for borrowers being charged too high a rate is dealt with in the United States is by laws prohibiting discretionary practices that are based on noneconomic factors such as race, religion, or gender.

These three legal concepts—the right to own private property, the right to foreclose on loans that go into default, and the right of a lender to earn a return—are fundamental to developing an active mortgage market. Although the specific rules and procedures that a country sets up are important, what matters most is that the country establish a stable, predictable system. Markets work best when the legal system is transparent and predictable; that is, when all participants understand the degree to which contracts are enforceable and they can form reasoned opinions about the likely behavior of MBSs and the nature and extent of the credit risks.

Economic Environment

Establishing an SMM requires more than just a supportive legal infrastructure; it requires a high degree of financial sophistication among consumers and lenders, an active primary market, and an economic infrastructure that is capable of providing significant support services. In this section, we examine specific components of the economic environment that must be in place in order for an SMM to flourish. These components include an acceptance of consumer credit by society, a system of consumer credit reporting, a system for appraising property, a support infrastructure for the secondary market, a technology infrastructure capable of secure transmission of mortgage data, and a liquid capital market. We now discuss the role of each of these components.

Acceptance of Consumer Credit

The first prerequisite for the success of any market is that it must fill a need for society. If consumers view mortgage debt as inherently bad, or if they are uncomfortable with the notion of financing housing, then neither a primary nor SMM will succeed. If consumers do not want to finance housing purchases, then no reason exists to create mortgage markets.

In many parts of Asia, for example, considerable opposition to the financing of housing purchases exists. Particularly in countries in which extended family ties are very strong, the traditional method of financing a house has been for the extended family to gather enough funds to make an all-cash purchase of the house. If the homeowner was unable to raise enough funds and had to resort to using a mortgage, a social stigma existed. In such cases, family members would frequently set a goal of helping the borrower retire the debt as quickly as possible. Although this is changing in many Asian countries, such as Taiwan, a stigma still is attached to mortgage borrowing in some parts of the continent.

Even if consumers are willing to take out mortgages to finance housing, there must also be an ingrained cultural acknowledgement that such mortgages must be repaid. In countries with relatively little experience with consumer financing, there may be a tendency of borrowers to view mortgages more as grants than as loans. Overcoming such an attitude and developing a national recognition that debt repayment is expected is a prerequisite to establishing any type of mortgage market.

Credit Reporting System

Countries that do not have long-established traditions of consumer credit frequently do not have the same economic infrastructure in place that other countries do. One example of this is a credit bureau or credit reporting system. Lenders must have a way of evaluating both a potential borrower’s willingness and ability to repay a mortgage loan. In many emerging economies, this evaluation has traditionally been handled by ensuring that loan officers are local residents who personally know the borrower. Although such a system can be highly effective in a locally oriented primary market system, it is unlikely to be effective for a secondary market.

Because a secondary market is typically national in scope, it is not practical to rely on personal

knowledge of borrowers for two reasons. First, there would be a clear information asymmetry between primary and secondary market participants. Primary lenders would have both the incentive and the opportunity to retain good-quality loans while selling bad-quality loans to the secondary market. This would effectively create a market for "lemons"—defective or undesirable loans.[32] With no exogenous way of measuring the credit quality of the borrowers, secondary market participants would be at the mercy of the primary market lenders. Second, even if primary lenders behaved in a perfectly scrupulous manner, there would still likely be great variation in credit quality across loan officers simply because perceptions of creditworthiness will vary. That is, two lending officers, both with the best of intentions, may examine the same applicant and genuinely arrive at different conclusions regarding the applicant's level of creditworthiness. Either of these situations will discourage mortgage investing.

Establishing a comprehensive consumer credit collection system is imperative for creating a national mortgage market but doing so takes time. A need to pass legislation defining what information can be collected and disseminated is likely; furthermore, it will take time to establish the physical and technological infrastructure to collect credit data, and it will take time to determine the exact set of variables which best predict consumer behavior in that particular market. Finally, even after the infrastructure has been put into place, it will take years to collect a sufficiently complete data set to allow credit modeling. Because of the time required, it is imperative that any country considering establishing an SMM begin establishing a credit reporting system as soon as possible.

