

CONSUMER IMPACTS OF SUBSTITUTING
RADIAN LIEN PROTECTION COVERAGE FOR
REFINANCE LENDER'S TITLE INSURANCE

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In addition to his work in the title insurance area, Dr. Lipshutz has studied the economics of many other industries, including the pulp and paper industry, the pesticide industry, the automobile industry, and the mortgage insurance industry. He has presented testimony on economic issues before the President's Council on Wage and Price Stability, the US International Trade Commission, the US Environmental Protection Agency, Federal and State courts, and the American Arbitration Association.

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I. INTRODUCTION

In a recent report, Liu purports to demonstrate the superiority of Radian Lien Protection (“RLP”) over refinance lender’s title insurance by an analysis of the “consumer surplus” which would be generated by the wholesale adoption of RLP as a substitute for refinance lender’s title insurance.¹ The study suffers from numerous defects, both in data and methodology. Most important, Liu’s study considers consumer surplus in isolation as a measure of the increase in the economic welfare of real estate refinance lenders, without considering any of the offsetting economic costs imposed on consumers.

When reduced to its essentials, Liu’s argument is a very simple one: if RLP costs less per policy than title insurance, then if everyone who now buys lender’s title insurance bought RLP instead, the purchasers would spend less money in total. The argument would be correct except for one important detail: RLP does *not* cost less than title insurance under the conditions which are required to qualify to use the RLP product. *Title insurance rates applicable under these conditions are cheaper than RLP. Equally important, the substitution of RLP for refinance title insurance would impose costs on the California consuming public that more than outweigh any putative benefits.*

II. ARE THERE PRICE SAVINGS FROM RLP?

Liu does not present any tabular data on the title insurance rate schedules he uses, and instead presents a set of rough graphs.² In order to determine which rates Liu has

¹ P. Liu, “The Increase in Consumer Surplus from Radian Lien Protection – The California Market,” Cambridge, The Brattle Group, December 11, 2002, henceforth “the Liu report.”

² Liu states that he has used the rate schedules posted on the California Department of Insurance website. The California DOI website does not appear to post any actual title insurance rate schedules, but only to provide a simplistic title insurance rate calculator.

used, I digitized his graphs and examined the resulting schedules. Table 1 presents the results. The various rate schedules which Liu presents appear to be calculated using a number of simple percentage discounts from an underlying rate schedule (25%, 45%, 55%, 65%, and 75%), which correspond to a wide variety of non-comparable situations, including:

- a. Different types of policies (e.g., standard coverage vs. extended coverage)
- b. Different prior policy ages (e.g., very old prior policy vs. newer prior policy)
- c. Different lending conditions (e.g., same lender or new lender)
- d. Different prior policy types (e.g., standard coverage policy replaced by extended coverage policy).

Liu makes no attempt to determine how frequently each of these different types of policies is used. Accordingly, his average rate figure has little connection to the average title insurance refinance rate actually charged in California.

More troubling is the fact that Liu *omitted* from his analysis the title insurance rates available in California that are used in circumstances comparable to those in which the RLP is available.

The RLP is not generally available to all refinance lender's title insurance users. Radian's advertising states that, in order to use the RLP, a lender must be able to enter all orders electronically through the RadianClose system, a capability generally possessed only by large lending institutions, and to insure an entire mortgage pool. The two largest title insurers in California, who write over 60% of all California title insurance policies, offer rates which are lower than the rates for the RLP to lenders capable of electronic submission and committed to insuring large mortgage pools. [N.B. Liu does not perform

his analysis using the RLP rates that Radian actually charged. Instead, Liu uses a speculative rate that he claims Radian would charge in the future. I have carried out my analysis using both sets of RLP rates, actual and speculative.]

Figure 1 compares the RLP rate actually charged (including the same \$50 search fee that Liu uses in his comparisons) to the title insurance refinance rate offered both by Fidelity National Title Insurance Company and First American Title Insurance Company under the same conditions as are required to qualify for an RLP, i.e., electronic submission of data and commitment to submitting a large number of policies on an ongoing basis. *Under these conditions, the title insurance policy is \$50 cheaper than an RLP for liabilities up to \$300,700 and is \$27.50 cheaper for liabilities from \$300,700 to \$650,000.* Under the same assumptions on the degree of utilization as are made by Liu, i.e., that all insureds qualify either for an RLP or an electronic submission title insurance refinance rate, the *substitution of the actual RLP for title insurance would cost California consumers an extra \$57 million each year, a cost stream with a present value of \$284 million dollars.* The calculations are set forth in Table 2. Thus rather than providing a consumer benefit of \$1.4 billion as Liu claims, an “apples to apples” application of Liu’s methods demonstrates that the RLP imposes an excess cost on the California public of over a quarter of a billion dollars.

The situation does not change qualitatively even under the assumption that the RLP rate would change to the rate assumed by Liu. Figure 2 compares the RLP rate of \$1.83/thousand up to \$300,700 of liability with a maximum of \$275 and a minimum of \$75, and a rate of \$1.20/thousand from \$300,700 to \$650,000 of liability (plus a \$50 search fee) to the title insurance rate. Under these conditions, the RLP is cheaper for

liabilities up to \$175,000; identical for liabilities between \$175,000 and \$300,700; and up to \$500 more expensive for liabilities of up to \$650,000. Again assuming that all refinances qualify to use both products, *substitution of the RLP for title insurance at the speculated rate would cost California consumers an extra \$8 million per year, a cost stream with a present value of \$40 million.* The calculations are set forth in Table 3.

So, in terms of out of pocket cost, RLP is no bargain. But that is just the beginning of the story.

III. WHO GETS RLP PRICING?

At the threshold, it is worth observing that RLP charges are made to banks, not borrowers, and it is a matter of individual bank policy as to whether the difference between the RLP premium and a title insurance premium is passed on to the borrower or retained by the bank. But it is equally important to note that the RLP credit rating and property type qualification criteria have disproportionate negative impacts on several borrower segments.

The RLP program description originally indicated that qualifying loans must be by a borrower with a FICO score of 570 or above. While Radian advertising literature no longer lists this criterion, it is not possible to determine whether this criterion is still being used in Radian's underwriting (either directly or by the lender's selection of the loans to be made so they can be included in a pool qualified for RLP coverage). To the extent that FICO scoring continues to be part of the RLP qualification process, it disqualifies minority borrowers disproportionately. A recent study by Fannie Mae³ indicates that 7% of non-minority mortgage loan applicants have a FICO score of less than 580, while 11%

³ Susan Wharton Gates, Vanessa Gail Perry, and Peter M. Zorn, "Automated Underwriting for Mortgage Lending: Good News for the Underserved?" Housing Policy Debate, vol. 13, no. 2, 2002, p. 386

of minority applicants have FICO scores below 580. In other words, *the RLP FICO criterion excludes a 57% larger proportion of minorities than non-minorities from being included in mortgage pools with RLP insurance eligibility. Title insurance underwriting creates no such racial discrimination.*

The RLP program also explicitly excludes borrowers who are owners of mobile homes and other manufactured housing. The 2000 Census indicates that about 3.6% of the owner-occupied housing units in the state (about 437,000 units) are mobile homes. This percentage varies widely across the state, however. Almost 8% of the California population lives in counties in which the proportion of mobile homes exceeds 10%. In seven counties, the proportion of mobile homes exceeds 20%. Further, in several sub-county regions, the percentage exceeds 60%. These results are illustrated in Figure 3. Because mobile homes are often purchased by lower income families, the effect of excluding these dwellings from the RLP program is to deny credit to some of California's poorest and most vulnerable citizens. In contrast, lender's title insurance is available for mobile home mortgages, and at highly favorable rates, as low as \$250 (which includes all search and examination charges) for \$40,000 of liability, which exceeds the median value of a mobile home loan of around \$37,000 (80% of \$45,900).⁴

IV. WHAT DOES THE LOSS OF TITLE EXAMINATION COST THE CALIFORNIA PUBLIC?

The constant repair of the public record by the title insurance process is almost invisible, but it performs an important function in protecting the public from the very real

⁴ e.g., First American Title Insurance Company Schedule of Fees for use in all counties in the State of California, Section C-14; Fees and Charges of Fidelity National Title Insurance Company, a California corporation, for the State of California, Section C-13

risks of financial fraud. An error-riddled public record makes it virtually impossible to check on the bona fides of any proposed financial transaction.

The importance of a clear public record has been shown by contemporary research in comparative international economics. A title insurance system we in the U.S. take so much for granted that we barely notice it is critically lacking in much of the world. In his seminal work, Hernando DeSoto notes:

“Few seem to have noticed that the legal property system of an advanced nation is the center of a complex web of connections that equips ordinary citizens to form ties with both the government and the private sector, and so to obtain additional goods and services. Without the tools of formal property, it is hard to see how assets could be used for everything they accomplish in the West. How else could financial organizations identify trustworthy borrowers on a massive scale? How could physical assets, like timber in Oregon, secure an industrial investment in Chicago? How could insurance companies find and contract customers who will pay their bills? How could information brokerage or inspection and verification services be provided efficiently and cheaply? How could tax collection work?

