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IZA DP No. 14955

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Carl J. Wojtaszek
United States Military Academy

Michael S. Kofoed
United States Military Academy and IZA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Sensitivity of Charitable Giving to Realized Income Changes: Evidence from Military Bonuses and the Combined Federal Campaign*

The permanent income hypothesis states that agents perfectly smooth consumption given a large, anticipated shock to income. Testing these implications is difficult given the endogenous nature of income and payment timing. We leverage exogenous variation in military bonus size and timing matched with donations from a large workplace charitable drive where soldiers contribute via payroll deductions during a fixed open enrollment period. Our findings suggest that soldiers are 5 to 10 percent more likely to contribute if they receive their bonus during the open enrollment period. We show that soldiers smooth donations more with age and increased bonus experience.

JEL Classification: D9, D64, H31

Keywords: charitable giving, altruism, income shocks, permanent income hypothesis

Corresponding author:
Michael S. Kofoed
United States Military Academy
607 Cullum Road, West Point
New York, 10996
USA

E-mail: michael.kofoed@westpoint.edu

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"If you have much, give of your wealth; if you have little, give of your heart"
- Arabic Proverb

1. Introduction

Charitable giving is an American institution with over 80 percent of U.S. households participating in the nearly $200 billion of support received by non-profits annually (Brooks 2008). Much of this giving supports educational, religious, cultural, scientific, and welfare organizations, providing public goods and increasing social welfare outside of government expenditures. The United States stands in sharp contrast to developed European countries that rely much more heavily on governments for public good provision (Brooks 2008).[1] Yet, despite charity's importance, there exists relatively little empirical evidence on the drivers of charitable giving.

Chief among these potential factors that affect an individual's propensity to contribute to charity is the role of income and, more specifically, income shocks. Previous research shows charitable giving across the income distribution produces a U-shaped curve—with both the lowest and highest income earners contributing the largest portion of their income (McClelland and Brooks 2004). However, how changes in income affect charity is difficult to confidently estimate given a lack of detailed donation data and exogenous variation in income. Some researchers use tax filing records that contain both income and charity deduction information. However, even with such detailed data, identifying truly exogenous income changes remains difficult.

[1] Meer and Tajali (2021) also find that charitable donations to public schools decrease when educational spending by local school districts increase. These findings are due to a drop in donation requests by teachers.

In this paper, we overcome the challenges to identification using variation in income timing from when the Army distributes enlistment bonuses to soldiers. We compare the charitable giving of similar soldiers who differ only in the month they receive their bonus. In the U.S. Army, soldiers receive their bonuses on the anniversary of their induction (or basic training) date. In this setting, the timing and size of bonuses are not a function of soldier performance but rather are tied to arguably arbitrary rules. This variation in payment timing, combined with the set timing of a large federally administered annual charity drive, allows for a well-identified investigation of the effect of large, well-anticipated income changes on charitable giving. Using the income change that accompanies a soldier's promotion and using the timing of an alternative charity event, we then show robustness by presenting our results in two additional settings.

Our findings suggest that soldiers are 5 to 10 percent more likely to contribute to charity if they receive a large, anticipated, transitory income change (generated by a bonus) during a charity campaign. We also observe excess sensitivity to the timing of an anticipated, permanent income change (generated by a promotion) during a workplace charity campaign. In addition, we find that this excess sensitivity diminishes with age and previous bonus exposure, suggesting that experience with consumption smoothing plays an important role.

Existing theoretical[2] and empirical research does not provide a clear answer of how we should expect a person's charitable giving to change when given more income. Using the Consumer Expenditure Survey, McClelland and Brooks (2004) estimate a U-shaped relationship

[2] Economists have proposed multiple theories for why individuals donate to charity. First, agents may be responding to either pure altruism (wanting to give with no expectation of reward) or impure altruism (giving because it increases their utility) (Meer and Rosen 2009, Anderoni 1990, Anderoni 1998). Second, economists have proposed that giving generates a "warm glow" response captured in the agent's utility. This warm glow essentially makes the agent happier when giving (Anderoni 1990, Harbaugh 1998a, Crumpler and Grossman 2008). Finally, donating may signal virtue or prestige to agents' peers (Harbaugh 1998b, Glazer and Konrad 1996, Meer 2011, Lieber and Skimmyhorn 2018).

between income and donations. However, these estimates are simply correlational without a rigorous identification strategy. Kuhn et al. (2011) study the effects of winning the lottery on several household decisions. The authors offered subjects the opportunity to donate their honorarium to charity and found that lottery winners were only slightly willing to donate. List (2011) finds a U-shaped income-giving relationship but also that giving increases among certain demographic groups (i.e., religious donors and those around higher tax brackets) (Feldstein 1975). Meer and Priday (2021), however, find a significant positive relationship between income and giving, using the Panel Study of Income Dynamics.

Friedman (1957) first proposed the permanent income hypothesis (PIH), which implies that a rational forward-looking agent will smooth an expected income shock such that it should not change their consumption patterns. Our experimental setting is ideal to testing PIH with regards to charity because soldiers know they are receiving their bonus, but the payment timing is exogenous.[3]

Previous research examining the effects of income on charitable giving is mixed largely due to a lack of clean exogenous variation and data. Randolph (1995) finds evidence that agents do conform to PIH by smoothing income shocks with respect to charity. However, Auten, Sieg, and Clotfelter (2002) show that any attempt to separate permanent from transitory income and

[3] To test the implications of PIH, Parker (1999) and Souleles (1999) examine the response of consumption to the timing of income tax refunds. They find consumption expenditures to be excessively sensitive to when a household receives a tax refund despite it being anticipated. In contrast, later work by Browning and Collado (2001) find that the consumption pattern of Spanish households is not sensitive to bonus receipt. Supporting both findings, Hsieh (2003) examines the sensitivity of consumption to the receipt of income tax returns and Alaska Permanent Fund payments. He finds that Alaskans respond according to the PIH when income changes are large and well anticipated and display excess consumption sensitivity when income changes are small. Most recently, Ni and Seol (2014) examine variations in the large monthly pay for Korean government employees and find excess sensitivity in consumption among households with lower "committed expenditures." The findings in these studies make it difficult to predict not only consumption behavior but also how charitable giving may respond to anticipated income changes.

changing prices likely suffers from a latent variable problem in estimation. Seeking to correct for this, Bakija and Heim (2011) use tax return data to control for predictable future changes in tax laws and produce results consistent with the PIH, where permanent income shocks have stronger influence on charitable giving than transitory ones. We contribute to this literature by leveraging detailed payroll data combined with an exogenous variation of bonus payment timing to better understand how agents change their charitable contributes given permanent and transitory shocks to their income.

The ideal experiment to measure the sensitivity of charitable giving with regards to anticipated income changes requires a setting where individuals are identical along all dimensions related to charitable giving except for income shock timing (Bakija 2000). We would then want to vary when and how much a person received in income, observing any change in their level of charity. For the obvious reasons of cost and privacy, this experiment is impossible to undertake on any large scale. However, settings like this do exist across large organizations where income payments vary and employees can donate to charities through their workplace.

We overcome these issues in data and identification by exploiting unique institutional characteristics in the U.S. Army including previously unavailable data containing the charitable contributions of military service members via payroll deductions during an open enrollment period. Examining data from this population has several advantages over previous studies. First, military personnel data contain detailed demographic characteristics, career information, and pay records. These data allow us to observe the exact timing of income events, such as bonuses and promotions, and charitable contributions while controlling for individual heterogeneity. Second, like most Americans, most military personnel—due to their modest income and limited deductions—do not itemize on their tax returns. Thus, we do not need to rely on itemization to

study charity like those studies using tax data. A lack of itemization implies soldiers face a uniform price for charity, allowing us to estimate income shocks independent of substitution effects.[4]

Finally, the bureaucratic nature of military bonuses and centralized promotions provide plausibly exogenous timing to anticipated temporary and permanent income shocks that we can exploit to produce unbiased estimates. This timing happens regardless of a soldier's demographics, merit, or ability. The combination of these unique administrative payroll data combined with an exogenous, quasi-experimental setting allows us to estimate the causal effect of income shock timing on charitable giving.

2. Background

2.1 Measuring Charitable Giving

The Combined Federal Campaign (CFC) is the world's largest and most successful annual workplace charity campaign, raising over $7 billion since its inception. Established through executive order by President Kennedy in 1961, the CFC consolidated all federal workplace charitable giving efforts into a single campaign season that runs annually from September 1 to December 15. During the campaign window, federal employees are encouraged to support any of the over 4,400 eligible non-profit organizations through one-time or monthly automatic payroll deductions (U.S. Office of Personnel Management 2014).[5]

[4] Boskin and Feldstein's (1977) research on low- and middle-income families suggest there are ample reasons to be concerned about an "itemization effect." Given that about 70 percent of taxpayers do not itemize, research on the charitable giving of this population seems both relevant and necessary.

[5] For a complete list of current charities that participate in the CFC, see http://www.opm.gov/combined-federal-campaign/universal-giving/.

Within the Army, the CFC is considered the responsibility of the commander and receives a broad range of support.[6] Each unit, down to the company level,[7] has an appointed CFC representative who oversees the announcement of the campaign season, distributes promotional material and contribution forms, monitors unit participation, and processes contributions. The attention and oversight given to the CFC ensures complete information and promotes a high participation rate among soldiers. In fact, it is typical for units to have 100 percent face-to-face contact goals and participation rates over 50 percent (Dodson 2013). In 2016, the Department of Defense alone raised over $14 million through the CFC (Cronk 2014).

Soldiers can contribute to the CFC in one of two ways. The first is through a one-time donation using check or cash. This method requires a soldier to fill out a CFC donation form, designate their charity of choice, and submit their contribution to an appointed CFC representative. These donations require no pay deduction and therefore do not show up in a soldier's leave and earnings statement.[8, 9] The second way is through a pay deduction—either one time or monthly. Like before, a soldier fills out the CFC donation form and returns it to their appointed CFC officer. Financial personnel then enter the deductions into the soldier's pay records for automatic deduction.[10] The Department of Defense records these donations on a

[6] It is common within the Army for commanders to promote the CFC season with ceremonial cake cuttings, unit addresses, and competitions between subordinate units measured by participation level or total amount contributed (Stone 2013).
[7] The average company in the Army has between 80 and 120 soldiers.
[8] Most of these types of donations are one-time small cash donation and are between $1 and $5 (Guido 2014).
[9] The group of soldiers that make small cash donations likely differ in their motives for giving from those that make payroll deductions. Because unit commanders often set participation goals, many soldiers are induced to participate. The group of soldiers most likely to give a small cash donation give primarily to be counted as participants toward the unit goal. One the other hand, soldiers who take the time to fill out the payroll deduction and designate several specific charities represent a group that has charity in mind when donating (Galui 2015).
[10] Over 80% of these donations are monthly pay deductions.

soldier's monthly leave and earnings statement, and thus they appear in the data.[11] Therefore, for this paper, we measure soldier charitable giving as the amount they donate through a payroll deduction to any charity listed by the CFC.