Property Appraisal System

The cornerstone of a mortgage is the notion that it is secured by collateral with some known value. MBS investors will demand that property used to secure the underlying mortgages be appraised in a manner that is uniform through the country and consistent with international standards.

The primary concern that MBS investors will have with respect to property appraisals is that the system for conducting them be accurate, replicable, and impartial. Until recently, this meant establishing a national network of appraisers that would agree to follow a predefined set of procedures for establishing value. Such systems include those of the Royal Society of Chartered Surveyors in the United Kingdom and the Appraisal Institute in the United States. These networks typically set both procedural and ethical standards for the industry and can take disciplinary action for violations of those standards. For example, in the United States, appraisers maintain self-regulating procedures that can "disbar" unethical member appraisers.

In the past 10 to 15 years, a number of theoretical advances have been made in using econometric techniques to estimate property value. Indeed, most lenders in the United States are now willing to accept "automated" valuations for routine mortgage loans. The key to such systems is the systematic collection of sales price and property attribute data and their availability to the public.

[32] For details of the market for lemons, see Akerlof, George A. 1970. "Market for Lemons: Quality Uncertainty and Market Mechanism." *Quarterly Journal of Economics*, 84(3).

Secondary Market Support Services

As discussed in section 3, an SMM requires a significant infrastructure to support it. In particular, the market must have access to mortgage servicers, MBS trustee providers, investment bankers, attorneys, and accountants. Most of these services must be in place before the development of the secondary market or must be developed simultaneously with it.

Technology Infrastructure

Because of the complexity of the instruments, investors in MBSs and MBS derivatives typically demand information about the underlying mortgages and borrowers. At MBS origination, investors will demand to know information such as the distribution of coupon rates, loan types, initial loan balances, and borrower credit information. As the MBS ages, investors need updated payment histories and loan balances. The data is essential for investors to value the MBSs. From various disclosed data, investors can make informed estimates of future cash flows and hence current value. Accuracy of the data is very important and auditors must be able to assure investors that the disclosures are accurate.

Providing this information in a timely manner can only be done through computer systems. This means that primary lenders and servicers must have access to a secure data network through which they can transmit this information monthly. MBS issuers must have data centers with the storage and computational capacity to aggregate the data, analyze it, and send it to the investors. The infrastructure must be sufficient not only to gather and analyze this information but also must be able to protect the data and the privacy of the borrowers.

Liquid Capital Markets

SMMs are not typically the first capital market that a nation establishes. The social benefits of liquid stock and bond markets are usually large enough to warrant their establishment far in advance of an SMM. Experience in these markets helps develop the human capital; that is, the expertise and technical skill base that the country needs to create the SMM.

Having liquid capital markets already in place also helps attract international capital to the SMM. The success of those markets helps assure potential international investors that the country has the legal, economic, and regulatory infrastructure that it needs to successfully operate a secondary market. The existence of a capital market is also important for attracting domestic capital as well. Not only will the smooth running of the preexisting capital markets assure domestic investors, but they will have access to an already existing infrastructure for making capital market investments. That is, domestic investors will already have access to brokers and other financial service providers.

Mortgages and MBSs typically have a significant exposure to interest rate risk.[33] A liquid capital

[33] Even adjustable-rate mortgages typically have exposure to interest-rate risk. This exposure occurs because almost all adjustable-rate mortgages have either payment caps or interest rate caps that limit their responsiveness to interest rates. Even if such caps did not exist, if interest rates rose high enough quickly enough, then borrowers would begin defaulting on the loans, thus exposing lenders and guarantors to a type of interest-rate–driven credit risk.

market, especially a fixed-income capital market, will normally provide some method for hedging that interest rate risk. Ideally, this market will have derivative products, such as interest rate caps, floors, swaps, and swaptions, which are explicitly designed for hedging interest rate risk. Even if such instruments do not exist, however, an MBS investor may be able to take short positions in bonds or other fixed-income instruments to help hedge its interest-rate risk.

