Institutions and Geographic Concentration in VA Mortgage Lending

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Disclaimer: The views expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Philadelphia, the Federal Reserve System, or Baystate Health.

Abstract

The U.S. Department of Veterans Affairs (VA) home loan guaranty program lowers the cost of homeownership for veterans and their families by removing the barriers of a downpayment and private mortgage insurance. Even with the recent growth in the program and the attractive terms, many veteran homeowners have not used it. As a consequence, some areas of the country with large numbers of veterans have disproportionately few VA loan originations, even after controlling for area housing market conditions. We explore the role of institutions in explaining the disproportionate concentration of loan originations in county-level Home Mortgage Disclosure Act (HMDA) data, and we test whether the presence of military installations, VA facilities, and veterans service organization (VSO) posts within each county contributes to lending patterns. We find that close proximity to a military site is a strong positive predictor of county-level rates of VA mortgage lending, even after controlling for the number of veterans and servicemembers living in the area.

The U.S. Department of Veterans Affairs (VA) home loan guaranty is one of the benefits for veterans that were established under the Servicemen's Readjustment Act of 1944, commonly known as the GI Bill. The VA home loan program is among the first federal programs designed to increase rates of homeownership and assist veterans and their families in reintegration to civilian life (Retsinas and Belsky, 2002). Today, veterans are less likely than the general public to face a housing cost burden and more likely to be homeowners (Arnold, Bolton, and Crowley, 2013). Nonetheless, there are large numbers of veterans, particularly younger veterans and those in single-parent

households, who face extreme housing cost burdens. For example, 32 percent of all post-9/11 veteran families face a housing cost burden, and half of single-parent, post-9/11 veteran families are housing cost-burdened (Hanson and Woods, 2016).

Through the VA home loan program, the federal government lowers the effective cost of homeownership for hundreds of thousands of veterans and servicemembers annually. While it is unknown how many families are able to move from being renters to homeowners because of this program, it is popular among veterans because it helps to lower the initial and ongoing cost of homeownership. In the 2010 National Survey of Veterans, 66 percent of veterans who ever had a mortgage reported that they had used the program and about half of those who had used it cited the no-downpayment option as driving their decision (Westat, 2010). A more recent study from the Consumer Financial Protection Bureau (CFPB) found that servicemembers (including both active-duty servicemembers and veterans) who are first-time homebuyers have been increasingly turning to VA mortgages rather than conventional loans (Clarkberg and Lapid, 2019).

While the share of the population that has served in the military is declining, VA lending has been on the rise since the last recession. The number of VA purchase-mortgage originations in 2017 was over triple the volume in 2005, while conventional loan originations were at 51 percent of the 2005 peak. Use of the program also varies geographically; it is underused in high-cost, coastal areas that are home to many veterans. This article examines recent VA mortgage use and whether the presence of military and veterans' institutions can help explain its uneven distribution across the United States.

Research from a variety of disciplines has documented patterns between the presence of certain institutions in a community and the economic and social outcomes of residents and neighborhoods. In the case of our study, institutions can directly contribute to the use of VA loans by counseling prospective borrowers on how to use their benefits, a service that is often collocated with VA medical centers. In addition, institutions such as military bases, veterans' centers, medical centers, clinics, and veterans service organizations (VSOs) may have an indirect impact by facilitating communication between prospective borrowers and those who have knowledge of the program.

We hypothesize that close proximity to military and veterans' facilities can serve as a positive predictor of VA mortgage use, assuming these institutions directly or indirectly increase awareness of the program. We create a county-level panel data set that includes measures of the number of home loan originations by type of mortgage (conventional, VA, and Federal Housing Administration [FHA] loans), distances to VA facilities and military installations, and counts of the largest VSO posts. Because the relationship between community institutions and lending patterns could be confounded by other factors, we include controls for county-level demographics and housing market conditions.

Using a multilevel, longitudinal model, we find that proximity to military bases is a strong positive predictor of VA loan use, even controlling for the approximate size of the population that is eligible to borrow using the program. The share of VA loans decreases in areas with higher housing costs, although there are more VA loans per eligible borrower in higher-cost areas and places that have experienced more rapid house price appreciation. This suggests that in high-

cost areas veterans either use alternative types of mortgages that allow greater loan amounts and require fewer administrative hurdles, or they are priced out of homeownership because they lack sufficient income to buy, relative to nonveteran homebuyers in these high-cost markets. Overall, veteran homeownership rates and incomes are higher than their non-veteran counterparts, but the relationship between income, homeownership, and veteran status is complicated, as the effects of military service appear to vary both across eras of service and across race and gender (Angrist, Chen, and Song, 2011; Conley and Heerwig, 2011; Vick and Fontanella, 2017).

Literature

There are numerous examples in the literature of how community institutions and amenities affect individuals' behavior.[1] For example, Card (1993) documents the relationship between proximity to colleges and individuals' schooling and earnings outcomes. Mikhed and Scholnick (2014) find that facing higher travel costs to visit a bankruptcy trustee makes it less likely that Canadian consumers will file for bankruptcy. Peterson, Krivo, and Harris (2000) show that neighborhood crime rates in Columbus, Ohio in 1990 were negatively correlated with proximity to recreation centers but positively correlated with proximity to bars. Although the institutions that are present in a community may, in some cases, be spuriously related to individual and neighborhood outcomes, they may also have a causal impact on communities. Matsaganis (2008) explains how institutions such as churches provide settings for communication, specifically information-sharing about public health issues, improving health literacy and access to care.

Despite their large geographic footprint and role in local employment markets, there are few studies that explore the relationship between military bases and individual outcomes (Meadows et al., 2013). Military installations, VA facilities, and the density of VSOs may increase the social capital of veterans and, in turn, increase knowledge and use of the VA home loan guaranty program. While our data do not allow us to observe individual behavior or neighborhood-level characteristics, we hope it will help lay the groundwork for future research about the VA home loan program and the effects of military bases on local communities and housing markets.

The existing literature on the VA home loan guaranty program debates the impact the program has on housing markets and the shape of the urban landscape following World War II (Altschuler and Blumin, 2009; Bennett, 1996; Humes, 2006). Minority and female veterans, while formally eligible, were historically unable to use the program due to racist and sexist lending practices of the times (Altschuler and Blumin, 2009; Mettler, 2005). More recently, Fischer and Rugh (2018) examine Home Mortgage Disclosure Act (HMDA) data from 1990 to 2015 and find that VA lending has contributed to the integration of residential neighborhoods.

Fetter (2013) finds that the VA loan guaranty program increased rates of homeownership primarily through lowering the age at which many Americans bought their first homes. Vigdor (2006) finds that removing liquidity constraints, in the case of the VA loan guaranty by removing the need for a downpayment, may have the unintended consequence of increasing home prices for those who do not use the program. Quigley (2006) shows that, in recent decades, the credit quality of VA

[1] See Sampson, Morenoff, and Gannon-Rowley (2002) for a thorough discussion of how institutions and competing factors influence social processes in a community.

borrowers has generally been riskier than that of other types of borrowers, but rates of foreclosure have been only slightly higher than conventional loans and lower than FHA loans. Goodman, Seidman, and Zhu (2014) compare FHA and VA loan performance and find that VA loans perform better after controlling for borrower characteristics. They attribute this to differences in lending rules that govern each program.

There has been little recent analysis on which veteran consumers choose VA mortgages, with the exception of a novel analysis by the CFPB. In that study, Clarkberg and Lapid (2019) use a data set of consumer credit records matched to the Servicemembers Civil Relief Act[2] data—provided by the Department of Defense (DoD)—to track changes in the use of VA loans among first-time homebuying servicemembers. They find that under 40 percent of these first-time homebuyers used VA mortgages to purchase in 2006–2007, as compared to nearly 80 percent by 2016. The uptick in VA use was similar for prime and nonprime servicemembers.

To our knowledge, no studies have explored explanations for geographic disparities in utilization, the focus of this article. The most relevant work focuses on use of the FHA loan program, which has a number of parallels with the VA program: low downpayments, many first-time homebuyers, and a surge in use during and after the mortgage crisis.

The FHA and VA programs play a key role in stabilizing the mortgage market when credit from other sources contracts, ensuring the availability of credit, particularly to those without the ability to make large downpayments (Passmore and Sherlund, 2018). Duca and Rosenthal (1991) explain that FHA mortgage originations rise when the overall default risk in an area increases. While FHA mortgages have standard underwriting rules across geographic areas, conventional mortgage lenders are free to ration credit by using more stringent underwriting in areas where default risk is more prevalent (Ambrose, Pennington-Cross, and Yezer, 2002).

Immergluck (2011) demonstrates that even after controlling for numerous loan-, borrower-, neighborhood-, and MSA-level characteristics, there is considerable variation in the use of FHA mortgages across different metropolitan areas. He points out that areas heavily reliant on FHA financing would be particularly affected by any policy changes that reduced the availability or generosity of the FHA program. The VA program, although a smaller percentage of loans, should have a similar stabilizing effect on area housing markets. Interestingly, FHA and VA lending might actually be particularly sensitive to the next financial crisis. Kim et al. (2018) document that as of 2016, three-quarters of FHA and VA loans were originated by nonbanks, which are not as well capitalized as depository institutions and may be particularly vulnerable to liquidity pressures in times of economic stress.

