



Arrears Stratification in Washington State

Developing Operational Protocols in a Data Mining Environment

May 2010

Funded by a Section 1115 Grant from the U.S. Department of Health and Human Services,
Office of Child Support Enforcement

Carl Formoso, PhD

Qinghua Liu, PhD

Management Accountability & Performance Statistics Office
Economic Services Administration
Washington State Department of Social and Health Services

Acknowledgements

This project was funded by a grant from the federal Office of Child Support Enforcement (OCSE). We gratefully acknowledge their support to make this report possible.

A number of individuals, groups and organizations were indispensable to the successful operation and completion of this project. We want to thank David Stillman, the Director of the Washington State Division of Child Support (DCS), and his leadership team. Without their support and continuing interest in our research, this report would not have been completed. We would also like to thank Brice Montgomery from DCS who provided policy advice for the report.

We highly appreciate Dr. Michael Horn, Chief of the Economic Service Administration's Management Accountability & Performance Statistics (E-MAPS), and Dr. Andrew Dyke from ECONorthwest, for their thorough reviews and valuable feedback on the report.

Our thanks go to Sarah Kollin from E-MAPS as well. She monitored the project progress and coordinated the work among researchers, the outside evaluator, DCS, and the OCSE to make sure the project went successfully. Other employees from DCS and E-MAPS who were particularly helpful to us were: Charles Donnelly, Bryan Enlow, Ken Forgy, Janet Hazelton, and Jialing Huang.

Finally, our special thanks would go to Dr. Carol Welch, the former chief of E-MAPS, who greatly encouraged us to apply for the grant and was heavily involved in the successful application process.

The Authors

Table of Contents

Executive Summary	4
ES.1 Introduction.....	4
ES.2 Major Findings.....	6
ES.3 Policy Implications.....	7
1 Introduction	10
1.1 Background	10
1.2 Project Goals	12
2 Data and Methods.....	14
2.1 Data sources.....	16
2.2 The Stratification Flow by Cohort	17
3 Relationship between Arrearage Growth, Earnings, and Monthly Order Amount by Stratum	22
4 Development of Risk Score System.....	30
4.1 Risk Factors	30
4.2 Risk Score	36
5 Spells of Arrearage Change.....	48
6 Testing Practical Application.....	54
7 Practical Application of the Stratification Flow and Risk Score	63
7.1 Debt Growth Method.....	63
7.2 Time Ratio Method	67
8 Major Findings and Policy Implications.....	69
8.1 Major Findings	69
8.2 Policy Implications	70
Appendix	73
Appendix I. Non-Analyzable Strata	73
Appendix II. Use of Lagged CSDB Data.....	74
Appendix III. Relationship of debt growth, earnings, and MOA for Dec03 NCPs	77
Appendix IV. Technical and Statistical Summary	82
References.....	94

