

## **Work-Related Overpayments of Social Security Disability Insurance Beneficiaries: Prevalence and Descriptive Statistics**

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**ABSTRACT**

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**Project Number**

D-MP-15-06

**Title**

Work-Related Overpayments of Social Security Disability Insurance Beneficiaries: Prevalence and Descriptive Statistics

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**Date**

July 2018

**Key Findings and Policy Implications**

Work-related overpayments occur when the Social Security Administration (SSA) issues a monthly benefit to which an individual is not entitled because of engagement in substantial gainful activity. These overpayments account for a substantial sum of money and create administrative and fiscal challenges for SSA to manage. Overpayments may also create financial challenges for overpaid beneficiaries who are obligated to repay overpayments. Despite the total magnitude of work-related overpayments and reported frustrations from beneficiaries, few details are known about the prevalence of overpayments or the size of individual overpayments.

In this study, we use an algorithm to produce statistics on the prevalence, duration, and amount of work-related overpayments accrued to Social Security Disability Insurance (DI) beneficiaries based on SSA administrative data for January 2010 through December 2012. We also document beneficiary characteristics that are associated with work-related overpayments.

We found that:

- 1.9 percent of all DI beneficiaries in our sample were overpaid due to work in one or more months during the three-year study period.
- Among DI beneficiaries with sufficient earnings to put them at risk of a work-related overpayment, 71 percent were overpaid.
- Work-related overpayments lasted for a median of nine months.
- Work-related overpayments accrued to a median of over \$9,000.

The findings indicate that work-related overpayments are prevalent among beneficiaries who engage in substantial gainful activity after exhausting work incentives that preserve benefit payments. The broad scope of this issue suggests that SSA should continue and increase efforts to prevent or reduce overpayments.

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## I. INTRODUCTION

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For decades, efforts by the Social Security Administration (SSA) to increase employment among Social Security Disability Insurance (DI) beneficiaries have generated considerable interest from policymakers and researchers. Comprehensive, in-depth research, however, on the extent, causes, and associated beneficiary characteristics of benefit overpayments as a result of such work activity has been relatively limited. Work-related overpayments occur when SSA issues a monthly benefit to which an individual is not entitled because SSA either is not aware that the beneficiary has sufficient earnings to be ineligible for benefits in that month, or has not yet investigated earnings and suspended or terminated benefits accordingly. These overpayments occur for a confluence of reasons, including the failure of beneficiaries to report work activity timely as required by DI rules, constrained administrative resources within SSA to act on reports of beneficiary work activity, and the complexity of rules governing beneficiary work activity (Government Accountability Office [GAO] 2011, GAO 2013, GAO 2015). Overpayments may also occur for reasons not related to work, but we focus on work-related overpayments in this research and use the term ‘overpayments’ to refer to work-related overpayments.

Work-related overpayments to DI beneficiaries account for a substantial sum of money and create administrative and fiscal challenges for SSA to manage. Annual SSA reports indicate that totals for work-related overpayments ranged from \$831 million to \$980 million per year from fiscal years 2010 through 2012, representing 0.68 to 0.86 percent of total DI payments (SSA 2013a). These rates fall short of SSA’s own payment accuracy targets.

Beneficiaries are obligated to reimburse overpaid funds unless a successful appeal of the overpayment finding or a request that the overpayment be waived are filed. Overpayments can be quite large, especially in comparison to the generally modest financial resources of DI

beneficiaries. One common method for repaying overpayment debt is partial withholding of a DI benefit after benefit payments have resumed (GAO 2011). Because the withholding is limited, it can take many years before the debt is repaid. Recovery of overpayments may continue after the benefits convert to retirement benefits at the full retirement age, may also result in benefit reductions for auxiliary beneficiaries, and, should the beneficiary die, may be collected from surviving dependents. There are administrative costs associated with recovering overpayments and SSA estimates that it costs 7 cents for every \$1 in overpayments recovered (SSA 2016). In some cases, the debt is never repaid. Of all the overpayment debt (work-related and overpayments for other reasons) identified in 2004, 53 percent was recovered, 26 percent was still outstanding, and 21 percent was waived or cancelled a decade later (SSA Office of the Inspector General [SSA OIG] 2015).

Given these circumstances, compelling anecdotal evidence suggests that overpayments can be traumatic experiences for beneficiaries and may function as disincentives to work. For example, during qualitative interviews conducted as part of an assessment of SSA's Benefit Offset National Demonstration (BOND), field staff and beneficiaries reported concerns about the consequences of overpayments (Gubits et al. 2013, Hoffman et al. 2017). Similarly, qualitative interviews conducted with 91 beneficiaries who had recently worked at levels high enough to trigger overpayments revealed that overpayments were common and a great source of frustration (O'Day et al. 2016). Similar findings emerged from semi-structured interviews with 84 overpaid SSDI beneficiaries, as did reports that over half of the interviewed beneficiaries immediately terminated employment upon learning of their overpayment (Kregel 2017). The magnitude and prevalence of these negative beneficiary reactions to work-related overpayments cannot be quantified without additional research.

Despite the total magnitude of work-related overpayments and reported frustrations from DI beneficiaries, few details are known about the prevalence of overpayments or the size of individual overpayments. The authors of a recent GAO report estimated that 0.4 percent of all primary DI beneficiaries encountered a work-related overpayment over a 15-month period (GAO 2013). However, the authors relied on sources other than SSA administrative records, and they acknowledge that their statistics likely understate the prevalence of overpayments. The SSA Office of Inspector General (OIG) conducted reviews of 985 DI beneficiaries in current pay status or in temporary benefit suspense in October 2003. The report found that 3.2 percent had a work-related overpayment over a more-than 10-year period beginning in October 2003 and ending in February 2014, with an average overpayment amount of \$14,397 among those overpaid (SSA OIG 2015). Calculations based on estimates in that report suggest that 63 percent of beneficiaries who engaged in substantial gainful activity (SGA, worked enough to earn above a specified threshold or engaged in equivalent activity) and were therefore at risk for an overpayment were, in fact, overpaid. Finally, case reviews of 275 beneficiaries with substantial earnings from 2007 through 2011 revealed estimated average work-related overpayments lasting 9 months and totaling \$8,114 (SSA OIG 2014). Estimates from that same report suggest that 60 of 65 beneficiaries at risk for a work-related overpayment (92 percent) were overpaid. These are the best available statistics on work-related overpayments, but they were generated from relatively small samples of beneficiaries and there is some ambiguity about the sample selection criteria.

We have found no research that describes the characteristics of beneficiaries who encounter work-related overpayments. In general, the a priori expectation is that beneficiary characteristics associated with low levels of mental functioning or little contact with the SSA disability

programs are more likely to be overpaid if they work at the SGA level because these beneficiaries may have limited understanding of or exposure to the SSDI rules regarding reporting work activity. For example, we might expect beneficiaries with high levels of education to be less likely to be overpaid given work. However, this expectation is not borne out in all cases, as described below. Further research into the nature of the beneficiary experience, SSA operations, and the functioning of overpayments within the benefit ecosystem is necessary to inform reasonable expectations and further explicate the results of this paper.

This report adds to the body of evidence on overpayments by providing more detailed statistics on the prevalence of work-related overpayments to DI beneficiaries, the average size and duration of overpayments, and characteristics of beneficiaries who received overpayments. We use an overpayment algorithm developed for the BOND evaluation to provide information on overpayments. The algorithm uses SSA administrative data that generate the overpayment decisions and thus provides greater accuracy compared to efforts to identify overpayments using external data sources. In addition, administrative data allow us to scale our analysis more easily than the case reviews employed by other studies. In this analysis, we use a 10 percent random sample of DI beneficiaries who received or were potentially eligible for DI benefits in January 2010.

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## II. BACKGROUND: SSA POLICY REGARDING WORK ACTIVITY

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SSA defines disability, in part, as “the inability to engage in substantial gainful activity,” or SGA. SGA refers to work activity with a value<sup>1</sup> above a certain annually adjusted monthly threshold, \$1,170 and \$1,950 in 2017 for non-blind and blind individuals, respectively. Because disability and therefore eligibility for DI benefits are defined by an inability to engage in SGA, it follows that work affects eligibility for benefits. It does so in four stages, which as depicted in Exhibit 1.

