National Insecurity?

Payday Loan Access and Military Personnel Performance and Retention*

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Abstract

Does borrowing at 400% APR do more harm than good? The Pentagon asserts that payday loans harm military readiness and successfully lobbied for a binding 36% APR cap on loans to military members and their families (effective October 1, 2007). But the existing evidence on how access to high-interest debt affects borrower behavior is inconclusive. We use within-state variation in state lending laws, and exogenous variation in the assignment of Air Force personnel to bases in different states, to estimate the effect of payday loan access on personnel performance outcomes. We find insignificant average effects of payday loan access on separation (attrition) from the Air Force; the upper bound is a 4% increase in separation. We also examine three metrics of job performance and readiness, and find some evidence of nontrivial negative effects on overall job performance and severe misbehavior. Heterogeneity seems to be important: we find some evidence that the effects that vary in intuitive ways with youth, experience, and financial sophistication, and in surprising ways with cognitive ability. We find no evidence of negative effects in fields where security clearance is critical. Overall, the results provide some ammunition for the Pentagon's position. The implications for social welfare are less clear-cut, but the increase in severe misbehavior following increased exposure to payday lending is suggestive of negative welfare effects.

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I. Introduction

Does borrowing at 400% APR do more harm than good? The Pentagon is convinced it knows the answer re: military performance. Following evidence that payday lenders target military markets (Graves and Peterson 2005), and internal studies showing high prevalence of borrowing and concomitant adverse effects on personnel stress levels and job attentiveness (Department of Defense 2006), the Pentagon successfully lobbied Congress for a binding federal cap on loans to military members ("servicemen") and their families (36% APR, effective October 1, 2007). In lobbying, the Pentagon argued that "predatory lending undermines military readiness, harms the morale of troops and their families, and adds to the cost of fielding an all volunteer fighting force" (Department of Defense 2006, p. 9). The President of the Navy Marine Corps Relief Society called payday lending in particular "the most serious single financial problem that we have encountered in [a] hundred years" (Center for Responsible Lending et al 2007).[1] Payday borrowing is viewed as particularly problematic given its high annualized cost (390% APR),[2] prevalence (e.g., an estimated 20-25% of military households borrowed in 2005),[3] and the high frequency of serial borrowing.[4]

Existing research offers little consensus on how high-interest loans affect borrowers. In theory, the effects can go either way. Neoclassical models predict that borrowers will be weakly better off on average (at least in expectation); otherwise they would not borrow. Some behavioral models can generate negative effects; e.g., if consumers have self-control problems (Skiba and Tobacman 2008b), systematically underestimate the costs of short-term debt (Stango and Zinman 2008), or are overly optimistic about future prospects. In practice empirical studies have found mixed evidence on whether high-interest borrowing helps or harms borrowers.[5]

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[1] The Navy Marine Corps Relief Society argues that "Marines who are preoccupied with their financial troubles are distracted from their main obligations".

[2] The standard payday loan contract is "$15 per $100" for a two-week loan, usually in the $100-$300 range), secured by a check post-dated to the date of the borrower's next paycheck deposit.

[3] The 20-25% prevalence estimates are from Stegman (2007) and Tanik (2005). Prevalence estimates that are based simply on self-reported surveys of potential borrowers (e.g., Brown and Cushman 2006) are much lower due to substantial underreporting of payday borrowing (Tanik 2005, footnote 19) and other high-interest borrowing (Zinman 2007; Karlan and Zinman forthcoming).

[4] Defense (2006) and Brown and Cushman (2006) find evidence of prevalent serial borrowing among servicemen.

[5] Morgan and Strain (2008) find that access reduces dunning and bounced checks, and increases bankruptcy, and Morse (2007) finds that access to payday loans helps communities smooth negative shocks. Melzer (2007) finds that access increases several measures of financial distress, and Skiba and Tobacman (2008a) find that payday borrowing increases bankruptcy. Karlan and Zinman (2008) find that access to a different subprime product—a 4-month installment loan at 200% APR— has overall positive effects on borrower economic and subjective well-being in South Africa. But Karlan and Zinman do find

Our work is the first attempt to identify the causal effects of payday loan access on servicemen. A key challenge is the likelihood that lenders (and borrowers) may locate strategically. So borrowing, or proximity to lenders, may be correlated with omitted variables that have independent effects on borrower well-being or productivity.[6]

We tackle endogeneity using two sources of quasi-experimental variation. One source is the extensive within-state variation in laws authorizing or prohibiting payday lending; this addresses the endogeneity of lender location decisions. The second source is the assignment of Air Force personnel to bases in different states based primarily on "the needs of the Air Force" (Powers 2008). Other researchers have shown that, conditional on occupation and experience a virtually identical assignment system used by the U.S. Army[7] is orthogonal to various sets of individual and location characteristics (Antecol and Cobb-Clark 2006; Lleras-Muney 2006).[8] Air Force personnel assignment rules (Air Force 2005a) thus help us address the endogeneity of borrower location decisions. More to the point, enforced mobility and the relatively self-contained nature of military life make it plausible that military job performance is uncorrelated with omitted variables— e.g., changes to welfare programs or labor market prospects-- that might be correlated with changes in state laws governing payday lending.

Our outcome variables are four measures of military job retention and performance for all enlisted members of the U.S. Air Force ("airmen"), stationed at all 67 domestic Air Force bases, in 35 states,[9] for the time periods 1996-2001 or 1996-2007 (depending on the outcome). Reenlistment eligibility is a useful summary measure of job performance because airmen are only eligible to reenlist if their job performance has been satisfactory. Reenlistment itself might be affected independent of the eligibility channel, if payday loan access changes outside options for airmen. And reenlistment is arguably the outcome of greatest interest to a military that has no lateral entry and must rely on current retention to fill future leadership positions (Asch and

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some evidence of increased stress levels; see Fernald, Hamad, Karlan, Ozer, and Zinman (2008) for more details.

[6] Previous studies estimating effects on civilian populations have addressed the endogeneity issue using a variety of experimental and quasi-experimental methods. Morgan and Strain (2008) use law changes in 3 states. Morse (2007) uses natural disasters (with a propensity-score matched control group) and lender prevalence. Melzer (2007) uses household distance to the nearest border of a payday-permitting state in a sample of low- and middle-income households from payday-prohibiting states. Skiba and Tobacman (2008b; 2008a) use a discontinuity in the approval criteria a single large lender. Karlan and Zinman (2008) use a field experiment that randomly assigned loans within a pool of marginal rejected applicants.

[7] Department of Defense (DoD) Directive 1315.7, "Military Personnel Assignments", provides guidelines for assignment of personnel for all branches of the military.

[8] We have relatively limited data on individual characteristics, but our Appendix Table 3 confirms that AFQT scores are not correlated in economically significant magnitudes with state payday lending regime.

[9] We count the District of Columbia as a state. See Carrell and West (2005) for a complete list of the Air Force bases and their locations.

Warner 2001). Our two other measures capture severe misbehavior and hence critically poor job readiness: forced enrollment into the Weight Management Program, and the presence of an Unfavorable Information File.[10]

We find weak evidence for adverse effects of payday loan access on separation from the military, and stronger evidence for adverse effects on job performance (reenlistment ineligibility and Unfavorable Information File). There is some evidence that heterogeneity is important along margins that accord with the Pentagon's priors: younger, less experienced, and less financially sophisticated airmen all seem to exhibit relatively adverse job performance when exposed to payday loans. More surprisingly, we find some evidence of more adverse effects in occupations with *higher* average cognitive ability as proxied by Armed Forces Qualifying Test (AFQT) score.

