The Effect of Deployment Tempo on Marine Corps Selected Reserve Retention
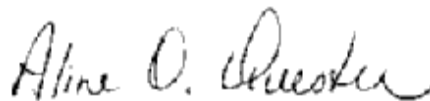
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Executive summary

Since September 11th, 2001, the Marine Corps has involuntarily activated considerable numbers of the Selected Marine Corps Reserve (SMCR) to support Operation Noble Eagle (ONE), Operation Enduring Freedom (OEF), and Operation Iraqi Freedom (OIF). The ongoing presidential mobilization of the Reserves represents the longest period of reliance on these forces since the formation of the All-Volunteer Force. In this paper, we examine how this increase in operational tempo has affected the composition of and retention in the SMCR.

Our analysis is two-pronged. First, we use descriptive statistics to understand changes in the SMCR between September 2001 and September 2006. Second, we use survival analysis to determine the effect of activation on a reservist's decision to stay affiliated with the SMCR. For both of these analyses, we use data supplied by USMC-HQ, Manpower & Reserve Affairs.[1]

The enlisted manpower levels were fairly constant from September 2001 to September 2006, but the officer manpower levels decreased by 19 percent between these two points. Even more grave is the 37-percent decline in officers affiliated with drilling units. We expect this is due in part to a policy that requires officers to find a new unit or switch to Individual Mobilization Augmentee (IMA) status when they are promoted.[2] We recommend that the policy be revisited.

Both the enlisted and officer force saw changes in terms of demographic characteristics between September 2001 and September

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1. We used two sets of data. The first is an extract from the Marine Corps Total Force Structure database, and the second is the mobilization and deployment file maintained by Reserve Affairs Policy Branch.

2. Although, in September 2001, 31 percent of SMCR officers were IMAs, by September 2006, the percentage had grown to 46.

2006. Minority representation declined in the enlisted force and increased in the officer corps. This is attributable, at least in part, to differences between those who joined the SMCR after September 2001 and those already in the SMCR at that point. Enlisted who joined after September 2001 were less likely to be minority than those already in. The converse is true for officers. There was not a clear distinction by race in terms of separations from the SMCR during this time period.

Education levels have decreased for both the enlisted and officer force. Again, this is at least partly attributable to the fact that both officer and enlisted reservists who joined after September 2001 had lower education levels than those who joined before that date. This may reflect the fact that joining the SMCR becomes less attractive to college/graduate students as the probability of being activated increases. For officers and prior-service (PS) enlisted Marines, the probability of leaving decreased as the level of education increased.

All those in the SMCR had a high probability of being activated in this time period. During September 2001 through September 2006:

- Activation rates were:

    — 55 percent for those in the SMCR as of September 2001

    — 38 percent for those who joined after September 2001

    — Higher for officers than for enlisted. In every month, a higher proportion of the officers were activated compared with the enlisted.

- Activation rates differed by occupation:

    — Nine MOSs had over 80 percent Marines activated for 2 to 15 months.

    — Median activation rate over entire period was less than 50 percent for enlisted and less than 60 percent for officers.

The effect of activation on retention differed for officers and enlisted Marines. We examined both the probability of being activated (as proxied by the proportion of the Marine's MOS already activated) and a Marine's actual activation experience on the probability that

the Marine would continue his or her affiliation with the SMCR. We find that those non-prior-service (NPS) enlisted reservists who were in the most heavily activated MOSs were more likely to leave before an activation compared with those reservists in less activated MOSs. This was not true for officers or PS enlisted reservists.

After an activation, both NPS enlisted reservists and officers who experienced longer activations were more likely to leave than those who had average or shorter than average lengths of activation. For NPS enlisted reservists, the probability of leaving increased as the length of activation increased. For officers, only those who had the longest period of activation (more than 24 months) were more likely to leave than those with an average length activation. These results suggest that the USMCR can improve retention by limiting the active duty activation period for these reservists. The length of activation had no effect on PS enlisted retention.

Perhaps more troubling is that, after activation, junior PS Marines were much more likely to leave than mid-level PS Marines. This was true regardless of the length of their activation. For PS enlisted Marines, after activation, E-3s and E-4s are 50 percent more likely to leave compared with PS E-5s. Likewise, company grade officers are 40 percent more likely to leave compared with majors after an activation. These Marines are just beginning to establish their civilian careers and may find it difficult to do this while maintaining a part-time military career. We recommend that the Marine Corps explore the role of civilian employment in SMCR officer and enlisted PS Marine loss behavior.

In the near future, the SMCR will continue to experience recruiting/retention challenges as the Active component endstrength increases and as the new DoD policy on the length and timing of reserve activations is implemented. We strongly recommend that the Marine Corps continue to monitor loss behavior and expand its focus to include analyzing patterns for those who return to the Active component, those who remain in the Selected Reserves (SelRes), and those who choose to leave completely.

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Introduction and overview

Since September 11th, 2001, the Marine Corps has involuntarily activated considerable numbers of the Selected Marine Corps Reserve to support Operation Noble Eagle, Operation Enduring Freedom, and Operation Iraqi Freedom. The ongoing presidential mobilization of the Reserves represents the longest period of reliance on these forces since the formation of the All-Volunteer Force. The Marine Corps is concerned that the duration and nature of this mobilization may contribute to reduced retention in the SMCR and to difficulties in maintaining authorized endstrength levels. In this study, we focus on determining how members of the SMCR have responded to the increased pace of involuntary activations since September 11th. Specifically, we assess the relative effect of the mobilization on SMCR retention and identify cohorts experiencing lower retention levels.

Background

Reservists may be mobilized to support the active military forces under Title 10 of the United States Code (see table 1). Since the end of the cold war, each sitting U.S. president has mobilized the Reserves to support various emergency operations and military contingencies:

- George H. W. Bush authorized the mobilization of reservists under sections 12304 and 12302 to support Operation Desert Shield/Desert Storm [1, 2, and 3].

- William Clinton authorized the mobilization of reservists under section 12304 in support of operational missions to Haiti [4], in and around former Yugoslavia [5], Southwest Asia [6], and Kosovo [7].

- George W. Bush ordered the most recent mobilization of the Reserves in support of ONE, OEF, and OIF following the September 11th Al Qaeda attacks on the United States in 2001 [8].

Table 1. Reserve mobilization statutes

Section of Title 10, United States Code (U.S.C.)	Requirements	Conditions of mobilization
Full mobilization, 12301(a)	Requires declaration of war or national emergency by the Congress Requires Congress to be in session	All reservists, including members in an inactive status and retired members No limit on number Duration of war or emergency + 6 months
Partial mobilization, 12302	Requires declaration of national emergency Report to Congress every 6 months	Ready Reserve Not more than 1 million Not more than 2 years
Presidential Reserve Callup, 12304	Requires Presidential notification of Congress No declaration of national emergency	Not more than 200,000 SelRes, with up to 30,000 IRR 365 days Includes weapons of mass destruction incidents
15-day Statute, 12301(b)	Service Secretaries may call up Ready Reserve members up to 15 days per year	Annual training Operational missions Involuntary
Reserve component volunteers, 12301(d)	Requires consent of the individual Reserve component members Governors must consent to activation of National Guard	All reservists No number limitation stated No duration stated

The frequency of reserve mobilization to support military contingency operations in the 1990s marks a departure from previous patterns of low use during the cold war era. The orientation of the Reserves has made a transition from being strategic to being more operationally focused. In particular, since September 2001, the Reserves' operational role has become more demanding and publicly prominent. All six Department of Defense (DoD) Reserve components have activated considerable numbers of their forces to support

the ongoing mobilization. Military forces in Iraq and Afghanistan mainly require ground forces and have drawn most heavily from the Army National Guard (ARNG), the U.S. Army Reserve (USAR), and the SMCR [9]. While the ARNG and the USAR have provided the greatest number of soldiers to support ongoing military operations in the continental United States (CONUS) and abroad, the SMCR has activated nearly all eligible members.

Research issues

Activation and deployment impose a number of costs—both financial and psychological—on reservists. These costs include stress due to separation from family and friends, a decline in income, and longer work hours [10]. The costs will not be the same for all reservists. For instance, it is more likely that a reservist with high civilian earnings will experience a decline in income after being activated compared with a reservist with low to moderate civilian earnings [11]. As the pace of activations and deployments continues, these costs may increase to a point where reservists' willingness to remain affiliated with the United States Marine Corps Reserve (USMCR) is affected.

Compared with the Active component, relatively little work has been done that examines the effect of a presidential mobilization on the retention behavior of reservists. The paucity of research on this topic is due at least in part to the fact that, since the inception of the All-Volunteer Force, there have not been any major mobilizations of the Reserves lasting for an extended period of time.

Recent research on career Marines and officers in the Active component has found that the increased frequency of deployments has little effect on reenlistment and retention rates. Reenlistment for first-term Marines, however, is negatively affected by deployments [12].[3] Furthermore, there is concern that the sustained pace of operations within the active-duty Marine Corps may have spillover effects. Focus group evidence suggests that those leaving active duty express little

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3. Despite the negative effect of increased deployments on first-term reenlistments, however, the Marine Corps consistently has made all of its first-term reenlistment goals.

interest in joining the Reserves because of perceived high rates of deployment tempo (DEPTEMPO) [13]. Given these various factors, it is important to understand what effect, if any, increased DEPTEMPO in support of the Long War is having on the retention of enlisted Marines and officers in the USMCR.

Until recently, no clear evidence existed of potentially widespread deployment-related effects: the SMCR met its yearly recruiting goals through FY 2005, and overall retention had not dropped significantly. At the end of FY 2006, however, the Marine Corps saw a potential sign of strain in its reserve forces when it missed achieving its authorized endstrength level for the first time since September 11th.

In this study, we analyze the retention behavior of Selected Reserve members since September 11th, 2001. To quantify the effect of the ongoing mobilization on continuation behavior, we developed models for SMCR enlisted and officers that explicitly assess certain aspects of the current mobilization and their effect on the probability of remaining in the SelRes (e.g., activation status, deployment status, and length of active-duty period). A primary objective of this research is to determine how Marines are reacting to mobilization policy and to inform the Marine Corps' future decisions regarding the management of its reserve forces and continuing rounds of activations.

This research is also aimed at informing recruiting and retention policies by describing the relationship of various individual characteristics and career events in terms of the probability of continuing to affiliate with the SMCR. Identifying the traits of people who are more likely to leave (or to stay in) the SelRes can be useful in targeting recruiting resources and affiliation and reenlistment incentives.

Data

To conduct our analysis, we use two sources of individual-level data, both supplied to us by USMC Headquarters, Manpower and Reserve Affairs (M&RA). The first is an extract of individual-level records for members of the SMCR from the Marine Corps' Total Force System (MCTFS). We supplement our MCTFS extract with data from the mobilization and deployment file maintained by the Reserve Affairs

Policy Branch within the Reserve Affairs Division of M&RA and data from the Reserve Common Component Personnel Data System (RCCPDS). The datasets are end-of-month snapshots from September 2001 through September 2006. In the overview section, we include Marines who are in Initial Active Duty and Training (IADT) status, fully trained drilling members of the SMCR, and Individual Mobilization Augmentees (IMAs). In our model, we include only IMAs and those fully trained drilling members of the SMCR.

Organization of report

We have organized the rest of the paper as follows. The next section provides an overview of the SMCR. Here we use descriptive statistics to depict the enlisted and officer components of the SMCR in terms of their size and composition at different points in time. Following this, we describe patterns in activation and deployment since September 2001. We discuss activations and deployments for both enlisted reservists and officers. We also show activation and deployment history by Military Occupational Specialty (MOS) to develop an understanding of how the ongoing mobilization may be drawing on occupational fields differently. Finally, we discuss separations from the SelRes. We do this in two ways: (1) we present simple summary statistics on loss patterns, and (2) we formally model the relationship between activation and loss controlling for demographic and service characteristics. We then discuss the implications of our results.

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SMCR overview

The Marine Corps Reserve augments and reinforces the Active component of the Marine Corps and is designed to mirror its structure. It includes three components: the Ready Reserve, the Standby Reserve, and the Retired Reserve. The Ready Reserve component is its primary source of personnel to augment the active force for military contingency operations and wartime. It is made up of two organizations: the Selected Marine Corps Reserve (SMCR) and the Individual Ready Reserve (IRR). Approximately 39 percent of the Marine Corps' Ready Reservists are in the SMCR, and the remaining 61 percent are in the IRR. Within the Ready Reserve, the SMCR is the first source of augments to the Active component—and the focus of our study.

Since FY 2004, the SMCR has had an authorized endstrength level of 39,600.[4] The SMCR has four subcomponents:

1. SMCR units
2. Individual Mobilization Augmentees (IMAs)
3. Active Reserve (AR)
4. Initial Active Duty for Training (IADT).

SMCR units, which make up 80 percent of the Marine Corps' Selected Reserve force, are made up of part-time, drilling, paid reservists. IMAs are fully trained members of the SMCR who are not assigned to units; they make up about 6 percent of the SMCR. Another 6 percent of the SMCR are ARs; they are full-time, active-duty reservists who provide support for managing the Marine Corps Reserve for the purpose of organizing, administering, recruiting, instructing, and training reservists. Those Marine reservists who are in IADT status represent the remaining 8 percent of the SMCR. In this section, we provide an overview of the SMCR in terms of its size, demographic composition, and basic military characteristics.

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4. Appendix A has SMCR authorized endstrength levels for FY 2001–2006.

The enlisted SMCR

In figure 1, we display the monthly inventory of enlisted SMCR from September 2001 through September 2006. The total number of Marines composing the enlisted SMCR has experienced some slight fluctuations since September 2001; however, overall endstrength at the end of each fiscal year has remained about the same.[5]

Figure 1.   Monthly inventory of USMCR enlisted force, September 2001–2006
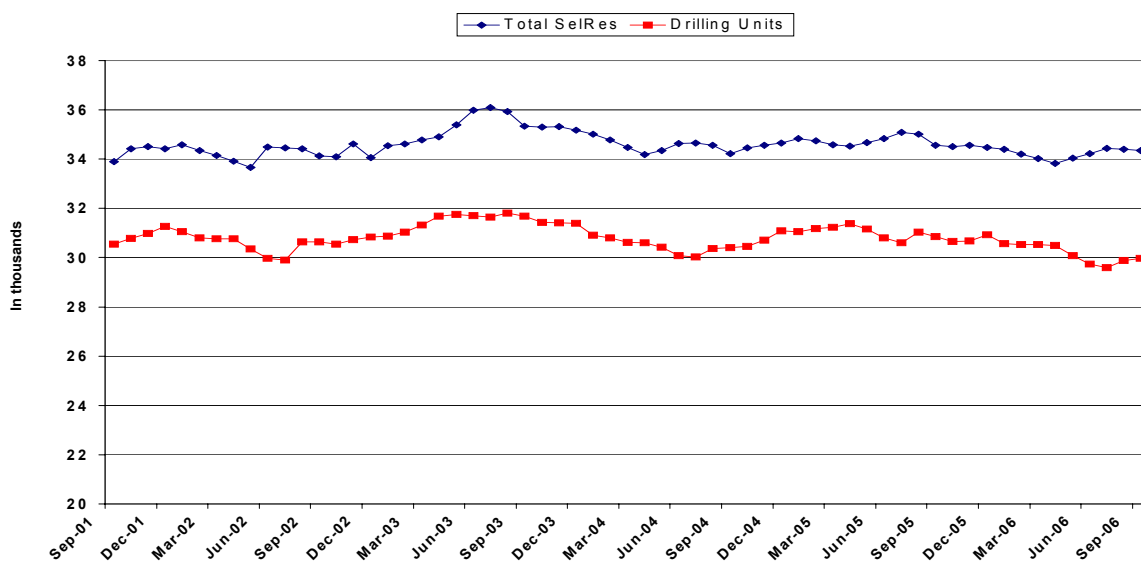
The most notable changes in the monthly inventory occurred in 2003 and early 2004. During the early months of OIF (first half of 2003), the enlisted SMCR steadily increased in number, peaking at 36,094 in July. This increase coincides with the period during which the Marine Corps instituted a forcewide stop-loss order [14, 15]. The Marine Corps ordered the termination of its total force stop-loss order in May 2003 [16, 17], and enlisted SMCR manpower levels began to steadily decrease from August 2003 through April 2004. Since this time, the enlisted SMCR population remains relatively constant. The number

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5.   In September 2001, for example, there were 33,890 enlisted members in the SMCR. In September 2006, there were 34,338.

of reservists in the SMCR drilling units has followed the same patterns as the overall SelRes. However, the number of enlisted SMCR in drilling units at the end of FY 2006 was 29,973, which is nearly 2 percent lower than the enlisted strength of 30,547 achieved in FY 2001.

In table 2, we compare the characteristics of enlisted SMCR at the end of FY 2001 and at the end of FY 2006. The demographic characteristics of enlisted Marines have stayed roughly the same since September 2001. In both time periods, enlisted Marine reservists were primarily young, single, white men with high school diplomas—very much alike in these respects to their active component counterparts. Roughly 75 percent of SMCR Marines have no dependents and, for the most part, their geographic distribution[6] has not shifted by more than 1 percentage point between September 2001 and September 2006.

There have been slight shifts, however, in the demographic characteristics of SMCR Marines. In September 2006, enlisted reservists were less diverse in terms of race. The percentage of whites increased by 4.4 percentage points, while the percentage of blacks and Hispanics decreased by 3.5 and 2.9 percentage points, respectively. The total percentage of SMCR Marines with Tier 1 credentials has remained steady at about 98 percent; those with traditional high school degrees increased by 4.6 percentage points from 2001 to 2006. Enlisted SMCR members, however, were 5.1 percentage points less likely to have some college education in September 2006 than in September 2001. The lower levels of advanced educational attainment may reflect less time available to devote to higher education given the increased operational tempo. The nature of reserve service has also changed, as have the expectations placed on reservists. Lower levels of advanced educational attainment may also reflect the fact that joining the SMCR becomes less attractive to college students as the probability of being activated increases. Not only has the SMCR maintained its high level of quality, as reflected by the percentage of Tier 1 Marines, but the average Armed Forces Qualification Test (AFQT) score increased by nearly 5 percent from 64.2 to 67.4 as well.

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6.   We define geographic regions using the Census Bureau's nine geographic divisions plus a category for non-U.S. locations.

Table 2. Demographic characteristics of SMCR enlisted members

Variable	September 2001	September 2006	Direction of change[a]
Demographic characteristics			
Age (years)	24.2	24.0	nc
Male	95.7%	95.7%	nc
Race			
White	63.8%	68.2%	+
Black	10.9%	7.4%	-
Hispanic	16.0%	13.1%	-
Other race	9.3%	11.2%	+
Education			
Tier 1 - Traditional high school degree	84.7%	89.0%	+
Tier 1 - High school degree with college	11.4%	6.3%	-
Other Tier 1	1.7%	2.4%	+
Tier 2	1.8%	1.9%	nc
Tier 3	0.1%	0.1%	nc
"Quality" measures			
Tier 1 status	97.8%	97.7%	nc
AFQT score	64.2	67.4	+
Dependency status			
No dependents	75.7%	73.5%	-
1 to 2 dependents	16.6%	18.9%	+
3 to 4 dependents	6.5%	6.5%	nc
5 or more dependents	1.2%	1.1%	nc
Geographic region			
New England	4.7%	5.2%	+
Mid-Atlantic	14.8%	14.0%	-
South Atlantic	18.5%	17.8%	-
ES Central	6.2%	5.7%	-
WS Central	13.2%	12.8%	nc
EN Central	13.8%	14.8%	+
WN Central	4.7%	5.4%	+
Mountain	4.7%	5.3%	+
Pacific	18.7%	17.2%	-
Non U.S.	0.7%	0.3%	nc
Number of observations			
	33,890	34,338	

a. If less than 0.5% difference, then no change, nc; otherwise +, increase; -, decrease.

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In table 3, we compare the military characteristics of enlisted SMCR members over time. The enlisted SMCR is overwhelmingly made up of Marines with no prior active service who are serving their first term as reservists and are in paygrades E-4 and below. In September 2006 (compared with September 2001), enlisted SMCR members were slightly less likely to have any prior active service, had fewer months on average with their reserve units, and were more likely to be under obligation. By the end of FY 2004, over half of the Marines in the SMCR had joined since September 11th. The percentage of Marines affiliating with the SMCR since September 11th had increased to 77 percent by September 2006. In other words, the overwhelming majority of these Marines have joined the SMCR during a period when optempo has steadily increased and the expectation of being activated is clear. The activation and deployment patterns of enlisted SMCR members support this expectation. At the end of September 2006, we find that nearly 56 percent of those in the SMCR at that time had been activated at least once and, of those who had been activated, nearly 85 percent had deployed in support of OIF or OEF.

Table 3.   Military characteristics of SMCR enlisted members

Variable	September 2001	September 2006	Direction of change[a]
Characteristics of service			
Prior active service	14.0%	10.0%	-
Years of service	3.9	4.1	nc
Months in reserve unit	28.2	17.4	-
Post-9/11 accession	n/a	77.0%	n/a
Currently under obligation	75.0%	79.0%	+
Activation/deployment status			
Not yet activated	100.0%	44.3%	-
Activated at least once	n/a	55.7%	n/a
Activation included deployment	n/a	84.6%	n/a
Present paygrade			
E-1	8.9%	7.3%	-
E-2	15.1%	11.3%	-
E-3	33.1%	43.2%	+
E-4	21.6%	18.5%	-
E-5	12.2%	11.2%	-
E-6	4.3%	4.4%	nc

Table 3.   Military characteristics of SMCR enlisted members (continued)

Variable	September 2001	September 2006	Direction of change[a]
E-7	3.1%	2.6%	-
E-8 and E-9	1.6%	1.6%	nc
Occupational fields[b]			
01XX, Personnel, administration and retention	4.3%	3.2%	-
02XX, Intelligence	1.3%	1.2%	nc
03XX, Infantry	21.3%	23.4%	+
04XX, Logistics	3.5%	2.8%	-
05XX, MAGTF planning	0.1%	0.2%	nc
06XX, Command and control systems[c]	9.8%	9.4%	nc
08XX, Field Artillery	4.4%	4.1%	nc
11XX, Utilities	2.2%	2.1%	nc
13XX, Engineer, construction, facilities, and equipment	8.4%	8.6%	nc
18XX, Tank and assault amphibious vehicles	2.4%	2.1%	nc
21XX, Ordnance	2.6%	2.4%	nc
23XX, Ammunition/explosive ordnance disposal (EOD)	1.3%	1.5%	nc
28XX, Ground electronics maintenance	2.0%	2.1%	nc
30XX, Supply administration and operations	4.7%	3.8%	-
31XX, Traffic management	0.3%	0.4%	nc
33XX, Food service	2.2%	1.9%	nc
35XX, Motor transport	11.0%	11.4%	nc
57XX, Nuclear, biological and chemical defense	0.6%	0.5%	nc
58XX, Military police/corrections	2.2%	2.3%	nc
59XX, Electronics maintenance	0.3%	0.3%	
60/61/62XX, Aircraft maintenance	2.6%	2.6%	nc
63/64XX, Avionics	1.3%	1.2%	nc
65XX, Aviation ordnance	0.6%	0.6%	nc
66XX, Aviation logistics	0.7%	0.7%	nc
68XX, Meteorology and oceanography	0.1%	0.2%	nc
70XX, Airfield services	0.9%	0.8%	nc
72/73XX, Marine air command and control systems	1.0%	0.9%	nc
99XX, Other reporting MOSs	7.4%	9.0%	+

a. If less than 0.5% difference, then no change, nc; otherwise +, increase; -, decrease.
b. We do not report relative percentages for occupational fields (occfields) consistently with 50 or fewer Marines.
   These include occfields 26XX, signals intelligence; 34XX, financial management; 43XX, public affairs; 44XX, legal
   services; 46XX, combat camera; 68XX, METOC; and category B MOSs. We do include these MOSs in our models,
   which we present later.
c. Since September 2001, the Marine Corps has merged occfield 25XX, communications, and occfield 40XX, infor-
   mation technology, with occfield 06XX, command and control. For September 2001, we merge the data for these
   occfields with occfield 06XX.

There were also changes in grade distribution during the past 5 years. Enlisted SMCR members are more heavily concentrated among junior Marines (E-1s to E-3s), particularly E-3s, while the percentage of noncommissioned officers (E-4s to E-5s) decreased from 33.8 percent at the end of FY 2001 to 29.7 percent in September 2006. In comparison, the staff NCO ranks have experienced less fluctuation in their relative percentages: they represented 9 percent of the enlisted Marines in September 2001 and 8.6 percent in 2006.