Observing soldiers who donate to the CFC through future payroll deductions has an additional benefit beyond being visible in the data. Research that finds excess sensitivity to income often note the presence of liquidity constraints as a probable mechanism but lack the exogenous variation to test this theory (Bachetta and Gerlach 1997, Attanasio, Goldberg, Kyriazidou 2008, Crossley and Low 2014). However, because the soldiers we observe donate through a future payroll deduction, credit constraint concerns should be minimal, allowing us to better measure and explore other potential mechanisms of charitable giving's sensitivity to the receipt of anticipated income.

2.2 Military Bonuses

To attract and retain well-qualified soldiers for military occupational specialties (MOS) that are in demand or difficult to fill, the Army offers both monetary and non-monetary incentives. The most popular incentive are bonuses offered to both new recruits and re-enlisting soldiers. Enlistment and re-enlistment bonuses can range from between zero dollars to more than $50,000. The bonus amount offered to any individual soldier depends on the Army's current demand for a particular rank, MOS, and the contract length and is independent of an individual soldier's characteristics or unobserved ability. Typically, the Army adjusts enlistment incentives quarterly to account for changes in labor market conditions, and it also provides bonuses to fill

[11] There may be concern that we can only observe giving through payroll deductions, especially if one-time cash donations are the primary means through which soldiers give. In comparing annual CFC campaign fundraising reports for several military installations to the donations we observe in the pay data for those same installations, we can account for over 60 percent of the participants and nearly 80 percent of the total fundraising dollars. This suggests that payroll deductions capture the primary way in which soldiers give.

high-priority jobs and for optional, additional training. These regulations create a setting in which soldiers who enlist for the same MOS and length of service may receive different bonus amounts based on the particular needs of the Army when they signed their contract.

In addition to the variation in income due to bonus size, the timing of when a soldier receives their bonus payment also varies. For soldiers who qualified for a bonus upon initial enlistment, the Army distributes their payments over the length of their contract. Typically, a soldier will receive 50 percent of their bonus payment upon completing their advanced individual training.[12] The Army pays out the remaining amount in equal installments upon the anniversaries of a soldier's basic active service date (when they entered the Army). For example, a soldier who enlists with a $24,000 bonus for four years will receive $12,000 upon completing their initial training and then three annual payments of $4,000 during their contract. Soldiers who receive a re-enlistment bonus have the option to receive a lump sum payment or annual installments over the length of their contract. Soldiers typically receive their re-enlistment bonus payment (either lump sum or first installment) in the month following their re-enlistment contract signing date. Under both initial enlistment and re-enlistment, the Army's method of bonus payment creates an environment in which soldiers receive large, anticipated income shocks throughout the year with timing that is determined largely by training completion dates and enlistment anniversary dates.

Finally, these bonuses represent substantial temporary income changes to a soldier. In 2010, the base pay for a sergeant in the Army with four years of service was $28,968. With an average initial enlistment bonus of approximately $7,000, an enlisted soldier would receive

[12] Advanced individual training occurs after a soldier completes their 10 weeks of basic training and can range from 1 to 18 months in length depending on the soldier's MOS.

bonus payments of up to 12 percent of their annual salary. Re-enlisting soldiers are eligible for even larger bonuses, resulting in payments of over 25 percent of their annual salary. The substantial size of these bonuses relative to a soldier's annual income provides large, anticipated income shocks that should be much more salient to an individual than income shocks created by marginal tax rate changes or even traditional employment bonuses.

3. Data and Empirical Framework

3.1 Data

We combine two sources of individual-level data on military service members who served on active duty between January 1, 2003 and December 31, 2013.[13] This period provides a sample of soldiers who experience up to ten charity campaigns. The first dataset, from the Office of Economic and Manpower Analysis (OEMA), contains a monthly snapshot of demographic, occupation, and pay data on every soldier in the Army during the stated time period. Demographic data include a soldier's sex, race, religion, marital status, age, and home of record.[14] Occupation data provide information on a soldier's location, primary MOS, type assignment type (training or operational), and rank at the time of a charity campaign. Pay data include a soldier's monthly basic pay, hazardous fire pay for serving in a combat zone, and any bonus payments.

Finally, from the panel nature of the data, we construct a soldier's initial entry month, the month she arrives at a new unit, the month when she is promoted, and the month when she

[13] Our sample ends at 2013 because after this year, the CFC moved to an online system that allowed anyone the opportunity to donate at any time during the year; essentially ending the open enrollment period.

[14] A soldier's home of record is the state in which they were living before entering the military.

receives a bonus. We merge these data to a second dataset, also provided by the OEMA. These data list the monthly CFC allotments deducted from a soldier's pay. Because the CFC allotments run for 12 months, from January through December, soldiers who agree to contribute to the CFC through an allotment during a campaign are identified by observing the following year's CFC allotment schedule. We collapse the data by individual and campaign year, producing a dataset that contains an observation for each individual by year.

We impose the following sample restrictions on the data. First, because the date a soldier enters the Army establishes the timing for future bonuses and promotion, we restrict our sample to only those soldiers who enter the Army after January 1, 2004. These restrictions allow us to provide controls for each soldier's entry characteristics. We also remove all soldiers who do not appear in the data for at least three years. We do this for two reasons. First, nearly every soldier is contracted for a minimum of three years of service. During this period, 40 percent[15] of soldiers did not complete at least three years of service. Most soldiers who exit before their contract ends do so because of disciplinary and medical reasons. Second, and more practically, because a soldier's participation in the CFC is identified in the data by their next year's charity allotment, we must observe a soldier for a minimum of two years.

Additionally, we restrict our sample to soldiers who are assigned to units located within the United States. Army regulations pertaining to the CFC allow units overseas to modify the campaign dates. Without knowing these modifications, we cannot be certain when these soldiers were exposed to the CFC. Finally, we drop soldiers who are missing data that cannot be

[15]About 30 percent of soldiers drop out during basic training or advanced individual training (AIT); a career course that follows basic (Marrone 2020). The other 10 percent drop out because of health or discplinary reasons. Our sample consists of those who complete a full enlistment term and thus qualify for their bonuses.

determined by later observations (e.g., a soldier missing their marital status for every monthly observation).

In addition to these necessary sample restrictions, we also remove soldiers with small population characteristics that also have a significant impact on their enlistment bonus size. For instance, we remove soldiers who score in the lowest AFQT category (3 percent). For this group, enlistment bonuses are rare and typically very small. For a similar reason, we also remove soldiers who enter the Army with an age waiver (2 percent).[16] Finally, we remove soldiers who enter the Army with more than a bachelor's degree (0.2 percent). Because of their advanced education and correlated high AFQT scores, these soldiers' bonuses are over 50 percent larger than the average enlistment bonus.[17]

When constructed, the dataset consists of 1,122,266 observations. Each soldier-year observation contains detailed demographic information as well as the individual timing of bonus payments, promotions, and charitable contribution to the CFC. Since we construct this dataset from transactional databases used by the military in their day-to-day operations, measurement error is likely minimal.

Table 1 compares the summary statistics for the three main groups of soldiers—those who receive a bonus outside the campaign (May–August and January–April), those who receive a bonus during the campaign (September–December), and those who do not receive a bonus in the campaign year. A few things are noteworthy. First, the CFC participation rate for those who receive a bonus is higher than those who did not, consistent with the idea that charitable giving increases with income. Also, CFC participation among those who receive a bonus during the

[16] During this time, the Army's enlistment age limit was 35.
[17] We also estimate our regressions without this additional set of sample restrictions. The results are not robust across samples.

campaign is higher than for those who receive a bonus outside the campaign. Likewise, the amount a soldier contributes to the CFC is higher for those who receive a bonus during the campaign window.

Looking across the demographic categories shows that the sample is relatively balanced. First, despite the statistical power generated by our sample's size, most of the characteristics show no statistical difference in the timing of their bonus. Second, of the statistically different characteristics (with *p*-values less than 5 percent), the differences are not economically significant—often being less than 0.5 percentage points between groups. Third, many of the statistically different characteristics run counter to our results being positive and significant.. For instance, black, secular, divorced, married, and lower AFQT soldiers have lower CFC participation but are more likely to receive their bonus during the CFC. Likewise, those who are single, have higher AFQTs, and are high school graduates have greater CFC participation but are less likely to receive their bonus during the campaign. In the end, only the characteristics of bonus amount, private, and holding a GED have statistical, and potentially economic, significance and move in the same direction as an excess sensitivity story.[18]

Because we exploit the variation in the month a solider receives their bonus to identify the effect of bonuses on charitable giving, we want to check first that the bonus timing is uncorrelated with other factors that might influence a person's generosity toward charity. To investigate this further, in Figures 1.A–1.F we plot the percentage of soldiers in a given category by the month they receive their bonus. All appear relatively flat throughout the year. Of the categories that do vary, such as occupational branch (i.e., infantry, armor, or quartermaster) or

[18] To verify that these three characteristics are not driving our main results, we also estimate the main regressions with a more restrictive sample that excludes these groups and balances the bonus amount. The result of excess sensitivity to bonus receipt is still present.

marital status, it is not obvious that there are dramatic shifts that coincide with the CFC window of September–December. In Figure 1.F, where we plot age categories by month of bonus receipt, there are a greater number of soldiers below the age of 20 who receive their bonus during a campaign. While we control for age with dummy variables for each year of age, we also estimate the full set of regressions excluding the under-20 age category—the results are robust to this specification.

3.2 Identification Strategy

We estimate the following model to capture excess sensitivity of charitable giving to income receipt:

$$CFC\ Part_{iy} = \beta_0 + \beta_1 BonusBeforeCFC_{iy} + \beta_2 BonusDuringCFC_{iy} + \beta_2 BonusAfterCFC_{iy} + \mu_{iy}, \quad (1)$$

where $CFC\ Part_{iy}$ indicates whether a soldier participated in that year's charity campaign. The variables, $BonusBeforeCFC_{iy}$, $BonusDuringCFC_{iy}$, and $BonusAfterCFC_{iy}$, indicate if a solider received a bonus in the period before, during, or after a year's campaign window. Therefore, β_1, β_2, and β_3 estimate the effect of receiving a bonus before, during, or after the CFC window on a person's charity participation.