On balance, our results provide support for the Pentagon's concern that payday lending taxes military performance, readiness, and budgets. Our results are less definitive on whether payday lending imposes *social* costs. Negative impacts on job performance may not necessarily be welfare-decreasing if they result from airmen responding rationally to changes in their opportunity sets. But the fact that *severe* misbehavior seems to increase with exposure to payday lending is suggestive of negative welfare effects and merits further study.

The remainder of the paper proceeds as follows. Section II describes the payday loan product, market, and the prevalence of military borrowing. Section III describes state regulation of payday lending. Section IV describes the assignment of servicemen to bases in different locations. Section V describes our measures of job performance and separation from the Air Force. Section VI details our empirical strategy and identifying assumptions. Section VII presents our main results. Section VIII discusses some policy and welfare implications of these results. Section IX concludes.

II. Payday Lending and the Military

In a standard payday loan contract the lender advances the borrower \$100-\$300[11] in return for a check, dated to coincide with the borrower's next paycheck, in the amount of \$115-\$345. The market rate is about \$15 per \$100 advanced (390% APR for a 2-week loan), although fees as high

[10] Our four personnel outcomes are topical, given the military's concern about the effects of payday borrowing on military readiness. But they are only a subset of outcomes that might be affected by high-interest borrowing; e.g., we lack direct measures of financial condition or subjective well-being.

[11] Stegman (2007) estimates that 80% of payday loans are for \$300 or less, and we draw much of the information in this section from Stegman's overview of the industry. See also Caskey (1994).

as $30 per $100 are not uncommon.[12] Nearly all transactions are face-to-face in retail outlets, although internet lending is growing.[13]

The closest substitute for a payday loan is arguably overdraft protection on a bank account (Stegman 2007; Morgan and Strain 2008).[14] The other expensive loan products labeled "predatory" by the Pentagon and consumer advocates require collateral (pawn, auto title, subprime home equity) or a durable purchase (rent-to-own), or are available only once a year (tax refund anticipation).[15]

Most payday lenders are non-depository institutions. Many are check-cashers ("multi-line" lenders), but stand-alone ("mono-line") lenders are common as well. The industry's growth has been striking: from very few outlets in the early 1990s to an estimated 24,000 in 2006 (Stephens Inc. 2007). As others have noted, this means that there are now more payday lending outlets in the U.S. than McDonalds and Starbucks combined.[16]

Payday borrowing among servicemen has been prevalent. Stegman (2007) estimates that 20% of military households took a payday loan in 2005, and Tanik (2005) presents some data suggesting that annual prevalence may in fact be as high as 25%. Using data from various sources, we estimate that perhaps 19% of military households used payday loans in 2001 (Appendix Table 1). As the table illustrates, estimating prevalence in earlier years is hindered by data limitations.[17]

The prevalence of payday borrowing in the military can be explained by both demand- and supply-side factors (Graves and Peterson 2005; Department of Defense 2006; Stegman 2007). On the demand side, military families may be relatively prone to smooth consumption (due, e.g., to their youth, births, frequent moves, pay fluctuations from hazardous vs. non-hazardous

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[12] See Flannery and Samolyk (2005), DeYoung and Phillips (2006), and Skiba and Tobacman (2007) for evidence on competition, pricing, and profitability in the payday loan industry.

[13] Stephens Inc. (2007) estimates that Internet payday lending is growing at 40% annually and comprised 12% of total volume in 2006.

[14] Bouncing checks is quite costly due to legal ramifications, and negative effects on the credit score (CheckSys) banks use to screen applicants for a deposit account (Campbell, Martinez-Jerez and Tufano 2008). With overdraft protection a bank pays overdrawn checks rather than returning them. In exchange the bank charges the account holder a $20 to $30 fee. So in many cases getting a payday loan is cheaper than overdrawing the checking account (particularly if the account holder runs the risk of overdrawing multiple checks).

[15] The one exception is the relatively rare "military installment loan". Department of Defense (2006) reports that payday lending outlets outnumber military installment loan outlets by orders of magnitude.

[16] The McDonald's 2007 annual report shows U.S. 13,862 restaurants at year-end 2007. Horovitz (2006) reports that Starbucks had 7,950 U.S. stores during 2006; a graph in the 2006 Starbucks annual report (p. 16) suggests a comparable number.

[17] See Section VIII for a discussion of how time-varying borrowing prevalence might affect the interpretation of our results.

assignments), and relatively reliant on credit to smooth consumption (due, e.g., to limited labor market options for spouses, geographic isolation from family members). On the supply side, military borrowers are relatively attractive credit risks: they offer a steady paycheck (the primary requirement for obtaining a payday loan), and also may face pressure (both implicit and explicit) from their employer to repay. Military borrowers are also concentrated geographically, which allows lenders to efficiently amortize the fixed costs of outlet operations.

As noted at the outset, the Pentagon is concerned that payday borrowing creates financial distress among rank-and-file personnel. The Pentagon holds that this financial distress creates stress and other distractions that adversely affect job performance. Moreover, heavily indebted servicemen are viewed as security risks and are often stripped of their security clearances due to concerns of bribery and treason (Associated Press 2006). So serial payday borrowers may be ineligible for positions or assignments that require security clearance; indeed, there is anecdotal evidence of personnel taking on debt in order to avoid hazardous assignments that require security clearance.

III. State Laws Governing Payday Lending

State laws are an important determinant of access to payday loans. Many states have laws that effectively prohibit payday lending by imposing binding interest rate caps on payday loans or consumer loans more generally. Other states explicitly outlaw the practice of payday lending.[18] These laws prohibiting or discouraging payday lending are generally well-enforced, if not always perfectly enforced (King and Parrish 2007), and hence provide a good source of variation in availability of payday loans across states and time.[19] In contrast, many states have laws that

[18] We define a state as permitting payday lending if its laws do not prohibit the standard payday loan contract defined in Section II, for a loan of $100 of more. For most state-years classifying states this way is relatively straightforward. Our primary sources are the laws themselves (statutes, superseded statues, and session laws). We then consulted several secondary sources to confirm that our readings of the laws were sensible. Three particular issues involved in classifying a state-year as permitting or prohibiting bear mention. First, beginning in 2005 or 2006, five states that otherwise permitted payday lending banned lenders from locating in areas deemed off-limits by military commanders. We code these state-fiscal year cells as prohibiting. The second issue is that litigation resulting in court decisions affected the interpretation and enforcement of laws for several years in Alabama and Arkansas. We classify these state-fiscal years based on the interaction of laws and court decisions. The third issue is that two states have regulated particular contract terms in ways that may be binding but do not evidently restrict access. Oklahoma for several years imposed a minimum loan term of 60 days. Texas for several years allowed only $14 per $100 (a shade below the standard $15). Following Fox and Mierzwinski (2001) we code these Oklahoma years as prohibiting and the Texas years as permitting. Appendix Table 4 (Columns 3-6) shows that dropping the cells affected by these three issues does not substantively change the results.

[19] Publicly available time series data on lending outlets in all states is scarce, but Stephens Inc (2004; 2005; 2006; 2007) is an exception. Using this data our Appendix Table 2 shows the strong correlation between

restrict *serial* payday borrowing and/or lending, but only three states had the means to enforce these restrictions (a central database, most critically) during any part of our sample period.[20]

Table 1 summarizes the substantial amount of variation in payday lending laws for the 35 states covered in our samples. Column 1 describes the variation for our Reenlistment sample (for which we have outcomes data over October 1995-September 2001). Column 2 describes the variation for our Weight Management Program sample (for which we have outcomes data over October 1995-September 2004). Column 3 describes the variation for our Unfavorable Information File sample (for which we have outcomes data over October 1995-September 2007). Since we use within-state variation to help identify the causal effects of payday loan access, the most important count for our purposes is the number of law changes (from permitting to prohibiting or vice versa). For instance, 12 states made 13 changes during our Reenlistment sample period, and 17 states made 25 changes during our Unfavorable Information File sample period. The last row of the table shows that state laws permitted payday lending in more than 60% of the state-fiscal year cells represented in each of our samples.

