

**Single-Family Mortgages Originated and Outstanding:
1990 - 2004**

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PREFACE

This OFHEO Research Paper presents statistics for single-family mortgages originated and outstanding by loan type for calendar years 1990 through 2004. Statistics are provided for conventional and government-insured or –guaranteed loans and, within each of those sectors, for fixed-rate and adjustable-rate mortgages (FRMs and ARMs). Conventional loans are also divided into jumbo and non-jumbo loans. OFHEO developed the estimates to give policy makers and the public a statistical baseline for the single-family mortgage market since 1990. The paper was prepared to enhance public understanding of the United States housing finance system.

Forrest Pafenberg, Senior Policy Analyst in the OFHEO Office of Policy Analysis and Research, prepared the study under the supervision of Robert S. Seiler, Jr. Lori Bowes, Tom Lutton, and Kevin Winkler of OFHEO, and Anthony Pennington-Cross, formerly of OFHEO, provided helpful comments on an earlier draft. Edward Szymanoski of the Department of Housing and Urban Development, Kathleen Mangold of the Department of Veterans Affairs, and Mike Feinberg and Joyce Halasz of the Department of Agriculture’s Rural Housing Service provided data used in the paper. Michelle Hamecs and Michael Carliner of the National Association of Home Builders, Joseph McKenzie of the Federal Housing Finance Board, David Torregrosa of the Congressional Budget Office, James Kennedy of the Board of Governors of the Federal Reserve, Doug Duncan and Marina Walsh of the Mortgage Bankers Association of America, Barbara Miles of the Congressional Research Service, Frank Nothaft of Freddie Mac, Orawin Velz of Fannie Mae; and John Bancroft of Inside Mortgage Finance Publications also provided useful comments and suggestions with regards to the assumptions made in the analysis.

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Introduction

This paper presents statistics for single-family mortgages originated and outstanding by loan type for calendar years 1990 through 2004 compiled by the Office of Federal Housing Enterprise Oversight (OFHEO). The paper estimates each sector of the market and aggregates the sectors to estimate the total mortgage market. That approach is followed for both mortgages originated and mortgages outstanding. OFHEO has developed those estimates to afford policy makers and the public a statistical baseline for the single-family mortgage market since 1990 that can be used to assess market trends. The data reflect statistics publicly available from other sources combined with estimates and assumptions selected on the bases of reasonableness and simplicity after extensive discussions with mortgage market analysts from industry, academia, and the government.

The paper provides statistics for conventional and government-insured or –guaranteed mortgages. Conventional loans are divided into jumbo and non-jumbo mortgages.¹ Due to the lack of data on specific underwriting terms in virtually all data series on the conventional single-family market, the paper makes no attempt to estimate conforming conventional loans—those non-jumbo mortgages that meet the underwriting guidelines of Fannie Mae and Freddie Mac. Within the conventional jumbo and non-jumbo and the government-insured sectors, statistics are presented for fixed-rate and adjustable-rate mortgages (FRMs and ARMs).

The paper's estimates of single-family mortgages originated and outstanding include subprime, second liens, and home equity loans (HELs), but do not specifically disaggregate those three market sectors, due to the conflicting definitions and extensive overlap of the sectors across disparate data series. It is hoped that additional research will allow OFHEO to identify the subprime and HEL sectors in future estimates of the conventional mortgage market.

The remainder of paper is divided into two sections. Section I reviews the major data series on mortgage finance and discusses their limitations. Section II presents the assumptions used to divide total single-family conventional mortgages originated and outstanding into the jumbo and non-jumbo markets, and to divide activity in those markets into FRMs and ARMs. That section also presents OFHEO's estimates of government-insured and conventional mortgages originated and outstanding for the period.

¹ Traditionally, single-family mortgages have been segmented into government-insured or -guaranteed, conforming conventional, and non-conforming conventional loans. Conforming conventional mortgages are defined as loans with unpaid principal balances below the conforming loan limit (which was \$333,700 in 2004) that are underwritten to the guidelines of Freddie Mac and Fannie Mae. Non-conforming loans are either a) jumbo mortgages or b) those mortgages not underwritten to the guidelines of the Enterprises.

I. Data Series

Housing and mortgage-related data typically fall into three broad categories: demographic, microeconomic, and market. Demographic and microeconomic data are developed at levels as disaggregated as individual consumers or companies. Market data include macroeconomic data available at the national level and microeconomic data available at the individual market or sector level. This paper uses microeconomic data at the level of the single-family mortgage market published by federal agencies, trade associations, and private firms. Each of the major data series on mortgage finance has significant limitations. This section reviews those series and their limitations.