Executive Summary

ES.1 Introduction

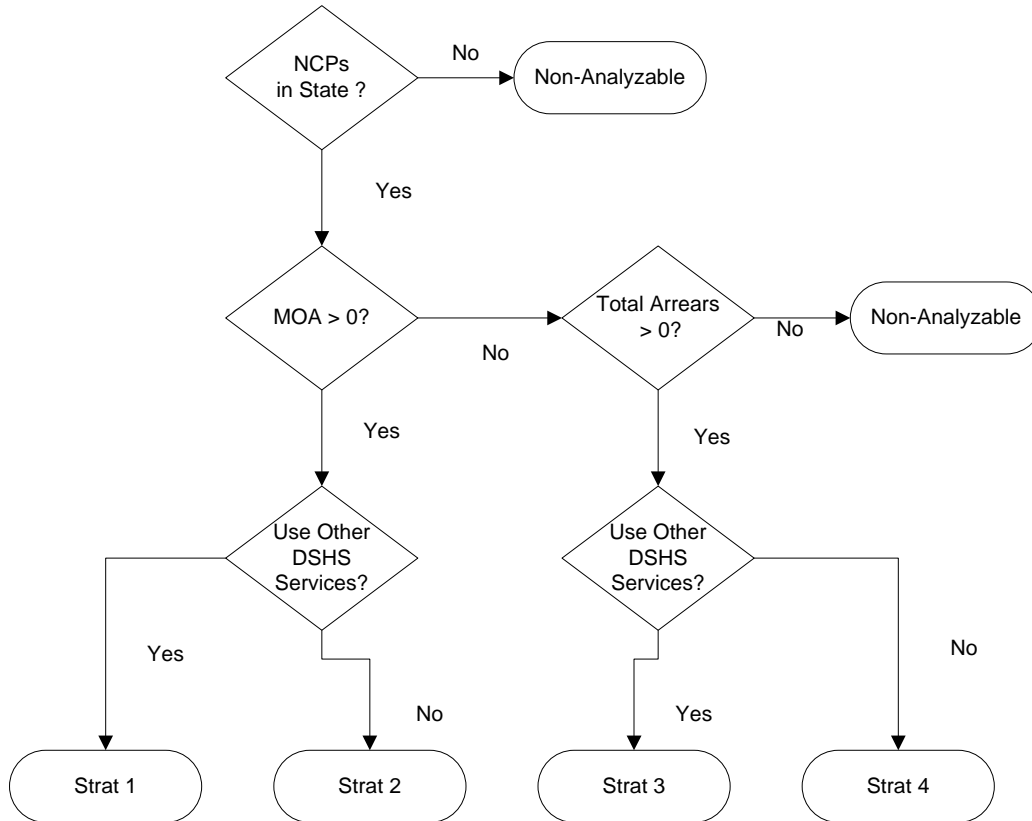
Arrears, or child support debt, is a large and growing problem in Washington State and across the nation. By the end of Federal Fiscal Year 2009 (FFY2009), the total amount of child support arrears in Washington State had reached nearly \$1.8 billion. Studying debt and payment patterns across different types of child support cases can help to identify the underlying causes of arrears growth at the case level. This knowledge can, in turn, support development of evidence-based methods for managing child support debt in the field. Washington's Arrears Stratification project, funded by the Office of Child Support Enforcement (OCSE) 1115 Grant, sought to build the evidence base necessary to develop such practical debt management tools for caseworkers. This 18-month grant responded to OCSE's 2008 Priority Area Two: Using Business Intelligence/Data Analysis to Improve Performance.

This project builds on earlier work by Washington State's Division of Child Support (DCS) that focused on classifying child support cases according to the presumed collectability of arrears and the likelihood that a non-custodial parent (NCP) will accumulate additional arrears. This study extends Washington's earlier analysis and describes a case classification system that consists of two components: (1) a "stratification flow" that assigns cases to one of four distinct groups based on existence of an order for current support and an NCP's use of other Department of Social and Health Services (DSHS) services; and (2) a risk score that serves as an indicator of an NCP's likelihood of arrears accumulation.

The research relies on four main data sources: (1) child support data from the DCS Support Enforcement Management System (SEMS), (2) wage data from the Employment Security Department (ESD), (3) records of public service use from the Client Services Database (CSDB), and (4) incarceration data from the Department of Corrections (DOC).

Stratification

This study first develops a stratification flow based mainly on NCPs' payment obligations and use of other state services (Figure ES.1). The stratification flow classifies noncustodial parents into four strata: (1) NCPs with current support due and with other DSHS service usage; (2) NCPs with current support due and with no other DSHS service usage; (3) NCPs with no current support due and with other DSHS service usage; and (4) NCPs with no current support due and with no other DSHS service usage.

Figure ES.1 NCPs Stratification Flow¹

Risk Score

Washington’s earlier work identified a number of case-level factors that strongly correlate with the creation and growth of child support debt. In this study, we develop a numeric “risk score” that summarizes the extent to which an NCP exhibits the identified risk factors. We demonstrate the relationship between the risk score, on the one hand, and debt growth and poor NCP payment patterns on the other for each strata.

