Evaluation of Income Determination Methods for Imputing Child Support Orders in Washington State

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Executive Summary

The Economic Services Administration's Management and Accountability Statistics Performance (EMAPS) unit was tasked to evaluate changes to income determination statutes for imputing income to establish child support orders for non-custodial parents (NCPs). In June 2020, these changes went into effect. The most substantial change essentially re-defined full-time work from 40 hours per week to 32 hour per week for certain industries characterized by low wages. An estimated 66% of child support orders in Washington are based on imputed income.[1]

For example, retail workers average about 30 hours per week, and leisure and hospitality workers 26 hours, in those industries, a 40-hour work week might not be possible.[2] It may be overly burdensome for low-wage earners to have their child support orders imputed on the presumption of a 40-hour work week.

Child support enforcement research from other states has found that overly burdensome orders are counter-productive. Compliance with child support orders declines when non-custodial parents have orders above a certain ratio of orders to wages. Determining 'right-sized' orders would hypothetically improve child support outcomes.

The 2020 statutory changes were largely based on recommendations from the Child Support Schedule Workgroup, which suggested more relevant factors should be considered when determining the extent unemployment or underemployment was voluntary. The intent was to improve assumptions about how many hours per week are appropriate for imputing NCP income.

A pilot based on the Workgroup recommendations provided flexible guidelines for how Support Enforcement Officers (SEOs) were to apply new imputation methods in the Tacoma and Spokane field offices. New child support cases were assigned to the Pilot beginning in March 2020, with the new income determination statute coming into effect in June 2020. Although the intent of the pilot and the 2020 statute (or current statute) were nearly identical, SEOs operating under the pilot guidelines had more flexibility.

[1] Washington State 2018 Child Support Order Review, Prepared for the 2019 Child Support Schedule Workgroup, January 2019, pg. 4, https://www.dshs.wa.gov/sites/default/files/ESA/dcs/documents/2018%20Child%20Support%20Order%20Review.pdf
[2] U.S. Bureau of Labor Statistics, Economic News Release, "Average weekly hours and overtime of all employees on private nonfarm payrolls by industry sector, seasonally adjusted", Feb. 4, 2022, https://www.bls.gov/news.release/empsit.t18.htm

This report evaluated case outcomes following the Pilot guidelines compared to cases that were established under the current statute, as well as cases with orders established under the former statute. Case outcomes were measured on three dimensions: mean monthly payment amounts, the total number of payments made that are 75% or more of the order amount, and the ratio of total payment amounts to total order amounts within a given period of time.

The evaluation used multivariate statistics to control for various factors that may be associated with the outcome measurements, such as administrative, socio-economic, and geographic characteristics of child support cases.

The findings of this report conclude that the Pilot guidelines and the current statute for income determination, found in RCW 26.19.071, are more effective at achieving desired outcomes than cases established under the former statute.

Cases established under the current, 2020 statute were associated with 9.1% higher mean payment than cases established under the former statute, on average.

Cases in the Pilot group, and cases established under the current policy were associated with 19.9% and 25.1% more total payment counts at 75% or more of the order amount on average, respectively. These cases were also associated with a 4.0% and 8.6% higher ratio of total payment amounts to total order amounts, respectively.

It is inconclusive whether or not the Pilot guidelines or current statute are associated with better child support outcomes. Inconclusive comparisons of outcomes between the Pilot and current statute are likely the result of the Pilot's small sample size. Both the Pilot and the current statute succeed at improving collection outcomes compared to the former policy.

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Background

Effective Child Support enforcement is a reliable source of income for Custodial Parents (CPs) and their children, and a proven means of mitigating and preventing childhood poverty. A key component to effective support is setting appropriate monthly order amounts for NCPs. Appropriately setting orders are necessary for the financial well-being of families, including NCPs (Hodges, 2020b).

Child support orders are relatively high and burdensome for low income NCPs whose monthly orders are typically imputed. This has a negative impact on making reliable payments (Sorensen, 2002), and results in a growth in arrears and sub-optimal child support collections (Takayesu, 2011). When orders are too low, CPs and their children are deprived of resources. Income determination methods need to be accurate for imputing appropriate monthly order amounts.

Child support orders become less effective and even counterproductive when orders are too high, resulting in partial and irregular payments (Hodges, 2020b). The problem is more acute for NCPs who did not report income or had income of less than $10,000, in which case orders are set by imputed income (Sorensen, 2007).

Empirical evidence suggests that NCP fathers make higher monthly payments on average when the order amount and ratio of monthly orders to wages increases. Other evidence suggests that as the ROTW increases, average payment amount compliance with support orders decreases (Meyer, 2008).

A study examining child support in California found that payment performance in terms of percent of current support paid and regular payment frequency declined when orders exceeded 19% of a NCPs income. The study concluded by recommending a 19% threshold for setting child support to maximize collection frequency in California (Takayesu, 2011).

A Wisconsin-based study found that a 30% ratio of orders to wages optimized mean payment amounts, but resulted in declines of regular payment frequency and percent of current support paid (Hodge, 2020). This finding is further supported by a Maryland-based study that found higher ratios of orders to wages resulted in lower payment frequencies and compliance with orders paid in full (Saunders, 2014).

These studies demonstrate that there is a likely trade-off between maximizing payment collection amounts versus regular payment frequencies and percent payment compliance. Higher ratios of orders to wages may increase aggregate collection amounts, but are regressive, where lower income NCPs pay a larger proportion of their pre-discretionary income towards child support.

Child support is not meant to be punitive towards NCPs, nor should it be meant to create barriers for families with children born out of wedlock. Income determination for 66% of child support cases in Washington are imputed[3]. This report seeks to evaluate if new income determination guidelines for imputing order amounts in Washington improved effectiveness in payment collection amounts, regular payment frequency, and percent payment compliance.

[3] Washington State 2018 Child Support Order Review, Prepared for the 2019 Child Support Schedule Workgroup, January 2019, pg. 4, https://www.dshs.wa.gov/sites/default/files/ESA/dcs/documents/2018%20Child%20Support%20Order%20Review.pdf

Research Purpose

Income determination is a critical business function of the Department of Child Services (DCS), the accuracy of which is foundational to establishing 'right sized orders'. Child support policy research broadly concludes that orders set too high or too low create barriers to families in their achievement of economic stability and financial self-sufficiency.

The 2019 Child Support Schedule Workgroup issued its recommendation to Washington State Legislature in September 2019, including recommendations regarding how to determine the income of the parents for purposes of establishing child support obligations. Income is only imputed when a parent is voluntarily underemployed or voluntarily unemployed as defined in RCW Chapter 26.19.071.

If enacted, these recommendations would increase the number of factors and complexity used to impute income. This necessitated the development of new guidelines for Support Enforcement Officers (SEOs), i.e. officials responsible for managing child support cases, to investigate factors used to impute income. In March 2020, a pilot project was set up to field test the new, more flexible guidelines, where SEOs at the Tacoma and Spokane field offices selected a proportion of new cases to use the new recommendations. Enrollment of cases under the Pilot ended December, 2021.

RCW 26.19.071 was amended in the 2019-2020 legislative session (under bill 2302-S AMS WM S7203.4) to include a broader, specific set of factors to determine how and when a parent's income is imputed (refer to **Appendix 1** for a comparison of statutory changes). Although the Pilot follows the same intent and spirit of the statute, SEOs in the Pilot have more flexibility and guidance from the Child Support Schedule Workgroup. SEOs also began managing new cases under the Pilot guidelines for income determination three months before the statutory changes went into effect.

On June 11, 2020, several major statutory changes concerning income determination went into effect, the core of which redefined the definition of full-time hours from 40 hours a week to a more flexible amount of time reflective of industry characteristics. For example, increases in minimum wage have prompted some employers in low-wage sectors, such as retail or food & beverage, to decrease working hours. Furthermore, persons experiencing economic barriers, such as recently exiting public assistance, recently released from incarceration, or recent high school graduates have fewer available opportunities to work a full 40 hours a week, factors that are related to assessing if an NCP is voluntarily or involuntarily unemployed or underemployed, which also impacts income determination.

This statute change effectively reclassifies full-time hours from 40 to 32 hours a week for a substantial proportion of parents whose orders are established by imputed income determination. Imputed income is calculated as minimum wage for the jurisdiction in which the parent resides multiplied by full-time hours. The expected effect is a more accurate income determination for low-income NCPs, potentially reducing overly burdensome monthly child support orders.

This report evaluates the effectiveness of both the Pilot and the current statute against the former statute, and against each other.

Methodology

Data

Administrative data from the Support Enforcement Management System (SEMS) – a statewide case management system that maintains all of Washington's child support program data – is the primary data source for this evaluation. SEOs in Tacoma and Spokane field offices selected eligible new cases to apply the pilot income determination policy too, i.e. the Treatment Group. Data collection ran between March 2020 and November 2021, cases collected in the final month had only one month of observation data, whereas those in the first month had a 23 month long observation period.