This section stresses that an SMM cannot exist in isolation. It requires a significant base of technical, financial, and economic support to be successful. Some of these skills and services should already be in place if a country already has well-functioning capital markets. Others, such as consumer credit reporting, may have to be created from scratch. In order for an SMM to succeed, the economic environment of the country must be sufficiently well developed to support this complex and sophisticated market. Similarly, the regulatory environment in which the SMM must work must also be receptive and sufficiently developed to support the marketplace. In the next section, we examine several regulatory issues that must be addressed when developing an SMM.

Regulatory Environment

Like the legal and economic environments, the regulatory environment must be receptive and ready to work with an SMM. This means ensuring that the regulators for the market have sufficient technical resources to monitor the market, that they have a clear mandate to provide a transparent regulatory process, and that they have the authority to take quick action in the event they detect a problem in the marketplace.

Regulatory Mandate

Many countries have separate regulatory bodies for their banking system and their securities system. For example, in the U.S. the Securities and Exchange Commission regulates publicly traded securities, while the Federal Reserve System, along with the Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation, regulate banking activities. Mortgage securities tend to straddle the line between banking and securities regulation. As a result, it is relatively easy for the SMM to receive either too little or too much regulatory attention.

Any country with an emerging economy that is in the process of beginning an SMM would be well served to provide a clear regulatory mandate for that market. That is, designate a specific entity and give it the primary responsibility for regulation of the SMM. This clear mandate will provide an unambiguous signal as to which body is responsible for regulating the market.

Human and Technical Resources

Ideally, employees of regulatory bodies will have the same set of technical skills as do the participants in the markets that they regulate. For markets that are both highly specialized and highly technical in nature, this standard can be almost impossible to meet. Those employees that develop state-of-the-art skills will find that their services are very much in demand in the private sector and will be highly tempted to leave the regulatory body.

The key is for the senior management of the regulatory body to recognize that they must compete with the private sector for this highly specialized labor. To attract and retain competent employees, they must provide salary, benefits, and advancement opportunities that are comparable with those being regulated.

In addition to the human resources, regulatory bodies must also have access to the same level of technical resources that are commonly used by market participants. For an SMM regulator, this means having access to interest-rate data, pricing models, and prepayment information that is as good as that held by the MBS issuers and investors.

Transparency

One of the main themes in this paper has been that SMMs work best within a "culture of transparency." This observation is especially true with respect to regulatory bodies. They must conduct their work in a way such that there can be no question as to their impartiality and integrity. If the market comes to believe that regulators are not evenhanded with respect to all market participants, it will create a crisis of confidence in the market and usually cause a flight of capital.

Creating a culture of transparency for a regulatory body means having clearly defined procedures and processes for its regulatory activities. It means ensuring that when regulatory actions are taken, the investing public is informed in an orderly and consistent manner. It also means that when overlapping areas of responsibility are present, regulatory bodies work together to develop a unified approach to those responsibilities.

It is convenient to consider the legal, economic, and regulatory environments of a nation as distinct and apart from each other. In reality, however, they each rely and build on each other. The economic environment cannot exist if the legal environment is hostile toward it. Similarly, the legal environment is irrelevant if a regulatory culture is not present that both respects and enforces the law. A country that seeks to develop an SMM must ensure that all three environments—legal, economic, and regulatory—are able and willing to support that market.