Equation 1 demonstrates how the timing of the annual CFC drive and soldier income receipt from bonus payment creates groups of soldiers that can be used to estimate the sensitivity to charitable giving.[19] On the surface, there are some reasons why this simple approach may not

[19] This also examines the scenario in which comparable soldiers within the CFC window receive different sized bonus payments.

produce unbiased estimates. First, bonuses are a function of a soldier's enlistment options, specifically, the job they choose, the length of the contract they sign, and the bonuses available when they signed their contract. These represent choices made by a soldier that might also be correlated with their level of generosity. Second, soldiers also choose when to meet with a recruiter and sign their enlistment contract. There is potential concern that soldiers who sign their contract in June, immediately after graduating high school, are different than those who sign their contract in January. Finally, because the timing of bonuses is a function of when an individual begins their enlistment and when they complete their initial training, there is concern that the timing of bonuses may be correlated with other soldier events, such as promotions, that influence charitable giving.

To overcome the challenges to identification stated above, we use variation in how the Army pays its bonuses and detailed administrative soldier records to compare the charitable giving of soldiers who receive income from bonuses at different times and/or different amounts but who are otherwise observably identical. There are three distinct sources of variation. First, although a soldier chooses when to sign their enlistment contract, they have far less control over the timing of when they will *actually* enter the military due to the availability of basic training slots and the Army's current needs. Wojtasezek (2015) shows that, conditional on a set of covariates known to the Army at the time of enlistment, the delay assigned to a soldier is uncorrelated with soldier characteristics. Since part of a soldier's enlistment bonus is paid on the anniversary of their entry into the military, the timing of these bonuses can be thought of as exogenously assigned.

Second, a soldier's first bonus is paid only after completing their initial training and arriving at their first unit. Because a soldier's initial training consists of several courses, when a

soldier completes their training depends largely on the length of courses and time spent waiting for a seat in the next course. This policy creates variation that allows two soldiers to enter the Army on the same date and with the same MOS to complete their training at different dates—and hence receive a bonus at different times. Figure 2 shows how a soldier's initial delay, follow-on training delays, and delays before arriving at a unit generate variation in bonus timing relative to charitable campaign windows. Finally, we take advantage of the variation in bonuses from the enlistment choices a soldier makes. The Army offers a variety of bonuses that create variation beyond the bonuses paid due to job choice and years of service contract. For instance, in addition to the bonus given for selecting a four-year infantry position, a soldier may earn an additional bonus because of a priority need for that MOS.

With this variation and a detailed set of controls, we can compare the charitable giving of two soldiers who entered the Army at similar times, selected the same jobs, and are eventually assigned to the same unit—but whose bonuses were paid at different times. One soldier receives their income shock during the CFC window while another receives their income shock outside of the CFC window. We estimate the effect of income on charitable giving the following empirical model below:

$$\begin{aligned} CFC\ Part_{iy} = \beta_0 + \sum_{m=1}^{12} \beta_m BonusMonth_{iy} + \sum_{m=1}^{12} \rho_m PromMonth_{iy} \\ + \sum_{n=1}^{11} \theta_n EntryMonth_{iy} + \sum_{m=1}^{12} \alpha_m UnitArrivalMonth_{iy} \\ + X_{iy}\Gamma + \tau_y + \mu_{iy}, \end{aligned} \tag{2}$$

where β_1—β_{12} estimate the effect of receiving a bonus payment in a particular month on a soldier's CFC participation rate. The omitted category are soldiers who do not receive a bonus during a given year. In addition to this specification, we estimate one with only soldiers who received a bonus with the omitted group being soldiers whose bonus lay outside the CFC window. The estimates ρ_1—ρ_{12} estimate the effect of a soldier being promoted during a given month on their CFC participation rate. Like the specification with bonuses, the omitted category are soldiers who are not promoted during a particular campaign year. The variables *EntryMonth* and *UnitArrivalMonth* control for the factors that affect a soldier's bonus timing—the Army pays out a soldier's bonus when they arrive at their first unit after training is complete and on the anniversary of their enlistment date for subsequent years. The vector X_i is a set of controls for a soldier's demographic and military career characteristics such as sex, race, religion, marital status, rank, MOS, home of record, training status, and duty station. Given this, the effect of a well-anticipated income change on CFC participation is identified by a very specific type of variation in bonus timing that is generated by the Army's training requirements and availability of school slots.

We estimate Equation 2 using a dummy variable for whether a person contributed to the CFC to estimate the effect of income shock timing on charitable giving participation. In later specifications, we replace the left-hand side variable with a continuous variable representing the CFC donation amount to estimate the impact of bonus and promotion timing on CFC donation size. We also investigate how the bonus size affects charitable giving by replacing the dummy variable *BonusMonth* with a continuous variable that represents the bonus amount received in each month. Finally, we interact bonus timing with several individual characteristics to examine any heterogeneous effects.

4. Findings

4.1 Sensitivity to Bonus Receipt

In Table2, we present the results of CFC participation on when a soldier receives his bonus. In this specification, the dependent variable equals one if a soldier participated in the CFC and zero otherwise. The variables for when a soldier received a bonus are similarly coded with a soldier given a one for any period in which they receive a bonus and zero otherwise. Column 1 displays estimates with a basic set of controls for unit arrival and entry month. The shaded rows indicate periods that fall within the CFC window. Panel A provides estimates for the effect of receiving a bonus in one of three four-month periods—before, during, or after the CFC window.

Two things are noteworthy. First, soldiers who received a bonus anytime during the year are more likely to give than those who did not receive a bonus—the omitted group. Second, soldiers who received their bonus during the CFC window are 0.011 percentage points more likely to participate in the CFC than soldiers who receive their bonus outside the window. All the estimates are positive and statistically significant, and on a mean participation rate of 0.218, these numbers are also economically significant. Soldiers who receive a bonus during the campaign window are 9 percent more likely to participate compared to those who receive no bonus and are 5 percent more likely to participate when compared to those who receive a bonus outside the campaign window. Panel B investigates the effect of bonus timing by months and shows that participation increases the closer soldiers receive their bonuses to the CFC window.

In Column 2, we add an exhaustive set of controls to control for any differences across soldier characteristics. The estimates are smaller under this specification yet are still statistically significant and exhibit a remarkably similar pattern. In Panel A, soldiers who receive a bonus during the CFC window are, again, 0.013 percentage points more likely to participate than those

who received a bonus before the window. Figure 3 graphs the estimates and their 95 percent confidence intervals from Panel B. The figure shows an upward trend in CFC participation, with a spike in November, followed by a downward trend after the CFC window. These estimates suggest that when a soldier receives a bonus relative to the campaign matters for participation. Also, the fact that soldiers who receive their bonus in July and August seem to experience an increase in participation, as well as the soldiers who receive their bonus in January and February, suggests there are small, lingering, and anticipatory effects to bonus receipt.

A second way in which the results in Table 2 may suffer from omitted variable bias is that the base group, soldiers who do not receive a bonus, may differ in terms of their willingness to participate in the CFC across the months of the year along a dimension being used as a control. If this is the case, including the large group of soldiers who do not receive a bonus may bias the estimates of those receiving bonuses. In available appendices, we estimate the same regression contained in Table 2 but omit soldiers who did not receive any bonus. The estimate's magnitude and pattern is not substantially different, indicating that the characteristics of soldiers who did not receive a bonus in a given year are not driving the results.

In Table 3, we investigate if the size of a soldier's bonus influences their participation and amount contributed toward the CFC. The estimates in Column 1, Panel A show that for each $1,000 in bonus money a soldier receives during the campaign window, his participation increases by 0.001 percentage points, compared to receiving a bonus either before or after the campaign. Panel B shows a similar result and a trend toward greater participation the closer a soldier receives their bonus to the campaign.

In like fashion, Column 2, Panel A shows that for each $1,000 in bonus money a soldier receives during the CFC window, the amount they donate increases by 10 to 15 cents. On an

average bonus size of $6,000 and a donation size of $16 per year,[20] this translates to a 4 percent increase in the donation amount. Panel B shows in detail the impact of bonus amount timing on the contribution amount. Again, the months of November and December appear to be the months driving the results in Panel A. This suggests that the sensitivity of soldiers to the size and timing of bonuses works through both the intensive and extensive margins. Not only does bonus timing increase soldier participation, but larger bonuses received during the campaign also increase the amount contributed.

4.2 Sensitivity to Income Change Due to Promotion

To complement our findings from bonuses, we use the timing of a second source of predictable income shock, the pay increase from a promotion, and show that it generates a similar charitable giving response. Military pay is directly linked to a soldier's rank and their time in service, and therefore promotions generate a permanent income change for service members. These income changes are small relative to the bonuses soldiers can receive; however, they are significant in that they represent a permanent income increase that can be anticipated. For example, in 2012 a soldier's pay increase for promotion from E3 to E4 (the most common rank in the Army) was approximately $190 per month (Defense Finance and Accounting Service 2013).

Promotions within the enlisted ranks of the Army are largely a function of a soldier's time in service and the current needs of the Army for their particular job. For junior enlisted soldiers—between the rank of private and specialist—promotion is almost exclusively a function of their time in service. The Army promotes soldiers almost automatically, absent any

[20] The amount of $72 per year represents the average annual CFC contribution of those who participate in the CFC. If you include non-participants, the average contribution is approximately $16.

disciplinary action, upon reaching their 6-, 12-, and 24-month time in service dates. Commanders have some discretion over the monthly soldier promotion list and can recommend up to 10 percent of their junior enlisted soldiers for an early promotion—up to 6 months early. Promotions for the more senior enlisted members of the Army, sergeants, and staff sergeants depend on not only time but also on the Army's current needs. Soldiers who seek promotion to sergeant or staff sergeant must meet time-in-service requirements, pass a promotion board (interview), and submit a promotion packet.

Once a soldier has met these requirements, their command forwards the promotion packet to the Army's centralized promotion authority at Human Resources Command (HRC). There, all the packets are graded, assigned a point value, and rank ordered. Each month, HRC determines the Army's need for each of the over 200 MOSs and announces the cut-off for promotion in that MOS. The Army promotes soldiers with a ranking above the announced cut-off the following month, while soldiers below the cut-off remain on the promotion list. This promotion system creates an environment in which soldiers who all become eligible for promotion at the same time are promoted on different schedules. For example, the Army will promote a soldier in an MOS that has a shortage of soldiers in the next rank much quicker than a soldier in an MOS that is currently over strength.

With this understanding of the Army's promotion system in mind, we present in Table 4 the results of promotion timing on charitable giving as a separate check for sensitivity. From the estimates in Column 1, Panel A, soldiers promoted during the campaign are 0.006 to 0.011 percentage points more likely to contribute to the CFC compared to soldiers promoted outside the campaign. In Panel B, the effect of promotion timing is more pronounced. A soldier

promoted in December is 0.014 percentage points, or 7 percent, more likely to contribute to the CFC than a soldier promoted in May.

Figure 4 displays these results graphically. While these results suggest soldiers also display sensitivity to promotion, the interpretation of the results is not as clear as for bonuses. Soldier promotions have two components, an increased income component and an increased status that comes from achieving a higher rank. While most promotions, especially at the enlisted level, are not accompanied by an immediate change in job description or responsibility that might also influence a person's sense of charitable giving, the effect of the change in title cannot be separated from the increase in income.