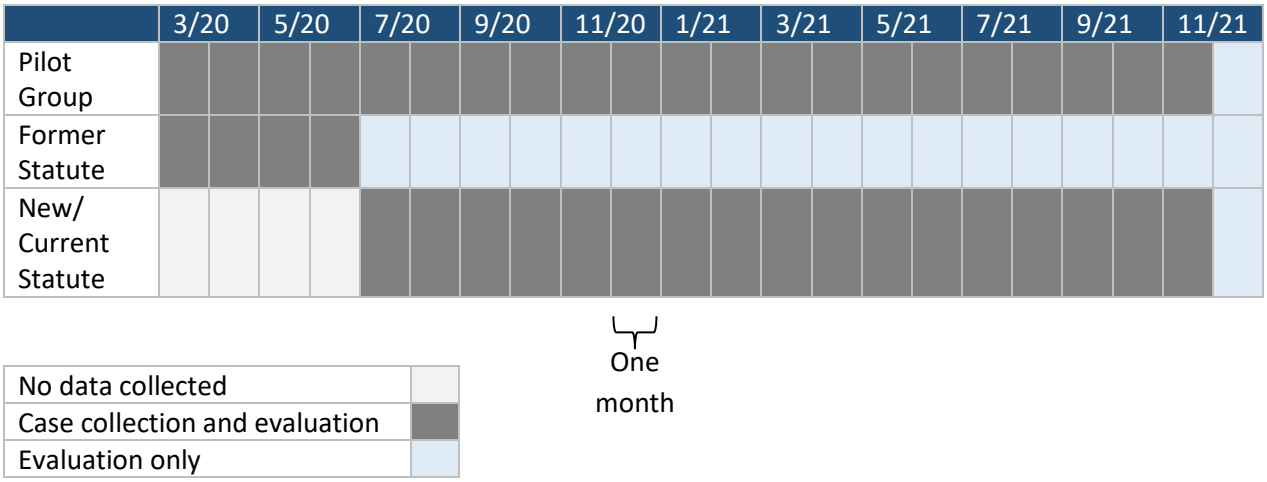
The Income Determination Pilot project had a sample size selection goal of 385 cases for the treatment group. Unfortunately collection efforts only yielded 247 valid cases. The goal of 385 cases was to achieve a 5% margin of error at a 95% confidence level, meaning that if the case population was randomly resampled, the mean characteristics of the cases would fall within a +/- 5% difference from the true mean 95% of the time. The smaller sample size means that the margin of error is +/- 6.2%. Although not ideal, this wider margin of error was deemed sufficient given limited resources and a finite collection timeline.

$$Margin\ of\ Error = \ z \times \sqrt{\frac{\hat{p} \times (1-\hat{p})}{n} \times 100} \ \Rightarrow \ 1.96 \times \sqrt{\frac{0.5 \times (1-0.5)}{247} \times 100} \ = \ \pm 6.2\%$$

$$z = z-score \qquad \hat{p} = sample\ proportion \qquad n = sample\ size$$

The first comparison group, Control Group 1, consisting of cases with orders based on the former income determination imputation statute, contained 3,274 valid cases. Control Group 2, which followed the new imputation statute, had 14,019 valid cases. Case, collection and evaluation periods differed between these groups (refer to **Table 1** for a timeline).

Table 1: Timeline of Case Collection and Evaluation



Valid cases were selected based on eligibility for the new income determination policy with respect to the following criteria:

- Cases established by administrative order (cases established by court order were not included)
- Non-tribal cases
- Cases where paternity was not at issue
- Cases within DCS jurisdiction to establish (non-interstate cases)
- Non-domestic violence cases

In addition, only valid cases with established monthly child support orders of at least one month were used in the analysis (refer to **Table 2** for a breakout of valid cases used for analysis).

Table 2: Breakout of Valid Cases Used for Analysis

	Treatment Group (Pilot)		Control Group 1 (Former Policy)		Control Group 2 (New/Current Policy)	
	n	***%***	***n***	***%***	***n***	***%***
Total Valid Cases	**247**	**100.0%**	**3,274**	**100.0%**	**14,019**	**100.0%**
New orders not yet in system	5	2.0%	2	0.1%	381	2.7%
No orders	49	19.8%	946	28.9%	2,676	19.1%
Total Order Amount = $0	21	8.5%	255	7.8%	1,292	9.2%
Total Valid Cases w/ Orders > 0	**172**	**69.6**	**2,071**	**63.3%**	**9,670**	**69.0%**
No Payments made	40	16.2%	310	9.5%	2,879	20.5%
Total Valid Cases w/ Payments	**132**	**53.4%**	**1,761**	**53.8**	**6,791**	**48.4%**

In addition to SEMS data, quarterly earnings data from ESD and area level information from the 2019 American Community Survey (ACS) 5-year Estimates were used. ESD earnings data includes NCP's wage information that is updated every quarter. The earnings data were critical for calculating the ratio of orders to wages, and a key variable associated with NCP payment behavior.

Area level information from the ACS was necessary to control for payment behaviors associated with local socio-economic characteristics.

It is important to note that the case collection and evaluation period of this evaluation took place entirely during the COVID-19 pandemic, during which many NCPs may have experienced temporary or permanent layoffs. Workers in industries, such as retail or food and beverage, were especially hard hit. However, a significant amount of paycheck disruption was offset by expanded unemployment insurance (UI) benefits and IRS issued Economic Impact Payments (Stimulus Checks).

Expanded UI began March 2020, which coincided with pandemic layoffs. This would have covered all NCPs within the collection and evaluation period exposed to pandemic related layoffs. However, the Stimulus Checks were delivered as one-time payment in several tranches in April 2020, December 2020/January

2021, and March 2021. Due to the different windows in which observations were collected, an unequal proportion of NCPs would have received these stimulus payments during their evaluation timeframe.

Some of these IRS payments would have been intercepted by DCS, which could potentially bias payment outcomes. For example, the Former Statute group would have more IRS intercepts on average than the Current Policy group because the collection period for the later contained more NCPs that received stimulus checks within their evaluation timeframe.

A secondary analysis was therefore conducted to investigate the extent of this bias, and found that the impact of the income determination statutory change may have been understated. This secondary analysis provides further evidence that the impact of the statutory change are consistent, and likely stronger than the initial findings, which show that the current income determination policy is better at achieving 'right-sized' orders than the former (refer to **Appendix 5**: Analysis of IRS Interceptions on Model Outcomes).

Other confounding effects of the pandemic could impact outcome estimates when considering how the pandemic disproportionately, and dynamically impacted different geographic areas and identity groups. It is assumed that all study groups would have experienced the impact of the pandemic simultaneously, thus the effect of the policy change should be isolated from the estimation.

Outcome Variables

This evaluation estimated the impact of the statute change using three outcome measures (refer to **Appendix 2**: for descriptive statistics of outcome variables and statistical comparisons across groups):

Mean Monthly Payment Amount

Since the evaluation period is short, sample size is limited and skewed right, which is typical of income-based distributions. Moreover, payments tend to stabilize and increase in size over the duration of the lifetime of a case. Mean monthly payment amounts per NCP were therefore log-transformed to adjust for the non-normal distribution.

$$Log\ (\overline{P_i}) = Log(\sum_{t=1}^{m} P_{i,t} \div M_i)$$

- $P_{i,t}$ is the amount paid by NCP *i* in a given month *t* (*t*=0,1,2,…*m*)
- M_i is total months where NCP i is within the observation period of the study and is required to pay monthly orders

Regular Payment Frequency

The method for measuring regular payment frequency, i.e. the total number of payments counts made during the period of the study per NCP, was borrowed from other research into child support program payments (Takayesu 2011). Payment counts per month were coded as a binary outcome, with payments equaling 75% or more of the monthly order amount (MOA) counting as one, else zero (Hodges, 2020b). It is possible for a NCP to make multiple payments in month, in which case multiple payments within the same order month have the amounts summed and counted as one if equaling 75% or more of the monthly order amount.

$$\overline{F_i} = \sum_{t=1}^{m} B_{i,t}$$

- $\overline{F_i}$ is regular payment frequency by NCP *i*
- B_i is a binary variable such that payments made in a given order month >= 75% MOA, then *B*=1

Payment Compliance Rate

Payment compliance is the percent of total payment amounts paid during the study period divided by the cumulative monthly orders amounts within the same period per NCP.

$$\bar{R}_i = \sum_{t=1}^{m} P_{i,t} \div \sum_{t=1}^{m} O_{i,t}$$

- $\bar{R}_i$ is the payment compliance rate for NCP *i*
- $P_{i,t}$ is the payment amount for NCP *i* in a given month t
- $O_{i,t}$ is the MOA for NCP *i* in a given month t

In some cases, NCP order payments are higher than 100% of their MOAs. Reasons for this could conceivably vary, however, this study was unable to identify a reason and could therefore not control for this. This study, referring to existing studies covered in this report, censors these outliers as follows:

$$\bar{R}_i = 0, if \bar{R}_i \leq 0$$

$$\bar{R}_i = \bar{R}_i, if\ 0 < \bar{R}_i \leq 1$$

$$\bar{R}_i = 1, if \bar{R}_i \geq 1$$

Independent Variables

NCPs within the treatment or two comparison groups are assigned an indicator, or dummy variable, per their respective assignment to evaluate the program and policy impact on their payment behaviors. Three major factors associated with the NCPs' measured payment behavior – identified in other studies – are also controlled for:

- Ability to pay;
- Willingness to pay;
- And, strength of the enforcement system

Ability to Pay

NCPs' ability to pay is intrinsic to their available resources. This study measured the monthly log mean wage (*W)* for NCPs over three years between 2018 and 2020. Again, log transformation was used to address skewness in the income distribution.

The ratio of orders to wages, as measured by the average monthly order (MOA) amount to mean monthly wages was censored, such that the ratio was capped at either 0% or 100% (the same method that was applied to the compliance rate outcome variable). This variable was also log-transformed.

Other studies used discrete ROTW measures at: 1) 10-19%, 20-29%, 30-49%, and 50% or over (Takayesu, 2011); and 2) 15-24%, 25-34%, 35-49%, and 50% or over, (Meyer, 2008). Takayesu (2011) concluded that 19% is the tipping point to maximize the collection of orders, while Hodges (2020b) suggests 30%. The limitation of both studies is that those studies used discrete variables. In the meantime, Saunders (2014) used continuous ROTW indicating that the higher the ROTW the lower the compliance rate. This study held ROTW as a continuous variable.

Ability to pay is also influenced by arrears. This study used log-transformed total amount owed during the evaluation period. Other measures, such as the NCP's number of children and age – which are correlated with MOAs – are also used.

A NCP's ability to pay is largely controlled for in this evaluation, and likely does not suffer from significant omitted variable bias. Nonetheless, the evaluation could be improved upon if NCPs' wealth was also known.

Willingness to Pay

Willingness to pay is more difficult to control for as administrative data does not fully capture the many potential nuances of a NCPs' willingness to pay child support. The level of attachment to children, a factor associated with willingness, could possibly be approximated by visitations or joint custody arrangements. This data, however, was unavailable.

