

# FHA/VA Financing and Price Discounts

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## Abstract

This study examines the effects of FHA and VA mortgage financing on home prices. Using a database of nearly 9,000 homes sales in the San Antonio, Texas area, hedonic analyses reveal that both types of government-backed financing are associated with reductions in selling prices. The results may imply a cost shifting behavior on the part of buyers and an implicit subsidy on the part of sellers. The regressions show that the price discounts for FHA underwriting are about 4% (3.81% to 4.14%) relative to conventional financing. VA discounts, as expected, are smaller, ranging from about 2% to 3.46%. Given the prior literature, the results are likely a result of the fact that FHA and VA homebuyers are able to shift some costs to sellers.

This study examines the effects of FHA and VA mortgage financing on home prices. Borrowers using FHA and VA default protection programs borrow at higher loan-to-value ratios (LVRs) and payment-to-income ratios (PTIs) relative to conventional underwriting standards. Higher LVRs and PTI ratios are offset by the payment of additional financing costs in the form of default insurance premiums and origination fees. Given prior evidence on the existence of the capitalization of various financing costs, there exists the possibility that FHA/VA financed properties will attract price discounts. That is, given that FHA/VA borrowers are required to pay additional financing costs, one could expect that the reservation prices, and ultimately bids, for FHA/VA borrowers, might be lower than for a conventional borrower in an attempt to offset the burden of the additional fees. Sellers, faced with high opportunity costs and a selling process that is typified by a series of sequential bids, may accept what is in fact a low, early bid from a buyer in an attempt to minimize opportunity costs.

The basic hypothesis in this study therefore is that, assuming buyer bids above seller reservation prices, the “low” FHA/VA buyer bids might lead some sellers into accepting price discounts. The study empirically searches for evidence to support the hypothesis of such price discounts.

This study uses a database of over 9,000 home sales in the San Antonio, Texas (Bexar County) area to search for such price effects. The findings reveal that FHA and VA financing result in significantly lower sales prices relative to conventional financing. The results support the supposition that the financing costs associated with FHA and VA origination fees are capitalized into sales prices.

The next section looks more specifically at standards of the most common form of FHA underwriting (the 203b) and the VA programs relative to conventional standards. This is followed by a review of relevant literature, the empirical framework, data description, and the hedonic analyses. The final section reports the empirical findings and conclusions.

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## The FHA and VA Programs

Both the FHA and VA occupy a specific niche in the mortgage underwriting spectrum. The FHA default insurance program began as a program to encourage lenders to lend to lower income borrowers for the purchase of modest houses. However, the FHA has expanded beyond its original mission. Today the program is, at least in part, a taxpayer subsidy of high credit risk purchases for housing by “credit-constrained” households with incomes sufficient to offset higher loan payments (Pennington-Cross and Nichols, 2000; and Pennington-Cross and Yezer, 2000). For these borrowers, the FHA program provides the ability to buy more house than that possible under conventional underwriting standards (Goodman and Nichols, 1997). Specifically, the real benefit sought by FHA borrowers may be the lower up-front costs in the form of lower downpayments and the financing of closing costs (Hendershott, LaFayette, and Haurin, 1997).

Specifically, the FHA will insure an amount that includes a beginning amount of about 97% of an acceptable price, plus allowable closing costs and the upfront FHA premium. The total amount insured is subject to limits (\$155,000 in the study area). However, given the amounts insurable, it is not impossible for FHA users to have insured and financed an amount that exceeds the original purchase price.

The higher LVRs that result in lower downpayments also require correspondingly higher monthly payments. The FHA therefore allows a more lenient monthly PTI ratio of 31% (versus 28% for conventional loans).<sup>1</sup> Thus, *relative to a specific payment*, the higher PTIs result in less income needed, but note that *for a similarly priced house*, the higher LVRs and premiums paid can result, on net, in more income needed to carry the total FHA financed payment, relative to conventional financing. The FHA premiums charged are not inconsequential; currently 1.5% of the insured amount charged upfront, plus 0.5% of the outstanding balance paid annually.<sup>2,3</sup>

The VA has increased its default guarantee program limits as well, although its program is of course limited to a much smaller market and its costs are limited to a funding (or origination) fee. VA loans offer default guarantees that require no premium and unless VA limits are exceeded, a 100% LVR. While there are no monthly premiums as such, the VA requires the payment of an origination or funding fee of about 2% by the borrower.<sup>4</sup>

In sum, relative to conventional loan underwriting, FHA and VA borrowers purchase housing services at higher LVRs than they would otherwise be able to

with conventional financing. Offsetting the benefits of lower downpayments are additional financing costs relative to conventional lending.