The risk score includes six factors derived from data about an NCP: (1) the number of active cases; (2) the extent of use of other DSHS services; (3) the size of the NCP’s current support relative to earnings; (4) whether earnings are below a critical threshold; (5) whether the NCP’s child support debt is above a threshold; and (6) incarceration history. The risk score identifies low-risk noncustodial parents who are not meeting their child support obligations, but for whom targeted intervention might improve collections. The risk score also identifies high-risk noncustodial parents where debt growth is essentially unpreventable under existing

¹ MOA refers to monthly order amount.

circumstances. For this high-risk group of NCPs, order modifications may be appropriate to prevent accumulation of uncollectible arrears.

ES.2 Major Findings

We summarize the major findings from our research, below:

1. Consistent with earlier work, we find that current support larger than 20% of an NCP's gross monthly earnings, or gross monthly earnings below \$1,400, corresponds to arrearage growth.
2. At equivalent levels of earnings and current support due, arrearage growth is generally larger for NCPs who have used other DSHS services. Below about \$3,000 gross monthly earnings, NCPs who have used other DSHS services have lower current support due than NCPs with similar incomes who have not used other DSHS services. But the service users also pay a smaller fraction of support due.
3. The vast majority of NCPs (over 80%) with arrearage debt who do not owe current support have gross monthly earnings below \$1,400, and their payments are typically very low. Earnings for these NCPs were likely also low when they had current support due, which would lead to the accrual of debt.
4. For Dec03 NCPs who only owe arrears, average monthly payments are less than one percent of average debt, suggesting that it would take about 100 months to pay off the debt on average. But there are 7,031, 30% of Dec03 arrears only NCPs, who only averaged paying \$2.16 monthly. The monthly payment of this group of NCPs was only about 0.03% of their debt and their final debt at the end of the 48 month period was \$44.4 million. We might expect this group to take about 300 months to pay off debt.
5. Combined with payment information, classifications of NCPs by stratum and risk score demonstrate a clear link to payment behavior. Evaluation of specific risk factors and the stratum of the noncustodial parent can lead to targeted strategies for improvements.
6. As risk score increases, earnings levels drop rapidly for both DSHS service users and non-service users. For a given risk score, NCPs who have not used other DSHS services tend to have lower earnings than those who have used other services. On the other hand, current support decreases with risk for NCPs who were service users and increases for those who were not. The threshold risk score above which average current support exceeds 100% of average earnings is much higher for service users than for non-users.
7. For service users, higher risk scores typically correspond to use of many services, suggesting a greater variety of barriers to payment. For non-service users, the number of open cases is the key factor increasing risk because more cases typically correspond to greater current support due. These conclusions support our stratification based on service use.

8. The achievement of this study is that the stratification and risk score methodology allows the identification of high risk and low risk NCPs as well as collectible and uncollectible debts. Table ES.1 shows an example of identification results by using risk score system developed in the study. Among the NCPs with current support due and debt growth over \$5,000 within 48 months, we identified a total of 2,241 low risk NCPs whose debt growth reached \$22.3 million over the 48 months. This debt growth is very likely avoidable and collectible. From the same group of NCPs, we also identified a total of 33,596 high risk NCPs whose debt growth was \$493.5 million over the 48 months. As a group, their current support obligation exceeded their income – a situation not likely to bring in full current support payment—making the accrual of debt unavoidable and the resulting debt essentially uncollectible.

Table ES.1 Identification of Low Risk and High Risk NCPs*

	Low Risk	High Risk
Total number of NCPs	2,241	33,596
# of NCPs using other DSHS services	548	19,279
# of NCPs not using other DSHS services	1,693	14,317
Total number of custodial families involved	2,430	54,116
Total number of children involved	3,685	71,192
Total debt growth	\$22.3 Million	\$493.5 Million
Collectibility of debts	Avoidable, Collectible	Unavoidable, Uncollectible

* Refers to Dec03 NCPs with current support due and debt growth over \$5,000 within 48 months.

