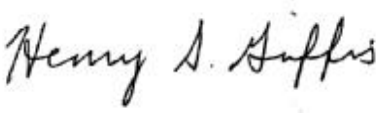
CRM D0013462.A1/Final
January 2006

Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines With and Without Dependents

Aline O. Quester • Anita U. Hattiangadi
Robert W. Shuford

4825 Mark Center Drive • Alexandria, Virginia 22311-1850

Approved for distribution: January 2006



Henry S. Griffis, Director
Workforce, Education and Training Team
Resource Analysis Division

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Executive summary

Following the attacks of September 11, 2001, the United States launched a war against global terrorism. Operation Enduring Freedom began in Afghanistan in October 2001; Operation Iraqi Freedom began in Iraq in March 2003. Marines have been heavily deployed, both fulfilling their normal missions and engaged in enemy combat. This study examines how associated deployment tempo has affected retention for heavily deployed Marines. We focus mostly on retention in FY04, but also look at retention patterns in FY02 and FY03.

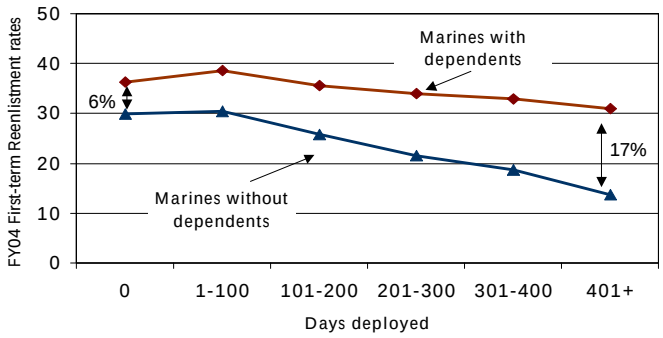
Findings for first-term enlisted Marines

For first-term Marines making reenlistment decisions in FY04, deployment to a crisis area and more total days deployed were associated with lower reenlistment rates. Although Marines with *no* deployment time in their first term of service also had lower reenlistment rates, reenlistment rates fell as deployed days increased for those who were deployed. Deployment tempo most negatively affected Marines without dependents, almost exclusively single Marines (see figure 1).[1]

Although it may seem counterintuitive, Marines without dependents historically have reenlisted at lower rates than those with dependents. The finding that high deployment tempo has a more negative effect on first-term Marines without dependents than on those with dependents will surprise some readers, but this finding is robust in our statistical analyses that control for other factors that affect retention.

1. Servicemembers do not count as dependents. Thus, if a Marine is married to another Servicemember, there are no dependents unless he or she has children or a dependent parent.

Figure 1. First-term reenlistment rates for Marines with and without dependents, FY04



We also found substantial differences in *average days deployed* for first-term Marines making reenlistment decisions in FY04. Marines without dependents averaged 49 more deployed days than those with dependents. How can we explain this difference in average deployed time? There are several possible reasons why Marines without dependents are more heavily deployed:

- They are more likely to volunteer for deployments.
- Commanders are more likely to select them for deployments, particularly if there is little advance notice for the deployment.
- They are concentrated in PMOSs that deploy more frequently.

Our analysis indicates that about 65 percent of the reason is that Marines without dependents are more likely to volunteer or be selected for deployments (we cannot distinguish between these two explanations). About 35 percent of the reason is that Marines without dependents are concentrated in heavily deploying MOSs.

Virtually all recruits enter the Marine Corps without dependents, but, by the end of the first term of service, almost half have acquired dependents (usually spouses).[2] Because these Marines selected or

2. For those making first-term reenlistment decisions in FY04, 96 percent had no dependents at accession, but only 53.5 percent had no dependents at the time of the reenlistment decision.

were assigned to their MOSs at entry, how can we explain the concentration of Marines without dependents in heavily deploying MOSs? Our hypothesis is that it takes time to find a spouse, and Marines in heavily deploying MOSs did not have as much search time as Marines with lighter deployment schedules.

Findings for second- and third-term enlisted Marines

In contrast to the results for first-term Marines, we found virtually no relationship between days deployed and reenlistment decisions for Marines making second- or third-term reenlistment decisions. Even for these career Marines, however, those with dependents were more likely to reenlist (although the differences were very small for third-term Marines).

We also found that second- and third-term Marines without dependents averaged more deployment days than did their counterparts with dependents. For those reenlisting in FY04, the differences were 32 days for those making second-term reenlistment decisions and 11 days for those making third-term reenlistment decisions.

Findings for Marine Corps officers

We also examined the relationship between the number of days deployed and officer retention rates in the March 2004 to March 2005 period. For Marine Corps officers, deployment to a crisis area or more deployed days were positively associated with retention. We estimated the effects for officers both before and after retirement eligibility. For both groups, officers who deployed more or who were in a crisis area were more likely to be retained.

Overall, retention rates for officers without dependents were similar to those for officers with dependents. Year-of-service patterns, however, were quite different. Early in their careers, officers with dependents were more likely to be retained. Then, at about the 9^{th} year of service, the pattern reversed and officers without dependents were more likely to be retained. After the 12^{th} year of service and until retirement eligibility, retention rates were similar for both groups.

Background

As the Global War on Terrorism continues, so does the increase in deployment tempo for both officers and enlisted Marines. Many worry about the implications of this—in particular, whether high deployment tempo negatively affects Marines' retention. In fact, it is a common public perception that increases in deployed time lower retention. For example, at a recent meeting of the National Governors Association, one governor observed, "I think all governors right now are worried about the long-term effects of long deployments and frequent deployments on recruiting and retention" [1].

Despite these fears, there has been little analysis on the effect of increased deployment tempo (including wartime deployments) on Marines' retention behavior. And although the demands of frequent and long deployments are well recognized for Marines with dependents, many are unaware of the effect that increased deployment tempo has on the retention decisions of Marines without dependents—a group that makes up most of the first-term force. Solid evidence on the relationship (or lack thereof) between deployment tempo and retention is critical to the Marine Corps as it designs policies and answers questions from Congress and the public.

Thus, the Assistant Commandant of the Marine Corps asked CNA to study this issue, designating the Deputy Commandant, Manpower and Reserve Affairs as the study sponsor. The study focuses on the post-9/11 relationship between deployment tempo and retention, especially on differences in responses for Marines with and without dependents. We limit our discussion to major findings, though our supporting statistical work is available in the appendices.[3]

3. Reference [2] is an annotated briefing that reports many of these results, as well as the results from focus groups of Marines on the East and West coasts.

Factors influencing reenlistment rates

Deployment tempo

Definition

In this study, deployment tempo (DEPTEMPO) is measured by the number of *deployed days*—the sum of five categories of time spent away from home: operational days, exercise days, unit training days, home station training days, and mission support temporary duty (TDY) days. Any day that a Servicemember is engaged in one of these activities and is not at home in his or her bed at night is counted as a deployed day. Although this definition of deployed days might not be the one that the Marine Corps would have chosen, it is the one that Congress chose. Moreover, this definition of deployed time provides the only machine-readable reporting of deployment events for all Marines.[4]

Effect on reenlistment rates of first-term enlisted Marines

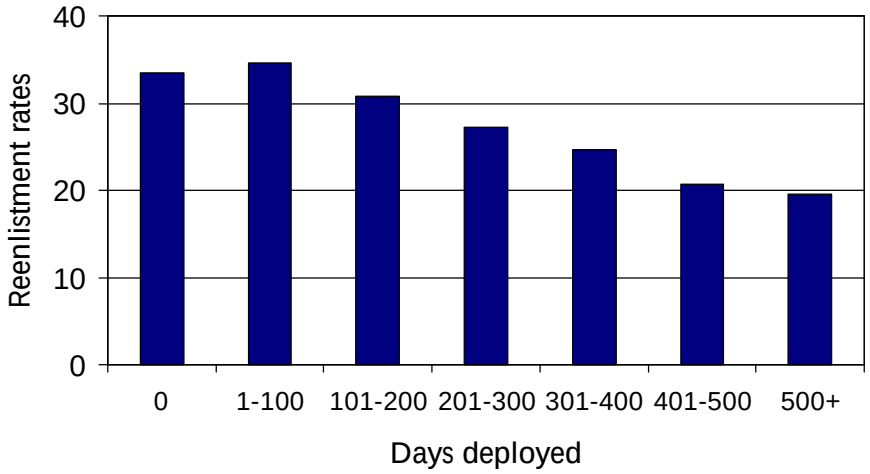
For all Marines reenlisting in FY04, we have counts of the number of days they were deployed in the previous 36 months. For first-term recommended and eligible Marines making reenlistment decisions in FY04, there is a strong negative relationship between number of days deployed and reenlistment rates (see figure 2).[5] However, for those

4. The PERSTEMPO legislation in the National Defense Authorization Act (NDAA) of 2000 required the Services to report the number of DEPTEMPO (deployed) days and required a $100/day payment if a Servicemember was "deployed" over 400 days in a 2-year period. The payment was waived after 9/11, but the reporting requirement for DEPTEMPO continued.

5. All reenlistment discussions in this paper refer to the population of recommended and eligible Marines.

Marines who did not deploy at all in their first term of service (12 percent of the population), the reenlistment rate is lower than for those who deployed 1 to 100 days.

Figure 2. FY04 reenlistment rates for first-term (zone A) Marines, by number of days deployed



As with all findings we report, this negative relationship between deployed days and reenlistment for FTAP[6] Marines making their decision in FY04 is supported by multivariate statistical analyses reported in appendix A. In addition to the negative reenlistment impact of substantial deployed time, deployment to a crisis area, primarily Iraq or Afghanistan, reduced reenlistment probabilities by about 8 percentage points for first-term Marines making their reenlistment decisions in FY04.

In contrast, the effect of deployments to a crisis area had positive effects on reenlistments for Servicemembers reenlisting in FY02 when only 1 percent of the FTAP population deployed to Bosnia, Iraq, or

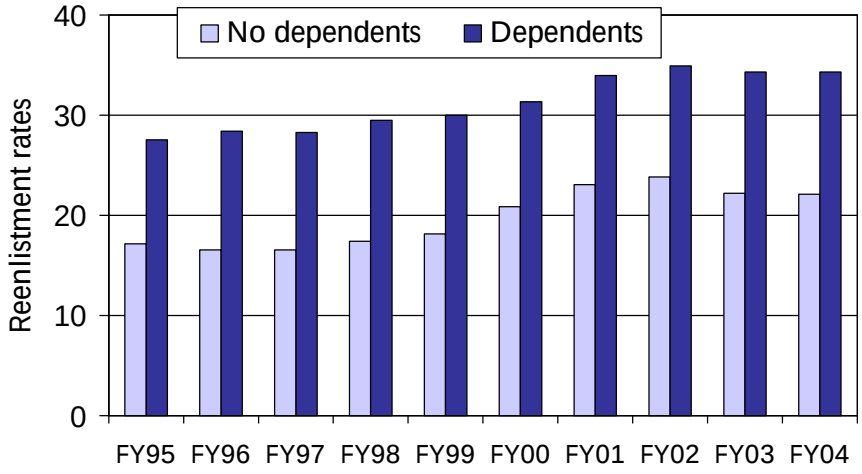
6. The Marine Corps identifies the first-term population making reenlistment decisions as the FTAP population. FTAP stands for first-term alignment plan.

Afghanistan. All else equal, this added 5 percentage points to the reenlistment probability. For the FY03 FTAP population, when 25 percent had deployed to a crisis area, however, the impact on reenlistment probabilities was negative.

Dependency status

Despite public perception to the contrary, Marines without dependents reenlist at substantially lower rates than Marines with dependents.[7] This is true for reenlistments of first-, second-, and third-term Marines, but the effects are largest for first-termers (see figure 3).[8]

Figure 3. First-term reenlistment rates for Marines, by dependency status



7. For example, see [4]. Most Marines without dependents are single, although the group contains some Marines married to other Servicemembers. In addition, most Marines with dependents are married, but some are single Marines with dependents.

8. We have found the same pattern for Sailors, and the authors of [3] found the same effect for first-termers in all Services.

We focus our analyses on FY04 reenlistment decisions, both because they are the most recent and because these Marines have experienced the highest levels of deployment tempo.[9]

Because the reenlistment rates of Marines with dependents and Marines without dependents are so different, we examine them separately. Table 1 shows this information for FY04 populations of recommended and eligible Marines at the first, second, and third reenlistment points. For example, reenlistment rates for first-termers were 22 percent for Marines without dependents and 35 percent for Marines with dependents.

Table 1. FY04 reenlistment rates, by dependency status

	Marines			
	With no dependents		With dependents	
	No.	Reenlistment rate	No.	Reenlistment rate
First-termers (Zone A)	11,700	22%	9,100	35%
Second-termers (Zone B)	1,200	61%	3,900	73%
Third-termers (Zone C)	350	84%	2,300	89%

As table 1 also shows, Marines without dependents represent over half of recommended and eligible Marines at the first reenlistment point, almost one-quarter at the second reenlistment point, and about 13 percent at the third reenlistment point.