IV. Military Assignments: An Exogenous Source of Variation in Location

The second source of variation we use to estimate the causal effects of payday loan access is the fact that Air Force personnel do not generally *choose* to live in a particular location. Rather, personnel are distributed across locations based on the overall manpower needs of the Air Force. The primary factor in selecting individuals for an assignment is the individual's "qualifications to fill a valid manpower requirement and perform productively in the position for which being considered."[21] Thus, individuals are assigned based on their occupation and experience. There are up to 428 enlisted occupations (Air Force Specialty Codes) in our dataset and the average domestic Air Force base has personnel in 163 of these occupations.[22] Frequent movement of personnel from location to location is necessary due to the rotational system of overseas

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state legal authorization and store outlets per capita in our cross-section of states. We do not include state fixed effects because there are only six law changes during this sample period (12/31/03-7/1/06), four of which might not have affected state-level store counts because they did not apply statewide: they only authorized military command to place payday outlets off-limits to servicemen. Other reports note rapid and widespread lender entry and exit following law changes (Fox 1999; Reisdorph 2005; Graves 2007).

[20] Appendix Table 4 (Column 7) shows that our main results do not change if we drop cells from state-years in which there was a database that might have helped prevent serial borrowing.

[21] The Air Force assigns personnel to locations without regard to race, age, gender, religion, national origin, spouse's employment, etc. Co-location issues are considered for married couples who are both in the military but these assignments are also based on job qualifications and not location preferences.

[22] This statistic is from our separation and reenlistment sample, which categorizes occupation data at the five-digit alphanumeric level. Our UIF and WMP data have occupations collapsed at the three-digit level, and the average base has 108 of the 141 three-digit occupations represented.

assignments. This creates a situation where military personnel tend to move to a new location every two to four years.[23] Because the 67 domestic Air Force bases are spread out across 35 states this results in Air Force households moving frequently across state lines.[24]

Other studies have used military assignments as an exogenous source of variation in location. Lleras-Muney (2006) uses Army assignments to identify the effects of air pollutants on children's health. Angrist and Johnson (2000) and Lyle (2006) use Army assignments to identify the effects of parental absences (which are higher at certain bases for operational reasons) and household relocations on children's academic achievement, divorce rates, spousal employment, and children's disability rates. Antecol and Cobb-Clark (2006) use Army assignments to examine racial discrimination. These prior studies find that the location of assignment for Army personnel is largely uncorrelated with the demographic characteristics of the individual (Antecol and Cobb-Clark 2006) and uncorrelated with age, gender, education, number of dependents and a host of health variables (Lleras-Muney 2006). Lyle (2006) also showed that the Army largely assigns absences and relocations without regard to the academic achievement of military children.

Our grouped-level data lacks many demographic details, but we conduct a similar exogeneity test by regressing average Armed Forces Qualifying Test (AFQT) scores for Air Force personnel from 1996 through 2007 on a dummy variable for whether state laws permitted payday lending.[25] Appendix Table 3 reports the results for different samples based on experience (down rows) and specifications (across columns). Each cell reports the result on the variable that equals 1 if the state law permitted payday lending in that location-fiscal year. Because assignments are made based on manpower needs, we control for a full set of occupation by year fixed effects in all specifications. Columns (2)-(4) contain additional control variables, and Column (4) is our preferred specification for estimating the average treatment effects of payday loan access.

The results show no systematic correlation between personnel AFQT scores and payday lending access laws. Only 2 of the 16 coefficients on the payday law variable are statistically significant at the 5-percent level, and the point estimates are small in magnitude and of varying signs. For example, the positive coefficient in column (1) for career-term airmen indicates that

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[23] Once members with the required qualifications are identified to fill a position, other factors such as how long the individual has been at their current assignment, volunteer status, and individual preferences "may be considered to the extent these factors are consistent with operational manning requirements." Assignments "based solely on the fact a member can be used or prefers assignment elsewhere" are explicitly forbidden (Air Force 2005a).

[24] On average, personnel in each occupation are observed in 25 different states in our separation and reenlistment sample and in 29 different states in the UIF and WMP samples.

[25] As we discuss in Section V, our data are grouped at the occupation by location by year by term level. We lack the demographic information used for exogeneity tests in prior studies.

average AFQT scores are 0.84 percentile points higher at bases in states that authorize payday loans than at bases in states that do not authorize payday loans. This 1.4% increase (on a mean of 62; means for other sub-samples and variables are reported in Table 2) goes to zero when we add state or base effects (Columns 3 and 4).

V. Job Performance Measures

We use four different measures of retention and job performance as dependent variables. Table 2 contains summary statistics. Below we detail each of the four measures and then summarize how they might be affected by access to payday loans.

A. Background: Organization and Evaluation of Air Force Personnel

Enlisted personnel in the Air Force (a.k.a. "airmen") enlist under contracts for 4- to 6-year terms. After completing two enlistment terms an airmen becomes "career term". With few exceptions, airmen must enlist in the Air Force prior to age 27, but a vast majority (approximately 80% in 2006) enlists between the ages of 18 and 21. Those who serve multiple terms nearly always do so without interruption; consequently, term of enlistment is highly correlated with age, experience, and rank. For example, in 2000, 90% of first-term airmen were below the rank of E-5 and 80% were below the age of 25.

All airmen complete a six and a half-week Basic Military Training (BMT) at Lackland Air Force Base in San Antonio, Texas. After completing BMT they attend a technical training course that lasts between 4 and 52 weeks, depending on occupational specialty. Then airmen are assigned to their permanent duty location. For non-overseas[26] assignments, airmen typically remain at their first duty assignment for the remainder of their initial enlistment. Subsequent assignments generally occur every two to four years and are not necessarily concurrent with reenlistment.

Supervisors continuously evaluate each airman's job performance. At a minimum, each airman receives an annual enlisted performance report (EPR). We do not have access to these reports, but observe a summary measure of performance (reenlistment eligibility), and two measures of extremely bad performance/behavior: the presence of an Unfavorable Information File, and forced enrollment into the Weight Management Program.

[26] According to our data, 75-percent of enlisted personnel are in non-overseas assignments.

B. Reenlistment or Separation

Conditional on satisfactory job performance (detailed below), reenlistment is a voluntary decision made by active enlisted members of the military at the end of their term.[27]

We use separation (unconditional on eligibility) as our primary outcome variable. Separation rates are critical because lateral entry is rare in the US Armed Services. Accordingly, retention is the only way to ensure that qualified personnel are available to fill future leadership positions. As the Deputy Chief of Staff for Air Force Personnel stated: "It takes eight years to replace the experience lost when an 8 year noncommissioned officer (NCO) leaves the Air Force."[28] The Pentagon has taken several steps in recent years to prevent separation, including changes to the compensation system.[29]

The available data on separation (and reenlistment ineligibility) is *grouped* by five-digit occupation (Air Force Specialty Code),[30] location (i.e., the base), fiscal year, and term of enlistment (first, second, career).[31] These groupings are based more on reporting considerations than actual functional/operational groups. The data provides the total number of airmen in each group who ended their term in that fiscal year (average of 5.03 per group), the number who were eligible to reenlist (average of 3.67 per group, see below for more details), and the number who reenlisted (average of 1.92 per group). In total, our separation and reenlistment eligibility data encompasses 428 different occupations, across the 67 domestic Air Force bases in 35 different states, from fiscal years 1996 through 2001. This gives us 26,255 first-term, 23,061 second-term, and 40,106 career-term occupation-base-year groups.

