

# Prerequisites for a Successful Secondary Mortgage Market: The Role of the Primary Mortgage Market

by Michael J. Lea

## INTRODUCTION

Securitization and secondary mortgage market development are major topics of interest throughout the world. The success of the secondary market in the U.S. has led both private and public sector officials in many countries to recommend its creation as a way of enhancing the flow of funds to housing. However, what is often overlooked in such discussions is the readiness of the primary market. True and sustainable secondary market development cannot proceed unless and until the primary market is able to produce a sufficient volume of high quality mortgages that meet the servicing and performance requirements of investors. This paper will address the primary market prerequisites for securitization and secondary market development and review the primary market conditions in Mexico to assess the

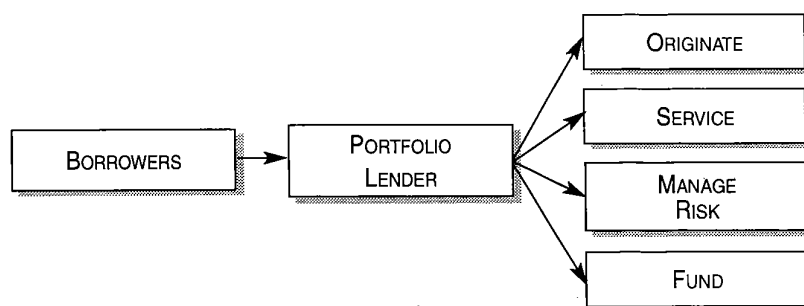
likelihood for a sustainable secondary market in the near to medium term.

The importance of the primary market is magnified with the introduction of a secondary market. This is due to the fact that there is a separation of functions in a secondary market. This leads to functional specialization and dependence of one party on the actions of others.

As shown in Figure 1, the traditional model of mortgage lending is the portfolio lending model in which one institution performs the

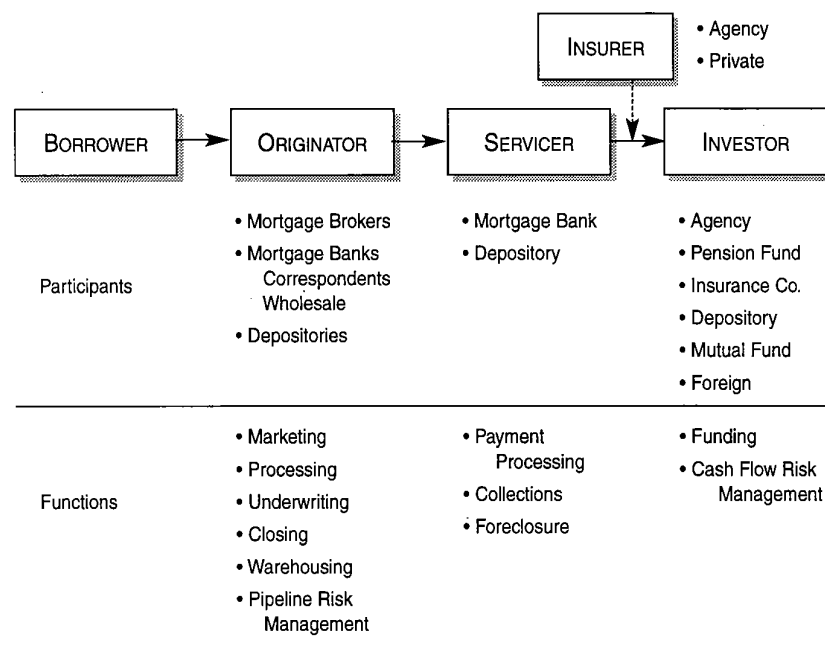
major functions of origination, servicing, funding and portfolio risk management.<sup>1</sup> These intermediaries may utilize the services of third-party vendors, such as mortgage insurers, appraisers and credit agencies. However, a single firm accomplishes the primary functions. The portfolio lender originates a mortgage to a homebuyer, services it, and performs the pipeline risk management and portfolio management functions, including funding. Portfolio lenders may be depository institutions (commercial banks, savings banks, savings and loans, building societies), con-

Figure 1 The Bundled Home Mortgage Delivery System—Traditional Model



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**Figure 2** Unbundled Mortgage Delivery System—Modern Model



tract savings institutions or European-style mortgage banks.

Figure 2 shows the modern unbundled mortgage delivery system characteristic of a secondary mortgage market. In this model the functions of origination, servicing, risk management and funding are unbundled and managed by different specialized entities. Originators may be traditional depositories, mortgage companies or mortgage brokers. The institution that originates the loan may or may not be the one that services it. Depositories or mortgage companies do servicing. In the unbundled model there are a wide variety of investors ranging from depositories (investing in loans originated and serviced by others) to mutual funds. In the global market, they may be either domestic or foreign. Finally, credit risk management is often specialized as well, provided by third

parties such as mortgage insurance or bond insurance companies (public or private).

The dependence of one functional entity on another means that mistakes are more difficult to hide in a secondary market system.<sup>2</sup> In the portfolio lending system, a loan that is mis-priced or has incomplete documentation or weak underwriting can be "buried" in the portfolio. However, in a secondary market system in which the loan is sold, these "blemishes" become apparent much more rapidly. Origination specialists also must be more cognizant of pipeline risk because their loans are sold soon after origination. Pipeline risk is the risk that between the time a lender makes a binding commitment to a borrower and the time the loan is either sold or placed in portfolio, the value of the loan will decline. If a loan is mis-priced, the lender takes an immediate loss. Even if the loan is

properly priced, incomplete or erroneous documentation can lead to a lender having to repurchase a loan at a future date. Thus the quality of mortgages produced by the primary market becomes much more important in a secondary market.

A successful secondary market is based on effective management of the basic functions and risks involved in mortgage lending, no matter what institutional entities are involved or what separation of functions exists in the market. Also, the degree of competition in the primary market may have a major bearing on the readiness of lenders to participate in a secondary market.

## MARKET STRUCTURE

### Macroeconomic Environment

The structure of the domestic mortgage market is an important factor in secondary market development. First and foremost, mortgages must be attractive investments. The interest rates on the mortgages must be market determined and provide investors with a positive, real, risk-adjusted rate of return. Thus, the mortgage rate must be sufficient to cover the investor's marginal funding cost (both debt and equity), the risks of mortgage investment, and the administrative cost of servicing the mortgages and mortgage-backed securities. The cash flows from mortgages must be predictable so that investors can price and evaluate the risks of their investments. In addition, the mortgage market must be at a sufficient stage of development to produce a significant volume of loans to justify the up-front costs of developing the secondary market infrastructure.

The state of development of a country's mortgage market will depend in large part upon the degree of macroeconomic stability and past government policies affecting housing finance. Macroeconomic stability is very important for several reasons. First, it

has a major effect on the demand for mortgages. High rates of inflation and nominal interest rates are typical features of volatile economies. These features have the effect of reducing the affordability of conventional mortgages. The use of fixed-rate mortgages in an inflationary environment creates a tilt effect in which the real payments on the mortgage are much greater in the early years of the mortgage. Variable-rate mortgages can reduce the tilt effect but subject borrowers to potential shock and affordability issues. Indexed mortgages can improve affordability but are complex for both borrowers and lenders. The affordability improvement of any instrument may not be sufficient to stimulate demand if volatility creates uncertainty and short-term investment horizons for borrowers.<sup>3</sup>

A volatile economy also affects the supply of funds and the characteristics of mortgages offered by lenders. In a volatile environment, lenders are reluctant to offer long-term loans. This may lead them to not offer mortgages or only offer short maturity loans that, in turn, are less affordable for consumers. Pipeline risk (the risk that market rates and prices change between the time the loan commitment is made and the loan is funded) is also much higher in a volatile market.