Column 2 of Table 4 presents the results of promotion timing on a soldier's contribution amount. Panel A's results are statistically different at the 10 percent level between soldiers who receive a promotion outside the CFC window and those who receive a promotion during the CFC window—with soldiers who receive their promotion during the CFC giving approximately 50 to 75 cents more per $1,000 increase in bonus. A more detailed look in Panel B shows that promotions during November and December have the largest effect. While promotion seems to matter most in the latter months of the CFC window, these findings do not coincide with the November spike seen in the bonus timing results. While we hesitate to read too much into this spike in November, it is consistent with anecdotal evidence of increased emphasis during the final weeks of the campaign window, when units seek to reach their participation goals. Finally, looking across Columns 1 and 2, the clear patterns of increased participation and larger donations suggest that promotions, like bonuses, may affect both the intensive and extensive margin. Promotions during the CFC window induce soldiers, who may not have otherwise given to charity, to participate as well as induce soldiers who already give to give more.

4.3 Using the Timing of an Alternate Charity Campaign

Beyond the plausibly exogenous bonus and promotion schedule and extensive set of controls used in the preceding analysis, it may still be possible that bonus and/or promotion timing is related to charitable giving in an unobserved way. To address this concern, we would ideally want the CFC window to vary from year to year and across locations. While this is not possible given the regulations governing the campaign's timing, a second best approach is to look at the participation rate for a similar charitable campaign with different timing. If sensitivity to an alternative charity window is found with the same sample that also displays sensitivity to the CFC, it would bolster the conclusion that income receipt timing plays a role in charity participation.

The Army holds the Army Emergency Relief (AER) campaign annually from March to May. Like the CFC, it receives substantial promotion and command support. Soldiers can contribute to the AER through a pay allotment, making their participation observable in the Army pay data. However, unlike the CFC, which allows contributions to a wide variety of charities, the AER raises money for a specific purpose—helping soldiers and their dependents in need through the award of grants, interest-free loans, and scholarships (Army Emergency Relief Home, 2021). Table 5 provides the summary statistics for AER campaign participation. The sample restrictions are like those used to construct the CFC sample with one exception. Because money raised through the AER stays primarily at the installation, major military installations have better resourced campaign drives. For this reason, we restrict the sample to the 31 largest

military installations in the U.S.[21] Despite this restriction, however, over 85% of the soldiers from our original sample remain.

In Table 6, we present the results using the timing of the AER campaign. The estimates in Column 1, Panel A show the effect of bonus timing in and out of the AER campaign window on participation. A soldier who receives a bonus during the AER campaign is 0.8 percentage points more likely to participate than a soldier who receives a bonus outside the window. Since 20.1 percent of our sample contributes to the AER, this translates to a 4 percent increase in participation. While this estimate is less than half of the CFC estimates, it is not surprising given that a soldier can only contribute to the AER organization during the campaign—compared to the CFC, where a soldier can contribute to virtually any charity. Column 1, Panel B shows the effect of bonus timing by month. While many of the estimates are not statically different from one another, a trend of higher participation leading up to the campaign window is visible. Column 2 presents the estimates of amounts contributed to the AER on month of bonus receipt. Again, the results are not statistically significant but are suggestive of a pattern like that seen for CFC contributions.

Finally, Figure 5 graphs the results of both CFC and AER participation on bonus timing for comparison.[22] The shaded regions represent the stated charity windows, and the horizontal axis shows the months in which soldiers received a bonus. The graph shows that participation for both campaigns increases with soldiers who receive a bonus during that particular campaign.

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[21] Eglin Air Force Base, Fort Benning, Fort Bliss, Fort Bragg, Fort Campbell, Fort Carson, Fort Drum, Fort Eustis, Fort Huachuca, Fort Hood, Fort Jackson, Fort Knox, Fort Leavenworth, Fort Lee, Fort Leonard Wood, Fort Lewis, Fort Myer, Fort Meade, Fort Polk, Fort Richardson, Fort Riley, Fort Sam Houston, Fort Shafter, Fort Sill, Fort Stewart, Fort Story, Fort Wainwright, Presidio, Schofield Barracks, and Wheeler.

[22] In the graph both CFC participation and AER participation coefficients are estimated from the same sample—restricted to the largest 31 military installations.

This trend occurs even though the campaigns happen at different times of the year, lending support to the main findings of excess sensitivity.

4.4 Sensitivity and Experience

Hseih's (2003) work on the excess sensitivity of consumption to income has shown that people can display excess sensitivity when income shocks are small and not perfectly anticipated but respond in a manner more in line with the predictions of the PIH when shocks are large and well anticipated. Appealing to a "bounded rationality" argument that consumers will smooth consumption only when the cost of calculating the anticipated income change is low relative to the gain in utility from consumption smoothing has been able to unify the seemingly contradictory results of previous empirical findings. However, our findings of excessive sensitivity, even with income shocks much larger than those in any previous studies, suggest that size is not the only determinant.

In Table 7, we investigate whether "experience" with income shocks alters excess sensitivity. One idea is that the consumer's cost of calculating the anticipated income shock is not constant over their lifetime. Instead, it seems reasonable to expect that as a person is exposed to income shocks, they gain experience in how they should respond to them. Experience lowers the cost of calculating anticipated income and allows consumers to consumption smooth smaller and smaller sized shocks. Unlike the populations used by Hseih (2003), Browning and Collado (2001), and Paxson (1992), our sample consists of young soldiers whose military paycheck and bonuses are often their first exposure to substantial income.[23] In Column 1, we interact a

[23] The mean age in our sample is 23.

soldier's age with the timing of their bonus, allowing us to examine the sensitivity to bonus timing across soldier experience levels.

The results show that for each additional year in age, a soldier's sensitivity to the timing of their bonus decreases by 0.1 percentage points. Figure 6 shows the result of a similar regression using age bin dummy variables to allow for non-linearities. Young soldiers who receive a bonus during a CFC campaign are 2.5 percentage points more likely to contribute than young soldiers who receive a bonus outside the campaign. As the age of the soldier increases, the sensitivity to the timing of bonuses decreases until the two groups are statistically indistinguishable—at age 27. Column 2 adds a second dimension to experience by interacting the number of bonuses a soldier has received before a CFC campaign. In this way, soldiers gain experience not only from becoming older but also by having specific experience with the income shocks of bonuses. As Column 2 shows, the more specific experience of having a past bonus has three times the impact than that of aging one additional year on a soldier's sensitivity to bonus timing.[24,25]

5. Discussion and Conclusion

5.1 Discussion

This paper finds significant evidence of soldiers possessing excess sensitivity to income in their response to charitable giving. Solders who receive bonuses or are promoted during the

[24] An additional year of age closes the gap between soldiers who receive their bonus inside and outside the CFC window by 0.118 percentage points. In comparison, one additional exposure to a bonus reduces the gap by 0.368 percentage points. The first two bonuses a soldier receives are typically less than six months apart with remaining bonuses being paid annually.

[25] We also estimate similar specifications interacting a soldier's AFQT score and find no effect of this ability measure on a soldier's excess sensitivity. Additional interaction regression for sex, marital status, religion, and race are in the appendix.

time of a charitable campaign are more likely to participate in giving than those who receive the same treatment outside of the charitable campaign drive. Our results also suggest the size of a bonus increases the size of donations and that the effect is more concentrated near the end of the campaign window. These results add to the literature in two ways. First, they provide additional insight into a factor that influences charitable giving. Second, they point to the presence of excess sensitivity to large, anticipated income fluctuations, whereas previous research has found none.

Further, because of the unique environment of the military and the CFC, additional insights can be drawn as to the mechanisms that can explain our results. First, the sensitivity found in this paper cannot be a product of soldiers increasing their giving in response to an unanticipated increase in lifetime earnings. Soldiers know both their bonus payment schedule and likely promotion schedule well in advance, giving them almost perfect information about their future income. Additionally, soldier sensitivity due to liquidity constraints can also be ruled out as a potential mechanism. Because the CFC contributions in this study come from future payroll deductions, soldiers are donating out of future income that, by virtue of it being a military paycheck, is all but guaranteed to be the same or larger in the future. Given this environment of future income certainty and unconstrained contribution ability, we should not expect a soldier's charitable giving to be sensitive to income for the reasons most often theorized.

With these two mechanisms put aside, we consider why our findings of soldiers with large, anticipated income shocks show excess sensitivity when past research looking at large income shocks on consumption sensitivity find none. Bounded rationality implies adherence to the PIH when the costs of smoothing outweigh the benefits. In fact, previous research by Hseih (2003) and Browning and Collado (2001) finds no excess sensitivity to large income shocks

using samples where the average household is middle-aged and has likely experienced many similar income shocks.[26] However, a young adult with little experience with calculating and smoothing income shocks (or understanding of the utility gains of smoothing) may find it more difficult to implement a consumption smoothing strategy successfully.

If this is the case—that people require some level of experience to properly consumption smooth—then we might expect greater excess sensitivity to exist with people who have less experience with income shocks. Ni and Seol (2014) examine the characteristics of a set of households that demonstrate excess sensitivity to large, anticipated income shocks. Their findings show young households (under 43 year of age) are more likely to exhibit excess sensitivity. Our analysis explores this possible dimension further, not only looking at a much younger population but also showing that the number of previous income shocks and age are important factors.

A second possibility is that charity is different from normal consumption. Research by both economists and psychologists suggest there exists an impulse to give that may be driven by emotional motives, cognitive biases, and personal gain via "warm glow." If this is the case, then income itself may not be the driving mechanism. Instead, income and promotion may be serving as a proxy for a "positive" event that influences a person to do something "positive" for someone else. The fact that charity participation increases with a promotion, even though promotion brings a significantly smaller income shock, is suggestive that income may not be the only mechanism at work.

[26] Hseih (2003) uses the annual Alaska Permanent Fund payments as income shocks, which are very familiar to Alaskan residents. In a similar way, Browing and Collado (2001) use an institutional feature of the Spanish payment system, which is also very familiar. Additionally, both studies use samples where the average household head is in their mid-40s.

Finally, the findings of this paper highlight an important dimension on which fundraising organizations may inexpensively increase charitable contributions. They suggest that timing a fundraising campaign to coincide with when people are likely to receive additional income can increase participation. While at first targeting fundraising around individual income shocks may seem impractical, many income shocks are easily predictable. For instance, tax returns are generally dispersed within a month of tax filing, with most people filing between February and April. Additionally, the practice of workplace charity—where companies encourage employees to contribute to charity through a payroll deduction—is becoming more common, allowing for the timing of these campaigns to coincide with known company bonus schedules or individual promotions and raises.