In the remainder of this article, we first offer a brief history of the VA program, describe its current characteristics, and document the disparity in the use of VA mortgages across geographies. We then turn to a multivariate analysis of this disparity and its changing characteristics over time. Finally, we discuss these results and conclude.

[2] The Servicemembers Civil Relief Act provides legal and financial protections for servicemembers while on active duty and during the transition home. The intent of the law was to allow those who serve to focus on their mission.

VA Lending Program

Brief History and Description of the Modern VA Lending Program

As with the other provisions of the GI Bill, the VA loan program was originally designed to assist World War II veterans with their readjustment to civilian life (Frydl, 2009). To be eligible, a borrower must be a current active-duty servicemember or a veteran who provided a minimum threshold period of service, which can range from 90 days to 24 continuous months.[3]

The main components of the VA loan program are the purchase and refinance mortgage guaranty benefits. During federal fiscal year (FY) 2017 (October 2016–September 2017), 740,389 VA purchase and refinance loans were guaranteed, with 49 percent being refinancings (VA, 2018: 190–192). The remaining 51 percent were mortgages for the purchase or construction of homes. Of the latter, 41 percent of borrowers were first-time homebuyers. In this article, we focus on the purchase mortgages since their origination volume is not as sporadic as refinance mortgages, and as Quigley (2006) argues, purchase mortgages more directly promote homeownership.

The VA loan program facilitates homeownership for qualified veterans and active-duty servicemembers by lowering costs for borrowers. Since the VA provides a guaranty of a portion of the principal balance, the borrower does not have to purchase private mortgage insurance, helping to substantially reduce a borrower's monthly payments. Also, the program requires no downpayment, resulting in lower upfront costs for homebuyers. In fact, 80 percent of VA purchase loans made during FY 2017 involved no downpayment (VA, 2018: 192).[4]

Substitutes for VA Loans

The main substitutes for VA loans are FHA loans and conventional mortgages. As with VA loans, FHA purchase loans allow borrowers to put little money down, currently just 3.5 percent. The borrower pays for mortgage insurance provided by the FHA. Because of this government insurance, lenders are willing to provide lower interest rates and allow greater flexibility in borrower credit standards, relative to conventional loans with low downpayments. Like the FHA program, VA loans are restricted to owner-occupants.

Borrowers who do not use VA or FHA mortgages will generally take out conventional loans. Conventional borrowers who make downpayments of less than 20 percent of the purchase price must generally buy private mortgage insurance. Mortgage insurance can be costly. Borrowers must continue to pay private mortgage insurance until they have established the 20-percent equity threshold. Conventional loans have no particular loan limit, although in order to be securitized by the government sponsored enterprises Fannie Mae and Freddie Mac (Fannie/Freddie), they must

[3] A detailed description of current eligibility rules can be found at http://www.benefits.va.gov/HOMELOANS/purchaseco_eligibility.asp. Rules differ for veterans who served during different periods.

[4] Most borrowers incur a VA funding fee, which can be paid up front by the borrower, rolled into the mortgage principal, or paid by the seller. The amount of the funding fee is a function of the size of the downpayment, whether the borrower is taking cash out, the borrower's type of military service (regular vs. Reserves or National Guard), whether this is the borrower's first or a subsequent VA loan, and other factors. Fees commonly range from 1.25 to 3.3 percent of the loan amount, although they can be waived for certain veterans with service-related disabilities. Current fees are posted at https://www.benefits.va.gov/homeloans/purchaseco_loan_fee.asp.

be at or below the "conforming" loan limit, which was $417,000 in most parts of the country until 2017 when it was increased to $424,100.

Because VA mortgages allow borrowers to put no money down, and do not require payment of mortgage insurance fees, they are usually the most cost-effective option for qualified borrowers. In some instances, FHA interest rates may be below the rates of comparable VA loan products for a particular borrower, which may provide an incentive for using the FHA program instead. A veteran would need to supply the necessary downpayment, however, and the interest rate difference would have to be large enough to offset the cost of the FHA mortgage insurance premiums. Finally, a veteran cannot use multiple VA loans concurrently, which may also influence the decision of whether to choose an FHA or VA mortgage for a particular purchase.

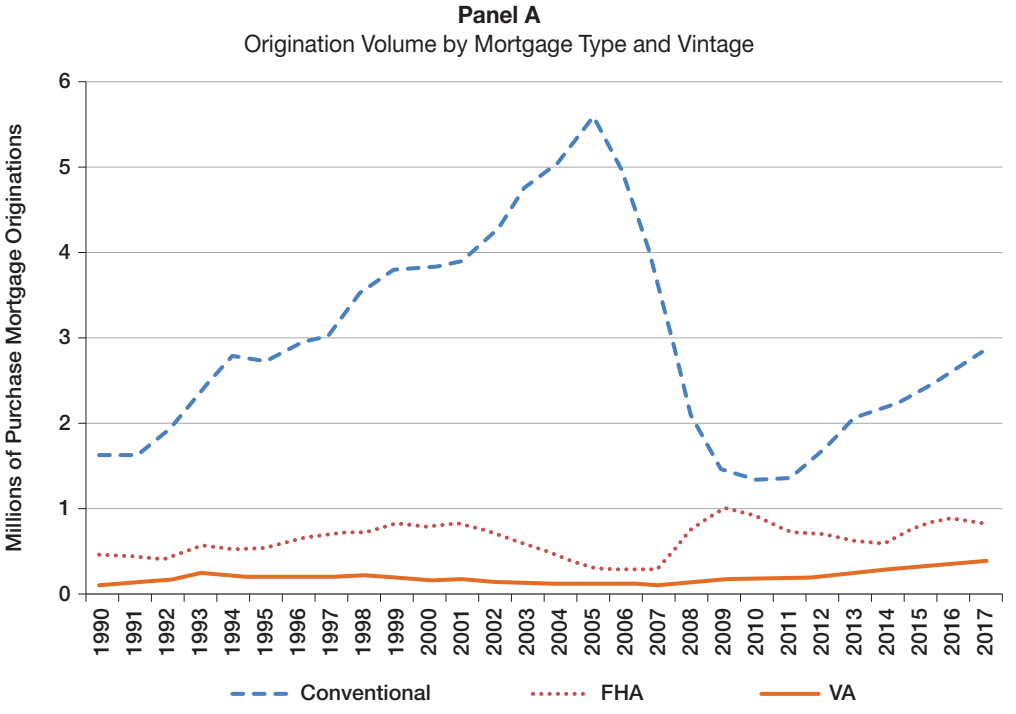
VA loans do not have loan limits per se, but there are maximum guaranty amounts, and the VA publishes the maximum loan amounts that can be originated in each county with zero downpayment. In recent years, these "loan limits" were set to the same values as the Fannie/Freddie conforming loan limits for single-family residences, including the feature that higher cost areas receive commensurately higher loan limits. Unlike with the Fannie/Freddie limits, however, VA loans may be originated in excess of the threshold, although this triggers a downpayment requirement. For 2017, we find that the origination amount for about 3 percent of nationally originated VA loans exceeded this published zero-down-payment "loan limit," but in high-cost counties 6 percent exceeded the threshold.

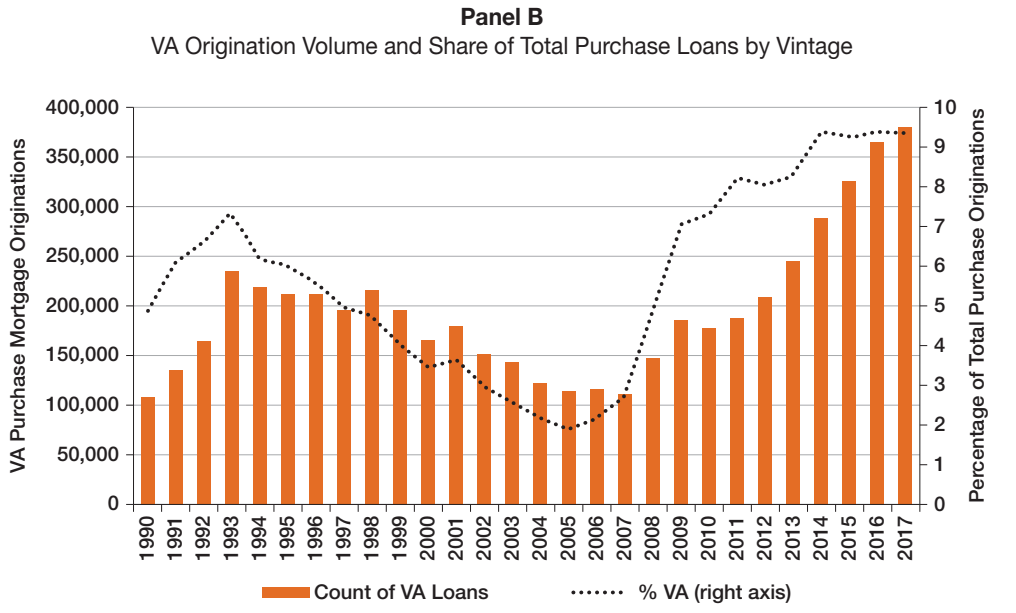
Use of the VA Program Since 1990

According to HMDA data, each year since 1990, between about 125,000 and 380,000 VA purchase mortgages have been originated. As a percentage of all VA, conventional, and FHA mortgages, VA mortgage originations tend to be counter-cyclical. VA lending made up just 1.9 percent of purchase mortgages at the market's height in 2005 with 113,000 loans, but as conventional lending shrunk in the housing market recovery, VA lending increased dramatically—both in levels and as a percentage of all lending (exhibit 1). By 2017, VA loans made up 9.4 percent of all mortgages, with 380,000 originations—more than three times the 2005–2007 annual volume and the highest number of VA purchase originations since HMDA data collection began. It is worth noting that although the housing market has recovered in most areas and conventional purchase mortgages have increased, VA lending has continued its surge, perhaps owing to the absence of zero downpayment alternatives and general tightness of the credit box in the conventional mortgage market (Goodman, 2017).