Section 5. Summary

The intent of this paper has been to examine the issues surrounding the establishment of a secondary mortgage market (SMM), including the benefits of such a market to homeowners, lenders, investors, and society at large. Our central argument is that mortgage markets in general, and SMMs in particular, make society better off. We can see this in a number of ways. First, a secondary market increases the capital flow into the mortgage markets, which reduces the costs of borrowing and increases the affordability of homeownership. Second, a secondary market segregates mortgage origination from mortgage investment. We argued that, although financial institutions are well suited to originating mortgages, they are not well suited to long-term investing in "whole" mortgage loans. The SMM allows financial institutions to concentrate solely on originating loans and then sell them to more appropriate long-term investors in the secondary market. Third, we argued that properly structured SMMs can attract international capital to a nation's housing markets, further reducing the cost of borrowing to consumers.

We also argue that markets work best when information about the market is widely available at little or no cost and that it is in the best interest of society to establish a "culture of transparency" with respect to the development of an SMM. This transparency must permeate all aspects of the market, from the rules used to determine which mortgages qualify for sale to the secondary market, to the laws governing default and foreclosure, and to the accounting methods used to track MBS investments. Even regulatory bodies must be transparent with respect to the procedures they use to enforce the financial laws of the country.

Starting a successful SMM is a major undertaking for any country. It is an undertaking that takes time and that requires the full integration of the legal, economic, and regulatory environments of the country. Although a significant effort, the benefits for the citizens of the country can be very large. The reduction in borrowing costs and the expansion of funds available directly translate into more affordable housing with the existing housing stock. This allows more people to become homeowners and gives them a stake in the political and social stability of the country.

Appendix A. Romania Case Study

Romania started an initiative in 2001 with the assistance of the U.S. Agency for International Development to encourage reform of its financial and capital markets. This mission was expected to also provide a kickoff for Romania's mortgage securitization, but, due to numerous legal barriers, accounting and taxation issues, and capital market infrastructure constraints, the first mortgage-backed security (MBS) was not issued until 2005.

Primary Mortgage Market

Romania did not have an active primary mortgage market until the 21st century. The most significant development was the €10 million mortgage program that the European Bank for Reconstruction and Development made to one local bank in Romania in 2003. The mission of the mortgage program was to provide funding support to European countries with capital shortages for housing finance. Previously, a lack of stable long-term funding sources for Romania's local banks existed. Before mortgage securitization, the main funding sources were the international financial institutions and the main banking organizations with branches in Romania. During the past few years, however, major Romanian banks have shown great interest in developing the primary mortgage market due to rapid economic improvement.

Traditionally, the typical term of mortgage loans is between 10 and 15 years. This practice has evolved to 20 to 25 years since 2003. Due to the extension of the maturity, borrowers are able to qualify with lower monthly payments, which improved the affordability of homeownership. The level of nominal interest rates is high relative to that of the United States or other countries due to high inflation rates and this remains a major affordability factor. The high level of mortgage interest rates is an obstacle to the development of the primary mortgage market.

Government Support

Critical legal infrastructure support and tax treatment rules for MBSs needed to be clarified before sales of mortgage securities in Romania's secondary mortgage market.

Legal and Regulatory Framework

To support the MBS transactions, the Romanian government enacted several laws: Securitization Law, Mortgage Bond Laws, and Mortgage Banks Law. It also modified the prior Mortgage Loan Law to permit various institutions to invest in the newly established security. These legislative changes established the foundation to support the rapid development of the new mortgage securitization market.

According to Romanian law, the transfer of the present and future assets to a special purpose entity (SPE) is done by an assignment. The assignment is only effective with an agreement between the originating institution and the SPE and a written document regarding the agreement is preferable. Also, the debtor needs to be notified by registered mail and the originator's creditors need to be notified by a posted public notice at the originator's headquarters.

The feature of bankruptcy remoteness for the SPE is implemented by limiting the scope of business and by not allowing it to have any employees. The transfer of assets needs to be notarized and registered. Under Romanian law, the business activity of purchasing and transferring assets is free from licensing requirement. One unique treatment regarding servicing is that it may only be operated by credit unions and financial institutions with the authorization of the National Bank of Romania (NRB). This treatment indirectly implies that, for any securitization deals, it is highly recommended to coordinate with NRB to deal with regulatory issues.