5.2 Conclusion

Our findings show soldiers' charitable giving is overly sensitive to anticipated income shocks from both bonuses and promotions but that this sensitivity decreases in both age and experience. Given that both events are well anticipated and charitable contributions come from payroll deductions, the sensitivity is unlikely to be a product of a lifetime earnings increase or credit constraint. These findings stand in stark contrast to both the prediction of the PIH and the previous research that finds no excess sensitivity of consumption to large, anticipated income shocks. However, as other researchers have shown, excess sensitivity may depend heavily on the individual's characteristics. Our findings support this notion by showing that age and previous experience with income shocks lessen the excess sensitivity of individuals. This study adds a new dimension to the factors that influence charitable giving and provides an insight into why individuals may deviate from the predictions of the PIH warrants further investigation.

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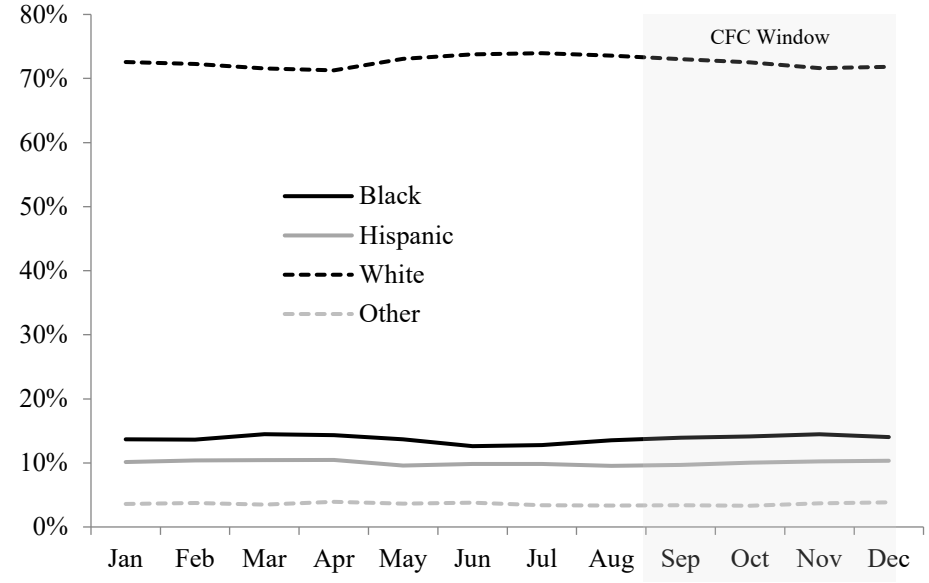
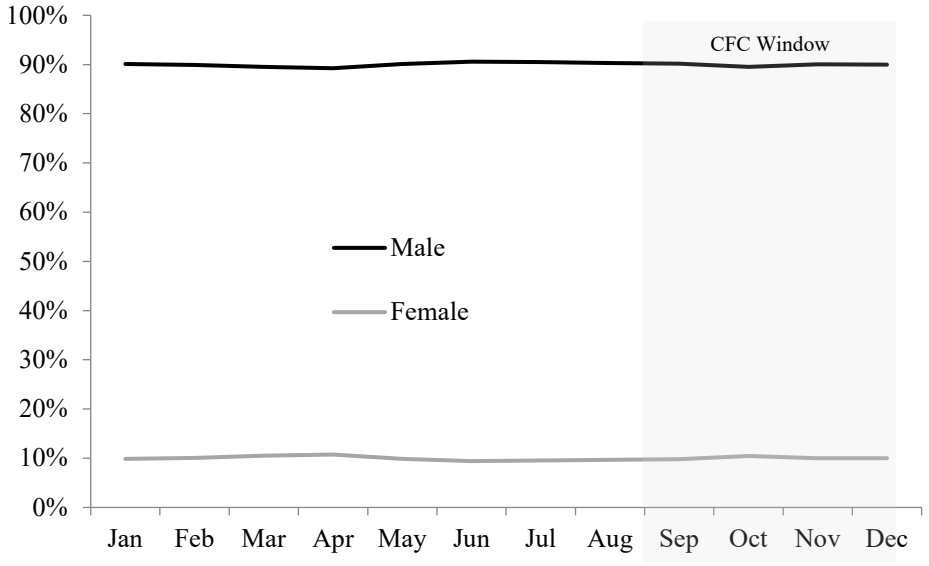
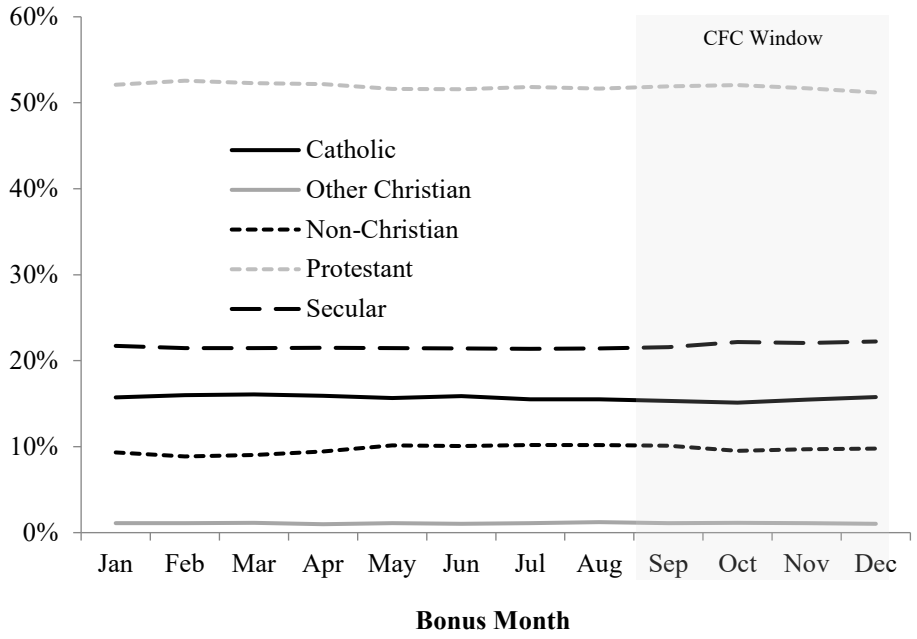
Figure 1: Distribution of race (A), sex (B), religion (C), marital status (D), branch (E), and age (F) by month of bonus receipt.