A volatile macroeconomic environment also creates difficulties for investors. Like lenders, they may prefer short-term assets, in part because of the difficulties of forecasting inflation and interest rates. Investors must be able to forecast cash flows with a tolerable level of variance in order to price and evaluate the risk of their investments.

#### Market Structure

Government policies determine the competitive environment in which mortgage lending is done. In the past, special circuits for housing finance have prevailed in many coun-

#### INVESTOR SPREAD REQUIREMENTS

**Credit risk** refers to the risk of default, either on the collateral or by the servicer. The spread required by investors will be a function of the probability of default, the loss potential per default and the time delays before third party credit enhancement, if any, comes into force.

**Liquidity** refers to the ability to rapidly turn assets into cash. The more difficult an asset is to sell, or the greater the discount involved in selling, the greater the yield premium (relative to the benchmark) the investor will require. The required liquidity premium will be greater for newly developed markets because investors will be unfamiliar with the asset and how to evaluate it. An additional liquidity risk arises if investor liabilities are short term, as typically mortgage assets have a relatively long duration.

**Interest rate risk** arises when there is a mismatch in the rate characteristics of assets and liabilities. This can arise through a maturity mismatch (e.g., funding long-term, fixed-rate assets with short-term liabilities), or a basis mismatch (e.g., funding an asset, the rate on which adjusts according to a particular index, with a liability, the rate on which adjusts according to a different index). The greater the mismatch, the larger the spread the investor will require to compensate for the risk that funding rates will move differently than investment rates.

tries. A special circuit is characterized by specialized lenders that dominate the mortgage market, supported by government incentives, both financial and regulatory. Their preferences often lead to the offering of mortgages at rates less than that necessary to provide acceptable risk-adjusted returns for investors. This leaves out those lenders with nonsecuritizable portfolios, unless the government augments the return on the mortgages for investors.<sup>4</sup>

For secondary market development, mortgage rates must provide a return that is attractive relative to their alternative investment opportunities. For banks or institutional investors that are typically the major investors in MBS, this means a positive spread over comparable duration government bonds. The yields on such bonds provide a default-risk free pricing benchmark for

investors. The spread must compensate the investor for the risks of the investment including credit risk, liquidity risk and interest rate risk (See **Investor Spread Requirements** in box above).

The more competitive the mortgage market, the greater the potential for secondary market development. This is particularly the case if the market environment will support the entry of mortgage companies that rely on securitization (off-balance sheet finance) for funding. In countries in which the dominant lenders are depository institutions with abundant capital and access to relatively cheap retail funds, securitization is often not a cost effective form of finance and it is difficult to create a secondary market. This has been the case in Europe where secondary mortgage markets have been slow to develop.

# CHARACTERISTICS OF THE INSTRUMENT

## Standardization

Standardization of the mortgage instrument is a key factor in secondary market development. Mortgages should be pooled with similar characteristics to facilitate larger pool size and more liquidity and to reduce the due diligence costs of investors and rating agencies. There can be many types of mortgages present in the housing finance system, but only those with sufficient volume are candidates for sale and securitization.

Investors and rating agencies must be able to do due diligence with reasonable cost. The more heterogeneous the terms and documentation of the loans, the greater the cost of due diligence and the less competitive is sale through securitization. In order to reduce the transaction costs of evaluating mortgage loans and the processing costs of issuing and administering MBS, the characteristics (e.g., rate adjustment, amortization schedule, term) of the mortgages should be uniform.

The degree of uniformity depends on the characteristic involved. In the U.S. residential market, almost all pools will be restricted to 1-4 family residential properties.<sup>5</sup> Loan size may be restricted (for example, Fannie Mae and Freddie Mac are constrained by law to maximum loan size for 1-4 family loans of \$275,000, a limit which is changed annually according to an external index). Geographic restrictions may apply for certain pools of non-conforming loans (loans not eligible for purchase by the government-sponsored enterprises). Table 1 shows some of the variables taken into consideration in creating pools for securitization.

Constraints on loan adjustment features are common. For example, fixed-rate mortgages (FRMs) are not pooled with adjustable-rate

Table 1 Example of Pooling Criteria

Criterion	Example
Property Type	Residential 1-4 family
Loan Purpose	Limits on percentage of pool for non-owner-occupied, second homes, co-operatives and cash-out refinancing
LTV	Limits on percentage of pool above certain LTV
Loan Term	Final maturity 30 years; specified weighted average remaining term to maturity
Loan Coupon Rate	Specified weighted average interest rate with specified coupon range (minimum, maximum)
Loan Rate Adjustment Index	All loans use same index for adjustment
Loan Size	Minimum and maximum (legislatively set for loans purchased by Fannie Mae and Freddie Mac)
Loan Insurance	Private mortgage insurance if LTV > 80% (government-insured loans pooled separately)

mortgages (ARMs) and ARMs with different indices will not be pooled together. Loans with deferred interest or negative amortization are not pooled with fully amortizing loans. There will be an allowed range of loan maturities and loan coupon rates. These limits allow investors to more accurately predict prepayments and pool cash flows. A wider range allows for more loans in a pool (enhancing liquidity) but more uncertainty in estimating prepayments. An important constraint in pooling is that no loan in the pool can have a coupon rate less than the security coupon rate. This constraint ensures that the servicer always has a financial incentive to service the loans. There may be constraints on loan purpose or LTV in order to achieve certain ratings or credit enhancement objectives.

## Documentation

In addition, standardized documentation must be available for all loans. Typical documentation includes the mortgage note (document describing the mortgage obligation) and deed (document conveying owner-

ship to lender as security for the repayment of the mortgage). Because the U.S. is comprised of 50 states, there is variation in the security for the loan, which can be in the form of a deed of trust, mortgage or deed to secure debt. A key legal prerequisite is the timely and cost effective registration of title and lien. A barrier that exists in many developing countries is the imposition of transfer taxes or stamp duties on title and lien registration or transfer. Long delays in the registration process can also increase the risk of both primary market and secondary market transactions.

A loan file will contain the application, property appraisal and borrower credit report. Lenders use standardized application and disclosure forms, the format of which has been determined by the U.S. Department of Housing and Urban Development. The appraisal determines the value of the property through examination of the sales prices of similar properties construction costs of new properties and market conditions and trends. Since January 1995, a uniform residential appraisal report has been used for

nearly all lenders, including those intended for sale to Fannie Mae or Freddie Mac and those insured by the FHA and VA.<sup>6</sup> In addition to the implicit oversight of investors, financial institution regulators have established appraisal guidelines for the institutions they supervise.

The credit report is a key document that is required for all loans. There are no specific guidelines regarding credit reports but they have become increasingly important in underwriting. The information compiled by credit bureaus is used to compute credit scores, such as the FICO score, which have become the basis of loan decisions, in some cases even supplanting the appraisal.<sup>7</sup> Additional credit requirements include employment verification, income verification (pay stubs, in some cases income tax returns) and asset/liability information (e.g., bank accounts, loans etc.).