Another study, which examined perceived fairness on the part of NCPs, found that when imputed income was higher than actual income, lower-income NCPs were less willing to pay. And that larger arrears at the time of establishment discouraged NCPs to pay (Lin, 2020).

Strength of the Enforcement System

Strength of the enforcement system is associated with payment behavior (Lin, 2020), the strength of which may vary across field offices. However, this study did not examine variation across field office operations.

Automated payment withdrawals as well as unemployment compensation garnishing were used as proxies for the strength of the enforcement system.

NCP Understanding of the System

NCPs' ability to navigate bureaucracy and an understanding of the Child Support system is another factor potentially associated with payment behavior.

This is a difficult factor to quantify, and could be a potential source of bias. English as a second language was controlled for. Higher education is a good measure for proclivity in navigating bureaucracy, but is not available in the SEMS data.

Other variables

This study also examined other explanatory factors at the case level, such as gender, NCP race and ethnicity, number of children, supporting children in foster care, whether the CP and NCP reside in the same county, and if the NCP resides within the Seattle metropolitan statistical area were included.

Neighborhood data at the zip-code level where the NCP resides provided bachelor degree or higher attainment, unemployment rates, poverty rates, rent-to-income rates, and internet connectivity rates per capita (refer to **Appendix 3:** for a complete list of outcome and independent variables with descriptions, and **Appendix 4:** for descriptive statistics of independent variables).

Findings

Descriptive Information

Monthly Payment Amounts

Differences across the three outcome measures exist across the Pilot, Current Statute, and Former Statute groups for this evaluation. Mean monthly payments for NCPs with MOAs are roughly equivalent between the current and former statute groups, and about $80 dollars less per month in the Pilot.

The distribution of payment amounts is positively skewed, having a long-tail towards higher payments. This can be seen on **Chart 1**, where the median amount is lower than the mean. This is common with income based distributions, and often requires a log-transformation to satisfy some regression assumptions.

The lower mean monthly payments in the Pilot could be evidence of the more flexible income determination policy and guidelines, where MOAs are expected to be lower for those with imputed income. This is weakly supported by lower median MOAs in the Pilot and Current Statute groups (refer to **Chart 2** for Monthly Order Amounts by Group). However, descriptive statistics alone are inconclusive.

Chart 1: Monthly Payments by Group

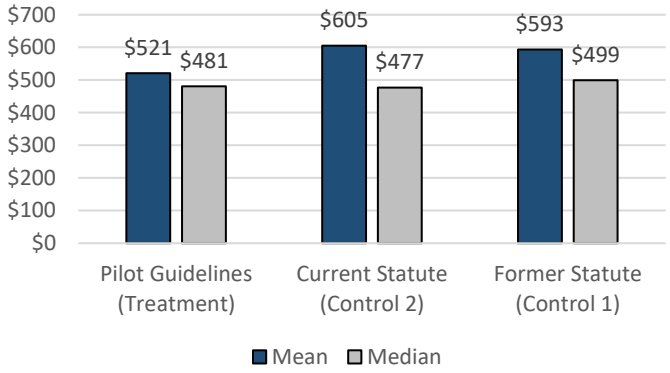
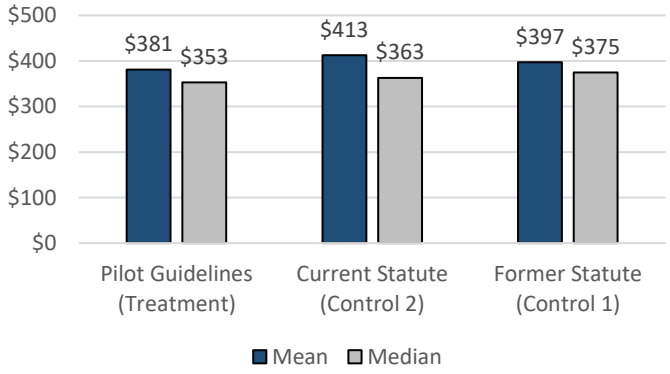


Chart 2: Monthly Order Amount by Group

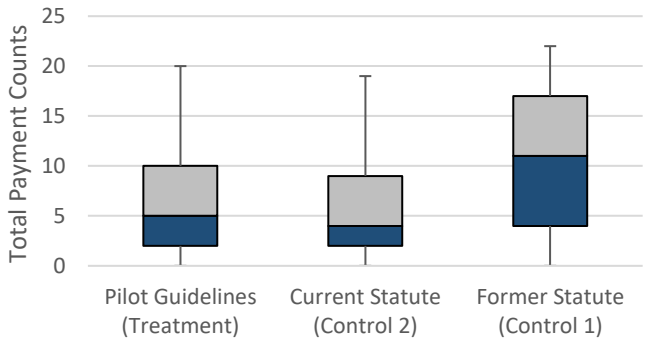


Payment Frequency

Looking at **Chart 3** it would appear that Former Statute group has higher payment counts for NCPs with MOAs. This is misleading.

Each group had different length case collection periods. Cases selected earlier on would have longer observation periods, and would therefore have more total payment counts. The Former Statute group had the most cases with long observation periods in which more payment counts would have been tallied. Controlling for total monthly order months is critical in the regression analysis to mitigate bias.

Chart 3: Distribution of Total Payments by Group



Note: Payments are only counted when 75% or more of the monthly amount due is paid

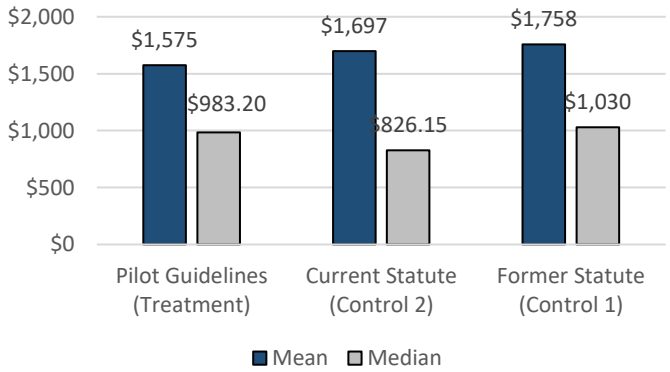
If looking at total payments divided by total order months, the payment rate is much closer: 78%, 76% and 80% for the Pilot, Current Statute, and Former Statute, respectively. This does not tell the whole story; other factors may be influencing payment regularity.

Payment Compliance

The payment compliance rate for NCPs with MOAs is censored: when the total payments paid exceeds the total MOA in a given period, the compliance rate is capped at 100%. Based on descriptive statistics alone, there is not much discrepancy between the groups: 92%, 90% and 94% for the Pilot, Current Statute, and Former Statute, respectively.

Again, these numbers do not take into account other factors associated with outcomes, such as NCP's wages, initial arrears, or total order months. Multivariate statistical analysis is needed to investigate the relationship between income determination methods and outcomes while simultaneously considering other factors.

Chart 4: Monthly Wage by Group



Control Variables

The Former Statute group includes slightly more financially advantaged cases than the Pilot and Current Statute groups (refer to **Chart 4** for monthly wage by group).

The mean ratio of orders to wages (ROTW) – censored such that cases exceeding a ratio of 100% are capped at 100% – is similar for the Pilot, Current Statute, and Former Statute groups (refer to **Chart 5** for the mean ROTW by group).

The cases in this study had an overall mean ROTW of 32%[4], including NCPs with imputed income. This is close to the optimal 30% ROTW to maximize payment amounts identified in the Wisconsin study (Hodge, 2020). However, it is well above the 19% threshold in the California study for maximizing the collection of regular payments (Takayesu, 2011).

Initial arrears at the time of order establishment are expected to impact payment behavior as well. However, it is important to note that all payments are first counted towards what is currently due, excess payments thereafter can be applied to arrears. The Former Statute has the highest mean and median debt, but all groups are highly skewed towards the right, indicating a significant number of highly indebted outliers (refer to **Chart 6** for initial arrears at order establishment by group).

Total order months are suspected to further impact payment behavior. Cases with longer histories would have more total payments, and it is theorized that these cases would also have more stable payments overtime. The Former Statute group has nearly double the total order months than the other two groups (refer to **Chart 7** for total order months by group).

Chart 5: Mean Ratio of Orders to Wages by Group

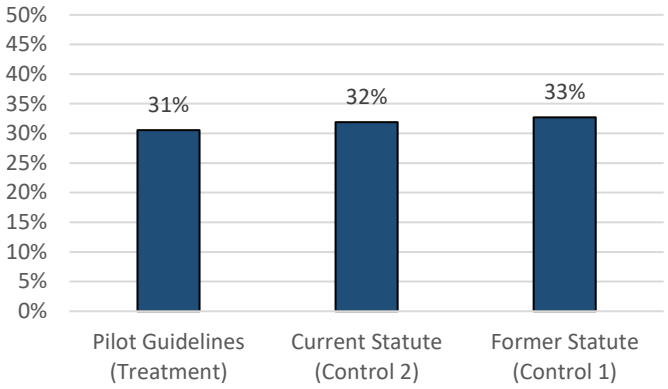


Chart 6: Initial Arrears at Order Establishment by Group

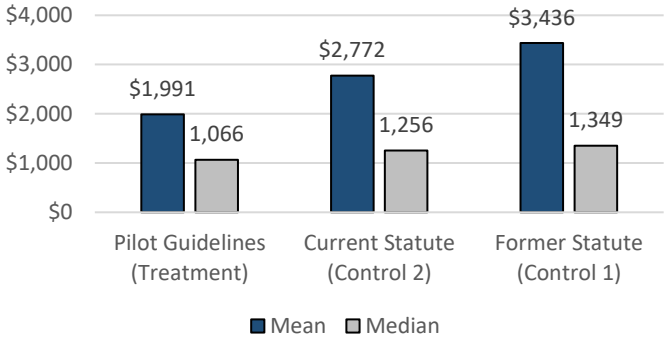
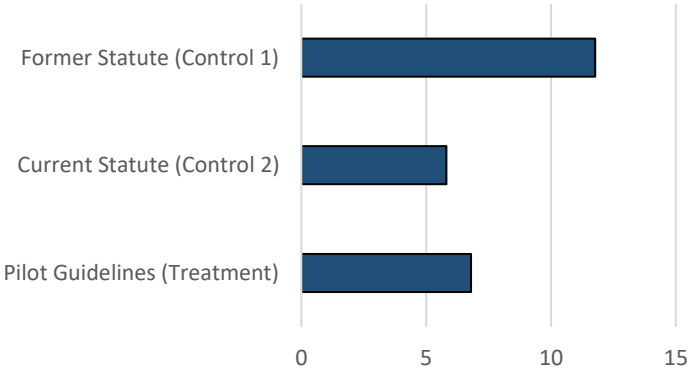