Given the above, the general hypothesis is that, given evidence of the capitalization of various financing costs and the specific nature of credit constraints of FHA and VA borrowers, FHA and VA financing costs could be capitalized into buyer reservation values and thus buyer bids. Sellers, in turn, may accept FHA and VA bids under the high opportunity costs scenario described below. The contribution in this study is to examine the hypothesis that these borrowers, faced with higher financing fees, seek to mitigate the costs of these programs by making lower bids.

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### Prior Literature on FHA and VA Effects

A number of issues associated with FHA underwriting and loan choice and the capitalization of financing differentials have received research attention in recent years. Of concern here is the evidence that FHA and VA borrowers are credit-constrained. Notable examples include Pennington-Cross and Nichols (2000), who find that the FHA/conventional loan choice is driven by income and credit history with worse credit scores found for FHA borrowers. Berkovec, Kogut, and Nothaft (2001) find similar results for the FHA/conventional choice in the context of ARM loans. Rosenthal, Duca, and Gabriel (1991) also find that credit constraints affect the FHA/VA/conventional choice. Hendershott, LaFayette, and Haurin (1997) find that downpayment and monthly payment constraints affect the FHA/conventional choice. Goodman and Nichols (1997), however, find that the credit restrictions that lead to FHA/VA choice may be temporary, as approximately one-half of all FHA borrowers are able to qualify for conventional financing within one year.

Studies on capitalization effects can be separated into the effect of interest rate costs (points) before and after the elimination of FHA and VA interest rate restrictions on FHA and VA loans. Borrowers were prohibited from paying interest rate differentials when specified rates on FHA and VA loans were lower than market rates. As a result, sellers paid the interest rate differential. Sellers subsequently shifted the points back to borrowers in the form of higher prices. Zerbst and Brueggeman (1977, 1979) found that sellers capitalized 43% of the effect of points for FHA loans into selling prices. Both Guntermann (1979) and Agarwal and Phillips (1983) found partial shifting of loan discount points to buyers by increasing sales prices, for the former, a shift of 73% for new homes, the latter, a shift of 61% for existing homes.

Subsequent to the lifting of interest rate restrictions, the shifting of points took the form of various seller interest rate subsidies and seller concessions to buyers. Asabere, Huffman, and Mehdiian (1992) found a 10% discount associated with all cash transactions and Asabere and Huffman (1997) find a 3% discount associated with seller concessions in the form of buyer interest rate buydowns for conventional loans. No specific discounts were found for FHA/VA loans, however.

Thus the consensus of the literature is that there is empirical support for (a) the existence of mortgage choice criteria based primarily on credit constraints and

(b) that various types of financing costs, including loan type, interest rate, differentials, and seller concessions have been capitalized into housing prices. This research is a logical extension of the prior literature. The hypothesis is that such credit-constrained borrowers may seek to capitalize these additional financing costs into sales prices. This study thus provides new evidence on the impacts of mortgage choice and the role of capitalization of mortgage terms on prices.

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### Additional Financing Costs and Price Discounts

Mortgage insurance premiums and origination fees offset the higher risk of default for FHA loans. The hypothesis is that the additional financing costs associated with FHA/VA loans have implications for housing markets. Specifically, that the additional financing costs will lower buyer reservation prices and subsequently buyer bids, resulting in price discounts.

As noted, the hypothesis is that the fees associated with FHA/VA mortgages would dampen buyer reservation prices and therefore buyer bids. Search theory tells us that sellers facing opportunity costs such as mortgage payments, property taxes, maintenance costs, and other carrying costs may be significant enough to create rapid discounting behavior by sellers (e.g., Cronin, 1982; and Yavas, 1992). While the seller has no benevolent intentions whatsoever to sell for less to any buyer, the individual will eventually be forced to minimize the opportunity costs by accepting a lower, early bid so long as the price discount does not exceed the savings in opportunity costs. Note that an acceptance of a lower, early bid is only acceptable as long as it exceeds the seller's reservation selling price adjusted for opportunity costs.