9. In addition, we have a longer series of deployment information for these Marines than we have for Marines making decisions in FY02 or FY03. Data on deployed days are available only from October 2000.

Deployment tempo and reenlistment rates

First-term enlisted Marines with and without dependents

Deployment tempo has increased substantially for the Marine Corps as a whole in the last few years. Various press articles have focused on the hardships of deployment for Servicemembers with families.[10] However, there has been much less attention paid to the hardships on Marines without dependents—usually single Marines.

RAND's James Hosek and Mark Totten looked at the relationship between deployments and reenlistments for the FY93-FY99 period and noted that, "compared with those without dependents, first-term members with dependents had higher reenlistment, and reenlistment rose with nonhostile deployments and, to a lesser extent, with hostile deployments" [3].[11] Thus, evidence in the 1990s suggested that Servicemembers without dependents were more affected by deployments than were Servicemembers with dependents.[12]

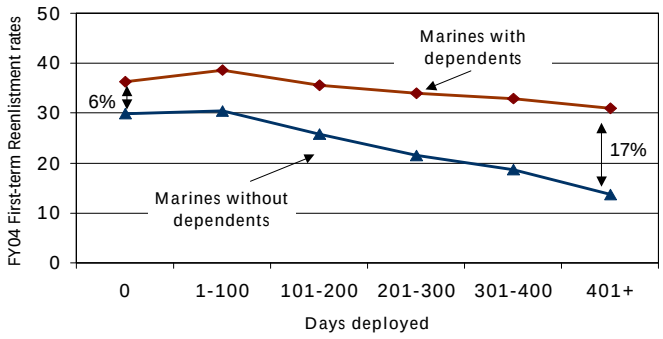
10. For example, see [4].

11. Hosek and Totten [3 and 5] studied the relationship between reenlistments and hostile/nonhostile deployments for all four Services, proxying deployments by time periods in which Servicemembers received Family Separation Allowances or Hostile Fire/Imminent Danger Pay. Since Servicemembers without dependents do not receive some of these pays, they developed algorithms to input deployment time to Servicemembers without dependents who were in units where those with dependents deployed. In general, they found a positive relationship between deployments and reenlistment for Marines in this pre-9/11 period [3].

12. We are not aware of any other post-9/11 analyses of the relationship between deployment tempo and reenlistment for Servicemembers with and without dependents.

In the post-9/11 environment, we find that the effect of deployment tempo on reenlistment behavior is substantially greater for first-term Marines without dependents than for those with dependents (see figure 4).

Figure 4. First-term reenlistment rates for Marines with and without dependents, FY04



As figure 4 shows, reenlistment rates fall as the number of deployed days in the first term of service increases (except for Marines with zero deployed days). For Marines with dependents, the reenlistment rate is just under 40 percent for those with 1 to 100 deployed days. The rate falls to just over 30 percent for those with 401 or more days deployed. For Marines without dependents, however, the drop in the reenlistment rate as deployed days increase is much sharper.

In addition to controlling for number of days deployed, in many of our logistic regressions we also controlled for whether Marines had been deployed at least 75 days in the 6 months before making their reenlistment decisions. For Marines making decisions in FY04, about 15 percent had been deployed at least 75 days in the 6 months before the decision. Our hypothesis was that these Marines *had already indicated positive reenlistment intentions*, even though they had not yet made their decisions, and, indeed, these Marines were considerably more likely to reenlist. Thus, this variable should be understood more as a

control for "reenlistment likelihood" or "self-selection" than as an indicator of Marines' responses to deployed time.[13]

Deployments to crisis areas

In our separate statistical analyses of these two groups, we found that deployed time had a much more negative effect on reenlistment probabilities for Marines without dependents (4-percentage-point reduction for each 100 days of deployed time) than for Marines with dependents (2-percentage-point reduction for each 100 days of deployed time). However, the impact of deployment to a crisis area (Iraq or Afghanistan primarily) was fairly similar—other things equal, about an 8-percentage-point reduction in reenlistment probability for Marines both with and without dependents.

Marines with no deployed days

Although most Marines in the first term of service are assigned to deployable billets, some Marines are not. For the FY04 FTAP population, 14 percent of Marines with dependents and 9 percent of Marines without dependents had zero days deployed; these Marines had lower reenlistment rates than those with 1 to 100 deployed days. As part of this study, we conducted a set of focus groups on the east and west coasts, and Marines who had not deployed expressed strong desires to deploy (see [2]). In fact, both FTAP Marines who have been heavily deployed and FTAP Marines who had little or no deployment time liked the idea of voluntary exchanges. We heard several instances of Marines who perceived themselves to be "the same" (in terms of MOS and skill) as heavily deployed Marines but who were unable to switch places with them for a deployment (usually because they were assigned to the base or station). Initiatives are underway to explore the possibility of such switches.

13. In FY05, however, Marines who did not intend to reenlist were sent on deployments (and brought back in the middle of deployments for separation). We don't believe this was the case in FY04. Thus, we do not expect to find that this effect holds in FY05.

First-term reenlistments in FY02 and FY03

We also estimated reenlistment models for first-termers making decisions in FY02 and FY03. Particularly for Marines reenlisting in FY02, deployment to a crisis area was less common (2, 22, and 49 percent of the FY02, FY03, and FY04 FTAP populations, respectively). In addition, as discussed earlier, information on deployed days or deployment to a crisis area is only available for 1 year before FY02 decisions and 2 years before FY03 decisions. With this caveat on the limited deployment tempo information for Marines making decisions in these years, we found the following:

- FY02 FTAP population
  - — For every 100 deployed days, reenlistment probabilities *increased* 1 percentage point for Marines without dependents and 4 percentage points for Marines with dependents.
  - — Deployment to a crisis area *increased* reenlistment probabilities by 5 percentage points.
- FY03 FTAP population
  - — For every 100 deployed days, reenlistment probabilities *decreased* 2 percentage points for Marines without dependents. There was no effect on reenlistment probabilities for Marines with dependents.
  - — Deployment to a crisis area *decreased* reenlistment probabilities by 16 percentage points.

Thus, in FY02, increased deployment tempo and deployment to a crisis area increased first-term reenlistment probabilities, but by FY03 such events had either no effect or a negative one on reenlistment.

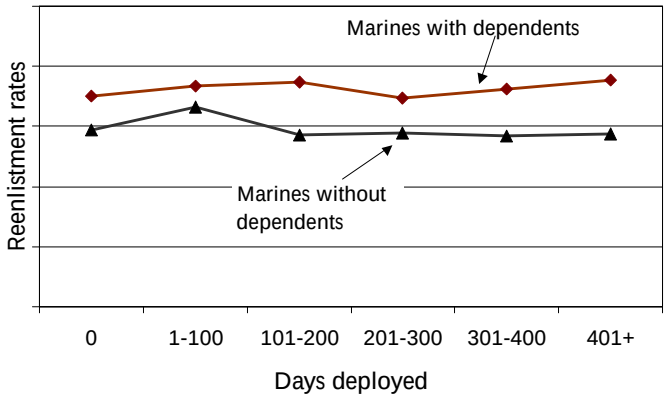
Second- or third-term enlisted Marines with and without dependents

Second-term Marines

In contrast to the results for first-term Marines, we found virtually no relationship between days deployed and reenlistment decisions for Marines making second-term (zone B) reenlistment decisions, regardless of dependency status (see figure 5).

In the logistic regressions reported in appendix A, we do find a deployment tempo effect for second-term Marines who did not deploy. Overall, second-term Marines with no deployed days in their second term[14] (20 percent of the population) had reenlistment rates 5 percentage points lower than Marines who deployed. Moreover, the impact of zero deployed time was stronger for Marines without dependents than for those with dependents (7- versus 4-percentage-point reduction).

Figure 5. Second-term (zone B) reenlistment rates for Marines with and without dependents, FY04



14. These Marines are in B billets (for example, drill instructor and recruiter billets) in their second terms.

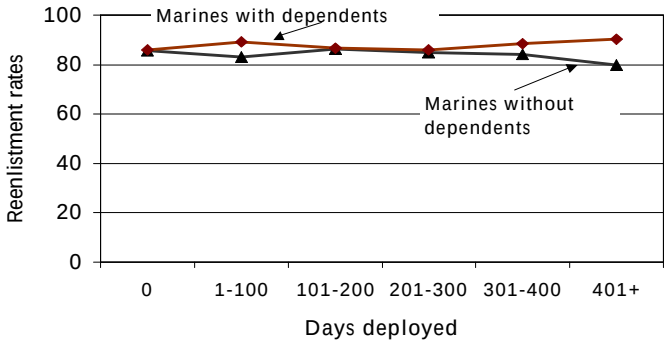
Deploying to a crisis area had no impact on overall FY04 reenlistment probabilities for second-term Marines, but when we estimated separate models by dependency status, Marines with dependents had a 3-percentage-point reduction in their reenlistment probability if they had deployed to a crisis area (however, the effect is only marginally significant). For Marines making second-term reenlistment decisions in FY02, however, the impact of deploying to a crisis area was positive and large (19-percentage-point increase in the reenlistment probability). Only 1 percent of these FY02 Marines, however, had deployed to a crisis area (compared with 49 percent in FY04). For the 11 percent of second-term FY03 Marines who had deployed to a crisis area, crisis area deployments had no effect on reenlistment probabilities.

All else equal, for second-term Marines reenlisting in FY04, we estimate an increase in reenlistment probabilities of almost 3 percentage points for each dependent. For second-termers reenlisting in FY02 and FY03, results are similar.

Third-term Marines

Figure 6 shows the simple relationship between deployed days and reenlistment decisions (by dependency status) for third-term (zone C) Marines making reenlistment decisions in FY04.

Figure 6. Third-term (zone C) reenlistment rates for Marines with and without dependents, FY04



These Marines, in their 10th through 14th years of service, had average reenlistment rates of 87 percent. In the logistic reenlistment regressions in appendix A, we find no statistically significant deployment tempo effects in the overall regressions. When we estimate separate models for reenlistments in FY04 for those with and without dependents, however, we get:

- No deployment tempo effects for those with dependents
- The following deployment tempo effects for the 10 percent of these Marines *without dependents*:
  - An 8.5-percentage-point increase in the reenlistment rate for those who deployed to crisis areas (30 percent of such Marines deployed to crisis areas).
  - A 3.5-percentage-point decrease in the reenlistment rate for every 100 days deployed.

For Marines without dependents who deployed 250 days and to a crisis area, these effects cancel each other out. But, for third-term Marines without dependents deployed to Iraq *and* deployed less than 250 days, the overall effect of deployment on reenlistments is positive.

For third-termers reenlisting in FY04, each dependent increased reenlistment probability about 1 percentage point, but the results were only marginally significant.

Summary: Enlisted Marines

The familiar phrase, "we recruit the servicemember, but retain the family," is true for members with dependents. However, sustainment of the force depends on retaining a sufficient number of qualified Marines from the *entire* eligible population. Reenlistment rates for Marines with dependents substantially exceed those for Marines without dependents. This difference is largest for those completing their first term of service, which consists primarily of Marines without dependents.

Moreover, the reenlistment rates of first-term Marines without dependents are more negatively affected by high deployment tempo than

are the reenlistment rates of Marines with dependents. This is not a new finding, despite common perceptions, since an earlier RAND study found similar results for all the Services.

Average deployed time for Marines with and without dependents

In focus groups conducted on both the east and west coasts, we heard that single Marines felt they were picked for deployment more often than their married counterparts.[15] To examine this, we asked: Does average deployed time differ for Marines with dependents and those without?

We calculated the number of days deployed for Marines making reenlistment decisions in FY02, FY03, and FY04. We did separate analyses for Marines with dependents and Marines without dependents. *For all zone A, B, and C reenlistment decisions and in all years, Marines with dependents averaged **fewer** deployed days.* Because the data on deployed days start in FY01, we can measure deployed days over virtually the entire first term for Marines reenlisting in FY04, but only for a shorter period for those reenlisting in FY02 and FY03. To indicate that the data are incomplete, we have italicized average deployed days for Marines making decision in FY02 and FY03 (see table 2).

For Marines making reenlistment decisions in FY04, those *without* dependents had *more* deployed days than their counterparts *with* dependents:[16]

- 49 more days for first-termers
- 32 more days for second-termers
- 11 more days for third-termers (see figure 7).

15. See [2] for a full discussion of the focus group findings.

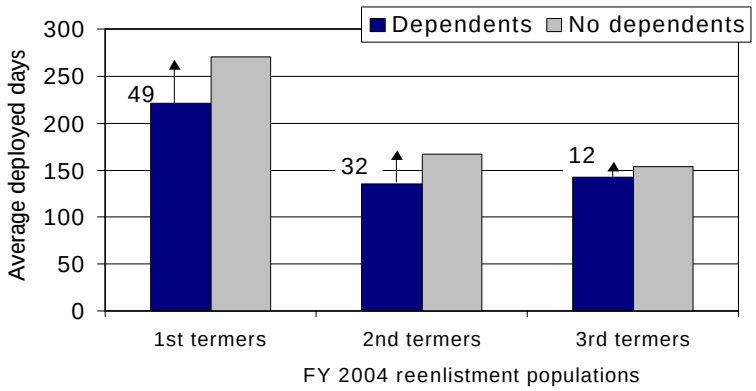
16. Appendix B tabulates average days deployed by PMOS and grade for FTAP Marines making reenlistment decisions in FY04.