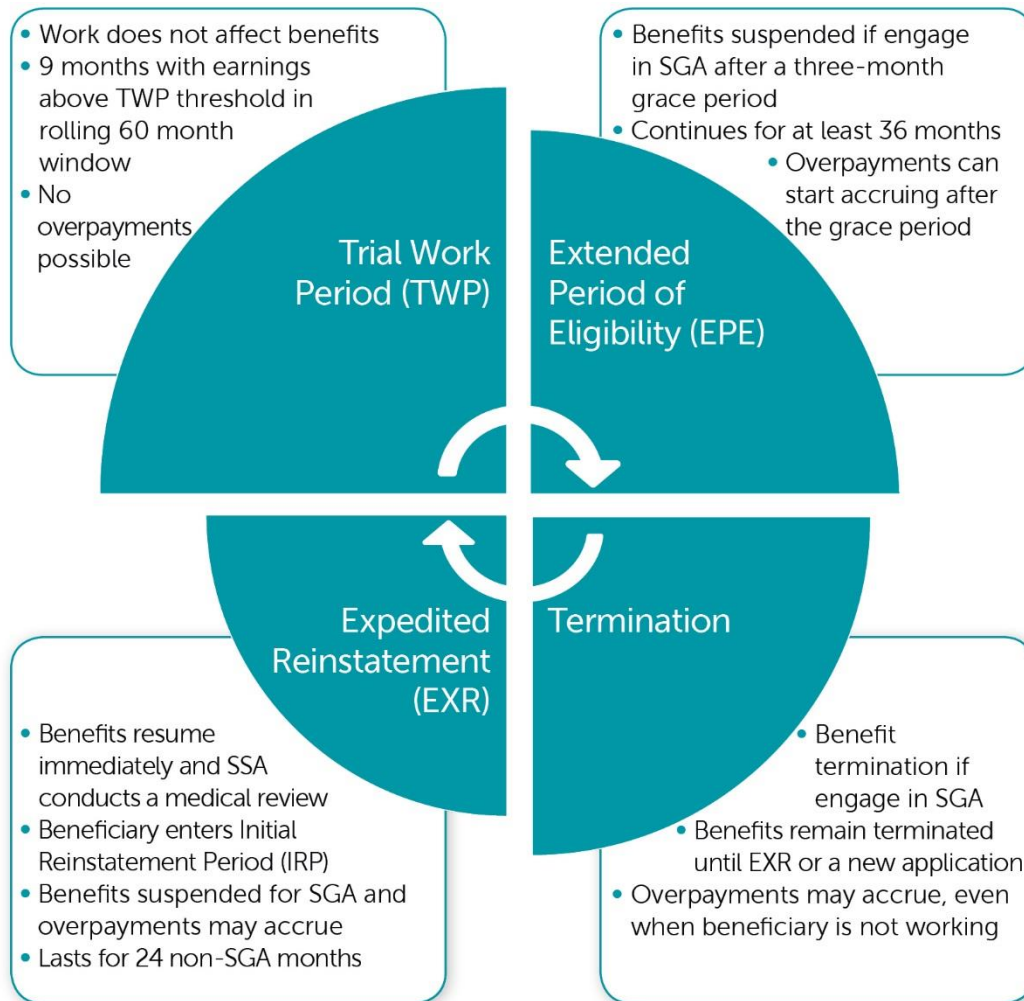
1. **The Trial Work Period (TWP).** When beneficiaries first become eligible for DI benefits and begin to work, they enter their TWP. During the TWP, work activity has no effect on receipt of DI benefits while beneficiaries test their ability to work. The TWP ends when the beneficiary works above an annually-adjusted monthly threshold (\$810 in 2016) in nine months within a rolling 60-month window.
2. **The Extended Period of Eligibility (EPE).** In the month following their last TWP month, beneficiaries enter their EPE, which lasts for at least 36 consecutive months. During the EPE, beneficiaries are ineligible for DI benefit payments in any month in which they engage in SGA, with the exception of their first SGA month in the EPE and a subsequent two-month grace period (GP)—amounting to a three-month GP. When a beneficiary is ineligible for benefits as a result of work activity in the EPE, the benefits are said to be suspended for work, meaning that benefits resume once the SGA ends. During this period, work-related overpayments can occur. Overpayments accrue during all months in which the beneficiary engaged in SGA and should have had benefits suspended, but received a benefit payment.
3. **Termination after the 36 EPE months.** Beginning with the 37th month after the TWP, an individual’s DI benefits will terminate if the beneficiary engages in SGA; otherwise the EPE continues. Benefits terminate in the month of SGA or after the beneficiary uses any of the three GP months that remain. Termination is a loss of eligibility for DI benefits. Overpayments can accrue from the month benefit eligibility terminates through the month when SSA takes the administrative steps to terminate the benefits. For example, benefit eligibility of a beneficiary who engages in SGA in the 37th month after the TWP terminates in that month if there are no remaining GP months, but if SSA does not actually terminate benefits until the 57th month, SSA will count all monthly benefits paid during that 20-month period as overpayments, even if the beneficiary was not working in months 38 through 57.
4. **Expedited Reinstatement (EXR) and the Initial Reinstatement Period (IRP).** After termination, a beneficiary may request EXR beginning with the first month in which she or

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<sup>1</sup> “Value” is critical to the SGA concept at all stages of the benefit lifecycle. The determination of whether a beneficiary is engaging in SGA is not a strict determination of the amount of the wages or self-employment earnings the beneficiary received. Rather, SSA offers a wide variety of work incentives that may reduce the beneficiary’s countable earnings below actual earnings, for the purposes of the SGA determination.

he is no longer engaging in SGA. Benefits resume immediately starting with the month of the request, SSA conducts a medical continuing disability review, and the beneficiary enters the IRP. As with the EPE, benefits are suspended in any month in which the individual engages in SGA. However, unlike with the EPE, the length of the IRP is variable. Specifically, the IRP lasts until the beneficiary receives 24 monthly benefit payments, not counting monthly payments that are suspended for SGA or certain other reasons. After the IRP, the beneficiary receives another TWP and the cycle begins again.

**Exhibit 1. The Relationship Between Work and Benefits for DI Beneficiaries**



To summarize, after beneficiaries complete the TWP and GP months, they are at risk for a work-related overpayment.<sup>2</sup> Overpayments may occur during the EPE, while terminated, or

<sup>2</sup> In rare instances, work-related overpayments occur because a new SSDI beneficiary returns to SGA in less than 12 months after disability onset, and therefore never met the SSDI eligibility criteria.



during the IRP. During these periods, if beneficiaries engage in SGA, SSA should suspend (during the first 36 months of the EPE or in IRP) or terminate (after the first 36 EPE months) benefits, referred to as suspension or termination due to work (STW). However, SSA does not always suspend or terminate benefits in a timely manner, and this lapse results in an overpayment. Beneficiaries who are not in STW status cannot have a work-related overpayment.

This description of SSA's work rules does not fully capture their regulatory complexity and the administrative challenge of enforcing them. A recent GAO report posits that the complexity of the SSA work rules contributes to overpayments (GAO 2015). Indeed, during qualitative interviews, beneficiaries reported that the SSA work rules were confusing and that beneficiaries did not have sufficient information (O'Day et al. 2016).

SSA is dependent on beneficiaries' timely reporting of changes in work activity to avoid overpayments. However, in 2010, only about one in four beneficiaries with earnings successfully reported their earnings to SSA (authors' calculations based on SSA 2011a). A higher proportion, 58 percent of employed beneficiaries who responded to the National Beneficiary Survey, indicated that they reported earnings to SSA within three months of starting a job (Wright et al. 2012). Together, these two statistics suggests that some beneficiaries attempt to report earnings but do not follow the correct reporting procedures or that some SSA staff do not correctly enter earnings reported by beneficiaries.