Noteworthy is the substantial literature on listing prices, price concessions, and the impact, in particular, of selling time or time-on-the-market (most recently, Pryce and Gibb, 2006) on sales prices.<sup>5</sup> One implication of these studies is that listing prices, price concessions, and sales prices are affected by a variety of transactional factors including seller motivations and behavior. Although no explicit examinations of the impact on opportunity costs on seller behavior are identified, the general concept is, of course, a fundamental component of finance theory.

Given the credit-constrained nature found for FHA users in particular, the hypothesis is put forth that these credit-constrained buyers may offer lower buyer bids that might be acceptable to certain sellers with high opportunity costs.<sup>6</sup> Of course, early, low bids may result in seller rejections and not all underbidding is due to FHA/VA financing. Lower buyer bids may also be a function of or accompanied by other factors, such as stronger negotiating ability. Thus, such seller behavior would, in effect, yield unintended, implicit subsidies (or cost shifts) for FHA/VA buyers whose reservation prices are lower. It is, therefore, an empirical question as to whether or not such discounts are possible under such a scenario.

Hedonic analyses are used to explore the potential price discounts associated with FHA and VA mortgage financing relative to conventional mortgage financing. The hedonic model employed to detect the partial effects of FHA and VA mortgage financing is as follows:

$$\text{Sales Price} = \beta_0 \exp(\beta_1 \text{FHA} + \beta_2 \text{VA} + \beta_3 \text{CON} + \sum_{\beta_4}^n X_{ij}). \quad (1)$$

Where:

*Price* = Sale price of the house;

*FHA* = FHA mortgage underwriting dummy variable;

*VA* = VA mortgage underwriting dummy variable;

*CONV* = Conventional mortgage underwriting dummy variable; and

$X_{ij}$  = Various housing and other pedestrian control variables.

A logarithmic transformation of Equation 1 will be used to measure the potential effects of FHA and VA mortgage financing relative to conventional mortgage financing. The estimated coefficients of  $\beta_1$  and  $\beta_2$  are expected to be significantly negative with the effect of FHA loans ( $\beta_1$ ) exceeding that for VA loans ( $\beta_2$ ).

## The Analysis

The database for this study was supplied by the Office of the Comptroller, State of Texas. The original data consisted of over 12,000 sales of residential property occurring over a one-year period from April 2001 to March 2002 in and around San Antonio (Bexar County), Texas. The data contain sales price and standard information on various price-determining factors. These factors include: housing characteristics, lot characteristics, locational effects, and sales transaction related characteristics. The variables also include the specific variables of interest in this analysis: the mortgage underwriting options of FHA insured, VA guaranteed or conventional financing.

The transaction related variables include sales price (*SPRICE*), date of sale in sequential months from April 2001 to March 2002 (*MONTH*), and days on the market (*DOM*). The specific variables used to measure the effect of housing characteristics are: square feet of improvements (*SQFT*), number of bedrooms and bathrooms (*BANDB*), age of structure (*AGE*), and two variables to account for exterior features: brick construction (*BRICK*) and type of foundation, slab (*SLAB*) versus all other. Specific lot characteristics include corner lot location (*CORNER*), cul-de-sac location (*CSAC*), and two lot improvement variables: the presence of a deck (*DECK*), and in-ground pool (*POOL*).<sup>7</sup>

A specific neighborhood amenity (*YESNEIGH*) is added for the proximity of a park or other recreational area. The location within a specific school district out

of 24 districts (SD1 to SD24) that are cross-referenced with a standard map of the area is also included.<sup>8</sup> To account for any regional locational effects, the location from the central business district as measured by four zones, aggregated by ZIP Code (*RING1* to *RING4*) is also included, beginning from the central city district of San Antonio.<sup>9</sup>

The sales observations were eliminated due to lack of data or the likelihood that the sale was spurious or contained unreliable information. An examination of the data also revealed sales with significant size differences at the upper end that would likely exceed any FHA/VA sale. Therefore the data are limited to sales with a maximum of 3,800 square feet (i.e., the nearest FHA/VA maximum size, rounded to the nearest 100 square feet), and to sales with 2 to 5 bedrooms and a maximum sales price of \$255,000, the highest priced VA sale in our data, to yield a database of 8,751 observations.<sup>10</sup> These adjustments should yield a highly representative, reasonably homogeneous database of FHA, VA, and conventional sales. Summary statistics for relevant variables are found in Exhibit 1.