Table 2. Number of Marines and average days deployed, by dependency status

Reenlistment FY and zones	Dependents		No dependents	
	Marines	Average days deployed	Marines	Average days deployed
FY04				
Zone A	9,100	221	11,700	270
Zone B	3,900	135	1,200	167
Zone C	2,300	142	350	154
FY03				
Zone A	9,780	*157*[a]	10,920	*204*
Zone B	3,670	*87*	920	*106*
Zone C	3,000	*92*	210	*115*
FY02				
Zone A	9,340	*73*	11,020	*107*
Zone B	3,860	*42*	990	*56*
Zone C	2,060	*43*	240	*46*

a. We italicized the information on days deployed for those reenlisting in FY02 and FY03 because the data do not reflect deployed days over the full term.

Figure 7. Average deployed days for Marines making reenlistment decisions in FY04



Why are Marines without dependents more heavily deployed?

There are several possible reasons why Marines without dependents are more heavily deployed:

- They are more likely to volunteer for deployments.
- Commanders are more likely to select them for deployments, particularly if there is little advance notice for the deployment.
- They are concentrated in PMOSs that deploy more frequently.

Although we have no data that allow us to sort out the relative importance of Marines without dependents volunteering, or being selected, for deployments, we can approximate the relative importance of PMOS concentrations vice biases toward deploying Marines without dependents.

We used regression analysis to explain variation in deployment days for Marines in the FY04 FTAP population. The regressions controlled for PMOS and dependency status. Holding PMOS constant, those without dependents averaged 32 more deployed days than those with dependents in the 36 months before their reenlistment decisions. Given that the overall difference in deployed days between those with and without dependents was 49 days, this suggests that about 65 percent of the explained difference in deployed days is due to dependency status and about 35 percent is due to the PMOS distribution. We also did these regressions for individual PMOSs, finding that within individual PMOSs, Marines without dependents were deployed more days. For example, FTAP FY04 riflemen (PMOS 0311) without dependents had 29 more deployed days than their counterparts with dependents.[17]

In short, there is strong empirical evidence that most of the reason why Marines without dependents are deployed more than those with dependents is not their concentration in PMOSs that deploy more.

17. Table 18 in appendix B shows average deployed days, by PMOS and grade, for FY04 FTAP Marines.

Why are Marines without dependents concentrated in PMOSs that deploy more frequently?

Although most of the explanation for the heavier deployment of Marines without dependents is not related to PMOS, some of it is. How can we explain this? At accession, 96 percent of the Marines in the FY04 FTAP population had no dependents. Thus, most were assigned their PMOSs when they were without dependents. How is it, then, that at the *end of their first term of service* Marines without dependents are concentrated in more heavily deploying PMOSs?[18]

It could be that it takes time to find a spouse. Marines in heavily deploying PMOSs simply did not have as much search time as Marines with lighter deployment loads. For the FY04 FTAP population, the first term of service in heavily deploying PMOSs has been very busy—some Marines deployed as many as three times in a 4-year enlistment.

To test this hypothesis for the FY04 FTAP population, we estimated the probability that a Marine without dependents would add a dependent (usually a spouse) during the first term of service. The explanatory variable was the average number of deployed days in the Marine's PMOS. We found that, after 100 days of deployed time in the first term, the probability of a Marine without dependents acquiring a dependent decreased as average deployed days in the PMOS increased. Table 3 shows the probabilities.

18. It also could be that Marines who are less interested in deploying are assigned PMOSs that deploy less, but we do not believe that this is likely.

Table 3. As deployed days increase, marriage probability decreases in the first term of service[a]

Average number of deployed days in the PMOS	Probability of adding a dependent (getting married) in the first term
0	47.9%
100	45.5%
200	43.1%
300	40.8%
400	38.5%
500	36.2%

a. All results are statistically significant. See appendix A, table 10 for the regressions.

In summary, Marines without dependents are more likely to have more deployed days than their counterparts with dependents. This is particularly true for those in the first term of service. For the FY04 FTAP population, two factors account for differences in the average number of deployed days between Marines with and without dependents:

- Differences are *mostly* attributable to higher deployment probabilities for Marines without dependents.
- Differences are *partially* attributable to differences in Marines' distribution by PMOS because those in more heavily deployed PMOSs are less likely to marry (i.e., acquire a dependent) during the first term.

Deployment tempo and officer retention

Using a methodology similar to what RAND used for enlisted personnel [3 and 5], Ronald Fricker did an analysis for all Services of the effect of "deployments" on officer retention in the 1990s. Deployments were measured by Family Separation Allowances (FSA) and Imminent Danger Pay (IDP),[19] so they included unaccompanied tours as well as conventional deployments.[20] Deployments were divided into hostile (IDP is paid) and nonhostile deployments. For this pre-9/11 analysis of the effect of deployments on retention, Fricker [6] finds the following:

- Increasing the number of nonhostile deployments leads to higher retention for officers in all Services.
- Increasing the number of hostile deployments somewhat mitigates this effect, but retention of Marine Corps officers who have had hostile deployments in the late 1990s is still higher than the retention of Marine Corps officers with no deployment events.
- Retention of junior officers is more negatively affected by hostile deployments than that of mid-grade officers.

We examined the relationship between the number of days deployed and officer retention rates for officers from March 2004 to March 2005. We restrict the analysis to officers with 4 or more years of service and the rank of O2 or higher. If the officer separated, we tabulated

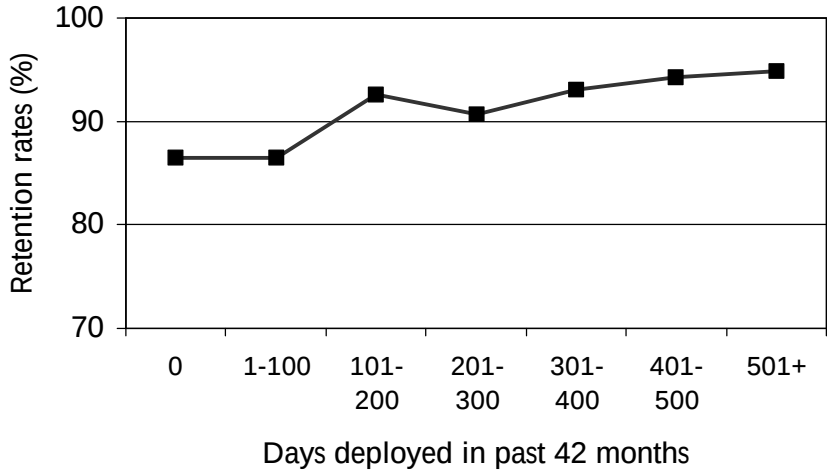
19. IDP used to be called Hostile Fire Pay.

20. FSA is not awarded to Servicemembers without dependents. The Defense Manpower Data Center (DMDC) prepared the data for the Fricker analysis and imputed deployment for those without dependents from the data for those with dependents in the Servicemember's unit. Short deployments were excluded because FSA and IDP are paid only if the member is deployed for at least 30 days.

the number of days deployed in the 42 months before separation. For officers who did not separate, we tabulated the number of days deployed in the 42 months preceding March 2005. *In all year-of-service categories, there is a positive relationship between retention and days deployed.* Officers who deployed a lot were *considerably* less likely to separate than officers who had not deployed or who deployed very little.

Before retirement eligibility, the two year-of-service categories with the lowest retention rates are 4 to 6 years of service (when officers are coming off their service obligations) and 9 to 11 years of service (when officers seem to be making decisions about a full military career). Figure 8 show the relationship for officers with 4 to 6 years of service, and figure 9 shows the relationship for officers with 9 to 11 years of service.

Figure 8. Retention rates by days deployed for officers with 4 to 6 years of service[a]

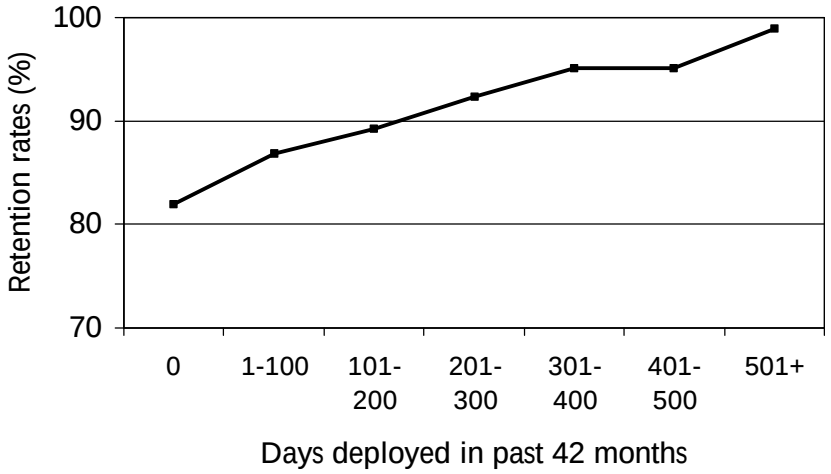


a. Retention rates are calculated from March 2004 to March 2005 for Marine Corps officers with 4 to 6 years of service in March 2004.

The retention rate was 86 percent for officers with 4 to 6 years of service who deployed less than 100 days in the previous 42 months. In

contrast, for officers in this year-of-service category who deployed more than 500 days, the retention rate was 95 percent.[21]

Figure 9. Retention rates by days deployed for officers with 9 to 11 years of service[a]



a. Retention rates are calculated from March 2004 to March 2005 for Marine Corps officers with 9 to 11 years of service in March 2004.

For officers with 9 to 11 years of service, the relationship is even stronger: the more deployed time, the more likely the officer is retained. Retention rates for officers with 9 to 11 years of service were:

- 92 percent for those who did not deploy in the previous 42 months.
- 99 percent for those who deployed more than 501 days in the same period.[22]

21. There were 272 officers with 4 to 6 years of service who deployed more than 500 days.

22. There were 84 officers with 9 to 11 years of service who deployed more than 500 days.

Table 4 provides more detail on the relationship between days deployed and retention for officers.

Table 4. Commissioned officers: Retention rates by years of service and days deployed[a]

		Days deployed						
Officer retention	Total	0	001-100	101-200	201-300	301-400	401-500	501+
4-6 years	3,193	141	710	489	707	507	367	272
Percent retained	91%	87%	87%	93%	91%	93%	94%	95%
7-8 years	1,599	80	350	260	343	267	190	109
Percent retained	94%	86%	93%	93%	94%	96%	96%	95%
9-11 years	1,912	111	466	369	416	304	162	84
Percent retained	91%	82%	87%	89%	92%	95%	95%	99%
12-18 years	2,916	249	941	569	577	352	150	78
Percent retained	97%	93%	95%	98%	98%	99%	100%	99%
19-28 years	1,637	203	731	285	254	98	46	20
Percent retained	79%	67%	74%	85%	89%	90%	87%	90%
29+ years	132	13	74	15	15	7	6	2
Percent retained	57%	39%	45%	67%	87%	86%	100%	100%
All years of service	11,389	797	3,272	1,987	2,312	1,535	921	565
Percent retained	91%	82%	86%	92%	93%	95%	95%	96%

a. The number of Marines in each category is as of March 2005. Retention rates are for March 2004 through March 2005. Days deployed are calculated for the previous 42 months.

Dependency status, deployment tempo, and retention

For our analysis of deployment tempo and officer retention by dependency status in the post-9/11 era, we focus on the March 2004 to March 2005 period (see table 5).

Overall, retention rates for officers without dependents are similar to retention rates for officers with dependents (91 percent). The year-of-service patterns, however, are quite different. Early in their careers, officers with dependents are more likely to be retained. Then, at about the 9th year of service, the pattern reverses and officers without dependents are more likely to be retained. After the 12th year of service and until retirement eligibility, the retention rates are similar.

Table 5. Officer retention rates, by dependency status[a]

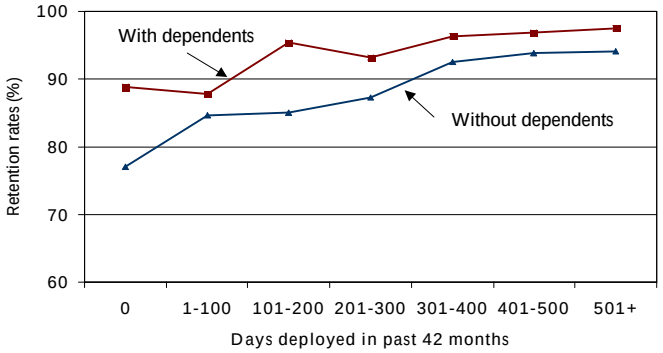
Years of service	Without dependents		With dependents	
	Number	Retention rate	Number	Retention rate
4-6	904	89%	1,959	93%
7-8	450	91%	1,145	95%
9-11	310	92%	1,602	90%
12-18	231	97%	2,685	97%
19-28	76	80%	1,561	78%

a. Retention rates are calculated from March 2004 to March 2005.