Chart 7: Total Order Months by Group

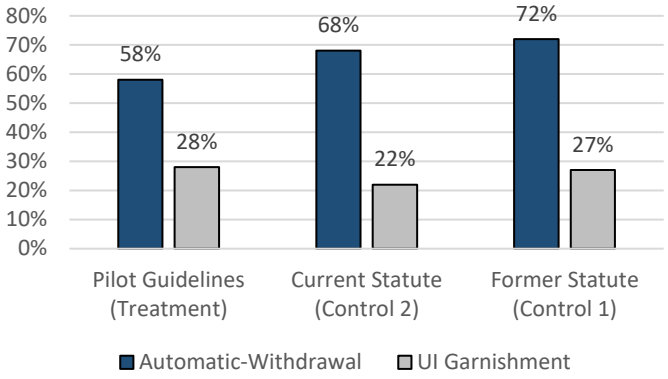


[4] Note: ROTW is censored at 100%, and only includes cases with orders greater than zero.

About 10% fewer NCPs in the Pilot group had automated withdrawals for MOA payments than the Current Statute and Former Statute groups. Auto-withdrawals are expected to improve payment regularity. NCPs in the Former Statute group would have had more time to set up automated withdrawals compared to the other two groups which fewer months since child support orders were established (refer to **Chart 8** for a comparison of payment methods across groups).

Involuntary garnishment from Unemployment Insurance (UI) benefits could also impact payment outcome. For example, UI benefits are only dispersed when someone files for unemployment. Typically these benefits would be less than wages earned while working, and could therefore be associated with lower payment amounts. However, this study also took place during the COVID-19 pandemic when expanded UI benefits were in place – this may have softened any reductions in support payments.

Chart 8: Support Payments by Group



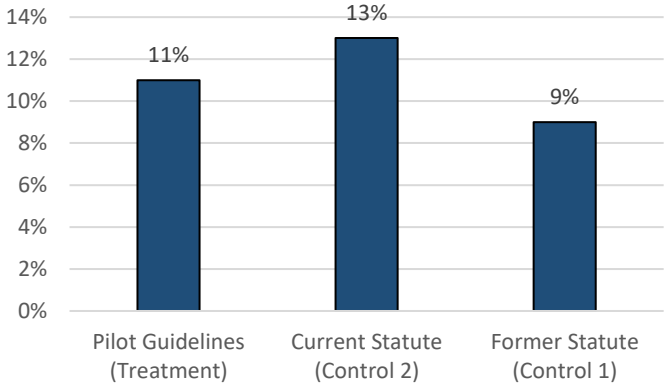
NCPs having served prison sentences would have experienced greater employment barriers than those who have not been incarcerated. Although the number of NCPs with a prison record is small, there are differences between the groups. 4% of the Pilot guidelines group, 2% in the Current Statute group, and 3% of the Former Statute group, have been, but are no longer, incarcerated.

There is little variation in average age across groups, which ranges from 32 to 34 years. The mean number of children represented in the orders among the groups is roughly the same (≈ 1.5). However, age is positively correlated with wages[5], which could influence payment outcomes. Moreover, "minimum age workers tend to be young (under 25)"[6].

[5] U.S. Bureau of Labor Statistics, "Median weekly earnings by age and sex, second quarter 2021", Median weekly earnings by age and sex, second quarter 2021 : The Economics Daily: U.S. Bureau of Labor Statistics (bls.gov)
[6] U.S. Bureau of Labor Statistics, "Characteristics of minimum wage workers, 2019", Characteristics of minimum wage workers, 2019 : BLS Reports: U.S. Bureau of Labor Statistics

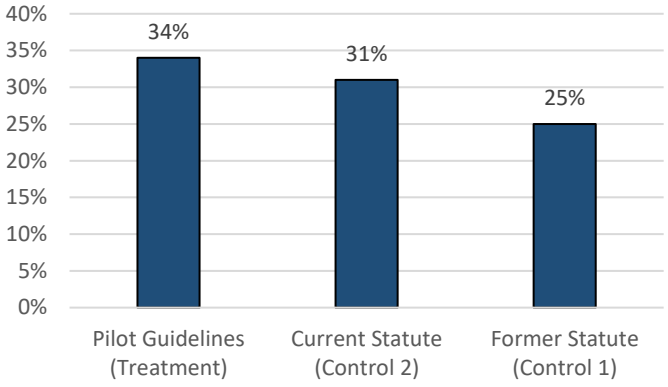
Foster care cases are fundamentally different from other cases under the child support enforcement program. NCPs for these cases have a higher proportion of females, and are often single-mothers. Males typically make up three-quarters of NCPs in non-foster care cases. 11% of cases in the Pilot are foster care cases; 13% in the Current Statute group, and 9% under the Former Statute (refer to **Chart 9** for the proportion of foster cases by group).

Chart 9: Proportion of Foster Care Cases



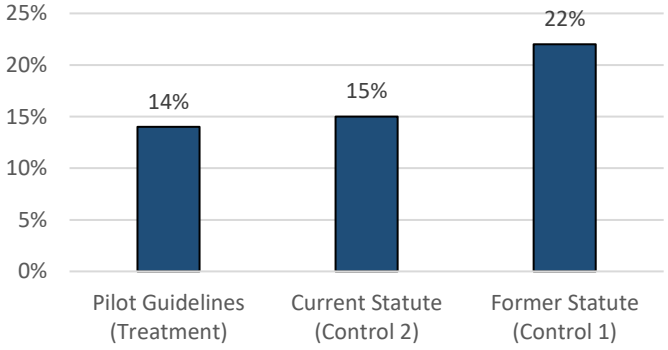
Regarding demographics, approximately 34% of cases in the Pilot were female NCPs. 31% in the Current Statute group, and 25% in the Former Statute group. The higher number of females in the Pilot and Current Statute group is correlated with the higher proportion of foster care cases in those groups as well (refer to **Chart 10** for the proportion of female NCPs by group).

Chart 10: Proportion of Female NCP Cases



More than half of all cases in this study did not have information on race or ethnicity for NCPs. This was consistent across the groups. Information on English as a second language (ESL) was available.[7] 14% of the Pilot and 15% Current Statute group had ESL NCPs. The Former Statute group has considerably more ESL speakers, consisting of 22% cases (refer to **Chart 11** for the proportion of ESL speakers by group). It is unclear why this difference exists.

Chart 11: Proportion of English as a Second Language Cases



All of the differences shown here across numerous variables that are potentially associated with payment behavior requires the use of inferential statistics to draw any conclusions on program and policy effects on the outcomes being evaluated.

[7] SEMS captured a yes/no binary input for English as the primary language. English as a second language is the same measure but inverted.

Inferential Statistics

Payment Amounts

A weighted least squares (WLS) regression was used to evaluate mean payments between the treatment group, and two control groups. The evaluation method was weighted by total order months per case because payment behavior tends to stabilize over longer periods; cases with a shorter order month history have higher payment amount variation. Mean payments were also log-transformed to account for the positive distribution of skewed mean payments i.e. skewed right.

WLS models that included exogenous variables in addition to the case level variables pulled from administrative data substantially improved the quality of the model fit. The best-fit models, based on the lowest Akaike information criterion (AIC) score, also included zip code level economic and household ACS data. County level exogenous data that controls cases within the Seattle MSA were only of slightly lower quality (refer to **Table 3** for Payment Amount Estimates, which includes the model summary and parameter estimates).

The treatment effect of the Pilot (Treat), compared to the Former Statute group (Control1) was inconclusive. The Current Statute group had a significant difference attributed to the statute change, being associated with 9.1% higher mean payment amounts than the Former Statute group based on the best fit model.[8]

There was no observable treatment effect for the Pilot group when compared to the Current Statute group (Control2), which followed the income determination/imputation policy established in June 2020. The two groups had equivalent outcomes.

NCP log-transformed mean annual earnings between 2018 and 2020 (Earn1820_AveAdj_Log) are positively associated with significantly higher monthly payments, such that a 1% increase in average monthly earnings translates to about a 0.5% increase in monthly mean payments. The log-transformed ROTW (ROTWadj_Log) is positively associated with the monthly payment amount, which corresponds to findings by existing academic studies. The higher the ratio, the higher the payment amount. In this case, a 1% increase in the ROTW is associated with a 0.8% increase in mean monthly payment amounts. The initial arrears (DEBT_First_Log) amount when an order was set is also statistically significant and positively associated with monthly payment amounts, albeit small, with a 10% increase in arrears associated with a 0.2% increase in monthly mean payments.

Payments made through auto-withdrawal (PmtType_AW) had a positive relationship with payment amounts of about 4.2% higher than non-auto-withdrawal payments, whereas payments intercepted from unemployment insurance benefits (PmtType_UI) were associated with a decrease of about 4.5%, likely a function of lower income as compared to employed NCPs.

[8] Note: All estimates in the written-body-text of this report are rounded to the nearest 10th and refer to the best-fit model unless otherwise mentioned.

Foster care cases (FC_Case) were associated with 17.9% lower NCP payment amounts. NCPs with a history of incarceration were also associated with 18.7% lower payment amounts.

A few demographic effects were significant. For everyone one year increase in age, payment amounts increased by 0.8%. Female NCPs (Gender_FL_NCP) were associated with 14.9% lower monthly payment amounts on average.

The number of children (ChildCnt) supported in a case was also significant, with mean payment amounts increasing 4.7% per child.