The specific variables used in the analysis are presented in Exhibit 2, along with basic descriptive statistics. Using the data described above, hedonic analysis is performed using the natural logarithm of sales price (*LnSPRICE*) as the dependent variable.<sup>11</sup>

The regression in Model 1 uses the variables described above. Models 2, 3, and 4 offer alternative location variables. In Model 2, *RING1*, *RING2*, and *RING3* and school district variables are replaced with a variable that accounts for relative locational differences by calculating the average sales price by ZIP Code (*SPBYZIP*). This variable is an attempt to account for quantity/quality differences in the sales data by location.<sup>12</sup> In Model 3, *SPBYZIP* is replaced by a variable that accounts for FHA sales as a percentage of total sales in a ZIP Code (*FHAPERC*);<sup>13</sup> this variable is used to account for any effects associated with large concentrations of FHA sales in a given location.

The adjusted  $R^2$ s for Models 1, 2, 3, and 4 are 71%, 76%, 72%, and 76%, respectively. The  $R^2$ s are well within reasonably acceptable levels for explaining sales prices in a large geographic area such as the study area. The *F*-Statistics for all models are also high and statistically significant at a 99% level of confidence, indicating acceptable statistical fit for all models. An examination of multicollinearity and standard regression diagnostics reveal no undue problems of statistical bias. Thus, the estimated coefficients for each variable are reliable.

## Results

*Non-Financing Control Variables.* The results for all the four models in Exhibit 2 are robust. There are no real qualitative differences between the estimated coefficients of the control variables of the three models. Looking at Model 1, *BANDB*, *YESNEIGH*, *SQFT*, *INPOOL*, *DECK*, and *MONTH* are significantly positive at conventional levels in all models, as would be expected. Variables with

**Exhibit 1** | Summary Statistics for Relevant Variables

Variable	Mean	Std. Dev.	Min.	Max.
<i>Sales Price</i>	107,950	43,813	14,101	255,000
<i>Conventional</i>	0.51	0.50	0	1
<i>FHA</i>	0.33	0.47	0	1
<i>VA</i>	0.16	0.37	0	1
<i>BANDB</i>	5.4	0.95	3	10
<i>SQFT</i>	1,823	567	1,000	3,800
<i>AGE</i>	21.0	17.3	0	99
<i>ALLBRICK</i>	0.09	0.28	0	1
<i>SLAB</i>	0.92	0.27	0	1
<i>DECK</i>	0.18	0.38	0	1
<i>INPOOL</i>	0.07	0.25	0	1
<i>CORNER</i>	0.10	0.30	0	1
<i>CULDESAC</i>	0.15	0.36	0	1
<i>YESNEIGH</i>	0.47	0.50	0	1
<i>DOM</i>	59.6	67.3	0	694
<i>MONTH</i>	5.0	3.4	0	11
<i>SPBYZIP</i>	113,377	39,015	40,494	406,731
<i>ISPBZIP</i>	9.8E06	3.0E06	2.5E06	2.5E05
<i>FHAPREC</i>	32.9	14.6	0	75
<i>RING1</i>	0.04	0.20	0	1
<i>RING2</i>	0.19	0.39	0	1
<i>RING3</i>	0.55	0.50	0	1
<i>RING4</i>	0.22	0.41	0	1
<i>SD1</i>	0.02	0.15	0	1
<i>SD2</i>	0.01	0.11	0	1
<i>SD3</i>	0.0003	0.02	0	1
<i>SD4</i>	0.007	0.08	0	1
<i>SD5</i>	0.0002	0.02	0	1
<i>SD6</i>	0.001	0.10	0	1
<i>SD7</i>	0.004	0.06	0	1
<i>SD8</i>	0.008	0.09	0	1
<i>SD9</i>	0.084	0.28	0	1
<i>SD10</i>	0.001	0.03	0	1
<i>SD11</i>	0.0005	0.02	0	1
<i>SD12</i>	0.0003	0.02	0	1
<i>SD13</i>	0.360	0.48	0	1

**Exhibit 1** | (continued)  
Summary Statistics for Relevant Variables

Variable	Mean	Std. Dev.	Min.	Max.
<i>SD14</i>	0.360	0.48	0	1
<i>SD15</i>	0.070	0.26	0	1
<i>SD16</i>	0.014	0.12	0	1
<i>SD17</i>	0.013	0.11	0	1
<i>SD18</i>	0.0001	0.01	0	1
<i>SD19</i>	0.0002	0.02	0	1
<i>SD20</i>	0.0005	0.02	0	1
<i>SD21</i>	0.004	0.07	0	1
<i>SD22</i>	0.001	0.03	0	1
<i>SD23</i>	0.002	0.04	0	1
<i>SD24</i>	0.012	0.11	0	1

significantly negative coefficients are *AGE*, *SLAB*, and *DOM*. *CORNER*, *CULDESAC*, and *ALLBRICK* are insignificant in Model 1.