The final major document requirement is the title report or title insurance policy. A title search verifies that the mortgagee owns the property being pledged as security for the lien. The title insurance policy insures against the risk that the mortgagee may not have clear title or may have encumbered the property with other liens (which could exceed the value of the property or have a priority to the loan being applied for). Lenders also require property and casualty insurance.

A key aspect of the secondary market is the representations and warranties given by loan originators. In all loan sales transactions, the seller will warrant that all documents are present and completed to the standards of the investor. Investors typically check only a fraction of the files for the loans they purchase. In the event that a loan goes into default and the investor finds a defect in the loan file (missing, incomplete, inaccurate or fraudulent information,) the seller will be required to repurchase the loan.

## MORTGAGE ORIGINATION

### Functions

Loan origination involves all the processes necessary to create a mortgage. It starts with finding the borrower and includes all the activities involved in the generation of a "good" loan that is marketable in secondary mortgage markets.<sup>8</sup> This involves:

- Finding the borrower, using a variety of distribution channels and marketing tools.
- Collecting information about the borrower, loan and property needed to underwrite the loan.
- Underwriting the loan.
- Getting any required investor approvals and obtaining all appropriate legal and other documents designed to protect the interests of the investor and to support the underwriting decision.
- Arranging for collection of property taxes and insurance, as well as any mortgage insurance that may be required to protect the investment.
- Closing the loan and presenting required disclosures of interest and settlement costs.

### Underwriting

Solid and consistent underwriting is key to secondary mortgage market development. Investors must have confidence that lenders are properly judging risk and using a consistent set of criteria in evaluating loans. A degree of standardization is necessary to lower costs of due diligence and allow investors, rating agencies and guarantors to quantify credit risk.

The objectives of home mortgage underwriting are:

- To control the probability and cost of default losses.
- To ensure that all legal and financial requirements are completed satisfactorily on the property that serves as collateral for the mortgage so that the interests of the mortgage holder are protected.
- To meet requirements of third parties who have an interest in the safety of the mortgage including such groups as:
  - \* Regulators who are concerned about the safety and soundness of the lending institution.
  - \* Secondary market organizations that may be interested in purchasing the mortgage.
  - \* Security rating services that may be called upon to provide a quality rating for a security that may include the mortgages as collateral.

As described by Mahoney and Zorn [1997], all mortgage underwriting, whether traditional or automated, is based on a wide variety of factors, broadly categorized as the "three Cs:" collateral, credit reputation and capacity, as illustrated in Figure 3.

### Collateral

Each mortgage is backed by real property, whether an owner-occupied home or an investor-owned dwelling. An accurate assessment of the value of the property is fundamental to determining whether, in the event of borrower default, the lender could recoup enough from the sale of the home to cover losses.

The amount of a borrower's own funds invested in the property, also referred to as

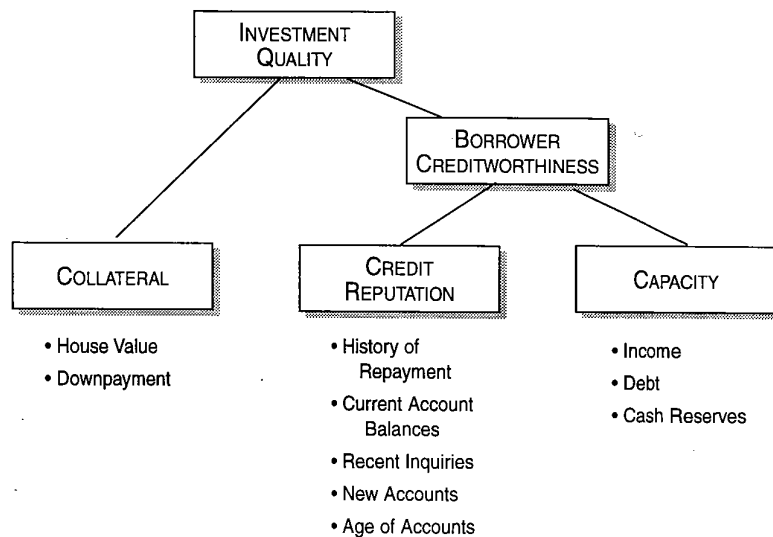
borrower equity, factors heavily into the lending decision. For years, mortgage research consistently has shown that a borrower with a significant financial stake in the property is less likely to default.

The relationship between borrower equity and loan default is shown in Figure 4, which examines the foreclosure experience of borrowers with differing downpayments. For loans purchased by Freddie Mac between 1985 and 1989, for example, borrowers who put down 5% to 9% were five times more likely to enter foreclosure than those who made downpayments of 20% or more.<sup>9</sup>

#### Appraisal

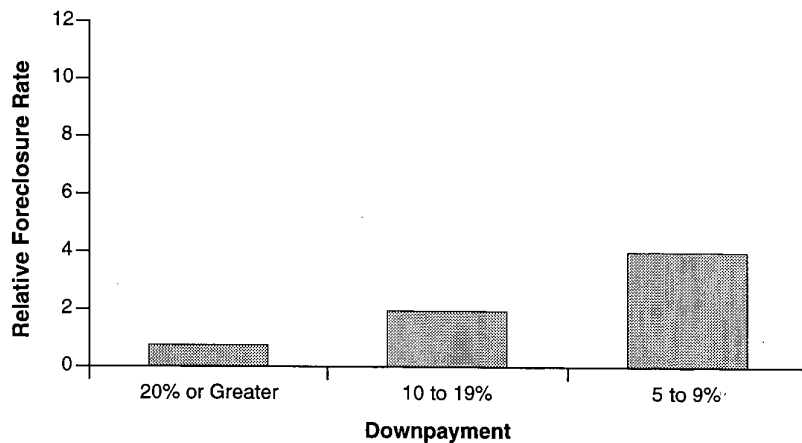
The key factor in assessing the adequacy of the collateral is the appraisal. The appraisal contains a detailed description of the property and three approaches to value: the cost, market and income approaches. The *cost approach* includes an estimate of the value of the land as vacant, the cost of replacing the improvement and an adjustment for estimated depreciation due to physical deterioration and functional and economic obsolescence of the property. The *market approach* estimates the value of the property based on sales prices of similar properties (comparables) in the neighborhood. The appraiser will generally utilize at least three comparables and make adjustments to the comparables for differences in the physical characteristics and condition of the properties. The *income approach* values the property based on the potential rent that could accrue to it. The appraiser will capitalize the potential rent of the property using an income multiplier or capitalization rate. In the U.S., greatest weight is placed on market comparables as the value of the collateral being what you can sell it for (as opposed to intrinsic value). For income producing properties, the income approach is also given heavy weight.

**Figure 3** The Three Cs of Mortgage Underwriting



Source: Mahoney & Zorn, 1997

**Figure 4** Foreclosure Rates Are Lower for Borrowers with Higher Downpayments



Source: Mahoney & Zorn, 1997

Because of the importance of the market approach to value, a critical factor in underwriting mortgage loans is good quality house price data. In the U.S., house price data can be obtained from government title registration offices and multiple listing services run by real estate brokers. In recent years, repeat sale indices based on sales prices of houses that have multiple loans purchased by Fannie Mae and Freddie Mac, have become important indicators of value.

Another critical factor in valuation is the competence and professionalism of the appraiser. In the U.S., individual states certify and license appraisers. The Appraiser Qualification Board of the Appraisal Foundation establishes certification requirements that assist states in developing their own requirements and administering certification exams. All federally-related mortgage transactions (i.e., loans made by federally-insured lenders or insured against default by a federal agency) must use a certified or licensed appraiser.