There were no statistically significant linkages with NCPs having English as a primary language (Lang_EG_NCP) with monthly payment amounts on average. There were also no significant linkages with neighborhood variables (denoted by the suffix "_zip") and whether NCPS and CPs reside in the same county (SAME_FIPS) on monthly mean payment amounts. NCPs residing in the Seattle MSA (SeattleMSA) were associated with 6.4% higher payments on average.

The model which included zip code level variables, NCP and CPs residing in the same county, and NCPs residing in the Seattle MSA performed similarly to the best-fit model, which included zip level variables but not the SAME_FIPS and Seattle MSA variables. The least best-fit model, which only included administrative data, had lower magnitude estimates for the impact of the pilot guidelines and statutory changes. These lower magnitude estimates were probably biased by the exclusion of area-level variables that are correlated with higher wages – such as the Seattle MSA and zip codes with higher household internet access rates (Intnt_HH_zip).

Table 3: Payment Amount Estimates

Model Summary						
Model	***Weighted Least Squares Regression***					
Dependent Variable	Mean_PayAmt_LOG					
Weight Variable	Tot_OrderMonth					
Observations	6,696					
Parameter Estimates						
Parameter	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***
Intercept	-3.5471	<.0001***	-0.7829	<.0001***	-0.6235	<.0001***
Treat	-0.0014	0.9646	0.0829	0.0806*	0.0833	0.0779*
Control2	0.0057	0.5426	0.0868	<.0001***	0.0852	<.0001***
Control1 (reference)	-	-	-	-	-	-
Earn1820_AveAdj_Log	0.8903	<.0001***	0.4747	<.0001***	0.4732	<.0001***
Earn_Change1920_K	0.0002	0.3158	-0.001	0.0017***	-0.0009	0.0023***
ROTWadj_Log	0.9126	<.0001***	0.8361	<.0001***	0.8352	<.0001***
PmtType_AW	-0.044	<.0001***	0.0424	0.0095***	0.0462	0.0046***
PmtType_UI	0.0217	0.0096***	-0.0443	0.0006***	-0.048	0.0002***
DEBT_First_Log	0.0195	<.0001***	0.0207	<.0001***	0.0204	<.0001***
Gender_FL_NCP	0.0297	0.0085***	-0.1615	<.0001***	-0.1605	<.0001***
Lang_EG_NCP	0.0058	0.6864	0.0078	0.7283	0.0094	0.6719
Age_NCP	0.0005	0.3374	0.0082	<.0001***	0.008	<.0001***
Record_Jail	-0.0842	0.0028***	-0.2072	<.0001***	-0.203	<.0001***
OldCase_Closed	0.0043	0.3277	0.0061	0.3679	0.0058	0.3885
Tot_OrderMonth	0.001	0.2032	0.0124	<.0001***	0.0123	<.0001***
ChildCnt	0.0186	0.0002***	0.0457	<.0001***	0.0484	<.0001***
FC_Case	-0.0837	<.0001***	-0.1972	<.0001***	-0.1958	<.0001***
PovFam_zip			-0.0021	0.1661	-0.0022	0.149
Unemp_zip			-0.0047	0.1589	-0.0027	0.4186
Educ_BS_zip			0.0001	0.8311	0	0.9403
RenttoInc_30Over_zip			0.0006	0.3642	0.0001	0.878
Intnt_HH_zip			0.0031	0.0249**	0.0014	0.3287
SAME_FIPS					-0.003	0.7982
SeattleMSA					0.0623	<.0001***
R-Square	0.7194		0.5747		0.5758	
AIC	65,736		52,135		52,815	
(Control2 as reference)						
Treat	-0.0071	0.8153	-0.0039	0.9327	-0.0019	0.9670
Control1	-0.0057	0.5426	-0.0868	<.0001***	-0.0852	<.0001***
Control2 (reference)	-	-	-	-	-	-

Note: Statistically Significant at *** 99% confidence interval, ** 95% confidence interval, * 90% confidence interval

Payment Frequency

The effects on payment frequency, as measured by total payments of at least 75% of the MOA owed, was estimated using a zero-inflated negative binomial model. This method was used to estimate the payment counts, which were over-dispersed, and highly correlated with the total order month variable containing excessive zeros.

The Pilot and Current Statute groups are estimated to have 19.9% and 25.1% more total payment counts than the Former Statute group on average, holding all other factors constant. There is no observable difference between total payment counts for the Pilot and Current Statute group.

There is a negative relationship between average total payment counts and the ROTW, suggesting that higher ROTW may reduce payment frequency. For example, a 1% increase in the ROTW is associated with a 3.9% reduction in average total payment counts made of at least 75% of the MOA owed.

Higher initial arrears are associated with lower average total payments[9] of about 0.5% fewer total payments per 1% increase in arrears.

Average total payment counts are estimated to increase by about 1.4% per additional child per case on average. Payment frequency and NCP age are associated with 0.3% more total payment counts per year of age.

NCPs with children in foster care were associated with 5.7% few total payment counts on average.

Factors such as female gender, incarceration records, and English as a primary language had no discernable effect on total payment counts, although female gender and incarceration records did negatively impact mean payment amounts. This later association is potentially an exogenous effect related to inequities.

Somewhat surprisingly, automated payments and UI interception were not associated with any effect on total payment counts on average.

The best-fit model only included administrative data, for the other models, no effects on total payment counts were observed from zip code, NCPs and CPs residing in the same county, or NCPs residing in the Seattle MSA variables, with the exception on family poverty rates by zip code. Mean total payment counts are expected to decrease by 2.6% per 1% increase in the poverty rate.

All of the models used in estimating this outcome perform similarly according to their AIC scores.

[9] Payment counts being defined as payments of at least 75% of the MOA owed.

Table 4: Payment Frequency Estimates

Model Summary						
Model	***Zero-inflated Negative Binomial Regression***					
Dependent Variable	Tot_PayCnt					
Discrete Classification Variable	Tot_OrderMonth					
Observations	6,696					
Parameter Estimates						
Parameter	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***
Intercept	0.7888	<.0001***	0.791	<.0001***	0.7902	<.0001***
Treat	0.1814	<.0001***	0.1809	<.0001***	0.181	<.0001***
Control2	0.2242	<.0001***	0.2235	<.0001***	0.2235	<.0001***
Control1 (reference)	-	-	-	-	-	-
Earn1820_AveAdj_Log	-0.027	0.0001***	-0.0285	<.0001***	-0.0285	<.0001***
Earn_Change1920_K	-0.0001	0.8367	0	0.8943	0	0.8779
ROTWadj_Log	-0.0389	<.0001***	-0.0407	<.0001***	-0.0407	<.0001***
PmtType_AW	0.0031	0.8263	0.0034	0.806	0.0033	0.8126
PmtType_UI	-0.0142	0.1892	-0.0145	0.1809	-0.0144	0.1843
DEBT_First_Log	-0.0048	0.0057***	-0.0048	0.0059***	-0.0048	0.0057***
Gender_FL_NCP	-0.0063	0.6679	-0.007	0.6331	-0.0072	0.6234
Lang_EG_NCP	0.0067	0.715	-0.0007	0.9698	-0.0011	0.9536
Age_NCP	0.0025	<.0001***	0.0025	<.0001***	0.0024	<.0001***
Record_Jail	-0.0399	0.2778	-0.0394	0.2839	-0.0392	0.2863
OldCase_Closed	-0.0217	0.0001***	-0.0219	0.0001***	-0.0221	0.0001***
Tot_OrderMonth	0.1217	<.0001***	0.1217	<.0001***	0.1217	<.0001***
ChildCnt	0.0138	0.0302**	0.0148	0.0208**	0.0149	0.0203**
FC_Case	-0.0583	0.0235**	-0.059	0.0221**	-0.0628	0.0178**
PovFam_zip			-0.0026	0.0432**	-0.0026	0.0448**
Unemp_zip			0.0005	0.8662	0.0005	0.8596
Educ_BS_zip			-0.0002	0.6975	-0.0002	0.6902
RenttoInc_30Over_zip			0.0006	0.2563	0.0006	0.2557
Intnt_HH_zip			0.0002	0.8531	0.0003	0.8196
SAME_FIPS					-0.006	0.5424
SeattleMSA					-0.0009	0.9321
AIC	27,938		27,940		27,944	
(Control2 as reference)						
Treat	-0.0428	0.2717	-0.0426	0.2741	-0.0425	0.2757
Control1	-0.2242	<.0001***	-0.2235	<.0001***	-0.2235	<.0001***
Control2 (reference)	-	-	-	-	-	-

Note: Statistically Significant at *** 99% confidence interval, ** 95% confidence interval, * 90% confidence interval

Ratio of Payments to Monthly Order Amounts

This analysis employed the Tobit regression model to investigate differences in the ratio of total payments to total monthly order amounts (MOA) within the case observation period for orders determined by different income determination methods while holding other explanatory factors constant. The Tobit regression was selected because it is designed to estimate linear relationships when either the left, or right side of the dependent variable is censored. For instance, the ratio of payments to MOAs – or the compliance rate – is capped at 0% and 100%. Tobit model are also very sensitive to calculating biased estimators when assumptions are not met. Log transformations of income-based variables were used to help mitigate bias. Heteroscedasticity in the residuals of the total month variable were also addressed using a Box-Cox transformation.

The best-fit model for this outcome estimate included variables based on administrative data, zip code level data, and data concerning whether or not the NCP and CP reside within the same county, and whether or not the NCP resides within the Seattle MSA.

The Pilot and Current Statute groups are associated with 4.0% and 8.6% higher ratios of payments to monthly order amounts than the Former Statute group. The Pilot and Current Statute group are also distinct from each other, with the Pilot group being associated with a 4.6% lower ratio of payments to monthly order amount, i.e. the payment compliance.