*RING1*, *RING2*, and *RING3* in Model 1, relative to the outer *RING4*, are negative and significant. These results do not conform to classical concentric circle theory; rather the results may be picking up the differences associated with higher priced properties located in the less dense suburban areas of the county. Several of the school districts in Model 1 (*SD1*, *SD2*, *SD4*, *SD6-SD10*, *SD14-SD17*, and *SD20-SD24*), are significant with various signs relative to one omitted district (*SD13*). These results imply that there are neighborhood type effects associated with the school district variables

*FHA* and *VA Underwriting Variables*. The estimated coefficients for *FHA* and *VA* are significantly negative at the 99% level of confidence in Model 1, with a coefficient of  $-0.0604$  for *FHA* and  $-0.0458$  for *VA*. These transform to partial effects of about 5.9% for *FHA* and 4.5% for *VA*. These effects are slightly higher than the coefficients found in Models 2, 3, and 4.

Model 2 includes a variation on *SPBYZIP* (*ISPBYZIP*) and drops the other location variables. The coefficient for *ISPBYZIP* is significant and negative, as would be expected for the inverse of *SPBYZIP*. Regressions on *SPBYZIP* and  $\text{Ln}(\text{SPBYZIP})$  found significant and positive coefficients. The coefficients for *FHA* and *VA* are  $-0.0423$  and  $-0.0206$ , respectively, which transforms to  $-4.14\%$  and  $-2.0\%$ .

Model 3 includes the *FHAPREC* variable that measures the concentration of *FHA* sales in an area. The coefficient for *FHAPREC* is negative and significant, which



Exhibit 2 | Regression Results

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value
FHA	-0.0604	-11.03***	-0.0423	-8.40***	-0.0388	-7.09***	-0.0414	-8.14***
VA	-0.0458	-6.78***	-0.0206	-3.34***	-0.0352	-5.33***	-0.0204	-3.32***
BANDB	0.0098	2.79***	0.0124	3.83***	0.0111	3.17***	0.0125	3.85***
YESNEIGH	0.0734	14.89***	0.0483	10.74***	0.0561	11.62***	0.0481	10.71***
SQFT	0.0004	66.44***	0.0003	58.84***	0.0004	57.66***	0.0003	58.58***
AGE	-0.0022	-10.17***	-0.0014	-8.39***	-0.0021	-11.44***	0.0014	-8.47***
DOM	-0.0001	-4.06***	-7.5E05	-2.41**	-0.0002	-5.61***	-7.9E05	-2.51**
INPOOL	0.1010	10.87***	0.1070	12.54***	0.1080	11.73***	0.1070	12.56***
BRICK	0.0002	0.02	-0.0007	-0.09	0.0023	0.29	-0.0005	-0.07
SLAB	-0.0305	-2.36**	-0.0219	-2.14**	0.0153	1.38	-0.0202	-1.95*
CORNER	0.0111	1.46	0.0128	1.83*	0.0117	1.56	0.0127	1.83*
CSAC	0.0078	1.18	0.0037	0.62	0.0076	1.17	0.0038	0.64
DECK	0.0607	9.93***	0.0428	7.60***	0.0547	9.03***	0.0427	7.59***
MONTH	0.0017	2.63***	0.0020	3.23***	0.0016	2.49**	0.0020	3.22***
ISPBYZIP			-55,548	-69.36***			-53,850	-37.42***
FHAPERC					-0.0096	-54.24***	-0.0004	-1.42

**Exhibit 2** | (continued)  
Regression Results

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value
<i>RING1</i>	-0.117	-6.25***						
<i>RING2</i>	-0.102	-10.88***						
<i>RING3</i>	-0.053	-7.87***						
<i>SD1</i>	0.537	29.94***						
<i>SD2</i>	0.260	11.95***						
<i>SD3</i>	-0.163	-1.33						
<i>SD4</i>	0.161	5.84***						
<i>SD5</i>	-0.226	-1.50						
<i>SD6</i>	-0.047	-2.01**						
<i>SD7</i>	-0.335	-8.83***						
<i>SD8</i>	-0.185	-6.80***						
<i>SD9</i>	-0.204	-21.95***						
<i>SD10</i>	0.135	1.79*						
<i>SD11</i>	0.128	1.34						
<i>SD12</i>	-0.174	-1.42						
<i>SD14</i>	-0.076	-13.74***						