Lenders may use in-house or independent appraisers. A key factor in evaluating appraisals is the incentive structure for the appraiser. Appraisers should be compensated on a fee basis in which the fee is independent of the value of the property. Otherwise, there is a bias towards overvaluation. Also, appraisers should not be related to developers whose units may be the subject of the appraisal.

#### Credit Reporting

Mortgage lenders also rely on credit information compiled by national credit bureaus to ascertain a borrower's track record of handling credit. Credit bureaus can provide lenders with detailed credit files; they also can provide a credit bureau score, which summarizes the information into one number reflecting an individual's expected credit performance.

Credit files contain extensive information about open and closed credit accounts. For each consumer, the credit file tracks how much of the available credit limit has been used, the consumer's history of repaying the account, and whether payment is up-to-date or delinquent. Credit files also document the number and nature of recent credit inquiries, which are requests by potential credit grantors to review a credit file. In addition, credit files contain information from public records, such as declarations of bankruptcy and unpaid judgments.

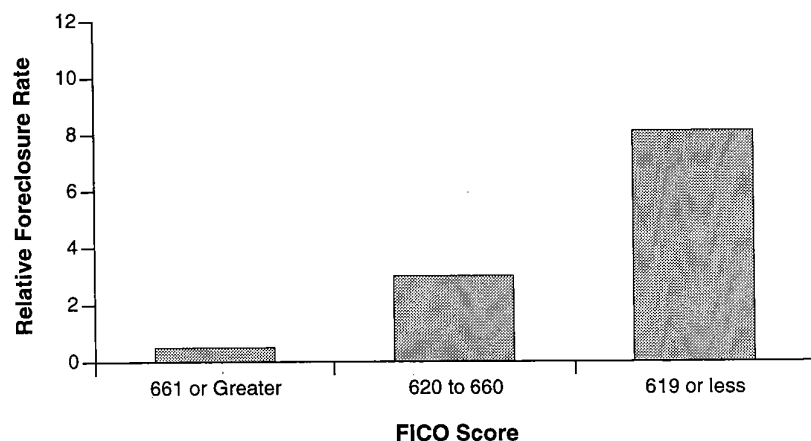
The need to consider so many varied pieces of information increases the difficulty of making an accurate assessment of an individual's credit profile. Credit bureau scores, long used in consumer lending, address this problem. Based on the statistical relationship between the information contained in individual credit files and actual repayment experience, credit bureau scores accurately summarize an individual's likelihood of repayment.

Freddie Mac research has shown that borrowers with strong credit profiles are significantly less likely to default on their mortgages. Based on its 1994 purchases, for example, Figure 5 shows that borrowers possessing weak credit profiles, defined as FICO scores under 620, were 18 times more likely to enter foreclosure than borrowers with FICO scores above 660.

#### Capacity

A borrower's financial wherewithal to repay a mortgage is a third important underwriting factor. Typically, capacity is evaluated using two ratios that express the percentage of an applicant's income needed to cover monthly debt obligations, including the mortgage payment. The housing-debt-to-income ratio, or "front-end" ratio, focuses on housing-related payments and is calculated as the ratio between monthly mortgage payments (including taxes and insurance) and gross monthly income. The total-debt-to-income ratio, or "back-end" ratio, also includes non-

**Figure 5** Foreclosure Rates Are Lower for Borrowers with Lower-Risk Credit Bureau Scores



Source: Mahoney & Zorn 1997

housing debt, such as car payments and consumer installment debt. Underwriting guidelines generally recommend front-end ratios of up to 28% and back-end ratios of up to 36%, although many loans are originated for borrowers with higher ratios. Borrower savings, referred to as cash reserves, also are used to assess capacity.

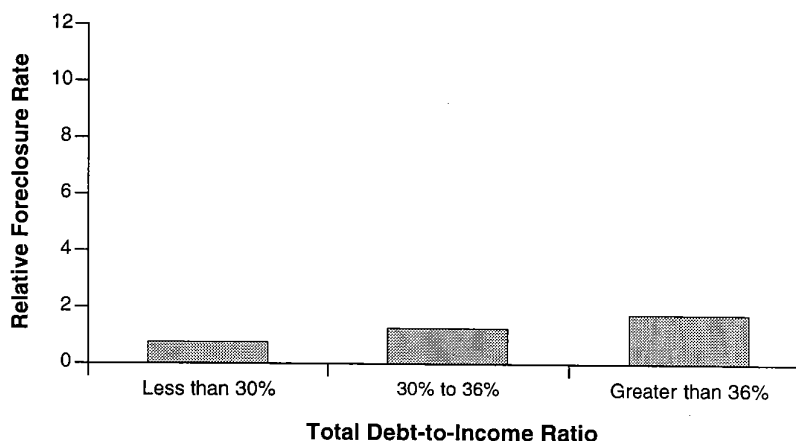
The linkage between total-debt-to-income ratios and foreclosure rates is demonstrated in Figure 6. For example, based on Freddie Mac's 1994 purchases, borrowers with total-debt levels greater than 36% of their incomes were twice as likely to enter foreclosure as those with ratios below 30%.

#### Automated Underwriting

In recent years, automation has become a key component of the loan underwriting activities of mortgage bankers. Some of these advancements have been stimulated by the government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac. The first system to go into operation was Loan Prospector, a system created by Freddie Mac.<sup>10</sup> Automated loan processing offers features dealing with credit evaluation, collateral evaluation, mortgage insurance and risk grading.

Automated underwriting combines the best in statistical analysis with state-of-the-art technology that collects and sorts a wealth of critical information. The starting place is to conduct a statistical analysis of the determinants of default based on a large number of transactions over an extended period of time (sufficient period to capture the effect of economic cycles). The results of the analysis are used to evaluate the credit worthiness of a prospective borrower. The system is automated in that the lender electronically transmits loan application data to the investor which uses this information along with property information to determine the risk class of the loan. A decision to accept or conduct

**Figure 6** Foreclosure Rates Are Lower for Borrowers with Lower Total Debt-to-Income Ratios



Source: Mahoney & Zorn 1997

further review is transmitted back to the lender, often within hours of submission. By greatly cutting the time between loan application and closing, automated underwriting systems can reduce lender and borrower costs and risk.

#### SECONDARY MARKETING

##### Functions

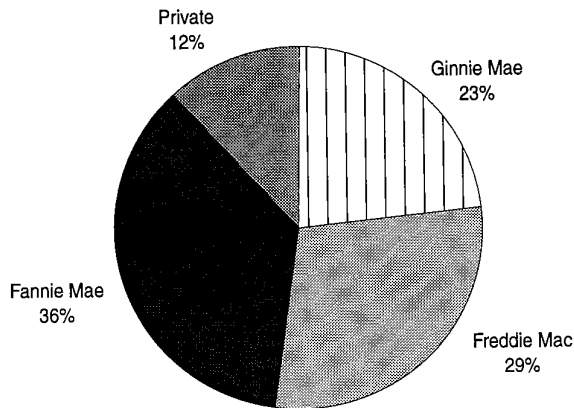
Secondary marketing is the function of financing and, subsequently, selling the originated mortgage to institutional investors. This activity includes the warehousing of the mortgage between the time the mortgage is closed and subsequently sold to an investor. It is arguably the most critical function in the secondary market. More mortgage bankers fail as a result of failure to manage the risks of secondary marketing than for any other reason.