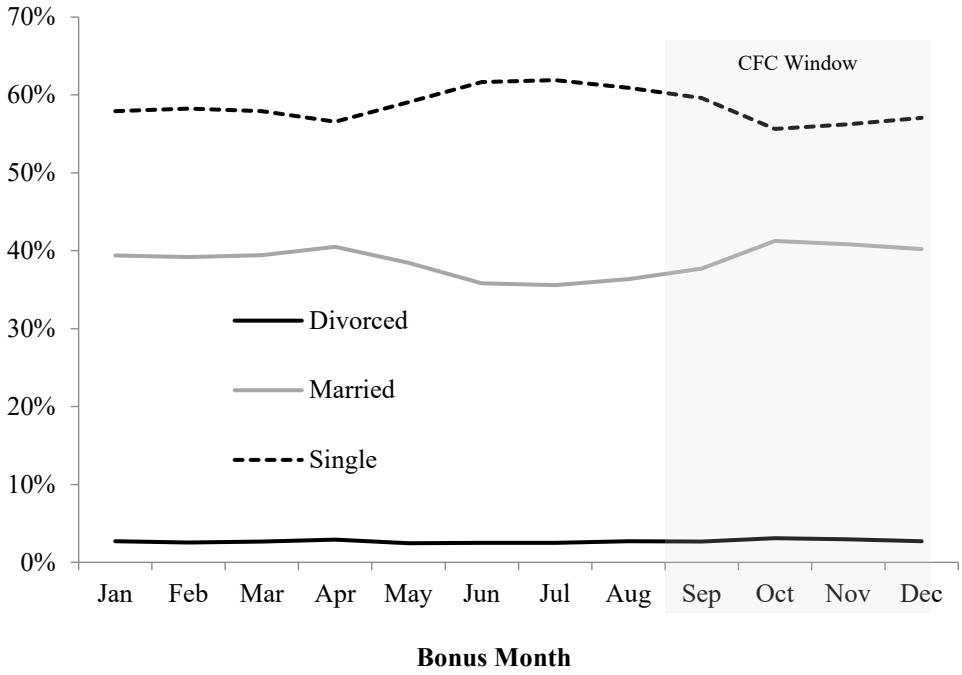
A) Race by Bonus Month



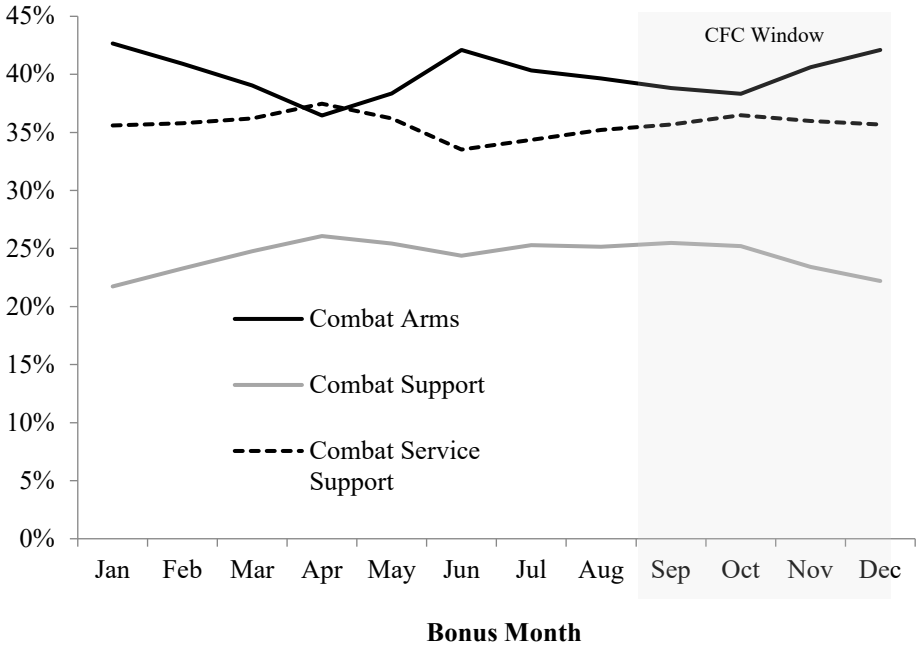
B) Sex by Bonus Month



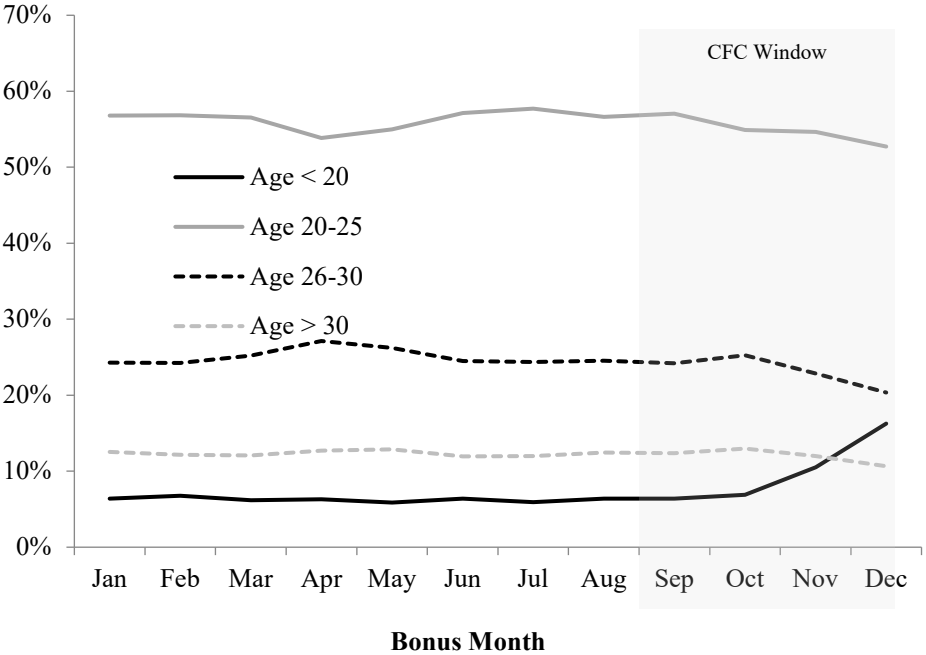
C) Religion by Bonus Month



D) Maritial Status by Bonus Month



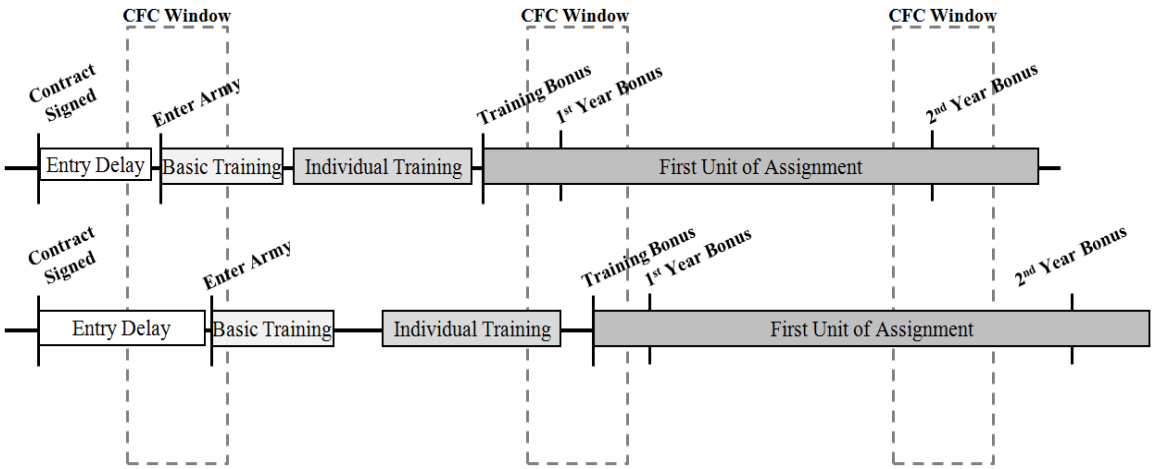
E) Branch by Bonus Month



F) Age by Bonus Month

These figures show that observable characteristics (except for ascension age) are the same regardless of whether the Army pays an enlistment bonus during the CFC open enrollment window. Ascension age ticks up for those under 20 because these soldiers ascend after graduating high school and are more likely to start basic training in the fall.

Figure 2: Bonus Timing Variation Induced by Training Delays



This figure shows the source of the exogenous variation in bonus timing. Consider two individuals who enter the Army at the same time, but the Army randomly assigns one solider to an earlier basic training date than the other. This action shifts the payment timing of a soldier's enlistment bonus during the CFC window, while the other soldier's bonus is paid just outside the enrollment period.

Table 1: CFC Bonus Timing Sample Summary Statistics

Covariate	Bonus During CFC (1)	Bonus Outside CFC (2)	No Bonus (3)	*p*-value H_o: (1) = (2)
CFC Participation	0.247	0.236	0.197	0.000
CFC Donation Amount	17.439	15.829	12.627	0.000
Male	0.901	0.902	0.870	0.171
Black	0.137	0.133	0.165	0.001
Hispanic	0.098	0.099	0.114	0.326
White	0.731	0.733	0.679	0.213
Other	0.035	0.035	0.041	0.180
Catholic	0.154	0.156	0.160	0.020
Christian (Other)	0.011	0.011	0.012	0.550
Non-Christian	0.096	0.097	0.096	0.324
Protestant	0.518	0.520	0.518	0.251
Secular	0.221	0.216	0.215	0.000
Combat Arms	0.412	0.401	0.289	0.000
Combat Support	0.238	0.254	0.303	0.000
Combat Service Support	0.351	0.345	0.408	0.002
Divorced	0.027	0.026	0.039	0.025
Married	0.400	0.396	0.492	0.336
Single	0.572	0.578	0.469	0.826
Bonus Amount ($1,000)	6.826	6.430	-	0.000
Private	0.428	0.414	0.269	0.000
Specialist	0.429	0.455	0.469	0.000
Sergeant	0.111	0.112	0.209	0.374
Staff Sergeant	0.019	0.019	0.055	0.068
AFQT Category 1 (High)	0.072	0.073	0.047	0.064
AFQT Category 2	0.399	0.402	0.322	0.038
AFQT Category 3A	0.293	0.287	0.287	0.000
AFQT Category 3B (Low)	0.234	0.236	0.373	0.207

Table 1 (Cont.)

Covariate	Bonus During CFC (1)	Bonus Outside CFC (2)	No Bonus (3)	*p*-value H_o: (1) = (2)
GED	0.133	0.126	0.184	0.000
High School Graduate	0.732	0.741	0.731	0.000
Some College	0.063	0.063	0.047	0.994
Associate's Degree	0.027	0.027	0.017	0.428
Bachelor's Degree	0.043	0.043	0.021	0.962
Age 17–18	0.026	0.014	0.008	0.000
Age 19–20	0.179	0.177	0.114	0.054
Age 21–22	0.259	0.264	0.219	0.000
Age 23–24	0.194	0.196	0.213	0.069
Age 25–26	0.129	0.133	0.162	0.000
Age 27–28	0.081	0.082	0.104	0.041
Age 29–30	0.049	0.049	0.065	0.050
Age 31–32	0.032	0.031	0.042	0.804
Age 33–34	0.021	0.020	0.028	0.524
Age 35–36	0.015	0.014	0.020	0.002
Age 37–38	0.010	0.010	0.015	0.211
Observations	155,773	223,522	742,971	379,295

Source: Office of Economic and Manpower Analysis. Notes: The sample consists of all soldiers who entered the Army between January 1, 2004 and December 31, 2013 and served at least three years. Additional sample restrictions are soldiers who were stationed within the U.S. at the time of the campaign, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The sample contains 1,122,266 observations. Column 4 contains the *p*-value from a regression of the individual characteristic on a set of dummy variables for Bonus During CFC and No Bonus with robust standard errors.

Table 2: CFC Participation on Bonus Months

Covariates	CFC Participation (1)	CFC Participation (2)
	Panel A: Bonus by Campaign Window	
Bonus Received Before CFC (1)	0.030***	0.006***
	(0.001)	(0.002)
Bonus Received During CFC (2)	0.043***	0.017***
	(0.001)	(0.003)
Bonus Received After CFC	0.032***	0.008***
	(0.001)	(0.002)
R-squared	0.004	0.081
H_0: (1) = (2), H_0: (2) = (3)	*p=0.000, p =0.000*	*p=0.003, p = 0.012*
	Panel B: Bonus by Month	
May Bonus	0.024***	0.004
	(0.002)	(0.003)
June Bonus	0.026***	0.003
	(0.002)	(0.003)
July Bonus	0.028***	0.008***
	(0.002)	(0.003)
Aug. Bonus	0.034***	0.008***
	(0.002)	(0.003)
Sep Bonus	0.038***	0.011***
	(0.002)	(0.003)
Oct. Bonus	0.031***	0.013***
	(0.002)	(0.002)
Nov. Bonus	0.042***	0.022***
	(0.002)	(0.005)
Dec. Bonus	0.047***	0.018***
	(0.002)	(0.004)
Jan. Bonus	0.038***	0.012***
	(0.002)	(0.003)
Feb. Bonus	0.033***	0.008**
	(0.002)	(0.004)
Mar. Bonus	0.031***	0.007**
	(0.002)	(0.003)
Apr. Bonus	0.019***	0.005
	(0.002)	(0.003)
Entry & Unit Arrival Month Dummies	Yes	Yes
Controls	No	Yes
Mean Participation	0.218	0.218
R-squared	0.004	0.081

Source: Office of Economic and Manpower Analysis Notes: There are 1,122,266 observations in all regressions. The shaded regions represent the CFC window. The sample consists of all soldiers who entered the Army between January 1, 2004 and December 31, 2013 and served at least three years. Additional sample restrictions are soldiers who were stationed within the U.S. at the time of the campaign, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The omitted group is soldiers who did not receive a bonus during the

campaign year. Included in both panels are controls for sex, race, religion, rank, entry month, unit arrival month, marital status, age, home of record, year, station, training status, education, AFQT category, and MOS. Standard errors are clustered at the station level, of which there are 480 in the U.S. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