**Exhibit 2** | (continued)

Regression Results

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value
SD15	-0.132	-9.48***						
SD16	-0.036	-1.80*						
SD17	-0.091	-4.28***						
SD18	0.004	0.02						
SD19	0.185	1.23						
SD20	0.313	2.95***						
SD21	-0.288	-8.46***						
SD22	-0.282	-4.19***						
SD23	-0.396	-6.94***						
SD24	-0.281	13.45***						
CTANT	10.85	482.15***	11.387	550.26***	11.115	527.63***	11.383	546.47***
Adj. R <sup>2</sup>	0.71		0.76		0.72		0.76	
F-Stat	545.99***		1,821.54***		1,489.88***		1,708.01***	

Notes: The number of observations is 8,751.  
 \*Significant at the 90% level of confidence.  
 \*\*Significant at the 95% level of confidence.  
 \*\*\*Significant at the 99% level of confidence.

supports the contention that larger concentrations of FHA sales depress sales. The coefficients on FHA and VA are  $-0.0388$  and  $-0.0352$ , which transform to  $-3.8\%$  for FHA and  $-3.5\%$  for VA. In Model 4, however, which includes both *ISPBYZIP* and *FHAPREC*, the *FHAPERC* variable is insignificant. In Model 4, there is a  $-0.0414$  coefficient for FHA and a  $-0.0204$  coefficient for VA, which transforms to  $-4.1\%$  and  $-2.0\%$ , respectively.

These results imply significant price discounts and capitalization effects for FHA and VA sales relative to sales with conventional mortgage underwriting. The preferred model is Model 4 but Models 2, 3, and 4 find coefficients for FHA that hover around  $-4.0\%$ . VA coefficients have a wider range, from about  $-2.0\%$  to  $-3.5\%$  ( $4.5\%$  in Model 1) but show consistently lower effects versus FHA in each model. The relative results imply a significant difference in the behavior of the two types of borrowers, with FHA borrowers receiving larger discounts.

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## Conclusion

The results support the hypotheses that homes associated with FHA and VA mortgage financing will be associated with reductions in equilibrium selling prices relative to conventional financing. The magnitudes of the estimated coefficients on FHA sales range from about  $-5.8\%$  in Model 1 to around  $-4.0\%$  in Models 2, 3, and 4. The corresponding price discount range based on the estimated coefficients for VA is from about  $-2.0\%$  to  $-4.5\%$  in Model 1.

Overall the results support the hypothesis that FHA and VA underwriting may result in price discounts. The hypothesis is that FHA/VA borrowers offer lower bids to offset the financing costs incurred; bids that are accepted by high opportunity cost borrowers. That is, in some sense, it appears that FHA and VA borrowers are tougher bargainers relative to conventional borrowers. Although the study has no information on actual appraisals for the data, it is likely that stringent FHA and VA property qualification procedures may also play a role in these negotiations.

The conclusions above should be qualified by the fact that the data do not allow an isolation of the use of private mortgage insurance (PMI). To the extent that PMI loans and the payment of PMI premiums are a significant proportion of the conventional loan category, the results would be understated.<sup>14</sup>

Cost shifting, although recognized in the prior literature, may not be the only cause of price discounts. For instance, agency bias, associated with seller agents who recommend the acceptance of FHA/VA buyer bids, may play a role; however, data are lacking to examine this issue in this paper.

Note also that the Bexar County data include significant percentages of FHA (33%) and VA (16%) sales. Thus the findings may be unique to markets with significant FHA and VA purchases such as the study area. Therefore, the ability to negotiate price discounts may be a function of the market share of FHA and

VA borrowers and that smaller discounts may occur in areas with fewer such sales. In addition, the wider range of effects for VA sales may be of further interest.

Further research on these effects should be conducted, especially in those areas that allow for the identification of PMI loans. The more recent development of the sub-prime loan market may also have an impact on real estate markets.

Finally, note that to the extent that such discounts are associated with more stringent property qualification procedures, the FHA and VA lowers the default risk exposure of the American taxpayer inherent in the risk of higher LVRs and PTI ratios associated with these programs.