Figures 10 and 11 show retention rates for officers with and without dependents by year-of-service group and deployed days. Regardless of dependency status:

- Officers are more likely to be retained if they have substantial deployed time
- Officers with little deployed time are more likely to leave.

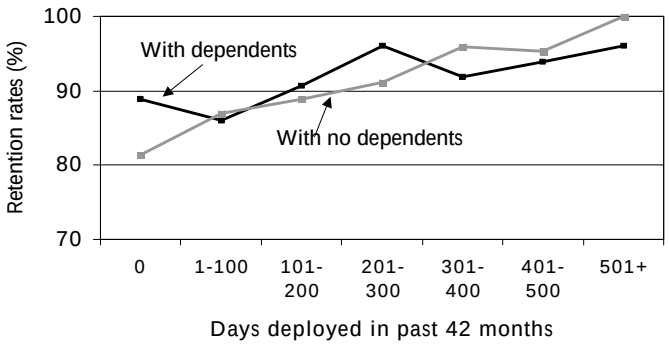
Figure 10. Retention rates for commissioned officers with 4 to 6 years of service, by deployed days and dependency status[a]



a. Retention rates are calculated from March 2004 to March 2005 for Marine Corps officers with 4 to 6 years of service in March 2004.

Although categorizing officers into those with and without dependents is useful for distinguishing retention patterns, there does not seem to be any difference in the response of these two groups to deployed time. Both officers with and without dependents are more likely to continue in the Marine Corps if they have been heavily deployed.

Figure 11. Retention rates for commissioned officers with 9 to 11 years of service, by deployed days and dependency status[a]



a. Retention rates are calculated from March 2004 to March 2005 for Marine Corps officers with 9 to 11 years of service in March 2004.

In summary, we examined retention rates between March 2004 and March 2005 for commissioned officers with 4 or more years of service and the rank of O-2 or higher. We found the following:

- Officers who graduated in the top third of their class at the Basic School (TBS) are more likely to be retained. (See appendix A.)
- Commissioned officers' retention rates are positively related to the past 42 months' deployment tempo. In all year-of-service groups:
  - — Officers with more deployed time are more likely to be retained.

— Officers deployed to crisis areas are more likely to be retained.

— The positive relationship between the number of deployed days and retention rates holds for officers with and without dependents and for retirement-eligible officers as well as non-retirement-eligible officers.

- Overall retention rates differed little by dependency status, but year-of-service retention patterns did differ.[23]

  — In the 4^{th} to 8^{th} years of service, officers without dependents are less likely to be retained than those with dependents.

  — In the 9^{th} to 11^{th} years of service, officers without dependents are more likely to be retained than those with dependents.

  — From the 12^{th} to the 18^{th} years of service, retention rates for officers both with and without dependents are the same.

Summary: Marine Corps officers

In the last few years, the Marine Corps has experienced a higher level of deployment tempo than before. Some have been concerned that high deployment tempo would negatively affect officer retention. The data to date, however, show that officers with the highest deployment tempo have the highest retention rates and officers with little deployment tempo have the lowest retention rates. In addition, officers who deployed to a crisis area and officers who placed in the top third at TBS are more likely to be retained.

23. Tables 14 and 15 in appendix A provide the data for those with, and without, dependents.

Conclusion

Deployment tempo is expected to remain high for at least as long as the Global War on Terrorism continues. We find that, at least for career Marines and officers, high deployment tempo has (so far) had little negative effect on reenlistment/continuation decisions. In fact, we find that officer retention increases with total days deployed or deployment to Iraq or Afghanistan. On the other hand, we find that increases in deployed days lowers reenlistment rates for first-term Marines---particularly those without dependents. We also find that first-term Marines without dependents average more deployed days than their counterparts with dependents. These econometric findings support evidence gathered through focus groups; first-term single Marines say that they are often tapped for deployment, either as volunteers or "volentolds."

As military leaders and policy-makers continue to grapple with the costs of sustained military deployments, we hope that this study can help to inform personnel decisions. It also provides a basis for tracking the effects of deployment on Marines---effects that may change as the war effort continues.

Appendix A: Technical results for the statistical analyses of retention

In this section, we model retention probabilities in a multivariate framework. Because the dependent variable, retention, is binary (a Marine either is retained or is not retained), we need to estimate the probability of retention given the Marine's characteristics. If we make appropriate assumptions about the distribution of error terms across Servicemembers in the sample, we can estimate the retention model using a logistic function. In this case,

$$y_t = \frac{1}{1 + \exp((-\beta)' x_i)} \quad ,$$

where y_t is the probability that individual Marine t will be retained
x_i is a vector of characteristics
β is the vector of estimated coefficients.

This equation is estimated using maximum likelihood techniques. Because the function is nonlinear, the marginal effects (derivatives) depend on the point at which they are evaluated. We evaluate them at the mean of the predicted probabilities. For our independent variables that are dummy variables (0 or 1), we estimate the marginal effect as the difference between a base case and the characteristic in question. For continuous variables, such as days deployed,[24] we use $\beta P(1 - P)$ as the derivative of the logistic functional form. For discrete (integer) variables, we estimate the marginal effect as a unit increase in the independent variable.

24. Since we measure deployed days in hundreds of days, the marginal effect (derivative) is the impact on retention of an increase of 100 days of deployed time.

Reenlistment and retention logit regressions

Previous work on the reenlistment decisions of Marines helped us to specify the models. What is unique about the current effort is that we have data on days deployed and on whether the Marine was deployed to a crisis area.

Data for the analysis

The Marine Corps provides the Defense Manpower Data Center (DMDC) with manpower and personnel data. CNA also regularly receives manpower and personnel data from the Marine Corps, storing it in a variety of analytic databases. For a previous study on the impact of lump-sum (versus installment) SRBs on reenlistment decisions, CNA built a reenlistment database for zone A (first-term), zone B (second-term), and zone C (third-term) reenlistment decisions. For this study, we updated CNA's reenlistment database to include reenlistment decisions through FY04. For officers, we used our Marine Corps personnel files to build retention rates from March 2004 to March 2005. To do the analysis, however, we still needed deployment information. Study sponsors suggested that we use the deployment data they had sent to DMDC since the Marine Corps had not yet established a database for keeping deployment information. In addition, the Marine Corps did not have information on deployments to crisis areas, but DMDC had independently built a crisis file from a variety of sources.[25]

Marine Corps' senior leadership wanted to restrict the analyses to the post-9/11 era. Thus, we used social security numbers to match officer retention and enlisted reenlistment data with the deployment and crisis data, building datasets for FY02, FY03, and FY04 reenlistments and for recent officer retention. Table 6 describes the variables used in the logistic regressions.

We first focus on the logistic regressions for enlisted Marines' reenlistment decisions. The data we used and some of the variables require explanation. The Services only began keeping deployment information in October 2000. For our reenlistment decision equations, we need to measure deployed days over the same period for all Marines making their decisions in a particular fiscal year—in short, those who made their reenlistment

25. We are now receiving deployment data directly from the Marine Corps, and it is constructing its own crisis database. We will archive these data as we receive them, providing the Marine Corps with a backup of its deployment data.

Table 6. Variable definitions

Variable	Variable definition
Dependent variables	
Reenlistment	1 if Marine reenlists; else 0. The population is all recommended and eligible Marines
Retention	1 if officer in the Marine Corps in March 2004 is still in the Corps in March 2005; else 0
Retention plan	1 if officer had not submitted separation or retirement papers as of March 2005; else 0.
Independent variables	
Male	1 if male; else 0
Race/ethnic identifiers	A set of 0/1 variables that describe the Marine's race/ethnic background (Black or Hispanic); else 0
Married or dependents	1 if Marine is married or has dependents; else 0.
Number of dependents	Number of dependents
No dependents, 3-6 years	1 if the officer has no dependents and has 3 to 6 years of service; else 0.
SRB level	Selective reenlistment bonus (SRB) level; varies from 0 to 5.
Base	Historical estimated reenlistment rate for PMOS if SRB level is zero (see appendix A text)
Paygrade identifiers	1 if Marine is in the specified grade; else 0.
Years of service and pilot/non-pilot identifiers	For the officer models, we use several years of service and pilot/non-pilot identifiers: pilot, 3-6 years; pilot, 7-8 years, pilot, 9-11 years; non-pilot, 3-6 years; non-pilot, 7-11 years; 12-18 years. These variables are 1 if the Marine belongs to the category; else 0.
O4, retirement eligible	1 if the officer is an O4 who is retirement-eligible, else 0. Because there are some mistakes in the Marine Corps data used to compute years of service, this variable has some errors. If the variable was computed correctly, the model would not estimate an effect since all retirement-eligible officers would leave.
Crisis operation	1 if Marine was ever deployed to Afghanistan, Bosnia, or Iraq; else 0.
Days deployed	Measured in hundreds of days. For reenlistment decisions, it is the days deployed in the last 12 months for FY02 populations, the last 24 months for FY03 populations, and the last 36 months for FY04 populations. For officers, it is the days deployed in the last 42 months.
Deployed 75 days in last 6 months	1 if Marine was deployed at least 75 days in the 6 months prior to making the reenlistment decision; else 0.
Never deployed	1 if the Marine was never deployed; else 0.

decisions on 1 October at the start of the year and those who made their decisions on 31 September at the end of the year. That meant we could go back 12 months for information on deployed days for FY02 reenlistment decisions, 24 months for FY03 decisions, and 36 months for FY04 decisions. We focused on FY04 decisions for three reasons: (1) the deployment information is richer, (2) these Marines have been more heavily deployed, and (3) those decisions are most recent. Since the deployment information covers different time periods for these 3 years of reenlistment decisions, we estimate each year's reenlistment decisions separately for each reenlistment zone.

Estimating reenlistment equations with 1 year of data

But estimating reenlistment equations with only 1 year of data presents problems for one of the independent variables: the SRB variable. SRBs are offered in MOSs with low reenlistment propensities to boost the reenlistment rate; however, a model estimated using only 1 year of data would probably find that SRBs had *negative* effects on reenlistment because MOSs with high SRBs still have lower reenlistment rates than MOSs without SRBs.[26] To overcome this problem, we included a "base" variable in our regressions—the average predicted reenlistment rate for the MOS if the bonus level is zero.[27] It is predicted from the logistic regressions estimated in a previous study [7].

Deployed 75 days in the last 6 months

We also control for whether the Marine was deployed 75 or more days in the 6 months before the reenlistment decision. Our hypothesis is

26. This is because some MOSs with very high reenlistment rates will have small (or zero) SRBs. Other MOSs may have low reenlistment rates—even with high bonus levels. These latter MOSs would have had *even lower* reenlistment rates if they had lower SRB multiples, but, unless we can observe the lower multiples (and their associated reenlistment rates), it will appear that high SRB levels are associated with low reenlistment rates. For the popular MOSs, it will appear that low SRB levels are associated with high reenlistment rates. To overcome this problem, we normally use many years of reenlistment information for our estimates—hoping that we get sufficient bonus level variation within MOSs to offset variation between MOSs.

27. We then normalized this variable to an approximate mean of zero.

that Marines who were heavily deployed at the end of their first enlistment had already signalled that they were likely to reenlist, and that is why they were more likely to be deployed.

Zone A: First-term reenlistment probabilities

Zone A reenlistment equations for the FY04 FTAP population

Table 7 shows the mean values for the variables, the estimated coefficients and their associated z statistics, and the derivative at the mean for two specifications of the FY04 zone A reenlistment logistic regressions. The first specification controls for whether the Marine was deployed at least 75 days in the 6 months before the decision (reenlistment or separation); the second specification omits that variable.

In both specifications, male, black, and Hispanic Marines are more likely to reenlist. These demographic variables play a large role in differentiating reenlistment probabilities: male Marines are 2 percentage points more likely to reenlist, Hispanic Marines about 4 percentage points more likely to reenlist, and black Marines between 12 and 13 percentage points more likely to reenlist.[28] All of these results (as well as results in the discussion that follows) hold "all else equal." They are derived from the derivatives that hold all variables, except the one of interest, at their mean and examine the effect of an increase in the variable of interest.

The "married or dependents" variable is not statistically significant, alhtough the "number of dependents" is: each dependent raises reenlistment probability by about 3 percentage points, which means that Marines with two children and a civilian wife are predicted to reenlist at a rate 9 percentage points higher than Marines with no dependents.[29]

28. When we say black Marines are 12 to 13 percentage points more likely to reenlist, we mean relative to Marines who are not black. In short, all comparisons are to the "not" category.

29. We tried various specifications for dependents, attempting to see if the responses were different for unmarried vs. married Marines with dependents. We found no significant differences.