Under Romanian data-protection regulation, the originating institution is mandated to disclose the borrower's information regarding the underlying transferring assets to the SPE and other relevant parties involved in the transaction deals, but it requires the borrower's consent to the disclosure and notification to the data-protection ombudsman. This also means that the disclosure of the borrower's related information does not violate bank confidentiality rules regarding the borrower's personal savings and account information.

Tax Issues Related to Mortgage Securitization

Under Romanian tax law, no stamp duty is levied on the transfer of assets unless the involved parties decide to notarize the deed. The tax charged on transferring assets for securitization purposes is exempted from value-added tax. For a securitization deal, the tax law requires a 16-percent withholding tax applied to both nonresident issuers receiving interest from Romanian domestic investors and nonresident investors earning interest from Romania domestic issuers. In addition, a 16-percent tax rate for the profit of the securitization company is assessed and the unit holders in securitization funds pay a 1-percent tax on revenues if the units are held for no less than 1 year and a 16-percent tax on revenue otherwise. Pursuant to double taxation treaties, the tax consequences for nonresidents may not exceed the difference in the tax paid to Romania and to the country in which nonresidents are legally domiciled.

Challenges Related to Mortgage Securitization in Romania

Special attention needs to be paid on several additional issues. First, the growth rate of salaries may be slow compared to potential increased payments for adjustable-rate mortgages. This growth rate implies that fear exists that people could borrow and not be able to afford the payments later on. Second, even though the average income increases, the low average income of Romanian households remains the main roadblock regarding the housing affordability problem. Third, the high level of mortgage contract rates will indirectly have a negative impact on mortgage securitization. Fourth, due to the high volume of informal market activities, it is difficult to verify the borrower's income. This challenge makes establishing a standardized underwriting procedure difficult. Fifth, the interest-rate risk involved in mortgage lending activity is commingled due to the existence of fixed and variable interest rates and the different rates for mortgage credit in "lei" or other currencies.

Appendix B. Taiwan Case Study

Taiwan first began to examine the feasibility and desirability of establishing a secondary mortgage market in the early 1990s. In 1994, the Taiwan Securities and Exchange Commission completed a feasibility study that laid out the issues and challenges associated with developing such a market. Development of the market was slow, however, primarily due to changes that were needed in the legal, accounting, and taxation areas. Due to these constraints, the first mortgage backed security was not issued until 2004.

Primary Mortgage Market

Taiwan has had a primary residential mortgage market for a long time. The volume, however, was low relative to the total value of housing. This was primarily due to two reasons: a cultural aversion to debt financing and the specific type of mortgage contract that was available. First, many Taiwanese were highly averse to borrowing. If they did use debt financing, they attempted to repay it as quickly as possible. Given this aversion, many Taiwanese would not even consider using a mortgage with its long-term obligation. Typical home purchases were completed only when a household either saved enough to make a cash-only purchase or was completed with borrowing from family members. The second issue was that Taiwanese mortgages were typically adjustable-rate mortgages (ARMs) that were indexed to the lending bank's prime rate. This rate was not transparent and was not set by the market: the prime rate level was fully controlled by the origination bank. Furthermore, these loans were purely floating loans; that is, they did not feature any interest-rate or payment caps. This meant that borrowers faced considerable uncertainty about future payment levels.

The Taiwanese financial system, both at the capital market and retail levels, underwent a significant transformation in the past decade. This transformation has greatly expanded credit opportunities for consumers and has resulted in a greater familiarity and acceptance of financial leverage and the use of debt. In addition, the government has created a number of subsidized residential mortgage programs offered to help homebuyers in specific demographic sectors. The typical sizes of the subsidized loans are NT$2.5 million in the Taipei metropolitan area and NT$2 million in other regions. Compared with the typical housing price of approximately NT$6.92 million, the government loans are usually not large enough to facilitate home purchases. As a result, most home purchases are completed using a tier of mortgages, some with subsidized rates and some at higher rates. This complication introduces additional challenges when banks try to package mortgages into mortgage-backed securities (MBSs).