Exhibit 1

Purchase Mortgage Originations, 1990–2017





FHA = Federal Housing Administration. VA = U.S. Department of Veterans Affairs.
Notes: Only purchase mortgages are included, with loans limited to first liens beginning in 2004, when lien information was first reported in Home Mortgage Disclosure Act (HMDA). Farm Service Agency and Rural Housing Service loans are excluded from the analysis.
Source: HMDA data

Disparities in Use of VA Program

VA lending is most prevalent in the mid-Atlantic, southeast, west coast, and Rocky Mountain states (exhibit 2). We consider veterans aged 64 or younger and active-duty servicemembers to constitute the population most likely to use VA mortgages to purchase homes, so we focus on this group. We refer to them as the "eligible" population, since this count is the best available proxy for the number of qualified residents who could use the program to buy a home.

A considerable number of counties with large numbers of veterans and active servicemembers have relatively low volumes of VA mortgages originated, particularly before the mortgage crisis (exhibit 3). Most of these are areas with higher home values, as indicated by the concentration of blue circles in lower right corner of each chart. In 2017, most of the low-VA outliers contained high-cost coastal cities in New York, New Jersey, Massachusetts, and California (exhibit 4). Higher house prices could also serve as a barrier for first-time homebuyers. For this reason, we control in our analysis below for house price levels, rates of house price appreciation, and rates of homeownership over time.

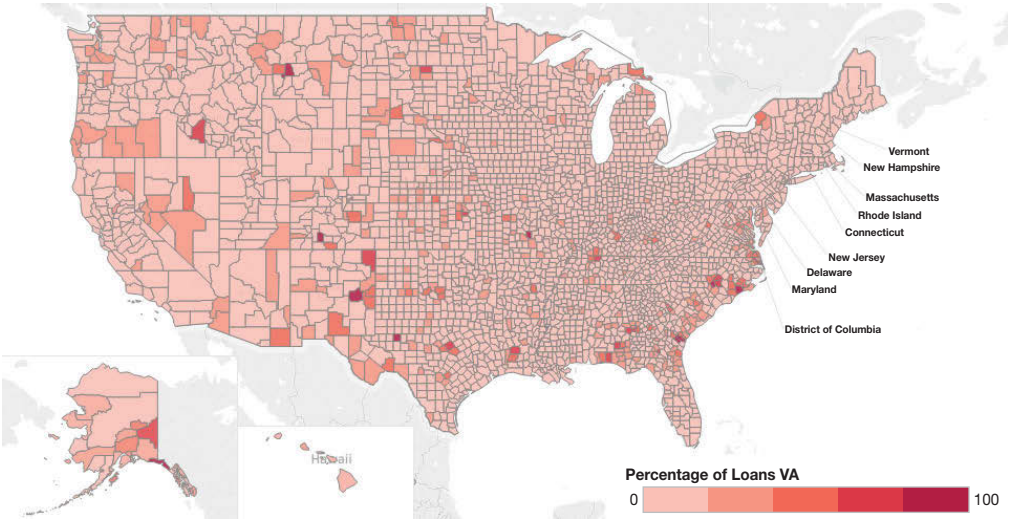
On the other hand, some counties appear to have considerably more VA mortgage originations than we would expect, given the relative numbers of eligible residents (toward the corner in the upper left quadrant of each plot in exhibits 3 and 4). The objective of this paper is also to help explain why those places have seen such a large share of VA lending.

Exhibit 2

VA Loans Originated in 2011

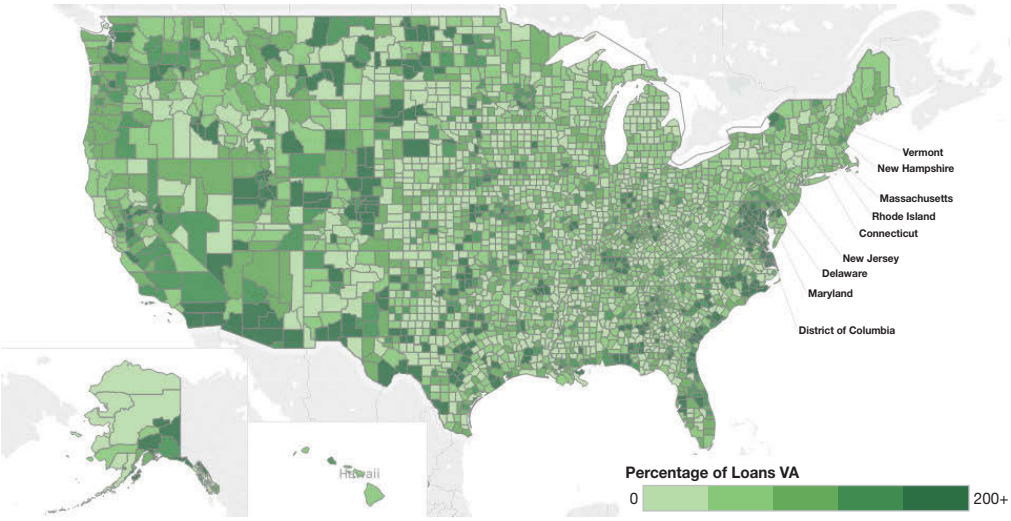
Panel A

VA Loans as a Percentage of All Mortgages Originated



Panel B

VA Loans Originated Per 10,000 Eligible



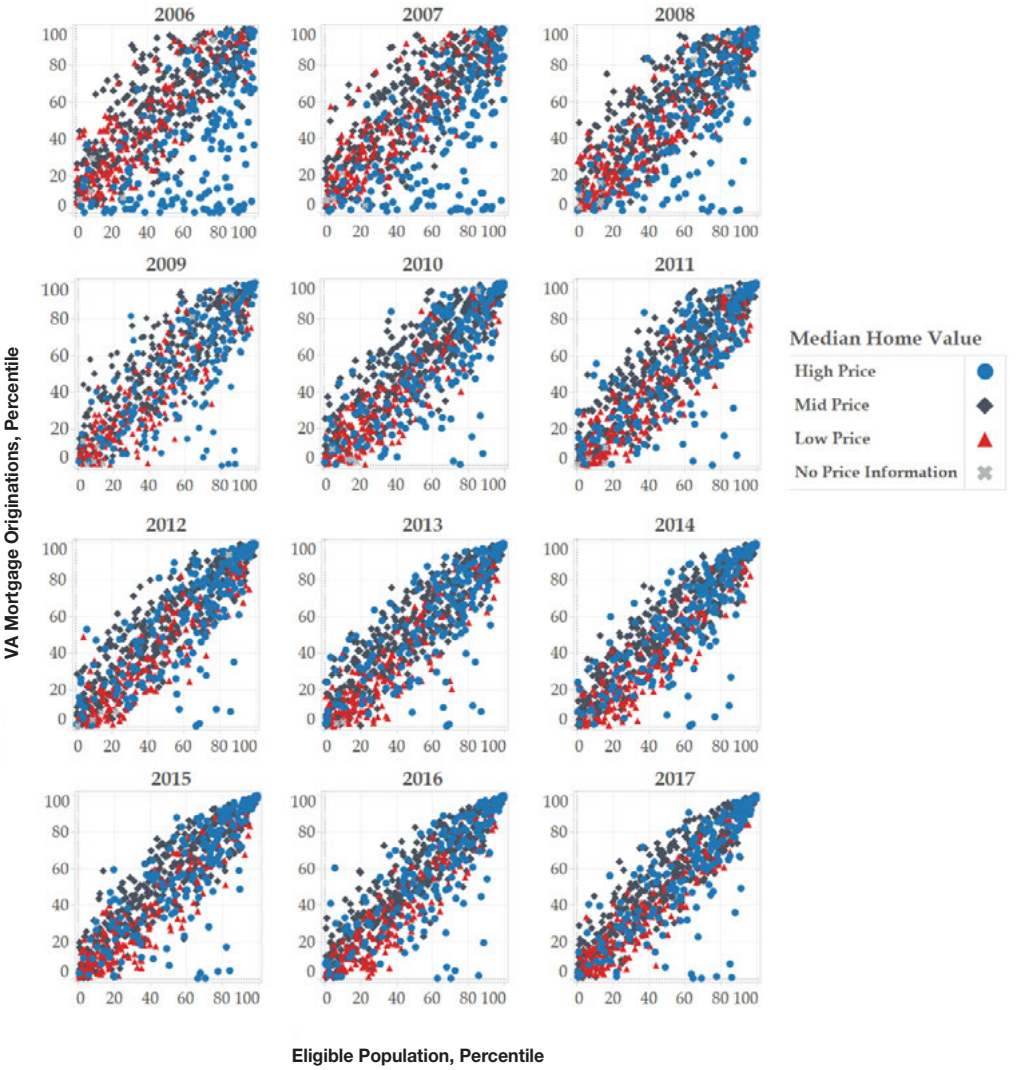
VA = U.S. Department of Veteran Affairs.