Other notable factors that influence payment compliance are historic average monthly income, where a 10% increase in average monthly income is associated with a decrease in compliance of 0.2% - a small albeit statistically significant amount. A 10% increase in the ratio of monthly orders to wages translates to about a 0.4% drop in compliance. These findings are consistent with the literature, which suggests increases in child support ROTW results in lower levels of compliance. If income imputation, based on historic income, is higher than NCPs current income, then orders may become too burdensome – resulting in lower compliance levels. The magnitude of these effects is nonetheless, minimal.

Most other variables examined here are statistically significant, but also have coefficients of negligible magnitude. There are some exceptions.

Payment compliance rates are strongly associated with a longer number of order months, with each additional order month associated with a 3.3% higher ratio of payments to order amounts. It is important to keep in mind that the observation window of this study does not exceed 22 months, and should not be extrapolated beyond that.

NCPs in foster care cases are associated with 8.1% lower payment compliance rates. Formerly incarcerated NCPs are associated with 16.2% lower compliance rates – a phenomenon that is probably correlated with difficult employment barriers.

Table 5: Payment Amount Estimates

Model Summary						
Model	***Tobit Regression***					
Dependent Variable	Rate_PayMOA					
Censored Variable	Rate_PayMOA					
Weighted Variable	Earn1820_AveAdj_Log					
Box-Cox Transformed Variable	Tot_OrderMonth					
Observations	6,696					
Parameter Estimates						
Parameter	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***	***Coeff***	***Pr > |t|***
Intercept	1.690208	<.0001***	1.541834	<.0001***	1.511351	<.0001***
Treat	0.040063	0.0381**	0.040739	0.035**	0.039861	0.0391**
Control2	0.086275	<.0001***	0.086344	<.0001***	0.086101	<.0001***
Control1 (reference)	-	-	-	-	-	-
Earn1820_AveAdj_Log	-0.065092	<.0001***	-0.066459	<.0001***	-0.06579	<.0001***
Earn_Change1920_K	0.000525	0.0381**	0.000526	<.0001***	0.000526	<.0001***
ROTWadj_Log	-0.102766	<.0001***	-0.103783	<.0001***	-0.103469	<.0001***
PmtType_AW	-0.052262	<.0001***	-0.052134	<.0001***	-0.052046	<.0001***
PmtType_UI	-0.034796	<.0001***	-0.034931	<.0001***	-0.034416	<.0001***
DEBT_First_Log	0.004141	<.0001***	0.00409	<.0001***	0.004144	<.0001***
Gender_FL_NCP	0.017183	<.0001***	0.016382	0.0231**	0.017275	0.0167**
Lang_EG_NCP	-0.027283	<.0001***	-0.02826	0.0047***	-0.027506	0.0059***
Age_NCP	0.002807	<.0001***	0.002786	<.0001***	0.002859	<.0001***
Record_Jail	-0.162154	0.0172***	-0.162471	<.0001***	-0.162142	<.0001***
OldCase_Closed	-0.014982	0.006***	-0.015254	<.0001***	-0.014741	<.0001***
Tot_OrderMonth	0.033409	<.0001***	0.033361	<.0001***	0.033342	<.0001***
ChildCnt	-0.000793	<.0001***	0.0000616	0.9844	-0.000526	0.8681
FC_Case	-0.087676	<.0001***	-0.087557	<.0001***	-0.080815	<.0001***
PovFam_zip			0.000523	0.443	0.000476	0.4844
Unemp_zip			-0.001693	0.2359	-0.00201	0.1615
Educ_BS_zip			-0.00028	0.2156	-0.000236	0.2966
RenttoInc_30Over_zip			0.000103	0.7163	0.000185	0.5192
Intnt_HH_zip			0.001967	0.0007***	0.002154	0.0003***
SAME_FIPS					0.011515	0.0257**
SeattleMSA					-0.009858	0.0636*
AIC	40,854		40,848		40,844	
(Control2 as reference)						
Treat	-0.046214	0.0122**	-0.045605	0.0134	-0.046239	0.0121**
Control1	-0.086275	<.0001***	-0.086344	<.0001	-0.086101	<.0001***
Control2 (reference)	-	-	-	-	-	-

Note: Statistically Significant at *** 99% confidence interval, ** 95% confidence interval, * 90% confidence interval

Conclusions

The Pilot project, which provided new income determination guidelines for SEOs to implement the 2020 statute changes for imputing NCP income appears to be successful when compared to the Former Statute group. There are no observable differences in compliance with monthly order performance between the Pilot and the Current Statute group (which follows the 2020 statutory changes), with the exception of monthly payment amounts, where the Current Statute group performs better. However, the sample size for the Pilot is relatively small, which decreases certainty around the estimate.

Holding all other factors constant, there is no observable association of NCPs in the pilot group having different average monthly payment amounts than the two comparison groups – there are statistically significant differences in the other two measures being evaluated: total payment counts of 75% or more of the order amount and the ratio of payment amounts to order amounts.

NCPs in the Pilot project group were associated with about 20% more total payments of 75% or more of the order amount than NCPs in the Former Statute group. There was no observable difference between NCPs in the Pilot group and those in the Current Statute group. However, the Current Statute group has about 25% more total payments of 75% or more of the order amount than the Former Statute group. It may be that the observed discrepancy in performance between the Pilot and Current Statute group is due to statistical noise from the small sample size of the Pilot.

The ratio of total payment amounts to total order amounts associated with NCPs in the Pilot was 4.0% higher than the Former Statute group, but about 4.6% lower than the Current Statute group. NCPs in the Current Statute group were associated with an 8.6% higher ratio of total payment amounts to total order amounts on average. It is unclear why the Current Statute group, which did not receive SEO guidelines for income determination, had a higher payment-to-order compliance rate. Again, this could be due to statistical noise arising from the small sample size of the Pilot. Moreover, the Pilot group had a three month period between March and May 2020 where the Current Statute was not in effect – although SEOs had more flexibility interpreting income determination guidelines, there could be an unseen bias at play.

The Current Statute group performed better than both the Pilot and Former Statute group. The Current Policy group had higher payment amounts on average than the Former Policy group of about 9.4%. The Pilot Group was associated with a similarly higher payment amounts, but failed to meet the null hypothesis significance testing threshold within a 95% confidence interval, but was within a 90% threshold. More conclusive findings may have been observed had the Pilot group been of a larger sample size.

Higher payments on average in the Current Statute group versus the Former Statute group could be evidence of more accurate orders being made, resulting in better outcomes and payment performance.

Important factors likely associated with payment behavior are barriers linked to NCP education levels along with race and ethnicity. Education data were not available. This could be biasing some estimates if these characteristics differ between groups.

The relationships found in this study between the ratio of monthly orders to wage and compliance with child support orders is further supported by findings from the survey of literature. However, this study does not seek to explain NCP payment behaviors, but only to estimate different outcomes between groups, while holding other factors constant.

Overall, there is strong evidence to suggest that the 2020 income determination policy for imputing NCP income appears to improve child support performance in terms of total payment amounts, total payments made on average that are 75% or more than the monthly order amount, and higher ratios of total payment amounts made to total order amounts.

Appendix 1: Comparison of Income Determination Statutory Changes

Changes in Income Determination and Imputation Rules	
Former Statute	***Current Statute***
"Full-time" means forty hours per week.	"Full-time" means the customary number of maximum, non-overtime hours worked in an individual's historical occupation, industry, and labor market. "Full-time" does not necessarily mean forty hours per week.
The court shall determine whether the parent is voluntarily underemployed or voluntarily unemployed based upon that parent's work history, education, health, age, or any other relevant factors.	The court shall determine whether the parent is voluntarily underemployed or voluntarily unemployed based upon that parent's assets, residence, employment and earnings history, job skills, educational attainment, literacy, health, age, criminal record, dependency court obligations, and other employment barriers, record of seeking work, the local job market, the availability of employers willing to hire the parent, the prevailing earnings level in the local community, or any other relevant factors.
Full-time earnings at minimum wage in the jurisdiction where the parent resides if the parent has a recent history of minimum wage earnings, is recently coming off public assistance, aged, blind, or disabled assistance benefits, pregnant women assistance benefits, essential needs and housing support, supplemental security income, or disability, has recently been released from incarceration, or is a high school student	Earnings of thirty-two hours per week at minimum wage in the jurisdiction where the parent resides if the parent is on or recently coming off temporary assistance for needy families or recently coming off aged, blind, or disabled assistance benefits, pregnant women assistance benefits, essential needs and housing support, supplemental security income, or disability, has recently been released from incarceration, or is a recent high school graduate. Imputation of earnings at thirty-two hours per week under this subsection is a rebuttable presumption; Full-time earnings at minimum wage in the jurisdiction where the parent resides if the parent has a recent history of minimum wage earnings, has never been employed and has no earnings history, or has no significant earnings history;
	When a parent is currently enrolled in high school full-time, the court shall consider the totality of the circumstances of both parents when determining whether each parent is voluntarily unemployed or voluntarily underemployed. If a parent who is currently enrolled in high school is determined to be voluntarily unemployed or voluntarily underemployed, the court shall impute income at earnings of twenty hours per week at minimum wage in the jurisdiction where that parent resides. Imputation of earnings at twenty hours per week under this subsection is a rebuttable presumption.

Note: A court shall not impute income to a parent who is gainfully employed on a full-time basis, unless the court finds that the parent is voluntarily underemployed and finds that the parent is purposely underemployed to reduce the parent's child support obligation. Income shall not be imputed for an unemployable parent. Income shall not be imputed to a parent to the extent the parent is unemployed or significantly underemployed due to the parent's efforts to comply with court-ordered reunification efforts under RCW chapter 13.34 or under a voluntary placement agreement with an agency supervising the child.