There have been shifts in the distribution of SMCR Marines by occupational field (see table 3), but simply looking at the distribution hides some large changes.[7] In occfield 04XX (Logistics), for instance, there was less than a 1-percentage-point decrease in the percentage of enlisted SMCR Marines, but this translates into an 18-percent decrease in the total number of enlisted SMCR Marines. The following six occfields[8] have experienced a decrease in number equal to 10 percent or more of their manpower levels in September 2001:

- 01XX, Administration, personnel, and retention (-25 percent)

- 04XX, Logistics (-18 percent)

- 18XX, Tank and assault amphibious vehicles (-11 percent)

- 30XX, Supply administration and operations (-19 percent)

- 63/64XX, Avionics (-11 percent)

- 70XX, Airfield services (-11 percent).

Another six occfields[8] experienced increases in number of 10 percent or more between September 2001 and 2006:

- 03XX, Infantry (+11 percent)

- 05XX, MAGTF plans (+246 percent)

- 23XX, Ammunition/EOD (+18 percent)

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7. We provide a complete list of the occfield inventories at the end of September 2001 and 2006 in appendix B.

8. We consider only occupations that had at least 50 members as of September 2006.

- 31XX, Traffic management (+21 percent)

- 68XX, Meteorology and oceanography (+64 percent)

- 99XX, Other reporting MOSs (+23 percent).

SMCR officers

Figure 2 shows the monthly inventory of SMCR officers from September 2001 through September 2006. While the Marine Corps was able to maintain its endstrength levels among the enlisted SMCR, it has experienced a gradual and persistent decline in the officer inventory since the end of FY 2001. Compared with the total number of SMCR officers at the end of FY 2001, the total number of SelRes officers has declined by 19 percent as of September 2006. The decrease in size for SelRes officers in drilling units has been much larger—a 37-percent decline. This larger decrease in the number of drilling SelRes officers means that many are shifting over to IMA status. In September 2001, 31 percent of SMCR officers were IMAs. By September 2006, this had grown to 46 percent. Note that, since IMA billets require field grade officers, those shifting to IMA status are mainly O-4s and above.

Figure 2.   Size of USMCR officer force, September 2001–2006
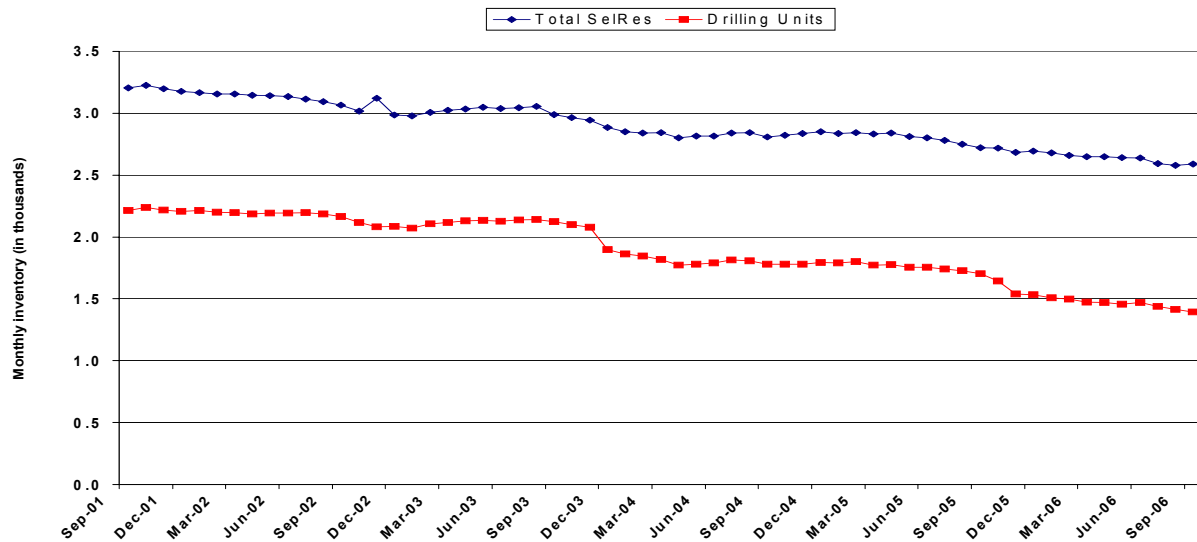
The size of the SMCR officer force held fairly steady around 3,000 during January through July 2003, when the forcewide stop-loss was in effect. Inventory levels resumed their downward trend when the Marine Corps lifted the stop-loss. This pattern is similar to the experience of the enlisted SelRes inventory in the same period. Unlike the enlisted SMCR, however, the SelRes officer population has continued to decline steadily. The inventory for SelRes officers in drilling units has followed the same pattern as total SelRes officers.

In table 4, we compare the demographic characteristics of SMCR officers at the end of FY 2001 and at the end of FY 2006. As was the case with the enlisted SMCR, we do not observe significant changes in the basic composition of the officers. The average SMCR officer in September 2006 looks very much like the average officer in September 2001. They are predominantly married, white men around age 40 with college degrees. Like the enlisted force, there is a slight shift in racial composition. However, unlike the enlisted SMCR, the shift among officers reflects a slight increase in diversity. Compared with September 2001, SMCR officers were 3.4 percentage points less likely to be white, 1.5 percentage points more likely to be Hispanic, and 1.8 percentage points more likely to be of some other racial/ethnic identity. The relative percentage of officers who were black remained the same—slightly over 4 percent.

Similar to the shift in education levels that we saw for enlisted Marines, SMCR officers in 2006 were less likely to have advanced degrees than those in 2001. Again, this may reflect a tendency among officers to have less time to devote to advanced studies given the demands on the Reserves under the higher operational tempo. The percentage who were married and had dependents increased only slightly and, for the most part, their geographic distribution has not shifted by more than 1 percentage point from 2001 to 2006.

In table 5, we provide the service characteristics of SMCR officers. Since September 2001, SMCR officers also have experienced some slight changes in their military characteristics. On average, officers are slightly more senior in terms of their years of service but have been with their reserve units for a much shorter period of time. Just over two-fifths of the officer inventory as of September 2006 have

joined the SMCR since September 11th. The percentage of officers affiliating with the SMCR since that date is not as high as we observed among the enlisted members (77 percent); however, these officers have joined with clear expectations of being activated in support of OIF or OEF. Indeed, at the end of September 2006, 75 percent of the current officer inventory had been activated, and over 70 percent of those who had been activated were deployed.

Table 4.   Demographic characteristics of SMCR officers

Variable	September 2001	September 2006	Direction of change[a]
Demographic characteristics			
Age (years)	39.0	40.0	+
Male	94.8%	94.6%	nc
Race			
White	85.0%	81.6%	-
Black	4.2%	4.3%	nc
Hispanic	3.6%	5.1%	+
Other race	7.2%	9.0%	+
Education			
Bachelor's degree	62.8%	69.4%	+
Graduate/professional degree	37.2%	30.6%	-
Dependency status			
No dependents	18.1%	16.3%	-
1 to 2 dependents	33.5%	30.2%	-
3 to 4 dependents	39.4%	45.3%	+
5 or more dependents	8.9%	6.8%	-
Geographic region			
New England	6.9%	7.6%	+
Mid-Atlantic	17.5%	16.9%	-
South Atlantic	20.8%	20.3%	nc
ES Central	3.8%	4.0%	nc
WS Central	10.0%	10.9%	+
EN Central	13.7%	14.0%	nc
WN Central	6.1%	5.8%	nc
Mountain	5.2%	5.6%	nc
Pacific	15.1%	13.9%	-
Non U.S.	0.8%	0.9%	nc

a. If less than 0.5% difference, then no change, nc; otherwise +, increase; -, decrease.

Table 5.   Military characteristics of SMCR officers

Variable	September 2001	September 2006	Direction of change[a]
Military characteristics			
Years of service	16.7	18.3	+
Months in reserve unit	23.3	15.9	-
Post-9/11 accession	n/a	41.0%	n/a
Currently under obligation	1.0%	1.0%	nc
Activation/deployment status			
Not yet activated	98.9%	24.9%	-
Activation included deployment	1.1%	71.4%	+
Present paygrade			
O-1	1.2%	1.9%	+
O-2	0.3%	0.8%	+
O-3	14.3%	15.3%	+
O-4	41.4%	32.1%	-
O-5	34.0%	36.9%	+
O-6	8.5%	12.6%	+
Occupational fields			
01XX, Personnel, administration, and retention	2.0%	2.0%	nc
02XX, Intelligence	5.2%	6.4%	+
03XX, Infantry	16.0%	13.8%	-
04XX, Logistics	7.3%	6.7%	-
06XX, Command and control	5.8%	6.0%	nc
08XX, Field artillery	7.0%	6.6%	nc
13XX, Engineer, construction, facilities and equipment	3.1%	3.3%	nc
18XX, Tank and assault amphibious vehicles	2.8%	3.0%	nc
30XX, Supply administration and operations	4.6%	3.7%	-
34XX, Financial management	1.0%	1.2%	nc
35XX, Motor transport	0.5%	0.1%	nc
43XX, Public affairs	1.0%	0.8%	nc
44XX, Legal services	6.3%	5.4%	-
58XX, Military police/corrections	1.6%	1.5%	nc
60XX, Aircraft maintenance	1.3%	0.7%	-
66XX, Aviation logistics	1.0%	0.7%	nc
72XX, Air control/air support/AAW/air traffic control	4.7%	3.9%	-
75XX, Pilots/naval flight officers	20.9%	20.6%	-
99XX, Other reporting and identifying MOSs	7.9%	13.6%	+

a. If less than 0.5% difference, then no change, nc; otherwise +, increase; -, decrease.

The overall SMCR officer grade shape is more like a top-heavy hexagon than a pyramid, even though SMCR requirements take the traditional pyramid shape. The percentage of officers in the company grades increased from 15.8 percent in 2001 to 18.0 percent in 2006. Traditionally, the SMCR has assessed nearly all its officers from the active component, usually at the rank of captain, which has resulted in extremely small numbers of 2nd and 1st lieutenants. This shortage was created by design, and the implications were not an issue before the current ongoing mobilization in which the lack of O-1s and O-2s has meant a severe shortage of platoon leaders for the SMCR. To help address this shortage, the Marine Corps implemented the Officer Candidate Class for Reserves in 2006 to provide a source of O-1s and O-2s. The slight increase in the percentage of these company grade officers by the end of FY 2006 most likely reflects the addition of this alternative affiliation program for non-prior active-duty Marines. In the field grades, the relative percentage of O-4s decreased, and O-5 and O-6 percentages increased. In fact, the percentage of O-6s exceeds the legally authorized level but is within the allowed waiver level. Overall, the Marine Corps continues to be off-balance in its grade shape given its requirements. It is clear that the Marine Corps needs to either seriously assess the way it recruits, retains, and manages its SMCR officers to better align the population with requirements or consider whether requirements need to be adjusted.

Table 5 also provides the relative distribution of SMCR by occfield as of September 2001 and 2006. Similar to our findings for the enlisted community, we do not observe large shifts in terms of percentage points in the occfield distribution. Roughly two-thirds of the occfields experienced slight decreases in their inventory levels.[9] Only two occupations experienced an increase of 1 percentage point or more:

1. Occfield 02XX, Intelligence, increased from a relative percentage of 5.2 in September 2001 to 6.4 percent in 2006.

2. Occfield 99XX, Other reporting and identifying MOSs, increased from a relative percentage of 7.9 to 13.6 percent.

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9. The SMCR officer inventory has decreased by 19 percent overall from September 2001 to 2006 and by 37 percent in the drilling SelRes.

Looking only at the distribution of officers by occfield hides the real problem: the overall number of officers at the end of FY 2006 is 37 percent less than at the end of FY 2001. Only occfield 99XX experienced a real increase in the number of officers assigned to it. The 99XX occupational field increased from 253 in September 2001 to 352 in September 2006. The increase in the 99XX inventory is directly driven by the increase in SMCR colonels. All other occfields experienced decreases in their inventories. Those that experienced the largest percentage decreases in size follow:[10]

- Occfield 03XX, Infantry (-31 percent)

- Occfield 04XX, Logistics (-26 percent)

- Occfield 08XX, Field artillery (-23 percent)

- Occfield 30XX, Supply administration and operations (-35 percent)

- Occfield 44XX, Legal services (-31 percent)

- Occfield 72XX, Marine air command and control systems (-33 percent)

- Occfield 75XX, Pilots/naval flight officers (-20 percent).

We include a complete list of the occupational field inventories for SMCR officers in appendix B.

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10. As with our analysis of the enlisted SMCR, we consider only occupations that had at least 50 members as of September 2006.

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Activation and deployment patterns since September 11th

In this section, we explore in more detail the activation and deployment experiences of the SMCR since September 11th.

Activation and deployment status

As table 6 shows, as of September 2006, the Marine Corps had 32,360 completed enlisted SMCR activations; another 5,989 activations were ongoing. These totals reflect all activations of all members who had been in the SMCR at any time between September 2001 and September 2006. For members activated more than once, we count each activation as a separate event. There were a total of 28,741 enlisted Marines in the SMCR who completed at least one activation. Of those enlisted Marines, 3,565 had completed more than one activation.

Table 6.   Total number of completed and ongoing activations in the SMCR as of September 2006

	Enlisted	Officers	Total
Completed activations	32,360	3,195	35,555
Ongoing activations	5,989	524	6,513
Total	38,349	3,719	42,068

Among officers, there were 3,195 completed activations and another 524 ongoing activations. Again, these totals reflect single and multiple activations and include activations of all officers who had been in the SMCR at any time between September 2001 and September 2006. There were a total of 2,740 SMCR officers who experienced at least one activation. Of those officers, 434 had completed more than one activation. Among all activated SMCR, enlisted members make up 91 percent of those with completed activations and 92 percent of those still on active duty.

Not all members of the SMCR who are activated are deployed outside CONUS in support of OIF or OEF. Depending on service requirements, reservists may be activated to provide backfill support in CONUS to active units that have been deployed, or they may serve as Individual Mobilization Augmentees supporting military operations at locations within CONUS. To assess cumulative patterns of deployment, we show the distribution of completed activations by deployment status and the length of the active duty period as of September 2006 in figures 3 and 4 for enlisted members and officers, respectively. Among enlisted members, nearly 75 percent of those activated deployed overseas. In comparison, officers are less likely to deploy (59 percent of those activated deploy). Regardless of deployment status, enlisted members are more likely than officers to have been activated for 12 months or less (86 percent of enlisted members versus 67 percent of officers). For both groups, however, activation lengths of 8 to 12 months are the modal category, which is consistent with the Marine Corps 7-month deployment cycle.

Figure 3. Distribution of completed enlisted SMCR activations[a] by length of active-duty period and deployment status, as of September 2006
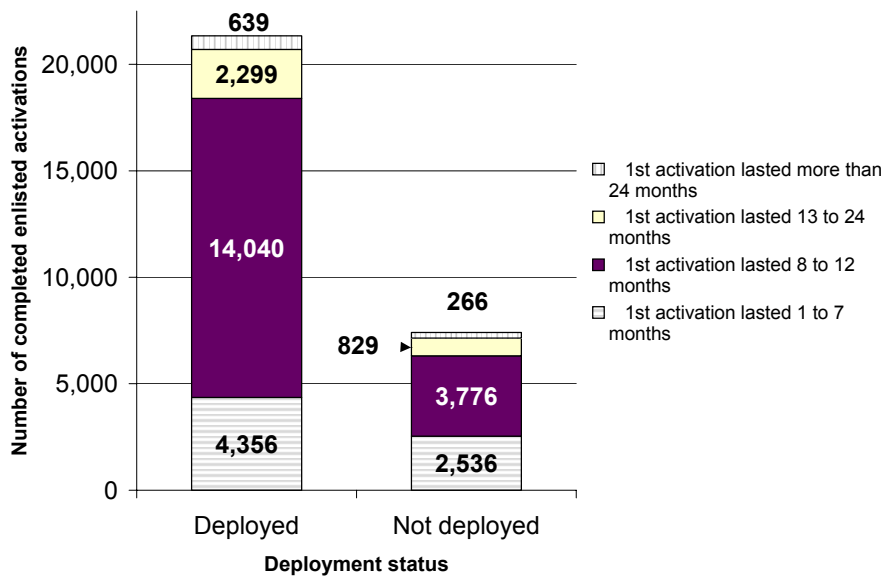
a. Activation length corresponds to the enlisted SMCR's first active-duty period.

Figure 4. Distribution of completed SMCR officer activations[a] by length of active-duty period and deployment status, as of September 2006
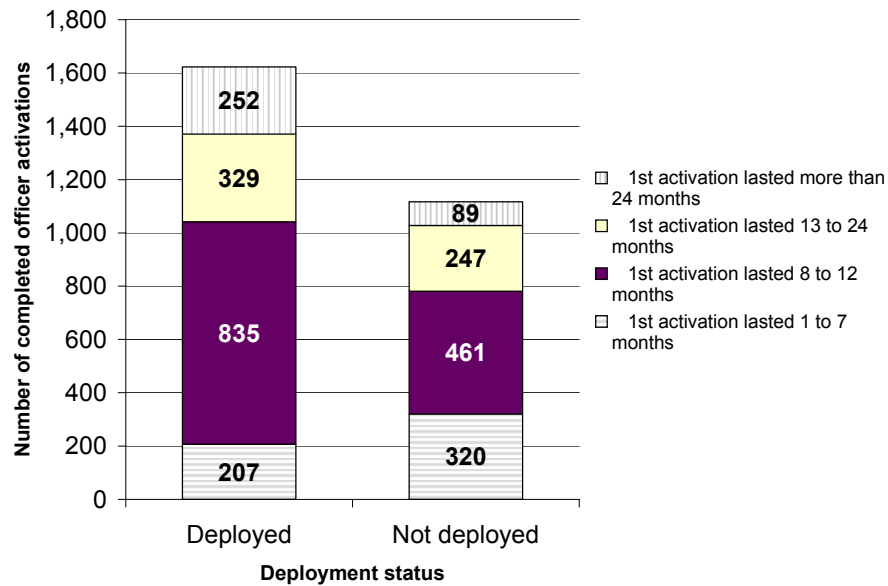
a. Activation length corresponds to the enlisted SMCR's first active-duty period.

Comparatively smaller percentages of enlisted and officer activations have lasted for more than 24 months. For the time period under study here, the current presidential mobilization policy[11] limited involuntary activations to no more than 24 cumulative months. In addition,

11. The current presidential order authorizes the Secretary of Defense and the Secretaries of the Army, Navy, and Air Force under Title 10 U.S.C. [8] "to order any unit, and any member of the Ready Reserve not assigned to a unit organized to serve as a unit in the Ready Reserve to active duty for not more than 24 consecutive months." In implementing this order, DoD restricted involuntary activations to no more than 24 *cumulative* months, so members activated more than once would not have their time clock reset to zero. DoD policy also directed the Services to limit involuntary activations, to the extent possible, to only one per member. However, a policy change announced by the Secretary of Defense on January 11, 2007, changes the 24-month time limit from the cumulative approach to the consecutive application authorized under the law [18] and resets the "activation clock" to zero for all members.

DoD mobilization policy guidance set a goal of 1 year activated, 5 years deactivated for every 6 years of continuous service in the Selected Reserves. Most likely, those members serving for more than 24 months are volunteering for continued active-duty time, although it is possible that these are really *voluntolds*—Marines who are heavily encouraged to extend their activations. Activations exceeding the 24-month limit represent a greater percentage of officer activations than enlisted. Only 3 percent of enlisted activations lasted longer than 24 months, while 12 percent of all officer activations exceeded 24 months. These activations occurred more often among officers who deployed (16 percent) than among those who did not (8 percent).

In figures 5 and 6, respectively, we graph the percentage of SMCR enlisted members and officers who were activated/deployed in each month from September 2001 through September 2006. Activations and deployments are not spread out evenly over the time period. Each data series exhibits the same trend: relatively low percentages of activations during FY 2002 following the September 11th attacks, a sharp increase in January 2003 followed by a sharp decrease around May 2003, and then a series of smaller increases and decreases with an overall downward trend.

The first sharp increase in January 2003 corresponds with the buildup to OIF, and the decrease in May follows the initial success of the contingency's operations. For that short period of time, over 40 percent of the enlisted SMCR and over 50 percent of the SMCR officers were activated. The proportion of the enlisted SMCR activated in any given month from mid-2004 through mid-2005 fluctuated between 25 and 35 percent; for officers, it fluctuated between 30 and 40 percent. During FY 2006, the proportion of the SMCR activated in any given month has decreased slightly to 15 to 20 percent for enlisted members and 20 to 25 percent for officers.

Demographic distinctions

We examined activation and deployment patterns by several demographic characteristics of interest. Specifically, we assessed whether Marines with dependents or with high education levels had similar activation/deployment patterns to Marines without dependents or

Figure 5.   Percentage of the enlisted SelRes force currently activated/deployed,
September 2001–2006
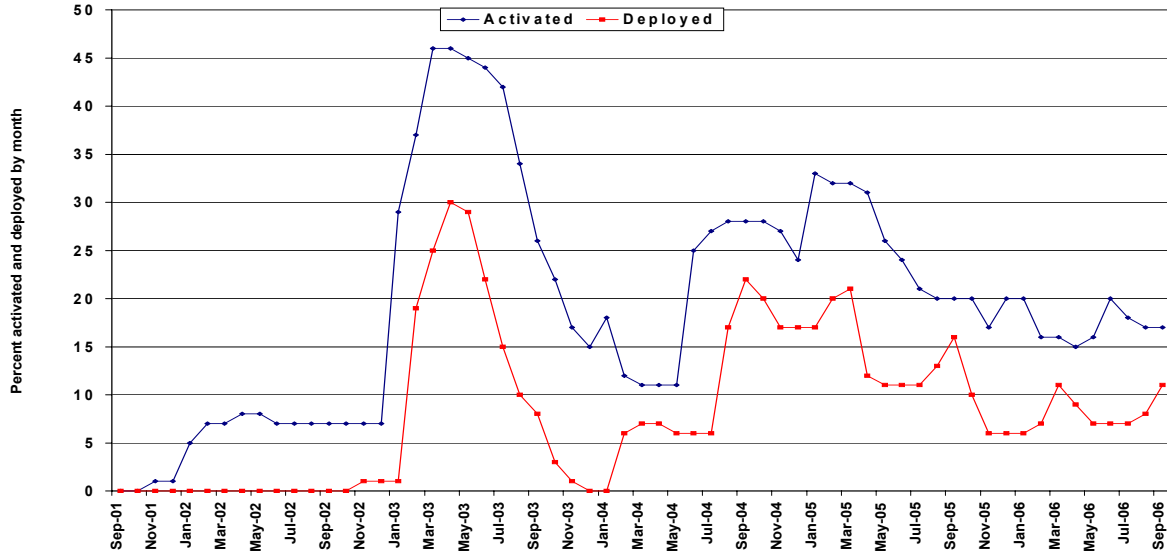
Figure 6.   Percentage of the commissioned officer SelRes force currently activated/deployed,
September 2001–2006
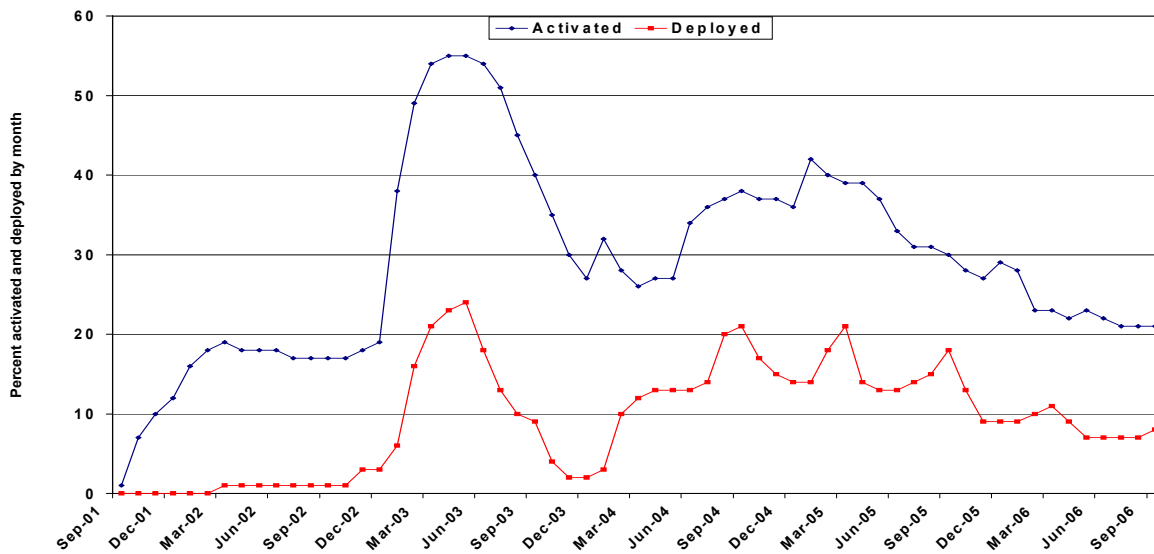
Marines without high education levels, respectively. We found that enlisted Marines with dependents were more likely to be activated than enlisted Marines without dependents each month throughout the time period. We also found that enlisted Marines who were activated had, on average, more years of service than those not activated. Dependency status and years of service tend to be related because Marines with more years of service are also older and will have had more time to establish families. These patterns imply, however, that certain groups of Marines who probably have different costs/benefits associated with activation also have different activation experiences. Thus, there might be differences in retention patterns between these two groups due not only to these different costs but also to these different activation experiences.