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In addition to public record-keeping systems, many other private services have evolved to assist parties in fixing, moving, and tracking representations [i.e., titles] so they can easily and securely produce surplus value. These include private entities that record transactions, escrow and closings organizations, abstractors, appraisers, title and fidelity insurance firms, mortgage brokers, trust services, and private custodians of documents. In the United States, title insurance companies further help by issuing policies to cover parties for specified risks, ranging from defects on titles to unenforceability of mortgages and unmarketability of title. By law, all these entities have to follow strict operating standards that govern their document-tracking capabilities, physical storage facilities, and staffing.”⁵

These benefits, so eloquently described by DeSoto, should not be lightly put at risk.

One important example illustrates the process. The California Department of Child Support Services routinely files a lien on the real property of a child support delinquent, even though it knows that the costs of foreclosure generally exceed the

⁵ H. DeSoto, “The Mystery of Capital, New York, Basic Books, 2000, pp. 60-62

amount of the lien.⁶ Why? Because the Department can simply wait for the delinquent to attempt to sell or refinance the property, at which point the title examination process reveals the lien and the transaction is halted until the lien is paid. This simple curative action results in substantial child support collections. Table 4 indicates that title clearing has resulted in the collection of \$45 million per year on average over the past three years.

The replacement of refinance lender's title insurance with RLP would result in a substantial decrease in the frequency with which the public record is repaired through the process of title examination. In order to estimate the rate at which the level of error in the public record would be increased by this change, I have constructed a model of the error production and correction process. (The mathematical details are set forth in the Appendix.) The model is based on a few simple facts:

1. An ALTA survey of underwritten title companies indicates that 25% of all title examinations now show the need for some curative action to be taken.
2. About 5% of the total housing stock is sold each year.
3. About 15% of home mortgages are refinanced each year.
4. The rate of increase of the California housing stock is about 1.8% per year.

Using these facts, I determined that about 2.8% of the existing housing stock develops a title defect each year. I then calculated how rapidly the fraction of the housing stock with title problems would rise from the current level of 25% if the frequency of title examination were to decline materially due to the substitution of the RLP for the examined refinance lender's title insurance policy.

Figure 4 presents the results of adopting Liu's assumption that all refinances would be insured by RLPs. The figure demonstrates that, *if RLP were to replace*

⁶ Private communication from XX

refinance lender's title insurance, the incidence of home title defects would increase by 44% over the next 15 years, from 25% today to 36% then.

Such a large increase in title defects would impose substantial costs on California homeowners. For example:

A. The Cost of Increased Delays in Real Estate Sales Transactions

Refinance title searches clean up the public record not only for refinancers, but for *all* users, including buyers and sellers. An impaired public record complicates all real estate sales transactions, by making it more time-consuming to establish the true state of title. While it is difficult to quantify all the costs of increased delay, one is relatively simple: interest expense for the seller.

A seller of real estate who has his or her closing delayed ends up paying some extra mortgage payments. Table 5 shows that, if an average of even one additional mortgage payment is imposed on California home owners who are selling their homes by a degraded state of the public record, in 15 years the total extra interest cost for all sellers will amount to some \$334 million per year.

B. Increases in the Consumer Cost of Title Insurance

Title insurance, like any other product, gets priced based on the underlying production cost. If costs go up, then prices must go up too if the insurer is to stay in business.

1. Increased Costs of Curative Actions

Regulatory bodies who have studied the subject indicate that about 30% of title insurance costs are generated by the closing process, including curative activity.⁷ Based on my experience in the title insurance industry, I estimate that no less than 25% of this closing cost is attributable to the correction of title defects prior to closing. When the average number of defects in the public record increases, the amount of work increases proportionately. Table 6 shows that *the increase in title defects produced by substitution of RLP for refinance lender's title insurance would increase title insurers' California costs by almost half a billion dollars over the next 15 years, even assuming that there is no growth in the real estate market.* These increased costs would be passed on to all California consumers of title insurance.

2. Increased Losses

Title insurance losses are much lower than losses in other lines of insurance, because title insurance concentrates on loss *prevention*.⁸ Nonetheless, losses and loss adjustment expenses are a significant cost factor. California title insurance losses paid in 2001 amounted to some \$65 million.⁹

There are three basic reasons that title insurance losses occur: the search process misses a defect in the public record; some form of chicanery takes place; or an “off-record” risk occurs (e.g., a valid mechanic’s lien existed but has not yet been filed at the search date). While the last of these issues is unaffected by the state of the public record,

⁷ For example, see Title Insurance Procedural Rule P-24, Texas Department of Insurance. The current rule estimates 40% for transactions above \$100,000 of liability, and 10% for transactions below \$100,000. Weighting these percentages by the proportion of revenue in Texas yields an average of 30%.

⁸ For a more complete discussion, see Nelson R. Lipshutz, “The Regulatory Economics of Title Insurance,” Praeger, 1994, chapter 1.

⁹ See Corporate Development Services, “Performance of Title Insurance Companies - 2002 Edition,” p. 82

the first two are directly related. The more defects that exist in the public record, the more defects there are that can be missed. The messier the public record, the easier it is to commit a fraud or forgery which is difficult to detect.

There is no compendium of data on California loss causes, but such compendia do exist in New York and New Jersey. The data for these states in 2001 show that about two-thirds of title insurance losses are related to record defects or chicanery, both of which are proportional to the fraction of the public record that is defective. Table 7 applies this distribution to California loss experience, and shows that *the increase in the incidence of title defects that would follow from the substitution of RLP for refinance lender's title insurance would increase title insurers' California losses by \$172 million over the next 15 years, even assuming that there is no growth in the real estate market. This extra cost stream has a present value of \$27 million.* These increased costs would be passed on to all California consumers of title insurance.

V. WHAT IS THE OVERALL CALIFORNIA CONSUMER EXPENDITURE IMPACT OF THE RLP?

I have combined all the quantitative impacts discussed above to estimate the consumer impact of introducing the RLP, using the same methodology as employed by Liu. The calculations are set forth in Table 8. My analysis demonstrates that, rather than increasing consumer surplus by \$283 million per year as Liu claims, with a present value of \$1.38 billion, *substituting the RLP for refinance title insurance would actually decrease consumer welfare by increasing consumer costs. If Radian charges the same rate it is currently charging, the cost increase will be about \$393 million per year, with a present value of \$1.4 billion; if Radian charges the rate which Liu speculates it will*

charge, the cost increase will be about \$344 million per year, with a present value of \$1.2 billion.

And there are also other issues to consider.

VI. HOW ADEQUATE IS RLP COVERAGE FOR THE LENDER?

The RLP product is a pool insurance product, with a total limit of liability for undisclosed liens of 0.5% of the total value of the pool. While this level of coverage might appear reasonable for extremely large pools of mortgages, it is extraordinarily low for the vast majority of mortgage pools. For example, the total coverage available for a \$2 billion mortgage pool would be \$10,000,000. If the average mortgage size in the pool were \$150,000 it would take the failure of 67 liens to exhaust the coverage. On the other hand, if the size of the pool of \$150,000 liens were \$25 million, then the coverage available would be \$125,000 and it would require only the partial failure of a single lien to exhaust the coverage and leave 99.5% of the liens unprotected.

From a statistical point of view, there is an enormous qualitative difference between 67 lien failures and a single lien failure. Radian operates with a gross profit margin of about 42%. If this same margin characterizes the RLP product, then the product has been priced on the statistical assumption that the mean number of losses a \$2 billion pool of \$150,000 mortgages will experience is about 39 (i.e., $67 \times (1 - 42\%)$). The probability that more than 67 losses would occur under these assumptions is about 0.002%.¹⁰ On the other hand, if the same statistical assumptions are applied to a \$25 million pool of \$150,000 mortgages, then the expected number of losses is less than 1.

¹⁰ This calculation is based on a Poisson distribution with a mean of 39 for the number of loss events. A Poisson distribution is the appropriate distribution to use for the case of small claim numbers. For example, see W. Feller, "An Introduction to Probability Theory and Its Applications – Volume 1," New York, Wiley, 1968, pp. 156 ff.