Of the 376,000 individual-year observations we disaggregate from this data, we find that 48% separate. Separation declines with term, from 62% at the end of the first term to 39% at the end of a career term. This pattern is due largely to the military retirement system that vests after twenty years of service.

C. Reenlistment Ineligibility

Reenlistment eligibility depends on satisfactory job performance and readiness. Air Force

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[27] Airmen are occasionally "administratively" discharged mid-term, usually for medical reasons or extremely poor performance/behavior.

[28] Lt. Gen. Donald L. Peterson, quoted in Parr (2001, p.1).

[29] Economists have long pointed out that the military pay table does not adequately distinguish between occupational subgroups within the services (Rosen 1992; Asch 1993; Asch and Warner 2001). The Pentagon has implemented occupation-specific bonuses and special payments to combat this problem.

[30] Five-digit is the finest level of disaggregation for AFSCs. Digits in the AFSC correspond to career category, career group, career field, skill level, and career field subdivision.

[31] Reenlistment eligibility and separation data is maintained by the Headquarters Air Force Personnel, Retention Status Reports (R-STATUS).

members are automatically ineligible to reenlist if they engage in specific types of bad behavior including: 1) Five or more days absent without leave (AWOL); 2) Serving suspended punishment pursuant to Article 15, Uniform Code of Military Justice (UCMJ); 3) Serving on the Control Roster (probation)[32]; or, 4) Convicted by civil authorities (Air Force 2001). Beyond this minimum eligibility criteria, unit commanders are also instructed "to ensure the Air Force retains only airmen who consistently demonstrate the capability and willingness to maintain high professional standards" (Air Force 2001). Therefore, 3- to 12-months before the end of each enlistment term the unit commander decides whether an airman is "selected" eligible to reenlist.[33] The Selective Reenlistment Program (SRP) instructs commanders to consider: 1) enlisted performance report (EPR) ratings, 2) unfavorable information from any substantiated source, 3) the airman's willingness to comply with AF standards, and 4) the airman's ability to meet required training and duty performance levels.

We measure reenlistment ineligibility from the same grouped data used to measure separation and described in the sub-section directly above. In our sample 28 percent of airmen were ineligible to reenlist at the end of their reenlistment contract. Unlike separation, which is highest for first-term airmen and declines with term, reenlistment ineligibility is u-shaped in term. First-term airmen are much more likely to be ineligible than second-term airmen (27% vs. 16%), most likely because the first term is used to weed out poor performers. But then career-term airmen have the highest ineligibility rates (34 percent) because of mandatory retirement at age 55 and up-or-out policies regarding promotions (Air Force 2001).[34]

D. Unfavorable Information File (UIF)

An Unfavorable Information File (UIF) is an "official repository of substantiated derogatory data concerning an Air Force member's personal conduct and duty performance" (Gittins and Davies 1996). Mandatory entries in a UIF include records of: 1) Nonjudicial punishment suspensions greater than one month; 2) Civilian court convictions; and, 3) Court martial convictions. Additionally, commanders have the discretion to place other documented misbehavior in an UIF including: letters of reprimand, confirmed incidents of sexual harassment, and less severe civilian

[32] According to Air Force (2005b) Section 2.1, "The control roster is a rehabilitative tool for commanders to use. Commanders use the control roster to set up a 6-month observation period for individuals whose duty performance is substandard or who fail to meet or maintain Air Force standards of conduct, bearing, and integrity, on or off duty."

[33] The unit commander typically is the Squadron Commander at the location of assignment.

[34] E.g., to be eligible for reenlistment after 10 years of active service an airman must have achieved the rank of E-6, technical sergeant, or higher.

court convictions and non-judicial punishment. Thus an airmen with an UIF has been sanctioned for severe misbehavior and is presumed to have unusually poor job performance and/or readiness (Gittins and Davies 1996; Air Force 2005b).

We obtained grouped UIF records by three-digit occupation, base, fiscal year, and term of enlistment for fiscal years 1996 through 2007.[35] The data specify the total number of airmen in the group and the number with a UIF. We have data for different 141 occupations and 141,434 occupation-base-year-term cells.

Of the 2.4 million individual-year observations we disaggregate from this data, 3.6% have a UIF. UIFs decrease in term, with first-term airmen at 6.1% and career-term at 1.6%.

E. Weight Management Program (WMP)

Air Force policy states that being physically fit is necessary for both military readiness and presenting a professional military image (Air Force 1994). Airmen who are identified as overweight are required to take corrective action. Until 2004 this entailed enrollment in the Weight Management Program (WMP).[36]

We obtained grouped WMP records by three-digit occupation, base, fiscal year, and term of enlistment for fiscal years 1996 through 2004.[37] The data specify total number of airmen in the group and the number with enrolled in the WMP. We have data on 139 occupations and 103,776 occupation-base-year-term cells.

Of the 1.8 million individual-year observations we disaggregate from this data, 2.2% are in the WMP. Second-term airmen are most likely (3.3 percent) and first-term least likely (1.8 percent).

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[35] Data obtained from the Headquarters Air Force Personnel, Interactive Demographic Analysis System (IDEAS) and unavailable for FY 2003.

[36] The WMP included exercise and monitoring of physical condition. Entry into the WMP was based on body-fat standards by age and gender: 20 percent for men 29 years old and younger; 24 percent for men 30 years old and older; 28 percent for women 29 years old and younger; and, 32 percent for women 30 years old and older. Individuals were measured for body fat percentage if they exceeded the prescribed weight for their height and gender; e.g., a six-foot tall male would be measured for body fat if his weight exceeded 200 pounds. The WMP was discontinued after 2004 and replaced with a fitness test that includes a 1.5-mile run, sit-ups, push-ups, and a waist measurement. Individuals who fail the fitness test are placed on a mandatory exercise program. Data were not available on fitness scores or the new program.

[37] WMP data obtained from the Headquarters Air Force Personnel, Interactive Demographic Analysis System (IDEAS) and unavailable for FY 2003.

F. Payday Borrowing, Performance, and Retention

As noted at the outset, the Pentagon asserts that payday borrowing impairs readiness and job performance by distracting airmen from their duties. There are at least two potential channels for such distractions. The one cited by the Pentagon is that payday borrowing causes financial distress and related distractions. Another possibility is that payday loan access increases the opportunity set for some households; e.g., by permitting liquidity constrained households to invest in side ventures, a spousal job, etc. A larger opportunity set makes separation from the military a more viable option and might induce a lower level of effort and job performance.

VI. Data and Methodology

We estimate the causal effect of payday lending access on our separation and job performance outcomes by disaggregating the grouped data and estimating the following model using ordinary least squares (OLS):[38]

$$[1] \quad \Pr(Outcome_{ijbt}) = \beta_0 + \beta_1 Payday_{st} + X_{jbt}\beta_2 + \gamma_b + \phi_{jt} + \varepsilon_s$$

where the probability of the personnel outcome (*Outcome*) of individual *i*, in occupation *j*, base *b (*located in county *c* and state *s)*, in fiscal year *t* is a function of whether payday lending is permitted (*Payday=1*) in the state of assignment *s*. The vector *X* includes group characteristics (AFQT scores and mean wage income)[39] and a time-varying location characteristic (fair market rent).[40] γ is a base fixed effect that controls for any time-invariant level differences across bases that might be correlated with payday lending laws. Since airmen are assigned conditional on the manpower needs of the Air Force in a given year, we also condition on ϕ_{jt} , the full set of occupation-year fixed effects. We cluster our standard errors at the state level to correct for

[38] Because our data are aggregated to occupation-location-year cells, as a robustness check we also estimate the model using weighted least squares with the grouped logistic transformation of the dependent variable suggested by Cox (1970). Specifically, the dependent variable is computed as follows: log (p + 1/2n) - log (1 - p + 1/2n), where p represents the proportion of individuals in the occupation-base-year cell who stay in the Air Force and n is the cell size. Results are qualitatively similar using this estimator.