Distinctions by Military Occupation Specialty

We also investigated whether there were differences in the pattern of activations/deployments for Marines from different Military Occupational Specialties (MOSs). We examined the percentage of Marines in each MOS that were activated/deployed each month from September 2001 through September 2006. We limited our analysis to non-training MOSs that averaged at least 50 members per month in this time period. This resulted in 74 MOSs that we analyzed for enlisted Marines and 18 MOSs that we analyzed for officers.
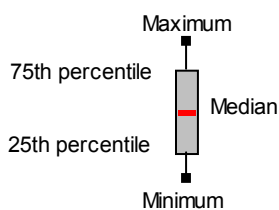
We used boxplots to summarize the distribution across years of the percentage of members in each MOS activated/deployed. Boxplots are a type of graph used to summarize distributions of variables (see diagram at left). They are interpreted as follows: the top and bottom points indicate the values of the maximum and the minimum, the top of the box indicates the 75th percentile, the bottom of the box indicates the 25th percentile, and the red line indicates the median. Figures 7 and 8, respectively, provide boxplots of the distributions for MOSs filled by enlisted Marines and MOSs filled by commissioned officers.

It is useful to keep in mind that we observe a total of 74 MOSs for enlisted Marines; thus, each year about 18 MOSs will fall above the

75th percentile and about 18 MOSs will fall below the 25th percentile. For commissioned officers, out of the 18 MOSs, about 4 will fall above the 75th percentile and about 4 will fall below the 25th percentile. To further establish how to interpret these figures, we examine the distribution of the percentage of an MOS that is activated for enlisted Marines in figure 7. Focusing on September 2006, the MOS with the largest percentage of its members activated had 46 percent of its members activated. A number of MOSs had no members activated; thus, the minimum is 0. Three-quarters of the MOSs had 23 percent or less of their members activated. One-quarter of the MOSs had 5 percent or less activated. Half of the MOSs had 16 percent or less of their members activated.

Figure 7.   Distribution of percentage in each enlisted MOS activated and deployed, September 2001–2006
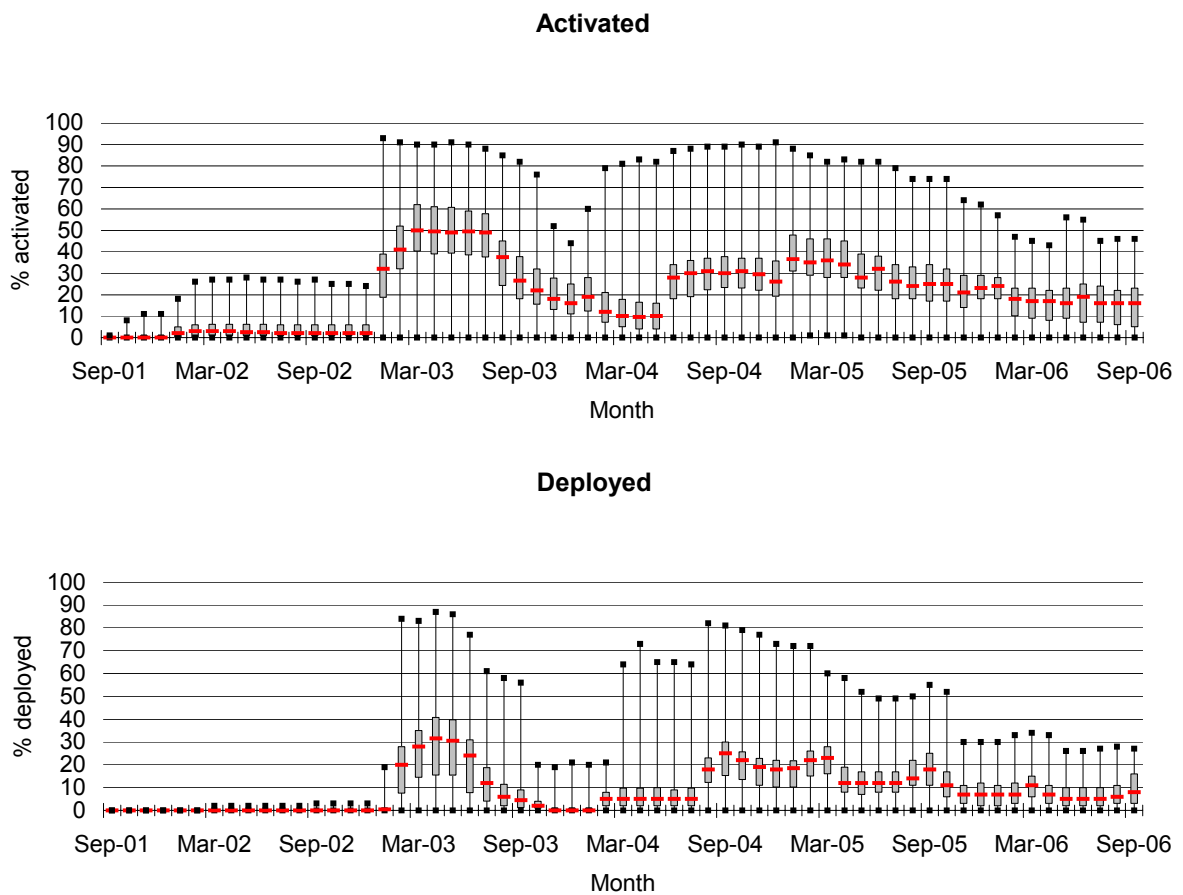
Note that the patterns in figure 7 roughly match up to the patterns in figure 5. This is not unexpected. The figures are simply different views of the same underlying data and patterns. One thing that figure 7 makes clear, however, is that the members of some MOSs had very different activation/deployment experiences compared with the average enlisted Marine. For instance, in March, April, and May of 2004, when only 11 percent of the overall enlisted SelRes force was activated, MOS 6114 (Helicopter Mechanic, UH/AH-1) and MOS 6154 (Helicopter Airframe Mechanic, UH/AH-1) had about 80 percent of their members activated.[12] In fact, between September 2001 and September 2006, nine different MOSs had over 80 percent of their members activated for periods ranging from 2 to 15 months.[13] We also observe the same type of pattern concerning deployments. While April 2003 saw the highest percentage (30 percent) of the overall force deployed, 11 MOSs had periods when over 60 percent of their members were deployed. MOS 6154 and MOS 7212 (Low Altitude Air Defense Gunner) had over 60 percent of their members deployed for 7 consecutive months.[14]

We identify the *most heavily* activated and deployed MOSs for enlisted SMCR as those MOSs that were most often above the 75th percentile for the distribution of activations. We similarly define the most heavily deployed MOSs. Table 7 lists the most heavily activated enlisted MOSs, table 8 lists the most heavily deployed, and table 9 lists those enlisted MOSs most heavily activated *and* deployed. We also indicate

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12. These MOSs averaged 60 members per month between September 2001 and September 2006.

13. The other seven MOSs are 0313 (LAV crewman), 0622 (digital multi-channel wideband transmission equipment operator), 0656 (tactical network specialist), 1833 (AAV crewman), 3112 (traffic management specialist), 5811 (military police), and 7212 (low-altitude air defense gunner).

14. The other nine MOSs that had 60 percent of their members deployed at some point are 0313 (LAV crewman), 0622 (digital multi-channel wideband transmission equipment operator), 0656 (tactical network specialist), 1391 (bulk fuel specialist), 1833 (AAV crewman), 2141 (AAV repairer/technician), 2147 (LAV repairer/technician), 3533 (logistics vehicle system operator), and 6114 (helicopter mechanic, UH/AH-1).

the number of months that the MOSs retained their respective status during two different time periods: January through December 2003 and January 2004 through September 2006. These differences in activation and deployment experiences for certain MOSs may contribute to differences in retention rates across these MOSs. This is an issue that we will examine later when we discuss the results of our modeling of reserve retention behavior.

Table 7.   Most heavily activated MOSs for enlisted Marines in SelRes, January 2003 through September 2006

MOS	Months heavily activated	Average percentage activated while heavily activated
From January 2003 through December 2003		
0193, Personnel/Administrative Chief	12	54%
0481, Landing Support Specialist	11	62%
0656, Tactical Network Specialist	7	81%
1141, Electrician	7	52%
1345, Engineer Equipment Operator	7	59%
1833, AAV Crewman	7	89%
2141, AAV Repairer/Technician	7	72%
3051, Warehouse Clerk	10	49%
3112, Traffic Management Specialist	12	63%
3529, Motor Transport Maintenance Chief	12	51%
3533, Logistic Vehicle System Operator	8	73%
7011, Expeditionary Airfield Systems Technician	11	62%
7051, Aircraft Rescue and Firefighting Specialist	8	48%
From January 2004 through September 2006		
0193, Personnel/Administrative Chief	31	37%
0231, Intelligence Specialist	24	30%
0352, Anti-tank Missileman	17	38%
0614, ULCS Operator/Maintainer	21	36%
1371, Combat Engineer	17	41%
6046, Aircraft Maintenance Administration Specialist	19	47%
6048, Flight Equipment Technician	17	33%
6541, Aviation Ordnance Systems Technician	22	49%

Table 8. Most heavily deployed MOSs for enlisted Marines in SelRes, January 2003 through September 2006

MOS	Months heavily deployed	Average percentage deployed when heavily deployed
From January 2003 through December 2003		
0311, Rifleman	8	20%
0614, ULCS Operator/Maintainer	11	30%
0651, Data Network Specialist	12	20%
3531, Motor Vehicle Operator	8	26%
From January 2004 through September 2006		
0811, Field Artillery Cannoneer	17	23%
1833, AAV Crewman	19	30%
2141, AAV Repairer/Technician	18	28%
2171, Electro-Optical Ordnance Repairer	17	17%

Table 9. Most heavily activated and deployed MOSs for enlisted Marines in SelRes, January 2003 through September 2006

MOS	Months heavily activated	Average percentage activated while heavily activated	Months heavily deployed	Average percentage deployed when heavily deployed
From January 2003 through December 2003				
0313, LAV Crewman	10	78%	9	56%
0369, Infantry Unit Leader	10	52%	11	23%
0622, Digital Multi-Channel Wideband Transmission Equipment Operator	11	66%	11	41%
1391, Bulk Fuel Specialist	7	77%	7	40%
2147, LAV Repairer/Technician	10	68%	7	51%
5811, Military Police	12	64%	11	37%
From January 2004 through September 2006				
0321, Reconnaissance Man	24	43%	26	25%
0369, Infantry Unit Leader	21	29%	18	14%
0629, Radio Chief	30	33%	22	19%
0651, Data Network Specialist	17	40%	18	17%
2841, Ground Radio Repairer	19	40%	23	21%
5811, Military Police	21	42%	22	27%
6114, Helicopter Mechanic	25	75%	18	47%
6154, Helicopter Airframe Mechanic, UH/AH-1	25	79%	17	53%

Figure 8 and tables 10 through 12 show similar information for SMCR officers' MOSs. For officers, there is less variation between MOSs in terms of activation and deployment than there was for enlisted Marines. Two patterns are noteworthy in terms of activations. First, since January 2003, all MOSs had some of their members activated each month. Second, the distribution of percentage of MOS members activated narrowed starting in February 2006. Since then, all MOSs had between 10 and 40 percent of their members activated.

Figure 8.   Distribution of percentage in each officer MOS activated and deployed, 2001–2006
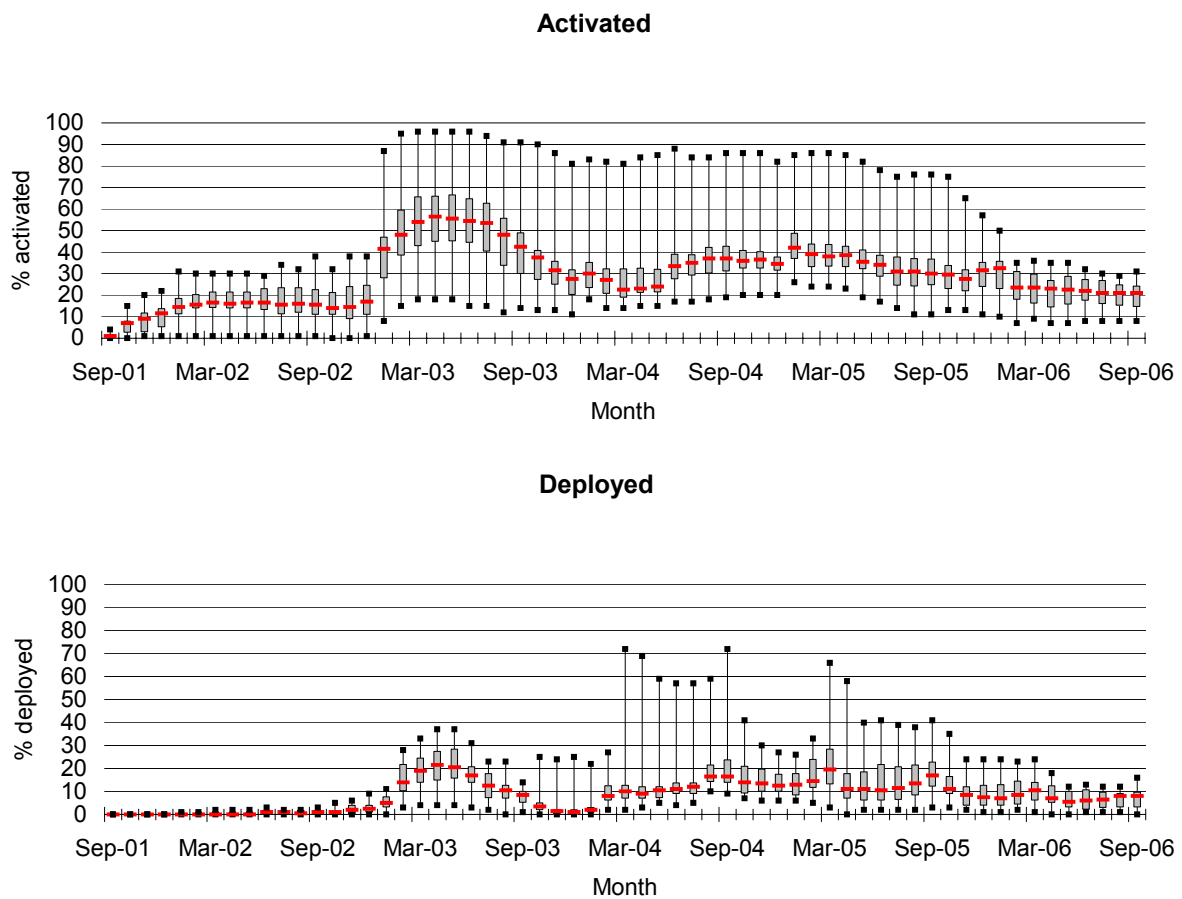
In terms of deployments, the spread of the percentage of MOS members deployed was fairly tight except for some months in mid-2004 and mid-2005. Because activations and deployments are much more evenly spread throughout officers' MOSs than throughout enlisted

MOSs, we would expect there to be less difference among SMCR officers' MOSs in terms of retention behavior due to activation/ deployment. We also identify *most heavily* activating and deploying MOSs for officers (see tables 10 through 12).

Table 10. Most heavily activated MOSs for SMCR officers, January through December 2003[a]

MOS	Months heavily activated	Average percentage activated while heavily activated
3002, Ground Supply Officer	7	61%
7557, Pilot KC-130 Aircraft Commander	12	92%
9904, Colonel, Logistician	11	62%

a. All MOSs that were heavily activated after 2003 were also heavily deployed. See table 12.

Table 11. Most heavily deployed MOSs for commissioned officers in USMC SelRes, January 2003 through September 2006

MOS	Months heavily deployed	Average percentage deployed when heavily deployed
From January 2003 through December 2003		
0302, Infantry Officer	10	22%
From January 2004 through September 2006		
0302, Infantry Officer	17	16%
0802, Field Artillery Officer	19	16%
1802, Tank Officer	19	22%

Table 12. Most heavily activated and deployed MOSs for commissioned officers in USMC SelRes, January 2003 through September 2006

MOS	Months heavily activated	Average percentage activated while heavily activated	Months heavily deployed	Average percentage deployed when heavily deployed
From January 2003 through December 2003				
0402, Logistics Officer	8	61%	8	21%
0602, Communications Officer	10	61%	11	20%
From January 2004 through September 2006				
7562, Pilot HMM CH-46 Qualified	31	49%	27	26%
7565, Pilot HMA	25	79%	22	45%
9906, Colonel Ground	27	36%	18	15%

Separations from the SelRes over time

The major question of concern is whether the ongoing mobilization is contributing to a decrease in reserve retention. In this section, we provide a preliminary examination of SMCR retention patterns since September 2001. For this exercise, we calculate retention as the percentage of reservists on hand in month x who remain in the SMCR 6 months later. In figure 9, we graph the 6-month retention rate for:

- All enlisted Marines

- Non-prior-service enlisted Marines

- Prior-active-service enlisted Marines.

In figure 10, we graph the 6-month retention rate for:

- Enlisted Marines who were not activated during this time period

- Enlisted Marines who completed an activation.

Figure 11 shows similar 6-month retention rates for SMCR officers.

The retention rate for all enlisted Marines is quite high throughout this time period (see figure 9). There are some slight bumps, but the rate never drops far below 90 percent. The retention rate for NPS enlisted Marines mirrors the retention rate for all enlisted Marines. In contrast, the retention rate for PS enlisted Marines is always lower than the rate for all enlisted Marines and is much more variable. This rate varies from just under 70 percent to just over 90 percent. The spike in retention rates early in calendar year 2003 coincides with the establishment of the forcewide stop-loss order.

The retention rate for both NPS and PS enlisted Marines who are not yet activated has been trending upward since mid-2003 (see figure 10). For NPS Marines, 6-month retention rates increased from a low of 75 percent in May 2003 to over 90 percent as of March 2006. For

Figure 9. Six-month retention rates for enlisted SMCR, September 2001 through
March 2006
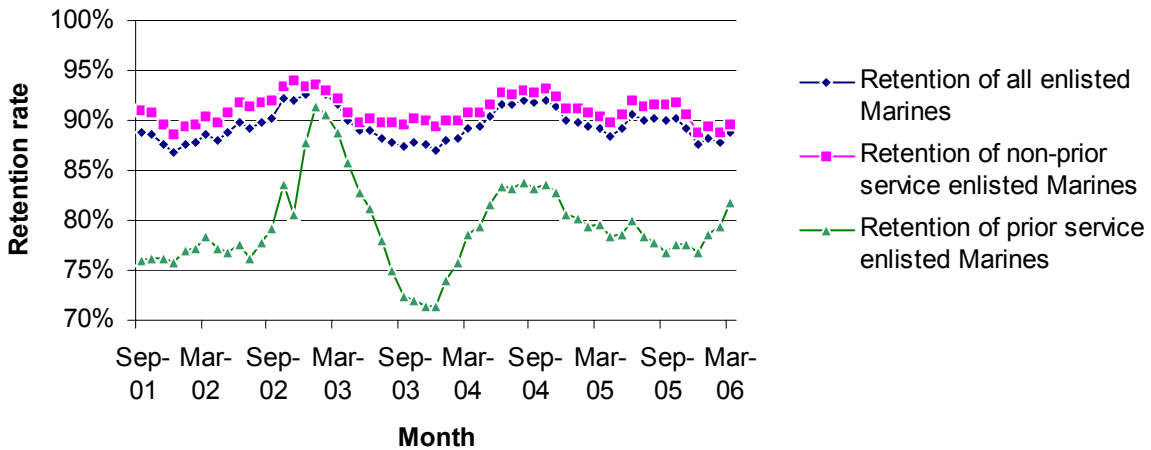
Figure 10. Six-month retention rates for enlisted SMCR by activation status, September 2001
through March 2006
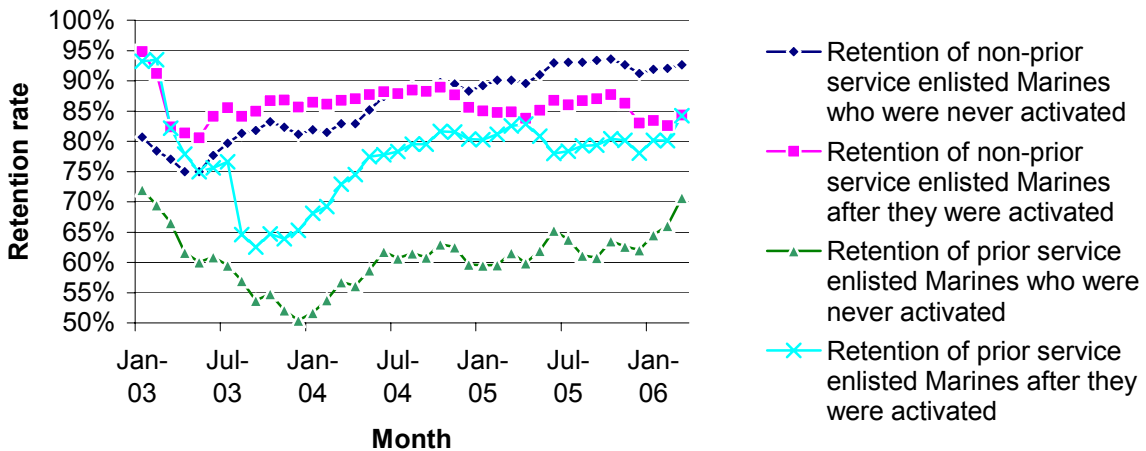
PS Marines, the 6-month retention rate has increased from a low of 50 percent in December 2003 to just over 70 percent as of March 2006. This increase could be due to changing expectations among members of the SMCR regarding the likelihood of activation. When the Marine Corps lifted its forcewide stop-loss order, Marines who did not want to risk future activation most likely left the SMCR as soon as possible. Those who remained and who have joined the SMCR since the beginning of OIF should expect to be activated at some point to support ongoing military operations. We also note that the 6-month retention rates for PS enlisted consistently has been lower than the retention rates for NPS Marines throughout the period. This is most likely because most non-prior-active-service enlisted members are under their initial military service obligation.

Figure 11.   Six-month retention rates for SMCR officers by activation status, September 2001 through March 2006[a]
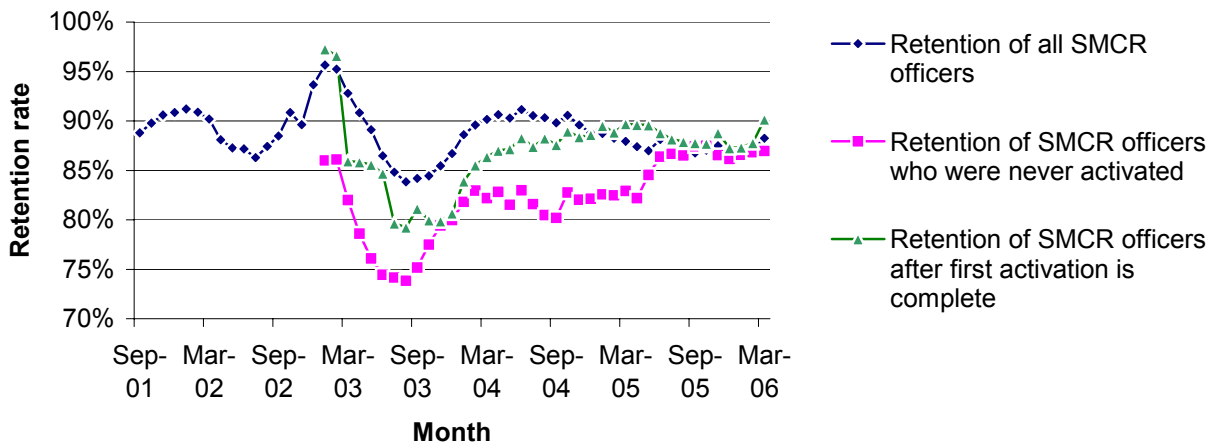
a. We do not include retention rates by activation status before January 2003 because these rates are influenced by small n-sizes.