Under these conditions, the probability that one or more losses will be experienced is 63%; in other words, two out of every three \$25 million dollar or smaller pools putatively insured by RLP will experience losses not covered by RLP. RLP coverage is grossly inadequate for small pools, based on Radian's own figures. ***This weakness is important, given the fact that around 80% of all mortgage pools are smaller than \$25 million.***

This conclusion is based on my analysis of the 4,607 Fannie Mae mortgage pools securitized during the period January 27 through February 24, 2003 as reported on the Fannie Mae website. (Because of the very large role played by Fannie Mae in the secondary mortgage markets, Fannie Mae experience is representative of the markets as a whole.) Table 9 presents the number of pools in each total liability range, the average pool size in each range, the average number of loans in a pool, the average amount of a loan in the pool, and the amount of coverage provided for the average sized pool in the liability range.

Figure 5 presents the distribution and cumulative distribution of the number of pools, and shows that about 80% of the pools have a liability of less than \$25 million. The fact that RLP coverage cannot provide much protection for such pools raises two serious questions. The first is whether the solvency of lenders insuring these smaller pools, who will typically be smaller, less well-capitalized lenders even if they have the technological sophistication to qualify for the RLP program, will be threatened by the inadequacy of their insurance coverage. The second is whether these small pools will continue to have capital market acceptance as the inadequacy of the coverage reveals itself over time. Because small pools are typically assembled by smaller financial

institutions, loss of capital market acceptance will tend to drive the smaller players out of the market, leaving the field clear only for the largest institutions.

It might be argued that the inadequacy of RLP coverage for small pools is unimportant, because so much mortgage pooling is done by large institutions. However, the small pools play a significant role in the total secondary market mix. Figure 6 presents the distribution and cumulative distribution of total mortgage amounts contained in pools below a given size, and shows that *pools of less than \$25 million provide financing for 25% of all securitized mortgages.*

VII. IS IT A GOOD IDEA FOR A MORTGAGE INSURER TO WRITE TITLE COVERAGE?

Radian is primarily a private mortgage insurance (PMI) company. PMI companies are a lot bigger and more profitable than title insurers, and Radian suggests that their participation in the title insurance market will lend increased financial strength to the market. There is some question as to whether this will really occur. Monoline statutes covering PMI and title insurance are very common. These statutes were enacted in the wake of the collapse of the first incarnation of the mortgage insurance industry during the Great Depression, which brought with it the failure of a number of associated title insurers. Despite the fact that 75 years have passed, there is still some merit to the argument advanced then.

In essence, PMI companies insure the risk of the overall economy. Why? Because people stop making mortgage payments only *in extremis*, e.g., when they lose their jobs. Big surges in mortgage defaults occur only when the overall economy is in trouble.¹¹ Title insurers also suffer variations in their loss experience over the real estate cycle. In

fact, peaks in losses tend to coincide for the PMI and title insurance industries. Figure 7 presents the ratio of losses to premiums for the PMI and title insurance industries over the period 1970 to 2001. The correlation coefficient of these two series is 0.59 which, while not overwhelming, is still significant. What it means is that at times when unfavorable loss experience is stressing the title insurance sector, a PMI company is likely to have its hands full managing its own extraordinary losses, and will not have a lot of surplus funds available to bail out its title insurance operations.

VIII. WHAT DOES RLP DO TO CALIFORNIA PREMIUM TAX REVENUES?

Title insurers write title insurance policies in the state in which the *property* is located. In contrast, an RLP is written in the state of domicile of the *lender* originating the insured pool.¹² This disparity raises a question as to how RLP would affect California premium tax revenues.

Premium tax on a title insurance policy on a loan on California property is due to the State of California. It has not been settled as to whether premium tax on an RLP would be due California or the state of domicile of the lender. In the event that premium tax on an RLP is due to the lender's state, that would have a material negative impact on California premium tax revenues.

I estimate that California currently collects about \$44 million in title insurance premium taxes annually, about \$8 million of which is attributable to residential refinances. Of the top 30 U.S. refinance mortgage originators in 2001, only 4 were domiciled in California, and these 4 wrote only 13% of the refinance mortgage volume

¹¹ See, e.g., I. Plotkin, E. Venezian, and N. Lipshutz, "The Private Mortgage Insurance Industry," report to FNMA, FHLMC, and HUD, Arthur D. Little, Inc., 1975

¹² K. Johnson, "Big Bucks Insurer Duel Lands in Sac," Sacramento Business Journal, October 4, 2002

originated by the top 30.¹³ This means that *87% of refinance mortgage volume is originated by non-California domiciliary lenders*. Thus, even excluding relative price considerations, the substitution of RLP for refinance lenders title insurance would put some \$7 million of annual California premium tax revenue at risk (i.e., 87% of \$8 million), a revenue loss stream with a present value of \$35 million using Liu’s social discount rate of 25%, excluding the effects of market growth. The calculations are set forth in Table 10.

IX. IMPLICATIONS FOR PUBLIC POLICY

In summary, my analysis demonstrates that, in exchange for an illusory decrease in initial customer cost, substitution of RLP for refinance lender’s title insurance would produce:

1. A consumer welfare decline in excess of \$1 billion from: higher current title insurance rates; future title insurance rate increases driven by a deterioration of the public record and the consequent increase in title insurer operating costs and losses; and increased mortgage interest charges produced by a slowing of real estate closings.
2. Possible differential exclusion of minority borrowers from the mortgage refinance market through the discriminatory effects of consumer credit scoring criteria.
3. Exclusion of mobile/manufactured home borrowers from the mortgage refinance market through the unavailability of coverage.
4. Weakening of the financial strength of smaller lenders because of the limited effective coverage of the RLP, with a concomitant decline in the availability of mortgage credit.

¹³ See “The 2002 Mortgage Market Statistical Annual – Volume 1 – The Primary Mortgage Market,” p. 39

5. A deterioration in the collection of child support payments through a decline in the frequency with which support liens are satisfied as part of the title examination process, as well as in the satisfaction of other liens and judgements.
6. A potential loss to the State of California of substantial premium tax revenues.

Approval of the RLP as a substitute for refinance lender's title insurance would not benefit California consumers.

TABLE 1
RELATIONSHIPS AMONG TITLE INSURANCE RATES USED BY

Liability (\$000)	Set 2/Set 1	Set 3/Set 1	Set 4/Set 1	Set 3/Set 2	Set 4/Set 2	Set 4/Set 3
50	0.75	0.53	0.34	0.70	0.45	0.64
100	0.59	0.41	0.27	0.70	0.46	0.66
195	0.54	0.37	0.26	0.68	0.47	0.70
303	0.53	0.34	0.25	0.65	0.47	0.73
400	0.55	0.35	0.25	0.64	0.46	0.72
500	0.55	0.35	0.25	0.64	0.47	0.72
600	0.55	0.36	0.26	0.65	0.47	0.72
650	0.55	0.36	0.26	0.66	0.47	0.72

SOURCE: Liu report, Figure 5. The digitized rate schedules are set forth

Set 1		Set 2		Set 3		Set 4	
Liab	Rate	Liab	Rate	Liab	Rate	Liab	Rate
48.97	217.60	50.33	289.12	50.96	412.54	49.42	646.20
100.14	247.09	100.04	415.91	98.53	597.62	99.05	909.34
198.95	338.30	198.79	623.99	195.81	922.49	196.98	1,318.66
303.37	436.38	303.85	826.02	303.59	1,274.04	304.01	1,754.59
400.09	527.44	397.03	962.29	400.22	1,507.95	397.08	2,085.65
498.91	612.15	499.31	1,118.67	501.05	1,742.15	503.47	2,404.65
597.73	690.37	600.20	1,261.96	597.00	1,937.06	604.97	2,703.82
651.70	733.04	652.04	1,336.95	652.34	2,038.26	653.28	2,830.52

FIGURE 1

ACTUAL RLP RATE VS. COMPARABLE TITLE INSURANCE RATE

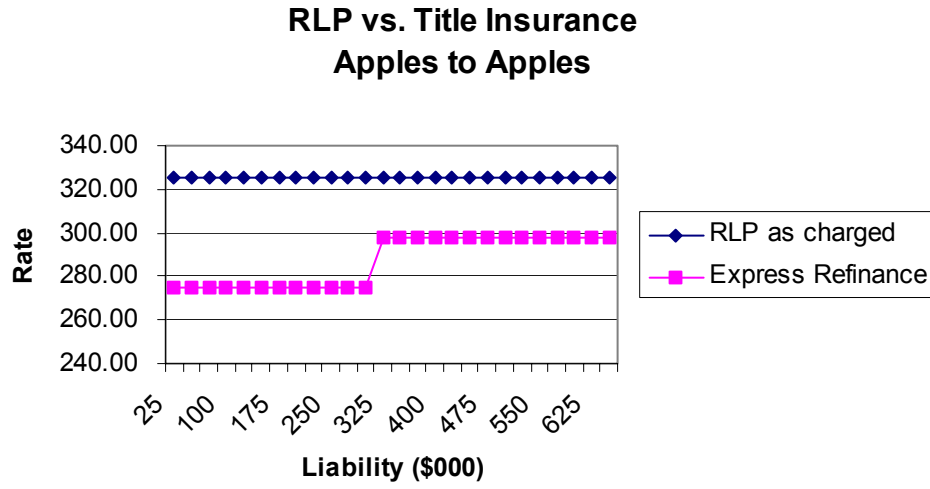


TABLE 2

TOTAL CONSUMER EXPENDITURE AT ACTUAL RLP RATE (INCLUDING \$50 SEARCH FEE)
VS. TOTAL CONSUMER EXPENDITURE AT COMPARABLE TITLE INSURANCE RATE