When SSA does not receive beneficiary earnings reports timely, SSA must wait to receive earnings information from an administrative data source. During the analysis period for this report, SSA learned of unreported earnings solely from Internal Revenue Service (IRS) data. These data were available with a notable delay: it could take as long as 18 to 24 months after the earnings occurred for SSA to receive IRS earnings data (SSA 2010). This delay is the result of

the nature of annual earnings reporting to the IRS. Employers are generally required to submit earnings information to the IRS on form W-2 by January 31st of the following calendar year. The standard deadline for employees (including self-employed workers for whom there are no employers) to report to the IRS is mid-April of the following calendar year and workers may request a six-month extension. Once SSA receives the IRS data, SSA staff must match the IRS records to the SSA account and process the data (Olsen and Hudson 2009). Overpayments may accrue during these delays, once the beneficiary has exhausted his or her TWP and GP months.

Whether the beneficiary self-reports earnings or SSA discovers earnings via IRS records, allegations of work incentives must be confirmed; wages must be verified; and other evidence, often from employers or other knowledgeable third parties, must be provided before a finding can be made. This process is called a work continuing disability review (work CDR) and, due to backlogs, can take several months to complete, potentially adding to the duration of overpayment accrual. A GAO report documented average delays in SSA beginning work CDRs of about seven months across a sample of 60 cases with overpayments (GAO 2011). These delays and subsequent overpayments occurred both for beneficiaries who did and did not report their earnings.

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### III. DATA AND METHODS

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#### A. Data

This analysis uses SSA administrative data to develop descriptive statistics on the prevalence, size, and duration of work-related overpayments as well as the characteristics of beneficiaries who are overpaid as a result of work activity. The primary administrative data sources for these statistics are the Disabled Beneficiary and Dependents (DBAD) files, which are monthly extracts of the Master Beneficiary Record (MBR), the primary repository for administering the DI program. As SSA learns of and processes information on beneficiary work activity, SSA staff update the MBR to reflect the revised status. Subsequent updates to the MBR overwrite previous updates, and historical records are not retained in that data source. The DBAD files capture historical information by preserving monthly snapshots of the MBR. A monthly DBAD snapshot includes the most recent monthly MBR update as well as up to 34 previous MBR updates. SSA preserves each monthly DBAD extract.

For this analysis, we used four different DBAD files. To select the sample, we used the January 2010, December 2012, and December 2014 files, as described in more detail below. January 2010 is the starting point of this analysis and we used the January 2010 file to produce the majority of the statistics on beneficiary characteristics. To conduct the analysis of overpayment prevalence, duration, and size, we used the March 2016 file, the most recent available at the time we began the analysis.

Because the DBAD files do not contain comprehensive beneficiary information, we supplement that data source with the Disability Analysis File (DAF) for additional information on beneficiary characteristics. The DAF is SSA's largest longitudinal database of DI beneficiary data and combines data from a variety of SSA administrative data sources, including the MBR.

The DAF is recreated every year to reflect revisions to the administrative data; this analysis used the 2014 version of the DAF.

## **B. Analysis Sample**

We selected our analysis sample to include a random 10 percent sample of beneficiaries with records in the January 2010 DBAD file who meet certain criteria designed to capture all eligible or potentially eligible nonterminated beneficiaries in January 2010, as of January 2010. First, at the start of the analysis period in January 2010, beneficiaries must be in a designated payment status defined in the data by the beneficiary's ledger account file (LAF) status. We included beneficiaries with LAF status codes indicating current payment status, payments deferred because of workers' compensation, and temporary suspension of benefits for one of ten reasons.<sup>3</sup> Nearly all beneficiaries who met all selection criteria (98 percent) were in current pay status in January 2010.

Second, we include only disabled-worker beneficiaries entitled to DI benefits on the basis of their own earnings histories in our sample. We exclude auxiliary beneficiaries who are entitled on the basis of a spouse's or parent's earnings, as well as beneficiaries who are dually entitled on the basis of both their own and spousal or parental earnings. We made these exclusions because, for auxiliary records, it is difficult to use the DBAD files to distinguish between overpayments accrued as a result of the primary beneficiary's earnings and those stemming from earnings of the auxiliary or dually entitled beneficiary. We implement these criteria by selecting records in which the beneficiary is entitled only to his or her own DI claim account in the January 2010 and December 2012 DBAD files.

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<sup>3</sup> We included beneficiaries with benefits temporarily suspended for the following ten reasons: (1) conditional payment status, (2) technical entitlement, (3) pending determination of continuing disability, (4) worked outside the United States, (5) worked inside the United States, (6) for better address, (7) prisoner suspension, (8) SGA suspension during the EPE, (9) refusal of vocational rehabilitation services, and (10) payee not determined.

Third, we include only beneficiaries who were under age 62 in the last month of analysis (December 2012) as well as those who were not assigned to one of two benefit-offset demonstrations. We implement the age criterion to avoid the different treatment of earnings associated with the Social Security Retirement program; it is possible for beneficiaries whose eligibility for DI benefits is terminated to claim retirement benefits starting at 62. We also exclude beneficiaries assigned to either the Benefit Offset Four-State Pilot (BOPD) or BOND according to the December 2014 DBAD. BOPD and BOND treatment beneficiaries are subject to a different formula for determining how earnings affect benefits relative to beneficiaries subject to current law and hence may differ in the size and duration of overpayments. Finally, we excluded 30 beneficiaries whose records were missing in the March 2016 DBAD file used for analysis.

Our final analytic sample includes 490,193 observations representative of all disabled-worker beneficiaries not assigned to BOPD or BOND and who were age 59 or younger and in current or designated suspense status in January 2010. As this is a 10 percent sample, we would expect there to be nearly 5 million such beneficiaries in the DI program in January 2010. In 2010, there were 5.8 million disabled-worker DI beneficiaries under age 60 (SSA 2011b). Because we make additional exclusions for dually entitled primary and auxiliary beneficiaries, we exclude beneficiaries assigned to BOPD and BOND, and we exclude additional LAF status codes, our sample size appears to be in line with published SSA estimates of the relevant DI population.

### **C. Identifying Overpayments**

For this analysis, we focus on overpayments during the EPE or for cases involving termination due to SGA. We do not include overpayments during the IRP, because the reason for overpayments and beneficiaries' awareness of accruing overpayments likely differ for

beneficiaries in the IRP versus in the EPE and following termination. Furthermore, a very small proportion (0.1 percent) of our sample engaged in SGA during the IRP in 2010 and were at risk for work-related overpayments.

We use a method to identify overpayments developed and used in the evaluation of BOND. The approach exploits documentation of changes in SSA actions in time within the March 2016 DBAD. The approach has three steps: (1) identify beneficiaries at risk for an overpayment as a result of work activity, (2) determine whether the beneficiary was overpaid, and (3) calculate the overpayment amount. We briefly describe these steps here as well as our efforts to validate our approach; more information is available in Hoffman et al. (2017).

First, we use the March 2016 DBAD to identify beneficiaries who were in STW during our analysis period of 2010, 2011, or 2012 and hence at risk for an overpayment.<sup>4</sup> Recall that beneficiaries not in STW are not at risk for overpayments either because they are not engaging in SGA or they are using TWP or GP months. We identify beneficiaries in STW during this period on the basis of “updated” data in the March 2016 DBAD—the most recent known SSA status at the time we began this analysis.

Next, we compare the updated data on STW status in the March 2016 DBAD to historical data on benefits due in 2010, 2011, and 2012 included in the March 2016 DBAD to identify work-related overpayments. We identify beneficiaries as overpaid when the updated data for a given month (which reflects retroactive adjustments) indicates that the beneficiary was in STW and the historical data for the same month (which reflects SSA knowledge as of that month)

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<sup>4</sup> SSA administrative data do not identify STW in a straightforward manner. Rather, a collection of data elements must be assessed in combination to determine STW status. We construct the STW measure used in this analysis following the algorithm used to identify STW in the DAF. We do not classify months during which benefits have been suspended as a result of work activity during the initial reinstatement period (IRP) of an expedited reinstatement (EXR), although the measure in the DAF does identify those months as STW months.

indicates the beneficiary received a benefit payment. Because beneficiaries in STW status are due no benefit, the amount of the overpayment is equal to the benefit otherwise due.