Table 7. Two specifications for FY04 zone A reenlistment logits

		Specification 1		Specification 2	
Variable	Mean	Coefficient[a]	Derivative	Coefficient[a]	Derivative
Male	0.938	0.121^	0.021^	0.113^	0.020^
		(1.79)		(1.69)	
Black	0.121	0.631**	0.122**	0.639**	0.128**
		(13.03)		(13.42)	
Hispanic	0.167	0.224**	0.040**	0.22**	0.041**
		(5.09)		(5.08)	
Married or dependents	0.465	0.067	N.S.	0.067	N.S.
		(1)		(1.02)	
Number of dependents	0.667	0.17**	0.031**	0.17**	0.033**
		(6.51)		(6.62)	
SRB level	0.699	0.13**	0.024**	0.139**	0.026**
		(5.54)		(6.01)	
Base	0.000	0.038**	0.007**	0.041**	0.008**
		(11.83)		(13.01)	
E3	0.109	-0.913**	-0.140**	-0.892**	-0.141**
		(-14.00)		(-13.88)	
E5 and up	0.272	0.201**	0.037**	0.222**	0.042**
		(5.42)		(6.08)	
Crisis operation	0.493	-0.454**	-0.081**	-0.383**	-0.071**
		(-11.88)		(-10.32)	
Days deployed (in 100s)					
Marine with dependents	2.069	-0.069**	-0.013**	0.048**	0.010**
		(-4.13)		(3.06)	
Marine with no dependents	2.531	-0.228**	-0.044**	-0.098**	0.019**
		(-13.50)		(-6.21)	
Deployed 75 days in last 6 months	0.155	1.257**	0.253**	-----	-----
		(25.84)			
Never deployed	0.116	-0.225**	-0.039**	-0.145**	-0.026**
		(-4.03)		(-2.60)	
Constant		-1.087**		-1.19**	
		(-13.20)		(-14.55)	
Average reenlistment rate		0.276		0.276	
Chi-Square		2,190		1,522	
Observations		20,806		20,806	

a. z statistics are in parentheses beneath the coefficients. ** indicates significance at the 1-percent level and ^ indicates significance at the 10-percent level.

Each increase in the SRB level raises reenlistment probability 2 to 3 percentage points. Finally, E3s are less likely to reenlist and E5s more likely to reenlist (relative to the omitted group of E4s). Being deployed to a crisis area (Afghanistan, Bosnia, or Iraq) lowers the reenlistment probability for FY04 FTAP Marines 7 to 8 percentage points. Since almost half of these Marines were deployed to crisis areas, this is an important effect. Marines who were never deployed (almost 12 percent of the FY04 FTAP population) also have reenlistment probabilities that are 3 to 4 percentage points lower than Marines who deployed.

Turning to the estimated effect of deployed days on reenlistment, one finds significant differences in the estimates from the two specifications. The first one controls for Marines deployed at least 75 days in the 6 months before their decisions. This variable is extremely powerful: these Marines (15.5 percent of the FTAP population) are much more likely than other Marines to reenlist. Their reenlistment probabilities are 25 percentage points higher than Marines who deployed less than 75 days in the 6 months before the decision.

We have two variables that measure each 100 days of deployment, one for Marines with dependents and one for Marines without dependents. Reenlistment probabilities for Marines without dependents are more negatively affected by an increase in deployed days than those for Marines with dependents. For Marines without dependents, the reduction in reenlistment probabilities for each 100 days of deployment is 4.4 percentage points if we control for whether the Marine was deployed 75 days in the last 6 months—and 1.9 percentage points if we do not. For Marines with dependents, there is a reduction of 1.3 percentage points for each 100 days of deployment in the first specification, and an *increase* in the reenlistment probability of 1 percentage point for each 100 days of deployment in the second specification. In summary, *FY04 FTAP Marines without dependents are more deterred from reenlistment than those with dependents if heavily deployed in their first term of service.*

We separately estimate equations for Marines with and without dependents (table 8). As discussed in the main text, Marines with dependents reenlist at significantly higher rates than Marines without

dependents. The regressions in the previous table also showed that reenlistment probabilities for Marines without dependents were more negatively affected by substantial deployment time. This finding is reinforced when the logistic regressions are estimated separately for those with and those without dependents.

Table 8. FY04 zone A reenlistment logits: Marines with and without dependents

	Marines with dependents			Marines without dependents		
Variable	Mean	Coefficient[a]	Derivative	Mean	Coefficient[a]	Derivative
Male	0.909	0.424**	0.084**	0.963	-0.483**	-0.082**
		(5.02)			(-4.34)	
Black	0.133	0.504**	0.109**	0.112	0.782**	0.135**
		(7.57)			(11.13)	
Hispanic	0.193	0.181**	0.038**	0.145	0.272**	0.042**
		(3.13)			(3.99)	
No. of dependents	1.436	0.154**	0.033**	0.000	-----	-----
		(5.86)				
SRB level	0.668	0.114**	0.024**	0.726	0.148**	0.023**
		(3.50)			(4.35)	
Base	0.371	0.034**	0.007**	-0.321	0.041**	0.007**
		(7.77)			(8.78)	
E3	0.110	-0.949**	-0.170**	0.109	-0.852**	-0.109**
		(-10.99)			(-8.60)	
E5 and up	0.280	0.235**	0.050**	0.265	0.147**	0.023**
		(4.64)			(2.66)	
Crisis operation	0.469	-0.409**	-0.085**	0.513	-0.519**	-0.079**
		(-7.89)			(-9.18)	
Days deployed (in 100s)	2.070	-0.089**	-0.019**	2.530	-0.209**	-0.038**
		(-4.68)			(-10.49)	
Deployed 75 days in last 6 months	0.138	1.24**	0.279**	0.170	1.278**	0.229**
		(17.94)			(18.62)	
Never deployed	0.143	-0.189*	-0.039**	0.092	-0.253**	-0.037**
		(-2.56)			(-2.95)	
Constant		-1.224**			-0.56**	
		(-12.51)			(-4.60)	
Avg. reenlistment rate		0.346			0.215	
Chi-Square		790			1,023	
Observations		9,671			11,135	

a. z statistics are in parentheses beneath the coefficients. ** indicates significance at the 1-percent level and * indicates significance at the 5-percent level.

Estimating separate reenlistment equations for Marines with and without dependents produces some interesting differences:

- Gender differences
  - — Male Marines with dependents are 8.4 percentage points *more likely* to reenlist than female Marines with dependents
  - — Male Marines without dependents are 8.2 percentage points *less likely* to reenlist than female Marines without dependents
- Paygrade difference
  - — Marines with dependents have stronger paygrade effects
  - — E3s (relative to E4s) are 17.0 percentage points *less likely* to reenlist if they have dependents (10.9 percentage points if no dependents)
  - — E5s (relative to E4s) are 5.0 percentage points *more likely* to reenlist if they have dependents (2.3 percentages if no dependents)
- Deployed days differences
  - — For each 100 deployed days, reenlistment probabilities are reduced by 1.9 percentage points for Marines with dependents (3.8 percentage points for Marines without dependents).

Deployed time for Marines with and without dependents

Single Marines without dependents averaged more deployment days than did Marines with dependents. This was true for in every reenlistment zone and in every year of our post-9/11 data. The differences were largest for first-termers and we focused our analyses on Marines making first-term reenlistment decisions in FY04.

We first estimated an ordinary least squares regression for deployed days. The independent variables were a married or dependents dummy variable and a set of 224 dummy variables that measured the average number of deployed days in each Primary Military

Occupational Specialty (PMOS).[30] This regression explained 38 percent of the variation in individual Marines' deployed days, and all variables (except 20 of the 224 PMOS dummies) are statistically significant at the 5-percent level or higher. Holding PMOS constant, single Marines without dependents averaged 32 more deployed days than those with dependents. Given that the overall difference in deployed days between those with and without dependents was 49 days, this suggests that about 65 percent of the explained difference in deployed days is due to dependency status, and about 35 percent is due to the PMOS distribution. We further verified these results by estimating several regressions by PMOS (see table 9 for the regression for Riflemen, MOS 0311).

Table 9. Days deployed in the first term of service: FY04 FTAP population of Riflemen (MOS O311)

Variable	Mean	Coefficient[a]	Derivative
Married or dependent	.384	-29.337**	-29.337
		(-4.73)	
Constant		383.719**	
		(99.92)	
Observations		2,354	

a. z statistic in parentheses beneath coefficient. ** indicates significance at the 1-percent level.

To investigate why Marines with dependents (mostly married Marines) were more concentrated in PMOSs with lighter deployment schedules, we estimated the probability that they would marry or add a dependent during the course of their first term as a function of the average number of deployed days in their PMOS. Table 10 shows the logistic regression.

We find that the probability of a Marine without dependents acquiring a dependent decreased as average deployed days increased. In short, the probability of marriage decreased as average deployed days in their

30. Results for this regression are available from the authors.

PMOS increased. For each additional 100 deployed days, the probability decreased by 2.4 percentage points.[31]

Table 10. Probability that a Marine without dependents adds a dependent during first enlistment: FY04 FTAP population that entered single and without dependents

Variable	Mean	Coefficient[a]	Derivative
Average number of deployed days in PMOS, in hundreds	2.33	-0.097**	-.024
		(-7.11)	
Constant		-0.083*	
		(-2.40)	
Average marriage rate		0.424	
Chi-Square		51.0	
Observations		20,045	

a. z statistic in parentheses beneath coefficient. ** indicates significance at the 1-percent level, and * indicates significance at the 5-percent level.

Zone A Reenlistment equations for FY02 and FY03 FTAP populations

As mentioned in the main text, Marines making reenlistment decisions in FY02 and FY03 had fewer deployment days on average than Marines making reenlistment decisions in FY04 both because deployment tempo has increased and because we did not start keeping information on deployed days until October 2000. Table 11 shows the reenlistment logits we estimated for zone A Marines in FY02 and FY03.

The effect of heavy deployment time on reenlistments for first-term Marines making reenlistment decisions in FY02 and FY03 was quite different from that for Marines making reenlistment decisions in

31. A more ambitious and rigorous approach would estimate a hazard model with time-based information on deployed days and marital status in the period.

Table 11. Reenlistment logits for zone A in FY02 and FY03

	FY02			FY03		
Variable	Mean	Coefficient[a]	Derivative	Mean	Coefficient[a]	Derivative
Male	0.932	0.007	N.S.	0.932	0.192**	0.032**
		(0.11)			(2.88)	
Black	0.125	0.593**	0.117**	0.124	0.563**	0.103**
		(12.21)			(11.34)	
Hispanic	0.155	0.178**	0.033**	0.159	0.138**	0.024**
		(3.91)			(2.96)	
Married or dependents	0.458	0.259**	0.048**	0.472	0.223**	0.039**
		(4.55)			(3.46)	
Number of dependents	0.685	0.148**	0.028**	0.700	0.199**	0.035**
		(6.10)			(7.43)	
SRB level	0.574	0.823**	0.170**	0.489	0.93**	0.180**
		(30.32)			(31.45)	
Base	0.001	0.059**	0.011**	0.000	0.065**	0.0120**
		(18.69)			(19.64)	
E3	0.108	-0.874**	-0.139**	0.101	-0.94**	-0.139**
		(-13.41)			(-13.76)	
E5 and up	0.327	0.166**	0.031**	0.332	0.106**	0.018**
		(4.64)			(2.91)	
Crisis operation	0.022	0.276*	0.053*	0.252	-1.053**	-0.163**
		(2.40)			(-20.57)	
Days deployed (in 100s)						
Marine with dependents	0.517	0.212**	0.040**	1.212	-0.001	N.S.
		(6.13)			(-0.04)	
Marine with no dependents	0.740	0.057^	0.011^	1.576	-0.105**	-0.019**
		(1.78)			(-4.62)	
Never deployed	0.298	0.01	N.S.	0.168	-0.217**	-0.036**
		(0.24)			(-4.36)	
Constant		-1.833**			-1.661**	
		(-23.32)			(-20.58)	
Avg. reenlistment rate		0.288			0.278	
Chi-Square		2,058			3,064	
Observations		20,348			20,690	

a. z statistic in parentheses beneath coefficient. ** indicates significance at the 1-percent level, * indicates significance at the 5-percent level, and ^ indicates significance at the 10-percent level.

FY04. As suggested earlier, however, some of those differences may be due to the fact that we have information on deployed days for a more limited period of time.

Given these caveats, we find that, for Marines with dependents, an increase of 100 deployed days:

- Increased reenlistment probabilities by 4 percentage points for FY02 FTAP populations
- Had no impact on reenlistment probabilities for FY03 FTAP populations
- Decreased reenlistment probabilities 0 to 2 percentage points (depending on specification) for FY04 FTAP populations

For Marines without dependents, an increase of 100 deployed days:

- Increased reenlistment probabilities by 1 percentage point for FY02 FTAP populations
- Decreased reenlistment probabilities by 2 percentage points for FY03 FTAP populations
- Decreased reenlistment probabilities by 2 to 4 percentage points (depending on specification) for FY04 FTAP populations.