	[1]	[2]	[3]	[4]	[5]=[2]x[3]	[6]=[2]x[4]
CALIFORNIA HOME VALUE 2001	Average 2002 Mortgage Liability	Number of Insured Loans	Actual RLP Rate	Title Insurance Rate	RLP Consumer Expenditure	Title Ins. Consumer Expenditure
Less than \$50,000	13,802	18,207	325	275.00	5,917,347	5,006,986
\$50,000 to \$99,999	41,406	120,619	325	275.00	39,201,059	33,170,127
\$100,000 to \$149,999	69,010	202,415	325	275.00	65,784,887	55,664,135
\$150,000 to \$199,999	96,614	222,455	325	275.00	72,297,987	61,175,220
\$200,000 to \$299,999	138,020	267,321	325	275.00	86,879,480	73,513,406
\$300,000 to \$499,999	220,832	228,435	325	275.00	74,241,347	62,819,601
\$500,000 to \$999,999	414,060	109,695	325	297.50	35,650,890	32,634,277
\$1,000,000 or more	601,040	27,852	325	297.50	9,052,002	8,286,063
					Total	
					389,025,000	332,269,816
Excess of RLP over Title Insurance		56,755,184				
Present Value @ 25% discount rate		283,775,922				

SOURCES:

- [1] 50% of average value of California homes in 2001 as reported by U.S. Census Bureau, inflated by 10.4% based on OFHEO inflator
- [2] Census housing value distribution, scaled to 50% mortgage amount and normalized to 2.1 million total California refinances
- [3] \$275 basic fee plus \$50 search fee for comparability, as in Liu report
- [4] Per First American and Fidelity National rate manuals
- [5] =[2]x[3]
- [6] =[2]x[4]

FIGURE 2

SPECULATIVE RLP RATE VS. COMPARABLE TITLE INSURANCE RATE

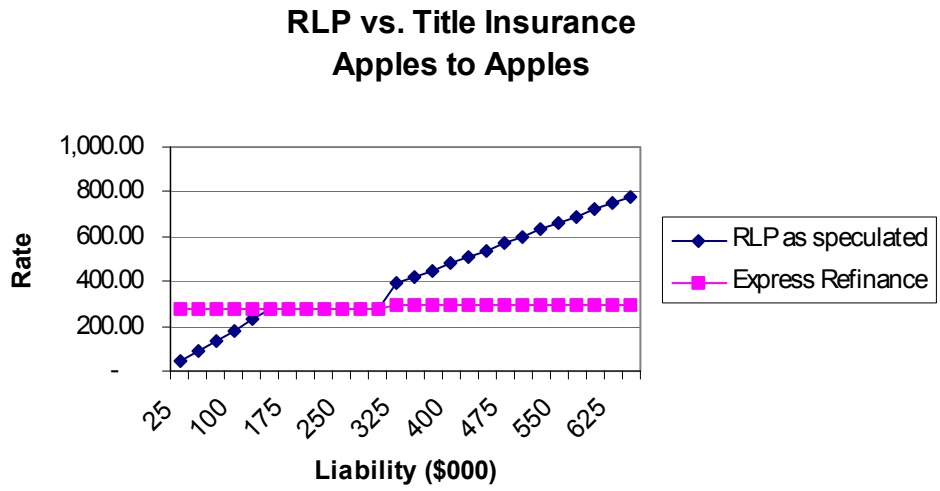


TABLE 3

TOTAL CONSUMER EXPENDITURE AT SPECULATIVE RLP RATE (INCLUDING \$50 SEARCH FEE)
VS. TOTAL CONSUMER EXPENDITURE AT COMPARABLE TITLE INSURANCE RATE

	[1]	[2]	[3]	[4]	[5]=[2]x[3]	[6]=[2]x[4]
CALIFORNIA HOME VALUE 2001	Average 2002 Mortgage Liability	Number of Insured Loans	Actual RLP Rate	Title Insurance Rate	RLP Consumer Expenditure	Title Ins. Consumer Expenditure
Less than \$50,000	13,802	18,207	125.00	275.00	2,275,903	5,006,986
\$50,000 to \$99,999	41,406	120,619	125.77	275.00	15,170,519	33,170,127
\$100,000 to \$149,999	69,010	202,415	176.29	275.00	35,683,236	55,664,135
\$150,000 to \$199,999	96,614	222,455	226.80	275.00	50,453,510	61,175,220
\$200,000 to \$299,999	138,020	267,321	302.58	275.00	80,885,053	73,513,406
\$300,000 to \$499,999	220,832	228,435	325.00	275.00	74,241,347	62,819,601
\$500,000 to \$999,999	414,060	109,695	546.87	297.50	59,989,157	32,634,277
\$1,000,000 or more	601,040	27,852	771.25	297.50	21,481,044	8,286,063
	Total				340,179,768	332,269,816
Excess of RLP over Title Insurance		7,909,953				
Present Value @ 25% discount rate		39,549,764				

SOURCES:

- [1] 50% of average value of California homes in 2001 as reported by U.S. Census Bureau, inflated by 10.4% based on OFHEO inflator
- [2] Census housing value distribution, scaled to 50% mortgage amount and normalized to 2.1 million total California refinances
- [3] Up to \$300,700 rate of 1.83/thousand with minimum \$75, maximum \$275; over \$300,700 rate of 1.20/thousand; PLUS \$50 search fee for comparability, as in Liu report
- [4] Per First American and Fidelity National rate manuals
- [5] =[2]x[3]
- [6] =[2]x[4]