Sources of Mortgage Market Data

There are a number of government sources of data on mortgage finance. The Monthly Interest Rate Survey (MIRS) conducted by the Federal Housing Finance Board (FHFB) collects data monthly on the interest rates on closed conventional first mortgages used to purchase homes. The Home Mortgage Disclosure Act (HMDA) data series collected by the Federal Financial Institutions Examination Council (FFIEC)² is one of the most comprehensive sources of information on single-family mortgage applications and originations and secondary market purchases. The Federal Reserve Board's Flow of Funds Accounts (FOFA) provides data on credit flows during each calendar quarter and credit aggregates outstanding at the end of each quarter. In constructing the accounts, the Federal Reserve uses balance sheet information from the Call Reports that federally insured commercial banks submit to the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve, or the Office of the Comptroller of the Currency (OCC); call reports that federally insured credit unions and thrifts submit to the National Credit Union Administration (NCUA) and Office of Thrift Supervision (OTS), respectively; and data on mortgages insured by the Federal Housing Administration (FHA) and guaranteed by the Department of Veterans Affairs (VA), which those agencies publish in a variety of releases. Until 1997, the Department of Housing and Urban Development (HUD) conducted a monthly Survey of Mortgage Lending that provided statistics on originations of single- and multifamily mortgages.

Trade associations and private firms also make mortgage finance data available to the public. The Mortgage Bankers Association of America (MBA) publishes a study each year, the *Annual Income and Cost for Origination and Servicing of 1- to 4-Unit Residential Loans*, which includes information on the composition of single-family loans originated and outstanding. Among private firms, Inside Mortgage Finance Publications (IMF) collects and publishes a wide variety of statistics on the mortgage industry on a weekly, monthly, and annual basis through newsletters and an annual *Mortgage Market Statistical Annual*. Similarly, Thomson Financial Media, publisher of *National Mortgage News*, annually publishes a multi-volume *Mortgage Industry Sourcebook*. Both IMF and Thomson Financial Media acquire government mortgage program data; survey large lenders, servicers, and mortgage conduits on their business activities; and review publicly available disclosure statements that lenders and issuers of mortgage securities file with regulators and the Securities Exchange Commission. Another important

² Lenders report HMDA data to their supervisory agency, whereas the FFIEC compiles and releases that data to the public.

private data source is LoanPerformance, a firm that collects monthly detailed information on the performance of mortgage loans sold into the secondary market and disseminates the data to clients.

Limitations of Mortgage Market Data Series

Government agencies and private firms collect data on the single-family mortgage market in different fashions and for many purposes. Data collection occurs through surveys (often for specific but limited reasons), mandatory reporting (to comply with regulations), fulfillment of the requirements of a business relationship (for example, a fiduciary relationship), financial reporting (for example, release of data to obtain a credit rating required by investors or counterparties), voluntary release (in return for a service, as when data providers get free summary results), and government censuses. Each of the data series discussed above is compiled under one or more methods of data collection.

The most important surveys of single-family mortgage lending conducted by the federal government are not comprehensive of the whole market but only cover specific segments. The MIRS includes contract and effective interest rates, fees, loan amounts, term to maturity, purchase price, and loan-to-value ratio. Published data are subdivided by new versus existing homes, by loan type (FRM versus ARM), and by jumbo versus non-jumbo loans.³ The MIRS provides no information on government mortgage programs or refinance loans, excludes conventional loan products that are non-self amortizing (such as construction balloon financing, land contracts, and home equity lines of credit) and deletes mortgages with term to maturity less than 10 years. Those restrictions mean that MIRS may not provide an accurate picture of the whole market during periods when refinancings represent a large proportion of mortgage originations.

Similarly, for each lender's originations, HMDA provides information on the borrower (income, race and ethnicity, and sex) and the location of the property (census tract and metropolitan area). HMDA was originally enacted to determine whether financial institutions were serving the housing credit needs of their neighborhoods and communities. The Congress amended the statute in 1989 to require the reporting of data about the disposition of applications received, mortgages made, and applicant and borrower characteristics. Although the intent of the reporting requirements was to ensure regulatory compliance, the HMDA data have become a major resource for mortgage market analysts and policy makers.

However, the HMDA series is not a complete census of mortgage originations and secondary market activity in the U.S. Reporting exemptions reduce coverage to an estimated 80 to 90 percent of single-family originations. Wholesale and correspondent lenders may fail to report the sale of loans to the secondary market. The data series does indicate whether a loan was conventional or government-insured and for a home purchase or a refinancing, but does not indicate loan type (ARM or FRM). Additionally, it does not permit distinguishing between prime and subprime mortgage originations, although some analysts have used the fact that some

³ Like the HMDA data, the loan-level MIRS data do not include number of units financed by the mortgage. That complicates estimating jumbo and non-jumbo conventional mortgages, since each year's conforming loan limits are greater for loans financing 2-, 3-, and 4-unit properties than for mortgages financing 1-unit homes.

lenders are known subprime originators to estimate that market segment. One other shortcoming of the HMDA series is the lack of data on the number of units of each property financed. That complicates estimating jumbo and non-jumbo conventional mortgages, since each year's conforming loan limits are greater for loans financing 2-, 3-, and 4-unit properties than for mortgages financing 1-unit homes.