We validated this approach to identifying and calculating overpayments for beneficiaries subject to current law using case reviews as part of the BOND evaluation. An SSA Benefit Authorizer conducted case reviews of 10 randomly selected cases for whom our algorithm indicated no overpayment and 20 cases with identified overpayments. For the 10 cases for which our algorithm identified no overpayment, the SSA case reviews agreed in 9 cases and identified only a \$2 overpayment in 1 case. This small discrepancy falls within the \$30 SSA administrative tolerance for overpayments and would not warrant officially recording the overpayment on the beneficiary's record or notifying the beneficiary of the overpayment. In all 20 cases for which the algorithm identified overpayments, SSA case reviews agreed. Our algorithm was within 5 percent of the SSA calculation of the overpayment amount for 16 of 20 cases and within 10 percent for 3 of the other 4 cases. In the final case, our algorithm predicted an overpayment of \$1,386 relative to the SSA calculated overpayment of \$1,865. The difference occurred due to a retroactive SSA recomputation of the beneficiary's monthly benefit amount that the algorithm did not capture. In aggregate, the predictions from our algorithm for all 20 cases was within 0.3 percent of the corresponding SSA estimate.

#### **D. Analytic Approach**

We begin our analysis by producing statistics on the prevalence, duration, and amount of work-related overpayments. We first present estimates for overpayments that accrued during the 2010 calendar year. These annual results provide context on beneficiary-level experiences that correspond to statistics on aggregate overpayments, which are often reported as annual measures (SSA 2013a). Next, we extend the horizon to a span of three years and produce the same statistics for overpayments that accrued in any month from January 2010 through December

2012. We use the Consumer Price Index to adjust for inflation from 2011 and 2012 values to 2010 dollars. We expect that the prevalence, duration, and amount of overpayments will all increase over the longer horizon.

We identify overpayments that occur during an observation window of up to three years in the data. Overpayment months need not be consecutive. These three-year statistics are lower-bound estimates of the prevalence, duration, and amount of overpayments beneficiaries encounter during the course of their DI tenure. For example, some beneficiaries may have accrued overpayments before 2010 or will begin to accrue overpayments in a later calendar year and will not be reflected in the prevalence rates in this paper.

We do not extend the analysis period beyond 2012 because, by definition, SSA identifies overpayments with a lag. The longer the duration between the analysis period and the follow up period, the more comprehensive the statistics on overpayments. The March 2016 DBAD file is the basis for our analysis and allows for an identification lag of at least three years and three months (the time from our last month of analysis, December 2012, to March 2016). An extension to include an additional year of analysis would decrease the identification period by a year to a minimum of two years and three months. A previous application of the overpayment methodology showed that moving from a lag of two years and ten months to a lag of one year and four months (that is, removing an additional 18 months of data) decreased the measured prevalence of overpayments by 7 percent, whereas moving from a lag of three years and ten months to a lag of two years and four months (similarly, removing 18 months of data) decreased the measured prevalence of overpayments by 4 percent (Hoffman et al., 2017). Accordingly, we are more confident in the estimates produced by using a longer identification period.



We conduct an analysis to produce estimates of the distribution of total number of months overpaid, based on observed overpayments occurring from January 2010 through December 2012. These estimates represent the minimum number of overpayment months beneficiaries encounter during their DI tenure. To improve on these estimates, we use survival analysis techniques, which are needed when only partial information is known for some beneficiaries (due to the fact that we do not observe overpayments before or after our analysis window). In our case, we use survival techniques to adjust our estimates of months overpaid and total overpayments for two factors: (1) left truncation, reflecting the potential bias for beneficiaries whose overpayments began before January 2010, because those with longer lengths of pre-2010 overpayments are more likely to be observed with an overpayment in the 2010 to 2012 window; and (2) right censoring to include the partial information known for beneficiaries whose overpayment extended into 2013 (i.e., that their months overpaid may exceed a certain value, but by how much is unknown). We flag observations with overpayments in January 2010 that are in a spell of consecutive STW months leading up to January 2010 as truncated. We flag observations with overpayments in December 2012 as censored; we do not observe overpayment or STW months in or after 2013. Survival analysis is used to produce estimates of the duration and amount of overpayment only and does not change the prevalence of overpayment nor the composition of overpaid beneficiaries.

We produce estimates of the duration of overpayment among the overpaid by deriving the distribution of overpayment time (that is, the survival curve) using the PROC PHREG command in SAS v9.4. The distribution of overpayment time can be used to determine the proportion of a population that will remain overpaid past a certain time. To arrive at this distribution, this nonparametric method calculates, for each month in the observation window, the proportion of

beneficiaries who exited overpayment status in that month, out of the beneficiaries with observable overpayment data in that month. The censoring indicator reflects whether or not the beneficiary was observed to have exited overpayment status in December 2012. In this way, the partial information known for right censored individuals (i.e. that they remained overpaid at least through and possibly beyond December 2012) is factored in by including individuals in the calculations for as long as they were observed. In a typical Cox model analysis, only the time to the *first* event would be analyzed and recurrent events would be ignored. As a simplifying assumption, we considered all episodes to be contiguous. Over three-quarters of overpaid beneficiaries in the analysis sample had just one overpayment spell.

In addition to accounting for right censoring, we account for the length of unobserved left truncation time (that is, the time beneficiaries were overpaid prior to 2010) among those who were overpaid in January 2010 and also had a consecutive spell of STW months leading up to January 2010. To do so, we start by counting the total number of consecutive STW months leading up to January 2010 (necessarily including STW in December 2009). We multiply the number of consecutive pre-2010 months by an estimate of the expected proportion of overpayment months.<sup>5</sup> This expected proportion is estimated from the sample of beneficiaries who had a first STW month in the 2010 to 2012 window; among this sample, we count the number of STW months before December 2012, the number of those months for which beneficiaries were overpaid, and divide the latter by the former to obtain the expected proportion of overpayment months. In sensitivity analyses, we tested other proxies for the number of pre-

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<sup>5</sup> An alternative approach would be to directly calculate the consecutive overpayment months used in the left truncation adjustment. This approach, however, goes beyond the scope and resources of this research.

2010 overpayment months, but found that the predicted 5th, 25th, 50th, and 75th percentile values were unchanged, and that there were only small changes to the 95th percentile.

We use the estimated distribution (the survival curve) of adjusted overpayment *months* described in the previous paragraph (accounting for right censoring and left truncation) to estimate the distribution of adjusted overpayment *amounts*. First, we calculate the unadjusted monthly overpayment amount by dividing the total unadjusted overpayment amount by the unadjusted overpayment length. We then multiply this value by the adjusted number of overpayment months (accounting for truncation and censoring) to arrive at the adjusted overpayment amount.

We also produce descriptive statistics comparing the characteristics of beneficiaries with at least one work-related overpayment in 2010, 2011, and 2012 to those in STW but not overpaid for at least one month during the same period. We use available information in the January 2010 DBAD to compare beneficiaries by age, gender, primary impairment, presence of a representative payee, duration of current entitlement, first STW month during the current entitlement, monthly benefit amount, and region. We supplement the January 2010 DBAD with information from the 2014 DAF for several measures that aren't available in the January 2010 DBAD or are more detailed in the DAF. DAF measures include race (which includes more granular categories relative to DBAD files), education, concurrent receipt of SSI benefits, level of DI benefit adjudication, and medical improvement status—none of which are available in DBAD files.<sup>6</sup> DAF records are available for 490,127 of the 490,193 total observations, resulting

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<sup>6</sup> Race information collected by the Social Security Administration may be missing for an increasing proportion of Americans (including DI beneficiaries) following several changes to the application process for a social security number starting in 1980. See Martin 2016.

in a 99.99 percent match rate. In both data sources, all characteristics reflect the most recent information known as of January 2010.

Finally, we conduct a multivariate analysis to estimate the relationship between beneficiary characteristics and the likelihood of overpayment. We estimate a logistic regression model in which the independent variable is a binary indicator of a work-related overpayment in 2010, 2011, or 2012. The analysis sample is all beneficiaries in STW during the same time period. We control for a variety of beneficiary characteristics including age group, gender, race, primary impairment, duration of current entitlement to DI, first STW of current entitlement relative to analysis period, assignment of a representative payee, monthly benefit amount category, level of adjudication, medical improvement status, concurrent receipt of DI benefits, and geographic region. We present marginal effects—estimates of the average effect of changing from the base category for the variable to the category indicated—for ease of interpretation.