FIGURE 4

IMPACT OF RLP ON FRACTION OF IMPAIRED TITLES

**% of Homes with Defective Titles IF RLP
Completely Replaces Refinance Title Insurance**

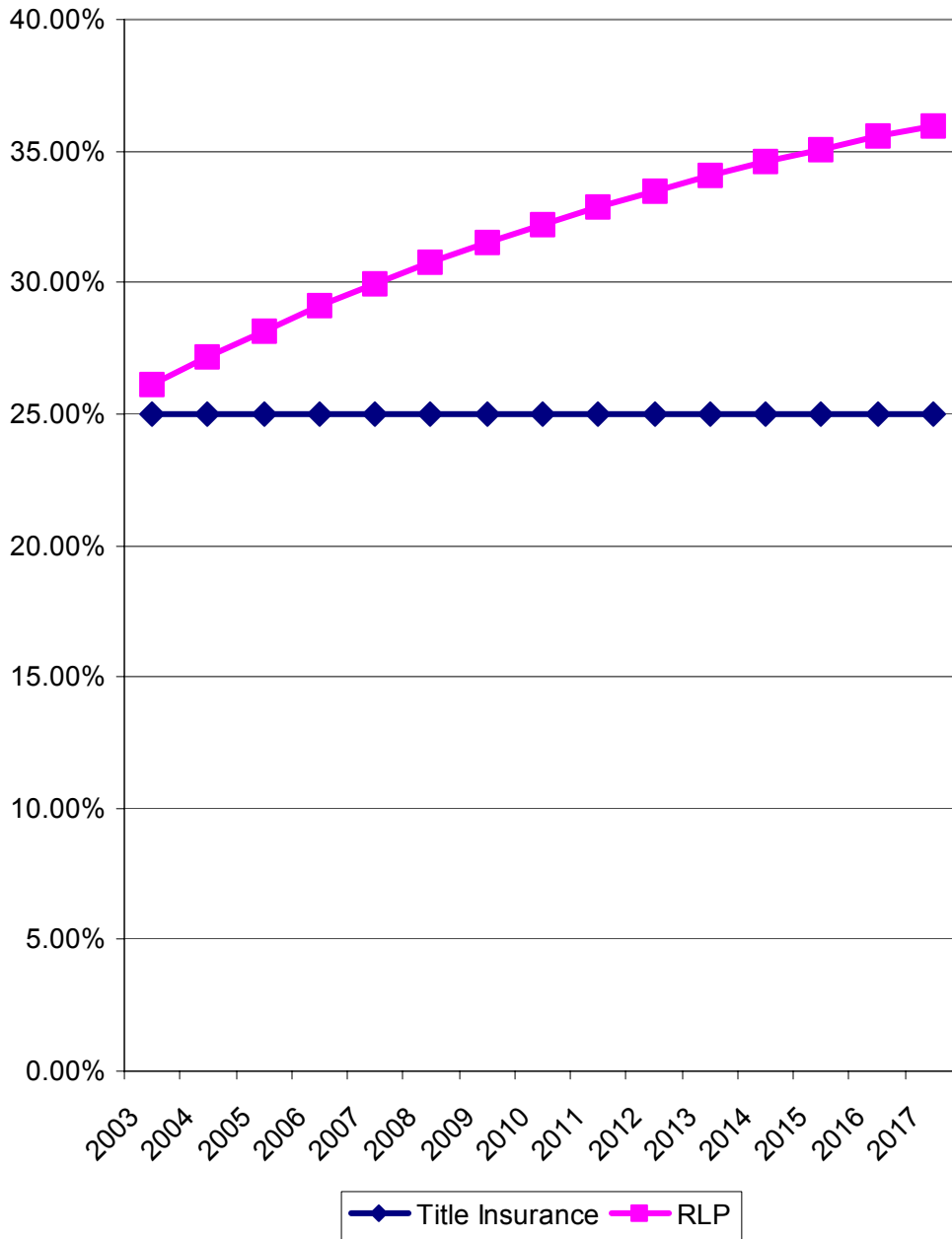


TABLE 4

CALIFORNIA CHILD SUPPORT PAYMENTS
COLLECTED BY THE SATISFACTION OF LIENS
DURING THE TITLE CLEARING PROCESS

Fiscal Year	Amount Collected
2000-2001	33,807,421
2001-2002	46,843,164
2002-2003 [a]	53,556,752
Annual Average	44,735,779

SOURCE: Statistics compiled by California Department of Child Support Services

[a] Annualized from 6 month figures July 1 through December 31, 2002

TABLE 5

IMPACT OF ONE-MONTH DELAY ON CALIFORNIA CONSUMERS' INTEREST EXPENDITURE IN 2017

	[1]	[2]	[3]	[4]=[2]-[3]	[5]	[6]	[7]=[5]x[6]	[8]=[4]x[7]
CALIFORNIA HOME VALUE 2001	Initial Mortgage Liability (=80% of average value)	Monthly Payment on 30 year mortgage (interest = 5%) at time of sale (= 7 years)	Monthly Principal payment at time of sale (= 7 years)	Monthly Interest payment at time of sale (= 7 years)	Number of 2002 sales (=5% of current housing stock)	Growth factor to 2017 at 1.83%/year	Number of 2017 sales (=5% of 2017 housing stock)	One month of Extra Interest Expense
Less than \$50,000	22,083	\$118.55	\$37.47	\$81.08	4,204	1.312611354	5,518	447,397
\$50,000 to \$99,999	66,249	\$355.64	\$112.41	\$243.23	27,850	1.312611354	36,556	8,891,654
\$100,000 to \$149,999	110,415	\$592.73	\$187.35	\$405.38	46,737	1.312611354	61,347	24,869,042
\$150,000 to \$199,999	154,582	\$829.83	\$262.29	\$567.54	51,364	1.312611354	67,421	38,263,806
\$200,000 to \$299,999	220,831	\$1,185.47	\$374.70	\$810.77	61,723	1.312611354	81,018	65,687,370
\$300,000 to \$499,999	353,331	\$1,896.76	\$599.52	\$1,297.23	52,744	1.312611354	69,233	89,811,332
\$500,000 to \$999,999	662,496	\$3,556.42	\$1,124.10	\$2,432.32	25,328	1.312611354	33,246	80,864,416
\$1,000,000 or more	800,000 (a)	\$4,294.57	\$1,357.42	\$2,937.16	6,431	1.312611354	8,441	24,793,530
							TOTAL	333,628,549

SOURCES:

- [1] Based on ranges in published Census distribution of 2001 California housing values
 [2] Per mortgage tables. Assumes 7-year average intersale period.
 [3] Per mortgage tables. Assumes 7-year average intersale period.
 [4] = [2] - [3]
 [5] See Appendix for derivation of sales rate.
 [6] = $(1.0183)^{15}$
 [7] = [5] x [6]
 [8] = [4] x [7]
 (a) Minimum possible

TABLE 6

INCREASE IN TITLE INSURANCE OPERATING COSTS FROM RLP

		2001	2003	2004	2005
[1]	Total CA Title Premium (assuming no growth)	1,887,077,929	1,887,077,929	1,887,077,929	1,887,077,929
[2]	Operating Margin	21.1%	21.1%	21.1%	21.1%
[3] = [1] x (1 - [2])	Total CA Title Expenses excluding losses	1,488,904,486	1,488,904,486	1,488,904,486	1,488,904,486
[4]	Fraction of Expense for Closing	30.0%	30.0%	30.0%	30.0%
[5] = [3] x [4]	Total CA Closing Expenses	446,671,346	446,671,346	446,671,346	446,671,346
[6]	Fraction of Closing Expenses for Curative Work	25%	25%	25%	25%
[7] = [5] x [6]	Total CA Curative Expenses Under Current Conditions	111,667,836	111,667,836	111,667,836	111,667,836
[8]	% Increase in Title Defects from RLP	4.5%	8.8%	12.7%	
[9] = [7] x [8]	Extra Annual CA Title Operating Expense		5,059,898	9,783,664	14,193,626
			2011	2012	2013
[1]	Total CA Title Premium (assuming no growth)		1,887,077,929	1,887,077,929	1,887,077,929
[2]	Operating Margin		21.1%	21.1%	21.1%
[3] = [1] x (1 - [2])	Total CA Title Expenses excluding losses		1,488,904,486	1,488,904,486	1,488,904,486
[4]	Fraction of Expense for Closing		30.0%	30.0%	30.0%
[5] = [3] x [4]	Total CA Closing Expenses		446,671,346	446,671,346	446,671,346
[6]	Fraction of Closing Expenses for Curative Work		25.0%	25.0%	25.0%
[7] = [5] x [6]	Total CA Curative Expenses Under Current Conditions		111,667,836	111,667,836	111,667,836
[8]	% Increase in Title Defects from RLP		31.5%	33.9%	36.2%
[9] = [7] x [8]	Extra Annual CA Title Operating Expense		35,138,959	37,864,548	40,409,075
[10] = sum of [9]	Total Extra Operating Expense	453,833,301			
[11]	Present Value @ 25% Discount Rate	72,052,602			

SOURCES:

- [1] CDS "Performance of Title Companies 2002 Edition"
- [2] CDS "Performance of Title Companies 2002 Edition" industry average
- [3] = [1] x (1 - [2])
- [4] Per allocation formula in Procedural Rule P-24, Texas Department of Insurance
- [5] = [3] x [4]
- [6] Regulatory Research Corporation estimate
- [7] = [5] x [6]
- [8] Computed using model described in Appendix as follows

	[a]	[b]	[c] = [b]/[a] - 1
	Examined Title Defect Prevalence	Title Defect Prevalence with RLP	% Increase in Title Defect Prevalence with RLP
2003	25%	26.13%	4.53%
2004	25%	27.19%	8.76%
2005	25%	28.18%	12.71%
2006	25%	29.10%	16.40%
2007	25%	29.96%	19.84%
2008	25%	30.76%	23.05%
2009	25%	31.51%	26.05%
2010	25%	32.21%	28.65%
2011	25%	32.87%	31.47%
2012	25%	33.48%	33.91%
2013	25%	34.05%	36.19%
2014	25%	34.58%	38.31%
2015	25%	35.08%	40.30%
2016	25%	35.54%	42.15%
2017	25%	35.97%	43.89%

- [9] = [7] x [8]
- [10] = sum of [9]
- [11] = present value of [9] @ 25% discount rate

TABLE 7
INCREASE IN TITLE INSURANCE LOSSES FROM RLP

		2001	2003	2004	2005
[1]	CA Title Insurance Losses	64,846,670	64,846,670	64,846,670	64,846,670
[2]	Fraction of Losses Related to Title Defect Prevalence	65.53%	65.53%	65.53%	65.53%
[3] = [1] x [2]	Losses Related to Title Defect Prevalence	42,495,153	42,495,153	42,495,153	42,495,153
[4]	% Increase in Title Defects from RLP		4.5%	8.8%	12.7%
[5] = [3] x [4]	Extra Annual CA Title Losses		1,925,542.43	3,723,169.57	5,401,378.93
			2011	2012	2013
[1]	CA Title Insurance Losses		64,846,670	64,846,670	64,846,670
[2]	Fraction of Losses Related to Title Defect Prevalence		65.53%	65.53%	65.53%
[3] = [1] x [2]	Losses Related to Title Defect Prevalence		42,495,153	42,495,153	42,495,153
[4]	% Increase in Title Defects from RLP		31.47%	33.91%	36.19%
[5] = [3] x [4]	Extra Annual CA Title Losses		13,372,117	14,409,340	15,377,658
[6] = sum of [5]	Total Extra Operating Expense	172,706,091			
[7]	Present Value @ 25% Discount Rate	27,419,590			