Home mortgages in the FOFA are loans secured by one-to-four-family residences, including owner-occupied condominium units and manufactured housing. That transaction type includes second mortgages on properties of those types, loans obtained under home equity lines of credit, mortgages held by households under seller-financing arrangements, and construction and land development loans associated with one-to-four family residences. The Federal Reserve Board uses data obtained from various sources—federal financial regulatory agencies, other federal agencies, private financial institutions, and trade associations, for example—to construct the FOFA. From the perspective of this paper, the limitations of the FOFA are that the data series on home mortgages used by the Board are of uneven quality and do not provide information on fixed- versus variable and jumbo versus non-jumbo loans.

Mortgage data series provided by private vendors also have limitations. LoanPerformance, for example, has the largest and most comprehensive loan-level database on single-family mortgages collateralizing mortgage-backed and -related securities issued in the U.S. LoanPerformance databases include loan-level information on securitized jumbo, subprime, home equity, and alternative A mortgages. However, those data series do not include loans backing mortgage-backed securities guaranteed by Fannie Mae, Freddie Mac, or the Government National Mortgage Association (Ginnie Mae), or loans that have not been securitized. Additionally, the series do not include securitized manufactured housing or multifamily mortgages or loans financed through private placements.

In summary, there are deficiencies in all available single-family mortgage market data series, whether collected by federal agencies, private firms, or trade associations. That is not surprising, as data collection efforts were designed to address specific areas of interest, and data collection is expensive and seldom done for “pure” research. Those deficiencies mean that OFHEO must make a number of assumptions in order to estimate the shares of mortgages originated and outstanding with specific characteristics.

II. Method and Assumptions

There are a number of baseline data series that allow estimation of total single-family mortgages originated and outstanding for 1990 through 2004. The SMLA provides estimates of single-family originations through 1997. For 1998 through 2004, IMF provides estimates of such originations based on FHA and VA endorsements and commitments and proprietary surveys of conventional mortgage lenders. The FOFA provides estimates of single-family mortgages outstanding. This paper relies on those three data series, which OFHEO believes are the most representative available, for estimates of the total single-family market

OFHEO obtained statistics on government-insured and -guaranteed mortgages directly from the FHA, the VA, and the Rural Housing Service (RHS). FHA and VA provided current endorsement and outstanding insurance-in-force statistics for their single-family insurance and guarantee programs for calendar years 1990 through 2004. Those statistics include subtotals for FRMs and ARMs. The data include insurance written during the calendar year as well as insurance-in-force at year-end. VA was able to provide disaggregated data on outstanding VA loans only from 1995 to the present. RHS only guarantees or directly makes FRMs.

Estimating Conventional Single-Family Mortgage Originations

Total originations of conventional single-family mortgages can be easily estimated for 1990 through 2004 using the data from FHA, VA, RHS, the SMLA, and IMF.⁴ Subtracting total government mortgage insurance written or guarantees provided each year from the estimates of total mortgage originations from the SMLA (1990-1997) and IMF (1998-2004) yields annual estimates of total conventional originations.

Data series compiled by IMF, the FHFB, and the FFIEC allow estimation of jumbo (and non-jumbo) shares of conventional single-family mortgage originations since 1990 (see Table 1). Those series provide significantly different estimates of the jumbo share of the market in that period. The IMF data series was compiled from surveys of large lenders and servicers and from a review of publicly available disclosure statements filed with the SEC. The FHFB estimates were obtained from the Monthly Interest Rate Survey, whereas the FFIEC estimates were derived from the annual HMDA data. To minimize bias, this paper uses the simple average of the jumbo market shares from the three series to estimate the jumbo portions of conventional single-family originations in 1990 through 2004.

⁴ OFHEO adjusted RHS Fiscal Year-end data to a calendar-year basis for the purposes of this paper.

⁶ Two limitations of those estimates should be noted. Due in part to the MBA survey sample design, the survey results appear to under-represent portfolio lenders and lenders that originate only subprime loans. Also, the MBA did not publish conventional ARM servicing percentages prior to 1993.

Table 1
Jumbo Share of Conventional
Single-Family Mortgage Originations, 1990-2003
(Percent)

Year	IMF Estimate	MIRS Estimate	HMDA Estimate	OFHEO Estimate
1990	23.64	7.93	28.80	20.12
1991	22.50	7.15	26.34	18.66
1992	21.83	6.51	21.28	16.54
1993	22.69	6.37	22.63	17.23
1994	25.69	7.93	25.62	19.75
1995	25.81	7.82	23.37	19.00
1996	26.48	9.25	22.93	19.55
1997	26.07	9.60	26.40	20.69
1998	27.84	8.71	23.40	19.98
1999	27.74	9.24	24.62	20.53
2000	26.97	9.91	26.64	21.17
2001	18.80	7.77	22.52	16.36
2002	20.30	7.72	26.30	18.11
2003	17.20	6.52	20.49	14.74
2004	17.60	7.02	N/A*	12.31

* 2004 HMDA not available until July 2005.