[39] We include the group's mean AFQT, and the proportion below the 31st percentile (an Air Force cutoff). Although exact income is not known for each individual, the military pay system makes imputation straightforward because income varies formulaically by rank, years of service, location, and in some cases occupation: see Carrell (2007) for details.

[40] We use fair market rent for 2-bedroom apartments as published annually by the US Department of Housing and Urban Development. We use the fair market rent for the base's MSA, or for the base's county if it is not part of an MSA.

potential serial error correlation at our unit of "treatment" (i.e., of variation in payday loan access): within states across years (Bertrand, Duflo and Mullainathan 2004).

Thus we use within-state variation in payday lending laws to estimate the causal effects of state laws permitting (or prohibiting) payday lending. As discussed in Section III it appears that (changes in) state laws do have very large effects (of perhaps 100%) on the penetration and hence availability of payday loan outlets. And as discussed in Section IV the exogenous variation in airman location (conditional on occupation-year) makes it unlikely that the error term contains omitted trends in the outcome that are correlated with changes in payday lending law.

Our estimates of the law effects—and hence the effects of payday loan access-- are reduced-form because we lack any data on borrowing, and we lack comprehensive data on lending locations. Hence knowing the prevalence of payday borrowing is key to interpreting the results. As discussed in Section II it seems likely that 15-25% of military households used payday loans annually throughout most of our sample. But it is possible that prevalence was substantially lower during the first few years of our sample, and we explore the implications of this in Section VIII.

Pentagon priors that young, inexperienced, relatively poor, and financially unsophisticated airman are particularly likely to exhibit negative effects from payday borrowing motivate estimating [1] on particular sub-samples as well as on the entire population of enlisted airmen. Below we report results by term of enlistment, occupation subgroups, and AFQT scores.

VII. Results

We begin by establishing the results obtained from estimating equation [1] for our four different job retention and performance measures. We then discuss how to map these estimates into magnitudes of interest for welfare and policy analysis in Section VIII.

A. Effects on Separation: Control Variable Specifications

Table 3 presents a full set of results for different specifications of equation [1] with separation from the Air Force as the outcome variable. As discussed in Section V, separation is quite costly from the Pentagon's perspective and hence arguably the most important outcome among the four we can measure.

We start in specification (1) with no control variables. Subsequent columns then add combinations of the control variables we discussed in Section VI: fixed effects (starting with occupation-year), time-varying group characteristics, and fair market rent. Specifications (4) and (5) also include several location characteristics circa 2000 (price levels, per capita income, population, percent of population in the Air Force, and other demographics). These variables drop

out in specifications (6) and (7) as we add state or base fixed effects. So specifications (1)-(5) estimate the effect of payday loan access using cross-section variation in state laws, and specifications (6) and (7) use within-state variation over time. As discussed in Section VI, specification (7), with base fixed effects, is our preferred specification.

Regardless of specification the point estimates imply that payday loan access is associated with a small increase in separation. The largest coefficients come from the specifications relying on cross-sectional law variation and imply that payday lending-access causes a 3% increase separation from the Air Force. We do not find a significant effect in our preferred specification (7). The point estimate of 0.0082, has a p-value of 0.13, and implies payday lending causes a 1.7% increase in separation. The upper bound of the 95% confidence interval is a 1.9 percentage point (3.9%) increase in separation. Reading down column (7), the point estimates imply percent changes that are quite similar across terms.

B. Effects on Job Performance Outcomes

Table 4 presents results from our preferred specification (with occupation-year and base fixed effects) for our other job performance outcomes: reenlistment ineligibility, unfavorable information file (UIF) status, and weight management program (WMP) status. Column (1) reproduces the comparable result on separation (from Table 3, Column 7) for reference.

The results for reenlistment ineligibility suggest that payday loan access causes nontrivial declines in job performance/readiness. The full sample point estimate implies a 0.95-percentage point (3.4%) increase in ineligibility and has a p-value of 0.07. The point estimate is largest for first-term airmen (this is again marginally significant, with a p-value of 0.09), and implies a much larger proportional increase (6.2%) than the point estimate for career term (1.3%).

Column (3) shows that the likelihood of an Unfavorable Information File (UIF) increases following the adoption of state laws permitting payday lending. The 0.21 percentage point implies that 5,100 (5.6%) more airmen were sanctioned for extremely poor readiness with a UIF. The point estimate is again significant for first-term airmen only (p-value of 0.06), and the point estimate on career term implies an effect that is smaller both absolutely (3,200 v. 500 airmen) and proportionally (5.7% v. 3.1%).

Column (4) shows no significant effects on enrollment in the Weight Management Program (WMP). But the results do not rule out nontrivial proportional effects in either direction; e.g., the full sample point estimate implies a 6.4 percent increase, with a lower bound of -5.9% and an upper bound of 18.2%.

C. Results for Different Occupations

Table 5 presents results for different occupation (i.e., career field) sub-groups. The motivation for these subsamples is Pentagon priors on heterogeneous treatment effects.

Panel A explores the Pentagon prior that the effects of payday loan access will be more adverse for airmen lacking in financial sophistication. Here we presume that airmen working in financial management and acquisition (i.e., contracting/procurement) are relatively sophisticated financially, and compare the estimated effects in this sub-sample to those found in the sub-sample comprised of all other (presumably less financially sophisticated) occupations. Despite a lack of power due to the small sample of airmen in finance/acquisition occupations, it seems fair to say that the Pentagon's prior finds some support on the separation and reenlistment ineligibility margins. The coefficients are *negative* (implying *declines* in separation and ineligibility) in the finance/acquisition subsample, and positive (as we found in the full sample) in the relatively unsophisticated occupations. In contrast the estimated treatment effects on severe misbehavior (UIF and WMP) are similar across the two sub-samples.

Panel B uses cognitive ability as a proxy for financial sophistication and compares estimated treatment effects for occupations in the top and bottom 25 percentiles of AFQT scores. We again find some evidence of heterogeneity on the separation and reenlistment ineligibility margins, but the results push against the Pentagon's priors (assuming that cognitive ability is a good proxy for financial sophistication, which is debatable).[41] Here the treatment effects are more adverse (greater increases in separation and ineligibility) in the *high* AFQT occupations. This pattern holds for the Weight Management Program as well. The point estimates are identical for Unfavorable Information File, but again this implies a larger adverse treatment effect (proportionally) for the high AFQT occupations because they have a substantially lower mean rate of UIF (2.6%, vs. 4.2% in the low AFQT occupations).

Panel C explores whether payday loan access has different effects on airmen in occupations requiring high security clearances (proxied by military intelligence career fields). The motivation here is Pentagon findings that a very high proportion of security clearance denials are due to financial difficulties. So adverse treatment effects in occupations where security clearance is relatively important might be particularly costly. Moreover if airmen in these fields sought to avoid hazardous duty (requiring high security clearance) by taking on payday loans, one might expect to find relatively large adverse treatment effects. But we do not find evidence of a

[41] We are not aware of any direct evidence on this question. Another interpretation is that there is other heterogeneity across occupations that is correlated with AFQT score (and financial sophistication) which drives these results.

significant effect on any of our outcomes in the high security clearance sub-sample (although our estimates are imprecise). In fact the point estimates on separation and reenlistment ineligibility are negative, in contrast to those for the other occupations.