The secondary mortgage market in the U.S. is still dominated by the GSEs (Figure 7). The two U.S. GSEs that perform these activities are Fannie Mae (formerly the Federal National Mortgage Association or FNMA) and Freddie Mac (formerly the Federal Home Loan Mortgage Corporation or FHLMC). The GSEs guarantee mortgage backed securities and the seller-servicer acts as the custodian holding the mortgage loans as collateral for the securities. GSEs, chartered by the federal government, are privately owned institutions that have been granted preferences in return for limiting their activities to mortgage investment.

FHA-insured and VA-guaranteed loans are pooled and sold as mortgage-backed securities guaranteed by a U.S. agency called the Government National Mortgage Association (Ginnie Mae or GNMA). Other mortgages are sold to private mortgage conduits that use them as collateral for MBS. In re-



**Figure 7** Breakdown of U.S. MBS Market—1999 Outstanding MBS \$2.57 trillion



Source: Federal Reserve

cent years, the private secondary market (in which non-conforming loans ineligible for purchase by the GSEs are sold) has been rising in importance.

#### Risk Management

The secondary marketing function is responsible for finding investors that will purchase loans from the mortgage banking operation and for managing the financial risks involved in making loans with an established interest rate in a changing interest rate environment, as well as other risks associated with the process. Although referred to in totality as pipeline risk, there are in fact four major risks the seller must manage as part of the secondary marketing function:<sup>11</sup>

**Commitment risk:** The risk that an interest rate commitment ("rate lock") offered to a home buyer for a loan is made and the firm is unable, generally due to market forces, to earn an adequate sales price to cover the costs of providing the commit-

ment. This risk may be reduced or offset by purchasing offsetting commitments (i.e., committing in advance to sell a loan or pool of loans at a particular rate).

**Pipeline risk:** The risk that a closed loan will change in value between the time of closing and shipment to an investor. This risk is often hedged using forward, option or futures contracts.

**Documentation risk:** The risk that a closed loan is underwritten improperly and does not conform to the investor's requirements. These loans are known as "lame loans" and frequently can be converted into acceptable loans for delivery, but usually after months of seasoning and additional documentation. The delays in delivery, or inability to deliver, produce costs for the originator.

**Liquidity risk:** The risk that certain types of mortgage loans may face large buy price—sell price (bid-ask) spreads.

This can happen if the firm buys loans wholesale (i.e., from other lenders) and is unable to generate a sufficient volume to securitize or sell the loans at a profit. Problems in reselling the loans may produce losses for the firm.

Most mortgage lenders in the U.S. have highly developed data processing systems that track loans during the commitment phase in order to ensure that there is sufficient volume to meet future sales obligations and that loans are pooled according to the precise characteristics demanded by investors. One of the main prerequisites of a secondary market is availability of such data and the means to manipulate it.

#### SERVICING

##### Functions

The servicing of mortgages is a critical component of a viable secondary mortgage market. The collection of mortgage payments and the periodic remittance of these payments to the investor (or conduit) is the major task of servicers (whether they are originators or third parties). In addition, servicers are the primary repository of information on the mortgage loans. Thus, they must maintain accurate and up-to-date information on mortgage balances, status and history and provide timely reports to investors.

Mortgage loan servicing involves all the activities related to:

- Collecting mortgage payments.
- Accounting for all financial transactions.
- Collecting past due accounts.
- Remitting payments to investors.
- Foreclosing on seriously delinquent properties.

- Disposing of foreclosed real estate.

Additional responsibilities may include administering an escrow account for real estate taxes and insurance, furnishing tax information to mortgagors when applicable and safekeeping collateral (custodial function).

### **Collections and Default Management**

An important part of the servicing is establishment of clear guidelines for the collection of mortgage payments. The documents must spell out payment obligations (dates, amounts, terms of adjustments, obligations for taxes and insurance) and procedures to be followed in the event of default. Although lender discretion in working with borrowers is an important part of the collection process, third-party investors must know what those procedures are before making their investment (in order to assess the degree of default risk) and what latitude exists in dealing with the borrower (e.g., forbearance or restructuring). Servicers also must make decisions about and implement procedures leading to foreclosure and repossession in the case of defaulted loans.

Default management is a major responsibility of the servicer. Loans that are delinquent present the servicer with additional costly activities for which they receive no additional revenue. In extreme cases, a delinquent loan may require initiating an even more costly foreclosure process. Delinquency refers to a situation in which a borrower has not made a payment by the due date, typically the 15th of the month. Mortgage lenders typically classify mortgage delinquent loans on the basis of 30, 60 and 90 days delinquent.

The Mortgage Bankers Association of America (MBA) reported that as of March 31, 2000, the overall seasonally-adjusted delinquency rate on one-to-four family unit

homes was 3.82%. The 90+ days past due rate was 0.54%.

Foreclosure refers to a legal process by which a mortgagee obtains title to the property from a mortgagor in default for purposes of disposing of the property to provide funds to pay off the loan. The MBA reported that the foreclosures started for all types of loans was 0.85% on March 31, 2000.

Investors require servicers to be pro-active in default management. The typical actions that a loan servicer will take at various stages of delinquency are:

- **30–60 days:** Reminders to delinquent borrower through mail or phone and/or provide counseling.
- **90 days:** Consider loan restructuring such as forbearance (reduced payments) or lower interest rate.
- **120+ days:** Commence foreclosure process.

### **Credit Enhancement**

Lenders (investors) can protect themselves from some losses in the lending process by requiring insurance. Mortgage insurance at least partially protects the investor against loss from a subsequent foreclosure that produces sale proceeds that are insufficient to cover the unpaid principal, interest and foreclosure costs. In the United States, there are three primary sources of default insurance:

- **Federal Housing Administration (FHA):** provides 100% coverage of principal loss and foreclosure processing costs.
- **Veterans Administration (VA):** provides partial insurance for a specified percentage of the loss.

- **Private Mortgage Insurance (PMI):** provides top loss insurance (e.g., 20% coverage of the outstanding balance greater than 70% LTV).

The secondary market GSEs require credit enhancement, which is usually in the form of private mortgage insurance for all loans purchased over 80% LTV. For securities backed by loans not purchased by the GSEs, additional credit enhancement comes in the form of pool insurance or senior-subordination.<sup>12</sup> The costs of credit enhancement will be a function of the characteristics of the mortgage loan collateral as well as the past performance of the servicer. For loans sold to the GSEs, the guarantee fee they charge will also be a function of the loan characteristics and servicer performance.

### **Information Requirements**

Investors are dependent on the servicer to collect and remit payments. The servicer must have good systems for accumulating and remitting cash and performance information on a timely basis and a good track record in collections.

Home mortgage servicing is characterized by low revenue per loan and potentially high expenses for difficult-to-service loans. As a result, loan quality and efficiency of operations is critical to a servicer's success. Servicing in the U.S. has become increasingly automated. This trend reflects demands of investors for more timely and comprehensive information, profit opportunities in marketing and cross-selling, and their own needs for improved risk management. A result has been an increased consolidation of servicing in the U.S. As of June 30, 2000 the top servicers in the U.S. had a combined market share of 60%, up from 20% in 1990.<sup>13</sup>

Information processing and real time transmission have become increasingly important

## MEXICO

in the U.S. secondary market. Historical performance data on mortgage payments (e.g., default and prepayment) is a major factor in risk assessment and pricing. Because of the importance of data in the assessment of risk, the demands on servicers are potentially great. Servicers must be able to process and disseminate large amounts of information. Thus, they must develop effective, automated management information systems.