Source: OFHEO based on data from Inside Mortgage Finance Publications, FHFB's MIRS, and FFIEC.

The MIRS provides annual estimates of the ARM share of conventional mortgages used to purchase homes for the period 1990 through 2004. Separate ARM share estimates are provided for jumbo and non-jumbo conventional mortgages, based on weighted data (Table 2). OFHEO used those estimates to derive the ARM and FRM shares of conventional single-family originations, assuming that refinance mortgages have the same characteristics as purchase loans.

Table 2
Adjustable Rate Mortgage (ARM) Share of
Conventional Single-Family Loans Closed, 1990-2003
(Percent)

Year	ARM Share of Non- Jumbo Loans	ARM Share of Jumbo Loans
1990	26	57
1991	21	46
1992	19	42
1993	18	47
1994	36	72
1995	29	66
1996	22	64
1997	19	47
1998	10	40
1999	17	58
2000	19	71
2001	9	51
2002	14	51
2003	16	50
2004	31	70

Source: OFHEO based on data from FHFB's MIRS.

Tables 3 through 5 present OFHEO estimates of single-family mortgage originations for 1990–2004. Table 3 presents total single-family mortgage originations for conventional and government mortgage programs by FRMs and ARMs. Table 4 presents total conventional single-family originations for the non-jumbo and jumbo market segments by FRMs and ARMs. Table 5 presents total FHA-insured and VA-guaranteed mortgages.

Table 3
Originations of Single-Family Mortgages, 1990 - 2004
Conventional and Government-Backed Mortgages, by Loan Type
(\$ Millions)

	Total Single-Family Mortgages	Total ARMs	Total FRMs	Conventional Single-Family Mortgages	Conventional ARMs	Conventional FRMs	Gov't-Backed Single-Family Mortgages	Gov't-Backed ARMs	Gov't-Backed FRMs
1990	\$458,405	\$123,680	\$336,002	\$381,756	\$123,071	\$258,685	\$77,927	\$609	\$77,318
1991	\$562,074	\$131,081	\$432,303	\$499,792	\$128,276	\$371,516	\$63,592	\$2,805	\$60,787
1992	\$893,666	\$198,205	\$696,809	\$830,115	\$189,301	\$640,814	\$64,899	\$8,904	\$55,995
1993	\$1,019,861	\$227,096	\$794,324	\$926,567	\$213,080	\$713,487	\$94,853	\$14,016	\$80,837
1994	\$773,121	\$299,698	\$475,392	\$632,736	\$272,765	\$359,971	\$142,354	\$26,933	\$115,421
1995	\$639,436	\$224,261	\$417,457	\$570,681	\$205,616	\$365,065	\$71,037	\$18,645	\$52,392
1996	\$785,329	\$226,700	\$560,793	\$680,578	\$205,619	\$474,959	\$106,915	\$21,081	\$85,834
1997	\$859,100	\$215,266	\$646,548	\$758,172	\$187,975	\$570,197	\$103,642	\$27,291	\$76,351
1998	\$1,450,000	\$220,284	\$1,232,703	\$1,304,458	\$208,648	\$1,095,810	\$148,529	\$11,636	\$136,893
1999	\$1,310,000	\$297,763	\$1,016,096	\$1,138,162	\$289,306	\$848,856	\$175,697	\$8,457	\$167,240
2000	\$1,048,000	\$289,455	\$762,326	\$932,875	\$279,957	\$652,918	\$118,906	\$9,498	\$109,408
2001	\$2,058,000	\$304,359	\$1,756,964	\$1,890,508	\$300,073	\$1,590,435	\$170,815	\$4,286	\$166,529
2002	\$2,680,000	\$529,588	\$2,150,412	\$2,491,939	\$515,818	\$1,976,121	\$188,061	\$13,770	\$174,291
2003	\$3,835,000	\$771,249	\$3,063,751	\$3,600,705	\$756,525	\$2,844,180	\$234,295	\$14,724	\$219,571
2004	\$2,810,000	\$984,824	\$1,825,176	\$2,677,463	\$964,282	\$1,713,181	\$132,537	\$20,543	\$111,994

Source: OFHEO based on data from Inside Mortgage Finance Publications, HUD, VA, and FHFB's MIRS.