There are also large differences in the percentages of Marines deployed to crisis areas in recent years (2 percent of the FY02 FTAP population, 25 percent of the FY03 FTAP population, and 49 percent of the FY04 FTAP population.)

Zone B: Second-term reenlistment probabilities

FY04 second-term reenlistments

Table 12 shows the results of the estimation of zone B reenlistment probabilities for Marines making their decisions in FY04.

Of most interest in this study is the impact of deployments and crisis area deployments on reenlistment probabilities. For second-term Marines, the strongest effects of deployment tempo on reenlistment

Table 12. FY04 zone B reenlistment logits: Overall estimates and derivatives obtained from separate estimation by dependency status

Variable	Mean	Coefficient[b]	Derivative	Derivatives for separate estimates[a]	
				With dependents	Without dependents
Male	0.935	0.367**	0.074**	0.077**	N.S.
		(2.87)			
Black	0.186	0.514**	0.094**	0.088**	0.116**
		(5.59)			
Hispanic	0.171	0.24**	0.046**	N.S.	0.106**
		(2.68)			
Married or dependents	0.783	0.091	N.S.	-----	-----
		(0.76)			
Number of dependents	1.682	0.148**	0.028**	0.026**	-----
		(4.46)			
SRB level	0.044	-0.321**	-0.065**	-0.073**	N.S.
		(-3.22)			
Base	0.000	0.044**	0.006**	0.005**	0.006**
		(5.60)			
E3 or E4	0.021	-3.086**	-0.594**	-0.629**	-0.495**
		(-8.72)			
E6 and up	0.371	0.696**	0.129**	0.117**	0.175**
		(9.80)			
Crisis operation	0.301	-0.134	N.S.	-0.031^	N.S.
		(-1.56)			
Days deployed (in 100s)					
Marine with dependents	1.195	0.024	N.S.	N.S.	-----
		(0.73)			
Marine with no dependents	1.488	-0.061	N.S.	-----	-0.013^
		(-1.41)			
Never deployed	0.198	-0.228*	-0.045*	-0.038*	-0.070^
		(-2.55)			
Constant		-0.001			
		(-0.01)			
Average reenlistment rate		0.70			
Chi-Square		453			
Observations		5,073		3,970	1,103

a. The logistic coefficients are not shown, but are available from the authors.

b. z statistic in parentheses beneath coefficient. ** indicates significance at the 1-percent level, * represents significance at the 5-percent level, and ^ indicates significance at the 10-percent level.

probabilities come from those who did not deploy. Almost 20 percent of FY04 zone B FTAP Marines did not deploy in the 36 months before their reenlistment decision. Other things equal, these Marines have reenlistment probabilities that are 4 to 7 percentage points lower than their counterparts who deployed. The largest effect is for zone B Marines without dependents.

Generally speaking, crisis-area deployments or considerable deployment time had no statistically significant effect on reenlistment probabilities. The two exceptions (crisis-area deployments for Marines with dependents and considerable deployed time for Marines without dependents) have very small or only marginally significant effects on reenlistment.

As in zone A, black and Hispanic Marines in zone B are more likely to reenlist, as are Marines with more dependents. Male Marines are more likely to reenlist than female Marines if they have dependents, but, all else equal, there are no gender differences in reenlistment for Marines without dependents. This latter finding differs from zone A.[32]

The estimated effects of grade are as expected: zone B E3 and E4 Marines are less likely, and E6 and above are more likely, to reenlist than E5s. Despite the presence of the base variable, we estimate a negative impact for SRBs on reenlistment.[33] In FY04, less than 5 percent of zone B reenlisters were offered SRBs. We suspect that the MOSs offered zone B SRBs were ones in which it is *extremely* difficult to get reenlistments. Thus, even with the SRBs, the reenlistment rates in these MOSs were lower than average.

FY02 and FY03 zone B reenlistment decisions

Probably the most interesting piece of additional information from these regressions is the effect of having been deployed to a crisis area (see table 13). In FY02, only 1 percent of Marines had deployed to a

32. In zone A, single male Marines without dependents were less likely to reenlist than single female Marines without dependents.

33. The base variable is supposed to capture the reenlistment rate for each MOS if the SRB is zero. It clearly did not accurately capture this reenlistment rate for the few zone B MOSs given bonuses in FY04.

Table 13. Reenlistment logits for zone B in FY02 and FY03

Variable	FY02			FY03		
	Mean	Coefficient[a]	Derivative	Mean	Coefficient[a]	Derivative
Male	0.949	0.303*	0.059*	0.940	0.181	N.S.
		(2.11)			(1.27)	
Black	0.177	0.607**	0.105**	0.187	0.572**	0.096**
		(6.22)			(5.68)	
Hispanic	0.141	0.166^	0.031^	0.166	0.056	N.S.
		(1.67)			(0.59)	
Married or dependents	0.796	0.105	N.S.	0.800	0.301*	0.057*
		(0.92)			(2.40)	
Number of dependents	1.744	0.179**	0.032**	1.720	0.112**	0.020**
		(5.30)			(3.12)	
SRB level	0.308	0.212**	0.038**	0.370	0.484**	0.078**
		(3.60)			(7.13)	
Base	0.002	0.048**	0.006**	0.000	0.049**	0.007**
		(5.50)			(5.42)	
E3 or E4	0.021	-3.227**	-0.602**	0.022	-2.943**	-0.586**
		(-8.61)			(-9.02)	
E6 and up	0.393	0.910**	0.164**	0.386	0.641**	0.113**
		(12.15)			(8.37)	
Crisis operation	0.011	1.43**	0.191**	0.119	-0.075	N.S.
		(2.79)			(-0.63)	
Days deployed (in 100s)						
Marine with dependents	0.293	0.277**	0.037**	0.681	-0.015	N.S.
		(3.23)			(-0.31)	
Marine with no dependents	0.387	0.173	N.S.	0.820	-0.054	N.S.
		(1.51)			(-0.82)	
Never deployed	0.460	-0.300**	-0.056**	0.312	-0.31**	-0.057**
		(-3.87)			(-3.65)	
Constant		-0.164			0.076	
		(-0.97)			(0.45)	
Avg. reenlistment rate		0.705			0.724	
Chi-Square		538.			427	
Observations		4,846			4,584	

a. z statistic in parentheses beneath coefficient. ** indicates significance at the 1-percent level, * represents significance at the 5-percent level, and ^ indicates significance at the 10-percent level.

crisis area, and the effect of such a deployment was positive, boosting reenlistment rates by 3.7 percent. In FY03, when almost 12 percent of zone B Marines deployed to a crisis area, the effect on reenlistment was essentially zero. By FY04, when 30 percent were so deployed, the effect on reenlistment was negative (although it was not statistically significant).

The deployment variables track shorter time periods (12 months for FY02 and 24 months for FY03). There are still negative reenlistment effects for those who did not deploy of about 6 percentage points in both years, and a positive effect for heavy deployers with dependents in FY02. This later result should be viewed with caution because of truncated data.

The Marine Corps offered SRBs to substantially greater numbers of zone B Marines in the FY02 and FY03 period than it did in FY04 (31 percent and 37 percent, respectively). In FY02, each one-level increase in SRBs made Marines, all else equal, 3.8 percentage points more likely to reenlist; in FY03, the effect of a one-level increase in the SRB was to increase reenlistments by 7.8 percentage points.

Zone C: Third-term reenlistment probabilities

FY04 third-term reenlistments

Third-term reenlistments occur between 10 and 14 years of service, usually at about 12 years of service. The pull of retirement is growing, reenlistment rates are very high, and the reenlistment discriminators that worked so well in the earlier years of service are much weaker. Table 14 shows zone C estimates for FY04 reenlistments. The only demographic variables that have any statistical significance are Hispanic and number of dependents, and their effects are small and only marginally significant. Very few zone C Marines were offered SRBs in FY04 and, like the FY04 estimates for zone B Marines, the estimated reenlistment effects of the SRBs are negative, meaning that the SRBs did not raise the reenlistment rates above the overall average rate. Again, we suspect that SRBs were offered only to extremely difficult-to-retain MOSs.

Table 14. FY04 zone C reenlistment logits: Overall estimates and derivatives obtained from separate estimation by dependency status

				Derivatives for Separate Estimates	
Variable	Mean	Coefficient[a]	Derivative	With Dependents	Without Dependents
Male	0.943	0.274	N.S.	N.S.	N.S.
		(0.95)			
Black	0.219	0.196	N.S.	N.S.	N.S.
		(1.10)			
Hispanic	0.136	0.413^	0.031^	N.S.	N.S.
		(1.85)			
Married or dependents	0.895	-0.369	N.S.	-----	-----
		(-1.14)			
Number of dependents	2.316	0.112^	0.009^	0.009^	-----
		(1.83)			
SRB level	0.049	-0.509**	-0.047**	-0.039*	-0.122*
		(-3.07)			
Base	0.000	0.147**	0.021**	0.023**	N.S.
		(4.40)			
E3 to E5	0.090	-3.269**	-0.568**	-0.554**	-0.647**
		(-19.15)			
E7 to E9	0.185	0.891**	0.062**	0.058**	N.S.
		(3.50)			
Crisis operation	0.312	0.132	N.S.	N.S.	0.085*
		(0.71)			
Days deployed (in 100s)					
Marine with dependents	1.255	0.088	N.S.	N.S.	-----
		(1.3)			
Marine with no dependents	1.324	-0.099	N.S.	-----	-0.035^
		(-0.76)			
Never deployed	0.179	-0.043	N.S.	N.S.	N.S.
		(-0.22)			
Constant		2.103**			
		(5.54)			
Average reenlistment rate		0.873			
Chi-Square		493.26			
Observations		2,601		2,327	274

a. z statistics in parentheses beneath coefficients. ** indicates significance at the 1-percent level, * indicates significance at the 5-percent level, and ^ indicates significance at the 10-percent level.

By zone C, most Marines are married with dependents. There is a small positive effect on reenlistments as the number of dependents increases (about 1 percentage point for each dependent).

Most of the deployment-related variables do not affect reenlistments. However, single Marines without dependents are 8.5 percentage points more likely to reenlist if they have been to a crisis area, though there is a negative effect of 3.5 percentage points for each 100 deployed days. These results almost cancel each other out since an average deployment is 210 days.

The grade at which the Marine makes the reenlistment decision is still important: those with grades below E6 are substantially less likely (than E6s) to reenlist, and those with grades E7 and above are more likely (than E6s) to reenlist.

The results for FY02 and FY03 zone C reenlistments are available from the authors. They show similar results to the ones reported for FY04.

Results for commissioned officers

A quick look

Table 15 provides retention rates for commissioned officers with and without dependents by number of days deployed and years of service.

We see a positive relationship between officer retention and days deployed in all year of service categorizations. This positive relationship is true for officers with and without dependents.

Statistical analyses

To investigate the relationship between deployment tempo and Marine Corps officer retention, we used two dependent variables:

- Retention rates (March 2004 to March 2005)
- Retention plans (did not submit separation or retirement papers as of March 2005).

Table 15. **Commissioned officers with and without dependents**: Retention rates by years of service and days deployed[a]

		Days deployed						
	Total	0	001-100	101-200	201-300	301-400	401-500	501+
Commissioned officers with dependents								
4-6 years	1,959	99	501	328	424	298	189	120
Percent retained	6.9%	88.9%	87.8%	95.4%	93.2%	96.3%	96.8%	97.5%
7-8 years	1,145	60	284	200	246	183	119	53
Percent retained	4.8%	90.0%	94.0%	94.0%	95.1%	97.8%	97.5%	98.1%
9-11 years	1,602	102	416	315	339	242	129	59
Percent retained	9.6%	81.4%	87.0%	88.9%	91.4%	95.9%	95.3%	100.0%
12-18 years	2,685	230	871	532	536	321	129	66
Percent retained	3.4%	92.2%	94.4%	98.3%	97.8%	99.1%	100.0%	100.0%
19-28	1,561	192	696	271	244	95	44	19
Percent retained	21.5%	66.7%	72.7%	86.0%	89.3%	89.5%	86.4%	89.5%
29+ years	129	13	72	15	15	6	6	2
Percent retained	43.4%	38.5%	44.4%	66.7%	86.7%	83.3%	100.0%	100.0%
All years of service	9,081	696	2,840	1,661	1,804	1,145	616	319
Percent retained	43.4%	81.9%	85.5%	93.1%	93.9%	96.6%	96.6%	98.1%
Commissioned officers without dependents								
4-6 years	904	35	156	113	204	147	131	118
Percent retained	88.8%	77.1%	84.6%	85.0%	87.3%	92.5%	93.9%	94.1%
7-8 years	450	20	66	59	96	83	70	56
Percent retained	91.1%	75.0%	90.9%	89.8%	91.7%	92.8%	92.9%	92.9%
9-11 years	310	9	50	54	77	62	33	25
Percent retained	92.3%	88.9%	86.0%	90.7%	96.1%	91.9%	93.9%	96.0%
12-18 years	231	19	70	37	41	31	21	12
Percent retained	97.0%	100.0%	97.1%	94.6%	97.6%	96.8%	100.0%	100.0%
19-28 years	76	11	35	14	10	3	2	1
Percent retained	80.3%	72.7%	88.6%	57.1%	80.0%	100.0%	100.0%	100.0%
29+ years	3		2			1		
Percent retained	66.7%		50.0%			100.0%		
All years of service	1,974	94	379	277	428	327	257	212
Percent retained	90.5%	81.9%	88.4%	87.0%	90.7%	93.0%	94.2%	93.9%

a. The number of Marines in each category is as of March 2005. Retention rates are for March 2004 through March 2005. Days deployed are calculated for the previous 42 months.