### PRIMARY MARKET PREREQUISITES IN A DEVELOPING COUNTRY: THE CASE OF MEXICO

#### Market Structure

Currently, the housing finance market in Mexico is in a state of retrenchment.<sup>14</sup> Commercial banks, battered by the effects of the December 1994 financial crises ceased virtually all mortgage lending by mid-1995 and have only recently begun to offer mortgages (Table 2). The aftermath of the crisis has left low-income housing programs as the main provider of housing finance in the country.<sup>15</sup>

#### Macroeconomic Environment

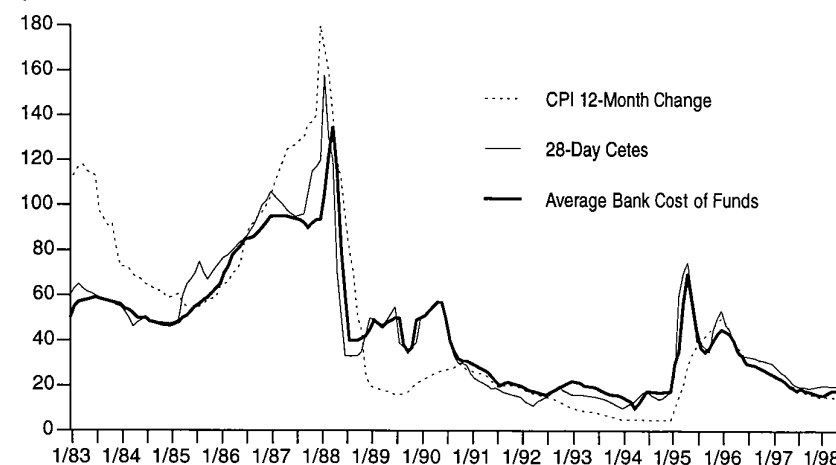
The historical macroeconomic environment in Mexico has not been favorable to the development of the primary mortgage markets. Since the early 1980s the country has experienced numerous financial crises and macroeconomic volatility. Inflation hit a high of almost 120% in 1983 and then an all time high of almost 180% in 1988. While the early 1990s seemed to bring a period of recovery, macroeconomic instability again erupted in December 1994. This period saw inflation surge to the 50% range and short-term government treasuries yields rose as high as 74.5%. Thus, in a 14-year period, Mexico has experienced three major macroeconomic episodes (Figure 8).

**Table 2** Distribution of New Mortgage Originations (Percentage of N\$ originated)

	1991	1992	1993	1994	1995	1996	1997
INFONAVIT	28.25%	21.40%	24.58%	25.12%	58.29%	55.42%	59.93%
FOVI	8.53%	4.24%	3.80%	5.89%	19.61%	16.77%	19.11%
FOVISSSTE	4.73%	3.69%	4.10%	5.02%	8.89%	7.61%	8.67%
Other	11.05%	7.48%	5.80%	5.11%	8.71%	12.96%	6.84%
Commercial Banks	47.44%	63.19%	61.72%	58.86%	0.00%	0.00%	0.00%
Autofinanciamientos	0.00%	0.00%	0.00%	0.00%	4.50%	7.24%	5.45%
Total	100%	100%	100%	100%	100%	100%	100%

Source: World Bank

**Figure 8** CPI and Interest Rates in Mexico



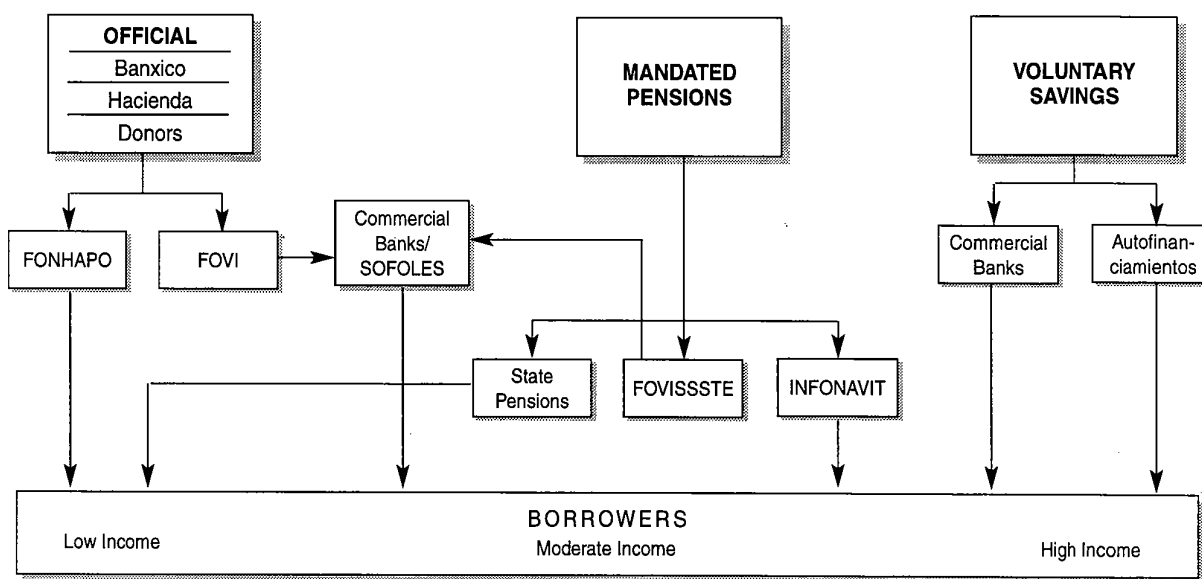
The Mexican mortgage market is highly segmented, with a variety of mortgage programs designed for different constituencies (Figure 9). The result is a balkanized mortgage market dominated by the government in all but the upper income segment of the market.

#### Mortgage Instrument

In response to this instability, the Mexicans introduced a novel mortgage instrument, the dual-index mortgage (DIM). The DIM attempts to create a loan that is both afford-

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**Figure 9** Mexico: Structure of the Housing Finance System, 1996



Source: World Bank

able to the borrower and profitable for the lender. It does so by separating the payment rate and the amortization or accrual rate on the loan. In the classic DIM, payments are adjusted based on the evolution of the minimum wage index and the amortization rate is based on either a short-term Treasury bill (Cete) rate or the cost of funds of the banks (CPP). Differences between the actual and required payments are deferred and added to the loan balance. Thus, this loan is subject to negative amortization (referred to as "refinancing" in Mexico).

While there is much merit to the design of this instrument, it creates two problems for development of a secondary market. First, the cash flows it produces are not forecastable. This is because the payment rate

is based on the minimum wage index, an administratively determined value. The performance of the minimum wage index in real terms is shown in Figure 10. With payments declining in real terms, the loans produce large amounts of negative amortization, deferring cash flows for investors and in some cases failing to pay off over the maximum term.<sup>16</sup>

In addition to having unforecastable and long duration cash flows, the DIMs used by all of the government-sponsored entities carry real rates well below that demanded by investors. For example, the current FOVI DIM has a fixed real accrual rate of 5%, below that of the Mexican government (at 6.5%) and well below that demanded by investors

for the risks involved in this instrument. The implicit yields on INFONAVIT loans are far lower. The result is origination of product that does not produce an attractive yield for investors.