SOURCES:

[1] CDS "Performance of Title Companies 2002 Edition"
 [2] Based on statistical reports filed with Title Insurance Rate Service Association (New York) and Title Insurance Rating Bureau of New Jersey, as follows:

	New Jersey	New York	Average
Record-Search-Related Losses	30.52%	31.83%	31.18%
Fraud and Related Losses	34.08%	34.63%	34.36%
Total Defect-Related Losses	64.61%	66.46%	65.53%
Other Losses	35.39%	33.54%	34.47%

[3] = [1] x [2]
 [4] Table 5 footnote [8]
 [5] = [3] x [4]
 [6] = sum of [5]
 [7] = present value of [5] @ 25% discount rate

TABLE 8

OUT-OF-POCKET COST TO CALIFORNIA CONSUMERS OF REPLACING REFINANCE TITLE INSURANCE WITH RLP

	Actual RLP Rate			Speculated RLP Rate		
	Annual Cost (Average (2003- 2017))	Total Impact Over Next 15 Years	Present Value @ 25% Discount Rate	Annual Cost (Average (2003- 2017))	Total Impact Over Next 15 Years	Present Value @ 25% Discount Rate
Extra Premiums without Considering Impacts of Cost-Driven Rate Increases	56,755,184	851,327,766	283,775,922	7,909,953	118,649,291	39,549,764
Extra Interest Costs Produced by Closing Delays	294,757,722	4,421,365,835	1,065,470,999	294,757,722	4,421,365,835	1,065,470,999
Minimum Premium Impact of Increases to Costs of Clearing Titles	30,255,553	453,833,301	72,052,602	30,255,553	453,833,301	72,052,602
Minimum Premium Impact of Increases to Title Losses	11,513,739	172,706,091	27,419,590	11,513,739	172,706,091	27,419,590
Total Added Consumer Cost	393,282,199	5,899,232,992	1,448,719,113	344,436,968	5,166,554,517	1,204,492,955

TABLE 9

CHARACTERISTICS OF RANDOM SAMPLE OF FNMA SECURITIZED LOAN POOLS

Pool Size (\$millions)	Number of Pools	Average Pool Size (\$millions)	Average Number of Loans in Pool	Average Loan Amount	Total Coverage for Average Pool
0 - 5	1,885	2,084,816	16	130,033	10,424
5 - 25	1,766	12,196,684	86	142,074	60,983
25 - 50	574	34,263,024	219	156,487	171,315
50 - 75	154	60,652,514	374	162,378	303,263
75 - 100	74	85,817,383	497	172,685	429,087
100 - 250	123	155,096,512	922	168,129	775,483
250 - 500	23	346,002,435	2,021	171,237	1,730,012
500 and up	8	1,445,954,975	9,475	152,603	7,229,775

SOURCE: FNMA pool data posted on website for period January 27 through February 24, 2003

FIGURE 5

DISTRIBUTION OF SIZES OF
FNMA SECURITIZED MORTGAGE POOLS

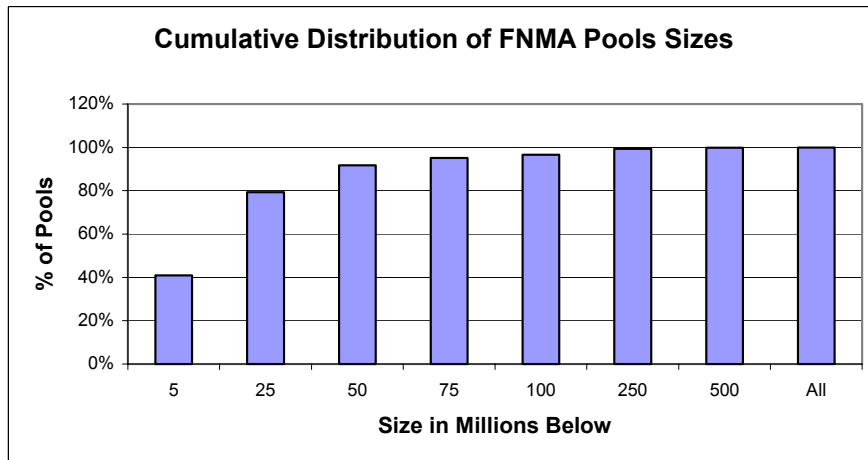
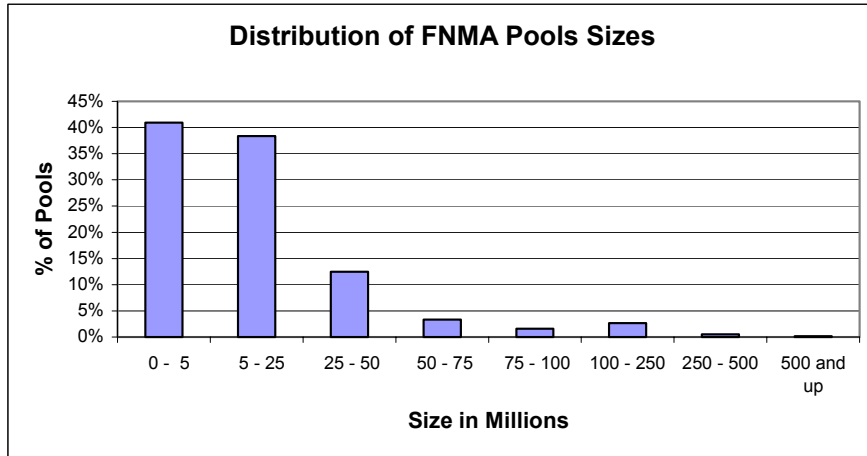


FIGURE 6
 DISTRIBUTION OF FNMA
 SECURITIZED MORTGAGE POOL AMOUNTS

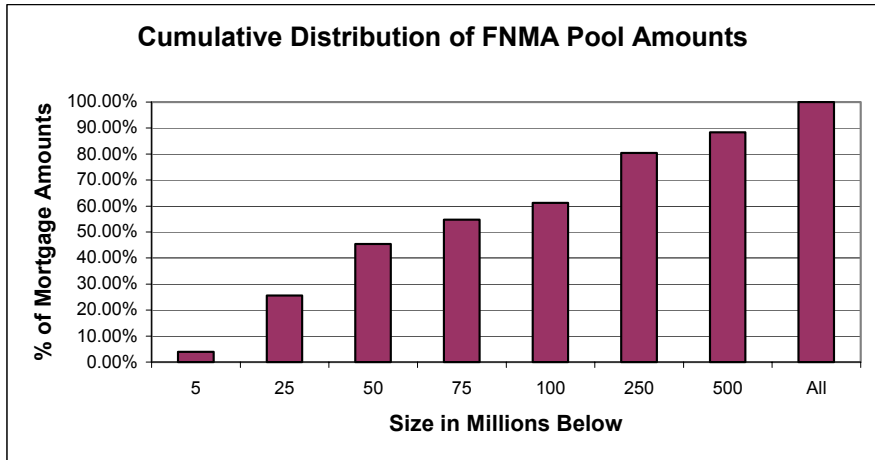
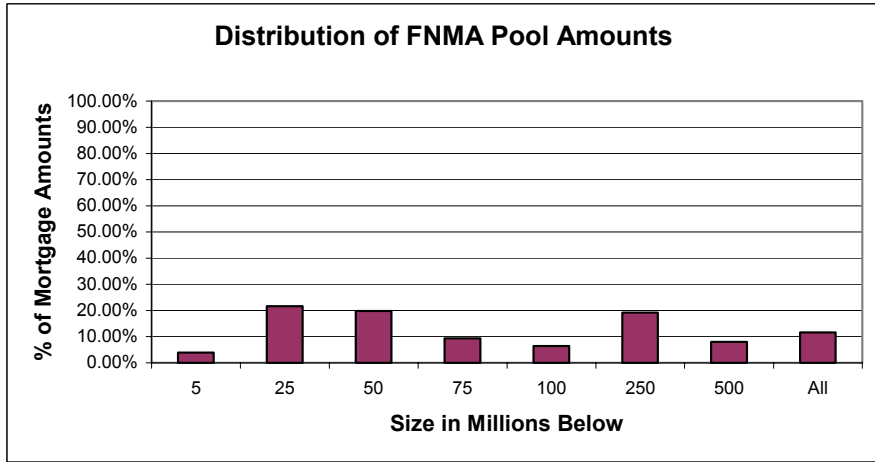