As in the work for enlisted Marines, we matched deployment histories to the officers' personnel records. For the retention rate analysis, we used the past 42 months of deployment information; for the retention plans analysis, we were able to use all deployment information since October 2000. As in the work for enlisted personnel, we used logistic regression analysis.

Officers who are not eligible for retirement

Table 16 shows the results of the logistic regressions for non-retirement-eligible officers. Both for retention and retention plans, higher levels of deployment tempo made officers more likely to continue. For each 100 deployed days, officer retention rates rose 0.7 percentage points and officer retention plans rose 0.4 percentage points.

Officer retention rates and retention plans also were positively affected by deployment to a crisis area. As with the deployment effects, these variables are statistically significant at the 1-percent level and contributed 1.8 percentage points to retention rates and 2.2 percentage points to plans to continue. Since the average retention rate was 92.6 percent (average plans to continue was 96.2 percent), these are very large effects.

Aside from the black variable in the retention rate regression, demographic factors (gender or race/ethnic background) are not significant factors in either officer retention rates or plans to continue. However, officers in the top third of their class were 2.8 percentage points more likely to continue.

The year of service/pilot/non-pilot variables performed as expected. All these estimates are relative to the omitted group, officers with 12 to 18 years of service. Pilots with 3 to 6 years of service (most of whom are still under service obligations) are more likely to continue, whereas non-pilots (most of whom have finished their service obligation) are less likely to continue.[34] In the 7^{th} to 8^{th} year of service and in the 9^{th} to 11^{th} year of service, all officers are less likely to continue

34. Because the electronically readable variable to identify whether an officer is still under a service obligation is blank for many records, we could not use it in our analyses.

Table 16. Retention rates for non- retirement-eligible commissioned officers

	March 2004 to Mach 2005 retention			Plan to continue as of March 2005[a]		
Variables	Mean	Coefficient[b]	Derivative	Mean	Coefficient	Derivative
Black	0.067	0.441**	0.025**	0.071	0.042	N.S.
		(2.92)			(0.2)	
Hispanic	0.035	0.187	N.S.	0.030	-0.354	N.S.
		(0.99)			(-1.28)	
Other ethnicity	0.042	0.178	N.S.	0.042	-0.472*	-0.020*
		(1.04)			(-2.09)	
Female	0.055	-0.015	N.S.	0.049	-0.071	N.S.
		(-0.11)			(-0.31)	
Top third TBS	0.265	0.466**	0.028**	0.310	0.107	N.S.
		(5.03)			(0.87)	
Crisis operation	0.546	0.28**	0.018**	0.552	0.614**	0.022**
		(3.22)			(4.68)	
Pilot, 3-6 YOS	0.097	1.76**	0.032**	0.092	3.557**	0.036**
		(5.51)			(3.52)	
Pilot, 7-8 YOS	0.037	-0.701**	-0.036**	0.053	-0.353	N.S.
		(-3.23)			(-1.33)	
Pilot, 9-11 YOS	0.061	-1.253**	-0.083**	0.071	-0.549**	-0.025**
		(-9.03)			(-2.76)	
Non-pilot, 3-6 YOS	0.264	-1.078**	-0.066**	0.232	-0.01	N.S.
		(-10.12)			(-0.06)	
Non-pilot, 7-8 YOS	0.080	-0.361*	-0.016*	0.114	0.306	N.S.
		(-2.22)			(1.52)	
Non-pilot, 9-11 YOS	0.091	-0.758**	-0.040**	0.113	-0.25	N.S.
		(-5.53)			(-1.46)	
No dependents, 3-6 YOS	0.144	-0.786**	-0.042**	0.118	-0.309	N.S.
		(-7.58)			(-1.41)	
Days deployed (in 100s)	2.169	0.107**	0.007**	2.632	0.11**	0.004**
		(3.79)			(2.78)	
Constant		2.721**			2.708**	
		(30.59)			(22.13)	
Mean dependent variable		0.926			0.962	
Chi-Square		542			138	
Observations		12,087			9,417	

a. No separation papers have been submitted as of March 2005. Officers must submit separation plans 4 to 10 months before separation.

b. z statistics in parentheses beneath coefficients. ** indicates significance at the 1-percent level and * indicates significance at the 5-percent level.

than are officers in the 12th to 18th year of service; both effects are stronger for pilots than non-pilots.

Finally, the retention models control for officers in the 3rd to 6th year of service who do not have dependents. These officers are less likely to continue than officers in the same years of service who do have dependents.

Officers who are eligible for retirement

We estimated the same two logistic regressions for officers who were retirement eligible. We caution, however, that a few of these officers may be close to, but not quite yet eligible for, retirement. That is because the Retirement and Separation branch separately analyzes each officer's record close to the 20-year point, and many electronic records are found to have minor date mistakes. If we had accurate information, we would have omitted O4s, who must retire at 20 years of service. Instead, we kept them in the estimation because some of them may not quite be retirement eligible.

Of most interest to this study is the relationship of deployed days and retention. The effects on retention of deployed days and deployment to a crisis area are even more positive for retirement-eligible officers than they were for non-retirement-eligible officers. For officers eligible for retirement:

- Each 100 deployed days
  - Increases the retention rate by 4.6 percentage points
  - Increases plans to continue by 3.8 percentage points
- Deployment to a crisis area
  - Increases the retention rate by 5.7 percentage points
  - Is positively—though not significantly—related to plans to continue.

Retirement-eligible officers who were in the top third of their TBS class are more likely (but not statistically significantly) to continue from March 2004 to March 2005. For the plans to continue in March 2005, however, retirement-eligible officers in the top third of their

TBS classes were 3.8 percentage points more likely to continue than their counterparts not in the top third. These results are statistically significant to the 10-percent level (see table 17).

Table 17. Retirement eligible

	March 2004 to March 2005 retention			Plans to continue as of March 2005[a]		
Variables	Mean	Coefficient[b]	Derivative	Mean	Coefficient	Derivative
Black	0.044	-0.382	N.S.	0.043	0.044	N.S.
		(-1.42)			(0.14)	
Hispanic	0.009	0.609	N.S.	0.008	0.325	N.S.
		(0.79)			(0.41)	
Other ethnicity	0.014	0.181	N.S.	0.019	0.349	N.S.
		(0.33)			(0.66)	
Female	0.027	0.251	N.S.	0.027	-0.084	N.S.
		(0.68)			(-0.23)	
Top third TBS	0.316	0.167	N.S.	0.347	0.272^	0.038^
		(1.23)			(1.85)	
Crisis operation	0.343	0.361*	0.057*	0.390*	0.246	N.S.
		(2.04)			(1.37)	
Retirement eligible O4	0.078	-1.925**	-0.406**	0.067**	-2.244**	-0.459**
		(-9.64)			(-9.83)	
Days deployed (in 100s)	1.184	0.357**	0.046**	1.601**	0.339**	0.039**
		(4.81)			(4.97)	
Constant		0.835**			0.914**	
		(9.13)			(8.53)	
Mean of dependent variable		0.758			0.793	
Chi-Square		191			179	
Observations		1,598			1,573	

a. No separation papers have been submitted.
b. z-statistics in parentheses beneath coefficient. ** indicates significance at the 1-percent level, * indicates significance at the 5-percent level, and ^ indicates significance at the 10-percent level.

None of the demographic variables are significant in explaining retention rates. As expected, retirement-eligible O4s are much less likely to continue.

Appendix B: Average deployment days for FY04 zone A Marines, by grade and PMOS

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
0121	3	88	29	37	31	62	60
0121	4	83	187	47	210	64	397
0121	5	77	38	53	45	64	83
0151	3	136	25	103	35	117	60
0151	4	143	208	106	218	124	426
0151	5	71	37	63	38	67	75
0161	3	74	7	95	8	85	15
0161	4	123	24	83	18	106	42
0161	5	110	3	41	4	70	7
0231	3	228	3	320	3	274	6
0231	4	286	24	233	14	267	38
0231	5	289	19	202	7	266	26
0311	3	414	199	401	113	409	312
0311	4	426	976	385	588	411	1,564
0311	5	381	275	362	203	373	478
0313	3	410	7	368	6	390	13
0313	4	395	76	346	32	380	108
0313	5	393	19	358	16	377	35
0321	4	345	50	341	10	344	60
0321	5	348	54	389	15	357	69
0331	3	385	31	359	39	370	70
0331	4	431	206	384	144	412	350
0331	5	411	41	447	33	427	74
0341	3	413	36	366	22	395	58
0341	4	427	232	401	157	416	389

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
0341	5	368	35	313	46	337	81
0351	3	398	23	374	28	385	51
0351	4	426	168	392	101	414	269
0351	5	388	26	295	29	339	55
0352	3	424	4	350	6	380	10
0352	4	381	36	377	31	379	67
0352	5	380	52	360	30	373	82
0411	3	235	18	177	14	210	32
0411	4	169	35	144	42	156	77
0411	5	133	6	119	8	125	14
0431	3	289	7	218	13	243	20
0431	4	266	58	174	47	224	105
0431	5	239	29	217	22	229	51
0451	4	199	10	123	7	167	17
0481	3	334	6	223	3	297	9
0481	4	359	61	335	45	349	106
0481	5	285	12	281	15	283	27
0511	4	102	9	181	4	127	13
0511	5	111	2	162	3	141	5
0612	3	390	14	315	8	363	22
0612	4	328	83	281	63	308	146
0612	5	306	33	291	39	298	72
0613	4	261	3	54	6	123	9
0614	3	310	7	228	7	269	14
0614	5	285	8	229	6	261	14
0621	3	354	48	338	35	347	83
0621	4	337	299	287	258	314	557
0621	5	334	103	319	98	327	201
0622	3	226	10	199	10	213	20
0622	4	227	56	223	39	225	95
0622	5	206	13	175	8	194	21
0627	4	227	16	102	9	182	25
0627	5	259	8	246	8	253	16
0651	3	216	15	217	10	216	25
0651	4	161	73	156	51	159	124

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
0651	5	146	22	148	11	147	33
0656	3	165	12	44	10	110	22
0656	4	156	104	143	67	151	171
0656	5	135	49	90	20	122	69
0811	3	439	30	438	19	439	49
0811	4	446	143	431	84	440	227
0811	5	434	67	409	38	425	105
0842	4	235	11	281	2	242	13
0844	3	360	10	294	8	331	18
0844	4	354	42	298	28	332	70
0844	5	318	29	322	23	320	52
0847	5	276	3	274	2	275	5
0861	3	397	4	234	2	343	6
0861	5	339	5	471	1	361	6
1141	3	159	8	160	3	159	11
1141	4	223	29	135	36	174	65
1141	5	261	11	109	8	197	19
1142	3	268	3	31	8	95	11
1142	4	206	35	160	27	186	62
1142	5	202	14	153	19	174	33
1161	3	212	5	0	2	152	7
1161	4	164	26	168	20	165	46
1161	5	275	4	149	2	233	6
1171	3	197	15	97	7	165	22
1171	4	223	53	185	35	208	88
1171	5	225	16	91	4	198	20
1181	5	79	6	75	3	78	9
1316	3	263	5	98	4	190	9
1316	4	158	10	103	16	124	26
1316	5	171	5	147	5	159	10
1341	3	169	16	199	10	181	26
1341	4	174	54	137	59	154	113
1345	3	231	23	226	21	228	44
1345	4	237	82	205	78	221	160
1345	5	259	27	177	28	217	55

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
1361	3	169	4	240	2	193	6
1361	4	200	17	113	4	183	21
1371	3	201	13	254	26	236	39
1371	4	286	131	229	110	260	241
1371	5	268	73	223	53	249	126
1391	3	195	23	199	9	196	32
1391	4	171	76	161	64	166	140
1391	5	139	16	127	15	133	31
1812	3	426	3	207	2	338	5
1812	4	368	38	323	17	354	55
1812	5	338	13	311	11	326	24
1833	3	451	17	342	15	400	32
1833	4	411	125	372	100	393	225
1833	5	426	57	395	35	414	92
2111	3	192	13	150	17	168	30
2111	4	207	61	143	69	173	130
2111	5	155	19	168	11	160	30
2131	3	243	5	183	2	226	7
2131	4	221	15	286	14	252	29
2141	3	147	4	204	5	178	9
2141	4	324	28	225	21	281	49
2141	5	379	27	240	21	318	48
2146	3	24	1	261	5	222	6
2146	4	263	29	207	13	246	42
2146	5	175	6	0	1	150	7
2147	4	278	18	194	17	237	35
2147	5	268	15	206	9	245	24
2161	3	109	4	166	1	121	5
2161	4	180	7	105	7	143	14
2171	4	165	27	215	16	184	43
2171	5	237	11	182	8	214	19
2311	3	245	11	197	10	222	21
2311	4	233	51	183	52	208	103
2621	3	47	4	0	1	38	5
2621	4	173	22	136	15	158	37