Table 4
Originations of Conventional Single-Family Mortgages, 1990 - 2004
Jumbos and Non-Jumbo Mortgages, by Loan Type
(\$ Millions)

	Conventional Single-Family Mortgages			Non-Jumbo Single-Family Mortgages			Jumbo Single-Family Mortgages		
	Conventional Mortgages	Conventional ARMs	Conventional FRMs	Non-Jumbo Mortgages	Non-Jumbo ARMs	Non-Jumbo FRMs	Jumbo Mortgages	Jumbo ARMs	Jumbo FRMs
1990	\$381,756	\$123,071	\$258,685	\$304,934	\$79,283	\$225,651	\$76,822	\$43,789	\$33,033
1991	\$499,792	\$128,276	\$371,516	\$406,514	\$85,368	\$321,146	\$93,278	\$42,908	\$50,370
1992	\$830,115	\$189,301	\$640,814	\$692,814	\$131,635	\$561,179	\$137,301	\$57,666	\$79,635
1993	\$926,567	\$213,080	\$713,487	\$766,920	\$138,046	\$628,874	\$159,647	\$75,034	\$84,613
1994	\$632,736	\$272,765	\$359,971	\$507,792	\$182,805	\$324,987	\$124,944	\$89,960	\$34,984
1995	\$570,681	\$205,616	\$365,065	\$462,252	\$134,053	\$328,199	\$108,429	\$71,563	\$36,866
1996	\$680,578	\$205,619	\$474,959	\$547,502	\$120,451	\$427,052	\$133,076	\$85,168	\$47,907
1997	\$758,172	\$187,975	\$570,197	\$601,306	\$114,248	\$487,058	\$156,866	\$73,727	\$83,139
1998	\$1,304,458	\$208,648	\$1,095,810	\$1,043,784	\$104,378	\$939,405	\$260,674	\$104,270	\$156,405
1999	\$1,138,162	\$289,306	\$848,856	\$904,459	\$153,758	\$750,701	\$233,703	\$135,548	\$98,155
2000	\$932,875	\$279,957	\$652,918	\$735,354	\$139,717	\$595,637	\$197,521	\$140,240	\$57,281
2001	\$1,890,508	\$300,073	\$1,590,435	\$1,581,158	\$142,304	\$1,438,854	\$309,350	\$157,769	\$151,582
2002	\$2,491,939	\$515,818	\$1,976,121	\$2,040,732	\$285,702	\$1,755,029	\$451,207	\$230,116	\$221,091
2003	\$3,600,705	\$756,525	\$2,844,180	\$3,070,081	\$491,213	\$2,578,868	\$530,624	\$265,312	\$265,312
2004	\$2,677,463	\$964,282	\$1,713,181	\$2,347,868	\$732,889	\$1,614,978	\$329,596	\$231,393	\$98,203

Source: OFHEO based on data from Inside Mortgage Finance Publications, HUD, VA, FHFB, and FFIEC

Table 5
Originations of Government-Backed Single-Family
Mortgages, 1990-2004, by Loan Type
(\$ Millions)

	Government-Backed Single-Family Mortgages	Government-Backed ARMs	Government-Backed FRMs	FHA-Insured Single-Family Mortgages	FHA-Insured ARMs	FHA-Insured FRMs	Gov't-Guaranteed Single-Family Mortgages	VA-Guaranteed ARMs	VA-Guaranteed FRMs	RHS-Guaranteed FRMs
1990	\$77,927	\$609	\$77,318	\$51,665	\$609	\$51,056	\$24,984	\$0	\$24,984	\$1,278
1991	\$63,592	\$2,805	\$60,787	\$46,468	\$2,805	\$43,663	\$15,814	\$0	\$15,814	\$1,310
1992	\$64,899	\$8,904	\$55,995	\$47,859	\$8,904	\$38,955	\$15,692	\$0	\$15,692	\$1,348
1993	\$94,853	\$14,016	\$80,837	\$78,965	\$12,248	\$66,717	\$14,329	\$1,768	\$12,561	\$1,559
1994	\$142,354	\$26,933	\$115,421	\$91,133	\$19,282	\$71,851	\$49,252	\$7,651	\$41,601	\$1,969
1995	\$71,037	\$18,645	\$52,392	\$45,079	\$13,176	\$31,903	\$23,676	\$5,469	\$18,207	\$2,282
1996	\$106,915	\$21,081	\$85,834	\$71,646	\$20,224	\$51,422	\$33,105	\$857	\$32,248	\$2,164
1997	\$103,642	\$27,291	\$76,351	\$74,245	\$27,262	\$46,983	\$26,683	\$29	\$26,654	\$2,714
1998	\$148,529	\$11,636	\$136,893	\$103,087	\$11,622	\$91,465	\$42,455	\$14	\$42,441	\$2,987
1999	\$175,697	\$8,457	\$167,240	\$122,373	\$8,450	\$113,923	\$49,465	\$7	\$49,458	\$3,859
2000	\$118,906	\$9,498	\$109,408	\$93,109	\$9,491	\$83,618	\$22,016	\$7	\$22,009	\$3,781
2001	\$170,815	\$4,286	\$166,529	\$132,377	\$4,278	\$128,099	\$35,114	\$8	\$35,107	\$3,323
2002	\$188,061	\$13,770	\$174,291	\$142,926	\$13,757	\$129,169	\$41,698	\$13	\$41,685	\$3,437
2003	\$234,295	\$14,724	\$219,571	\$164,637	\$13,832	\$150,805	\$66,002	\$892	\$65,110	\$3,656
2004	\$132,537	\$20,543	\$111,994	\$93,838	\$13,260	\$80,578	\$35,160	\$7,283	\$27,877	\$3,539