FIGURE 7

CORRELATION OF PMI AND TITLE INSURANCE LOSS RATIOS

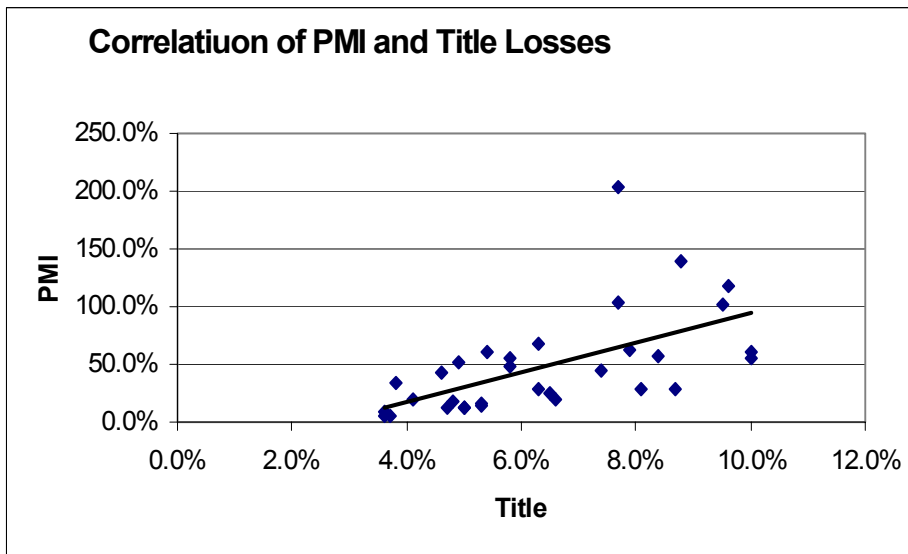
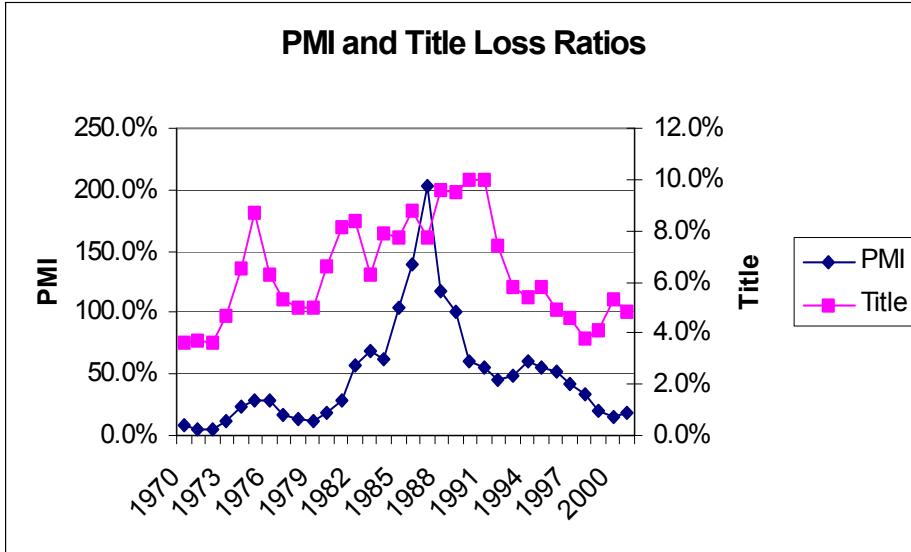


TABLE 10

POTENTIAL IMPACT OF RLP ON CALIFORNIA PREMIUM TAX REVENUES

[1]	California title Insurance premium 2001	1,887,077,929
[2]	Premium tax rate	2.35%
[3] = [1] X [2]	Total premium taxes on title insurance 2001	44,346,331
[4]	Fraction of title insurance premium from lender's policies	49.51%
[5]	Fraction of lender's policies from residential properties	64.80%
[6]	Fraction of lender's policies from refinances	57.4%
[7] = [3] X [4] X [5] X [6]	Premium taxes from residential refinances	8,166,191
[8]	Fraction of loans made by on California domiciliary lenders	86.86%
[9] = [7] X [8]	Potential annual premium tax losses from RLP	7,092,824
[10]	Present value excluding growth	35,464,122

SOURCES:

- [1] CDS "Performance of Title Companies 2002 Edition"
 [2] Per California statutes
 [3] = [1] x [2]
 [4] Based on distributions from statistical reports for New York business compiled by Title Insurance Rate Service Association (New York)
- | | | |
|-------------------|-------------|---------|
| | | as % |
| Owners policies | 257,539,000 | 43.56% |
| Lender's policies | 292,685,899 | 49.51% |
| Total premium | 591,214,922 | 100.00% |
- [5] Estimated assuming all property below \$500,000 is residential
- | | | |
|-------------------|-------------|---------|
| Lender's policies | 292,685,899 | 100.00% |
| Below 500,000 | 189,668,549 | 64.80% |
| Above 500,000 | 103,017,350 | 35.20% |
- [6] "The 2002 Mortgage Market Statistical Annual - Volume I," p.39
 [7] = [3] X [4] X [5] X [6]
 [8] "The 2002 Mortgage Market Statistical Annual - Volume I," p.39
 [9] = [7] x [8]
 [10] = present value of annuity @ 25% discount rate

APPENDIX

MATHEMATICAL MODEL OF TITLE DEFECT CREATION AND CURE

MATHEMATICAL MODEL OF TITLE DEFECT CREATION AND CURE

DEFINITIONS: Let

H_t = Housing units stock at end of period t

g = Housing stock growth rate

so $H_t = (1+g) H_{t-1} \rightarrow H_t = H_0 (1+g)^t$

f_s = fraction of housing stock sold during each year

f_r = fraction of housing stock each year with a mortgage refinancing

d = fraction of housing stock in which a new title defect appears each year

P_t = number of impaired titles at end of year t

E_s = fraction of property sale transactions in which a title examination occurs

E_r = fraction of refinance transactions in which a title examination occurs

$r_t = P_t/H_t =$ incidence rate of impaired titles

DERIVATION OF THE BASIC EQUATION

If nothing were ever done to cure title defects, the number of title defects in one year would be the number that existed in the prior year plus the number of new defects that arose during the year, that is

$$P_t(\text{before examination}) = P_{t-1} + d H_{t-1}$$

However, title defects are cured by the search, examination, and closing process (henceforth “examination”).

Since the vast majority of defects are cleared by this process, we can approximate the number of defects removed by examination conducted on sales transactions the product of the fraction of all sales transactions which are examined (E_s), the number of

existing defects existing in the properties which are sold. Since title defects are more or less uniformly distributed throughout the housing stock, the fraction of all defects included in the properties sold is the same as the fraction of the housing stock as a whole included in all properties sold (f_s). Hence,

$$\# \text{ of defects cleared by examination on sale}_t = E_s f_s (P_{t-1} + d H_{t-1})$$

Using the same argument, it is equally clear that

$$\# \text{ of defects cleared by examination on refinance}_t = E_r f_r (P_{t-1} + d H_{t-1})$$

Thus, the total number of defects in existence at the end of year t is

$$P_t = (1 - E_s f_s - E_r f_r) \times (P_{t-1} + d H_{t-1}) \quad [1]$$

The solution to this first order, linear, inhomogenous difference equation describes the time evolution of title defects in the housing stock.

GENERAL SOLUTION OF THE BASIC EQUATION

We apply the initial conditions that

$$P_{t=0} = P_0$$

$$H_{t=0} = H_0$$

To keep the calculations transparent, we rewrite equation [1] in the form

$$P_t = k P_{t-1} + l z^{t-1} \quad [2]$$

where

$$k = 1 - E_s f_s - E_r f_r$$

$$l = d H_0 (1 - E_s f_s - E_r f_r)$$

$$z = 1 + g$$

We now sequentially iterate equation [2].

Then

$$\begin{aligned}
P_1 &= k P_0 + 1 z^0 \\
&= k P_0 + 1
\end{aligned} \tag{3}$$

$$P_2 = k P_1 + 1 z$$

Inserting [3] yields

$$\begin{aligned}
&= k (k P_0 + 1) + 1 z \\
&= k^2 P_0 + k 1 + 1 z \\
P_2 &= k^2 P_0 + 1 [k + z]
\end{aligned} \tag{4}$$

Next, note that

$$P_3 = k P_2 + 1 z^2 \tag{5}$$

Inserting [4] into [5] yields

$$\begin{aligned}
P_3 &= k (k^2 P_0 + 1 [k + z]) + 1 z^2 \\
&= k^3 P_0 + k^2 1 + k 1 z + 1 z^2 \\
P_3 &= k^3 P_0 + 1 [k^2 + k z + z^2]
\end{aligned} \tag{6}$$

and by induction

$$P_n = k^n P_0 + 1 [k^{n-1} + k^{n-2} z + \dots + k z^{n-2} + z^{n-1}] \tag{7}$$

Equation [7] is the general solution of the basic equation.