## IV. RESULTS

### A. Statistics on Overpayments

In 2010, 1.2 percent of all DI beneficiaries in our sample accrued a work-related overpayment (Exhibit 2).<sup>7</sup> However, a relatively small fraction (1.8 percent) of all beneficiaries in our sample were in STW and hence at risk for a work-related overpayment. Of those engaged in SGA after the GP in 2010, 65.2 percent were overpaid. **Exhibit 2. The Prevalence, Duration, and Amount of Work-Related Overpayments in 2010**

Prevalence	
Percentage of all selected beneficiaries overpaid due to SGA	1.2
Percentage in STW in 2010 who were overpaid due to SGA	65.2
Duration	
Average number of months with overpayments due to SGA conditional on overpayment due to SGA in at least one month in 2010	6.5
Percentage of STW months in 2010 with an overpayment due to SGA	58.7
Overpayment Amount	
Mean 2010 overpayment due to SGA among all selected beneficiaries	\$82
Mean 2010 overpayment due to SGA among those overpaid in 2010	\$6,976
Median 2010 overpayment due to SGA among those overpaid in 2010	\$5,897
Total sample size	490,193

Source: March 2016 DBAD

Note: We classify work-related overpayments as those that occur due to SGA after the GP during the EPE or while terminated for SGA following the EPE.

Among those with a work-related overpayment in 2010, the average beneficiary was overpaid for six months—not necessarily consecutive—within 2010. This six-month timespan represents 58.7 percent of months in 2010 during which beneficiaries were in STW and at risk for a work-related overpayment as described above.

Reflecting the low overall prevalence of overpayments, in 2010 the mean SGA-related overpayment across the entire sample was \$82. The mean overpayment among those overpaid

<sup>7</sup> The prevalence of work-related overpayments is virtually unchanged when IRP overpayments are included, with 1.2 percent of beneficiaries overpaid.

was higher: nearly \$7,000. The median overpayment among those overpaid was lower, just below \$6,000, indicating that some beneficiaries received overpayments substantially larger than the median. Indeed, the 95th percentile of overpayments in 2010 was \$16,914.

When we analyze a three-year window of potential overpayments, we find that the prevalence, duration, and amount of overpayment are higher relative to those observed in the one-year time frame (Exhibit 3). The overall prevalence of work-related overpayments accrued during calendar years 2010, 2011, and 2012 is 1.9 percent, an increase from the 2010 rate of 1.2 percent. Indeed, for any fixed group of beneficiaries, the prevalence over any 3-year period will always be at least as large as the prevalence over any 1-year period within that 3-year period. The proportion of the sample in STW who were overpaid also increased, from 65 percent to 71 percent.

### **Exhibit 3. The Prevalence Duration, and Amount of Work-Related Overpayments in 2010–2012**

<b>Prevalence</b>	
Percentage of all selected beneficiaries overpaid due to SGA	1.9
Percentage in STW in 2010–2012 who were overpaid due to SGA	71.0
<b>Duration</b>	
Average number of months with overpayments due to SGA conditional on overpayment due to SGA in at least one month in 2010–2012	9.4
Percentage of STW months in 2010–2012 with an overpayment due to SGA	56.7
<b>Overpayment Amount</b>	
Mean 2010–2012 overpayment due to SGA among all selected beneficiaries	\$192
Mean 2010–2012 overpayment due to SGA among those overpaid in 2010–2012	\$9,941
Median 2010–2012 overpayment due to SGA among those overpaid in 2010–2012	\$7,219
Total sample size	490,193

Source: March 2016 DBAD

Note: We classify work-related overpayments as those that occur due to SGA after the GP during the EPE or while terminated for SGA following the EPE.

Beneficiaries overpaid at any point in 2010, 2011, or 2012 were overpaid for an average of nine months. This period is about 50 percent larger than the average number of overpayment

months in 2010, primarily because there is less right censoring of spells in the three-year window than in the one-year window. In contrast, the percentage of STW months with overpayments declined from 59 percent in 2010 alone to 57 percent in 2010–2012. Because this is a cohort analysis, this decline may reflect the inclusion of terminated beneficiaries. Once terminated, beneficiaries are included in the denominator for the statistic indefinitely and the statistic may in part reflect the increased likelihood of termination over time. Overpayments presumably become less likely the longer a beneficiary has been terminated.

The average overpayment amount accrued from 2010 through 2012 was \$192 among all beneficiaries and \$9,941 among those with an overpayment. Among those overpaid, the overpayment amount increased by 43 percent relative to the one-year statistics. Because the total overpayment amount is a product of the duration of the overpayment and monthly benefit amount, which is relatively constant over a short time period, we would expect the growth in the size of the overpayment to be roughly proportional to the change in the duration of the overpayment. Indeed, the duration of overpayment for those overpaid increased by 45 percent.

The increase in the prevalence, duration, and size of overpayments observed when shifting from one- to three-year estimates highlights the impact that truncation and censoring may have on our statistics. Thirty four percent of beneficiaries with overpayments in 2010, 2011, or 2012 were overpaid in January 2010 and an additional seventeen percent were overpaid in December 2012. We expect that some beneficiaries in the former group had overpayment spells that began before 2010. Indeed, we see that 86 percent of beneficiaries overpaid in January 2011 and 83 percent of those overpaid in January 2012 were also overpaid in the previous month. This suggests that a significant portion (likely over 80 percent) of beneficiaries overpaid in January

2010 were also overpaid before the start of our analysis period. Similarly, we expect that some of those overpaid in December 2012 continued to be overpaid beyond 2012.

We update the three-year estimates to account for left truncation and right censoring and estimate the total duration of overpayments that occurred in 2010, 2011, or 2012. Recall that these adjustments are based, in part, on a proxy for the pre-2010 overpayment months. This proxy is derived from the experiences of approximately 6,000 overpaid beneficiaries in our sample with first STW months in 2010, 2011, or 2012. During those three years, the ratio of overpayment months to STW months was 65 percent for those beneficiaries. We multiply this estimate by the number of consecutive pre-2010 STW months for each beneficiary with a first STW month before 2010 (1.7 months); the average of this product is 1.1 months.<sup>8</sup> We use the proxy for number of pre-2010 overpayment variables as the ‘entry time variable’ in our truncation adjustment. We account for right censoring by flagging overpayments in December 2012 as censored observations.

The adjusted estimates of the total duration of overpayments accounting for censoring and truncation differ slightly from the unadjusted estimates. Among those overpaid, we observe overpayments for a median of 7 months in 2010, 2011, and 2012. The results shown in Exhibit 4 indicate that, if we continued to follow those overpaid across the entirety of their overpayment spells, the overpayments we observed in 2010, 2011, and 2012 would continue for some beneficiaries, resulting in a median overpayment duration of 9 months. The 25th, 75th, and 95th percentiles of overpayments are also estimated to increase when accounting for truncation and censoring to 4, 16, and 30 months, respectively.

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<sup>8</sup> We ran several models to account for left truncation in addition to the model on which we base the main results. One alternative was to account for pre-2010 overpayment months during any pre-2010 STW months, even if they were not consecutive to January 2010. This alternative specification produced an average of 2.8 consecutive pre-2010 overpayment months and the results are identical to those presented in Exhibit 4.



**Exhibit 4. Percentiles for Number of Overpayment Months in 2010-2012, Observed and Adjusted for Truncation and Censoring**

	Overpayment months observed in 2010–2012	Estimated overpayment months, adjusted for truncation and censoring
5th percentile of overpayment months	1	1
25th percentile of overpayment months	3	4
50th percentile of overpayment months	7	9
75th percentile of overpayment months	14	16
95th percentile of overpayment months	24	30
Total sample size		9,444

Source: March 2016 DBAD

Exhibit 5 presents estimated overpayment amounts among overpaid beneficiaries that account for left truncation and right censoring. The predicted overpayment amounts for each quartile are between about \$1,000 and \$2,500 higher when accounting for truncation and censoring. The median overpayment amount observed during the three-year analysis period is \$7,219. When we account for truncation and censoring, the median rises to \$9,282. The estimated overpayment amount for the 5th percentile is unchanged at \$928, while the 95th percentile of overpayment amounts rises to over \$35,000 when accounting for truncation and censoring.