Notes: "Eligible" population includes veterans aged 18–64 and active-duty servicemembers, according to the 2011 5-year American Community Survey. First-lien purchase mortgages only are included.

Sources: Home Mortgage Disclosure Act; U.S. Census Bureau data

Exhibit 3

Counties Ranked by Eligible Population and Volume of VA Loans Originated, 2006–2017



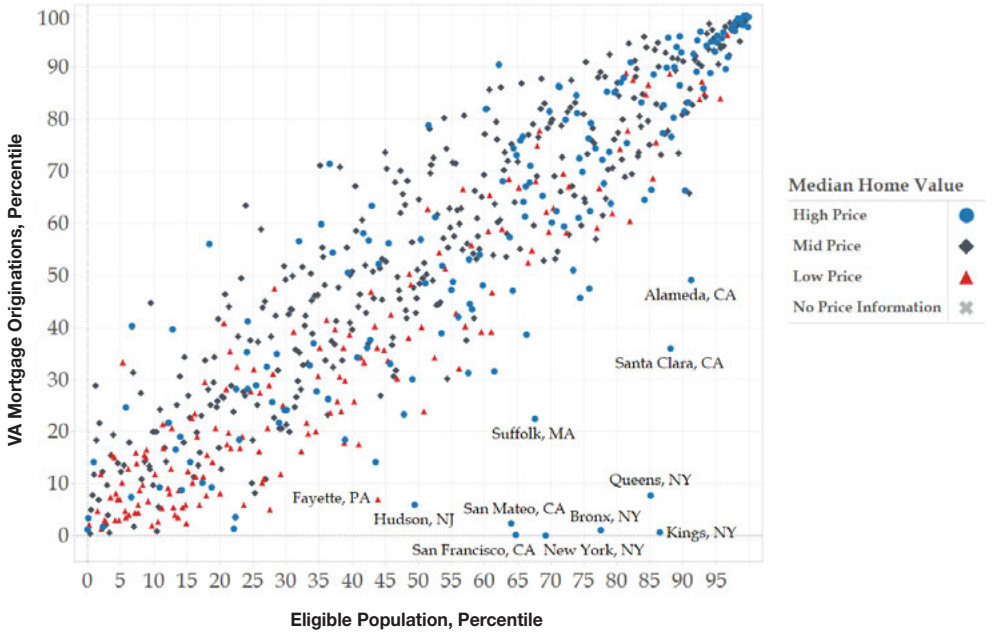
VA = U.S. Department of Veteran Affairs.

Note: For each calendar year counties are ranked by eligible population (number of VA mortgage originations) and assigned a percentile value which is displayed along the x (y) axis.

Sources: Authors' analysis of U.S. Census Bureau, Home Mortgage Disclosure Act, and Zillow data.

Exhibit 4

Counties Ranked by Eligible Population and Volume of VA Loans Originated, 2017



VA = U.S. Department of Veteran Affairs.
Note: Counties are ranked by eligible population (number of VA mortgage originations) and assigned a percentile value which is displayed along the x (y) axis.
Sources: Authors' analysis of U.S. Census Bureau, Home Mortgage Disclosure Act, and Zillow data

Data

We create a unique dataset from several sources. To measure volumes of loan originations at the county level we use HMDA data from 2006 to 2017. In addition, we obtained county-level demographics from the American Community Survey (ACS). To measure home price levels and changes, we use county-level home value indices provided by Zillow. We also use data on the locations of military installations and veterans' services facilities from DoD and VA, respectively. Finally, we collected post location data from four large national VSOs. We conduct our analysis at the county level—the finest level of geography at which each type of data is available.[5]

Home Mortgage Disclosure Act

HMDA data are reported by depository institutions and certain for-profit, nondepository institutions. The data are compiled each year by the Federal Financial Institutions Examination Council. We restrict the sample to first-lien, owner-occupied purchase mortgages that are VA, conventional, or FHA loans. We total the number of originations each year by county. Exhibit 5 presents summary statistics.

[5] We are primarily constrained by the availability of annual U.S. Census Bureau data, which is difficult to obtain for many areas below a county level. Similarly, while Zillow does provide house price indices at the ZIP Code level, these are not available for as many areas of the country as their county-level series.

Exhibit 5

Summary Statistics of County Loan Origination Volumes, Demographics, and Housing Market Characteristics

Median Values	2006-2007	2008-2011	2012-2014	2015-2017	All Years
HMDA Variables					
VA Originations	51	91	148	226	118
Conventional Originations	2,111	718	956	1,378	1,109
FHA Originations	169	527	423	550	428
% Originations VA	2.1	5.9	8.4	9.3	6.8
% Originations FHA	7.1	38.1	26.4	26.0	27.2
VA Originations Per 10,000 Eligible	50	91	180	313	143
FHA Originations Per 10,000 Adults	15	42	32	44	35
Ratio of VA to FHA Originations	0.3	0.16	0.33	0.38	0.27
ACS Variables					
Population	176,821	182,700	190,083	195,734	185,890
Number of Veterans	15,781	15,342	13,986	13,077	14,449
% Veterans [Civil Population Only]	11.1	10.2	9.0	8.1	9.5
Number of Veterans Aged 18-64	9,747	8,917	7,423	6,458	8,106
% Veterans [Civil Population Aged 18-64 Only]	8.1	7.2	5.8	5.0	6.5
Number in Armed Forces	179	219	147	148	176
% in Armed Forces	0.1	0.1	0.1	0.1	0.1
% Eligible	8.3	7.4	5.9	5.1	6.7
Ratio Veteran to Non-Veteran Income [Males Only]	1.12	1.14	1.13	1.12	1.13
% Housing Units Owner-Occupied	70.2	68.7	67.0	66.8	68.0
Zillow Variables					
Zillow Home Value Index [Nominal $]	$165,650	$146,300	$139,900	$160,700	$150,200
Year-Over-Year % Change in Zillow Home Value Index	3.6	-3.8	1.7	5.1	1.2

ACS = American Community Survey. FHA = Federal Housing Administration. HMDA = Home Mortgage Disclosure Act. VA = U.S. Department of Veteran Affairs.

Note: Counties are included here if they were included in the 1-year ACS from 2006–2017 and had Zillow county-level house price data for each year 2006–2017 (including backward-looking measures of house price change).

Source: Authors' analysis of U.S. Census Bureau, HMDA, and Zillow data

U.S. Census Bureau American Community Survey

We include several measures from the 1-year ACS for the years 2006–2017, as displayed in exhibit 5. To capture the veteran population that may be eligible for and most likely to use the program, we include the civilian population aged 18 to 64 who are veterans and the population over 18 who are in the armed services.

Zillow

We use data from Zillow to measure county home values. Unlike self-reported estimates of home values from sources such as the ACS, Zillow data are calculated based on home price transactions and are adjusted using hedonic characteristics.[6]

Veterans Affairs Facilities

We hypothesize that VA hospitals, clinics, and veterans' centers might encourage the dissemination of information about the loan program and have a positive relationship with program use. VA hospitals may act as a hub of activity for veterans and share their campuses with organizations that provide non-medical services to veterans, such as Disabled American Veterans offices. We include VA cemeteries as an initial falsification test. If cemeteries were correlated with more VA loans, we might suspect that simply having a greater historical presence of veterans, and therefore VA facilities, would be the true explanation for our findings. We found no evidence of such a relationship, however.

To test whether proximity to VA facilities is associated with higher use of VA loans, we obtained a shapefile of VA facility locations as of March 31, 2012, from the National Center for Veterans Analysis and Statistics.[7] Because this is a snapshot of facilities, it may overstate (understate) the proximity of some counties to VA facilities in areas where there have been closures (openings) of VA facilities over the period we examine. We measure the distance from the center of each county to the nearest VA hospital, clinic, veterans center, and VA cemetery. The mean and median distance from the center of a county to each facility is reported in exhibit 6.

Military Installations

We hypothesize that proximity to a DoD site—particularly, one that employs a large number of people—will have a positive relationship with VA loan originations. Lenders and borrowers located near bases may have greater awareness of the program, which could result in a greater incidence of VA lending, even after accounting for the size of the eligible population living near bases. We obtained the locations of 818 military installations from the DoD.[8] In order to focus on installations that employ a large number of people and are likely to have an effect on the use of VA loans, we

[6] For more information on how the Zillow index is calculated or to obtain the data, visit https://www.zillow.com/research/data/. Data acquired from this site on December 19, 2018; we downloaded data for the market segment "all homes" for all available counties. Aggregated data on this page is made freely available by Zillow for non-commercial use.

[7] Files are available at http://www.va.gov/VETDATA/docs/Maps/VA_Facilities.zip.