Recently, many commercial bank DIMs have been restructured into price-level-indexed mortgages (PLAMs, indexed to a new legal unit of account for financial contracts, the *Unidad de inversión* (UDI)). The UDI mortgages are a fixed-real-rate loan. They solve one of the major problems of the DIM, forecastable cash flows, as payment rates are effectively indexed to inflation rather than the minimum wage index. In addition, they insulate borrowers from variable real rates. However, they introduce another major problem, payment shock. If the inflation rate rises faster

than wage rates for any period of time, the purchasing power of households declines. If there is a sudden burst of inflation, as was the case in 1995, the payment burdens of borrowers can become unsustainable. This can result in a high level of default as shown in Figure 11.<sup>17</sup>

### Loan Origination

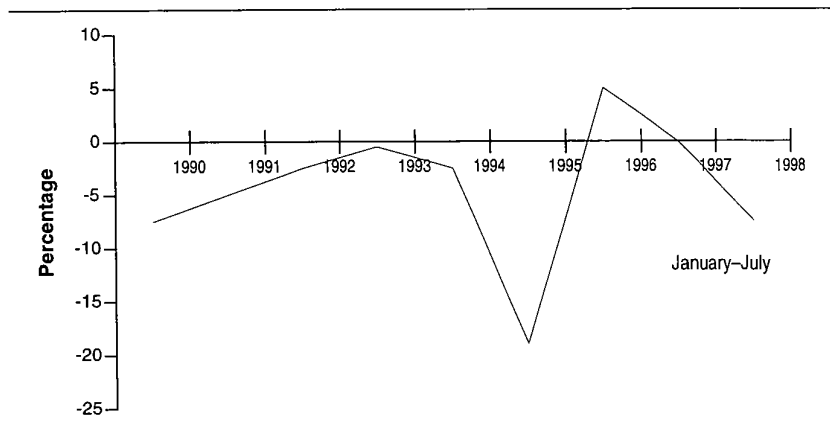
Loan documentation has not been standardized among the Mexican commercial banks. That said, most banks claim internal consistency (i.e., each has a standard loan file format). The most common documentation kept in loan files are the loan contract, credit report, appraisal and notary/title documents. There is no title insurance available; however, U.S. companies are looking at the market.

In the larger banks, the loan application contains similar information to that found in U.S. loan applications, including demographic information on the borrower(s), employment history and an accounting of net worth.

Credit reports in Mexico are unlike those in the U.S. Standardized credit reports from reporting bureaus are not typically available for anything except credit card payment history. Credit bureaus do not exist in part due to banks being hesitant to share credit information.

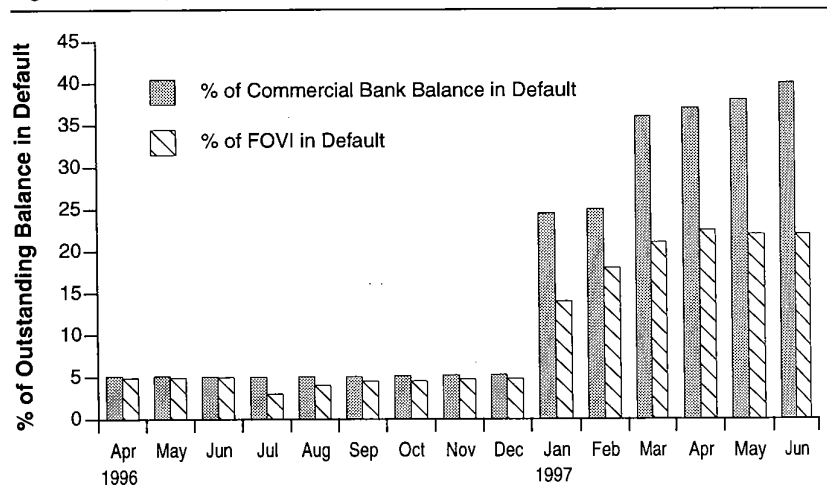
Another hindrance in the credit reporting process is the state of information systems at many of the banks. These systems are not able to provide the required management reports that properly summarize credit histories. Reported problems include the inability to tie payment history databases with customer information databases, and an inability to tie, through the database, all of a customer's accounts into a single record, thus making it impossible to develop a comprehensive credit history on a client. In addition, customers have found that if they apply for a loan using a slightly different name or address, bank systems will see

**Figure 10** Annual Increase in Real Wages (Based on Relation Between CPI and Salario Minimo)



Source: CNBV

**Figure 11** Comparison of Commercial Bank and FOVI Default Rates



Source: CNBV

them as two separate people; this has resulted in multiple loans being taken out on a single property.

Some of the commercial banks have begun experimenting with computerized credit

scoring systems. At least two of the largest banks have recently installed computerized credit scoring systems that were purchased from U.S. vendors. However, the existence of a model cannot overcome the problem that there are no data with which to popu-

late it. These models typically use backward propagating techniques that use a borrower's past history to predict the probability of default. Given the state of information systems, most banks are having a difficult time extracting the required loan history. In addition, given that the bulk of the portfolios have defaulted in the last three years, there is not a lot of data with which to create proper default models.

Thus, many banks send investigators into the field to perform a more qualitative analysis of the borrower. A credit report may thus include information on a borrower's work habits (e.g., the worker's ability to arrive to work on time), a visual assessment of the borrower's assets and even interviews with the borrower's neighbors attesting to his or her moral character. As a result many such reports are anecdotal and incomplete.

There are no enforced appraisal standards in Mexico. In the larger banks, appraisal reports are typically made by in-house appraisers. Appraisals are a very inexact process in Mexico, due in large part to the lack of a source for determining comparable prices from previous home sales (i.e., a multiple listing service, like that found in the U.S., is not available in Mexico). Often appraisers will value the home based, in large part, on the cost of building materials used and then make a best guess estimate as to the value of the land. This is particularly common given that most loans for housing in Mexico are for new units; the resale market in Mexico is very small. Independent appraisers are also active in Mexico. They typically use similar methods as do the in-house appraisers, though their personal incentives are often different. Specifically, independent appraisers base their fee on the value of the appraisal. The higher the appraised value, the higher their fee. Understanding this situation, banks will often adjust their maximum loan amount in an

attempt to compensate for a potentially inflated house value.

Because of the interest in securitization, some institutions are placing greater emphasis on the quality of their loan files. The second largest bank, Bancomer, has revamped their mortgage division along the lines of a U.S. mortgage bank. They have invested a large sum in systems that will allow them to extract and manipulate loan level information. Not surprisingly, as noted below, they are the first Mexican lending institution to attempt a securitization. In addition, there is an initiative underway with the Mexican mortgage banks (SOFOL) to create an industry standard loan file and servicing system. The goal of this initiative is to develop a standard set of documentation and procedures that will facilitate the securitization of mortgages.

#### Servicing

Adequate servicing of mortgage portfolios is one of the greatest problems in the Mexican housing finance sector today. Lax servicing in all institutions (private and government) has in part resulted in very high default rates. There are four major issues that constrain the ability of Mexican financial institutions to service their mortgage portfolios:

- Reliance on manual processes.
- Lack of legal recourse.
- Poor information systems.
- Moral hazard created by government bailouts.