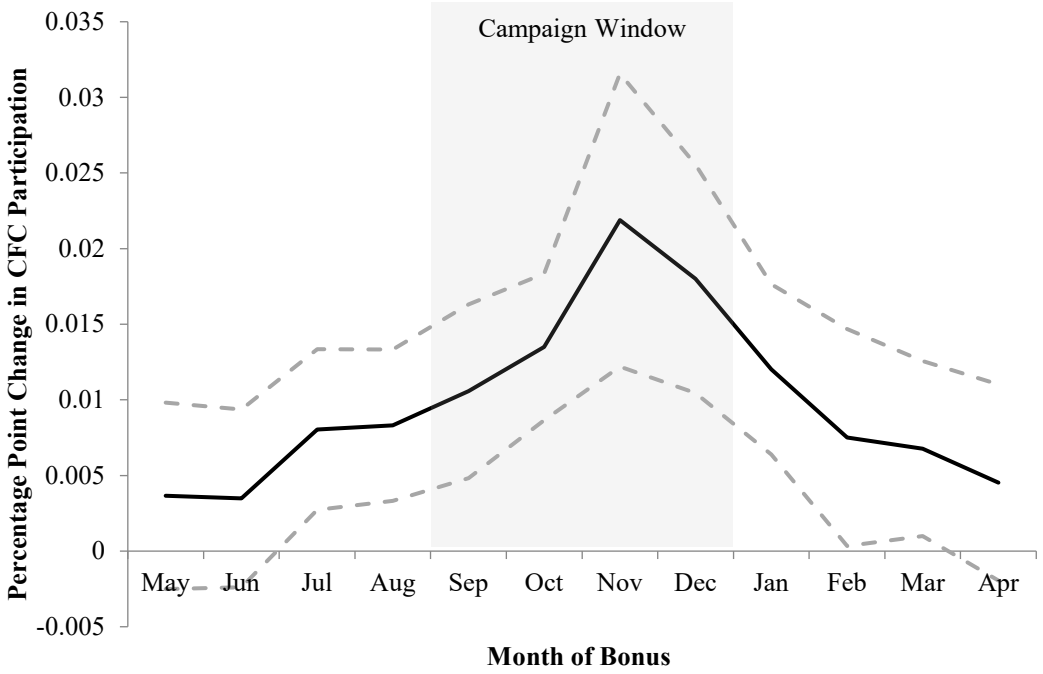
Table 3: OLS Regressions: CFC Participation/Amount on Bonus Amount Timing

Covariates	CFC Participation (1)	CFC Amount (2)
	Panel A: Bonus Amount by Campaign Window	
CFC Bonus Amount Before (1)	0.001***	0.056
	(0.000)	(0.034)
CFC Bonus Amount During (2)	0.002***	0.219***
	(0.000)	(0.049)
CFC Bonus Amount After	0.001**	0.117**
	(0.000)	(0.048)
R-squared	0.081	0.032
H_0: (1) = (2), H_0: (2) = (3)	*p = 0.003, p = 0.004*	*p=0.006, p = 0.032*
	Panel B: Bonus Amount by Campaign Month	
May Bonus Amount	0.000	0.073
	(0.000)	(0.064)
June Bonus Amount	0.001	-0.027
	(0.000)	(0.049)
July Bonus Amount	0.002***	0.113**
	(0.000)	(0.048)
Aug. Bonus Amount	0.001***	0.047
	(0.000)	(0.051)
Sep Bonus Amount	0.002***	0.122**
	(0.000)	(0.061)
Oct. Bonus Amount	0.002***	0.167***
	(0.000)	(0.063)
Nov. Bonus Amount	0.002***	0.312***
	(0.001)	(0.068)
Dec. Bonus Amount	0.002***	0.239***
	(0.000)	(0.063)
Jan. Bonus Amount	0.002***	0.200***
	(0.000)	(0.069)
Feb. Bonus Amount	0.001	0.043
	(0.000)	(0.069)
Mar. Bonus Amount	0.000	0.185**
	(0.000)	(0.079)
Apr. Bonus Amount	0.000	0.040
	(0.000)	(0.053)
Controls	Yes	Yes
R-squared	0.081	0.032

Source: The Office of Economic and Manpower Analysis. Notes: Estimates are for each $1,000 in bonus. There are 1,122,266 observations in all regressions. The shaded regions represent the CFC window. The sample consists of all soldiers who entered the Army between January 1, 2004 and Dec. 31, 2013 and served at least three years. Additional sample restrictions are soldiers who were stationed within the U.S. at the time of the campaign, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The omitted group is soldiers who did not receive a bonus during the campaign year. Controls are sex, race, religion, rank, entry month, unit arrival month, marital status, age, home of record, year, station,

training status, education, AFQT category, and MOS. Standard errors are clustered at the station level, of which there are 480 in the U.S. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 3: CFC Participation Rate on Bonus Month (base group is no bonus received during campaign year)



This figure plots coefficient estimates for whether a solider participates in the CFC given the timing of bonus payment. Each point shows the change in participation compared to those who did not receive a bonus during the given year. Note the spike in CFC participation if the bonus is paid during the campaign open enrollment window.

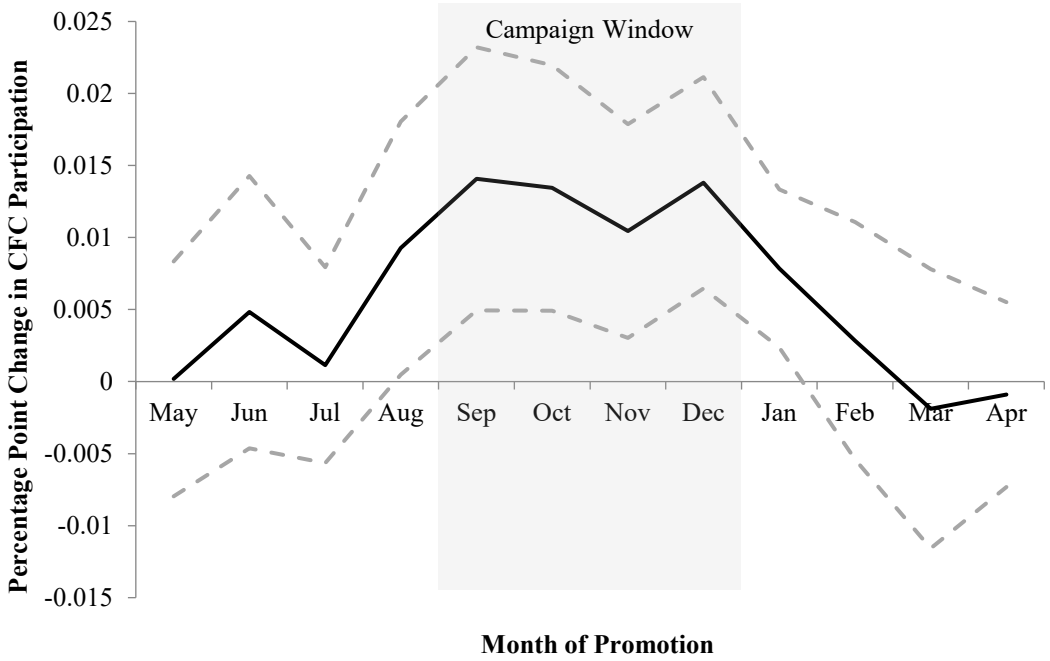
Table 4: CFC Participation/Amount on Promotion Timing

Covariates	CFC Participation (1)	CFC Amount (2)
	Panel A: Promotion by Campaign Window	
Promotion Before CFC (1)	0.001	-0.624*
	(0.003)	(0.368)
Promotion During CFC (2)	0.012***	-0.129
	(0.004)	(0.409)
Promotion After CFC (3)	0.006***	-0.890*
	(0.003)	(0.293)
R-square	0.079	0.032
H_0: (1) = (2), H_0: (2) = (3)	*p = 0.005, p = 0.072*	*p = 0.061, p = 0.073*
	Panel B: Promotion by Month	
May Promotion	0.000	-0.951**
	(0.004)	(0.432)
June Promotion	0.005	-0.910*
	(0.005)	(0.515)
July Promotion	0.001	-0.522
	(0.003)	(0.427)
Aug. Promotion	0.009**	-0.093
	(0.004)	(0.441)
Sep Promotion	0.014***	-0.641
	(0.005)	(0.651)
Oct. Promotion	0.013***	-0.489
	(0.004)	(0.597)
Nov. Promotion	0.010***	0.223
	(0.004)	(0.536)
Dec. Promotion	0.014***	0.450
	(0.004)	(0.493)
Jan. Promotion	0.008***	-0.312
	(0.003)	(0.559)
Feb. Promotion	0.003	-1.833**
	(0.004)	(0.713)
Mar. Promotion	-0.002	-1.32**
	(0.005)	(0.565)
Apr Promotion	-0.001	-0.580**
	(0.003)	(0.292)
Controls	Yes	Yes
R-squared	0.081	0.032

Source: The Office of Economic and Manpower Analysis. Notes: There are 1,122,266 observations in all regressions. The shaded regions represent the CFC window. The sample consists of all soldiers who entered the Army between January 1, 2004 and December 31, 2013 and served at least three years. Additional sample restrictions are soldiers who were stationed within the U.S. at the time of the campaign, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The omitted group is soldiers who did not

receive a bonus during the campaign year. Controls are sex, race, religion, rank, entry month, unit arrival month, marital status, age, home of record, year, station, training status, education, AFQT category, and MOS. Standard errors are clustered at the station level, of which there are 480 in the U.S. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 4: CFC Participation Rate on Promotion Month



This figure plots coefficient estimates for whether a solider participates in the CFC given the timing of promotion. Each point shows the change in participation compared to those who were not promoted during the given year. Note the spike in CFC participation if a solider is promoted during the campaign open enrollment window.

Table 5: AER Bonus Timing Sample Summary Statistics

Covariate	Bonus During AER (1)	Bonus Outside AER (2)	No Bonus (3)	*p*-value H_o: (1) = (2)
AER Participation	0.217	0.223	0.193	0.961
AER Donation Amount	8.727	8.653	7.756	0.427
Male	0.900	0.906	0.873	0.965
Black	0.138	0.132	0.163	0.046
Hispanic	0.100	0.099	0.114	0.569
White	0.727	0.735	0.682	0.149
Other	0.035	0.035	0.041	0.983
Catholic	0.157	0.155	0.159	0.813
Christian (Other)	0.096	0.098	0.098	0.961
Non-Christian	0.010	0.011	0.012	0.214
Protestant	0.521	0.517	0.515	0.161
Secular	0.215	0.220	0.216	0.213
Combat Arms	0.403	0.431	0.298	0.038
Combat Support	0.239	0.220	0.298	0.122
Combat Service Support	0.358	0.349	0.404	0.132
Divorced	0.027	0.030	0.042	0.002
Married	0.433	0.450	0.518	0.000
Single	0.539	0.520	0.440	0.000
Bonus Amount ($1,000)	6.531	6.612	-	0.112
Private	0.353	0.293	0.189	0.106
Specialist	0.479	0.526	0.528	0.397
Sergeant	0.146	0.157	0.225	0.002
Staff Sergeant	0.023	0.025	0.058	0.326

Table 5 (Cont.)