[8] Files are available at https://explore.data.gov/download/wcc7-57p3/ESRI.

matched the DoD files to the Defense Manpower Data Center (DMDC) personnel data for 2009.[9] We used this file to exclude installations with fewer than 100 DoD personnel. We then measured the distance from the center of each county to the nearest major DoD site.[10]

Exhibit 6

Summary Statistics of County Proximity to Facilities

	Mean	Median	SD
Distance in Miles to Nearest...			
VA Hospital	48	33	102
VA Clinic	18	14	14
Veterans' Center	27	23	21
VA Cemetery	42	35	33
Military Base or Other Major Installation	28	20	34
% with Bases or Installations in County	38		
# VSO Posts Per 1,000 sq Miles	34	17	68

SD = standard deviation. VA = U.S. Department of Veteran Affairs. VSO = veterans service organization.
Note: Counties are included here if they were included in the 1-year American Community Surveys from 2006–2017 and had Zillow house price data for each year 2006–2017 (including backward-looking measures of house price change).
Source: Authors' analysis of data from the U.S. Department of Defense (DoD), American Legion, American Veterans (AMVETS), Military Officers Association of America (MOAA), and Veterans of Foreign Wars (VFW)

Large numbers of military families live near DoD sites, and active-duty servicemembers may use the program to buy a home after 90 continuous days of service. Further, retired military servicemembers enjoy select privileges at bases even after separating from the military, and as a result, they may be likely to purchase homes near bases in order to continue to benefit from both the social connections and the amenities available on the base. We attempt to account for these facts by controlling our models for the number of active-duty servicemembers and veterans under age 65 living in a county. Unfortunately, the U.S. Census Bureau's estimates of servicemembers living in a county exclude those deployed overseas at the time of data collection. Thus, to the extent that servicemembers and their families purchase homes while stationed elsewhere, the data will underestimate the "eligible population," and the presence of a DoD site may be a proxy for the presence of military families of deployed servicemembers. Because the majority of borrowers who use the program do so after active-duty service, we do not expect that miscounts in the number of active-duty servicemembers drive our results.[11]

[9] Files are available at https://www.dmdc.osd.mil/appj/dwp/getfile.do?fileNm=M02.zip&filePathNm=pubSelectedLocations.

[10] We also compared the DMDC data to the ACS measure of active-duty servicemembers. We found a very strong correlation between DMDC counts of personnel by location of employment and the ACS measure of active-duty servicemembers by residence, suggesting that many servicemembers employed at domestic bases live in the county where they work and that the ACS data are a comparable measure of active-duty servicemembers.

[11] According to the National Survey of Veterans, 81.4 percent of veterans who used the program did so after service (Westat, 2010).

Veterans Service Organizations

We collected post locations from four major VSOs: the American Legion, Veterans of Foreign Wars of the United States (VFW), American Veterans (AMVETS), and Military Officers Association of America (MOAA). These four organizations are among the largest membership organizations listed in 2012/2013 Directory of Veterans and Military Service Organizations published by the VA.

All four VSOs we study state as part of their mission advocating at the local and federal level for the interests of veterans and their families. In addition, the organizations sponsor community programs that are intended to increase patriotism and support for American troops. The organizations differ in their size and in their membership criteria. In order to estimate the effect of VSOs, we geocoded the address of each post. We count the number of posts within each county and calculate their density, using the county land area.

Sample

We restricted our sample to counties that were included in the 1-year ACS for all years from 2006 through 2017, each of these has a population of 65,000 or more. We limit the sample in this way in order to reduce noise in estimates coming from sparsely populated areas and to allow us to capture annual variation in the control variables. We further restrict the sample to the 657 counties for which Zillow county-level home value indices were available for the entire study period.

Our sample of 657 counties includes counties from all 50 states and the District of Columbia. In 2017, our sample of counties had a total population of 258 million individuals and a veteran population of 13.7 million. This represented roughly 81 percent of the total population and 72 percent of the veteran population in 2017.

Within our sample, the median number of VA mortgages originated in a county annually was just 118, with the median ranging from a low of 51 in 2006 and a high of 238 in 2016. When VA lending was at its lowest, conventional lending was near its height for the period, and as conventional lending fell throughout the housing bust, VA lending was on the rise (exhibit 1). FHA lending resembles VA lending in this regard, although the median level of FHA lending peaked in our sample counties in 2009.

From 2006 to 2017, VA mortgages as a percentage of all loans originated rose dramatically, from under 2 percent of loans to over 9 percent.[12] This is striking, because the share of young adults serving in the military has declined over time, and the veteran population has decreased and aged. Roughly 10 percent of adult residents in the typical county in our sample were veterans, and most of these were veterans aged 64 or younger. In half of the sample counties, only 0.1 percent or fewer of the adult residents over time were active servicemembers (exhibit 5).

[12] The Veterans Benefits Improvement Act of 2004 significantly increased the standard guaranty amount, which would be expected to increase demand for the program. As shown in exhibit 1 panel B, however, the number of VA loans originated did not dramatically increase until 2008. Beginning in 2008, high-cost areas in the continental United States also qualified for greater guaranty amounts, which should also have increased VA demand, although during the same period, FHA and conventional loans—VA substitutes—were experiencing similar loan limit increases in these high-cost areas.

Estimation Strategy

We use a mixed-effects or multi-level model in order to estimate the effect of time-invariant variables (for example, proximity to major military installations) on both the initial levels and change over time in the use of the VA loan program.[13] The mixed-effects model allows each county to have a unique trajectory of VA lending over the sample period. The model allows us to account for the clustering of county lending levels over time. The model has two levels: the first level represents the "within-county" change in VA lending over time, while the second level allows us to estimate the change in VA lending attributable to "between-county" differences.

We estimate two sets of these models. In the first, the dependent variable is the percentage of all purchase loans originated in a county that are VA mortgages. In the second set of models, the dependent variable is the VA loan origination rate, which we specify as the number of VA loans originated per 10,000 eligible residents (veterans aged 18 to 64 and servicemembers).

Beginning with the first set, PCT_{ij} is the percentage of loan originations that are VA loans, in county i during year j, and the general form of the model is:

$$PCT_{ij} = \gamma 00 + \gamma 10 YEAR_{ij} + \gamma 20 PCTELIG_{ij}$$

$$+ \gamma 01 \mathbf{DIST}_{i} + \gamma 02 VSODENSITY_{i}$$

$$+ \gamma 30 \mathbf{HSGMKT}_{ij} + + \gamma 40 INCRATIO_{ij} + \gamma 03 \mathbf{STATE}_{i} + (\varepsilon_{ij} + \zeta 0_{i} + \zeta 1_{i} YEAR_{ij}).$$

in which *PCTELIG* is our estimate of the percentage of a county's adult population that is either in the military or a veteran between ages 18 and 64. $\mathbf{DIST}_{i}$ is a vector of time-invariant variables indicating distance from the county center to the key military and VA sites, which we hypothesize may be associated with greater utilization of the VA loan program. For military installations, the distance measure is set to zero if a major installation is located within the county, otherwise it is equal to the natural log of the number of miles from the county center to the nearest major installation. For VA sites we include the natural log of the distance from the county center to the nearest VA hospital, VA clinic, veterans' center, and VA cemetery. Note that we include VA cemeteries to test for a spurious relationship between the siting of VA facilities and variation in VA lending. $VSODENSITY_{i}$ is the time-invariant natural log of the number of VSOs per thousand square miles in each county.

$\mathbf{HSGMKT}_{ij}$ is a vector of three variables related to the conditions of the local housing market. We include the percentage of housing units in a county that are owner-occupied, the natural log of the Zillow median home value in the county, and the year-over-year percentage change in the median value.

We include a measure of the median income of veteran males relative to nonveteran males, $INCRATIO_{ij}$, to control for variations in the relative purchasing power of veterans across-counties. Although on average in our sample the median income of veterans was higher than nonveterans (a

[13] For more information on mixed-effects models, we recommend Singer and Willett (2003). Note that because several of our main question predictors are time-invariant, it is not possible to estimate our models using a simple linear model with county-specific fixed effects.

ratio of 1.18). In certain areas, veterans may have considerably less purchasing power; for example, in San Francisco in 2017, the ratio was 0.76.

Finally, we include a set of state fixed effects, $\mathbf{STATE}_i$, to control for time-invariant characteristics of states that may influence utilization of the VA home loan program. For example, several states provide additional incentives to veteran homebuyers.

In the second set of models the dependent variable is the number of VA loans per 10,000 potentially eligible adults (*RATE*):

$$RATE_{ij} = \gamma 00 + \gamma 10 YEAR_{ij} + \gamma 20 PCTELIG_{ij}$$

$$+ \gamma 01 \mathbf{DIST}_i + \gamma 02 VSODENSITY_i + \gamma 30 \mathbf{HSGMKT}_{ij} + + \gamma 40 INCRATIO_{ij}$$

$$\gamma 03 \mathbf{STATE}_i + (\varepsilon_{ij} + \zeta 0_i + \zeta 1_i YEAR_{ij}).$$

The independent variables are the same in both models.

Results

We find a strong relationship between VA loan originations and home values. Higher home values are associated with a lower percentage of VA loans but more VA loans per 10,000 eligible adults. In addition, we find that proximity to major military installations is associated with greater use of the program, both in terms of the percentage of all loan originations and when measured as a rate. We do not find evidence that VA facilities are associated with utilization of the program. We find mixed evidence for an association between VA lending and the density of VSOs—VSO density is not associated with the percentage of VA loans but is negatively associated with the rate of VA lending. We interpret this result to suggest that VSOs are not causally linked to VA borrowing. VSO densities are high in the Midwest and Great Plains states, where unobserved macroeconomic conditions (population shifts, local economic factors) may be driving lower rates of VA loan originations.