VIII. Discussion

We now discuss some implications of our results for policy and welfare analysis.

One issue is whether our treatment effects capture the most relevant policy margin at this juncture. The new federal cap on loans to military households (36% APR) may have different effects than the state laws we use.[42] But state-level regulation continues to be a relevant margin, as evidenced by recent binding restrictions enacted in Ohio, Oregon, and Virginia.[43]

A related issue is external validity to other populations. We are not aware of any reason for concern that our results do not apply to other branches of the military. Whether our results apply to civilians is very much an open question. It stands to reason that service members might well have different preferences, risks, and endowments than civilians. Service members also tend to face greater scrutiny of their financial affairs (from superiors), and in recent years the military implemented mandatory financial education and other treatments that are specifically designed to promote financial soundness and discourage expensive borrowing (Department of Defense 2006). Some civilians have access to such resources but they are rarely required to avail them. Outside options might vary as well; this is critical because even "behavioral" borrowers may be better off borrowing at 400% APR if they have less-regulated outside options that are even worse (e.g., loan sharks).

Another issue is external validity with respect to the time period. If payday borrowing was less prevalent among servicemen during the early part of our sample period (as is entirely possible), then our estimates may understate the contemporary average effect of payday loan access. We explore this possibility by re-estimating our main specification after dropping the first three years of our sample (October 1995-September 1998). The results are reported in Appendix Table 4, column (2) and do not show any significant differences from our full sample results (reproduced in column 1). But the coefficients suggest that if anything the effects of payday loan

[42] The federal law has applies broadly to all loan products, and may also have differential enforcement (time will tell whether it is enforced more or less effectively than state laws).
[43] For details see http://www.ncsl.org/programs/banking/PaydayLend_2008.htm and http://www.ncsl.org/programs/banking/PaydayLend_2007.htm .

access on separation and ineligibility were less adverse during more recent years. This could be due to the development of the monitoring and education interventions described above.

Overall our results indicate why the Pentagon might have fairly concluded that banning payday lending is privately optimal; i.e.., that borrowing at 400% APR does more harm than good *to the military*. First, although we do not find robust evidence that payday loan access increases separation from the military, the results are suggestive in that the point estimates are positive for all terms and for 4 out of 6 occupation groupings. A thought exercise illustrates why the budget implications of even a small increase in separation might lead the Pentagon to err on the side of restricting payday borrowing. Assume that the point estimate for our full sample (0.0082, with a p-value of 0.13) is the true separation effect wrought by payday loan access, and that the Pentagon wishes to counteract this effect. The literature on military separation elasticities with respect to wages implies that this 1.7% increase in separation could likely be offset[44] with a pay increase of roughly 1%.[45] This would cost the Pentagon $1.1 billion if applied to all servicemen.[46] Second, our results suggest that payday loan access does impair job performance, and sometimes severely. Third, while the average treatment effects on performance (and perhaps separation) might be small (if nontrivial), the fact that only about 20% of servicemen use payday loans in a given year imply larger treatment-on-the-treated effects (and/or large spillovers).[47] This suggests that many servicemen experience a severe decline in performance/readiness as a result of payday borrowing; these severe adverse effects may be disproportionately costly to productivity and readiness. Finally, our results offer some support for Pentagon priors that payday loan access affects job performance relatively adversely for younger, less experienced, and less financially sophisticated airmen.

In contrast, our results only begin to shed light on the question of whether borrowing at 400% APR does more *social* harm than good. The fact that we find fairly strong evidence of increases in severe misbehavior (as indicated by an Unfavorable Information File) in the presence of payday lending suggests that expensive borrowing creates low-prevalence but high-impact social

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[44] Note that the marginal airmen might be different for each treatment; i.e., the airmen retained by the pay increase would not necessarily be the airmen who separate due to payday loan access.

[45] Studies have found that a 1-percent increase in military pay generally results in a 1 to 2-percent increase in retention. Warner and Goldberg (1984), Hosek and Peterson (1985), Saving, et al. (1985), Smith et al. (1991), Daula and Moffitt (1995), and Asch and Warner (2001) estimate the first-term military pay elasticity of retention to be 1.0-2.0, 3.5, 4.4, 1.3, and 2.14, respectively.

[46] Figure based on FY07 DoD military personnel budget of $110.4 billion. Some targeting may be feasible, but note that the Pentagon paid $789 million in reenlistment bonuses alone in fiscal year 2002.

[47] Large treatment-on-the-treated effects on individuals are common in the existing literature; see, e.g., Melzer (2007) for large negative effects, and Karlan and Zinman (2008) for large positive effects.

costs. This certainly merits further study. But there may be offsetting benefits that are missed by our limited set of outcome measures. As noted at the outset, increases in separation or reenlistment ineligibility may be *good* outcomes from the perspective of airmen (and society) if treatment effects are driven by changes in outside options that make it optimal for airmen to reduce effort on-the-job. Richer data on outcomes and baseline characteristics (including outside borrowing options) will be needed to map treatment effects into well-specified models of consumer choice and welfare analysis.

IX. Conclusion

We estimate the effects of payday loan access on military readiness and performance using Air Force personnel data, within-state variation in state lending laws, and exogenous variation in the assignment of personnel to bases in different states.

Overall the results provide ammunition for the Pentagon's concern that payday borrowing has adverse effects on military readiness and budgets. Although we find insignificant average effects of payday loan access on separation (attrition) from the Air Force; the full sample point estimate implies a 1.7% increase and has a p-value of 0.13. We do find evidence of nontrivial negative effects on overall job performance (i.e., of increases in reenlistment ineligibility) and severe misbehavior (i.e., of increases in the presence of an Unfavorable Information File). Heterogeneity seems to be important along some margins that accord with Pentagon priors: we find some evidence that performance effects are more adverse for first-term airmen, and for airmen in occupations with relatively low financial sophistication. More surprisingly, we find some evidence that adverse effects on separation and performance are stronger in occupations with *higher* average AFQT scores. We find no evidence of negative effects in occupations where security clearance is critical (military intelligence fields).

The social welfare implications of our results are less clear. Performance declines may be optimal for airmen (and society) if they are a rational response to changes in opportunity sets brought about by payday loan access. The fact that we find increases in severe misbehavior following increased exposure to payday loans casts some doubt on that channel, since it seems

unlikely that the marginal effort needed to maintain adequate readiness and performance is more costly than a discharge for poor performance.[48]

In any case, more work will be needed to identify the causal effects and welfare implications of access to expensive credit. In particular our results highlight the value of baseline data (e.g., on outside options), borrowing data, richer outcome data (e.g., on financial condition and subjective well-being) and (targeted) treatments that vary at the individual level and thereby increase power.

[48] See http://www.tpub.com/content/advancement/14325/css/14325_487.htm for information on different types of discharges and some (anecdotal) evidence on their implications for veterans' benefits and civilian labor market options.