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
2621	5	250	34	161	23	214	57
2631	4	253	3	11	4	115	7
2631	5	325	11	296	4	317	15
2651	4	185	21	87	9	156	30
2651	5	178	20	185	13	181	33
2671	4	128	5	118	6	122	11
2671	5	243	15	104	9	191	24
2673	5	4	3	87	5	56	8
2674	4	168	8	45	5	121	13
2674	5	141	12	80	9	115	21
2676	4	198	7	25	2	159	9
2676	5	121	8	147	11	136	19
2822	4	85	5	76	3	82	8
2822	5	38	6	97	7	70	13
2831	3	114	2	102	3	107	5
2831	4	136	11	120	16	127	27
2831	5	0	1	225	4	180	5
2834	5	261	2	178	3	211	5
2844	3	239	5	97	7	156	12
2844	4	230	51	206	53	218	104
2844	5	188	41	228	45	209	86
2846	3	161	2	87	5	108	7
2846	4	165	15	135	17	149	32
2846	5	138	19	181	13	156	32
2847	3	118	2	72	3	90	5
2847	4	252	24	104	29	171	53
2847	5	164	50	187	39	174	89
2871	4	76	4	6	1	62	5
2871	5	131	4	60	5	91	9
2881	3	174	3	139	3	157	6
2881	4	177	7	18	3	129	10
2881	5	187	13	169	9	179	22
3043	3	174	29	113	36	140	65
3043	4	155	193	122	194	138	387
3043	5	136	36	128	32	132	68

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
3051	3	147	37	89	39	118	76
3051	4	137	147	106	156	121	303
3051	5	75	14	40	11	59	25
3052	3	140	1	15	5	36	6
3052	4	69	7	152	12	122	19
3052	5	23	2	41	4	35	6
3112	3	65	4	46	9	52	13
3112	4	24	30	72	42	52	72
3112	5	5	3	9	5	8	8
3381	3	263	28	237	28	250	56
3381	4	239	147	222	172	230	319
3381	5	252	38	235	45	243	83
3432	3	108	12	81	14	94	26
3432	4	65	54	60	50	62	104
3432	5	40	6	62	5	50	11
3451	3	0	3	0	5	0	8
3451	4	20	22	20	15	20	37
3451	5	33	3	0	6	11	9
3521	3	137	23	147	20	142	43
3521	4	201	199	166	179	185	378
3521	5	188	100	154	92	171	192
3531	3	178	65	159	58	169	123
3531	4	219	283	195	305	206	588
3531	5	178	58	154	69	165	127
3533	3	221	21	205	23	213	44
3533	4	303	128	259	133	280	261
3533	5	274	12	172	15	217	27
4067	4	56	20	20	10	44	30
4067	5	41	11	54	9	47	20
4341	4	66	13	35	6	56	19
4341	5	59	10	23	2	53	12
4421	3	133	10	29	5	98	15
4421	4	64	23	37	22	50	45
4421	5	3	4	7	2	4	6
4611	4	2	2	2	5	2	7

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
4612	4	60	5	20	5	40	10
4641	3	342	4	148	3	259	7
4641	4	166	16	25	8	119	24
4641	5	143	4	255	4	199	8
4671	3	70	3	91	5	83	8
4671	4	147	3	71	7	94	10
5524	4	37	32	61	15	44	47
5524	5	12	32	34	24	21	56
5711	3	127	5	147	4	136	9
5711	4	171	39	163	29	167	68
5711	5	223	15	128	13	179	28
5811	3	123	20	126	27	125	47
5811	4	121	176	68	144	97	320
5811	5	106	59	122	54	113	113
5831	3	5	4	0	4	2	8
5831	4	2	40	2	33	2	73
5831	5	29	3	0	5	11	8
5937	3	187	8	158	10	171	18
5937	4	184	4	200	8	195	12
5937	5	258	3	310	2	278	5
5942	4	187	5	87	3	150	8
5942	5	144	8	257	6	192	14
5952	3	86	3	227	2	142	5
5952	4	257	2	97	7	133	9
5952	5	152	3	121	7	130	10
5953	4	164	7	63	10	104	17
5953	5	69	13	68	18	68	31
5954	4	88	9	114	5	98	14
5954	5	134	7	188	9	165	16
5962	4	155	5	107	8	125	13
5962	5	247	5	46	5	147	10
5963	5	115	3	145	4	132	7
6042	3	221	2	234	4	230	6
6042	4	255	16	166	11	219	27
6042	5	179	8	157	9	167	17

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
6046	3	109	3	43	2	83	5
6046	4	242	40	219	45	230	85
6046	5	253	20	213	25	231	45
6048	3	399	4	173	5	274	9
6048	4	308	25	202	42	241	67
6048	5	252	22	266	34	261	56
6062	4	311	7	249	19	266	26
6062	5	359	10	237	16	284	26
6072	3	195	4	83	4	139	8
6072	4	362	14	153	24	230	38
6072	5	277	25	232	29	253	54
6073	4	271	15	205	19	235	34
6073	5	253	18	166	15	214	33
6074	4	75	8	50	8	63	16
6092	4	275	23	180	26	225	49
6092	5	250	14	287	10	266	24
6111	4	303	3	510	2	386	5
6112	3	465	4	242	4	353	8
6112	4	300	15	245	23	267	38
6112	5	277	22	275	17	276	39
6113	4	337	17	359	16	348	33
6113	5	359	34	327	16	349	50
6114	3	417	5	308	4	368	9
6114	4	452	18	365	17	410	35
6114	5	353	29	281	39	311	68
6122	4	146	5	34	4	96	9
6122	5	76	7	143	12	118	19
6123	4	418	1	147	13	167	14
6123	5	73	1	161	11	153	12
6124	5	288	5	205	9	234	14
6132	4	224	7	158	8	189	15
6132	5	247	6	217	13	227	19
6152	4	399	7	356	8	376	15
6152	5	377	22	287	20	334	42
6153	4	435	21	407	17	423	38

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
6153	5	442	18	434	27	437	45
6154	4	321	9	366	15	349	24
6154	5	327	14	375	25	357	39
6172	3	418	5	441	3	427	8
6172	4	339	26	309	12	330	38
6172	5	383	18	333	16	359	34
6173	3	343	2	198	3	256	5
6173	4	302	14	291	14	297	28
6173	5	419	20	287	17	358	37
6174	4	363	6	450	2	385	8
6174	5	428	10	344	14	379	24
6212	3	326	2	148	7	188	9
6212	4	348	10	272	21	297	31
6212	5	309	14	304	18	306	32
6213	5	374	5	375	5	374	10
6214	4	287	4	216	2	263	6
6216	4	149	3	123	5	133	8
6216	5	205	9	127	9	166	18
6217	4	347	14	366	10	355	24
6217	5	409	21	415	38	413	59
6222	5	221	5	137	10	165	15
6226	4	57	2	44	4	48	6
6226	5			63	8	63	8
6227	4	281	4	124	5	194	9
6227	5	185	8	224	11	207	19
6252	4	312	4	215	16	235	20
6252	5	328	15	337	12	332	27
6253	5	442	2	403	4	416	6
6256	4	85	6	74	9	79	15
6256	5	128	7	131	12	130	19
6257	4	429	11	350	7	398	18
6257	5	408	22	336	16	378	38
6276	5	228	15	157	5	210	20
6282	4	331	4	191	4	261	8
6282	5	317	3	312	6	313	9

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
6287	4	423	3	291	2	370	5
6287	5	408	5	323	10	352	15
6312	4	242	8	150	8	196	16
6312	5	352	3	239	7	273	10
6313	4	433	5	351	3	402	8
6316	4	259	8	104	3	217	11
6316	5	176	4	234	2	195	6
6317	3	473	2	236	3	331	5
6317	4	444	9	257	12	337	21
6317	5	458	13	293	5	412	18
6322	4	249	19	186	10	227	29
6322	5	320	12	238	13	277	25
6323	4	356	19	364	20	360	39
6323	5	346	26	290	29	317	55
6324	4	319	27	256	22	291	49
6324	5	282	20	304	16	292	36
6332	4	419	2	254	4	309	6
6332	5	291	8	220	8	256	16
6333	4	363	7	377	7	370	14
6333	5	349	5	386	2	360	7
6337	4	304	4	294	14	296	18
6337	5	365	9	364	18	365	27
6386	4	346	7	378	2	353	9
6412	4	156	4	122	7	134	11
6412	5	250	6	206	16	218	22
6413	4	257	6	224	12	235	18
6413	5	249	19	200	24	222	43
6423	3	206	1	187	4	190	5
6423	4	158	4	88	9	110	13
6423	5	252	5	193	7	217	12
6432	3	264	3	252	3	258	6
6432	4	141	9	177	12	161	21
6432	5	370	3	119	12	169	15
6433	4	247	7	256	5	251	12
6433	5	281	9	236	7	262	16

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
6461	4	298	2	128	3	196	5
6461	5	323	7	182	3	281	10
6462	5	171	3	203	4	189	7
6464	4	380	1	185	4	224	5
6464	5	261	1	349	4	331	5
6467	4	229	2	197	6	205	8
6467	5	139	5	154	6	147	11
6482	4	103	5	97	2	101	7
6482	5	211	10	83	4	174	14
6483	5	237	5	206	5	222	10
6484	4	394	7	349	3	381	10
6484	5	284	6	343	4	307	10
6492	4	205	9	156	6	185	15
6492	5	115	14	116	17	115	31
6531	3	312	21	268	9	299	30
6531	4	311	86	344	61	325	147
6531	5	388	31	379	19	384	50
6541	3	151	10	149	3	150	13
6541	4	208	54	247	54	227	108
6541	5	230	24	192	10	219	34
6672	3	195	8	179	10	186	18
6672	4	184	71	133	109	153	180
6672	5	169	30	147	22	160	52
6694	3	37	5	0	3	23	8
6694	4	77	12	55	16	65	28
6694	5	212	5	7	1	178	6
6821	4	181	12	14	10	105	22
6821	5	108	4	93	5	99	9
6842	5	228	1	62	6	86	7
7011	4	113	20	81	16	99	36
7011	5	174	8	154	4	167	12
7041	3	201	6	152	3	185	9
7041	4	213	43	113	24	177	67
7041	5	259	9	147	18	184	27
7051	3	72	18	95	19	84	37

Table 18. Average deployment days, by grade and PMOS, for zone A Marines making reenlistment decisions in FY04 (continued)

		No dependents		Dependents		All Marines[a]	
PMOS	PG	Average deployment days	No. of Marines	Average deployment days	No. of Marines	Average deployment days	No. of Marines
7051	4	99	52	57	49	79	101
7051	5	101	11	55	19	72	30
7212	4	251	26	201	25	226	51
7212	5	257	20	270	12	262	32
7234	4	182	4	217	11	208	15
7234	5	170	5	187	6	180	11
7242	4	307	14	200	11	260	25
7242	5	226	12	232	9	228	21
7257	4	131	26	76	16	110	42
7257	5	150	25	131	23	141	48
7314	4	261	5			261	5
7314	5	281	1	260	5	263	6
7372	5	155	2	225	5	205	7

a. If the number of Marines in the paygrade/MOS combination was less than 5, the information was not included in the table.

References

[1] Dan Balz, "Guard Deployments Weigh on Governors," *The Washington Post*, 19 Jul 2005, p. A03.

[2] Anita U. Hattiangadi, Lewis G. Lee, and Aline O. Quester. *Deployment Tempo and Retention in the Marine Corps*, Oct 2005 (CNA Annotated Briefing D0013118.A1)

[3] James Hosek and Mark Totten. *Serving Away From Home: How Deployments Influence Reenlistment*, 2002 **(**RAND, MR-1594-OSD**,** pp. 47-48)

[4] "Deployments Strain Marriages." *Poughkeepsie Journal*, 24 Apr 2005

[5] James Hosek and Mark Totten. *Does Perstempo Hurt Reenlistment? The Efect of Long or Hostile Perstempo on Reenlistment*, 1998 **(**RAND, MR-990-OSD**)**

[6] Ronald Fricker. *The Effects of PERSTEMPO on Officer Retention in the U.S. Military*, 2002 **(**RAND, NR-1556-OSD**)**

[7] Anita U. Hattiangadi, Deena Ackerman, Theresa H. Kimble, and Aline O. Quester. *Cost-Benefit Analysis of Lump Sum Zone A, Zone B, and Zone C Reenlistment Study: Final Report*, 2003 **(**CRM D0009652.A2)

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