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How Do Earnings Change When Reservists Are Activated?

A Reconciliation of Estimates Derived from Survey and Administrative Data

Francisco Martorell, Jacob Alex Klerman, David S. Loughran

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1200 South Hayes Street, Arlington, VA 22202-5050
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Summary

A large fraction of the reserve force has been activated since September 11, 2001, in support of the Global War on Terror and its associated contingencies. Among the hardships of activation is the possibility that the labor market earnings of reservists might fall while they are activated relative to their earnings before being activated. Recent research by Loughran, Klerman, and Martin (2006) (hereafter referred to as LKM) suggests that most reservists in fact earn substantially more while they are activated than they do while not activated. LKM draw this conclusion from administrative earnings records maintained by the Department of Defense (DoD) and the Social Security Administration (SSA). However, self-reported earnings recorded in the 2004 and 2005 Status of Forces Survey of Reserve Component Members (SOFS-R) imply the opposite conclusion: Activated reservists on average experience significant earnings losses.

Estimates of earnings changes derived from SOFS-R and administrative data might differ for a number of reasons. The SOFS-R and administrative data differ in the samples of reservists surveyed, the way earnings are defined, and the time period over which pre- and during-activation earnings comparisons are made. Misreporting and nonresponse bias, problems common to all surveys, might bias estimates derived from the SOFS-R data. On the other hand, civilian earnings may not be recorded perfectly in our administrative data sources, leading to biased estimates derived from those data. In this study, we report on the results of a set of analyses designed to quantify the relative importance of these and other reasons why estimates of earnings changes derived from SOFS-R and administrative data differ.

Matched SOFS-R and Administrative data

Our analyses employ a unique dataset consisting of individual SOFS-R responses matched to administrative data on military and civilian earnings derived from the same sources employed by LKM. When weighted, the 2004 and 2005 SOFS-R were designed to be representative of the Selected Reserves. The surveys record information on a wide range of topics including labor market earnings both before and during activation. The administrative data we used come from a variety of sources. We draw information on military pay from the Active Duty Pay Files and Reserve Pay Files maintained by the Defense Manpower Data Center (DMDC). The pay files contain a detailed breakdown of all compensation that military personnel receive each month and permit the computation of the implicit value of federal income tax exemptions accorded to some military earnings (the federal “tax advantage”). We draw information on civilian earnings from SSA’s Master Earnings File (MEF). These SSA earnings records include all earnings subject to Medicare taxes. Although these data cover the vast majority of civil-
ian earnings, they cannot include earnings not reported to SSA, such as any earnings received under the table.

These various datasets were merged with the assistance of DMDC and SSA. RAND supplied DMDC and SSA with programs that analyzed the matched data and generated group-level statistics that could be further processed at RAND without the risk of divulging sensitive survey or SSA earnings data on individuals.

Key Findings

We first established a baseline difference in earnings change estimates. Broadly speaking, the administrative data indicate significant average earning gains whereas the SOFS-R indicates significant average earnings losses. Baseline estimates of monthly earnings changes were $1,665 higher in the administrative data than in the 2004 SOFS-R and $7,247 higher than in the 2005 SOFS-R (the large difference between the 2004 and 2005 SOFS-R results is explained below). We then examined potential explanations for why these sets of estimates differ.

Our analyses depended crucially on our ability to align the definition of earnings in the SOFS-R with the definition of earnings in the administrative data. This alignment was less than perfect for a number of reasons. First, the SSA earnings data are reported on a calendar year basis whereas activation periods frequently span calendar years. Second, the survey does not clearly define the pre-activation period for which respondents are supposed to report earnings. Finally, SSA earnings data do not necessarily record all sources of labor market income, namely, income received “under the table.” Because we know that the administrative data record military earnings comprehensively, and because those data are available on a monthly basis, we are more confident in our interpretation of differences in estimates of military earnings across the SOFS-R and administrative data than we are in our interpretation of differences in estimates of civilian earnings across these data sources.

Tax Advantage

The SOFS-R instructs respondents to report pre-tax earnings, but the earnings received by reservists while serving in a combat zone are not subject to federal taxes (or state taxes in some cases). When the implicit value of the federal tax advantage is omitted from the administrative estimates of total earnings, the baseline difference in estimates of earnings changes declines by 28 percent in the case of the 2004 SOFS-R and by 8 percent in the case of the 2005 SOFS-R.

Misreporting of Military Earnings

Military earnings before and during activation are consistently higher in the administrative data than in the 2004 SOFS-R. Because we believe that we can align the military earnings definitions quite closely in the SOFS-R and administrative data, we conclude that respondents in the 2004 SOFS-R, on average, underreport military earnings. Respondents in the 2005 SOFS-R, on average, overreport military earnings. On closer examination, however, the 2005 result is driven by a small number of outliers in the SOFS-R. These comparisons suggest that respondents to the SOFS-R significantly underreport military earnings, especially while activated. This could be because reservists fail to account for the many different types of pays and allowances they receive while serving on active duty.
In the case of the 2004 SOFS-R, we conclude that underreporting military earnings by SOFS-R respondents accounts for up to 42 percent of the baseline difference in estimates of earnings changes. A smaller share of the difference between the 2005 SOFS-R and administrative data estimate of earnings changes is explained by underreporting, but this is because the baseline discrepancy in estimates is so much larger.