Appendix 2: Descriptive Statistics of Outcome Variables and Statistical Comparisons between Groups

Total Payment Counts: Descriptive Statistics									
Group	***N***	***Mean***	***Median***	***Min***	***Max***	***Variance***	***Std Dev***	***Skewness***	***Kurtosis***
Pilot	132	6.3	5.0	0.0	20.0	28.61	5.3	0.74	-0.45
Former Statute	1761	10.8	11.0	0.0	22.0	50.34	7.1	-0.07	-1.42
Current Statute	6791	5.6	4.0	0.0	19.0	22.35	4.7	0.79	-0.29

Total Payment Counts: Aspin-Welch-Satterthwaite t-Test (Differences)					
Difference Between Group	***Mean Difference***	***Mean Difference at 95% Confidence Level***		***t-Value***	***Pr > |t|***
Pilot & Former Statute	-4.5	-5.4	-3.5	-9.02	<.0001***
Pilot & Current Statute	0.7	-0.2	1.7	1.55	0.1231
Former Statute & Current Statute	5.2	4.8	5.5	29.09	<.0001 ***

Mean Monthly Payment Amount ($): Descriptive Statistics									
Group	***N***	***Mean***	***Median***	***Min***	***Max***	***Variance***	***Std Dev***	***Skewness***	***Kurtosis***
Pilot	132	520.8	480.5	8.5	1499.4	118459.1	344.9	0.64	-0.08
Former Statute	1761	593.0	498.8	0.4	11904.0	304991.0	552.3	7.42	121.21
Current Statute	6791	605.2	476.5	0.00	12312.0	349505.9	591.2	3.98	37.93

Mean Monthly Payment Amount ($): Aspin-Welch-Satterthwaite t-Test (Differences)					
Difference Between Group	***Mean Difference***	***Mean Difference at 95% Confidence Level***		***t-Value***	***Pr > |t|***
Pilot & Former Statute	-72.2082	-136.8	-7.6577	-2.21	0.0285**
Pilot & Current Statute	-84.3990	-145.3	-23.5213	-2.74	0.0069***
Former Statute & Current Statute	12.1908	-41.5802	17.1986	-0.81	0.4161

Mean Monthly Compliance Rate (%)									
Group	***N***	***Mean***	***Median***	***Min***	***Max***	***Variance***	***Std Dev***	***Skewness***	***Kurtosis***
Pilot	132	91.9	100.0	5.5	100.0	376.4	19.4	-2.77	7.26
Former Statute	1761	93.9	100.0	0.3	100.0	323.4	18.0	-3.46	11.67
Current Statute	6791	89.9	100.0	0.0	100.0	492.7	22.2	-2.46	5.19

Mean Monthly Payment Amount ($): Aspin-Welch-Satterthwaite t-Test (Differences)					
Difference Between Group	***Mean Difference***	***Mean Difference at 95% Confidence Level***		***t-Value***	***Pr > |t|***
Pilot & Former Statute	-2.0411	-5.4838	1.4017	-1.17	0.2433
Pilot & Current Statute	1.9129	-1.4684	5.2942	1.12	0.2652
Former Statute & Current Statute	3.9540	2.9616	4.9464	7.81	<.0001***

Appendix 3: Variable List and Descriptions

Variable Name	Description	Type
Treat	Pilot (Treatment) Group	Binary
Control1	Former Statute (Control 1) Group	Binary
Control2	New/ Current Statute (Control 2) Group	Binary
Tot_PayCnt	Total number of payment counts that sum to 75% or more of the monthly order amount within a month. For example, two payments of 50% of the order amount made within a month would be counted as one.	Integer
Mean_PayAmt	The average payment amount per month (log-transformed)	Numeric
Rate_PayMOA_Censored	Payment compliance is the percent of total payment amounts paid during the study period divided by the cumulative monthly orders amounts within the same period per NCP	Numeric
Earn1820_AveAdj_Log	Average monthly wages between January 2018 and December 2020. All wages are adjusted by adding $50 in order to offset minimum order amount of $50.	Numeric
Earn_Change1920_K	Difference between average 2020 wages and average 2019 wages divided by 1,000.	Numeric
OldCase_Closed	Number of closed cases for NCP	Integer
ROTWadj_Log	Ratio of orders to adjusted wages. Includes imputed wages, all wages are adjusted by adding $50 in order to offset minimum order amount of $50. (log-transformed)	Numeric
PmtType_AW	NCP enrolled in automatic child support payment withdrawals (voluntary)	Binary
PmtType_UI	NCP has child support payments garnered from unemployment insurance benefits (involuntary)	Binary
DEBT_First_Log	Initial arrears at time of child support case establishment (log-transformed)	Numeric
Gender_FL_NCP	NCP's identifying as female	Binary
Lang_EG_NCP	English as the primary language of the NCP	Binary
Age_NCP	Age of NCP	Integer
Record_Jail	NCP with history of incarceration	Binary
Tot_OrderMonth	Total number of order months since case establishment	Integer
ChildCnt	Total number of children in child support case	Integer
FC_Case	Foster care child support case	Binary
PovFam_zip	Percent of household at or below federal poverty rate by zip code	Numeric
Unemp_zip	Unemployment rate by zip code	Numeric
Educ_BS_zip	Percent of individuals with bachelor degree or greater by zip code	Numeric
RenttoInc_30Over_zip	Ratio of average rent costs to average income for ages ≥ 30 by zip code	Numeric
Intnt_HH_zip	Percent of households with Internet access by zip code	Numeric
Same_Fips	NCP and CP reside in same county	Binary
SeattleMSA	NCP resides with Seattle metropolitan statistical area	Binary

Appendix 4: Descriptive Statistics of Independent Variables

Variable: Earn1820_AveAdj_Log									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	171	6.48	6.94	3.91	9.43	2.52	1.59	-0.38	-1.1
Former Statute	1995	6.57	6.98	3.91	9.85	2.65	1.63	-0.41	-1.13
Current Statute	9788	6.47	6.78	3.91	10.22	2.69	1.64	-0.28	-1.19

Variable: Earn_Change1920_K									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	171	-1.12	0	-80	46.41	244.07	15.62	-0.91	5.87
Former Statute	1995	-1.15	0	-127	85.84	258.62	16.08	-0.65	7.62
Current Statute	9788	-1.37	0	-158	158.67	258.78	16.09	-0.21	12.56

Variable: OldCase_Closed									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	198	0.07	0.00	0.00	2.00	0.09	0.30	5.02	26.15
Former Statute	2330	0.45	0.00	0.00	19.00	0.93	0.97	5.13	64.41
Current Statute	11345	0.16	0.00	0.00	12.00	0.35	0.59	5.92	53.33

Variable: ROTWadj_Log									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	138	3.03	3.1	0	6.9	2.84	1.69	-0.09	0.14
Former Statute	1784	3.2	3.1	0	8	3.01	1.74	0.16	0.25
Current Statute	7243	3.07	3	0	8.6	3.34	1.83	0.07	-0.09

Variable: PmtType_AW									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	153	0.58	1	0	1	0.25	0.5	-0.31	-1.93
Former Statute	2016	0.72	1	0	2	0.21	0.46	-0.88	-0.95
Current Statute	8083	0.68	1	0	2	0.22	0.47	-0.77	-1.38

Variable: PmtType_UI									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	153	0.28	0	0	1	0.2	0.45	0.98	-1.05
Former Statute	2016	0.27	0	0	1	0.2	0.44	1.05	-0.91
Current Statute	8083	0.22	0	0	1	0.17	0.41	1.38	-0.1

Variable: DEBT_First_Log									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	198	5.95	6.97	0	9.48	8.43	2.9	-1.23	0.22
Former Statute	2220	6.48	7.21	0	10.96	7.59	2.75	-1.35	1.03
Current Statute	11092	6.25	7.14	0	12.15	8.1	2.85	-1.32	0.63

Variable: Gender_FL_NCP									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	247	0.34	0	0	1	0.23	0.48	0.66	-1.58
Former Statute	3274	0.25	0	0	1	0.19	0.43	1.18	-0.6
Current Statute	14019	0.31	0	0	1	0.21	0.46	0.82	-1.32

Variable: Lang_EG_NCP									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	247	0.86	1	0	1	0.12	0.35	-2.12	2.5
Former Statute	3274	0.78	1	0	1	0.17	0.42	-1.34	-0.2
Current Statute	14019	0.85	1	0	1	0.13	0.36	-1.93	1.74

Variable: Age_NCP									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	222	32.07	31	16	60	65.42	8.09	0.64	0.47
Former Statute	2715	34.09	33	17	69	64.03	8	0.65	0.63
Current Statute	12517	33.17	32	16	80	68.46	8.27	0.75	0.79

Variable: Record_Jail									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	247	0.04	0	0	1	0.04	0.19	4.98	22.97
Former Statute	3274	0.03	0	0	1	0.03	0.17	5.37	26.86
Current Statute	14019	0.02	0	0	1	0.02	0.14	6.76	43.71

Variable: Tot_OrderMonth									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	153	6.5	5	0	21	33.34	5.77	0.73	-0.52
Former Statute	2016	11.03	12	0	22	62.04	7.88	-0.11	-1.54
Current Statute	8083	5.66	4	0	19	26.01	5.1	0.77	-0.41

Variable: ChildCnt									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	199	1.45	1	1	4	0.6	0.78	1.83	2.83
Former Statute	2335	1.52	1	1	9	0.77	0.88	2.28	7.33
Current Statute	11366	1.44	1	1	9	0.61	0.78	2.25	6.8

Variable: FC_Case									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	199	0.11	0	0	1	0.09	0.31	2.59	4.74
Former Statute	2335	0.09	0	0	1	0.08	0.29	2.86	6.18
Current Statute	11366	0.13	0	0	1	0.12	0.34	2.16	2.68

Variable: PovFam_zip									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	9.69	8.6	1.7	32	26.85	5.18	0.94	1.12
Former Statute	1870	8.99	8.2	0	100	26.53	5.15	3.59	52.07
Current Statute	9582	8.96	8	0	100	25.41	5.04	2.32	26.19

Variable: Unemp_zip									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	5.96	5.9	0.8	21.3	5.14	2.27	2.76	15.55
Former Statute	1871	5.55	5.6	0	41.3	4.38	2.09	4.36	57.89
Current Statute	9585	5.61	5.6	0	41.3	4.36	2.09	2.87	24.71

Variable: Educ_BS_zip									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	25.78	23.4	5.7	75.6	143.71	11.99	1.11	1.82
Former Statute	1872	27.21	24.6	0	81.2	161.81	12.72	1.45	2.63
Current Statute	9585	27.55	24.8	0	100	171.11	13.08	1.4	2.39