While retention for PS Marines who completed an activation has also been trending upward, retention for NPS Marines with completed activations has been more steady. Before August 2004, NPS enlisted

with completed activations had higher retention rates compared with enlisted who had not yet been activated. In August 2004, the pattern changed. Since then, NPS enlisted with completed activations have had lower retention rates compared with enlisted who had not yet been activated. For PS Marines, those who had been activated were always more likely to stay in the SMCR than those who had not yet been activated.

Like the overall retention rate for enlisted Marines in the SMCR, the overall retention rate for SMCR officers is also quite high (see figure 11). Both have been trending somewhat downward since October 2004 with the trend for officers more pronounced. In contrast to NPS enlisted Marines, those officers who completed an activation were always more likely to stay than those officers who had never been activated. In mid-2005, these two retention rates converged to approximately 86 percent.

Finally, officers and PS enlisted Marines who are likely to have higher costs for remaining in the Reserves (those with high education levels) are also more likely to stay affiliated with the Reserves during this time period (see figures 12 and 13).[15] This is especially true for PS enlisted Marines; however, NPS enlisted Marines with high education levels are less likely to remain in the Reserves. Recall that both enlisted Marines and officers were less likely to have high education levels in September 2006 than in September 2001 (high education is defined as more than a high school diploma for enlisted Marines and more than a B.A. degree for commissioned officers). The differences in retention rates between those with high education levels and those with average education levels can help explain this change for enlisted Marines, but it cannot explain the change for officers.

While the USMCR has seen an increase in activations and deployments since September 11th, it is not clear how this has affected whether and which type of Marines stay affiliated with the SMCR. The

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15. Figure 12 graphs the retention rate of those nonobligated reservists who have recently completed an activation, but the pattern is similar for all nonobligated reservists and nonobligated reservists who were not activated in this time period.

Figure 12. Six-month retention rates for SMCR enlisted Marines, September 2001 through March 2006, by education level and prior-service status
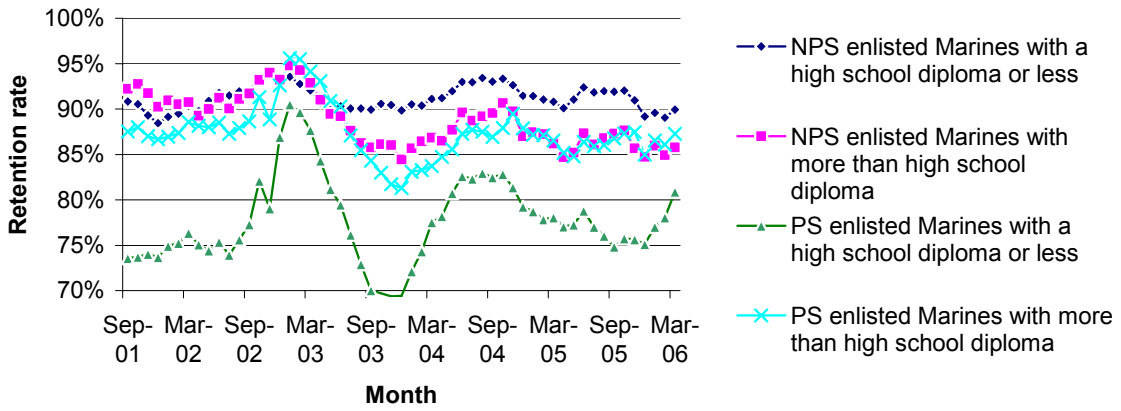
Figure 13. Six-month retention rates for SMCR officers, September 2001 through March 2006, by education level
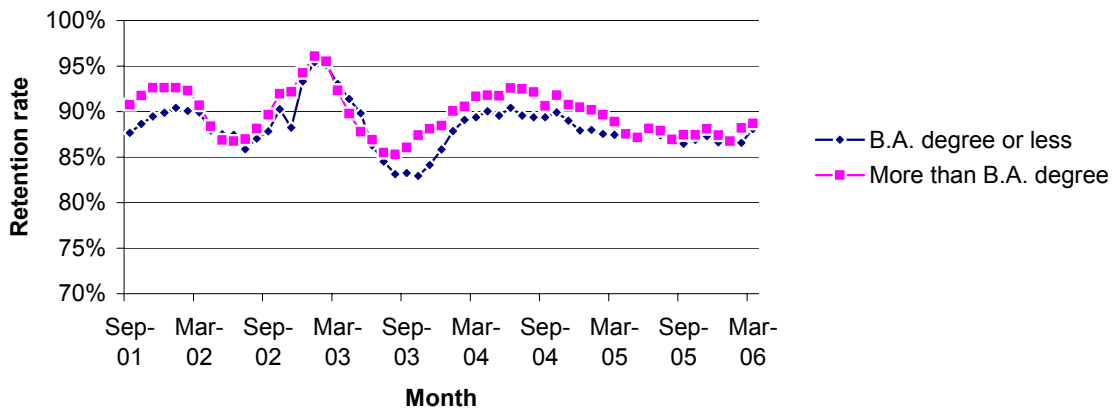
composition of the SelRes was very similar in both September 2001 and September 2006. There is not a clear trend in terms of when activations and deployments increased and when retention rates of non-obligated Marines decreased. Furthermore, groups that may have higher costs to activation/deployment (such as Marines with high education levels) appear to be more—not less—likely to stay affiliated with the Selected Reserves.

All of these patterns suggest that, to fully understand the relationship between retention and activation/deployment, we need a statistical model that can take into account a Marine's individual characteristics, his or her service characteristics, and outside factors that may affect retention, such as the unemployment rate. Furthermore, this model needs to consider the dynamic nature of service in the Selected Reserves and to analyze the retention rates of those reservists who are actually able to leave the SMCR (i.e., those who are not currently activated).

Hazard models of reserve losses

To set the most effective and efficient reserve personnel policies, the Marine Corps needs to have a thorough understanding of Selected Reserve retention behavior. This includes having the most accurate measurement of the effect of events (e.g., activation and deployment) as well as other observable characteristics (e.g., education level and length of service) on the probability of leaving the SelRes. The dynamic nature of the ongoing reserve mobilization means that each month reservists potentially will be changing their status—for example, from never activated to activated, from recently deactivated to activated, or from never activated to a loss. SelRes activity takes on additional states or conditions—nonactivation, activation, or loss—and there are many different paths that reservists might take with respect to activation and loss since September 11th.

Perhaps the most intuitive way to examine how activation/deployment affects SelRes loss is to compare the loss behavior of numerous Marines who experience different levels of activation/deployment. What this type of simple comparison does not take into account is that there are other factors that may be related both to the level of activation/deployment and to loss behavior. For instance, staff NCOs are more likely to have been activated and are more likely to continue in the SelRes compared with enlisted Marines of lower rank. Thus, if we simply compared the loss behavior of those activated with those not activated, we might incorrectly conclude that those who were activated were more likely to continue in the SelRes. To isolate the effect of activation on loss behavior from these types of confounding effects, we need to use a statistical model that allows us to control for other factors that may affect loss.[16] Because we are interested in explaining the duration of affiliation, we use a hazard rate, or survival, model.

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16. We discuss the methodological issues of modeling the dynamic nature of reserve losses in earlier work on enlisted reserve loss patterns [19].

Hazard rate models

We use hazard rate models to conduct our statistical analyses of factors associated with SelRes losses. In this subsection, we describe the approach and explain why it is an appropriate technique for our analysis.

Background

We want to be able to explain the time-to-loss for a typical cohort of reservists. Using regression methods to explain duration (time-to-loss) data of this type presents a number of practical problems [20, 21, and 22]. One difficulty is that the events and characteristics that might explain individual risk may be changing over time.

One technique designed explicitly to deal with duration data is survival analysis. As outlined in [20], these techniques are used in a variety of professions. For example, industrial engineers use these techniques to help explain the time-to-failure of equipment. In medicine, epidemiologists use these techniques to explain survival time following treatment of disease, and economists use survival analysis to explain durations of unemployment. In the current context, we use the approach to model the probability that a particular person will leave the SelRes, given that others at potential risk have remained (survived).

Modeling assumptions and techniques[17]

In survival analysis, the risk of loss occurring at time t for an individual j is a function of time and personal characteristics:

$$h_j(t) = g(t, \beta_0 + x_j\beta_x)$$

This is called a *hazard function.* In our analysis, we use a semi-parametric hazard model—the Cox proportional hazards model—in which the parameters of the hazard function are defined as follows:

$$h(t|x_j) = h_0(t)\exp(x_j\beta_x)$$

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17. References [21] and [22] provide introductions to survival analysis.

The Cox model leaves the baseline hazard, $h_0(t)$, unspecified and unestimated. This is done to avoid placing any constraint on the shape of the hazard over time. Because the Cox model does not estimate a baseline hazard, it is not possible to recover an estimate of an intercept (usually referred to as β_0). The Cox model does constrain how the x_j variables affect the baseline hazard; they are assumed to shift the baseline hazard function multiplicatively.

Reservists can flow in and out of the SelRes, so any given reservist may have several periods of affiliation. As a result, any given reservist may have more than one loss from the SelRes. We include only the first loss from the SelRes in our hazard model. Ideally, we would want t to equal the time in months since a reservist entered the *currently observed* period of affiliation in the Reserves. Unfortunately, our reserve data do not include a variable that allows us to identify this date for reservists who were already in the SelRes in September 2001. We only know the date they originally joined the SelRes. Those reservists who were in the SMCR as of September 2001 present us with the problem of left truncation and contribute to biased estimates.[18] To address this problem, we estimate three sets of models for enlisted members and three sets of models for officers:

- In the first model, we estimate the risk of loss *before activation*. We include only SMCR members who have joined the SelRes since September 2001—that is, t equals the time in months since entering the SelRes for those who joined or reentered after September 2001. This approach captures nearly 80 percent of SMCR enlisted and almost half of SMCR officers.

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18. Those reservists who were in the SMCR as of September 2001 were at risk of loss some time before we actually observe them, and we observe them in September 2001 only because they had survived to that point. This problem is handled in semiparametric models by not counting them as being at risk during the truncation period. In testing our model specifications, we found that setting t as the time in months since originally joining the SMCR inflates the hazard estimates associated with measures of activation and deployment status, while truncating t at September 2001 for those in the SMCR as of that date tends to significantly lower the estimated hazard rates associated with these variables.

- In the second model, we estimate the risk of loss *after activation*. In this model, we include only those SMCR members who have a completed activation—that is, t equals the first month in which the SelRes member is deactivated. This approach captures all enlisted SMCR and SMCR officers who have at least one completed activation since September 2001 and nicely addresses the left truncation issue by defining these Marines to be at risk of loss only at the point at which they are deactivated.

- In the third model, we estimate the risk of loss *before and after activation*. As in our first model, we include only those SMCR members who have joined the SelRes since September 2001—that is, t equals the time in months since entering the SelRes for those who joined or reentered after September 2001.

The purpose of the hazard model is to find out how the characteristics x are associated with risk. We determine this by using maximum likelihood estimation of the hazard functions. We estimate coefficients (β) for the variables in the model to best fit the observed data. Specifically, we select coefficients on the characteristics of reservists to maximize the probability of observing the losses that actually occurred at each particular time in the SMCR after September 11th, 2001. To do this, we maximize the likelihood function given in [22].

In dealing with duration data, hazard rate models are preferred to alternative statistical techniques because they address the various problems that arise in standard regression techniques. In particular:

- Hazard rate models can explicitly represent the complex stochastic process underlying survival times. The assumptions behind standard ordinary least squares, probit, and censored regression models are not as well suited to explain time-to-loss.

- The hazard models address data-censoring (truncation) problems. The data available usually cover a narrow window of time. Hazard rate models can account for observations that were at risk before we observed them (reservists in the SelRes before the data period) or are still at risk when we stop observing them (reservists who remain in the SelRes after our data end). By doing so, hazard rate models avoid biased estimates.

- The approach deals with time-varying characteristics. Time-to-loss from the SelRes is likely to depend on a set of personal characteristics and events that change over time. Designing a regression approach that would explain survival time would present a real challenge. In the hazard model, the person's characteristics are reevaluated at each point in time that a SelRes loss occurs.

Interpreting results

The model of interest estimates the risk of a SelRes loss associated with a set of demographic, military career, and mobilization variables, such as gender, paygrade, activation, and deployment status. Results are expressed as *hazard rates,* which compare the risk for two people who are the same except for a unit difference in one characteristic. This is easiest to understand for categorical variables, such as variables indicating gender. For instance, suppose we include a variable that takes on the value of 0 if the reservist is male and 1 if female. Thus, the hazard rate for that characteristic is the difference in risk for female reservists compared with male reservists. A hazard rate of 1 (or close to 1) indicates that the risk is not appreciably different for reservists with that characteristic than for those without. A value of less than 1 indicates lower risk. For example, a value of 0.5 means that a reservist has only half the risk of leaving the SelRes as someone without the characteristic. In other words, the person is less likely to leave. Similarly, values above 1 indicate higher risk—that is, the person is more likely to leave. The estimation actually determines the coefficient β_i, and each hazard rate is calculated as $\exp(\beta_i x_i)$.

The hazard rate for continuous variables is the ratio of the hazards for a 1-unit increase in the continuous variable. For instance, the hazard rate for the variable measuring months of service when a reservist joined the SelRes is the ratio of the hazard of a reservist who joined the SelRes with $t+1$ months of service with the hazard of a reservist who joined the SelRes with t months of service.

In interpreting the results, it is important to note the *p-value* of the estimate. The p-value measures the smallest significance level at which we would reject the hypothesis that the underlying hazard rates

are equal. It measures how certain we are that the risk of loss differs for reservists with and without a certain characteristic. Thus, a smaller p-value means that we are more certain that the risk of loss differs between those with and without that characteristic. Typically, researchers consider p-values of 0.10 or less as indicating a significantly different risk. For example, suppose we are interested in whether female or male reservists are more at risk of leaving. In our model, we would include a variable indicating whether a reservist is female. If the p-value associated with that variable is equal to 0.05, there is only a 5-percent chance that the risk of loss for female reservists is the same as that for male reservists.

SelRes attrition models

As noted in our earlier subsection on modeling assumptions and techniques, we estimate the probability of a loss for three models that reflect different decision-making points and comparison groups for reservists:

- The first model estimates the risk of loss for those who joined the SMCR since September 2001 and have not yet been activated. We refer to this as the *Before Activation* model.

- The second model estimates the risk of loss for those who have completed their first active duty period. We refer to this as the *After Activation* model.

- The third model estimates the risk of loss for those who joined the SMCR since September 2001, if they are not currently activated, which we define as those who have not yet been activated and those who have completed their first activation. We refer to this as the *Before and After Activation* model.

We estimate each set of models separately for enlisted and officers. For enlisted members, we estimate one set of models for those with no prior active service and a second set for those with prior active service. We relied on previous work on Reserve and Active component attrition to specify the models (see table 13 for a list of our variables). In this effort, we add indicator variables for occupation field and the date of the observation.

Table 13. Variable definitions

Variable	Variable definition
Dependent variable	
Loss	0 if the SelRes member remains in the SelRes in a given month; else 1 if the member is a loss
Independent variables	
Female	1 if female; else 0
Racial/ethnic identifiers	A set of 0/1 variables that describe the SelRes member's racial/ethnic background (white, black, Hispanic, other)
Education level— enlisted models	A set of 0/1 variables that describe the SelRes member's highest level of education (traditional high school degree, high school degree with college, other Tier 1, Tier 2 GED/alternative credentials, Tier 3 no high school degree or equivalent)
Education level— officer models	1 if hold a graduate/professional degree; else 0
Number of dependents	A set of 0/1 variables that indicate the SelRes member's number of dependents (no dependents, 1 or 2 dependents, 3 or 4 dependents, 5 or more dependents)
Geographic region	A set of 0/1 variables that indicate the SelRes member's geographic area of residence, defined using the Census Bureau's 10 geographic divisions
Unemployment rate	Monthly unemployment rate of the SelRes member's home of record state
Paygrade identifiers	1 if the SelRes member is in the specified grade; else 0
MOS heavily activated	1 if the SelRes member's MOS lies above the third quartic in terms of members already or currently activated, else 0 (before activation models only)
Military occupation	A set of 0/1 variables that indicate the SelRes member's 2-digit occupation field
Date of observation	A set of 0/1 variables that indicate the month and year of observation
Activation status/ length, pre-OIF	A set of 0/1 variables that indicate the member's activation status: not yet activated, activated 1-7 months pre-OIF, activated 8-12 months pre-OIF
Activation status/ length, OIF period	A set of 0/1 variables that indicate the member's activation status: not yet activated, activated 1-7 months, activated 8-12 months, activated 13-24 months, activated over 24 months
Activation included deployment	1 if the SelRes member was deployed during their activation; else 0

Data

We created our reserve database from two sets of data supplied by USMC Headquarters, Manpower and Reserve Affairs (HQ M&RA). The first is an extract of individual-level records from members of the SMCR from the Marine Corps Total Force System. The second set of data is from the mobilization and deployment file maintained by the Reserve Affairs Policy Branch within the Reserve Affairs Division of M&RA. Both datasets are end-of-the-month snapshots from Septem-

ber 2001 through September 2006. For modeling purposes, we include only Marines who are fully trained, drilling members of the SMCR and Individual Mobilization Augmentees. In table 13, we describe the variables that we use in our hazard models.

Using our database, we track the monthly status of each SelRes member. We identify a member as a "loss" from the SelRes when he or she either no longer appears in the monthly snapshot for at least 3 consecutive months or transfers to the Individual Ready Reserve or Active Reserve for at least 3 consecutive months. By looking out 3 months, we verify that the person has really left the SelRes component rather than being subject to some administrative action that causes his or her record to disappear from the data file and then reappear over a 2- to 3-month period.

Defining attrition as a loss from the SelRes is different from typical attrition studies of active duty personnel that look at decisions at the reenlistment point (e.g., see [12 and 13]). This approach is not easily adaptable for analyzing reserve attrition because the reenlistment point is ambiguous and Marines can transition from the SMCR to the IRR before they reach the end of their mandatory service obligation. When estimating a hazard model, however, it is important to define when an observation is "at risk" of loss. In our model, this means that we need to define when a member of the SelRes is at risk of leaving the SelRes. We defined members to be at risk of loss under three different scenarios: Before Activation, After Activation, and Before and After Activation.

Next, we use the mobilization and deployment file (which is maintained by the Reserve Affairs Policy Branch within the Reserve Affairs Division of M&RA) to classify the SelRes members as either "completed an activation" or "not yet been activated." As mentioned before, we consider only the first activation of the SelRes members. We further classify the SelRes members by the length of time, in months, that the member was activated and by whether the completed activation included a deployment outside the continental United States (OCONUS).

For the first scenario, in which we estimate the risk of loss before activation, the model assesses the loss behavior of reservists from Septem-

ber 2001 through September 2006. Because none of the Marines have been activated under the first scenario, we do not include independent variables in these models that measure activation status/length and deployment status. We do include a variable that measures the proportion of a Marine's MOS already or currently activated to determine if Marines in more heavily activated MOSs are at a greater risk of loss.

For the second and third scenarios, we assess the loss behavior of reservists from January 2003 through September 2006, which includes the buildup for Operation Iraqi Freedom (OIF) as well as OIF. In these models, we include a set of independent variables that distinguish between activations that occurred before OIF and during the OIF period because it is very likely that activations and deployments before OIF were different from activations and deployments that happened during OIF in ways that we cannot observe and that, as a result, they affected loss behavior differently.

For each of the above scenarios, we estimate three sets of models. The first set evaluates the impact of the ongoing mobilization on non-prior-service (NPS) enlisted SelRes. The second set addresses prior-service (PS) enlisted SelRes, and the third set looks at SelRes officers. We estimate SMCR losses as a function of five general sets of variables: mobilization factors, military characteristics, individual characteristics, economic factors, and fixed effects. Each model includes the period when the Marine Corps-wide stop-loss was in effect. We control for this stop-loss period by including a set of time dummy variables (indicating month and year of the observation) in our model. These dummy variables control for the fact that the number of losses during stop-loss should be relatively small compared with the number of losses during the rest of the time period. The time dummy variables also account for the fact that longer activations were more likely to occur later on in the OIF time period. If we did not include these dummy variables for month and year, the estimated effect of longer activations could potentially pick up the effect of variables outside our model that were also changing over time.

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NPS enlisted loss patterns

Risk of loss before activation

The first model we discuss evaluates the risk of loss for NPS enlisted who have joined the SMCR since 2001, before activation. Our model includes monthly observations for this group from September 2001 through September 2006. Later, we look at the risk of loss for only those with completed activations and then for all NPS enlisted. By looking first at retention behavior of NPS enlisted reservists before they are activated, we build a first layer of understanding regarding those factors that significantly affect the risk of loss for these Marines that does not involve comparisons with those who have been activated.

Figure 14 provides a graphical summary of the hazard rates associated with reservists' individual perceptions of potential activation and select military and demographic characteristics. The hazard rate compares the risk for two people who are the same except for a unit difference in one particular characteristic. A hazard rate of 1 (or close to 1) indicates that the risk of loss is not appreciably different for Marines with that characteristic than for those without. A value of less than 1 indicates a lower risk. For example, a value of 0.5 means that a person has only half the risk of someone without the characteristic. A value above 1 indicates higher risk.

NPS enlisted take cues on activation potential from their MOS communities

We measure a reservist's perception of potential activation based on whether the member is in an MOS that has been heavily activated versus in an MOS that has not been heavily activated. We define heavily activated MOSs as those that were most often above the 75th percentile for the distribution of MOS activations. Our intent is to

determine whether reservists are gauging their potential for activation based on the activation patterns of other reservists in their MOS. It appears that NPS enlisted do take cues from the activation patterns of other reservists with whom they share the same MOS. Controlling for other factors, we find that NPS enlisted members who have not been activated and are in a heavily activated MOS have a significantly higher risk of loss. Enlisted Marines in the most heavily activated MOSs have an 85-percent greater risk of loss from the SMCR compared with others in MOSs that have not been heavily activated.

Figure 14. NPS enlisted SMCR before activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] September 2001–2006
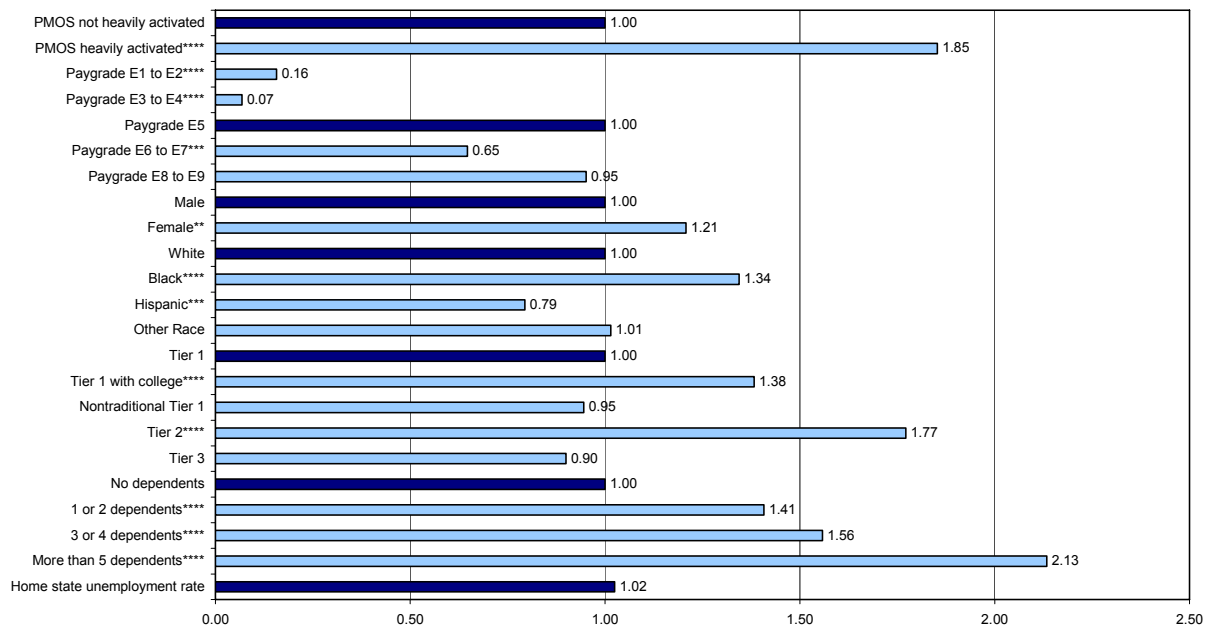
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

E-5s are the most likely to leave the SMCR

Among all paygrade levels, NPS Marines at the E-5 paygrade are the most likely to leave the SMCR. In comparison, the risk of loss for NPS junior Marines is extremely low. Junior Marines (E-1 and E-2) have an 85-percent lower risk of loss, while the risk of loss for Marines in paygrades E-3 and E-4 is even lower. We expect that the reason for the lower risk of loss for junior Marines is that most of the Marines at these paygrade levels are new joins to the SMCR who are still under their initial military service obligation (MSO). Senior Marines in paygrades E-6 and E-7 also have a significantly lower risk of loss compared with E-5s, while the most senior Marines in paygrades E-8 and E-9 are no more or less likely to leave. More senior NPS reservists are most likely not under obligation and are more easily able to transition out of the SMCR. In addition, the influence of retirement and its associated benefits will become a greater factor in their retention behavior.