VA Loans as a Percentage of All Originations

The first model (1) includes our key independent variables, including measures of proximity to military installations, VA facilities, and VSOs. In addition, it includes controls for housing market conditions and state fixed effects. Distance to the nearest major military installation is strongly negatively correlated with the share of originated VA mortgage loans, despite including a control for the share of the adult population (aged 18–64) that are veterans or active servicemembers, which should be a fairly accurate proxy for the population eligible for borrowing through the VA program.

Interestingly, other measures of proximity to institutions show no relationship. We find no support for an association between the density of VSOs and VA loan program utilization. We also find no evidence that proximity to the VA facilities matters: the coefficients on distances to VA clinics, hospitals, veterans' centers, and cemeteries are all near zero. While we find it reassuring that proximity to VA cemeteries was not significant, there were reasons to expect, a priori, that VSOs and other types of facilities might have a measurable, though small, impact.

Intuitively, VA lending is less common in counties where house prices are higher and where appreciation is greater. As previously discussed, larger loan values are permitted with no

Exhibit 7

VA Loans as a Percentage of All County Mortgage Originations (1 of 2)

	VA Mortgages as Percent of All Originations		FHA Mortgages as Percent of All Originations
	(1)	(2)	(3)
Constant	81.825***	79.193***	247.322***
	(4.081)	(3.291)	(7.319)
Year (0=2006)	0.845***	0.845***	1.017***
	(0.019)	(0.019)	(0.043)
% of Population VA Eligible	0.192***	0.193***	-0.220***
	(0.025)	(0.025)	(0.055)
In Miles to Nearest...			
Major DoD Installation	-1.242***	-1.224***	-0.277
	(0.148)	(0.142)	(0.149)
VA Clinic	0.143		
	(0.299)		
VA Hospital	0.251		
	(0.337)		
Veterans' Center	-0.182		
	(0.308)		
VA Cemetery	-0.610		
	(0.322)		
VSO Density	-0.503		
	(0.386)		
% of Housing Units Owner Occupied	-0.085***	-0.082***	-0.025
	(0.013)	(0.013)	(0.029)
Ratio of Veteran to Non-Veteran Income	1.083***	1.084***	1.097
	(0.194)	(0.194)	(0.718)
Zillow House Price...			
In Median Home Value	-5.737***	-5.751***	-18.549***
	(0.237)	(0.234)	(0.575)
Year-Over-Year Percentage Change	-0.072***	-0.072***	-0.866***
	(0.004)	(0.004)	(0.016)

Exhibit 7 (cont.)

VA Loans as a Percentage of All County Mortgage Originations (2 of 2)

	VA Mortgages as Percent of All Originations		FHA Mortgages as Percent of All Originations
	(1)	(2)	(3)
Observations	7,884	7,884	7,884
Deviance	38,285.3	38,290.9	58,481.7

DoD = U.S. Department of Defense. FHA = Federal Housing Administration. VA = Department of Veterans Affairs. VSO = veterans service organization.
*Notes: ***, **, and * represent statistical significance at 0.1, 1, and 5 percent levels, respectively. Standard errors are displayed in parentheses. Counties are included here if they had 1-year ACS estimates and Zillow house price data for each year 2006–2017 (including backward-looking measures of house price change). "Eligible population" is the count of residents aged 18–64 who are veterans or armed forces servicemembers. "Percentage eligible" captures the share of adults aged 18–64 who fit this description of eligibility. VSO density is calculated as ln (veteran service organization posts per 1,000 square miles). "Major DoD Installations" refer to DoD sites catalogued by the Defense Manpower Data Center (DMDC) in the 2009 personnel report that have 100 or more personnel. State fixed effects are included in each model*
Source: Authors' analysis of U.S. Census Bureau, Home Mortgage Disclosure Act, DoD, Zillow, American Legion, American Veterans (AMVETS), Military Officers Association of America (MOAA), and Veterans of Foreign Wars (VFW) data

downpayment in designated high-cost areas, but even those loan limits may be binding for some borrowers. In high-cost areas, 6 percent of borrowers in 2017 exceeded the loan limit for a loan with zero downpayment, and another 9 percent of borrowers took out a loan below but near (within 5 percent) the loan limit. In areas not designated as high-cost, borrowers did not seem as affected by these limits: 3 percent of borrowers exceeded the limit and 5 percent took out a loan near the limit.

In addition to loan limit considerations, veterans may have less purchasing power relative to nonveterans in high cost areas. For this reason, we include the ratio of veteran to nonveteran median income as a control in the models. The result is intuitive: there is a significant and positive association between veteran-to-nonveteran income and the share of VA loans in a county. In counties where male veterans' income outpaces the income of other male residents, it makes sense that VA loans would make up a greater share of the loan originations. Interestingly, the rate of owner occupancy in a county is negatively associated with VA loan use. This is surprising since the VA program is intended for owner occupants.

Our preferred model (2) eliminates variables that did not have a significant association with the share of VA loans in a county. The upper plots in exhibit 8 present the associated effects of moving from the .25 quantile, to the median, and the .75 quantile levels of two key variables, distance to DoD installation and Zillow home value index, on the share of loans that are VA. Counties with a major military installation have a 3.7-percentage-point larger share of VA loans, on average, than counties that are the median distance from an installation (20 miles). This is economically significant, as the county median VA share has ranged from 1.8 to 9.4 percent during our sample period.

The measures of housing market conditions are all statistically significant, but the most substantive finding is that as house prices increase, the percentage of VA loans decreases. Moving from a

county with the median Zillow home value, $150,200, to a county with home values of $214,925 (the .75 quantile level) is associated with a 2.1-percentage point decrease in the share of VA loans.

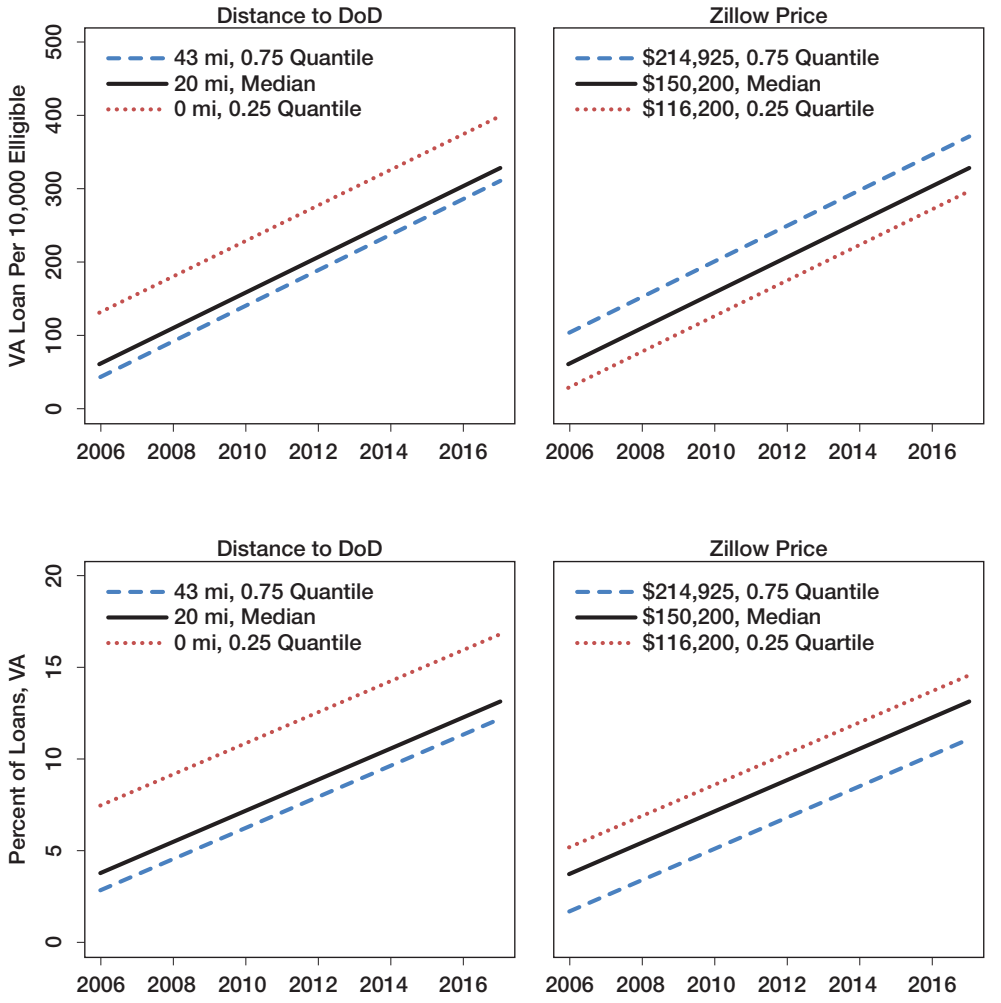
Robustness Checks

We estimate a model (3) to test whether our findings also apply to the percentage of FHA loans. We anticipate that the distance to major DoD sites should have no relationship with FHA loans, except in that FHA mortgages are a substitute for VA loans. The coefficient on PCTELIG remains significant, but negative, suggesting an inverse relationship between FHA loans and the presence of veterans. This is consistent with FHA and VA loans being similar loan products and, holding other factors constant, increasing the percentage of veterans and military servicemembers reduces utilization of FHA loans. In areas with more veterans, demand for FHA loans may be lower due to a higher percentage of the population being eligible for a more attractive loan product.