Variable: RenttoInc_30Over_zip									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	49.18	49.9	17.4	66.2	53.71	7.33	-1.16	3.01
Former Statute	1868	48.62	49.9	0	100	82.7	9.09	-0.99	7.21
Current Statute	9573	48.61	49.9	0	100	73.2	8.56	-1.05	5.87

Variable: Intnt_HH_zip									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	85.79	86.9	59.2	94.8	34.94	5.91	-1.08	1.72
Former Statute	1870	86.33	87	0	100	32.42	5.69	-2.45	28.56
Current Statute	9583	86.28	86.9	0	100	31.08	5.58	-1.34	8.53

Variable: SAME_FIPS									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	0.6	1	0	1	0.24	0.49	-0.43	-1.84
Former Statute	1872	0.55	1	0	1	0.25	0.5	-0.22	-1.96
Current Statute	9585	0.54	1	0	1	0.25	0.5	-0.17	-1.97

Variable: SeattleMSA									
Group	***N***	***Mean***	***Median***	***Min.***	***Max.***	***Variance***	***Std. Dev.***	***Skewness***	***Kurtosis***
Pilot	164	0.4	0	0	1	0.24	0.49	0.43	-1.84
Former Statute	1872	0.44	0	0	1	0.25	0.5	0.25	-1.94
Current Statute	9585	0.45	0	0	1	0.25	0.5	0.22	-1.95

Appendix 5: Analysis of IRS Interceptions on Model Outcomes

The timeframe for the observation periods of the Pilot, Current Statute, and Former Statute groups may be subject to selection bias arising from the COVID-19 pandemic and the subsequent government interventions. For example, the Pilot and Former Statute Groups have a disproportionate share of NCPs that received IRS issued Economic Impact Payments during the observation period from each other and the Current Statute group (refer to **Table 1**: IRS Economic Impact Payment Dates Relative to Cumulative Percent of Collected Observations).

Table 1: IRS Economic Impact Payment Dates Relative to Cumulative Percent of Collected Observations

	Cumulative Percent of Observations Collected within Payment Distribution Period		
Payment Date	Pilot Group	Former Statute Group	Current Statute Group
April 2020	4.9%	72.4%	0%
December 2020/ January 2021	63.7%	100%	37.9%
March 2021	70.0%	100%	47.3%

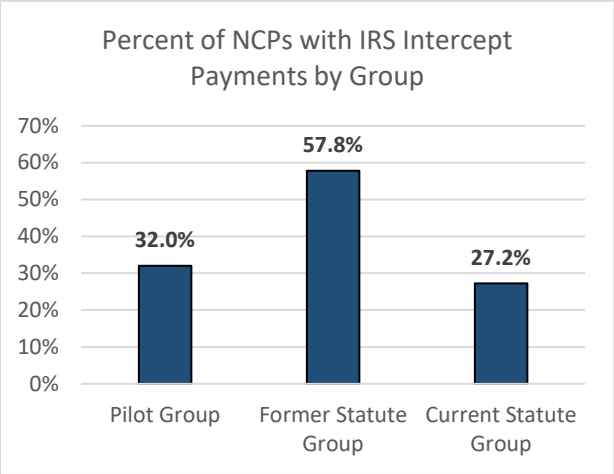
In addition, the Department of Child Services (DCS) had released two large tranches of suspended IRS Intercepts in June and August 2021. These tranches could also bias NCP payment behavior between groups given that unequal proportions of NCPs would have received the released Intercepts given different observation collection periods (refer to Table 2: Release of Suspended IRS Intercept Dates Relative to Cumulative Percent of Collected Observations)

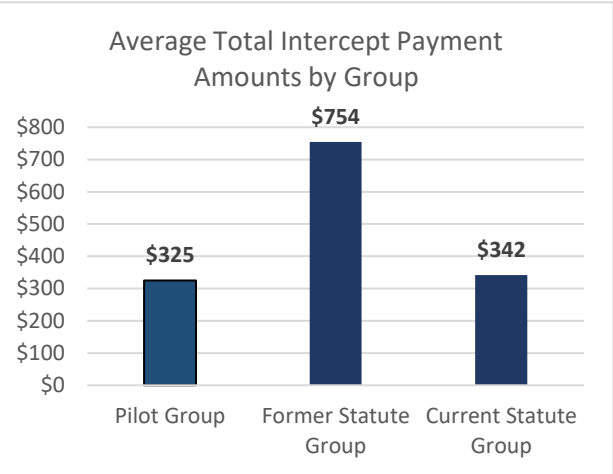
Table 2: IRS Economic Impact Payment Dates Relative to Cumulative Percent of Collected Observations

	Cumulative Percent of Observations Collected within IRS Intercept Release Periods		
Payment Date	Pilot Group	Former Statute Group	Current Statute Group
June 2020	16.1%	100%	5.4%
August 2020	29.2%	100%	14.7%

It is possible that IRS intercepts may inflate child support payments that otherwise would not have been made. Descriptive statistics for IRS intercepts between these two groups show significant discrepancy, especially for the Former Statute Group, which had the most observations collected within the payment distribution window (refer to **Chart 1**: Percent of NCPs with IRS Intercept Payments, and Average Total Intercept Payment Amounts between Group)

Chart 1:





**Note: The time period for the above charts is the entire collection and evaluation period for each group, respectively. Sample sizes by group are: Pilot (n= 153), Former Statute (n = 2,016), Current Statute (n = 8,083).*

The evaluation models were therefore revised to include an IRS Intercept control to limit potential biased introduced by Economic Impact Payments (Stimulus Checks) that coincided with different data collection periods between groups.

Following the addition of IRS Intercept controls, the revised models still finds that assignment to the Pilot Group and the Current Statute Group are associated with better child support collection outcomes – suggesting that new income determination guidelines achieve better 'right-sized' orders.

However, the coefficient estimates have changed in magnitude after adding in the IRS Intercept variable. These new estimates are presumably more accurate than the original estimates, and indicate better performance outcomes of the Pilot and Current Statute groups. The improved, higher performance estimates are likely due to bias in the Former Policy group, which was exposed to more economic stimulus actions correlated with the observation window of that control group.

Using the revised model, the Payment Amount outcomes of the Pilot Group are more statistically significant than the original model. These more conclusive findings show that the Pilot Group and the Current Policy group are both associated with 9.9% higher Payment Amount outcomes than the Former Policy group. The independent IRS Intercept variable is associated with 12.2% higher payment amounts on average (refer to **Table 3**: Except of Payment Amount Model Outcomes).

For Payment Counts, The Pilot group is now associated with a slightly lower frequency of counts, dropping from 19.9% more payment to 19.7% in the new model, with measures of statistical significance remaining the same. There is less than a 0.1% difference in the model estimates for the treatment effect of the Current versus Former policy groups. IRS Intercepts are associated with 11.6% more payment counts on average (refer to **Table 4**: Except of Payment Count Model Outcomes).

Controlling for IRS Intercepts in the Compliance of Payments to Orders model sees the largest change in outcome estimates. The Pilot Group is now associated with 6.7% higher compliance than the Former Policy group, whereas it the estimate had previously stood at 4.0%. The Current Policy group is 11.4% higher with the new model estimates, versus 8.6% higher than the Former Policy group using the old model. IRS Intercepts are associated with about 15% higher compliance rates on average (refer to **Table 5**: Except of Payment Compliance Model Outcomes).

Table 3: Except of Payment Amount Model Outcomes

Payment Amounts (log): Weighted Least Squares Regression Level 1				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	-0.0014	0.9646	0.0084	0.7754
Current Statute Group	0.0057	0.5426	0.0126	0.1601
IRS Intercept Payments	-	-	0.1302	<.0001***

Payment Amounts: Weighted Least Squares Regression Level 2				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.0829	0.0806*	0.0943	0.0444**
Current Statute Group	0.0868	<.0001***	0.0944	<.0001***
IRS Intercept Payments	-	-	0.1152	<.0001***

Payment Amounts: Weighted Least Squares Regression Level 3				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.0833	0.0779*	0.0850	0.0754*
Current Statute Group	0.0852	<.0001***	0.0864	<.0001***
IRS Intercept Payments	-	-	0.1102	<.0001***

Table 4: Except of Payment Count Model Outcomes

Payment Frequency: Zero-inflated Negative Binomial Regression Level 1				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.1814	<.0001***	0.1800	<.0001***
Current Statute Group	0.2242	<.0001***	0.2229	<.0001***
IRS Intercept Payments	-	-	-0.0183	0.0307**

Payment Frequency: Zero-inflated Negative Binomial Regression Level 2				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.1809	<.0001***	0.1795	<.0001***
Current Statute Group	0.2235	<.0001***	0.2222	<.0001***
IRS Intercept Payments	-	-	-0.0179	0.0354**

Payment Frequency: Zero-inflated Negative Binomial Regression Level 3				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.181	<.0001***	0.1797	<.0001***
Current Statute Group	0.2235	<.0001***	0.2223	<.0001***
IRS Intercept Payments	-	-	-0.0178	0.0366**

Table 5: Except of Payment Compliance Model Outcomes

Payment Compliance Rate: Tobit Regression Level 1				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.040063	0.0381**	0.066363	0.0006***
Current Statute Group	0.086275	<.0001***	0.113989	<.0001***
IRS Intercept Payments	-	-	0.154501	<.0001***

Payment Compliance Rate: Tobit Regression Level 2				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.040739	0.035**	0.067257	0.0005***
Current Statute Group	0.086344	<.0001***	0.114049	<.0001***
IRS Intercept Payments	-	-	0.154916	<.0001***

Payment Compliance Rate: Tobit Regression Level 3				
Variable	*Coeff without IRS Controls*	*Pr > |t|*	*Coeff with IRS Controls*	*Pr > |t|*
Pilot Group	0.039861	0.0391**	0.066604	0.0005***
Current Statute Group	0.086101	<.0001***	0.113782	<.0001***
IRS Intercept Payments	-	-	0.154631	<.0001***

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