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Table 1. Summary Description of State Laws Prohibiting or Permitting Payday Lending

	Reenlistment sample	Weight Management Program sample	Unfavorable Information File sample
	(1)	(2)	(3)
time period	October 1995-September 2001	October 1995-September 2004*	October 1995-September 2007*
# of states	35	35	35
# of law changes	13	18	25
# changes from prohibit to permit	10	14	16
# changes from permit to prohibit	3	4	9
# of states with a law change	12	14	17
# of states with multiple law changes	1	4	7
# of state-fiscal year cells	210	280	385
proportion of state-fiscal year cells with payday lending permitted	0.62	0.63	0.69

Beginning in 2005 five states passed laws prohibiting lending to military personnel if a commanding officer declared the payday lending premises off-limits; we code these cells as prohibited and report results after dropping these cells in Appendix Table 4 Column (3).
Alabama and Arkansas are unusual due to litigation resulting in court decisions affecting the interpretation and enforcement of laws. We classify several state-year cells for Alabama and Arkansas based on the interaction of laws and court decisions interpreting those laws. We report results after dropping these cells in Appendix Table 4 Column (4).
* No Weight Management Program or Unfavorable Information File data available for October 2002-September 2003.
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Table 2. Summary Statistics for Outcome and Control Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Panel A. Retention and Performance Measures					
1= Separation	376,289	0.475	0.50	0	1
First-Term	128,251	0.620	0.49	0	1
Second-Term	70,684	0.426	0.49	0	1
Career-Term	177,354	0.391	0.49	0	1
Finance/Acquisition Occupations	7,424	0.423	0.49	0	1
Military Intelligence Occupations	12,863	0.496	0.50	0	1
Low AFQT Occupations	160,232	0.473	0.50	0	1
High AFQT Occupations	76,702	0.499	0.50	0	1
1=Reenlistment Ineligibility	376,289	0.282	0.45	0	1
First-Term	128,251	0.271	0.44	0	1
Second-Term	70,684	0.161	0.37	0	1
Career-Term	177,350	0.338	0.47	0	1
Finance/Acquisition Occupations	7,424	0.269	0.44	0	1
Military Intelligence Occupations	12,863	0.277	0.45	0	1
Low AFQT Occupations	160,232	0.285	0.45	0	1
High AFQT Occupations	76,702	0.282	0.45	0	1
1=Unfavorable Information File	2,437,692	0.036	0.19	0	1
First-Term	923,214	0.061	0.24	0	1
Second-Term	415,464	0.035	0.18	0	1
Career-Term	1,099,014	0.016	0.13	0	1
Finance/Acquisition Occupations	41,450	0.023	0.15	0	1
Military Intelligence Occupations	85,049	0.025	0.16	0	1
Low AFQT Occupations	1,016,594	0.042	0.20	0	1
High AFQT Occupations	429,491	0.026	0.16	0	1
1=Weight Management Program	1,802,527	0.022	0.15	0	1
First-Term	650,823	0.018	0.13	0	1
Second-Term	295,263	0.033	0.18	0	1
Career-Term	856,441	0.021	0.14	0	1
Finance/Acquisition Occupations	31,831	0.023	0.15	0	1
Military Intelligence Occupations	56,468	0.023	0.15	0	1
Low AFQT Occupations	754,354	0.021	0.14	0	1
High AFQT Occupations	322,879	0.024	0.15	0	1
Panel B. Key Control Variables					
Wage Income (monthly)	2,437,692	3,048.74	713.95	1,907.10	5,995.38
First-Term	923,162	2,585.92	466.13	1,907.10	4,348.38
Second-Term	415,464	2,988.34	597.80	2,194.80	4,969.78
Career-Term	1,098,990	3,460.33	679.92	2,603.40	5,995.38
AFQT: Group Mean	2,437,616	63.65	9.40	15.00	96.50
First-Term	923,162	65.27	10.01	15.00	96.50
Second-Term	415,464	64.60	9.62	15.00	96.50
Career-Term	1,098,990	61.94	8.45	15.00	96.50
AFQT: Percent of Group Below 31st percentile	2,437,616	0.020	0.05	0	1
Fair Market Rent (county)	2,437,692	603.89	170.38	353.00	1,419.00

Observations report the number of individuals. High (Low) AFQT occupations are the top (bottom) 25-percentiles of occupations by average AFQT score. Finance/Acquisition Occupations are those in the "6F" Air Force Specialty Codes (AFSC). Military Intelligence Occupations are those in the "1N" AFSCs.

Table 3. Effects of Payday Loan Access on Separation from the Air Force: Estimates from Different Specifications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Observations
All Terms	0.0142	0.0129	0.0098	0.0160**	0.0149**	0.0052	0.0082	360,231-
	(0.0106)	(0.0101)	(0.0085)	(0.0075)	(0.0069)	(0.0060)	(0.0052)	376,289
First-Term	0.0033	0.0020	-0.0012	0.0094	0.0126	0.0088	0.0117	121,999 -
	(0.0154)	(0.0140)	(0.0135)	(0.0092)	(0.0091)	(0.0098)	(0.0084)	128,251
Second-Term	0.0192	0.0203	0.0160	0.0164*	0.0103	0.0024	0.0086	67,645 -
	(0.0130)	(0.0121)	(0.0107)	(0.0093)	(0.0077)	(0.0110)	(0.0099)	70,684
Career-Term	0.0199**	0.0181**	0.0144**	0.0171**	0.0141**	0.0043	0.0063*	170-587 -
	(0.0090)	(0.0089)	(0.0064)	(0.0064)	(0.0056)	(0.0040)	(0.0037)	177,354
Personnel-specific controls	No	No	Yes	Yes	Yes	Yes	Yes	
Location-specific controls	No	No	No	Yes	Yes	Yes	Yes	
Fixed effects	None	1	1	1	1, 2	1, 2, 3	1, 4	

The outcome variable = 1 if an airman separated from the Air Force at the end of his/her term.

Each cell presents an OLS estimate from equation 1 in the text on the variable for whether state law permits payday lending.

Fixed effects: 1=Occupation by Year, 2=Command (each Air Force base is under one of three mission Commands: Air Combat, Air Mobility, or Air Training), 3= State, 4=Base (each located in a single state).

Standard errors are clustered at the state level.

Personnel-specific controls include wage income and AFQT scores.

Location-specific controls include annual fair market rent, and the following data for 2000: non-housing and utility price-level, per capita income, population, percent of the population in the Armed Forces, percent of the population in rental occupied housing, percent of the population in the same house 1995-2000, and demographic characteristics. These controls drop out when base fixed effects are included.

Table 4. Effects on Payday Loan Access on Separation and Job Performance Outcomes

Outcome Measure:	1=Separation	1=Reenlistment Ineligibility	1=Unfavorable Information File	1=Weight Management Program
Sample	(1)	(2)	(3)	(4)
All Terms	0.0082	0.0095*	0.0021**	0.0014
	(0.0052)	(0.0051)	(0.0009)	(0.0013)
observations	376,289	376,285	2,412,096	1,785,131
First-Term	0.0117	0.0168*	0.0035*	0.0022
	(0.0084)	(0.0096)	(0.0018)	(0.0019)
observations	128,251	121,251	923,113	650,810
Second-Term	0.0086	0.0077	0.0011	-0.0012
	(0.0099)	(0.0072)	(0.0012)	(0.0018)
observations	70,684	70,684	414,911	294,981
Career-Term	0.0063*	0.0045	0.0005	0.0012
	(0.0037)	(0.0039)	(0.0005)	(0.0008)
observations	177,354	177,350	1,074,072	839,340
Sample Years	1996-2001	1996-2001	1996-2007^	1996-2004^

Each cell presents an OLS estimate from equation 1 in the text on the variable for whether state law permits payday lending.

All specifications include the same controls as specification (7) in Table 3: personnel and location-specific controls, occupation by year fixed effects, and base fixed effects. So Column (1) reproduces Column (7) in Table 3.

^ Data missing for 2003 fiscal year (October 2002-September 2003).

Standard errors are clustered at the state level.