**Exhibit 5. Percentiles for Overpayment Amounts in 2010-2012, Observed and Adjusted for Truncation and Censoring**

	Overpayment amounts observed in 2010–2012	Estimated overpayment amounts, adjusted for truncation and censoring
5th percentile of overpayment amounts	\$928	\$928
25th percentile of overpayment amounts	\$3,166	\$4,221
50th percentile of overpayment amounts	\$7,219	\$9,282
75th percentile of overpayment amounts	\$13,826	\$15,801
95th percentile of overpayment amounts	\$28,441	\$35,551
Total sample size		9,444

Source: March 2016 DBAD

## **B. Characteristics of Overpaid Beneficiaries**

The results from a univariate analysis show that beneficiaries who were in STW and overpaid in at least one month of 2010 through 2012 were statistically different from those in STW but not overpaid for nearly every characteristic we analyzed (Exhibit 6). There were differences in demographic characteristics including gender, age, race, and education, as well as differences in primary impairments. Those who were STW with and without overpayments also differed by programmatic factors including SSI receipt, use of a representative payee, monthly DI benefit amount, time since first STW month, level of benefit adjudication, medical improvement status, and SSA region.

The last column of Exhibit 6 shows how overpayment rates differ across each subgroup. Consistent with the variation in characteristics by overpayment status, we see substantial variation in overpayment rates by subgroups. Overpayment rates were highest for beneficiaries who were black, had less than a high school education, had a primary impairment of intellectual disability, or had monthly benefits of less than \$1,000. Over 78 percent of beneficiaries with those characteristics were overpaid relative to 71 percent of the entire sample. In contrast, 58 percent or fewer of those with a college degree, primary impairment of neoplasm, or with DI benefits of more than \$2,000 had overpayments.

Exhibit 6 also shows that the percentage overpaid is higher among those whose first STW month was in 2010, 2011, or 2012 (about 80 percent for each group) than for those whose first STW month was before 2010 (64 percent). This indicates that the prevalence of overpayments among those who enter STW during the three-year analysis period is higher than the prevalence of overpayments among all those at risk for overpayments over the same period—71.0 percent (Exhibit 3). Those who first became at risk for overpayments before 2010 may have been less

likely to have overpayments in 2010 through 2012 because they had accrued overpayments before 2010 and SSA had since suspended their benefits.

We expect there to be covariation across beneficiary characteristics (such as education and monthly DI benefit amount) and covariation between beneficiary characteristics and variables related to program participation such as the first STW month. These relationships are not accounted for in a univariate analysis and, accordingly, we conducted a multivariate analysis to isolate the association between each particular characteristics and the likelihood of an overpayment, holding all other characteristics constant.

In the multivariate analysis, several of the demographic characteristics are statistically significant predictors of overpayment among those at risk for overpayment in 2010, 2011, or 2012 (Exhibit 7). Among those at risk for overpayments, black beneficiaries were 17 percentage points more likely to be overpaid and Hispanics were 7 percentage points more likely to be overpaid than their white counterparts. In addition, beneficiaries ages 54 and under were more likely to be overpaid relative to those ages 55 and older, holding other characteristics constant. Age may predict overpayments in part due to the fact that SSA assigns the responsibility for processing work CDRs to different processing centers based on age. The centralized Office of Disability Operations in Baltimore, Maryland processes work CDRs for beneficiaries less than 54 years of age and regional processing centers conduct work CDRs for those 54 and older (GAO 2011). If the Office of Disability Operations completes work CDRs at a different rate than the typical regional processing center, we would expect to see different rates of overpayments around the age cut-off.

### Exhibit 6. Characteristics of Beneficiaries Suspended or Terminated for Work by Overpayment Status

	Distribution of beneficiary characteristics by work-related overpayment status			Percent in STW who were overpaid, by subgroup
	Overpaid	STW and not overpaid	P-value of difference between overpaid and STW not overpaid	
<b>Gender (%)</b>				
Male	49.7	53.5		69.5
Female	50.3	46.5	<.0001	72.6
<b>Age group (%)</b>				
< 40 years old	38.4	33.5		73.8
40–49 years old	35.8	33.6		72.3
50–54 years old	15.6	18.3	<.0001	67.7
55 and above	10.2	14.6		63.1
<b>Race (%)</b>				
Asian	1.8	2.6		62.7
Black	31.7	14.4		84.4
Hispanic	8.8	6.7		76.4
White	54.6	72.7	<.0001	64.8
North American Indian/Other	1.7	1.8		69.0
Unknown/Missing	1.4	1.8		65.9
<b>Education (%)</b>				
Less than high school	10.4	7.0		78.5
High school or equivalent	27.7	27.4		71.2
Some postsecondary school	15.3	17.2	<.0001	68.6
College or above	8.9	16.0		57.7
Missing	37.7	32.4		74.1
<b>Primary impairment (%)</b>				
Neoplasms	5.2	11.6		52.5
Mental disorders	30.6	27.9		72.8
Intellectual disability	10.1	6.5		79.2
Back or other musculoskeletal disorders	18.2	17.2	<.0001	72.2
Nervous system disorders	5.0	6.2		66.5
Circulatory system disorders	4.3	4.1		71.9
Injuries	5.1	7.6		62.2
Respiratory	1.4	1.4		71.8
Severe visual impairments	1.8	1.4		75.7
Digestive system	1.6	2.7		58.7
Other impairments	16.8	13.5		75.3
<b>SSI Receipt (%)</b>				
Concurrent DI/SSI receipt	11.9	9.0		76.4
DI-Only	88.1	91.0	<.0001	70.4
<b>Mean number of months received DI (%)</b>				
36 or fewer months	24.7	23.6		71.9
37 to 84 months	36.7	40.9	<.0001	68.8
85 or more months	38.6	35.5		72.7
<b>Representative payee (%)</b>				
No	90.7	92.7		70.6
Yes	9.4	7.3	0.0002	75.8
<b>Monthly DI benefits</b>				
Less than \$1,000	57.5	36.0		79.6
\$1,000 - \$2,000	40.1	55.9	<.0001	63.8
More than \$2,000	2.4	8.2		41.3

Exhibit 6 (continued)

	Distribution of beneficiary characteristics by work-related overpayment status			Percent in STW who were overpaid, by subgroup
	Overpaid	STW and not overpaid	P-value of difference between overpaid and STW not overpaid	
<b>First STW month</b>				
Before 2010	49.0	67.9		63.9
In 2010	19.1	11.0	<.0001	81.1
In 2011	16.4	11.4		77.9
In 2012	15.5	9.8		79.5
<b>Level of Adjudication (%)</b>				
Initial decision	81.1	83.5	0.0171	70.5
Reconsideration or reconsideration hearing	15.3	13.5		73.6
Administrative law judge	0.4	0.3		75.9
Other/Unknown	3.2	2.7		74.0
<b>Medical Improvement (%)</b>				
Expected	6.9	11.2	<.0001	60.2
Possible	54.9	54.6		71.2
Not expected	23.2	20.9		73.1
No information/missing	15.1	13.3		73.6
<b>SSA Region (%)</b>				
Atlanta	18.2	12.8	<.0001	77.8
Boston	6.3	8.7		64.0
Chicago	14.5	14.3		71.3
Dallas	15.5	12.7		75.0
Denver	2.9	3.5		67.1
Kansas City	4.6	5.1		68.7
New York	9.6	12.0		66.1
Philadelphia	11.5	12.0		70.1
San Francisco	13.6	14.6		69.5
Seattle	3.4	4.4		65.6
Sample Size	9,444	3,853		

Source: January 2010 DBAD, March 2016 DBAD, 2014 DAF

Note: Race, education, concurrent DI and SSI receipt, level of adjudication, and medical improvement status are all from the DAF. DAF records were available for 9,442 observations with overpayments and 3,848 observations in STW and not overpaid; we retain observations that do not match to the DAF and code the DAF variables as missing.