Mexican commercial banks have historically been set up mainly to deal with large commercial accounts. This has resulted in an almost uniform lack of consumer orientation. As a result, systems for originating and servicing consumer loans, including mort-

gages, have remained fairly undeveloped. This situation has led to a significant manual component to mortgage servicing in Mexico.

Many banks do the majority of their loan servicing in their retail branch offices. Specifically, loan payments and loan balances are calculated by a teller at the branch when the borrower comes in to make a payment. Loan balance information and payment histories are then remitted on a periodic basis to the main office. Because the loan is calculated at the teller window, many banks have made a policy not to take partial payments.

Payment collection has also been made difficult by the distribution of bank branches throughout the country and the fact that most clients are required to make payments in person.<sup>18</sup> The distribution of most commercial bank branches is concentrated in major urban areas. This situation makes it difficult for borrowers living in smaller towns and in rural areas to make payments. It has been noted anecdotally that borrowers often had to miss a day of work in order to make a mortgage payment. Faced with losing their job if they missed work, borrowers would choose not to pay their mortgage.

SOFOL have had a much better track record than commercial banks in servicing FOVI loans. They report default rates of less than 5% as compared to rates over 20% for commercial banks. The success of the SOFOL is due in large part to their abandonment of traditional servicing methods and designing programs that filled the needs of their Mexican clientele. The main feature of SOFOL servicing is that the bank goes to the client for payment rather than making the client go to the bank. To this end, some of the more innovative SOFOL have placed payment collection kiosks in housing developments and have started door-to-door payment collection services. Another factor is the fact that mortgage lending and

servicing is their only line of business as compared to commercial banks with many different business lines and concerns.

A major issue affecting the quality of mortgage portfolios and the assessment of any securities backed by mortgage loans is the moral hazard that has been created by government bailouts of mortgage borrowers. In 1996, a restructuring plan has been negotiated between the banks and the government wherein the government will subsidize up to 30% of borrower mortgage payments. The subsidy payment by the government will decline over a 10-year time period. Despite the government subsidies, a large number of restructured loans have fallen into default and have been restructured yet another time. The lesson borrowers learn from this experience is that it is acceptable to default on the loan because the government will bail them out. This attitude is compounded by the fact that foreclosure has been, up to very recently, an irrelevant alternative for most lenders. Mexican courts have been very unsympathetic towards banks with the result that foreclosure proceedings take several years and involve significant cost. There is, however, a significant reform in the foreclosure law that has been passed by the federal government and a number of the states that expedites procedures and puts more teeth into foreclosure as a possible deterrent.

### CONCLUSION

At the risk of repetition, the conclusion of this paper is that it is not possible to have a sustainable secondary mortgage market until there is a healthy and well-developed primary market. This does not mean that securitization is impossible, as it may be possible to do a few transactions with a narrow range of collateral in the form of private placements. But a sustainable secondary market involves generating an on-going flow of transactions that will develop liquidity in

the market, enhance investor and regulatory understanding and comfort, and achieve the desired increase in availability of funds and decreased relative cost of mortgage credit. This can only be done if there is a sufficient volume of attractively priced, well-documented and underwritten mortgage loans that are serviced by competent and reputable organizations.

There is of course an element of which comes first, the chicken or the egg, here. Some will argue that creating a secondary market is necessary to provide the proper incentives and guidelines for standardization, processing and management in the primary market. A well-developed secondary market can, indeed, have these benefits. But there are clearly minimum requirements regarding the economy, instrument and institutions that must be met before a viable secondary market can be created.

In this paper, we have attempted to develop the main primary market prerequisites for sustainable secondary market development. There are doubtlessly other important criteria that go into making a secondary market vision a reality. But the factors discussed above do provide a template for strengthening the primary market in order that a true secondary market can be created.

### NOTES

<sup>1</sup> Lea, M., "Models of Secondary Mortgage Market Development," in M. Watanabe, ed., *New Directions in Asian Housing Finance*, International Finance Corporation, 1998.

<sup>2</sup> Guttentag, J., "Secondary Market-Based Versus Depository-Based Housing Finance Systems," in *Secondary Mortgage Markets: International Perspectives*, M. Lea, ed., International Union for Housing Finance, 1998.

<sup>3</sup> Chiquier, L., "Dual Index Mortgages: Lessons from International Practice and

Conditions of Development in Poland," *Housing Finance International*, September 1998.

<sup>4</sup> In some instances, market rates may fall below subsidized levels on existing mortgages, creating a temporary opportunity for securitization. Unfortunately, this situation is not sustainable and, therefore, not the basis for true secondary market development.

<sup>5</sup> Therefore, there is no pooling of commercial (i.e., office, retail, hotel, warehouse) and residential properties. The definition of residential can include loans to cooperatives (corporate entities). There are typically guidelines on eligible properties, including condominiums, second homes and planned unit developments.

<sup>6</sup> Separate forms are used for condominiums and income (multifamily) properties.

<sup>7</sup> FICO scores are developed by Fair, Isaac and Co., Inc. See K. Palla, *Housing Finance International*, March 2000.

<sup>8</sup> See Harter, T., "Mortgage Banking," course prepared for Digital University, 1998. Digital University is an Internet-based financial institution education program that can be found at [www.dfin.com](http://www.dfin.com).

<sup>9</sup> Figure 4 is based on one-unit purchases by Freddie Mac from 1985 through 1989. Foreclosure is measured through April 1996, and foreclosure rates are presented relative to the average in the data used in each exhibit. For more detail, see Mahoney and Zorn.

<sup>10</sup> Fannie Mae has a similar system, Desktop Underwriter. The first automated underwriting system was introduced by PMI Mortgage in the early 1990s.

<sup>11</sup> Harter, op.cit.

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<sup>12</sup> The development of the senior-subordination structure has been a key factor in the growth of the private MBS market. In this structure, the senior security has priority claim on the pool cash flows. All defaults and cash flow shortfalls will be borne by the subordinate tranches until (in a worst case scenario) they are gone.

<sup>13</sup> Source: *Inside Mortgage Finance*, September, 2000.

<sup>14</sup> For more complete overviews of the housing finance sector, see Michael J. Lea, "Restarting Housing Finance in Mexico," *Housing Finance International*, Vol. XI, No. 2, December 1996. Bernstein, Lea and Renaud, "Mexico's Housing Finance System

1991-96, Privatization in an Unstable Environment." Paper presented at the AREUEA International Real Estate Conference, Berkeley, June 1997. Manuel T. Campos S. "Broadening Access for More Affordable Housing: Challenges and Opportunities in Mexico," *Housing Finance International*, Vol. XII, No. 2, December 1997.

<sup>15</sup> The principal government programs are the housing "pension funds" for private sector workers (INFONAVIT) and public sector workers (FOVISSSTE), respectively. FOVI is a trust fund of the government that funds dual-indexed mortgages offered by both commercial banks and SOFOLES (mortgage companies). Autofinanciamientos are loan-linked savings schemes that have

sprung up in the absence of commercial banks.

<sup>16</sup> The initial terms are set for 20 years and can be extended to 30 years. For FOVI loans, the balance outstanding at the end of the term is forgiven (paid by the government).

<sup>17</sup> The sharp increase in 1997 reflects a change in the definition of a defaulted balance. Prior to that time, only the missed payments were shown as in default. As of January 1, 1997, the balances of loans delinquent over 90 days are classified as in default.

<sup>18</sup> Checking accounts are not widely used in Mexico.