Table 5. Effects on Payday Loan Access for Different Career Fields

Outcome Measure:	1=Separation	1=Reenlistment Ineligibility	1=Unfavorable Information File	1=Weight Management Program
Panel A. Finance/Acquisition vs. Other Occupations	(1)	(2)	(3)	(4)
Finance/Acquisition Occupations	-0.0270	-0.0264	0.0043*	0.0025
	(0.0205)	(0.0206)	(0.0023)	(0.0029)
observations	7,226	7,226	41,450	31,831
Non-Finance/Acquisition Occupations	0.0087	0.0102*	0.0020**	0.0014
	(0.0054)	(0.0053)	(0.0009)	(0.0013)
observations	369,063	369,059	2,370,646	1,753,300
Panel B. High vs. Low AFQT Occupations				
Bottom 25 Percentile Occupations	0.0036	0.0036	0.0018**	0.0002
	(0.0048)	(0.0047)	(0.0007)	(0.0016)
observations	157,931	157,931	991,050	736,958
Top 25 Percentile Occupations	0.0158**	0.0216	0.0018	0.0041***
	(0.0068)	(0.0133)	(0.0012)	(0.0012)
observations	69,455	69,455	429,491	322,879
Panel C. High Security Clearance (Intel.) vs. Other Occupations				
Military Intelligence Occupations	-0.0099	-0.0046	0.0010	0.0040
	(0.0218)	(0.0196)	(0.0024)	(0.0034)
observations	9,822	9,822	85,049	56,468
Non-Military Intelligence Occupations	0.0085	0.0099*	0.0020**	0.0012
	(0.0052)	(0.0051)	(0.0009)	(0.0014)
observations	366,467	366,463	2,327,047	1,728,663

Each cell presents an OLS estimate from equation 1 in the text on the variable for whether state law permits payday lending.
All specifications include the same controls as specification (7) in Table 3: personnel and location-specific controls, occupation-year fixed effects, and base fixed effects.
^ Data missing for 2003 fiscal year (October 2002-September 2003).
Standard errors are clustered at the state level.

Appendix Table 1. Estimates of Payday Borrowing Prevalence in the Military

	2001	1999
Estimated total number of households borrowing that year	9,000,000 (CFA 2001)	6,000,000?
Estimated percent of borrowing households in military	3% (CRL 2005, p. 6)	3%?
Estimated number of military households borrowing	270,000	200,000?
Total number of military households	1,400,000	1,100,000
Estimated proportion of military households borrowing	0.19	0.18

All estimates include active-duty military only.
Total number of military households from U.S. Census and DoD Population Reports:
http://www.defenselink.mil/prhome/PopRep_FY06/download.html
Notes on 1999 estimates:
Total number of borrowing households is imputed based on number of lending outlets estimated in Stephens (2004): 8,000 in 1999 vs. 12,000 in 2001.
Percent of borrowing households in military is taken from 2001 because no earlier estimates exist.

Appendix Table 2. Payday Loan Legal Authorization Effects on Stores Per Million State Inhabitants

	LHS: stores per million inhabitants (mean = 103, median = 100)	
RHS	(1)	(2)
1=law permitted >= 6 months prior	96.24	111.24
	(18.01)	(15.38)
1= restriction applies only if military designates off-limits		87.00
		(9.41)
r-squared	0.25	0.29
N	137	137

Annual stores data for year-end 2003-2006 from Stephens (2006, 2007); three state-year cells are missing counts because a later report noted that an earlier count was mis-estimated but did not revise that count.
Population data from Stephens (2004, 2005, 2006, 2007).
We only include states with Air Force bases.
OLS with standard errors clustered on state.
We do not include state fixed effects because there are only six law changes during this sample period, four of which might not have affected state-level store count because they did not apply statewide: they only authorized military command to place payday outlets off-limits.

Appendix Table 3. Exogeneity Test: Mean AFQT Percentile on Payday Loan Access

Outcome:	Mean AFQT Score	Mean AFQT Score	Mean AFQT Score	Mean AFQT Score
Sample	(1)	(2)	(3)	(4)
All Terms	0.4620	0.3061	-0.0524	-0.0503
	(0.2756)	(0.1864)	(0.0769)	(0.0751)
First-Term	0.1971	0.1271	0.0689	0.0903
	(0.2012)	(0.1963)	(0.1483)	(0.1458)
Second-Term	0.1705	0.2064	-0.1332	-0.1382
	(0.2206)	(0.1474)	(0.1431)	(0.1353)
Career-Term	0.8439**	0.5145**	-0.0493	-0.0562
	(0.4129)	(0.2355)	(0.0952)	(0.0951)
Personnel-specific controls	No	Yes	Yes	Yes
Location-specific controls	No	Yes	Yes	Yes
Fixed effects	1	1	1,2 3	1, 4

Each cell presents an OLS estimate from equation 1 in the text on the variable for whether state law permits payday lending.

Fixed effects: 1=Occupation by Year, 2=Command (each Air Force base is under one of three mission Commands: Air Combat, Air Mobility, or Air Training), 3= State, 4=Base (each located in a single state).

2,412,096 observations from October 1995- September 2007 inclusive, except for October 2002-September 2003.

Personnel-specific controls include wage income and AFQT scores.

Location-specific controls include annual fair market rent, and the following data for 2000: non-housing and utility price-level, per capita income, population, percent of the population in the Armed Forces, percent of the population in rental occupied housing, percent of the population in the same house 1995-2000, and demographic characteristics.

Standard errors clustered at the state level.

Appendix Table 4. Results After Dropping State-Year Cells with Different Types of Law Variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1=Separation	0.0082 (0.0052)	-0.0010 (0.0088)	NA	0.0070 (0.0055)	0.0056 (0.0054)	0.0068 (0.0054)	NA
1=Reenlistment Ineligibility	0.0095* (0.0051)	-0.0016 (0.0040)	NA	0.0094* (0.0054)	0.0069 (0.0053)	0.0095* (0.0055)	NA
1=Unfavorable Information File	0.0021** (0.0009)	0.0019* (0.0011)	0.0025** (0.0011)	0.0024** (0.0009)	0.0019* (0.0010)	0.0012 (0.0008)	0.0020** (0.0009)
1=Weight Management Program	0.0014 (0.0013)	0.0008 (0.0022)	NA	0.0015 (0.0013)	0.0015 (0.0015)	-0.00004 (0.0009)	0.0013 (0.0013)
Sample Restriction	None	drop Oct 95-Sept 98	drop off-limits	drop court-related	drop binding min term	drop TX	drop database states

Each cell presents an OLS estimate from equation 1 in the text on the variable for whether state law permits payday lending.

Standard errors clustered at the state level.

All specifications include the same controls as specification (7) in Table 3: personnel and location-specific controls, occupation by year fixed effects, and base fixed effects.

Motivation for sample restrictions:

(1) reproduces Table 4 row 1 for reference.

(2) drops earlier years because military borrowing prevalence might have been lower.

(3) drops cells from 5 states in fiscal years 2006 and 2007 that prohibited lending from outlets that military commanders designated off-limits.

(4) drops cells from Alabama and Arkansas where we classify based on the interaction of court actions and the laws themselves.

(5) drops cells from Oklahoma when law specified minimum loan term of 60 days.

(6) drops cells from Texas; first two fiscal years difficult to classify definitively, 2000 law permitted $14 per $100 (standard is $15), then military-specific prohibition (see Column 3) in fiscal years 2006 and 2007.

(7) drops cells from 3 states with loan databases that made restrictions on serial borrowing enforceable in later years.

"NA" means no state-year cells affected in the sample for that outcome (fiscal years 1996-2001 for separation and reenlistment, fiscal years 1995-2005 for Weight Management Program).