In April 2002, a new index for ARMs was introduced. The index is publicly tracked by the government and is calculated as the average of the 1-year fixed savings deposit rate of the major banks in Taiwan.[34] Since then, virtually all ARMs have been tied to this transparent index plus margins. Typical margin ranges from 100 to 300 basis points, depending on the borrower's credit characteristics. Some banks tested the feasibility of offering fixed-rate mortgages (FRMs) on a pilot basis. To date, the share of FRMs in the market is still negligible. ARMs based on the public ARM index are the dominant product in the primary mortgage market. As of the end of 2006, more than NT$4.41 trillion total residential mortgage were outstanding. The average

[34] With respect to the number of major banks selected, it is fully determined by the bank.

interest rate is 2.28 percent per annum. The rates are typically adjusted every 3 months, with no annual or lifetime caps. The greater transparency has made consumers significantly more accepting of these loans.

The factors being considered during the loan underwriting process include the source of the borrower's income, employment status, and other debt expenses. Although a publicly maintained credit score is readily available, it has not been actively used as one of the underwriting criteria. Traditionally, not much variation occurred in initial loan to value (LTV). The vast majority of loans were originated with LTVs in the range of 70 to 80 percent. This common practice has changed since 2002. During the past 5 years, commercial banks introduced numerous programs with higher initial LTVs, sometimes more than 100 percent, to attract specific groups of qualified borrowers. The government, however, placed regulatory restrictions on these high LTV loans after the market experienced a severe default crisis in retail lending during 2006.

Government Support

Although the Taiwanese government has chosen not to establish public or semipublic mortgage agencies similar to the Federal Housing Administration, Ginnie Mae, Fannie Mae, or Freddie Mac, it has provided the critical legal infrastructure support and tax benefit to promote the MBS.

Legal and Regulatory Framework

For many years, legal constraints were the main roadblock to mortgage securitization. Taiwan's legal system—a type of common law—requires that new financial activities can only occur after explicit legal authorization. In order to authorize MBS transactions, the Taiwanese government enacted several laws, including the Financial Asset Securitization Law on July 22, 2002, and modified several other regulations to permit various institutions to invest in the newly established security type. Under the original regulation, institutions were not allowed to invest in any security that was not explicitly stated in the list of eligible securities.

One of the legal barriers was the transfer of title of the mortgage assets from the original lender to the MBS issuer. A special purpose trust (SPT) is a legal vehicle that is typically established to isolate the collateral assets from the MBS issuer and to ensure that, should the issuer enter bankruptcy, the security would still be viable. The law requires that the SPT be independent of the originating institution. The transfer of the assets from the originator to the SPT is not permitted without the authorization of the Financial Supervisory Commission. The theory is that this supervision ensures that the transfer of the assets related to securitization is complete and clean. In particular, it seeks to ensure that that the issuer does not retain recourse obligations in the transferred assets.

Tax Issues Related to Mortgage Securitization

The Financial Asset Securitization Law also governs the tax treatment of MBSs. The tax consequence for the net income of the SPT will be taxed pursuant to the same treatment applied to regular banks (2 percent of net income). The law requires the trustee to withhold 6 percent on interest paid to MBS holders; therefore, both domestic and foreign MBS holders will receive their coupon, net of the withheld taxes. After the withholding, however, the investors no longer

need to include the security income in their reported annual income for tax purposes. This effectively limited the tax rate of the MBSs at 8 percent regardless of the income level of the investor. The government intends to use this special tax rule to attract institutional and wealthy individual investors into this new type of security. In addition, the tax treatment associated with the transfer of assets is exempt from stamp duties, contract tax, and business tax.