Risk of loss higher for blacks and for women

All else being equal, blacks had a 34-percent higher risk of leaving compared with whites; Hispanics had a 20-percent lower risk of leaving compared with whites, and the risk of loss for those of other racial identification was not significant.

The hazard ratio for women was 1.21, indicating that women are at higher risk of loss than men are. The risk of loss for women Marines is statistically significant.

Having dependents increases risk of loss before activation

Previous research on the Active component has found that retention tends to be higher among Marines with dependents than without dependents [12]. However, family concerns are often noted as a source of stress for reservists. Our hazard model results indicate that, before activation, NPS enlisted reservists are at a significantly greater risk of loss if they have dependents. Notably, the risk of loss increases as a Marine's number of dependents increases: those with 1 or 2 dependents have a 40-percent greater risk of loss, those with 3 or4 dependents have a 55-percent greater risk of loss, and those with 5 or more dependents have over twice the risk of loss.

Those with higher educational credentials had higher risk

We include in the model variables for people whose education went beyond high school, who had nontraditional high school degrees, and who were Tier 2 or Tier 3. Marines whose education went beyond high school were much more likely to leave (nearly 40-percent higher risk) than those with high school diplomas. Tier 2 Marines also had a significantly greater risk of loss (nearly 80-percent higher). In contrast, those with nontraditional high school degrees and Tier 3 Marines were slightly, but not significantly, less likely to leave.

NPS enlisted more likely to leave before OIF

Like the Active component, the SMCR tends to be made up of first-term Marines. These Marines also tend to have no prior service, and we know from our earlier discussion of demographic trends that over 75 percent of the force as of September 2006 has affiliated with the SMCR since September 2001 and that these Marines tend to be under obligation.

The hazard rates associated with monthly fixed effects indicate two distinct patterns. During the first 16 months following September 11th, NPS enlisted reservists were much more likely to leave. Since January 2003, the pattern has changed and reservists are more likely to remain in any given month. The pattern is interesting because these Marines affiliated with the SMCR during a time when expectations were clear regarding the increased likelihood of being activated. Keep in mind that the Marine Corps did not involuntarily activate many members of the SMCR from September 2001 through December 2002. Potentially, those who joined in the year following the September 11th attacks may have been acting on an emotional response that they reconsidered as the direction of the global war on terrorism became more defined. Those Marines who have joined the SMCR since January 2003 should clearly expect to be activated. Indeed, we might surmise that these Marines joined the SMCR with the intent of being activated at least once before making a decision regarding their affiliation status. In addition, because the SMCR tends to be a first-term force by design, we expect that, when these Marines do reach a decision point regarding whether or not to con-

tinue their affiliation with the SMCR, many more will leave than will remain.

Risk of loss for only those NPS with completed activations

In this subsection, we turn our attention to the retention patterns of only those NPS reservists who have completed an activation. Because very few enlisted SMCR were activated before the buildup to OIF began in January 2003, we restrict our time period of analysis to February 2002 through September 2006. In this model, we consider four aspects of the ongoing mobilization: activation status before OIF, activation status during OIF, the length of the active duty period, and deployment status. We differentiate between activations that occurred before and during the OIF period because we believe that the nature of these activations during these two periods has been different. We consider enlisted members to be deployed if they are sent to support a named contingency operation outside CONUS. In nearly all cases, Marines have been deployed in support of OEF or OIF. Figure 15 provides a graphical summary of the hazard rates associated with activation, the length of activation, deployment status, and select military and demographic characteristics.

Risk varies by length and timing of activation

In this part of our analysis, all reservists under study have been activated. We are most interested in knowing whether the risk of loss differs regarding the timing of the activation (pre-OIF vs. during OIF) or the length. In the Marine Corps, activation periods for reservists tend to last 8 to 12 months, and most activations have occurred since January 2003. Consequently, we assess the risk of loss by length and period compared with those activated for 8 to 12 months during OIF. In terms of the timing of the active duty period, those NPS enlisted reservists activated before OIF are the least likely to leave. The risk of loss for those activated 1 to 7 months before OIF is 32 percent lower than that of those activated 8 to 12 months during OIF; those activated 8 to 12 months before OIF have a 20-percent lower risk. Those activated during OIF for 1 to 7 months also have a significantly lower risk of loss. In contrast, those activated for more than 12 months during OIF have a significantly higher risk of loss, and the level of risk

Figure 15. Only enlisted SMCR with completed activations, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] February 2002 through September 2006
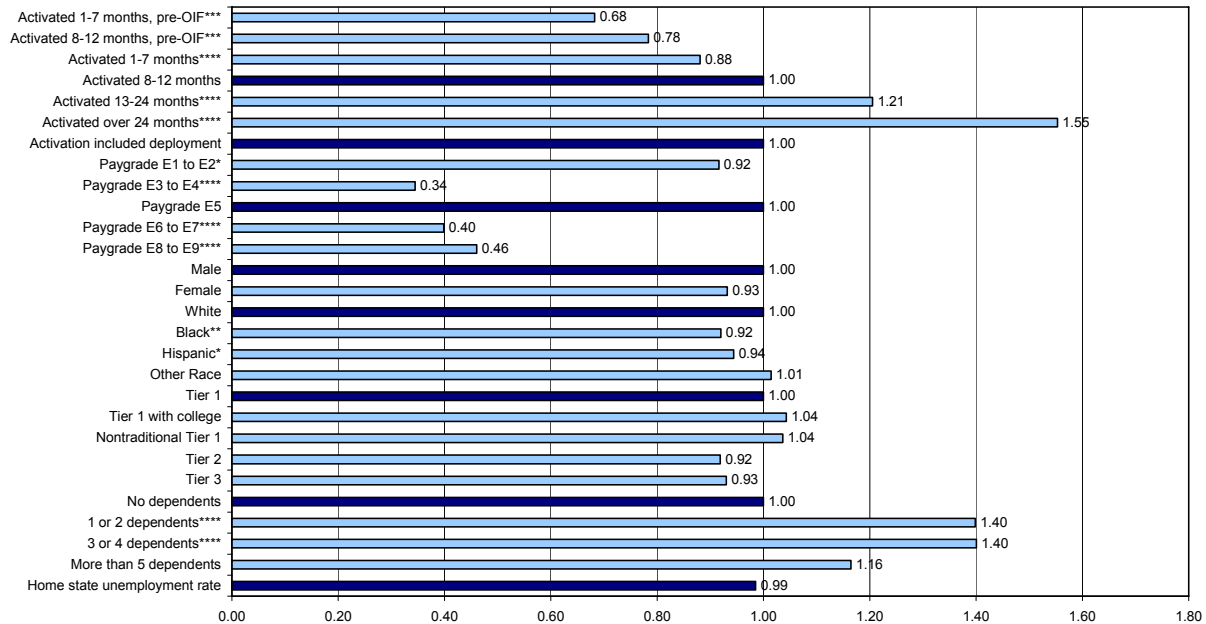
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

increases with the time activated. Those activated for 13 to 24 months have a 20-percent greater risk of leaving the SMCR; those activated for more than 24 months have an even higher risk of loss, 55 percent.

As we showed earlier in our discussion of basic activation and deployment patterns since September 11th, approximately 86 percent of those activated have served for 12 months or less, and activation lengths of 8 to 12 months are the modal category. These patterns are consistent with the Marine Corps 7-month deployment cycle. The loss behavior of enlisted SMCR who have been activated follows a pattern that nicely aligns with the expectations set by the Marine Corps' standard deployment practice. Activation lengths that exceed those expectations tend to have a significantly higher risk of loss compared with the 8- to 12-month OIF activation category.

Deployment does not significantly affect risk of loss

In the Active component, the effect of increased deployments on reenlistments has been mostly positive or has not had a significant effect [10, 12, 13]. Our results indicate that risk of loss for NPS Marines is not significantly different for those who deployed than for those who did not.

Occupational effects correspond with heavily activated MOSs.

In the before-activation model, we assessed reservist's perception of potential activation based on whether the member is in an MOS that has been heavily activated or one that has not been heavily activated. In the after-activation model, we include a series of variables that identify reservists' occupational fields. Compared with enlisted reservists in occfield 03XX, Infantry, we find several occupations in which reservists have a significantly higher risk of loss. They are shown below:

Occfield number	Occfield name	Percentage higher risk
01XX	Personnel and Administration	22
04XX	Logistics	17
06XX	Communications	9
08XX	Field Artillery	31
21XX	Ground Ordnance Maintenance	17
28XX	Ground Electronics Maintenance	17
30XX	Supply Administration and Operations	13

Personnel and Administration, Logistics, and Supply have experienced the largest decreases—from 15 to 25 percent—in their relative enlisted inventories since September 2001. Communications, Field Artillery, and Ground Ordnance Maintenance also experienced decreases of about 5 percent in their relative inventory levels since September 2001. In addition, occfields 01XX, 04XX, 06XX, 21XX, and 30XX included MOSs that we identified earlier in table 7 as being most heavily activated during the OIF period.

Those occupations in which reservists have a significantly lower risk of loss follow:

Occfield number	Occfield name	Percentage lower risk
02XX	Intelligence	20
11XX	Utilities	13
23XX	Ammunition and Explosive Ordnance Disposal	25
33XX	Food Service	14

Of these occfields, Intelligence and Food Service have seen their inventory levels decrease by 6 and 9 percent, respectively, since September 2001, yet their relative risk of loss remains lower than those Marines in occfield 03XX. Utilities and Ammunition and Explosive Ordnance Disposal have inventory levels that have grown. Only occfield 11XX, Utilities, was among the most heavily activated MOSs for enlisted SMCR from January through December 2003, but not thereafter. In addition, none of the other occupational fields with a significantly lower risk of loss were among the most heavily activated during the OIF period.

NPS enlisted more likely to leave before OIF and following the end of stop-loss

In the before-activation model, we found that the hazard rates associated with monthly fixed effects indicate two distinct patterns: (1) during the first 16 months following September 11th, NPS enlisted reservists were much more likely to leave, and (2) after January 2003, reservists were more likely to remain in any given month.

In the after activation-model, the patterns change slightly. Keep in mind that the loss behavior we are modeling now is for all Marines with a completed activation, regardless of when they started their current affiliation period. We expect that the reservists with completed activations early in the period are those who were already in the SMCR as of September 2001 and that those with completed activations later in the period will increasingly include a growing percentage of enlisted members who have joined the SMCR since September 2001. The hazard rate patterns for monthly fixed effects indicate that these Marines were much more likely to leave during the first 2 years of OEF and OIF and have been more inclined to stay since October

2004. These patterns support an overall shift in expectations among NPS reservists. Those already in the SMCR as of September 2001 did not affiliate with the certainty of being involuntarily activated. Those affiliating after September 2001 do have this expectation.

Specifically, NPS reservists with completed activations have significantly higher risk of loss from February through August of 2002; however, immediately before the buildup to OIF, their risk of loss is not significant. In January 2003, the Marine Corps imposed a forcewide stop-loss order that ran through May. It is interesting that the risk of loss for NPS enlisted Marines with completed activations was significantly higher during the first 3 months of the stop-loss order and then becomes insignificant. While no Marines were supposed to be leaving the Corps during stop-loss, it appears that the Marine Corps was providing special consideration to those who had already completed an activation. In the year following the end of stop-loss, the risk of loss in any given month tends to be significantly greater, but since FY 2004, the level of risk is insignificant.

Some characteristics have similar effects

Several variables had coefficients and significance levels that were similar to the hazard rates estimated for the before-activation scenario. These include paygrade and dependency status/number of dependents. The relative hazard rates by gender and education levels had significantly different levels of risk of loss in the before-activation model. In the after-activation model, however, we find no significant differences.

Risk of loss for all enlisted NPS SMCR (before and after activation)

In this final subsection, we focus on determining the relative effect of the ongoing mobilization on all NPS enlisted, including those who have not yet been activated and those who have been activated—but only for those whose current affiliation spell started since September 2001. For this model, our period of analysis begins in November 2001 and runs through September 2006. We include the same four aspects on the ongoing mobilization: activation status pre-OIF, activation

status during OIF, length of active duty period, and deployment status. Figure 16 is a graphical summary of the hazard rates associated with activation, the length of activation, deployment status, and select military and demographic characteristics.

Figure 16. All enlisted SMCR before and after activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] September 2001–2006
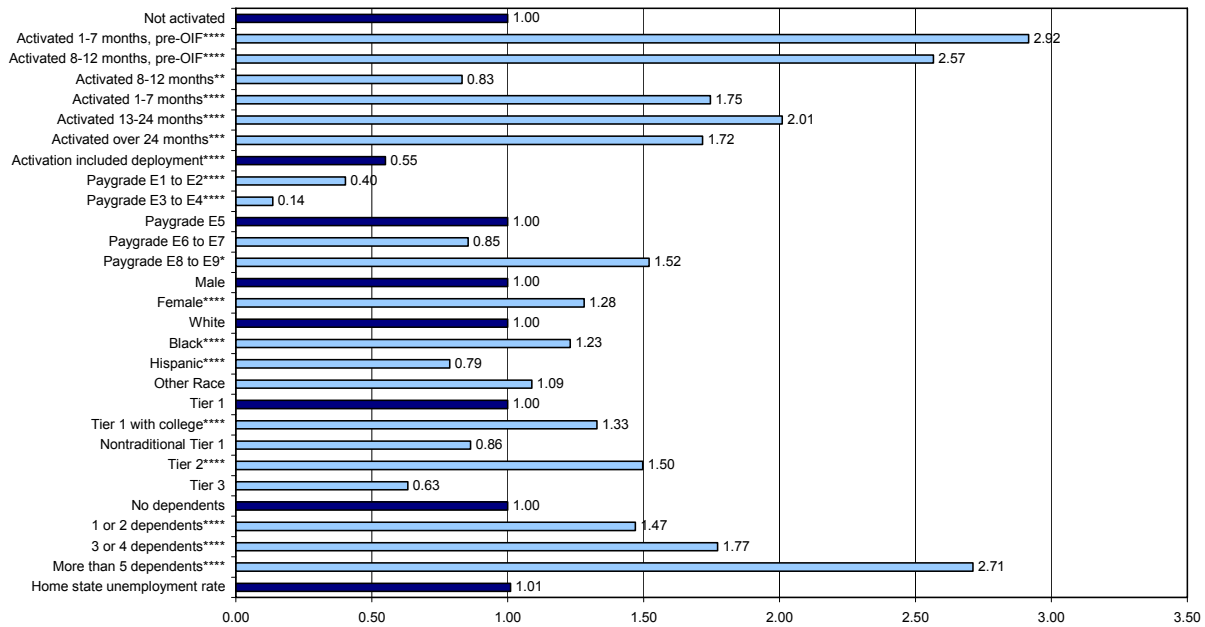
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

Overall, our pattern of results for our set of military and demographic characteristics tends to correspond to the patterns that we discussed for the before-activation model for which we also restricted the sample to include only NPS reservists whose currently observed affiliation period began after September 2001. The dramatic difference here is with regard to the relative effect of activation and deployment on the risk of loss. We find that the risk of loss for NPS Marines *who have been activated* is much higher compared with *those not yet activated* and that the level of risk tends to increase as the length of activation

increases. Compared with those not yet activated, the risk of loss for those activated before OIF is as follows:

- Nearly 3 times greater for those activated 1 to 7 months

- Over 2 times greater for those activated 8 to 12 months.

The risk of loss remains significantly higher for most activation lengths during OIF:

- Those activated 1 to 7 months have nearly 75 percent greater risk of leaving compared with those not yet activated.

- Those activated 13 to 24 months have twice the risk of leaving.

- Those activated over 24 months have a 72-percent higher risk of leaving.

Bear in mind, however, that nearly two-thirds of the enlisted SMCR members activated serve for periods lasting 8 to 12 months:

- These Marines have a 25-percent lower risk of leaving compared with those not yet activated.

In addition, deployment status has a significant and large dampening effect on the risk of loss. Enlisted SMCR loss behavior indicates a clear preference for when the Marine Corps meets the expectations it has set in terms of activation length.

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PS enlisted loss patterns

As with the non-prior service (NPS) enlisted force, we estimate three models for the prior-service (PS) force. The first model evaluates the risk of loss before activation for PS enlisted who joined the SMCR since 2001. The second evaluates the risk of loss for PS enlisted after they have been activated. The third model evaluates the risk of loss before and after activation for PS who joined the SMCR since 2001. For a full discussion of the models, see the foregoing section on NPS enlisted loss patterns.

Risk of loss before activation

Figure 17 provides a graphical summary of the hazard rates associated with reservists' individual perceptions of potential activationsand select military and demographic characteristics. The prior service enlisted SMCR community represents less than 15 percent of the total SMCR force. They tend to be older, more senior in rank, and generally are not under obligation. As prior service members, they have tried full-time active duty service and opted for part-time affiliation.

Heavy activation within MOS community does not increase risk of leaving

As with the NPS community, we first examine whether belonging to a heavily activated MOS affects one's decision to leave before one is activated. Unlike the NPS community, we find no effect.

E8/E9s least likely to leave

E-1s/E-2s are the most likely to leave, but we do not place any great significance in this result because there are very few E-1s/E-2s in the PS community. The other paygrades are about as likely to leave with the exception of E-8s and E-9s who are almost half as likely to leave as

E-5s. For these Marines, it is most probable that their decision to stay in the SMCR is heavily influenced by promised retirement benefits.

Risk of loss higher for blacks and lower for other minorities

Compared with white PS Marines, black PS Marines face a 9-percent higher risk of leaving before activation, while Hispanic and other racial minorities face lower risks of leaving (19 percent for Hispanics, and 12 percent for other race). This fits the same pattern seen in the NPS community.

Figure 17. PS enlisted SMCR before activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] September 2001–2006
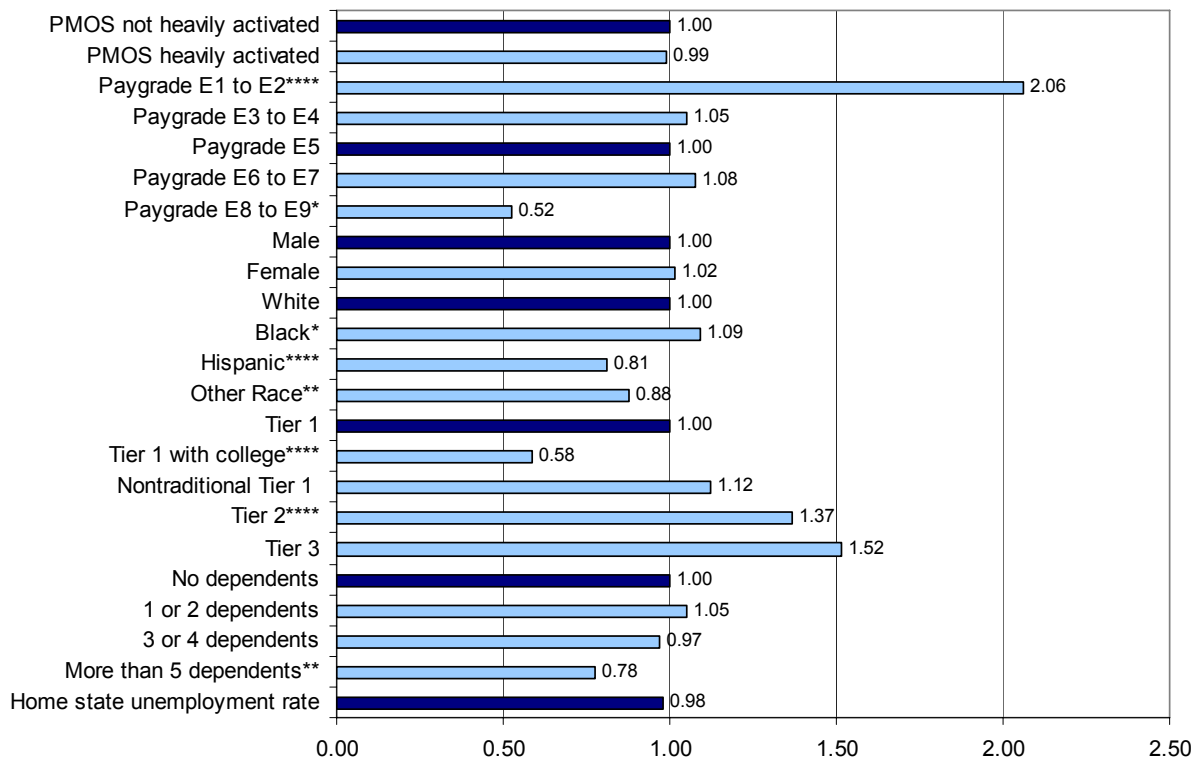
a. Significance levels are denoted as follows: * 0.1, ** 0.05, ***0.01, ****0.001
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

Those with more education and dependents are less likely to leave before activation

The risk of leaving increases as the level of education decreases, although only the results for Tier 1 with some college (42 percent less likely to leave than regular Tier 1) and Tier 2 (37 more likely to leave than regular Tier 1) are significant.

Dependency status hasno significant effect on the risk of loss for those PS reservists with lower numbers of dependents. However, those with five or more dependents are 22 percent less likely to leave compared with those with no dependents.

PS enlisted more likely to leave immediately before OIF

As with the NPS community, PS reservists were the most likely to leave in December 2002/January 2003. PS reservists were four times as likely to leave in this month compared with the end of stop-loss (August 2003). We expect that, at this point, those in the Reserves for whom activation was particularly unappealing chose to leave.

Risk of loss for only those PS with completed activations

In the second model, we modeled the probability of leaving for those PS reservists after they had completed an activation. We only include observations after January 2002 because there were no completed activations up until this point.[19] We control for both the timing (pre-OIF versus OIF) and length of the reservist's first activation, as well as whether or not the activation included deployment. Figure 18 shows a graphical representation of these results.

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19. Our period of estimation differs by 1 month for the PS enlisted models versus the NPS enlisted models. For the PS enlisted model, we were able to include January 2002.

Length and timing of activation does not affect probability of leaving

Neither the length/timing of activation nor being deployed during an activation affected a PS Marine's decision to leave after activation (see figure 18).

Figure 18. Only enlisted PS SMCR with completed activations, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] February 2002 through September 2006

Characteristic	Value
Activated 1-7 months, pre-OIF	0.82
Activated 8-12 months, pre-OIF	0.97
Activated 1-7 months	0.96
Activated 8-12 months	1.00
Activated 13-24 months	0.93
Activated over 24 months	1.15
Activation included deployment	1.03
Paygrade E1 to E2***	2.98
Paygrade E3 to E4****	1.49
Paygrade E5	1.00
Paygrade E6 to E7****	0.50
Paygrade E8 to E9****	0.42
Male	1.00
Female*	1.20
White	1.00
Black	0.88
Hispanic	1.01
Other Race	1.02
Tier 1	1.00
Tier 1 with college***	0.81
Nontraditional Tier 1	0.89
Tier 2*	1.31
Tier 3	1.35
No dependents	1.00
1 or 2 dependents	0.99
3 or 4 dependents**	0.87
More than 5 dependents**	0.76
Home state unemployment rate	0.99

a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

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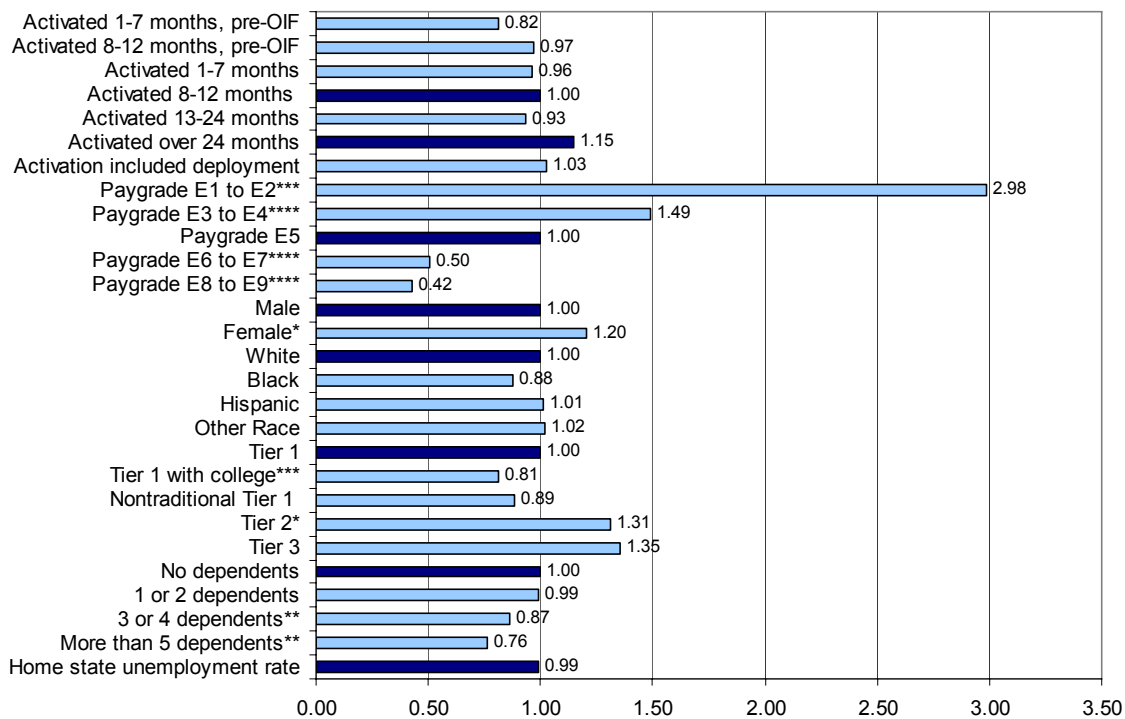
Other demographic and service characteristics echo before-activation results

After activation, the risk of leaving decreases as the paygrade increases. Again, we do not place any great significance on the results for E-1s/E-2s because there are very few in the PS community. E-3s and E-4s are then the most likely to leave; they face a 50-percent greater chance of leaving compared with E-5s. E-6s and E-7s are about half as likely to leave as E-5s, and E8s/E9s are about 60 percent less likely to leave compared with E-5s.