### Exhibit 7. Predictors of Overpayment among Beneficiaries Suspended or Terminated for Work in 2010, 2011, and 2012

	Marginal effect	P-value
Male	0.0	0.98
Female	--	--
Age: Under 40	5.6	0.00
Age: 40 to 49	6.1	0.00
Age: 50 to 54	3.7	0.01
Age: 55 and above	--	--
Race: Asian	-0.5	0.85
Race: Black	16.9	0.00
Race: Hispanic	6.7	0.00
Race: White	--	--
Race: North American Indian/other	2.1	0.45
Race: Unknown/missing	1.3	0.64
Education: Less than high school	3.6	0.02
Education: High school or equivalent	--	--
Education: Some postsecondary	-1.9	0.10
Education: College or above	-5.7	0.00
Education: Missing	2.4	0.03
Primary Impairment: Neoplasm	-10.8	0.00
Primary Impairment: Mental disorders	--	--
Primary Impairment: Intellectual disability	-1.0	0.60
Primary Impairment: Injury	-7.0	0.00
Primary Impairment: Back or musculoskeletal	-1.5	0.20
Primary Impairment: Nervous system	-5.1	0.00
Primary Impairment: Circulatory system	-0.5	0.80
Primary Impairment: Respiratory	-1.4	0.66
Primary Impairment: Severe visual impairments	2.3	0.46
Primary Impairment: Digestive	-9.5	0.00
Primary Impairment: Other	0.5	0.71
Concurrent DI/SSI receipt	-8.5	0.00
DI-only	--	--
Received SSDI for 36 or fewer months	-0.9	0.48
Received SSDI for 37 to 84 months	-0.8	0.39
Received SSDI for 85 or more months	--	--
No representative payee	--	--
Representative payee	-1.2	0.43
DI benefit amount less than \$1,000	--	--
DI benefit amount between \$1,000 and \$2,000	-11.5	0.00
DI benefit amount above \$2,000	-23.0	0.00
First STW month before 2010	--	--
First STW month in 2010	18.1	0.00
First STW month in 2011	14.0	0.00
First STW month in 2012	14.9	0.00
Adjudication level: Initial decision	--	--
Adjudication level: Reconsideration	1.0	0.42
Adjudication level: Administrative law judge/other/unknown	1.7	0.45
Medical Improvement: Expected	-6.3	0.00
Medical Improvement: Possible	-2.6	0.01

Exhibit 7 (continued)

	Marginal effect	P-value
Medical Improvement: Not expected	--	--
Medical Improvement: Unknown/missing	-1.2	0.43
SSA Region: Atlanta	--	--
SSA Region: Boston	-8.3	0.00
SSA Region: Chicago	-5.1	0.00
SSA Region: Dallas	-3.1	0.03
SSA Region: Denver	-5.3	0.02
SSA Region: Kansas City	-4.8	0.01
SSA Region: New York	-9.9	0.00
SSA Region: Philadelphia	-6.6	0.00
SSA Region: San Francisco	-4.1	0.00
SSA Region: Seattle	-6.9	0.00

Source: January 2010 DBAD, March 2016 DBAD, 2014 DAF

Note: Findings were derived from a logit model with a dependent variable indicating whether the beneficiary was overpaid in 2010, 2011, or 2012. Omitted categories are shown in the table with dashes for the marginal effects and p-values. Race, education, concurrent DI and SSI receipt, level of adjudication, and medical improvement status are all from the DAF. DAF records were available for 13,290 of the 13,297 observations in STW; we retain observations that do not match to the DAF and code the DAF variables as missing. The final sample size used in the regression was n=13,290.

Several health-related factors were also statistically significant predictors of overpayments among those in STW. Beneficiaries at risk for overpayment with neoplasms, injuries, nervous system disorders, and digestive system disorders were also less likely to be overpaid than those in the baseline “mental disorder” category—a category that primarily includes psychological disorders, and does not include those in the separate intellectual disability category—all other characteristics being equal. Although we hypothesized that characteristics associated with lower levels of mental functioning would be associated with an increased likelihood of overpayments, intellectual disability has no statistically significant difference in probability of overpayment, compared to the baseline category of mental disorders. Finally, beneficiaries in STW assigned to “medical improvement expected” or “medical improvement possible” status were also less likely to be overpaid than those categorized as “medical improvement not expected.”

The strong and significant associations between education and DI benefit amount and overpayments may signal disparities in compliance with SSA rules by STW beneficiaries at risk of overpayment. Relative to those with a high school–level education, beneficiaries with less than a high school education were 4 percentage points more likely and those with college or above were 6 percentage points less likely to be overpaid. Beneficiaries with a DI benefit amount over \$2,000 per month were 23 percentage points less likely to be overpaid than similar beneficiaries with DI benefits under \$1,000 per month. These findings suggest that beneficiaries with higher levels of education and the skills and training associated with higher-paying occupations (which determine the DI benefit amount) may be more apt to comply with the SSA requirements for reporting earnings. These beneficiaries may independently be better equipped to understand and adhere to the reporting requirements for SSA earnings, may be more likely to seek and receive appropriate guidance from SSA field offices, or may have less trepidation about



reporting work activity because of a relatively more stable financial situation, among other possibilities.

Several characteristics that may relate to exposure to SSA requirements were predictive of overpayments. Beneficiaries at risk of overpayment who were concurrently receiving DI and SSI benefits at baseline were significantly less likely than those receiving DI only to be overpaid holding other characteristics constant. We observed the reverse relationship in the bivariate results presented in Table 6, which highlights the importance of controlling for beneficiary characteristics. Unlike DI-only beneficiaries, concurrent beneficiaries must meet the more stringent monthly SSI reporting requirements. In addition, all else equal, beneficiaries who had a first STW month in the analysis period were significantly more likely to be overpaid relative to those who had a first STW month before 2010. The likely reason is that SSA has had a longer time to become aware of beneficiary earnings, complete a work CDR, and, if warranted, suspend benefits, thereby ending a spell of overpayments.

Finally, SSA region was a strong predictor of overpayments. Beneficiaries in the Boston and New York regions were 8 and 10 percentage points less likely to be overpaid, respectively, compared to their counterparts in the Atlanta region. There may be differences in awareness of reporting requirements for earnings or in the rate of SSA processing of work CDRs across geographic regions. Indeed, SSA began an effort to reduce the duration and size of overpayments in the New York region in 2010. This effort (described in the discussion section) may lead to a reduced prevalence of overpayments in a given time period. That is, if overpayment spells are shorter, there is a lower likelihood that a given overpayment spell occurred within January 2010 to December 2012.

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## V. DISCUSSION

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This analysis is the first to reliably quantify the beneficiary-level prevalence, duration, and size of work-related overpayments. Such statistics have been elusive because Recovery of Overpayments, Accounting and Reporting, the SSA system that tracks overpayments, is an operational tool structured to monitor the remaining balance of overpayments, rather than a research tool designed to produce beneficiary-level statistics. Previous analyses have produced approximate measures of overpayments using case reviews of relatively small samples or created lower-bound estimates using earnings data without information on use of DI work incentives such as the TWP. In this analysis, we used a 10 percent sample of DI beneficiaries meeting logical inclusion criteria, resulting in a sample size of nearly 500,000 beneficiaries. Our analysis is based on an administrative data algorithm that identifies work-related overpayments in a given month.

Our analysis focuses on the three-year period from January 2010 to December 2012. It is important to note that the U.S. economy was beginning its recovery from the Great Recession throughout this period. The prevalence and size of overpayments may be affected by economic conditions including the proportion of beneficiaries who work (and hence at risk for an overpayment) and also the resources SSA has to process work CDRs and adjust benefits timely.

The algorithm we used to identify overpayments may not capture all work-related overpayments. For example, because our algorithm is based on benefits due (benefit owed in that month based on work activity in that month), it will not capture any adjustments such as withholdings for repaying previous overpayments or lump sum transfers for reconciling underpayments. This circumstance could lead us to either underestimate or overestimate overpayments. Although beneficiary-level estimates may exhibit small differences from the

official SSA overpayment calculations, we expect the aggregate statistics to be unbiased estimates. Indeed, SSA case reviews of 20 current-law beneficiaries' records with overpayments found that the algorithm estimated an overpayment amount within 0.3 percent of the SSA calculation for the reviewed cases (Hoffman et al. 2017).