FIXING THE PARAMETERS OF THE GENERAL SOLUTION

The number of defective titles in the housing pool is not directly observable. However, we do have some empirical data on the frequency with which defective titles are detected as part of the search, examination, and closing process. A recent survey by the American Land Title Association has measured the fraction of all titles passing through the process which require curative work. Therefore, it is useful to use [7] to calculate the time evolution of this ratio.

We note that by definition

$$P_0 = r_0 H_0$$

$$L = d H_0$$

Hence

$$P_n = r_0 k^n H_0 + d H_0 [k^{n-1} + k^{n-2} z + \dots + k z^{n-2} + z^{n-1}] \quad [8]$$

Also, note that

$$H_n = z^n H_0 \quad [9]$$

Dividing [8] by [9], we find that

$$P_n/H_n = r_0 (k/z)^n + (d/z^n) [k^{n-1} + k^{n-2} z + \dots + k z^{n-2} + z^{n-1}] \quad [10]$$

Equation [10] represents the time evolution of the percentage of defective titles in the housing stock.

Because we know the value that the percentage of defective titles has achieved after several centuries of title examination, we can calculate this value in the limit of very large n . since $z > 1$ and $k < 1$, we know that the first term of [10] vanishes in the large n limit. Hence, we can write

$$P_{n \rightarrow \infty} / H_{n \rightarrow \infty} = r_0 = (d/z) [(k/z)^{n-1} + (k/z)^{n-2} + (k/z)^{n-3} + \dots + (k/z) + 1]$$

Summing the geometric series, we have

$$= (d/z) \{ [1 - (k/z)^n] / [1 - (k/z)] \}$$

and since $(k/z) \rightarrow 0$ as $n \rightarrow \infty$

asymptotically

$$r_0 = d / (z - k)$$

so

$$d = r_0 (z - k)$$

$$= r_0 (g + E_s f_s + E_r f_r) \quad [12]$$

so that we can calculate the rate at which title defects enter the housing stock in terms of the equilibrium incidence rate for title defects, the growth rate of the housing stock, and the frequency with which titles are examined. Based on the calculations described below, we estimate that about 3% of titles develop a defect each year ($d = 2.8\%$).

The Equilibrium Incidence Rate for title Defects

Based on a survey of underwritten title companies (called “title insurance agents” in many jurisdictions outside California)¹⁴, the American Land Title Association estimates that 25% of all title orders require some curative work to remove material defects from the record title.

The Growth Rate of the Housing Stock

We estimated the rate of growth of the housing stock in California using U.S. Census data for the Western census region.¹⁵ Because California plays such a dominant role in the region, the regional data form an excellent proxy for California data. Exhibit A-1 sets forth the data and analysis. Based on an exponential regression, we find that the long-term housing unit growth rate is 1.84%.

The Frequency with which Titles Are Examined

The frequency with which titles are examined is a function of two factors: the proportion of all titles which are part of a sale or refinance transaction each year, and the proportion of titles involved in these transactions which get examined.

¹⁴ American Land Title Association Abstractor and Title Agent Operations Survey 2000

¹⁵ Current Population Survey/Housing Vacancy Survey, Series H-111, Bureau of the Census, Washington, D.C. 20233.

We estimated the fraction of the housing stock involved in sales transactions based on national housing stock census data cited above and national sales data from the National Association of Realtors reported in the Freddie Mac Fact Book. The calculations are set forth in Exhibit A-2, and indicate that approximately 5% of the housing stock (including new houses held for sale) is sold each year ($f_s = 4.93\%$).

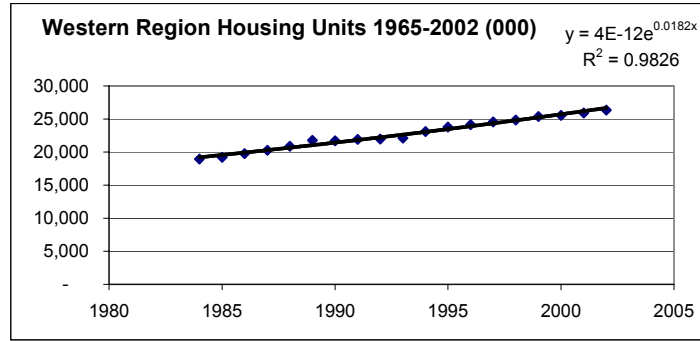
We estimated the fraction of the housing stock experiencing a refinance transaction each year based on the census national housing stock data and a study of refinancing carried out by Fannie Mae in 2002. The calculations are set forth in Exhibit A-3. Because refinance frequency fluctuates substantially, there is some ambiguity in selecting the appropriate frequency to use. Because the economy has experienced very frequent refinancing booms over the past twenty-five years, with California leading the way, we have used the national average refinance frequency for the period 2001-2002 to estimate the average California frequency. Our analysis indicates that about 5% of the housing stock is refinanced each year ($f_r = 4.61\%$).

With the exception of the few sales transactions which do not involve a mortgage or interactions among arm's-length parties, virtually all sales transactions involve a title examination of some kind ($E_s = 1$). Similarly, until recently, most refinancings involved some kind of title examination. Therefore, for the purpose of estimating the rate at which title defects enter the housing stock, we have used $E_r = 1$ for the asymptotic computation.

EXHIBIT A-1

RATE OF GROWTH OF CALIFORNIA HOUSING STOCK

West Region Housing Units	
1984	18,949
1985	19,225
1986	19,793
1987	20,279
1988	20,896
1989	21,783
1990	21,706
1991	21,903
1992	21,997
1993	22,108
1994	23,120
1995	23,785
1996	24,141
1997	24,560
1998	24,864
1999	25,400
2000	25,550
2001	25,933
2002	26,371



Growth Rate = 1.84%

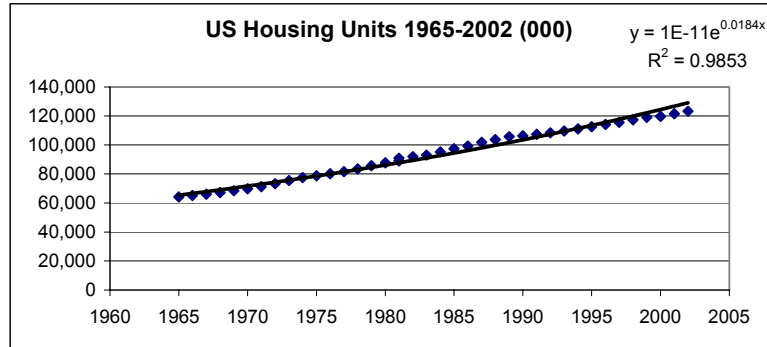
SOURCE: Current Population Survey/Housing Vacancy Survey, Series H-111, Bureau of the Census, Washington, D.C. 20233.

EXHIBIT A-2

FRACTION OF HOUSING STOCK SOLD EACH YEAR

Year All housing units

1965	64,213
1966	65,212
1967	66,014
1968	67,171
1969	68,479
1970	69,778
1971	71,320
1972	73,313
1973	75,407
1974	77,462
1975	78,821
1976	80,189
1977	81,645
1978	83,496
1979	85,735
1980	87,739
1981	88,988
1981	90,862
1982	91,876
1983	93,044
1984	95,256
1985	97,333
1986	99,318
1987	101,811
1988	103,653
1989	105,729
1990	106,283
1991	107,276
1992	108,316
1993	109,611
1994	110,952
1995	112,655
1996	114,139
1997	115,621
1998	117,282
1999	119,044
2000	119,628
2001	121,480
2002	123,318



Growth Rate = 1.86%

	Ratio to Home sales	Prior year
	4,103	3.88%
	4,034	3.80%
	4,455	4.15%
	4,853	4.48%
	5,023	4.58%
	4,983	4.49%
	5,429	4.82%
	5,710	5.00%
	6,462	5.59%
	6,756	5.76%
	6,735	5.66%
	6,950	5.81%
	7,347	6.05%
Average		4.93%

EXHIBIT A-3

INCIDENCE RATE FOR REFINANCINGS

National figures

[1]	Total Homeowners		100%
[2]	Fraction with Mortgages	62.80%	
[3]	Fraction with Mortgages refinancing	49.10%	
[4]=[2]x[3]	Fraction of homeowners refinancing ever		30.83%
Fraction of mortgages refinanced			
[5]	Before 2001	26.24%	
[6]	In 2001	15.81%	
[7]	First Half 2002	7.0600%	
[8]=2x[7]	Annualized 2002	14.1200%	
Fraction of housing stock refinanced			
[9]=[5]x[4]	Before 2001		8.09%
[10]=[6]x[4]	In 2001		4.87%
[11]=[8]x[4]	Annualized 2002		4.35%
[12]=0.5*{[11]+[11]}	Average rate 2001 to 2002		4.61%

SOURCE: G. Conner, K. Dynan, and W. Passmore, "Mortgage Refinancing in 2001 and Early 2002," Federal Reserve Bulletin, December 2002