Those with more education are also less likely to leave after activation. As with the before-activation results, only the risk for Tier 1 with some college (19 percent less likely) and Tier 2 (31 percent more likely) are significantly different from the risk of Tier 1. Those with the most dependents are also less likely to leave. Those with three or four dependents are 13 percent less likely to leave, and those with five or more dependents are 24 percent less likely to leave compared with those with no dependents.

PS enlisted more likely to leave before OIF and following the end of stop-loss

Similar to the NPS after-activation results, there was an increase in the likelihood of leaving in the first few months of OIF for those PS enlisted who had already completed an activation despite the implementation of stop-loss. The likelihood of leaving spiked again immediately after stop-loss and remained consistently high through the first few months of 2004.

Risk of loss for all enlisted PS SMCR (before and after activation)

Our final model for the PS community estimates the probability of leaving for all prior-service Marines who joined the SMCR after September 2001. We characterize activations in the same manner as for the after-activation model. See figure 19 for a graphical representation of our results.

Activation increases the likelihood of leaving for PS enlisted Marines. The only exception is activations that occurred pre-OIF and lasted less than 7 months. For all other types of activations, the risk of leaving increases with the length of activation. Deployment has no effect on the probability of leaving for this group.

As with the other two models for the PS enlisted force, the risk of leaving decreases with paygrade and decreases with education. Hispanics are less likely to leave compared with whites, and those with five or more dependents are less likely to leave compared with those with no dependents.

Figure 19. All enlisted PS SMCR before and after activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] September 2001–2006

Characteristic	Value
Not activated	1.00
Activated 1-7 months, pre-OIF	1.30
Activated 8-12 months, pre-OIF****	1.81
Activated 1-7 months****	1.53
Activated 8-12 months****	1.74
Activated 13-24 months****	1.95
Activated over 24 months****	3.07
Activation included deployment	1.07
Paygrade E1 to E2****	2.23
Paygrade E3 to E4**	1.08
Paygrade E5	1.00
Paygrade E6 to E7***	0.89
Paygrade E8 to E9	0.71
Male	1.00
Female	1.03
White	1.00
Black	1.02
Hispanic****	0.83
Other Race**	0.90
Tier 1	1.00
Tier 1 with college****	0.66
Nontraditional Tier 1	0.92
Tier 2****	1.37
Tier 3	1.67
No dependents	1.00
1 or 2 dependents	1.03
3 or 4 dependents	0.94
More than 5 dependents**	0.81
Home state unemployment rate	0.98
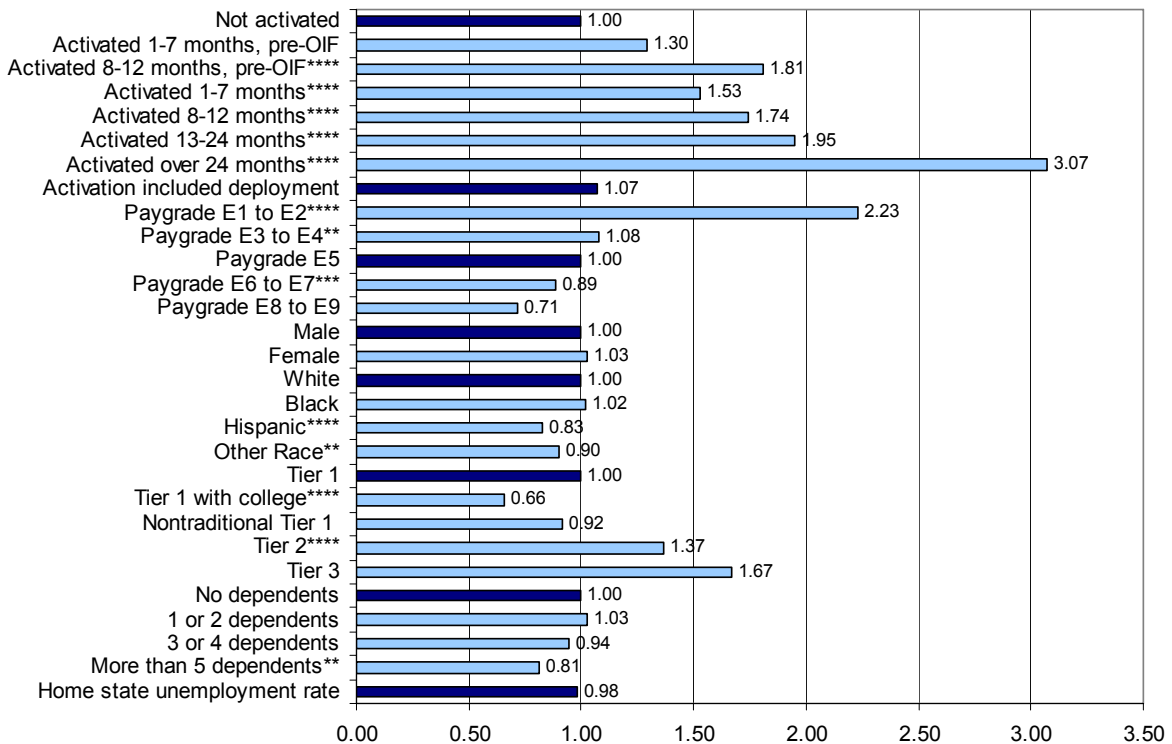
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

PS enlisted reservists were most likely to leave just before the start of OIF (December 2002/January 2003). There were also spikes in the probability of loss in the first few months of 2004 and 2006.

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Officer loss patterns

In this section, we turn our attention to the officer community. We estimated the officer models for paygrades O-1 through O-5. We assume that all SMCR officers have prior active service, so we do not include a variable for this characteristic in the models. Consistent with our approach in the previous section, the characteristics of most interest are mobilization factors, military characteristics, select demographics, and fixed effects. We provide the technical hazard model results in appendix C.

Risk of loss before activation

We also estimated three models assessing the relative risk of loss for SMCR officers. The first model we discuss evaluates the risk of loss for officers who have joined the SMCR since September 2001 and have not yet been activated (before-activation) for the time period from November 2001 through September 2006. Later, we look at the risk of loss for only those officers with completed activations and then for all officers, before and after activation. Figure 20 provides a graphical summary of the hazard rates associated with reservists' individual perceptions of potential activation and select military and demographic characteristics. The hazard rate compares the risk for two people who are the same except for a unit difference in one particular characteristic. A hazard rate of 1 (or close to 1) indicates that the risk of loss is not appreciably different for Marines with that characteristic than for those without. A value of less than 1 indicates a lower risk. For example, a value of 0.5 means that a person has only half the risk of someone without the characteristic. A value above 1 indicates higher risk.

Officers in stressed MOSs are only slightly more likely to stay

We measure a reservist's perception of potential activation as the proportion of his or her MOS already activated in a given month. Our intent is to determine whether reservists are gauging their potential

for activation based on the activation patterns of other reservists in their MOS. While it appears that officers do take cues from the activation patterns of other reservists with whom they share the same MOS, their risk of loss is not more likely but rather less likely. Controlling for other factors, we find that SMCR officers who see a higher proportion of their MOS already activated have a 9-percent lower risk of loss. The difference, however, is not statistically significant.

Figure 20. SMCR officers before activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] November 2001 through September 2006
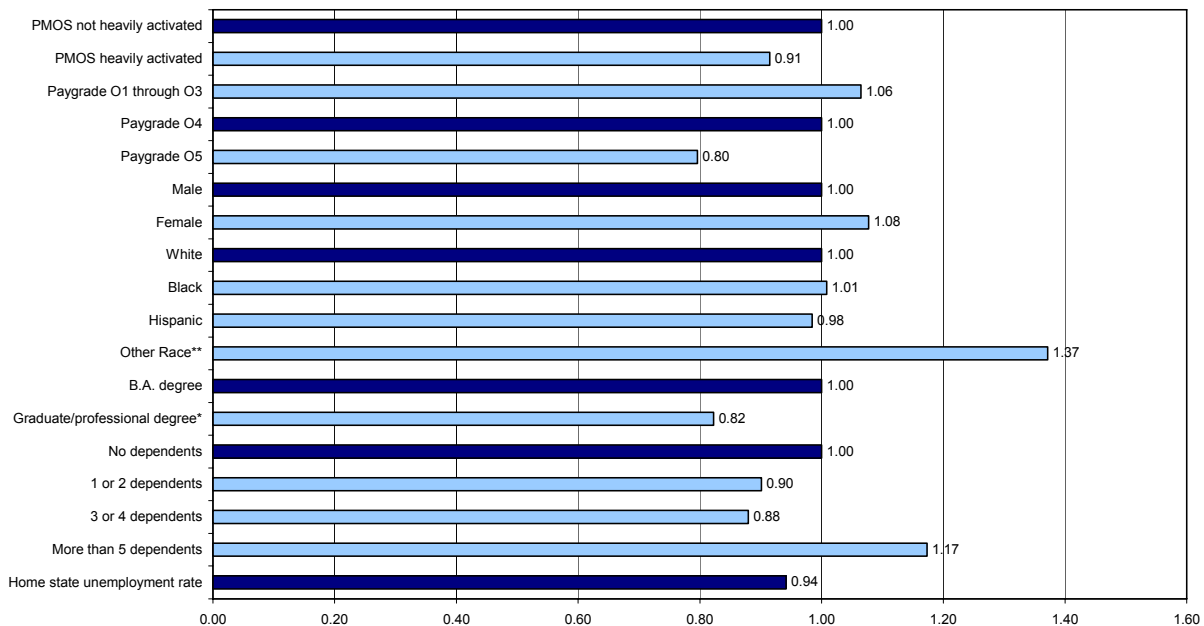
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

Risk of loss is lower for those with graduate/professional degrees

Controlling for other factors, we find that the risk of loss is significantly lower among those officers who have completed degree programs beyond the bachelor's degree. Specifically, SMCR officers with graduate or professional degrees have a nearly 20-percent lower risk of loss among officers who have not been activated.

Higher risk of loss persists over time

Earlier in our section that provided an overview of the SMCR, we displayed the monthly inventory of SMCR officers from September 2001 through September 2006 (see figure 2). We found that the Marine Corps has experienced a gradual and persistent decline in the officer inventory since the end of FY 2001. Our monthly fixed effect results tend to reflect the higher risk of loss that has persisted over time, although, for the majority of months, the estimated hazard rate is not statistically significant. The higher risk of loss peaks dramatically, and is highly significant, in December 2002 immediately before the Marine Corps issued its forcewide stop-loss order, at which time the risk of loss was much less likely. Following the cessation of stop-loss, risk levels returned to a persistently, higher likelihood of leaving.

Military and most demographic factors are not significant

The risk of loss associated with paygrade and other demographic characteristics, such as gender, racial affiliation, and dependency status/number of dependents, is not statistically significant. The exception here is those of "other" racial affiliation who have a 37-percent higher risk of loss before activation compared with whites.

Risk of loss for only those with completed activations

Next, we turn to the retention patterns of only those officers with completed activations. Because a smaller proportion of SMCR officers were activated before the buildup to OIF began in January 2003, we restrict our period of analysis to January 2002 through September 2006. In this model, we consider four aspects of the ongoing mobilization: activation status before OIF, activation status during OIF, length of active duty period, and deployment status. Figure 21 is a graphical summary of the hazard rates associated with activation, the length of activation, deployment status, and select military and demographic characteristics.

Figure 21. Only SMCR officers with completed activations, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] January 2002 through September 2006
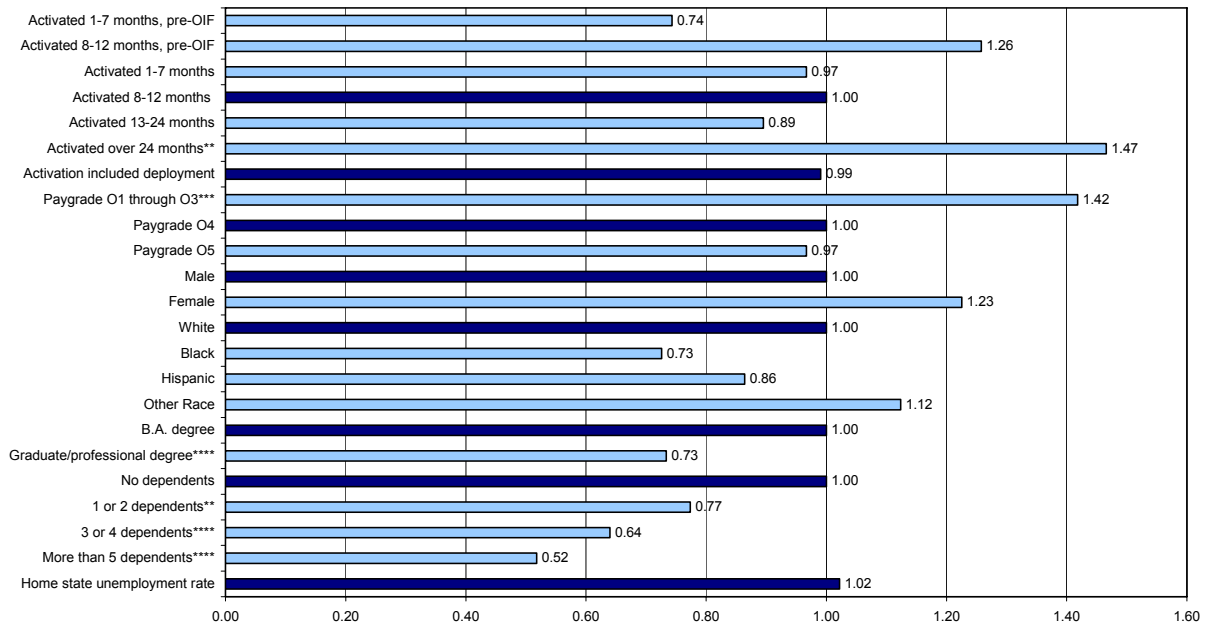
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

Likelihood of leaving does not differ by the length of active duty period

Controlling for other factors, when we assess the relative risk of leaving for only those officers with completed activations, activation, the length of the active duty period, and deployment status do not significantly affect the risk of leaving the SMCR. Only officers who have been activated for more than 24 months during the OIF period have a significantly higher risk of loss (47 percent higher) compared with those activated for 8 to 12 months. The hazard rate for officers who deployed does not differ significantly from those who did not deploy.

Risk of loss is highest among company grade officers

Among officers with completed activations, the risk of loss is significantly more likely among company grade officers. Company grade officers (paygrades O-1 to O-3) were significantly more likely to leave the SMCR compared with O-4s, while senior Marines at the O-5 paygrade level were not significantly different. The risk of loss for junior officers was over 40 percent higher than the risk for O-4s.

As the number of dependents increases, the risk of loss steadily decreases

Dependency status and the number of dependents takes on an increasingly significant effect on retention when we consider the loss behavior of only those SMCR officers who have been activated. The risk of loss is significantly less likely for those with dependents and steadily decreases as the number of dependents increases. While activation and deployment of reservists clearly places a burden on families, it appears that family support matters during a prolonged mobilization.

Officers remain more likely to leave

In the before-activation model, we found that officers were consistently at a higher risk of loss over time. This finding persists for officers with completed activations as well. The higher risk of loss tends to be statistically significant in the months preceding the Marine Corps' forcewide stop-loss, at which point the likelihood of leaving decreases dramatically. In the fall of 2003 and winter of 2004, officers with completed activations have a dramatically higher likelihood of leaving, and the higher rates of loss tend to be statistically significant. Since March 2004, the rate of loss tends to be higher than immediately following the end of stop-loss, but the rates are not significant.

Risk of loss for all SMCR officers (before and after activation)

In this final subsection, we focus on determining the relative effect of the ongoing mobilization on all SMCR officers, including those who have not yet been activated and those who have been activated—but

only for those whose current affiliation spell started since September 2001. For this model, our period of analysis begins in November 2001 and runs through September 2006. We also include the same four aspects of the ongoing mobilization: activation status before OIF, activation status during OIF, length of active duty period, and deployment status. Figure 22 provides a graphical summary of the hazard rates associated with activation, the length of activation, deployment status, and select military and demographic characteristics.

Figure 22. All SMCR officers before and after activation, risk[a] associated with mobilization factors, and select military and demographic characteristics,[b] November 2001 through September 2006
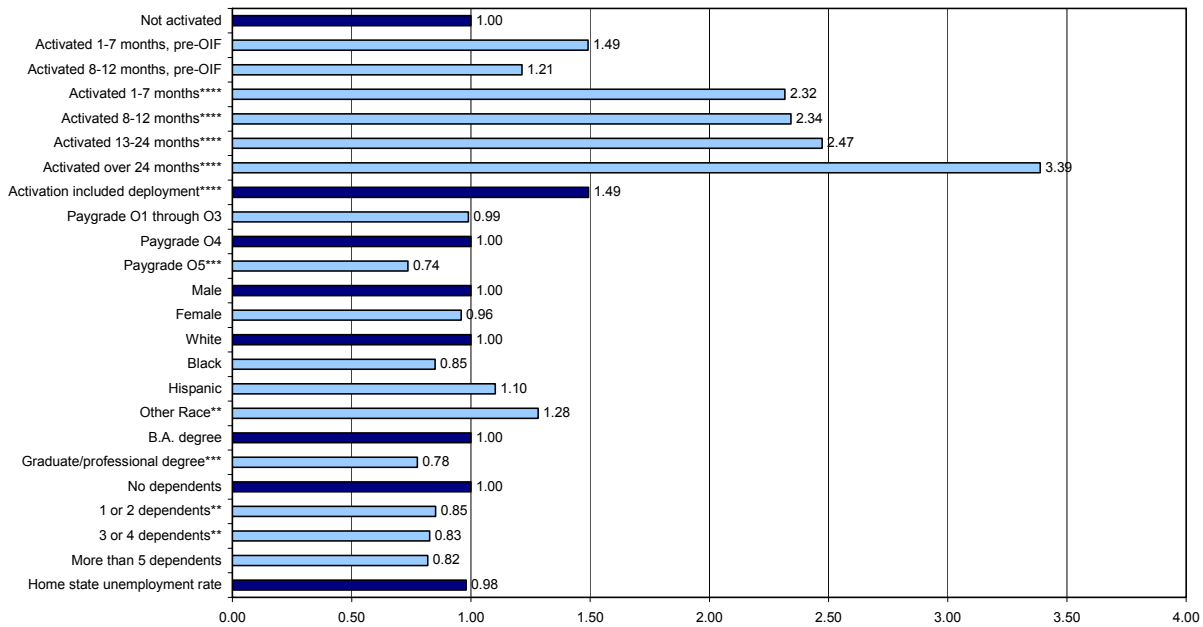
a. Significance levels are denoted as follows: * 0.1, ** 0.05, *** 0.01, **** 0.001.
b. Comparison variables for certain groups of characteristics are enclosed in parentheses, and their relative risk is equal to 1.

Overall, our pattern of results for our set of military and demographic characteristics tends to correspond to the patterns that we discussed for the before-activation model. The major difference here is with regard to the relative effect of activation and deployment on the risk

of loss. We find that the risk of loss for SMCR officers activated in support of OIF is much more likely than for those not yet activated. While the estimated hazard rates for officers with completed activations before OIF are greater than 1, they are not statistically significant. Compared with those not yet activated, the risk of loss for those activated during OIF is over twice as likely and increases slightly as the length of the active duty period increases. Officers with completed activations lasting over 24 months have the highest risk of leaving: over 3 times greater than those not yet activated. In addition, deployment increases the risk of leaving.

Risk of leaving for officers is persistently high over time

For all three scenarios under which we assess the risk of loss, the likelihood of leaving is persistently higher among officers for any given month in our period of observation, except for the period in which the Marine Corps imposed its forcewide stop-loss order. SMCR officers had the highest likelihood of leaving immediately before the buildup to OIF and the first several months following the end of the stop-loss. There are also signs of retention problems among the junior officer grades and O-4s. Although the estimated hazard rates for junior officers do not consistently attain statistical significance across our set of models, they do indicate that junior officers and O-4s are more likely to leave the SMCR than O-5s. This finding is consistent with the growth in the most senior paygrades (O-5s and O-6s) from September 2001 to 2006 that we observed earlier in table 5. Given our descriptive findings and the results of our models, we conclude that the greater likelihood of losses among O-3s and O-4s, combined with the overall tendency of officers to leave the SMCR over time, represent the most troublesome and persistent effects since the president authorized the ongoing mobilization of the Reserves following September 11th, 2001. These continuing negative relationships on losses clearly signal a serious problem area for the SMCR officer community.

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Summary

Overall, our hazard rate models for both the enlisted and officer communities in the SMCR indicate that activation is having an adverse effect on loss behavior. For both enlisted members and officers, activation and longer active duty periods are associated with significantly higher risks of loss. There are also some indications of problems among junior enlisted and officer paygrades for having a higher risk of loss. In particular, our after-activation models indicate that junior enlisted and company grade officers are at a significantly higher risk of loss. The good news is that senior enlisted and field grade officers tend to remain in the SMCR. On the enlisted side, it appears that the Marine Corps has been able to recruit enough NPS Marines to sustain the pipeline of members through the enlisted career pyramid. On the officer side, however, the career pyramid is becoming increasingly top heavy. This is a problem, in particular, for drilling SMCR units: these units require more company than field grade officers and are experiencing shortages in filling these positions.

Each community seems to have its own management culture. The enlisted community tends to be more fluid: members flow in and out of the SMCR throughout their careers. The good news is that the majority of Marines who are being activated for 8 to 12 months in accordance with the Marine Corps' standard 7-month deployment cycle are more likely to stay. The likelihood of losses among NPS enlisted Marines increases when activation lengths deviate from expectations. The Marine Corps should strive to continue to meet enlisted reservists' expectations of being activated for 8 to 12 months.

We observe specific occupational fields in the enlisted community where the SMCR is experiencing some challenges in keeping fully trained members, but the Marine Corps has managed these challenges by targeting affiliation and retention bonuses to these communties. Through September 2006, the enlisted community has been holding its own and has been able to maintain and sustain its force

levels. Whether the Marine Corps will be able to continue to sustain its NPS enlisted SMCR force levels via successful recruiting efforts is unclear. As the Marine Corps increases its endstrength over the next several years, there are real concerns that the pool of NPS enlisted SMCR recruits will decrease. It is also unclear whether an increase in the prior-service recruit pool will be feasible because the Active component also will be retaining more Marines over the next several years to help grow the force.

In the officer community, it seems that members make a decision either to remain in the Selected Reserve as a part-time career or to leave at the junior level. For the SMCR, the challenge is clearly at the level of its junior officers and countering the effects of activation and deployment. It may be that the pressures of trying to become established in a civilian career while maintaining a part-time military career are too great. We recommend that the Marine Corps explore the role of civilian employment in SMCR officer loss behavior. There also appears to be a growing shift in the inventory from officers in drilling units to IMAs. We expect that this is due in part to policy that requires officers to find a new unit when they are promoted or switch to IMA status. Currently, this is hurting the drilling units. The Marine Corps should consider changing this policy and investigate the implications of doing so.