Source: OFHEO based on data from HUD, VA, and RHS

Estimating Conventional Single-Family Mortgages Outstanding

As noted, the FOFA provide a baseline of total single-family mortgages outstanding. Subtracting total government-insured and -guaranteed mortgages outstanding at the end of each year from the FOFA estimates of single-family mortgage debt outstanding generates estimates of total conventional single-family mortgage debt outstanding.

Estimating the volume of jumbo mortgages outstanding is far more difficult than estimating the volume of jumbo originations for three reasons. First, there are no publicly available data series on outstanding jumbo mortgages. Second, the conforming loan limit has risen significantly in recent years (from \$214,700 in 1997 to \$333,700 in 2004). Thus, many single-family loans that were jumbo mortgages in the year they were originated, through seasoning, have become eligible to be refinanced into the non-jumbo mortgage market. Third, jumbo mortgages generally terminate at higher rates than non-jumbo loans. Adjustable-rate loans comprise a larger share of jumbo mortgages and have a higher termination rate than do FRMs. Moreover, prepayment rates of jumbo FRMs rise more rapidly when interest rates decline than do prepayment rates of non-jumbo FRMs. As a result, it is difficult to estimate how outstanding jumbo mortgages change over time.

After extensive discussion with mortgage market analysts from both the industry and academia, OFHEO has assumed that the jumbo share of single-family mortgage debt outstanding remained constant from 1990 through 2004. Specifically, this paper assumes that jumbo loans comprised 15 percent of outstanding single-family mortgage debt throughout that period. Two justifications may be offered for this assumption. First, the IMF, MIRS, and HMDA data indicate that the jumbo share of originations of purchase mortgages varied modestly during the period from 1990 through 2004. Second, house prices appreciated significantly at the national level over the period, with significant house price appreciation in the high-cost housing markets of the country where jumbo loans are generally made. There are many housing markets in California in 2004, for example, where the median sales price of homes (as measured by the Existing Home Sales series published by the National Association of Realtors) was above the conforming conventional loan limit, and where jumbo mortgages were not just originated by specialty lenders, but were a significant mortgage product offered by all lenders. However, as house prices rose, so did the conforming loan limit that divides the jumbo/non-jumbo market segments.

Data on conventional single-family mortgage servicing portfolios shed some light on the FRM and ARM shares of conventional single-family mortgage debt outstanding. The MBA's *Annual Income and Cost for Origination and Servicing of 1- to 4-Unit Residential Loans* provides estimates of conventional ARMs as a percent of conventional servicing volume for 1993 through 1997.⁶ This paper uses those estimates to quantify the volume of conventional ARMs outstanding in those years. For 1990 through 1992, the paper assumes that share is 10 percent. Beginning in the second quarter of 2003, the MBA significantly revised its quarterly *National Delinquency Survey* (and reported data back to 1998) to include information on segments of the conventional mortgage market. Specifically, the MBA separated prime and subprime servicers and began to report those segments separately. Because of the extremely

large size of the sample used in the quarterly delinquency study (ranging from 15 to 25 million loans per quarter), that data source was used for 1998–2004.

Decomposing jumbo and non-jumbo conventional mortgages into ARMs and FRMs requires a further simplifying assumption. This paper assumes that 32 percent of conventional ARMs outstanding were non-jumbo loans.⁷ That assumption is based on two observations. First, although the proportion of ARM originations in the non-jumbo market is much smaller than the jumbo market (See Table 1), the non-jumbo market is much larger in dollar volume. Second, prepayment rates in the jumbo market are much higher than in the non-jumbo market, and OFHEO assumes that a larger proportion of jumbo prepayments are refinancings from ARMs to FRMs. Subtracting the volume of non-jumbo ARMs from total non-jumbo conventional mortgage debt outstanding yields the volume of non-jumbo FRMs. Similarly, subtracting the estimates of non-jumbo ARMs and FRMs from total conventional ARMs and FRMs, respectively, yields estimates of jumbo ARMs and FRMs outstanding.

Tables 7 through 9 present statistics for single-family mortgage debt outstanding. Table 7 presents total single-family mortgages outstanding for conventional and government mortgage programs by FRMs and ARMs. Table 8 presents total conventional single-family mortgage debt for the non-jumbo and jumbo market segments by FRMs and ARMs. Table 9 presents total government mortgage programs for FHA, VA and RHS by FRMs and ARMs.

⁷ That assumption is based on OFHEO estimates of survivorship of conventional ARMs and FRMs in 2002 for mortgages originated from 1990 through 2001 from the Census Bureau 2001 Residential Finance Survey, which is conducted every 10 years. This paper makes the assumption for all years 1990 through 2004.