Our results indicate that, during the three-year period from January 2010 to December 2012, 1.9 percent of all beneficiaries meeting our selection criteria were overpaid. This statistic is not to be confused with the percent of DI beneficiaries overpaid due to work during any given month. This triennial estimate is within the range of estimates based on previous attempts to quantify the prevalence of overpayments, which range from 0.4 percent of beneficiaries overpaid in a 15-month period (GAO 2013) to 3.2 percent overpaid over a 10-year period (SSA OIG 2015). Among those who were in STW during the same time period and at risk for an overpayment, 71 percent were overpaid, according to our results. The prevalence of overpayments among those who first became at risk for overpayments during this period is higher—approximately 80 percent. Previous research estimated that between 63 percent and 92 percent of beneficiaries who engaged in SGA were overpaid (SSA OIG 2015, SSA OIG 2014). As previously noted, the estimates presented here are based on a different and presumably more reliable methodology.

The analysis also shows that if we were to track beneficiaries with overpayments observed in 2010, 2011, and 2012 across the entirety of their overpayment spell, overpayments accrued for a median of 9 months and \$9,282. Overpayments ranged from 4 months and \$4,221 at the 25th percentile to 16 months and \$15,801 at the 75th percentile. These estimates are in line with an average 9 month duration and total \$8,114 overpayment amount identified during SSA case reviews of 275 beneficiaries with substantial earnings from 2007 to 2011 (SSA OIG 2014). The

estimates are smaller than the \$14,397 average overpayment amount identified during a 10-year study beginning in 2003, but that estimate was based on a small sample of 32 overpaid beneficiaries (SSA OIG 2015). Additional sources of variation may include differences in methodology or sample, changes in the size of overpayments over time, or some combination.

In general, the results of this paper conform to the a priori expectations that beneficiaries with low levels of mental functioning or little contact with the SSA disability programs are relatively more likely to be overpaid given work than their counterparts with different disabilities and more contact with SSA programs. Notably, beneficiaries who concurrently receive DI and SSI benefits are less likely to be overpaid than their DI-only counterparts. This suggests that the strict earnings reporting requirements embedded in the SSI program may have spillover effects to the DI program. This is particularly notable because concurrent beneficiaries are more likely to have lower levels of education and lower DI benefit amounts, which are significantly associated with a higher likelihood of overpayment. Hence, the requirements and monitoring in the SSI program may be effective for populations that are otherwise less likely to be in compliance.

We do not have information on earnings among those overpaid, making it difficult to assess the potential burden of repayment relative to their incomes. For expositional purposes, assume that a beneficiary was overpaid \$9,282 over the course of nine months and earned \$1,500 in each of those months (50 percent above the 2010 SGA amount). During that nine-month period, the beneficiary received \$22,782 in earnings plus benefits and was later determined to owe over 40 percent of that income back to SSA. Overpayments represent the largest proportion of total income for those with earnings just above the SGA level. This likely explains why some, but not all, beneficiaries have negative reactions to overpayment notifications, as observed in previous

studies (Gubits et al. 2013, O’Day et al. 2016, Hoffman et al. 2017). Overpayment repayment plans, when granted, allow for beneficiaries to disperse the repayment, and thus any burden, over a longer time period.

Although the average estimated overpayment amount per beneficiary in our sample is modest—\$82 in 2010—in aggregate this implies total overpayments of \$402 million among all 4,901,930 SSDI beneficiaries who meet our sample selection criteria. This estimate is about one-half the size of the \$831 million overpayment amount reported by SSA (2013) for 2010. This difference is expected in large part because SSA calculations are based on all of the approximately 9,400,000 DI beneficiaries, a population almost twice as large as those represented by our sample. In fact, the SSA statistics imply an average overpayment of about \$88 among all DI beneficiaries, very similar to our estimate of \$82 per beneficiary in our sample. The composition of the sample used in our analysis differs from that of all DI beneficiaries and may contribute to the minor differences in the per beneficiary overpayment amount. In addition, the SSA figure is for overpayments detected in 2010, the first year of our three-year sample, and includes overpayment months before 2010. Our analysis focuses on overpayments incurred in the analysis period and detected in any year thereafter.

SSA has undertaken several efforts to reduce the size of overpayments. For example, in 2010, SSA began to dedicate staff to prioritizing work CDRs for the oldest cases and enhanced those efforts in 2011 (SSA 2011a). In October 2010, SSA began an initiative to reduce the size of overpayments among beneficiaries who do not report earnings. SSA identifies earnings through a review of IRS records and performs a work CDR if earnings suggest the beneficiary engaged in SGA. SSA piloted a program in the processing center for the New York region to prioritize work CDRs for beneficiaries most likely to have large overpayments, on the basis of a

predictive model (SSA 2011a). In June 2011, the program was expanded to include three processing centers, covering 60 percent of cases with unreported earnings (SSA OIG 2014). SSA reported that the pilot yielded a reduction in the size of work-related overpayments, and the agency implemented this practice nationwide in June 2013 (SSA 2013b). Although these efforts appear to be effective in reducing the size of overpayments, they are unlikely to reduce the incidence of overpayment episodes.

SSA is also implementing changes that may help reduce both the size and likelihood of overpayments. Until 2016, SSA learned about beneficiary earnings predominantly from IRS data. However, IRS data are not made available until the following calendar year, sometimes 18 to 24 months after the beneficiary earned the wages (SSA 2010). In late 2016, SSA implemented a program called Work Smart that conducts quarterly earnings checks based on the National Directory of New Hires. In addition, SSA is working to establish exchanges with payroll data providers to get faster access to wage data. These efforts are likely to reduce delays in identifying unreported earnings, which could reduce the likelihood and amount of overpayments.

The complexity in the DI rules governing earnings and the limited awareness beneficiaries have of those rules and requirements may contribute to work-related overpayments (GAO 2015). Although SSA has several efforts in place to support beneficiary comprehension, such as SSA-funded work-incentives counselors, the low rate of beneficiary-reported earnings suggests that there is much room for improvement.

One potential option for reducing overpayments is to revise SSA communication based on the relationship between beneficiary characteristics and the likelihood of overpayments. SSA informs beneficiaries about the reporting requirements during their initial claims application, via written documentation when their benefit application is initially approved, and in an annual letter

to beneficiaries about cost-of-living adjustments to benefits. All other sources of information are available upon request, and beneficiaries may not be aware of these resources. Our analysis found substantial variation in the likelihood of overpayment by race, education, primary impairment, and DI benefit amount, among other factors. The difference in education level by overpayment status may indicate that beneficiaries with lower education levels are less likely to read, understand, or remember the written material they received than their better-educated peers. Revision of the printed materials or conducting outreach phone calls may be a more effective means of communication for this population. Increased beneficiary awareness and understanding of the reporting requirements may translate into increased compliance and thus a lower incidence of overpayments.

Another option to reduce overpayments includes larger-scale changes to institute more accessible and monitored reporting requirements, similar to those in the SSI program. As previously discussed, beneficiaries who concurrently receive DI and SSI benefits are less likely to be overpaid than their peers who receive DI only. We hypothesize that the SSI reporting requirements and processes are more effective than those for the DI program (and have beneficial spillover effects for concurrent DI-SSI beneficiaries). Several elements of SSI reporting that may be beneficial for the DI program include consistently reporting wages during the first six days of the month and e-mail and text reminders to report wages. SSI beneficiaries also have the option to report earnings via a smartphone wage reporting application. In September 2017, SSA implemented an electronic earnings reporting system for DI beneficiaries, which is expected to improve reporting.

This article documents beneficiary-level statistics on work-related overpayments and provides information that may advance efforts to reduce overpayments. However, there are still



many unanswered questions about overpayments. For example, it is unclear the extent to which overpayments are the result of beneficiary behavior versus SSA policy and resources available to collect and process information on beneficiary earnings. Without this information, it is difficult to efficiently address the root causes of overpayments. Longitudinal studies may help track changes in the size and likelihood of overpayments that may be related to the recent and pending SSA efforts to reduce overpayments and point to additional areas for improvement. In addition, the implications of overpayments are unknown. Future research should consider the consequences of work-related overpayments for beneficiary employment and well-being.

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