The results of the officer hazard rate model, when taking into consideration the overall downward trend of the officer inventory since September 2001, also point to a recruiting problem. We expect that this problem will become more severe as the Marine Corps increases its Active component endstrength over the next several years. The Marine Corps has made this decision under the assumption that increasing active endstrength will hurt the SMCR in terms of the SMCR's ability to both recruit and potentially retain members. In addition, the Office of the Secretary of Defense has announced its intent to change DoD policy regarding activations in hopes of eventually stabilizing reservists' expectations regarding when and how long they will be activated [21]. The new policy directs the Services to maintain unit cohesiveness but also changes the time clock from a maximum of 24 cumulative months to a maximum of 24 consecutive months with a stated goal of activations lasting no longer than 12

months every 5 years. How members of the SMCR will respond to all these changes is unknown. We strongly recommend that the Marine Corps continue to monitor loss behavior and expand its focus to include analyzing patterns for those who return to the Active component, those who remain in the SelRes, and those who choose to leave completely.

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Appendix A: Authorized endstrengths for the SMCR

The authorized endstrength levels for the SMCR for FY 2001 through FY 2006 follow:

- 39,558 for FY 2001–2003
- 39,600 for FY 2004–2006.[21]

These authorized endstrength levels have remained nearly constant during these 6 years.

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21. Source: National Defense Authorization Acts for fiscal years 2001 through 2006.

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Appendix B: Enlisted and officer occupational field inventories

In table 14, we provide the enlisted and officer inventories by occupational field in September 2001 and September 2006. As discussed in the main text, the relative distributions of enlisted and officer inventories by occupational field have not shifted considerably between these two time periods. However, this pattern masks changes in actual numbers for many occupational fields. This is particularly the case among officers, for whom nearly all occupational fields have experienced a decrease in size from September 2001 to September 2006.

Table 14.   SMCR enlisted and officer inventories by occupational field

Occupational field	September 2001	September 2006	Percent change
Enlisted members			
01XX, Personnel, administration and retention	1,463	1,104	-24.5%
02XX, Intelligence	425	400	-5.9%
03XX, Infantry	7,227	8,043	11.3%
04XX, Logistics	1,176	965	-17.9%
05XX, MAGTF planning	22	76	245%
06XX, Command and control systems[a]	2,835	3,191	-3.7%
08XX, Field Artillery	1,491	1,407	-5.6%
11XX, Utilities	731	734	0.4%
13XX, Engineer, construction, facilities, and equipment	2,845	2,953	3.8%
18XX, Tank and assault amphibious vehicles	819	731	-10.7%
21XX, Ordnance	867	823	-5.1%
23XX, Ammunition/explosive ordnance disposal	439	517	17.8%
26XX, Signals intelligence	53	30	-43.4%
28XX, Ground electronics maintenance	688	718	4.4%
30XX, Supply administration and operations	1,601	1,290	-19.4%
31XX, Traffic management	116	140	20.7%
33XX, Food service	731	664	-9.2%
34XX, Financial management	29	23	-20.7%

Table 14. SMCR enlisted and officer inventories by occupational field (continued)

Occupational field	September 2001	September 2006	Percent change
35XX, Motor transport	3,726	3,903	4.8%
43XX, Public affairs	16	23	43.8%
44XX, Legal services	42	21	-50%
46XX, Combat camera	15	15	0.0%
57XX, Nuclear, biological and chemical defense	190	184	-3.2%
58XX, Military police/corrections	761	793	4.2%
59XX, Electronics maintenance	110	114	3.6%
60/61/62XX, Aircraft maintenance	886	884	-0.2%
63/64XX, Avionics	438	389	-11.2%
65XX, Aviation ordnance	208	196	-5.8%
66XX, Aviation logistics	233	248	6.4%
68XX, Meteorology and oceanography	36	59	63.9%
70XX, Airfield services	318	282	-11.3%
72/73XX, Marine air command and control systems	346	317	-8.4%
99XX, Other reporting and identifying MOSs	2,521	3,091	22.6%
Officers			
01XX, Personnel, administration, and retention	64	52	-18.8%
02XX, Intelligence	167	165	-1.2%
03XX, Infantry	514	356	-30.7%
04XX, Logistics	234	174	-25.6%
06XX, Command and control[a]	186	154	-17.2%
08XX, Field artillery	223	172	-22.9%
13XX, Engineer, construction, facilities, and equipment	99	85	-14.1%
18XX, Tank and assault amphibious vehicles	91	78	-14.3%
30XX, Supply administration and operations	147	96	-34.7%
34XX, Financial management	31	32	3.2%
35XX, Motor transport	15	3	-80.0%
43XX, Public affairs	31	20	-35.5%
44XX, Legal services	201	139	-30.8%
58XX, Military police/corrections	50	38	-24.0%
60XX, Aircraft maintenance	42	19	-54.8%
66XX, Aviation logistics	32	18	-43.8%
72XX, Air control/air support/AAW/air traffic control	151	102	-32.5%
75XX, Pilots/naval flight officers	671	534	-20.4%
99XX, Other reporting and identifying MOSs	253	352	39.1%

a. Since 2001, the Marine Corps has merged Occfield 25XX, Communications, and Occfield 40XX, Information technology, with Occfield 06XX, Command and control. For September 2001, we merge the data for these discontinued occfields with Occfield 06XX.

Appendix C: Technical results for hazard models of SelRes losses

In this appendix, we provide the technical results for our proportional hazards models. These results allow us to assess the relationship between retention and activation for SMCR members. Using survival analyis techniques, we are able to assess the relative effect of the mobilization on SMCR losses while taking into account the dynamic nature of the mobilization, and other important demographic, economic, and military service characteristics.

In tables 15 through 17, we list the hazard model estimation results for the risk of a SelRes loss for NPS enlisted members. In tables 18 through 20, we provide the hazard model estimation results for the risk of loss for prior service enlisted SMCR members. In tables 21 through and 23, we provide the hazard model estimation results for the risk of a loss for SMCR officers.

Table 15. Hazard model estimation for risk of loss, for NPS enlisted SMCR before activation, September 2001 through September 2006

	Hazard ratio	p-value
PMOS not heavily activated	1.000	
PMOS heavily activated	1.853	0.000
Male	1.000	
Female	1.208	0.031
White	1.000	
Black	1.344	0.000
Hispanic	0.794	0.002
Other race	1.015	0.832
Traditional high school diploma degree	1.000	
High school with college	1.382	0.000
Other Tier 1	0.946	0.704
Tier 2	1.772	0.000
Tier 3	0.900	0.833
No dependents	1.000	
1 or 2 dependents	1.408	0.000
3 or 4 dependents	1.558	0.000
5 or more dependents	2.133	0.000
South Atlantic region	1.000	
East North Central region	1.036	0.669
East South Central region	0.964	0.722
Mid-Atlantic region	0.908	0.209
Mountain region	1.640	0.000
New England region	1.126	0.274
Pacific region	1.047	0.564
West North Central region	0.923	0.473
West South Central region	1.032	0.681
Home state unemployment rate	1.025	0.357
Paygrade E-1 to E-2	0.157	0.000
Paygrade E-3 to E-4	0.068	0.000
Paygrade E-5	1.000	
Paygrade E-6 to E-7	0.647	0.003
Paygrade E-8 and E-9	0.952	0.876
Nov-01	7.341	0.000
Dec-01	1.939	0.196
Jan-02	3.282	0.001
Feb-02	2.750	0.016
Mar-02	4.971	0.000

Table 15. Hazard model estimation for risk of loss, for NPS enlisted SMCR before activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Apr-02	2.115	0.042
May-02	5.044	0.000
Jun-02	3.112	0.000
Jul-02	2.095	0.015
Aug-02	1.631	0.137
Sept-02	2.150	0.020
Oct-02	2.330	0.001
Nov-02	0.986	0.964
Dec-02	0.694	0.330
Jan-03	3.232	0.000
Feb-03	1.077	0.832
Mar-03	1.293	0.419
Apr--03	0.655	0.274
May-03	0.663	0.252
Jun-03	1.296	0.353
Jul-03	1.371	0.219
Aug-03	1.000	
Sep-03	1.361	0.231
Oct-03	0.669	0.158
Nov-03	0.875	0.620
Dec-03	0.508	0.019
Jan-04	0.842	0.520
Feb-04	0.529	0.028
Mar-04	0.803	0.388
Apr-04	0.807	0.393
May-04	0.746	0.248
Jun-04	1.135	0.601
Jul-04	0.896	0.660
Aug-04	0.972	0.908
Sep-04	0.299	0.000
Oct-04	0.521	0.016
Nov-04	0.472	0.007
Dec-04	0.439	0.002
Jan-05	1.255	0.329
Feb-05	0.654	0.100
Mar-05	0.743	0.219
Apr-05	0.553	0.024

Table 15. Hazard model estimation for risk of loss, for NPS enlisted
SMCR before activation, September 2001 through September
2006 (continued)

	Hazard ratio	p-value
May-05	0.820	0.410
Jun-05	1.146	0.549
Jul-05	1.053	0.825
Aug-05	0.628	0.060
Sep-05	0.884	0.597
Oct-05	1.010	0.966
Nov-05	0.427	0.001
Dec-05	0.545	0.020
Jan-06	0.875	0.564
Feb-06	0.596	0.036
Mar-06	0.654	0.074
Apr-06	0.945	0.806
May-06	1.007	0.977
Jun-06	1.477	0.079
Jul-06	1.037	0.875
Aug-06	0.654	0.071
Sep-06	0.368	0.000

Table 16. Hazard model estimation for risk of loss, for only NPS enlisted SMCR after first completed activation, September 2001 through September 2006

	Hazard ratio	p-value
Activated 1-7 months, pre-OIF	0.683	0.000
Activated 8-12 months, pre-OIF	0.783	0.000
Activated 1-7 months, OIF period	0.881	0.000
Activated 8-12 months, OIF period	1.000	
Activated 13-14 months, OIF period	1.205	0.000
Activated over 24 months, OIF period	1.553	0.000
Activation included deployment	1.000	0.996
Male	1.000	
Female	0.932	0.240
White	1.000	
Black	0.920	0.043
Hispanic	0.944	0.082
Other race	1.015	0.700
Traditional high school diploma degree	1.000	
High school with college	1.043	0.266
Other Tier 1	1.036	0.675
Tier 2	0.919	0.349
Tier 3	0.930	0.849
No dependents	1.000	
1 or 2 dependents	1.399	0.000
3 or 4 dependents	1.400	0.000
5 or more dependents	1.165	0.223
South Atlantic region	1.000	
East North Central region	1.040	0.419
East South Central region	1.063	0.283
Mid-Atlantic region	1.057	0.202
Mountain region	0.981	0.719
New England region	1.035	0.543
Pacific region	1.054	0.235
West North Central region	1.019	0.771
West South Central region	1.059	0.216
Home state unemployment rate	0.985	0.331
Paygrade E-1 to E-2	0.916	0.068
Paygrade E-3 to e-4	0.344	0.000
Paygrade E-5	1.000	
Paygrade E-6 to E7	0.398	0.000
Paygrade E-8 and E-9	0.461	0.000

Table 16. Hazard model estimation for risk of loss, for only NPS enlisted SMCR after first completed activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 01 - Personnel and Administration	1.217	0.004
Occfield 02 - Intelligence	0.799	0.044
Occfield 03 - Infantry	1.000	
Occfield 04 - Logistics	1.167	0.014
Occfield 05 - MAGTF Plans	0.573	0.117
Occfield 06 - Communications	1.087	0.049
Occfield 08 - Field Artillery	1.306	0.000
Occfield 11 - Utilities	0.873	0.097
Occfield 13 - Engineer, Construction, Facilities, and Equipment	0.989	0.799
Occfield 18 - Tank and AAV	1.081	0.257
Occfield 21 - Ground Ordnance Maintenance	1.169	0.032
Occfield 23 - Ammunition and Explosive Ordnance Disposal	0.745	0.002
Occfield 26 - Signals Intelligence/ Ground Electronic Warfare	0.809	0.833
Occfield 28 - Ground Electronics Maintenance	1.168	0.049
Occfield 30 - Supply Administration and Operations	1.133	0.034
Occfield 31 - Traffic Management	0.964	0.816
Occfield 33 - Food Service	0.859	0.061
Occfield 34 - Financial Management	1.277	0.673
Occfield 35 - Motor Transport	1.028	0.496
Occfield 44 - Legal Services	1.590	0.192
Occfield 57 - NBC Defense	0.820	0.201
Occfield 58 - Military Police and Corrections	1.057	0.492
Occfield 59 - Electronics Maintenance	1.190	0.432
Occfield 60 - Aircraft Maintenance	0.907	0.470
Occfield 61 - Aircraft Maintenance	0.987	0.932
Occfield 62 - Aircraft Maintenance	1.192	0.235
Occfield 63 - Avionics	0.937	0.746
Occfield 64 - Avionics	0.919	0.646
Occfield 65 - Aviation Ordnance	1.101	0.643
Occfield 66 - Aviation Logistics	0.962	0.778

Table 16. Hazard model estimation for risk of loss, for only NPS enlisted SMCR after first completed activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 70 - Airfield Services	1.073	0.552
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	0.964	0.800
Occfield 73 - Navigation Officer and Enlisted Flight Crews	0.966	0.932
Occfield 99 - Identifying MOSs and Reporting MOSs	0.866	0.448
Feb-02	17.153	0.000
Mar-02	7.301	0.054
Apr-02	5.246	0.027
May-02	11.458	0.000
Jun-02	1.695	.0609
Jul-02	2.994	0.016
Aug-02	2.286	0.085
Sep-02	0.698	0.728
Oct-02	0.908	0.841
Nov-02	0.485	0.334
Dec-02	0.978	0.972
Jan-03	2.201	0.098
Feb-03	3.331	0.031
Mar-03	2.227	0.022
Apr-03	1.042	0.919
May-03	1.448	0.263
Jun-03	3.177	0.000
Jul-03	1.462	0.222
Aug-03	1.000	
Sep-03	5.243	0.000
Oct-03	1.414	0.152
Nov-03	1.906	0.008
Dec-03	0.784	0.322
Jan-04	2.183	0.001
Feb-04	1.625	0.046
Mar-04	1.235	0.382
Apr-04	0.894	0.647
May-04	1.344	0.222
Jun-04	2.114	0.002
Jul-04	1.143	0.587

Table 16. Hazard model estimation for risk of loss, for only NPS enlisted
SMCR after first completed activation, September 2001
through September 2006 (continued)

	Hazard ratio	p-value
Aug-04	1.328	0.243
Sep-04	1.302	0.293
Oct-04	0.739	0.225
Nov-04	0.994	0.980
Dec-04	0.782	0.327
Jan-05	1.198	0.464
Feb-05	1.566	0.071
Mar-05	0.820	0.419
Apr-05	0.654	0.098
May-05	1.324	0.251
Jun-05	0.961	0.871
Jul-05	2.021	0.004
Aug-05	1.007	0.977
Sep-05	0.788	0.332
Oct-05	0.980	0.933
Nov-05	0.544	0.016
Dec-05	0.874	0.596
Jan-06	0.770	0.285
Feb-06	1.112	0.668
Mar-06	0.806	0.378
Apr-06	0.802	0.372
May-06	0.807	0.383
Jun-06	1.008	0.974
Jul-06	1.190	0.482
Aug-06	0.754	0.249
Sep-06	0.418	0.001

Table 17. Hazard model estimation for risk of loss, for NPS enlisted SMCR, before and after activation, September 2001 through September 2006

	Hazard ratio	p-value
Not activated	1.000	
Activated 1-7 months, pre-OIF	2.916	0.023
Activated 8-12 months, pre-OIF	2.566	0.004
Activated 1-7 months, OIF period	1.745	0.000
Activated 8-12 months, OIF period	0.832	0.014
Activated 13-24 months, OIF period	2.010	0.000
Activated over 24 months, OIF period	1.716	0.008
Activation included deployment	0.550	0.000
Male	1.000	
Female	1.281	0.001
White	1.000	
Black	1.230	0.001
Hispanic	0.786	0.000
Other race	1.089	0.123
Traditional high school diploma degree	1.000	
High school with college	1.328	0.000
Other Tier 1	0.863	0.233
Tier 2	1.497	0.000
Tier 3	0.633	0.361
No dependents	1.000	
1 or 2 dependents	1.469	0.000
3 or 4 dependents	1.772	0.000
5 or more dependents	2.711	0.000
South Atlantic region	1.000	
East North Central region	1.063	0.399
East South Central region	0.905	0.252
Mid-Atlantic region	0.913	0.161
Mountain region	1.405	0.000
New England region	1.111	0.231
Pacific region	1.021	0.757
West North Central region	0.867	0.131
West South Central region	1.056	0.430
Home state unemployment rate	1.010	0.664
Paygrade E-1 to E-s	0.403	0.000
Paygrade E-3 to E-4	0.136	0.000
Paygrade E-5	1.000	
Paygrade E-6 to E-7	0.854	0.164

Table 17. Hazard model estimation for risk of loss, for NPS enlisted SMCR, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Paygrade E-8 to E-9	1.520	0.068
Occfield 01 - Personnel and Administration	1.061	0.541
Occfield 02 - Intelligence	0.633	0.050
Occfield 03 - Infantry	1.000	
Occfield 04 - Logistics	1.064	0.534
Occfield 05 - MAGTF Plans	0.580	0.279
Occfield 06 - Communications	0.820	0.003
Occfield 08 - Field Artillery	0.963	0.648
Occfield 11 - Utilities	0.587	0.000
Occfield 13 - Engineer, Construction, Facilities, and Equipment	0.987	0.836
Occfield 18 - Tank and AAV	0.920	0.440
Occfield 21 - Ground Ordnance Maintenance	0.868	0.207
Occfield 23 - Ammunition and Explosive Ordnance Disposal	0.564	0.000
Occfield 26 - Signals Intelligence/ Ground Electronic Warfare	5.701	0.018
Occfield 28 - Ground Electronics Maintenance	0.617	0.001
Occfield 30 - Supply Administration and Operations	0.934	0.464
Occfield 31 - Traffic Management	0.937	0.775
Occfield 33 - Food Service	0.856	0.206
Occfield 35 - Motor Transport	0.913	0.140
Occfield 43 - Public Affairs	0.323	0.261
Occfield 44 - Legal Services	0.830	0.683
Occfield 57 - NBC Defense	0.664	0.120
Occfield 58 - Military Police and Corrections	0.954	0.725
Occfield 59 - Electronics Maintenance	0.446	0.016
Occfield 60 - Aircraft Maintenance	0.877	0.464
Occfield 61 - Aircraft Maintenance	0.961	0.829
Occfield 62 - Aircraft Maintenance	0.999	0.995
Occfield 63 - Avionics	0.488	0.014
Occfield 64 - Avionics	0.434	0.013
Occfield 65 - Aviation Ordnance	0.803	0.402

Table 17. Hazard model estimation for risk of loss, for NPS enlisted SMCR, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 66 - Aviation Logistics	0.634	0.024
Occfield 70 - Airfield Services	0.736	0.151
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	0.700	0.036
Occfield 73 - Navigation Officer and Enlisted Flight Crews	0.537	0.284
B billets	1.985	0.339
Occfield 99 - Identifying MOSs and Reporting MOSs	0.080	0.000
Nov-01	4.747	0.001
Dec-01	1.175	0.748
Jan-02	2.057	0.034
Feb-02	1.218	0.630
Mar-02	1.969	0.029
Apr-02	0.990	0.978
May-02	3.105	0.000
Jun-02	2.225	0.005
Jul-02	1.822	0.038
Aug-02	1.530	0.177
Sep-02	1.970	0..031
Oct-02	2.071	0.002
Nov-02	0.887	0.691
Dec-02	0.695	0.296
Jan-03	3.153	0.000
Feb-03	1.288	0.397
Mar-03	1.339	0.310
Apr-03	0.994	0.984
May-03	1.036	0.899
Jun-03	1.371	0.203
Jul-03	1..465	0.091
Aug-03	1.000	
Sep-03	1.184	0.460
Oct-03	0.661	0.087
Nov-03	0.789	0.310
Dec-03	0.477	0.002
Jan-04	0.782	0.279
Feb-04	0.537	0.009

Table 17. Hazard model estimation for risk of loss, for NPS enlisted SMCR, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Mar-04	0.678	0.075
Apr-04	0.596	0.020
May-04	0.668	0.062
Jun-04	0.855	0.461
Jul-04	0.649	0.049
Aug-04	0.903	0.621
Sep-04	0.323	0.000
Oct-04	0.477	0.001
Nov-04	0.469	0.001
Dec-04	0.415	0.000
Jan-05	0.887	0.557
Feb-05	0.556	0.007
Mar-05	0.663	0.047
Apr-05	0.520	0.003
May-05	0.765	0.189
Jun-05	0.861	0.451
Jul-05	0.841	0.392
Aug-05	0.598	0.013
Sep-05	0.707	0.085
Oct-05	0.851	0.416
Nov-05	0.380	0.000
Dec-05	0.418	0.000
Jan-06	0.748	0.144
Feb-06	0.536	0.003
Mar-06	0.559	0.004
Apr-06	0.837	0.367
May-06	0.786	0.223
Jun-06	1.155	0.454
Jul-06	0.833	0.357
Aug-06	0.517	0.001
Sep-06	0.356	0.000

Table 18. Hazard model estimation for risk of loss, for prior service enlisted SMCR before activation, September 2001 through September 2006

	Hazard ratio	p-value
PMOS not heavily activated	1.000	
PMOS heavily activated	0.990	0.818
Male	1.000	
Female	1.018	0.782
White	1.000	
Black	1.090	0.082
Hispanic	0.809	0.000
Other race	0.878	0.012
Traditional high school diploma degree	1.000	
High school with college	0.585	0.000
Other Tier 1	1.122	0.261
Tier 2	1,366	0.000
Tier 3	1.516	0.354
No dependents	1.000	
1 or 2 dependents	1.050	0.142
3 or 4 dependents	0.968	0.487
5 or more dependents	0.776	0.022
South Atlantic region	1.000	
East North Central region	1.139	0.028
East South Central region	1.181	0.028
Mid-Atlantic region	1.227	0.000
Mountain region	0.962	0.599
New England region	1.140	0.103
Pacific region	1.072	0.293
West North Central region	1.083	0.268
West South Central region	1.063	0.305
Home state unemployment rate	0.980	0.376
Paygrade E-1 to E-2	2.062	0.001
Paygrade E-3 to E-4	1.053	0.114
Paygrade E-5	1.000	
Paygrade E-6 to E-7	1.077	0.140
Paygrade E-8 and E-9	0.524	0.089
Nov-01	1.412	0.169
Dec-01	0.758	0.229
Jan-02	1.440	0.039
Feb-02	1.106	0.584
Mar-02	1.303	0.127

Table 18. Hazard model estimation for risk of loss, for prior service enlisted SMCR before activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Apr-02	1.157	0.392
May-02	1.364	0.062
Jun-02	1.181	0.313
Jul-02	0.933	0.677
Aug-02	1.092	0.597
Sept-02	1.281	0.155
Oct-02	1.325	0.066
Nov-02	0.999	0.993
Dec-02	4.179	0.000
Jan-03	1.930	0.000
Feb-03	0.592	0.016
Mar-03	0.319	0.000
Apr--03	0.368	0.000
May-03	0.758	0.159
Jun-03	1.198	0.306
Jul-03	0.798	0.236
Aug-03	1.000	
Sep-03	0.920	0.670
Oct-03	1.111	0.546
Nov-03	0.785	0.206
Dec-03	0.741	0.102
Jan-04	1.191	0.314
Feb-04	1.450	0.024
Mar-04	1.423	0.030
Apr-04	1.034	0.848
May-04	1.402	0.040
Jun-04	1.325	0.108
Jul-04	0.768	0.191
Aug-04	1.031	0.868
Sep-04	1.034	0.864
Oct-04	0.998	0.991
Nov-04	0.946	0.773
Dec-04	0.740	0.130
Jan-05	0.991	0.961
Feb-05	1.299	0.146
Mar-05	1.360	0.073
Apr-05	0.823	0.327

Table 18. Hazard model estimation for risk of loss, for prior service enlisted SMCR before activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
May-05	1.378	0.067
Jun-05	1.200	0.304
Jul-05	0.936	0.743
Aug-05	1.015	0.937
Sep-05	0.953	0.799
Oct-05	1.290	0.157
Nov-05	0.880	0.507
Dec-05	0.842	0.401
Jan-06	1.282	0.153
Feb-06	1.518	0.016
Mar-06	1.249	0.205
Apr-06	0.877	0.499
May-06	1.327	0.108
Jun-06	1.039	0.836
Jul-06	0.998	0.994
Aug-06	0.996	0.984
Sep-06	0.382	0.000