Covariate	Bonus During AER (1)	Bonus Outside AER (2)	No Bonus (3)	*p*-value H_o: (1) = (2)
AFQT Category 1 (Top)	0.069	0.066	0.044	0.000
AFQT Category 2	0.394	0.392	0.315	0.000
AFQT Category 3A	0.288	0.296	0.257	0.013
AFQT Category 3B (Bottom)	0.249	0.247	0.384	0.110
GED	0.125	0.135	0.191	0.001
High School Graduate	0.746	0.734	0.729	0.016
Some College	0.062	0.060	0.045	0.029
Associate's Degree	0.023	0.026	0.016	0.589
Bachelor's Degree	0.040	0.037	0.019	0.009
Age 17–18	0.003	0.002	0.001	0.029
Age 19–20	0.160	0.133	0.082	0.000
Age 21–22	0.254	0.267	0.224	0.065
Age 23–24	0.213	0.220	0.225	0.137
Age 25–26	0.142	0.144	0.174	0.139
Age 27–28	0.091	0.090	0.111	0.142
Age 29–30	0.053	0.055	0.068	0.185
Age 31–32	0.033	0.035	0.044	0.121
Age 33–34	0.022	0.023	0.029	0.233
Age 35–36	0.015	0.016	0.021	0.237
Age 37–38	0.010	0.012	0.015	0.109
Observations	100,533	265,562	647,319	366,095

Source: Office of Economic and Manpower Analysis. Notes: The sample consists of all soldiers who entered the Army between January 1, 2004 and December 31, 2013 and served at least three years. Additional sample restrictions are soldiers who were stationed at one of the 31 largest U.S. installations, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The sample contains 1,013,414 observations. Column 4 contains the *p*-value from a regression of the individual characteristic on a Bonus During AER dummy controlling for entry month, unit arrival month, and training status. Standard errors are clustered on the 31 U.S. military installations.

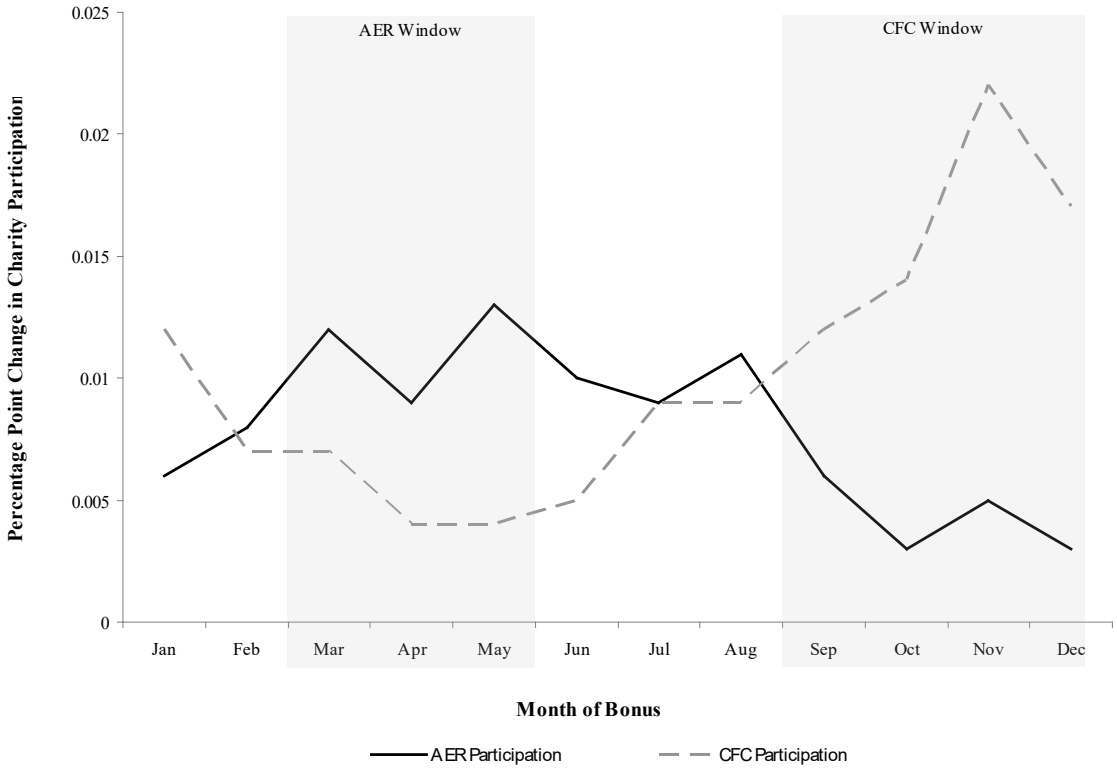
Table 6: AER Participation/Amount on Bonus Timing

Covariates	AER Participation (1)	AER Amount (2)
	Panel A: Bonus Amount by Campaign Window	
Bonus Before AER (1)	0.005**	0.384**
	(0.002)	(0.146)
Bonus During AER (2)	0.013***	1.027***
	(0.005)	(0.222)
Bonus After AER (2)	0.011**	0.831***
	(0.004)	(0.227)
R-squared	0.078	0.027
H_0: (1) = (2), H_0: (2) = (3)	*p =0.120, p=0.571*	*p=0.009, p=0.331*
	Panel B: Bonus Amount by Campaign Month	
Oct. Bonus	0.003	0.226
	(0.004)	(0.249)
Nov. Bonus	0.005*	0.310*
	(0.003)	(0.177)
Dec. Bonus	0.003	0.209
	(0.003)	(0.152)
Jan. Bonus	0.006***	0.506**
	(0.002)	(0.228)
Feb. Bonus	0.008*	0.792**
	(0.005)	(0.328)
Mar. Bonus	0.012***	0.823***
	(0.004)	(0.189)
Apr Bonus	0.009*	1.025***
	(0.005)	(0.279)
May Bonus	0.013**	1.035**
	(0.006)	(0.403)
June Bonus	0.010*	0.944**
	(0.006)	(0.386)
July Bonus	0.009*	0.607**
	(0.005)	(0.288)
Aug. Bonus	0.011**	0.898**
	(0.005)	(0.342)
Sep Bonus	0.006	0.480
	(0.005)	(0.300)
Controls	Yes	Yes
Observations	1,089,917	1,089,917
R-squared	0.078	0.027

Source: The Office of Economic and Manpower Analysis. Notes: The sample consists of all soldiers who entered the Army between January 1, 2004 and December 31, 2013 and served at least three years. Additional sample restrictions are soldiers stationed at one of the 31 largest U.S. posts at the time of the campaign, serving in one of 16 primary branches of the Army and not missing any administrative data. Included in the final

regression are controls for sex, race, religion, rank, entry month, unit arrival month, marital status, age, home of record, year, station, training status, education, AFQT category, and MOS. Standard errors are clustered at the station level.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 5: Charity Participation Rate on Bonus Month (base group is no bonus received in any month)



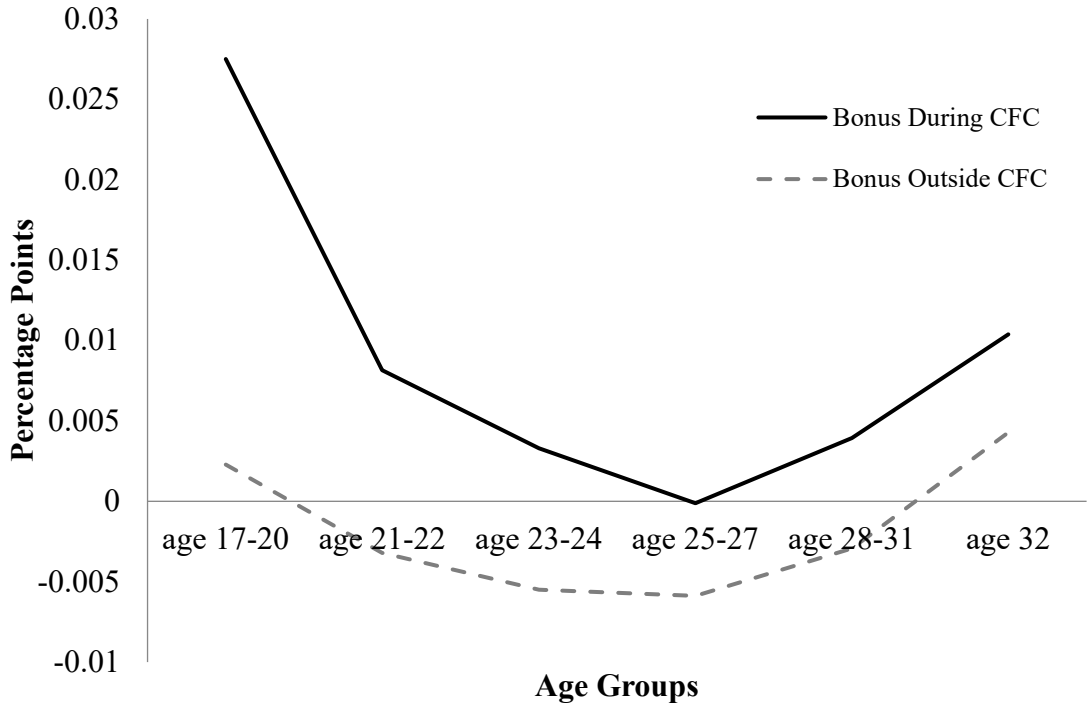
This figure shows the effect of bonus payment timing on participation in two different charitable campaigns. The Army Emergency Relief (spring enrollment period) and the Combined Federal Campaign (fall enrollment period). Note that soldiers participate at higher rates when their bonus is paid during the enrollment period for both charity drives.

Table 7: CFC Participation on Bonus Timing

Covariates	CFC Participation (1)	CFC Participation (2)
Outside CFC Bonus	0.007	0.013*
	(0.008)	(0.008)
Outside CFC Bonus X Age	-0.000	0.000
	(0.000)	(0.000)
Outside CFC Bonus X # of Bonuses		-0.005***
		(0.001)
During CFC Bonus	0.046***	0.056***
	(0.014)	(0.014)
During CFC Bonus X Age	-0.001**	-0.001*
	(0.000)	(0.000)
During CFC Bonus X # of Bonuses		-0.008***
		(0.002)
Age	0.001***	0.000***
	(0.000)	(0.000)
# of Bonuses		-0.001
		(0.001)
Controls	Yes	Yes
Observations	1,288,029	1,288,029
R-squared	0.080	0.080

Source: The Office of Economic and Manpower Analysis. Notes: The shaded regions represent the CFC window. The sample consists of all soldiers who entered the Army between January 1, 2004 and Dec. 31, 2013 and served at least 3 years. Additional sample restrictions are soldiers who were stationed within the U.S. at the time of the campaign, were serving in one of 16 primary branches of the Army, and were not missing any administrative data. The omitted group is soldiers who did not receive a bonus during the campaign year. Controls are sex, race, religion, rank, entry month, unit arrival month, marital status, age, home of record, year, station, training status, education, AFQT category, and MOS. Standard errors are clustered at the station level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 6: Change in CFC Participation by Age (results from regression with age interacted with bonus timing, base group = no bonus in CFC year)



This figure plots coefficient estimates for whether a bonus is paid during a given month with soldier age. We find that excessive sensitive seems to decline with age. This result implies that experience tends to help with consumption smoothing.