The key finding from our third model is that the coefficient on the distance to major DoD installations approaches zero and becomes statistically insignificant. This supports the conclusion that proximity to major DoD installations, rather than simply low downpayment, government-insured lending, is a meaningful predictor of VA loan demand.

Exhibit 8

Relationships Between County Characteristics and Predicted Use of VA Loans



DoD = U.S. Department of Defense. VA = U.S. Department of Veteran Affairs.
Notes: Based on Model 2, all control variables other than year and those displayed are set to median levels. Distance to DoD captures log distance in miles from county center to nearest major DoD installation.
Sources: Authors' analysis of U.S. Census Bureau, Home Mortgage Disclosure Act, DoD, VA, and Zillow data

VA Originations per 10,000 Eligible Residents

Results from the models where the outcome variable is the number of VA loan originations per 10,000 eligible adults (veterans and servicemembers aged 18–64) tell a similar story to the percentage VA models (exhibit 9). We find that house values in a county remain a strong predictor of VA loan utilization and that proximity to major DoD installations is associated with higher rates of VA loan originations. We find evidence that the density of VSOs is negatively associated with the rate of VA loan originations. We again find no evidence that VA facilities are associated with

VA lending, and the veteran-to-nonveteran median income ratio measure remains positive but becomes statistically insignificant.

Exhibit 9

VA Loan Originations in County per 10,000 Eligible Residents (1 of 2)

	VA Mortgages Per 10,000 Eligible Residents under Age 65		FHA Mortgages Per 10,000 Eligible Residents under Age 65
	(1)	(2)	(3)
Constant	-1247.283***	-1205.305***	102.106***
	(76.774)	(64.616)	(12.478)
Year (0=2006)	21.112***	24.144***	2.209***
	(0.567)	(0.567)	(0.080)
% of Population VA Eligible	-13.857***	-13.779***	0.356***
	(0.533)	(0.532)	(0.099)
In Miles to Nearest...			
Major DoD Installation	-23.263***	-23.112***	-0.262
	(2.510)	(2.488)	(0.305)
VA Clinic	1.122		
	(5.034)		
VA Hospital	5.079		
	(5.662)		
Veterans' Center	7.735		
	(5.184)		
VA Cemetery	-7.157		
	(5.415)		
VSO Density	-37.837***	-42.426***	2.897***
	(6.524)	(5.235)	(0.654)
% of Housing Units Owner Occupied	1.446***	1.472***	0.288***
	(0.274)	(0.272)	(0.054)
Ratio of Veteran to Non-Veteran Income	4.649		
	(4.154)		
Zillow House Price...			
In Median Home Value	122.144***	121.426***	-8.559***
	(4.967)	(4.946)	(1.041)
Year-Over-Year Percentage Change	1.248***	1.246***	-0.730***
	(0.088)	(0.088)	(0.023)

Exhibit 9

VA Loan Originations in County per 10,000 Eligible Residents (2 of 2)

	VA Mortgages Per 10,000 Eligible Residents under Age 65		FHA Mortgages Per 10,000 Eligible Residents under Age 65
	(1)	(2)	(3)
Observations	7,884	7,884	7,884
Deviance	86,715.8	86,721.6	64,628.8

*DoD = U.S. Department of Defense. FHA = Federal Housing Administration. VA = U.S. Department of Veterans Affairs. VSO = veterans service organizations. Notes: ***, **, and * represent statistical significance at 0.1, 1, and 5 percent levels, respectively. Standard errors are displayed in parentheses. Counties are included here if they had 1-year ACS estimates and Zillow house price data for each year 2006–2017 (including backward-looking measures of house price change). "Eligible population" is the count of residents aged 18–64 who are veterans or armed forces servicemembers. "Percentage eligible" captures the share of adults aged 18–64 who fit this description of eligibility. VSO density is calculated as ln (veteran service organization posts per 1,000 square miles). "Major DoD Installations" refer to DoD sites catalogued by Defense Manpower Data Center (DMDC) in the 2009 personnel report that have 100 or more personnel. State fixed effects are included in each model.*
Source: Authors' analysis of U.S. Census Bureau, Home Mortgage Disclosure Act, DoD, Zillow, American Legion, AMVETS, Military Officers Association of America (MOAA), and Veterans of Foreign Wars (VFW) data

There is an association between proximity to a military installation and VA home loans that is statistically significant and meaningful. Moving from a county with a military installation to a county the median distance from an installation (20 miles) is associated with a 70-loan decrease in the number of loan originations per 10,000 eligible residents (exhibit 8). This is a substantive effect given that over our sample period the median number of VA loans per 10,000 eligible in a county is 143.

Most control variables have intuitive signs. An increase in the Zillow home value from the median level ($150,200) to the .75 quantile level ($214,925) is associated with a 43.5-loan increase in the number of VA loans per 10,000 eligible residents. Again, this is economically and statistically significant. The rate of owner occupancy remains significant but is positive. This seems intuitive in that in areas where homeownership is higher, we see more VA loans among those eligible.

Counter to our hypothesis, in this model VSO density is negative and significant. We interpret this finding to suggest that some unobserved factors are driving the results, not that VSOs dampen VA lending. There is also a negative relationship between the percentage of the population that is VA eligible and the amount of VA lending that occurs per eligible member of the population. VSO density and the overall presence of veterans could be associated with other demographic or economic factors that are negatively associated with VA lending.

Robustness Checks

In our final model (3) we change the outcome variable from the rate of loan originations per 10,000 veterans under age 65 and servicemembers to the rate of FHA loan originations per 10,000 adults under 65. The association with distance to the nearest major military installation is insignificant and approaches zero. We also estimate the main models on a subset of the sample,

excluding the counties at or above the 95th percentile with respect to land area. The results were strongly robust.[14]

Discussion

Our finding of a positive relationship between VA borrowing and proximity to DoD installations is robust to alternative specifications and cannot be explained away by the share of the population that is eligible to participate, the relative economic status of veterans to nonveterans, area house prices, or the level of demand for general low downpayment lending in the area (as evidenced by FHA borrowing). The robustness of these results provides strong support for the hypothesis that institutions matter and help influence VA lending patterns. More research is necessary to explore the mechanisms.

Our analysis is limited by the type of data available on facilities and veterans. For example, we are constrained by the scale we have chosen. Choosing the county as the unit of analysis enables the creation of a panel dataset but limits us because distances from the county center to the nearest VA facility and major DoD installation are an imperfect measure of accessibility for individuals. Another limitation is the available data on veterans themselves. Using the ACS data does not allow us to identify the actual eligible population. As a result, we use a proxy measure: the U.S. Census Bureau's count of all active servicemembers and veterans aged 18–64. The fact that most military servicemembers do not use the VA home loan program until after service increases our confidence in using this proxy measure.

While we recognize these data limitations, we have no reason to suspect that they lead us to systematically over- or under-estimate distances or numbers of veterans. Measurement error, however, can lead us to estimate less precise effects, which are also biased toward zero. In other words, this measurement error could bias us against finding significant results. Finally, we caution that the 1-year ACS and Zillow data are available for only certain counties, so our findings may not be generalizable outside of our sample, particularly low-density areas.

Some important questions are whether there are differences in lender supply between areas with and without major DoD installations, and whether these differences pose potential risks to communities. For example, Kim et al. (2018) explain that nonbanks are largely reliant on warehouse lines of credit provided by large banks and are not capitalized to the extent of depository institutions, which makes them more susceptible to failure in the event of another economic downturn. This is particularly true since nonbanks have greater FHA exposure, which the authors explain carries greater financial risk than originating and servicing other types of loans. Areas with greater VA exposure, such as areas near bases, may be more reliant on nonbanks and may be more sensitive to possible future failure of some of these less capitalized institutions.

We find that *within* the VA market, lending patterns are similar, on average, in these two types of counties. In 2017, nonbanks originated 65 percent of the VA loans in the counties with major DoD installations and 65 percent of VA loans in counties without major DoD installations. The top seven lenders in terms of 2017 loan volume in counties with DoD installations were the same

[14] Full results are available from the authors upon request.

institutions that made up the top seven in non-DoD counties.[15] In DoD counties these firms made 33 percent of the loans originated that year, and in non-DoD counties they made 31 percent of the loans. The mean Herfindahl-Hirschman Index (HHI) value for VA lenders in DoD counties was 632, and the mean HHI in non-DoD counties was 652, indicating that both groups of counties have unconcentrated VA lending markets on average, which helps mitigate concerns about how the failure of a small number of VA lenders might affect communities near DoD installations.[16]

Conclusion

The VA program is a powerful tool for encouraging affordable, sustainable homeownership for veterans. The program allows buyers to purchase with no downpayment, and although higher loan-to-value loans are usually at greater risk of default, recent research from the CFPB finds that VA loans perform similarly to conventional mortgages held by military servicemembers, which require larger downpayments (Clarkberg and Lapid, 2019).