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## Endnotes

- <sup>1</sup> In addition, FHA income quality standards are more accepting of past credit problems and the FHA generally accepts lower credit scores.
- <sup>2</sup> Note that the FHA user pays the full cost of the inherent default risk involved, along with paying a substantial premium relative to the financing obtained.
- <sup>3</sup> In addition to the premiums necessary, the FHA imposes a more stringent property qualification. Specifically, the FHA requires a significantly more detailed property inspection, analysis, and appraisal process (Tompkins, 2000), as does the VA.
- <sup>4</sup> The 2% funding fee refers to the fee for active duty-eligible veterans at the time of the study. The fee has increased over time and can be reduced by making larger downpayments. Any amount over the limit (currently \$240,000) requires a 25% downpayment by the veteran on the excess (see Evaluation of VA's Home Loan Guaranty Program, 2004).
- <sup>5</sup> See also Asabere and Huffman (1993), Sirmans, Turnbull, and Dombrow (1995), Taylor (1999), and Genesove (2001), for examples most relevant to this study.
- <sup>6</sup> There is evidence in the data to support the hypothesis. A preliminary investigation of the sample reveals a significant difference in average days on the market for conventional financing versus FHA/VA financed sales (57 days for FHA/VA relative to 63 days for conventional).
- <sup>7</sup> The data do not contain any information on lot size by square feet. However, the variables used (*INPOOL*, *CORNER*, *CULDESAC*, and *DECK*) should account to some extent for any superior lot size effects.
- <sup>8</sup> *Ferguson's Quick-Finder MAPSCO 2000 Street Guide and Directory for San Antonio*, 2000, MAPSCO, Inc., Dallas, TX.
- <sup>9</sup> The rings are constructed using the ZIP Code for each property. Each ZIP Code is referenced with respect to the highway system present. The area's encircling highway system is used to define four locational areas bounded by rough concentric circles as separated by the highway system. Classical concentric circle theory would imply that properties in areas closer to the central city would sell at premiums related to accessibility and transportation costs.
- <sup>10</sup> The standard VA limit is \$240,000; however, there were no appreciable differences in results versus using the national VA limits. The data are also cut off at the FHA limit for the study area. However, this cut meant that the VA sales were nearly eliminated.

However, a statistically significant discount of 2% for FHA versus all other sales was found. For these and other regression results not reported, readers are invited to contact the authors.

- <sup>11</sup> A theoretical issue here is the possibility that the choice of financing is endogenous. That is, that sales price determines the FHA/VA choice, a consideration of importance here given the price limits associated with FHA/VA usage. As an anonymous reviewer notes, one solution would be to utilize a two-stage regression in which the determinants of FHA/VA choice yield a predicted FHA/VA result. Thus, a series of two-stage regressions were performed using various combinations of variables for the first stage. In all cases, predicted FHA was found to have a statistically significant effect on sales price. The predicted VA variable was insignificant, however, in several versions. Given that the FHA impact on sales price could not be dislodged, the standard hedonic results are found in Models 1–4. These results should not be seen as a refutation of the existence of this potential problem. Rather attempts to create a homogeneous database in which FHA/VA sales are present across the spectrum of sales prices may have minimized its severity. See Yavas and Yang (1995) for an example of the two-stage regression in the estimation of listing price.
- <sup>12</sup> As noted by an anonymous reviewer and detailed in the literature review, credit history and income among other factors are associated with the use of FHA/VA loans. The data do not allow an examination of the impact of such buyer characteristics. The *SPBYZIP* variable is an attempt to measure any relative FHA/VA/conventional sales price differentials by location, a measure that may capture some of these possible effects of the selection of FHA/VA loans. Several specifications of *SPBYZIP* were examined, including  $\text{Ln}(\text{SPBYZIP})$  and the inverse of *SPBYZIP* (*ISPBZIP*) with comparable results; *ISPBZIP* is reported in Model 2.
- <sup>13</sup> ZIP Codes are the smallest area-type data available in the data and thus serve as the best proxy for neighborhood. There are 65 ZIP Codes with FHA concentrations ranging from 0 to 75% (see Exhibit 1). Both *SPBYZIP* and *FHAPREC* were found to be collinear with the other location variables and thus were analyzed separately.
- <sup>14</sup> PMI premiums are significantly lower than FHA premiums. Generally, annual premiums are 0.32% for an 85% LVR with an upfront amount of two months premium required (see Colquitt and Slawson, 1997).

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