Table 6
ARMs as a Share of Conventional Single-Family Mortgages Serviced
(Percent)

	MBA Cost Study	MBA Mortgage Delinquency Survey	OFHEO Estimate
1990	N/A	N/A	10.0
1991	N/A	N/A	10.0
1992	N/A	N/A	10.0
1993	14.8	N/A	14.8
1994	15.0	N/A	15.0
1995	15.9	N/A	15.9
1996	15.9	N/A	15.9
1997	13.1	N/A	13.1
1998	N/A	13.52	13.52
1999	N/A	14.44	14.44
2000	N/A	12.85	12.85
2001	N/A	12.56	12.56
2002	N/A	12.45	12.45
2003	N/A	15.78	15.78
2004	N/A	17.99	17.99

N/A = not available

Source: OFHEO based on data from MBA

Table 7
Single-Family Mortgages Outstanding 1990 - 2004
Government-Backed and Conventional Mortgages by Loan Type
(\$ Millions)

	Total Single-Family Mortgages	Total ARMs	Total FRMs	Conventional Single-Family Mortgages	Conventional ARMs	Conventional FRMs	Gov't-Backed Single-Family Mortgages	Gov't- Backed ARMs	Gov't- Backed FRMs
1990	\$2,619,006	\$222,543	\$2,396,463	\$2,185,483	\$218,548	\$1,966,935	\$433,523	\$3,995	\$429,528
1991	\$2,787,155	\$239,217	\$2,548,101	\$2,330,405	\$233,040	\$2,097,364	\$456,750	\$6,177	\$450,736
1992	\$2,954,927	\$264,571	\$2,690,540	\$2,509,095	\$250,909	\$2,258,185	\$445,832	\$13,662	\$432,354
1993	\$3,116,354	\$428,533	\$2,688,058	\$2,689,498	\$398,046	\$2,291,452	\$426,856	\$30,487	\$396,606
1994	\$3,296,037	\$470,744	\$2,814,970	\$2,807,179	\$421,077	\$2,386,102	\$488,858	\$49,667	\$428,868
1995	\$3,466,975	\$528,699	\$2,927,240	\$2,929,155	\$465,736	\$2,463,420	\$537,820	\$62,963	\$463,821
1996	\$3,694,784	\$569,204	\$3,113,208	\$3,111,797	\$494,776	\$2,617,021	\$582,987	\$74,428	\$496,187
1997	\$3,935,471	\$518,860	\$3,402,661	\$3,311,298	\$433,780	\$2,877,518	\$624,173	\$85,080	\$525,143
1998	\$4,294,002	\$565,592	\$3,707,160	\$3,635,662	\$491,541	\$3,144,120	\$658,340	\$74,051	\$563,039
1999	\$4,715,611	\$638,691	\$4,060,871	\$3,999,965	\$577,595	\$3,422,370	\$715,646	\$61,096	\$638,501
2000	\$5,125,180	\$620,166	\$4,498,288	\$4,364,068	\$560,783	\$3,803,285	\$761,112	\$59,383	\$695,003
2001	\$5,634,348	\$662,167	\$4,973,188	\$4,872,008	\$611,924	\$4,260,083	\$762,340	\$50,243	\$713,104
2002	\$6,312,895	\$736,847	\$5,576,048	\$5,566,213	\$692,994	\$4,873,220	\$746,682	\$43,853	\$702,829
2003	\$7,111,109	\$1,054,775	\$6,056,334	\$6,431,743	\$1,014,929	\$5,416,814	\$679,366	\$39,846	\$639,520
2004	\$8,096,390	\$1,388,571	\$6,707,819	\$7,453,931	\$1,340,962	\$6,112,969	\$642,459	\$47,609	\$594,850

Source: OFHEO based on data from the Federal Reserve, HUD, VA, FHFB

Table 8
Conventional Single-Family Mortgages Outstanding, 1990 - 2004
Jumbo and Non-Jumbo Mortgages, by Loan Type
(\$ Millions)