**Analysis of Civilian Earnings**

As noted above, aligning the civilian earnings definitions in the SOFS-R and administrative data was complicated by the fact that SSA earnings are reported annually. For pre-activation earnings, we compared the SOFS-R estimates of civilian earnings to average monthly earnings received in the year before the activation as recorded in the administrative data. For the 2004 SOFS-R, the estimate of civilian earnings before activation in the survey was $890 (29 percent) higher than in the administrative data.

We could compute a comparable estimate of civilian earnings received during the activation period only for reservists whose activation spanned a full calendar year. In this limited sample, we found that average monthly civilian earnings during activation in the administrative data were $264 (34 percent) higher than in the 2004 SOFS-R.

These differences might reflect misreporting in the SOFS-R, but the difficulty in aligning the civilian earnings definitions makes it difficult to draw this conclusion with total confidence. In addition, the possibility that SOFS-R respondents are reporting pre-activation income not captured in SSA earnings records also prevents us from confidently attributing these civilian earnings differences solely to misreporting in the SOFS-R.

**Comparison of 2004 and 2005 SOFS-R Earnings Estimates**

Estimated earnings losses are much larger in the 2005 SOFS-R than in the 2004 SOFS-R. Our research suggests that this difference between the two waves of the SOFS-R is due to a few respondents who reported very large pre-activation earnings in the 2005 SOFS-R. The earnings questions in the 2005 SOFS-R asked respondents to report average earnings in the 12 months before activation whereas the 2004 SOFS-R did not specify the period over which average pre-activation earnings were to be computed. We conjecture that this change in question wording resulted in some respondents mistakenly reporting annual totals instead of monthly averages. A simple adjustment to the 2005 SOFS-R earnings data (dividing values that appear to be annual figures by 12) produces a distribution of earnings that closely resembles the earnings distribution in the 2004 SOFS-R.

**Nonresponse Bias**

The response rate to the 2004 and 2004 SOFS-R was 34 and 30 percent, respectively, which raises the possibility that the SOFS-R contains a select sample of reservists whose earnings experiences do not generalize to the full population of reservists. Our analyses in fact indicate that survey nonrespondents are quite different from survey respondents. Unweighted comparisons indicate that SOFS-R respondents are more likely than SOFS-R nonrespondents to be officers and in more senior pay grades and that average earnings as computed in the administrative data are 20 to 40 percent higher among SOFS-R respondents than nonrespondents. However, this differential nonresponse explains little of the difference between earnings change estimates in the SOFS-R and administrative data. This is because the influence of nonresponse bias is “differenced out” when computing earnings changes. Moreover, when SOFS-R survey weights
are applied, the difference in mean earnings levels between survey respondents and nonrespondents diminishes substantially. The effectiveness of the SOFS-R survey weights further reduces the substantive importance of nonresponse bias in explaining differences between the two sets of earnings change estimates.

Implications
The empirical findings reported here have a number of implications. First, analysts and policymakers should employ SOFS-R data on military earnings with caution, in part because the SOFS-R earnings data do not include the value of the federal tax advantage. This issue becomes especially important when analyzing earnings during activation, since many of the pays and allowances reservists received while activated are tax exempt. A second reason is that SOFS-R respondents appear to significantly underreport military earnings. The omission of the tax advantage and underreporting of military earnings help explain why the SOFS-R data imply average earnings losses rather than the average earnings gains implied by the administrative data. Our analyses do not permit us to determine whether the SOFS-R respondents also misreport civilian earnings.

For these and other reasons, we believe that military personnel analysts should employ administrative data when feasible. Processing pre-existing administrative data is less expensive and less time-consuming than collecting comparable survey data. Furthermore, administrative data on earnings are likely to be more accurate than self-reported earnings recorded in surveys, although analysts should also be aware that administrative data can miss some sources of earnings (for example, under-the-table earnings). A significant limitation of administrative data is the relatively small amount of information it contains about the study population. Certain critical objective characteristics of the study population may not be contained in available administrative data sources. And subjective data, such as reenlistment intentions, can be collected only by survey. Thus, the best option available to the analyst may often be to match administrative data on key objective characteristics to survey data containing a richer array of respondent characteristics, intentions, and attitudes.

Finally, our results have methodological implications for survey data collection. We find that although response rates are low, the SOFS-R survey weights are able to correct for much of the resulting nonresponse bias in mean earnings. Consequently, it may be advisable for DMDC to devote more effort to minimizing the misreporting of survey items than to improving survey and item response rates. For example, if earnings questions are included, it could be advisable to ask separate questions about separate sources of earnings. This conclusion regarding nonresponse bias may not generalize to surveys of other populations, in part because weighting characteristics that are strongly related to earnings (such as pay grade) are not typically known for entire sample populations.