Securitization Activities to Date

Although the concept has been studied for more than 10 years, the first Taiwan MBS was not issued until March 2004. According to the 2002 Regulations Governing Securitization of Financial Assets (RGSFA), any financial assets, including residential mortgage loans, can be securitized for channeling different sources of investment capital into consumer lending activities. To date, six mortgage-backed security deals have been issued totaling NT$49.57 billion (approximately US$1.54 billion). They are issued through private placements. Four are domestic issuances and two are issued to both domestic and offshore investors (denominated in euros, listed on the Irish Stock Exchange).[35] Because Taiwan does not have government mortgage insurance or guarantee agencies, these securities are similar to the private-label deals in the United States. All six deals are packaged using a senior-subordinate structure with credit tranching. Two of the deals also obtained external guarantees from international bond insurance providers. [36] The senior-subordinate credit enhancement consists of subordinated classes of securities to absorb the first and mezzanine default losses, enabling the remaining senior tranches to achieve investment-grade ratings.

These six MBS deals share some common features; for example, all loans are secured by a first lien on residential properties with concentrations in northern Taiwan, the originating institutions also serve as servicers of the MBSs, and the issuer and the trustee is Deutsche Bank. The Trust Law mandates that the trustee be responsible for searching for a backup servicer or being a backup servicer if necessary. Some deals involve only private-label loans, while other deals include both government-subsidized loans and private-label loans.

Due to the lack of historical mortgage performance data, the subordination levels of these deals are much higher than those in the United States This is likely to decline as the performance of these six deals provides a valuable benchmark of credit risks and as the rating agencies become more familiar with this new product in Taiwan.

We also note that the Taiwanese credit industry was in an excess capital situation during the past few years. When banks had excess capital, little incentive existed for them to sell off high-quality assets from their portfolios. The securitization activities were somewhat limited due to this market timing issue.

[35] The financial institutions issuing mortgage-backed securities (MBSs) were First Commercial Bank, Chinatrust Commercial Bank, Taishin Commercial Bank, Chang Hwa Bank, and Hsinchu International Bank. Hsinchu International Bank issued both domestic and offshore MBSs.

[36] Hsinchu International Bank arranged external credit enhancements from Ambac Financial Group, Inc., for mortgage-backed securities in tandem.

Other Issues Related to Mortgage Securitization

A number of issues still are limiting the growth of MBSs in Taiwan. First, no standardized mortgage product or underwriting standard exists in Taiwan. Without such standardization, the transaction costs of evaluating the underlying mortgages and the processing costs of mortgage securitization will remain high. Without uniform underwriting standards, the deviation in credit quality among underlying mortgages will be high, which can lead to higher MBS coupon spreads.

Second, prepayment risk is not fully understood for the Taiwanese market. No generally accepted prepayment benchmark exists within the country, and it is not clear that Taiwanese prepayment patterns are similar to those seen in other countries so as to allow the easy adoption of their models. One major difference, for example, is that in Taiwan partial prepayments, known as curtailment, is the major form of prepayment. Curtailment reduces the remaining balance of the mortgage relative to the house value, and lowers the current LTV and the default risk. The six MBS transactions are all backed by the pool of seasoned loans. Failure to capture the curtailment history of the underlying pool can lead to overstating the credit risk of the loans and cause undervaluation of the MBS.

Third, no mortgage insurance system is currently in place in Taiwan, either for individual loans or for MBSs as a whole. The lack of mortgage insurance makes MBSs less appealing to investors, and forces MBS issuers to structure the securities to minimize credit risk. In particular, they must use a senior-subordinate system in which the cash flows from the MBS are divided into tranches in a multiclass security. The junior tranches absorb any defaults that do occur.

Outlook

That six MBS have been issued in Taiwan in the past 3 years speaks to the ability of the country to develop this market more fully. As the market grows and develops we can expect to see ripple effects in the primary market that will include structuring of the primary loans to make them more appealing to the MBS marketplace. We also expect to see the development and emergence of a mortgage insurance industry to support both the MBS marketplace and the primary market. We note that at least two foreign private mortgage insurance companies have considered entering the Taiwanese market.