In recent years, the VA home loan guaranty program has grown both as a share of all mortgage originations and in the total number of originations. The growth of the program partly reflects the increasing appeal and availability of these loans relative to conventional mortgages. It remains to be seen if the program will continue to grow or stabilize if the housing market continues to improve and credit requirements loosen further. Fannie Mae and Freddie Mac have been offering loans with downpayments as low as 3 percent since late 2014, but most buyers using VA loans put zero down. The appeal of VA mortgages may be compromised if no-money-down loans return in large numbers to the conventional mortgage market.

We find that use of the program has been strongest in areas near major military installations and VA lending as a share of all mortgages has increased faster in places where a higher share of the population are veterans or active-duty military. Many of these counties had disproportionately low VA utilization at the peak of the housing market, when eligible borrowers were presumably using alternative forms of low downpayment lending. The strong positive association between VA lending and military installations—but not VA facilities—suggests that there is something unique about housing markets around bases. More research is needed to understand why this is. One possibility is that lenders, real estate brokers, and buyers and sellers are more willing around military installations than in other areas to engage in the process of financing a home purchase with a VA loan, which can be perceived as more burdensome because it requires specialized appraisals and inspections. This could be due to greater familiarity with the program or a desire to assist veterans and members of the military community.

Stakeholders who wish to increase veterans' access to homeownership may want to look to VA and military institutions to help provide outreach to veterans, lenders, and real estate brokers.

[15] Each HMDA respondent is treated as a separate lender in this analysis. The top three lenders in both counties (in identical order) were Mortgage Research Center, USAA Federal Savings Bank, and Navy Federal Credit Union. The remaining four lenders were Caliber Home Loans, Wells Fargo, Quicken, and Fairway Independent Mortgage Corporation.

[16] Importantly, the upper tail of the HHI distribution is thin: fewer than a dozen counties in our sample have HHIs in excess of 1500, and just four of these counties have military installations. The U.S. Department of Justice considers HHI values of 1500–2500 to be "moderately concentrated" (U.S. Department of Justice, 2018).

The assistance provided by the VA home loan guaranty is effective at lowering the cost of homeownership, and, arguably, it is in areas with high housing costs that assistance is most needed. In tight housing markets, where sellers often have multiple offers, the added administrative burden of the program may be enough to discourage its use. Moreover, survey evidence has documented that many veterans are simply unaware that the program exists.

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References

Altschuler, Glenn, and Stuart Blumin. 2009. *The GI Bill: The New Deal for Veterans*. New York: Oxford University Press.

Ambrose, Brent W., Anthony Pennington-Cross, and Anthony M. Yezer. 2002. "Credit Rationing in the U.S. Mortgage Market: Evidence from Variation in FHA Market Shares," *Journal of Urban Economics* 51 (2): 272–294.

Angrist, Joshua D., Stacey Chen, and Jae Song. 2011. "Long-Term Consequences of Vietnam-Era Conscription: New Estimates Using Social Security Data," *American Economic Review* 101 (3): 334–38.

Arnold, Althea, Megan Bolton, and Sheila Crowley. 2013. "Housing Instability Among Our Nation's Veterans." Washington, D.C.: National Low Income Housing Coalition.

Bennett, Michael J. 1996. *When Dreams Came True: The GI Bill and the Making of Modern America*. Washington, D.C.: Brassey's.

Card, David. 1993. Using Geographic Variation in College Proximity to Estimate the Return to Schooling. NBER Working Paper 4483. Cambridge, MA: National Bureau of Economic Research.

Clarkberg, Jasper, and Patrick Lapid. 2019. "Mortgages to First-time Homebuying Servicemembers." Washington, D.C.: Consumer Financial Protection Bureau. https://files.consumerfinance.gov/f/documents/cfpb_consumer-credit-trends_first-time-homebuying-servicemember-mortgages_022019.pdf.

Conley, Dalton, and Jennifer Heerwig. 2011. "The War at Home: Effects of Vietnam-Era Military Service on Postwar Household Stability," *American Economic Review* 101 (3): 350–54.

Duca, John V., and Stuart S. Rosenthal. 1991. "An Empirical Test of Credit Rationing in the Mortgage Market," *Journal of Urban Economics* 29 (2): 218–234.

Fetter, Daniel K. 2013. "How Do Mortgage Subsidies Affect Home Ownership? Evidence from the Mid-Century GI Bills," *American Economic Journal: Economic Policy* 5 (2): 111–147.

Fischer, Mary J., and Jacob S. Rugh. 2018. "Military Veterans and Neighborhood Racial Integration: VA Mortgage Lending Across Three Eras," *Population Research and Policy Review* 37 (4): 569–589.

Frydl, Kathleen. 2009. *The GI Bill*. New York: Cambridge University Press.

Goodman, Laurie. 2017. "Quantifying the Tightness of Mortgage Credit and Assessing Policy Actions." Washington, D.C.: Urban Institute. http://www.urban.org/sites/default/files/publication/88826/quantifying_tightness_of_credit.pdf.

Goodman, Laurie, Ellen Seidman, and Jun Zhu. 2014. "VA Loans Outperform FHA Loans. Why? And What Can We Learn?" Washington, D.C.: Urban Institute. http://www.urban.org/research/publication/va-loans-outperform-fha-loans-why-and-what-can-we-learn.

Hanson, Devlin, and Tyler Woods. 2016. "The State of Post-9/11 Veteran Families." Washington, D.C.: Urban Institute. https://www.urban.org/sites/default/files/publication/85986/the_state_of_post-911_veteran_families_final_last_11_21_2016.pdf.

Humes, Edward. 2006. *Over Here: How the GI Bill Transformed the American Dream*. Orlando, FL: Harcourt.

Immergluck, Dan. 2011. "From Minor to Major Player: The Geography of FHA Lending during the US Mortgage Crisis," *Journal of Urban Affairs* 33 (1): 1–20.

Kim, You Suk, Steven M. Laufer, Karen Pence, Richard Stanton, and Nancy Wallace. 2018. "Liquidity Crises in the Mortgage Market." Federal Reserve Board of Governor Finance and Economics Discussion Series 2018-016. https://doi.org/10.17016/FEDS.2018.016r1.

Matsaganis, Matthew D. 2008. *Rediscovering the Communication Engine of Neighborhood Effects: How the Interaction of Residents and Community Institutions Impacts Health Literacy and How It Can Be Leveraged to Improve Health Care Access*. ProQuest.

Meadows, Sarah O., Laura L. Miller, Jeremy N.V. Miles, Gabriella C. Gonzalez, and Brandon T. Dues. 2013. "Exploring the Association Between Military Base Neighborhood Characteristics and Soldiers' and Airmen's Outcomes," *Rand Health Quarterly* 3 (1).

Mettler, Suzanne. 2005. *Soldiers to Citizens: The GI Bill and the Making of the Greatest Generation*. New York: Oxford University Press.

Mikhed, Vyacheslav, and Barry Scholnick. 2014. Financial Benefits, Travel Costs, and Bankruptcy. Working Paper, No. 14-18. Philadelphia, PA: Federal Reserve Bank of Philadelphia. https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2014/wp14-18.pdf.

Passmore, Wayne and Shane M. Sherlund. 2018. "The FHA and the GSEs as Countercyclical Tools in the Mortgage Markets," *Federal Reserve Bank of New York Economic Policy Review* 24 (3): 28–40.

Peterson, Ruth D., Lauren J. Krivo, and Mark A. Harris. 2000. "Disadvantage and Neighborhood Violent Crime: Do Local Institutions Matter?" *Journal of Research in Crime and Delinquency* 37 (1): 31–63.

Quigley, John M. 2006. "Federal Credit and Insurance Programs: Housing," *Federal Reserve Bank of St. Louis Review* 88 (4): 281–309.

Retsinas, Nicolas P. and Belsky, Eric S. 2002. *Low-Income Homeownership: Examining the Unexamined Goal*. Washington, D.C.: Brookings Institution Press.

Sampson, Robert J., Jeffrey D. Morenoff, and Thomas Gannon-Rowley. 2002. "Assessing 'Neighborhood Effects': Social Processes and New Directions in Research," *Annual Review of Sociology* 28 (1): 443–478.

Singer, Judith D., and John B. Willett. 2003. Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence. New York: Oxford University Press.

U.S. Department of Justice. 2018. "Herfindahl-Hirschman Index." https://www.justice.gov/atr/herfindahl-hirschman-index.

U.S. Department of Veterans Affairs (VA). 2018. "Veterans Benefits Administration Annual Benefits Report, Fiscal Year 2017." https://www.benefits.va.gov/REPORTS/abr/docs/2017_abr.pdf.

Vick, Brandon, and Gabrielle Fontanella. 2017. "Gender, Race & the Veteran Wage Gap," *Social Science Research* 61: 11–28.

Vigdor, Jacob L. 2006. "Liquidity Constraints and Housing Prices: Theory and Evidence from the VA Mortgage Program," *Journal of Public Economics* 90 (8): 1579–1600.

Westat. 2010. "National Survey of Veterans, Active Duty Service Members, Demobilized National Guard and Reserve Members, Family Members, and Surviving Spouses." Washington, D.C.: U.S. Department of Veterans Affairs. https://www.va.gov/vetdata/docs/SurveysAndStudies/NVSSurveyFinalWeightedReport.pdf.