	Conventional Mortgages	Conventional ARMs	Conventional FRMs	Non-Jumbo Non-Jumbo	Non-Jumbo ARMs	Non-Jumbo FRMs	Jumbo Jumbo	Jumbo ARMs	Jumbo FRMs
1990	\$2,185,483	\$218,548	\$1,966,935	\$1,857,661	\$69,935	\$1,787,725	\$327,822	\$148,613	\$179,210
1991	\$2,330,405	\$233,040	\$2,097,364	\$1,980,844	\$74,573	\$1,906,271	\$349,561	\$158,468	\$191,093
1992	\$2,509,095	\$250,909	\$2,258,185	\$2,132,731	\$80,291	\$2,052,440	\$376,364	\$170,618	\$205,746
1993	\$2,689,498	\$398,046	\$2,291,452	\$2,286,073	\$127,375	\$2,158,699	\$403,425	\$270,671	\$132,754
1994	\$2,807,179	\$421,077	\$2,386,102	\$2,386,102	\$134,745	\$2,251,357	\$421,077	\$286,332	\$134,745
1995	\$2,929,155	\$465,736	\$2,463,420	\$2,489,782	\$149,035	\$2,340,747	\$439,373	\$316,700	\$122,673
1996	\$3,111,797	\$494,776	\$2,617,021	\$2,645,027	\$158,328	\$2,486,699	\$466,770	\$336,447	\$130,322
1997	\$3,311,298	\$433,780	\$2,877,518	\$2,814,603	\$138,810	\$2,675,793	\$496,695	\$294,970	\$201,724
1998	\$3,635,662	\$491,541	\$3,144,120	\$3,090,312	\$157,293	\$2,933,019	\$545,349	\$334,248	\$211,101
1999	\$3,999,965	\$577,595	\$3,422,370	\$3,399,970	\$184,830	\$3,215,140	\$599,995	\$392,765	\$207,230
2000	\$4,364,068	\$560,783	\$3,803,285	\$3,709,458	\$179,450	\$3,530,007	\$654,610	\$381,332	\$273,278
2001	\$4,872,008	\$611,924	\$4,260,083	\$4,141,206	\$195,816	\$3,945,391	\$730,801	\$416,108	\$314,693
2002	\$5,566,213	\$692,994	\$4,873,220	\$4,731,281	\$221,758	\$4,509,523	\$834,932	\$471,236	\$363,696
2003	\$6,431,743	\$1,014,929	\$5,416,814	\$5,466,982	\$324,777	\$5,142,205	\$964,762	\$690,152	\$274,610
2004	\$7,453,931	\$1,340,962	\$6,112,969	\$6,335,841	\$429,108	\$5,906,733	\$1,118,090	\$911,854	\$206,235

Source: OFHEO based on data from Federal Reserve, and the Census Bureau

Table 9
Government-Backed Mortgages Outstanding 1990 - 2004
FHA-Insured and VA-Guaranteed by Loan Type
(\$ Millions)

	Gov't-Backed Single-Family Mortgages	Gov't- Backed ARMs	Gov't- Backed FRMs	FHA- Insured Single-Family Mortgages	FHA-Insured ARMs	FHA- Insured FRMs	VA- Guaranteed Single-Family Mortgages	VA- Guaranteed ARMs	VA- Guaranteed FRMs	RHS FRMs
1990	\$433,523	\$3,995	\$429,528	\$278,371	\$3,995	\$274,376	\$155,116	\$0	\$155,116	\$36
1991	\$456,750	\$6,177	\$450,736	\$298,400	\$6,177	\$292,386	\$158,219	\$0	\$158,219	\$131
1992	\$445,832	\$13,662	\$432,354	\$286,743	\$13,662	\$273,265	\$158,573	\$0	\$158,573	\$516
1993	\$426,856	\$30,487	\$396,606	\$263,315	\$23,487	\$240,065	\$162,383	\$7,000	\$155,383	\$1,158
1994	\$488,858	\$49,667	\$428,868	\$313,108	\$39,667	\$263,118	\$173,808	\$10,000	\$163,808	\$1,942
1995	\$537,820	\$62,963	\$463,821	\$329,394	\$48,761	\$269,597	\$205,130	\$14,202	\$190,928	\$3,296
1996	\$582,987	\$74,428	\$496,187	\$361,319	\$61,510	\$287,437	\$216,934	\$12,918	\$204,016	\$4,734
1997	\$624,173	\$85,080	\$525,143	\$393,887	\$77,591	\$302,346	\$223,581	\$7,489	\$216,092	\$6,705
1998	\$658,340	\$74,051	\$563,039	\$412,798	\$63,368	\$328,180	\$237,342	\$10,683	\$226,659	\$8,200
1999	\$715,646	\$61,096	\$638,501	\$462,262	\$55,395	\$390,818	\$242,758	\$5,701	\$237,057	\$10,626
2000	\$761,112	\$59,383	\$695,003	\$499,899	\$54,302	\$438,871	\$248,849	\$5,081	\$243,768	\$12,364
2001	\$762,340	\$50,243	\$713,104	\$497,131	\$45,973	\$452,165	\$251,684	\$4,270	\$247,414	\$13,525
2002	\$746,682	\$43,853	\$702,829	\$486,221	\$40,249	\$445,972	\$246,797	\$3,604	\$243,193	\$13,664
2003	\$679,366	\$39,846	\$639,520	\$424,592	\$38,602	\$385,990	\$241,262	\$1,244	\$240,018	\$13,512
2004	\$642,459	\$47,609	\$594,850	\$392,875	\$40,529	\$352,346	\$236,108	\$7,080	\$229,028	\$13,476

Source: OFHEO based on data from FHA and VA