Appendix C. Guatemala Case Study

The Republic of Guatemala, in Central America, is located between Mexico to the north and Honduras and El Salvador to the south. Guatemala has a population of approximately 12 million people. During the mid-1990s, the country emerged from a prolonged period of internal armed conflict. Since that time, the country has experienced moderate economic growth. Guatemala signed the Central America Free Trade Agreement (CAFTA), which went into affect within Guatemala on July 1, 2006.

Capital Markets

Guatemala has an active financial services sector. Twenty-four financial institutions are operating within the country, but some have highly specialized missions, such as financing import-export activities. The four largest financial institutions dominate the retail and consumer financial services sector. The country has a history of allowing investment in the financial services industry. Citicorp and Lloyd Bank International, for example, each maintain offices in Guatemala while Bank of America, Chase, and the Bank of New York each have correspondent or trustee relationships with Guatemalan banks.

Guatemala has an uneven capital market structure. Although it does have a stock market, it is very small and has only a handful of firms listed on it. In practice, almost all firms in the country are privately owned. It does have an active primary corporate and government bond market, and at least one successful securitization of credit card receivables has occurred.

Primary Mortgage Market

Guatemala has an active primary mortgage market, although, according to a report by CountryWatch, few banks are willing to make mortgage loans for more than 5 years (not fully amortized). Such a relatively short window for mortgage loans is typical of countries in which originators must hold mortgage loans in portfolio; the short window allows the financial institutions to maintain a rough parity between the interest-rate risk of their assets and liabilities. Given that consumers typically prefer longer term mortgages, this may be an indicator that consumers could be made better off through securitization. If longer term lenders could enter the Guatemalan market via a secondary market, then consumers could obtain longer maturity loans while the primary lenders avoid taking on excessive interest-rate risk.

Secondary Mortgage Market

The country does appear to have many of the necessary elements for a secondary mortgage market (SMM). It already has a history of securitization, it is open to international financial institutions, and it has many of the legal requirements in place. For example, the Guatemala Constitution specifically recognizes the right to hold private property. The country's foreign investment law specifically allows foreign ownership of most real estate in the country.[37] Foreign nationals and interests have access to the court system.

[37] Foreigners are generally prohibited from owning property that is adjacent to oceans, rivers, and national borders.

What Guatemala currently lacks, however, is a fully functioning capital market system. As noted in the main body of this paper, it is difficult to envision a situation in which an SMM leads the development of other capital markets, such as the stock market. Furthermore, the relatively small size of the population means that the costs of developing an SMM cannot be amortized over a very large number of loans. Thus, considerable uncertainty exists in starting an in-country SMM.

An interesting solution to this dilemma has been proposed by the U.S. Overseas Private Investment Corporation (OPIC), an independent agency of the U.S. federal government. OPIC has agreed to serve as the guarantor for a mortgage-backed security (MBS) backed by Guatemalan mortgages amassed by the Guatemala Mortgage Corporation from Guatemalan banks. The MBS will be managed by Mercury Mortgage Finance, an international company with offices in both Miami and Guatemala.

OPIC has agreed to guarantee the MBS for up to $7.5 million. Interestingly, this protection includes political risk protection for MBS investors. OPIC anticipates that this MBS will consist of up to 1,500 individual mortgages. The MBS will be issued in U.S. capital markets and will provide Guatemalan borrowers with indirect access to the U.S. market. Perhaps more significantly, however, the transaction is specifically structured so as to transfer key U.S. servicing and securitization technology to Guatemala.

Outlook

OPIC is currently considering guaranteeing similar projects from Guatemala and other CAFTA (notably El Salvador) countries. This model may present an interesting option for many smaller countries. If they are open to international investment in their mortgage markets, they may be able to create a synthetic SMM. That is, they may be able to issue mortgages domestically but allow those mortgages to be placed into MBSs that are sold in foreign secondary markets. Provided that the foreign secondary market is transparent and protects the rights of the domestic lenders, this should provide domestic consumers with the benefits of securitization without having to force the economy to bear all of the market development and infrastructure costs.