Table 19. Hazard model estimation for risk of loss, prior service enlisted SMCR, after activation, September 2001 through September 2006

	Hazard ratio	p-value
Activated 1-7 months, pre-OIF	0.816	0.478
Activated 8-12 months, pre-OIF	0.972	0.855
Activated 1-7 months, OIF period	0.959	0.562
Activated 8-12 months, OIF period	1.000	
Activated 13 to 24 months, OIF period	0.932	0.325
Activated over 24 months, OIF period	1.148	0.323
Activation included deployment	1.029	0.640
Male	1.000	
Female	1.204	0.073
White	1.000	
Black	0.877	0.128
Hispanic	1.010	0.877
Other race	1.018	0.817
Traditional high school diploma degree	1.000	
High school with college	0.815	0.004
Other Tier 1	0.886	0.415
Tier 2	1.308	0.082
Tier 3	1.352	0.766
No dependents	1.000	
1 or 2 dependents	0.994	0.920
3 or 4 dependents	0.865	0.029
5 or more dependents	0.764	0.040
South Atlantic region	1.000	
East North Central region	0.841	0.092
East South Central region	0.838	0.167
Mid-Atlantic region	0.925	0.401
Mountain region	0.909	0.380
New England region	1.064	0.607
Pacific region	0.998	0.979
West North Central region	0.947	0.637
West South Central region	0.942	0.537
Home state unemployment rate	0.993	0.836
Paygrade E-1 to E-2	2.984	0.008
Paygrade E-3 to E-4	1.488	0.000
Paygrade E-5	1.000	
Paygrade E-6 to E-7	0.504	0.000
Paygrade E-8 to E-9	0.425	0.000

Table 19. Hazard model estimation for risk of loss, prior service enlisted SMCR, after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 01 - Personnel and Administration	0.914	0.425
Occfield 02 - Intelligence	1.150	0.297
Occfield 03 - Infantry	1.000	
Occfield 04 - Logistics	0.857	0.256
Occfield 05 - MAGTF Plans	0.181	0.088
Occfield 06 - Communications	1.003	0.979
Occfield 08 - Field Artillery	1.130	0.488
Occfield 11 - Utilities	0.718	0.094
Occfield 13 - Engineer, Construction, Facilities, and Equipment	0.913	0.369
Occfield 18 - Tank and AAV	0.975	0.884
Occfield 21 - Ground Ordnance Maintenance	0.834	0.370
Occfield 23 - Ammunition and Explosive Ordnance Disposal	1.097	0.642
Occfield 26 - Signals Intelligence/ Ground Electronic Warfare	1.046	0.876
Occfield 28 - Ground Electronics Maintenance	0.846	0.404
Occfield 30 - Supply Administration and Operations	0.958	0.716
Occfield 31 - Traffic Management	0.815	0.652
Occfield 33 - Food Service	0.916	0.656
Occfield 34 - Financial Management	0.835	0.722
Occfield 35 - Motor Transport	0.922	0.345
Occfield 43 - Public Affairs	0.716	0.516
Occfield 44 - Legal Services	0.384	0.102
Occfield 57 - NBC Defense	0.579	0.075
Occfield 58 - Military Police and Corrections	0.927	0.570
Occfield 59 - Electronics Maintenance	0.807	0.639
Occfield 60 - Aircraft Maintenance	0.870	0.486
Occfield 61 - Aircraft Maintenance	0.763	0.301
Occfield 62 - Aircraft Maintenance	0.774	0.389
Occfield 63 - Avionics	1.238	0.427
Occfield 64 - Avionics	0.884	0.702
Occfield 65 - Aviation Ordnance	0.570	0.101

Table 19. Hazard model estimation for risk of loss, prior service enlisted
SMCR, after activation, September 2001 through September
2006 (continued)

	Hazard ratio	p-value
Occfield 66 - Aviation Logistics	0.847	0.647
Occfield 70 - Airfield Services	0.657	0.066
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	1.125	0.583
Occfield 73 - Navigation Officer and Enlisted Flight Crews	0.931	0.835
B billets	1.199	0.857
Occfield 99 - Identifying MOSs and Reporting MOSs	0.644	0.070
Jan-02	0.000	1.000
Feb-02	0.000	1.000
Mar-02	4.706	0.156
Apr-02	0.000	1.000
May-02	2.469	0.408
Jun-02	1.951	0.422
Jul-02	1.335	0.686
Aug-02	1.185	0.810
Sept-02	1.437	0.658
Oct-02	1.098	0.866
Nov-02	0.515	0.412
Dec-02	0.694	0.651
Jan-03	2.994	0.034
Feb-03	5.427	0.002
Mar-03	0.253	0.196
Apr-03	0.634	0.503
May-03	0.000	1.000
Jun-03	0.456	0.324
Jul-03	0.293	0.122
Aug-03	1.000	
Sep-03	3.408	0.002
Oct-03	0.797	0.562
Nov-03	1.931	0.083
Dec-03	0.901	0.785
Jan-04	2.584	0.012
Feb-04	2.024	0.062
Mar-04	1.702	0.156
Apr-04	1.136	0.738

Table 19. Hazard model estimation for risk of loss, prior service enlisted SMCR, after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
May-04	1.603	0.215
Jun-04	1.502	0.295
Jul-04	0.902	0.797
Aug-04	1.090	0.827
Sep-04	1.410	0.404
Oct-04	1.084	0.839
Nov-04	1.118	0.786
Dec-04	0.636	0.293
Jan-05	0.996	0.993
Feb-05	1.730	0.181
Mar-05	0.882	0.756
Apr-05	0.977	0.956
May-05	0.956	0.914
Jun-05	0.659	0.314
Jul-05	2.441	0.026
Aug-05	1.000	1.000
Sep-05	1.032	0.936
Oct-05	1.137	0.748
Nov-05	1.160	0.716
Dec-05	1.562	0.282
Jan-06	1.031	0.939
Feb-06	1.601	0.250
Mar-06	1.705	0.173
Apr-06	1.171	0.700
May-06	0.787	0.563
Jun-06	0.618	0.259
Jul-06	1.296	0.534
Aug-06	0.577	0.191
Sep-06	1.101	0.828

Table 20. Hazard model estimation for risk of loss, for all prior service
enlisted SMCR (before and after activation), September 2001
through September 2006

	Hazard ratio	p-value
Not activated	1.000	
Activated 1-7 months, pre-OIF	1.296	0.295
Activated 8-12 months, pre-OIF	1.812	0.001
Activated 1-7 months, OIF period	1.531	0.000
Activated 8-12 months, OIF period	1.741	0.000
Activated 13-24 months, OIF period	1.949	0.000
Activated over 24 months, OIF period	3.070	0.000
Activation included deployment	1.071	0.254
Male	1.000	
Female	1.025	0.656
White	1.000	
Black	1.021	0.651
Hispanic	0.830	0.000
Other race	0.901	0.020
Traditional high school diploma degree	1.000	
High school with college	0.658	0.000
Other Tier 1	0.918	0.333
Tier 2	1.367	0.000
Tier 3	1.671	0.176
No dependents	1.000	
1 or 2 dependents	1.030	0.316
3 or 4 dependents	0.942	0.130
5 or more dependents	0.811	0.020
South Atlantic region	1.000	
East North Central region	1.113	0.041
East South Central region	1.160	0.026
Mid-Atlantic region	1.156	0.003
Mountain region	0.996	0.947
New England region	1.210	0.005
Pacific region	1.056	0.325
West North Central region	1.075	0.253
West South Central region	1.035	0.502
Home state unemployment rate	0.979	0.259
Paygrade E-1 to E-2	2.228	0.000
Paygrade E-3 to E-4	1.075	0.015
Paygrade E-5	1.000	
Paygrade E-6 to E-7	0.890	0.007

Table 20. Hazard model estimation for risk of loss, for all prior service enlisted SMCR (before and after activation), September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Paygrade E-8 to E-9	0.713	0.236
Occfield 01 - Personnel and Administration	1.144	0.020
Occfield 02 - Intelligence	0.859	0.117
Occfield 03 - Infantry	1.000	
Occfield 04 - Logistics	0.938	0.434
Occfield 05 - MAGTF Plans	0.701	0.188
Occfield 06 - Communications	0.950	0.337
Occfield 08 - Field Artillery	1.044	0.603
Occfield 11 - Utilities	1.010	0.920
Occfield 13 - Engineer, Construction, Facilities, and Equipment	0.978	0.685
Occfield 18 - Tank and AAV	0.909	0.354
Occfield 21 - Ground Ordnance Maintenance	0.950	0.574
Occfield 23 - Ammunition and Explosive Ordnance Disposal	0.805	0.123
Occfield 26 - Signals Intelligence/ Ground Electronic Warfare	0.709	0.056
Occfield 28 - Ground Electronics Maintenance	1.073	0.479
Occfield 30 - Supply Administration and Operations	0.996	0.947
Occfield 31 - Traffic Management	1.038	0.866
Occfield 33 - Food Service	0.892	0.231
Occfield 34 - Financial Management	1.534	0.043
Occfield 35 - Motor Transport	0.999	0.988
Occfield 43 - Public Affairs	1.044	0.857
Occfield 44 - Legal Services	0.838	0.514
Occfield 57 - NBC Defense	1.024	0.886
Occfield 58 - Military Police and Corrections	1.107	0.177
Occfield 59 - Electronics Maintenance	1.466	0.018
Occfield 60 - Aircraft Maintenance	1.189	0.053
Occfield 61 - Aircraft Maintenance	1.005	0.968
Occfield 62 - Aircraft Maintenance	1.151	0.269
Occfield 63 - Avionics	1.201	0.128
Occfield 64 - Avionics	1.090	0.502

Table 20. Hazard model estimation for risk of loss, for all prior service
enlisted SMCR (before and after activation), September 2001
through September 2006 (continued)

	Hazard ratio	p-value
Occfield 65 - Aviation Ordnance	0.976	0.859
Occfield 66 - Aviation Logistics	0.938	0.651
Occfield 70 - Airfield Services	0.774	0.035
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	0.923	0.499
Occfield 73 - Navigation Officer and Enlisted Flight Crews	0.435	0.030
B billets	2.530	0.191
Occfield 99 - Identifying MOSs and Reporting MOSs	0.404	0.065
Nov-01	1.237	0.378
Dec-01	0.711	0.122
Jan-02	1.433	0.028
Feb-02	1.110	0.546
Mar-02	1.308	0.098
Apr-02	1.166	0.332
May-02	1.388	0.034
Jun-02	1.201	0.230
Jul-02	0.952	0.749
Aug-02	1.129	0.431
Sep-02	1.316	0.091
Oct-02	1.383	0.021
Nov-02	1.006	0.969
Dec-02	4.108	0.000
Jan-03	2.002	0.000
Feb-03	0.650	0.031
Mar-03	0.383	0.000
Apr-03	0.399	0.000
May-03	0.745	0.116
Jun-03	1.172	0.336
Jul-03	0.914	0.597
Aug-03	1.000	
Sep-03	0.980	0.901
Oct-03	1.138	0.382
Nov-03	1.159	0.316
Dec-03	0.886	0.416

Table 20. Hazard model estimation for risk of loss, for all prior service enlisted SMCR (before and after activation), September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Jan-04	1.506	0.004
Feb-04	1.446	0.009
Mar-04	1.448	0.008
Apr-04	1.066	0.663
May-04	1.444	0.010
Jun-04	1.281	0.104
Jul-04	0.788	0.165
Aug-04	1.036	0.828
Sep-04	0.974	0.879
Oct-04	0.967	0.843
Nov-04	1.162	0.346
Dec-04	0.751	0.095
Jan-05	1.113	0.508
Feb-05	1.313	0.079
Mar-05	1.219	0.194
Apr-05	0.859	0.375
May-05	1.385	0.031
Jun-05	1.102	0.518
Jul-05	1.016	0.919
Aug-05	1.004	0.977
Sep-05	0.953	0.762
Oct-05	1.338	0.055
Nov-05	1.047	0.769
Dec-05	0.933	0.681
Jan-06	1.449	0.011
Feb-06	1.415	0.021
Mar-06	1.396	0.024
Apr-06	0.993	0.966
May-06	1.249	0.151
Jun-06	1.064	0.693
Jul-06	1.003	0.987
Aug-06	0.872	0.398
Sep-06	0.531	0.002

Table 21. Hazard model estimation for risk of loss, for SMCR officers
before activation, September 2001 through September
2006

	Hazard ratio	p-value
MOS not heavily activated	1.000	
MOS heavily activated	0.915	0.481
Male	1.000	
Female	1.077	0.629
White	1.000	
Black	1.008	0.965
Hispanic	0.984	0.932
Other race	1.371	0.015
Bachelor's degree	1.000	
Graduate/professional degree	0.822	0.077
No dependents	1.000	
1 or 2 dependents	0.901	0.312
3 or 4 dependents	0.880	0.268
More than 5 dependents	1.173	0.475
South Atlantic region	1.000	
East North Central region	1.035	0.823
East South Central region	1.012	0.959
Mid-Atlantic region	1.070	0.642
Mountain region	0.835	0.375
New England region	1.024	0.895
Pacific region	0.986	0.937
West North Central region	1.140	0.454
West South Central region	0.862	0.385
Home state unemployment rate	0.941	0.301
Paygrade 0-1 through O-3	1.065	0.505
Paygrade O-4	1.000	
Paygrade O-5	0.796	0.154
Nov-01	2.015	0.290
Dec-01	0.481	0.375
Jan-02	1.819	0.293
Feb-02	3.498	0.016
Mar-02	2.103	0.204
Apr-02	1.894	0.244
May-02	2.439	0.089
Jun-02	0.556	0.411
Jul-02	1.380	0.555
Aug-02	1.507	0.452

Table 21. Hazard model estimation for risk of loss, for SMCR officers before activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Sept-02	1.467	0.512
Oct-02	1.183	0.745
Nov-02	1.871	0.191
Dec-02	13.038	0.000
Jan-03	3.507	0.007
Feb-03	0.804	0.758
Mar-03	1.148	0.811
Apr--03	0.216	0.156
May-03	0.585	0.451
Jun-03	1.941	0.202
Jul-03	0.669	0.535
Aug-03	1.000	
Sep-03	1.665	0.335
Oct-03	2.033	0.148
Nov-03	2.761	0.033
Dec-03	1.326	0.581
Jan-04	2.087	0.145
Feb-04	1.746	0.283
Mar-04	1.449	0.483
Apr-04	1.465	0.462
May-04	0.797	0.710
Jun-04	2.393	0.077
Jul-04	0.349	0.198
Aug-04	1.009	0.988
Sep-04	2.735	0.042
Oct-04	1.186	0.762
Nov-04	1.296	0.628
Dec-04	0.939	0.911
Jan-05	1.742	0.289
Feb-05	1.054	0.928
Mar-05	1.828	0.231
Apr-05	0.842	0.778
May-05	2.421	0.070
Jun-05	1.712	0.291
Jul-05	1.204	0.750
Aug-05	1.245	0.697
Sep-05	1.230	0.707

Table 21. Hazard model estimation for risk of loss, for SMCR officers before activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Oct-05	1.016	0.978
Nov-05	0.837	0.762
Dec-05	0.991	0.988
Jan-06	1.007	0.990
Feb-06	0.917	0.883
Mar-06	1.090	0.872
Apr-06	1.139	0.812
May-06	0.722	0.582
Jun-06	1.249	0.671
Jul-06	1.451	0.473
Aug-06	0.805	0.701
Sep-06	0.435	0.245

Table 22. Hazard model estimation for risk of loss, for SMCR officers with one completed activation, September 2001 through September 2006

	Hazard ratio	p-value
Activated 1-7 months, pre-OIF	0.743	0.285
Activated 8-12 months, pre-OIF	1.258	0.159
Activated 1-7 months, OIF period	0.967	0.782
Activated 8-12 months, OIF period	1.000	
Activated 13-24 months, OIF period	0.895	0.326
Activated over 24 months, OIF period	1.466	0.024
Activation included deployment	0.991	0.916
Male	1.000	
Female	1.225	0.252
White	1.000	
Black	0.726	0.160
Hispanic	0.864	0.502
Other race	1.124	0.401
Bachelor's degree	1.000	
Graduate/professional degree	0.734	0.001
No dependents	1.000	
1 or 2 dependents	0.773	0.018
3 or 4 dependents	0.640	0.000
5 or more dependents	0.518	0.001
South Atlantic region	1.000	
East North Central region	0.974	0.869
East South Central region	0.797	0.346
Mid-Atlantic region	1.084	0.541
Mountain region	0.957	0.814
New England region	1.338	0.085
Pacific region	0.938	0.678
West North Central region	1.349	0.075
West South Central region	1.086	0.592
Home state unemployment rate	1.022	0.668
Paygrade O-1 through O-3	1.418	0.002
Paygrade O-4	1.000	
Paygrade O-5	0.967	0.704
Occfield 01 - Personnel and Administration	0.605	0.137
Occfield 02 - Intelligence	0.680	0.025
Occfield 03 - Infantry	1.000	
Occfield 04 - Logistics	1.115	0.456

Table 22. Hazard model estimation for risk of loss, for SMCR officers with one completed activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 06 - Communications	0.800	0.170
Occfield 08 - Field Artillery	0.898	0.557
Occfield 13 - Engineer, Construction, Facilities, and Equipment	0.991	0.964
Occfield 18 - Tank and AAV	0.988	0.950
Occfield 30 - Supply Administration and Operations	0.818	0.333
Occfield 34 - Financial Management	1.277	0.394
Occfield 35 - Motor Transport	3.142	0.124
Occfield 43 - Public Affairs	1.292	0.387
Occfield 44 - Legal Services	0.494	0.005
Occfield 58 - Military Police and Corrections	0.726	0.332
Occfield 60 - Aircraft Maintenance	0.751	0.498
Occfield 66 - Aviation Logistics	0.598	0.263
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	0.615	0.029
Occfield 75- Pilots/Naval Flight Officers	0.855	0.225
Jan-02	0.000	.
Feb-02	0.000	.
Mar-02	0.000	.
Apr-02	0.000	.
May-02	14.346	0.005
Jun-02	0.000	.
Jul-02	7.271	0.018
Aug-02	1.554	0.721
Sep-02	6.005	0.054
Oct-02	4.206	0.074
Nov-02	5.092	0.040
Dec-02	1.645	0.621
Jan-03	4.102	0.094
Feb-03	2.161	0.531
Mar-03	0.848	0.893
Apr-03	0.000	.
May-03	0.000	.
Jun-03	0.913	0.941
Jul-03	0.560	0.636
Aug-03	1.000	

Table 22. Hazard model estimation for risk of loss, for SMCR officers
with one completed activation, September 2001 through
September 2006 (continued)

	Hazard ratio	p-value
Sep-03	12.552	0.001
Oct-03	1.430	0.644
Nov-03	3.979	0.064
Dec-03	3.144	0.117
Jan-04	6.223	0.013
Feb-04	3.645	0.081
Mar-04	2.467	0.224
Apr-04	2.971	0.140
May-04	2.357	0.252
Jun-04	3.380	0.103
Jul-04	1.570	0.562
Aug-04	2.765	0.177
Sep-04	2.037	0.375
Oct-04	3.271	0.114
Nov-04	3.891	0.072
Dec-04	1.553	0.580
Jan-05	3.450	0.106
Feb-05	5.109	0.036
Mar-05	2.879	0.163
Apr-05	2.594	0.227
May-05	3.830	0.077
Jun-05	1.157	0.856
Jul-05	2.749	0.206
Aug-05	2.169	0.313
Sep-05	1.948	0.386
Oct-05	2.556	0.219
Nov-05	3.564	0.093
Dec-05	2.658	0.215
Jan-06	1.618	0.531
Feb-06	4.108	0.066
Mar-06	3.175	0.125
Apr-06	2.849	0.174
May-06	1.993	0.372
Jun-06	1.284	0.755
Jul-06	3.824	0.082
Aug-06	1.688	0.503
Sep-06	2.000	0.404

Table 23. Hazard model estimation for risk of loss, for SMCR officers, before and after activation, September 2001 through September 2006

	Hazard ratio	p-value
Not activated	1.000	
Activated 1-7 months, pre-OIF	1.491	0.495
Activated 8-12 months, pre-OIF	1.214	0.626
Activated 1-7 months, OIF period	2.317	0.000
Activated 8-12 months, OIF period	2.343	0.000
Activated 13-24 months, OIF period	2.474	0.000
Activated over 24 months, OIF period	3.388	0.000
Activation included deployment	1.494	0.001
Male	1.000	
Female	0.959	0.749
White	1.000	
Black	0.850	0.295
Hispanic	1.102	0.480
Other race	1.282	0.019
Bachelors degree	1.000	
Graduate/professional degree	0.775	0.006
No dependents	1.000	
1 or 2 dependents	0.852	0.048
3 or 4 dependents	0.827	0.037
5 or more dependents	0.819	0.273
South Atlantic region	1.000	
East North Central region	1.192	0.167
East South Central region	1.083	0.665
Mid-Atlantic region	1.155	0.214
Mountain region	0.928	0.653
New England region	1.185	0.230
Pacific region	1.088	0.541
West North Central region	1.292	0.068
West South Central region	1.079	0.556
Home state unemployment rate	0.980	0.665
Paygrade O-1 through O-3	0.990	0.896
Paygrade O-4	1.000	
Paygrade O-5	0.735	0.010
Occfield 01 - Personnel and Administration	1.080	0.708
Occfield 02 - Intelligence	0.904	0.504
Occfield 03 - Infantry	1.000	

Table 23. Hazard model estimation for risk of loss, for SMCR officers, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Occfield 04 - Logistics	1.299	0.040
Occfield 06 - Communications	0.772	0.079
Occfield 08 - Field Artillery	0.997	0.980
Occfield 13 - Engineer, Construction, Facilities, and Equipment	1.002	0.990
Occfield 18 - Tank and AAV	0.917	0.621
Occfield 30 - Supply Administration and Operations	1.181	0.282
Occfield 34 - Financial Management	1.101	0.690
Occfield 35 - Motor Transport	1.370	0.592
Occfield 43 - Public Affairs	0.960	0.890
Occfield 44 - Legal Services	0.777	0.180
Occfield 58 - Military Police and Corrections	1.223	0.363
Occfield 60 - Aircraft Maintenance	0.925	0.774
Occfield 66 - Aviation Logistics	1.187	0.557
Occfield 72 - Air Control/Air Support/ Antiair Warfare/Air Traffic Control	0.827	0.304
Occfield 75 - Pilots/Naval Flight Officers	0.619	0.000
Nov-01	1.866	0.302
Dec-01	0.399	0.244
Jan-02	1.505	0.426
Feb-02	2.818	0.024
Mar-02	1.736	0.301
Apr-02	1.558	0.369
May-02	2.108	0.110
Jun-02	0.486	0.282
Jul-02	1.299	0.583
Aug-02	1.362	0.529
Sep-02	1.547	0.392
Oct-02	1.155	0.747
Nov-02	1.769	0.165
Dec-02	11.492	0.000
Jan-03	3.364	0.002
Feb-03	0.695	0.587
Mar-03	1.198	0.721
Apr-03	0.204	0.132

Table 23. Hazard model estimation for risk of loss, for SMCR officers, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
May-03	0.560	0.386
Jun-03	1.945	0.141
Jul-03	1.069	0.892
Aug-03	1.000	
Sep-03	1.754	0.179
Oct-03	1.643	0.212
Nov-03	2.040	0.069
Dec-03	1.737	0.150
Jan-04	2.391	0.025
Feb-04	1.477	0.339
Mar-04	1.497	0.313
Apr-04	1.267	0.566
May-04	0.776	0.585
Jun-04	1.400	0.426
Jul-04	0.700	0.466
Aug-04	1.297	0.541
Sep-04	2.084	0.074
Oct-04	1.176	0.714
Nov-04	1.581	0.275
Dec-04	0.948	0.906
Jan-05	1.986	0.091
Feb-05	1.545	0.309
Mar-05	1.640	0.227
Apr-05	0.846	0.734
May-05	2.277	0.039
Jun-05	1.596	0.239
Jul-05	0.897	0.812
Aug-05	1.092	0.836
Sep-05	1.440	0.373
Oct-05	1.520	0.307
Nov-05	1.585	0.254
Dec-05	1.320	0.516
Jan-06	1.468	0.335
Feb-06	1.282	0.549
Mar-06	1.368	0.432
Apr-06	1.233	0.617
May-06	1.405	0.403

Table 23. Hazard model estimation for risk of loss, for SMCR officers, before and after activation, September 2001 through September 2006 (continued)

	Hazard ratio	p-value
Jun-06	1.424	0.380
Jul-06	1.592	0.251
Aug-06	0.911	0.826
Sep-06	0.650	0.386

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