While significantly reducing the large existing debt load will not be easy, the findings and protocols developed in this study suggest a path to such reductions and to prevention of similar debt growth in the future.

ES.3 Policy Implications

Common sense suggests that preventing debt accumulation is preferred to managing debt after it has been accrued. A 2004 report from the Office of Child Support Enforcement (OCSE) echoes this sentiment in practical terms, concluding that “the best ways to avoid the accumulation of arrears are to set appropriate orders initially, modify orders via simple procedures promptly when family circumstance change, and immediately intervene when current support is not paid.” These steps seek to prevent debt accumulation that can quickly become unmanageable for the NCP. We recommend using our research to develop tools that support child support staff as they seek to achieve the following goals:

1. Develop case management strategies tailored to NCP characteristics.

Our study demonstrates the strong relationship between NCP characteristics and payment patterns. The risk score and associated data can provide caseworkers with a standardized method of identifying high- and low-risk NCPs, and of selecting the most appropriate

debt management strategies for a given case. NCPs with poor payment histories but who are at low risk of accumulating arrears are the most promising targets for more aggressive collection efforts. NCPs with poor payment histories but who are at high risk of accumulating arrears are much less likely to be capable of meeting their current support obligations, let alone reducing their accumulated debt. The most appropriate debt management strategies for this group include order modification and writing off debt that is most likely uncollectible.

2. Set appropriate orders to prevent debt growth.

Arrearage growth typically occurs when current support due is more than 20% of NCPs' gross monthly earnings and when gross monthly earnings are below \$1,400. While these thresholds are approximate, they provide a useful baseline for setting more appropriate current support obligations. Specifically, we recommend exploring: (1) Updating the Washington State Child Support Schedule; (2) Reducing default orders; and (3) Incorporating more income information, such as unemployment compensation, Social Security benefits, and labor and industry compensation into the order setting process.

3. Modify orders promptly based on changes of family circumstance.

Changes in family circumstances, such as loss of employment, an increase in family size, NCPs being on public assistance or being incarcerated, are associated with arrearage growth. DCS should change the modification review criteria to encourage more timely order modification to control the accumulation of arrearage. Specifically, we suggest: (1) Programming the Support Enforcement Management System (SEMS) to automatically conduct "3-Year Cycle"² modification reviews; (2) Adopting the following screening criteria to determine/define "substantial change in circumstances" which must be demonstrated for modification outside of the "3-Year Cycle": (a) Incarceration or release; (b) Documented disability of obligor lasting more than a year, or termination of disability; (c) Death of child in a case with multiple children; (d) Disability of a child; (e) Reasonable probability that adjustment of order will remove obligee from TANF; (f) Obligor arrears of \$3,000 or more.

4. Cooperate with other partners to help NCPs overcome their barriers.

Greater cooperation with DCS's partners, such as prosecutors, other DSHS administrations, and non-governmental partners may help DCS pursue the goals above. For example, at the time of the first paternity order, DCS should work with related

² DCS is required to do a modification review every 3 years for the cases currently on public assistance. This is called "3-Year Cycle".

partners to reach young, low-income men before they acquire multiple cases and multiple orders that they cannot pay.

While seeking ways to better manage debt, the emphasis must remain on prevention. Setting and maintaining accurate orders – orders based on actual income, taking into account significant barriers to collection within the case load – must be the highest priority.

Much of information used in this study is not easily accessible to case workers. But centralized data processing using existing databases and data warehouses could be used to transmit key data points to staff in the field through a web-based application. These would include details about each NCP's risk score and flagging of existing or potential problems.

The problems and trends identified in this report are not unique to Washington State. Consistent with the goals of OCSE's 1115 grant program, we believe our reported findings to be of value to other states with the technical infrastructure to develop approaches to NCP stratification and debt management strategies similar to those outlined in this report.

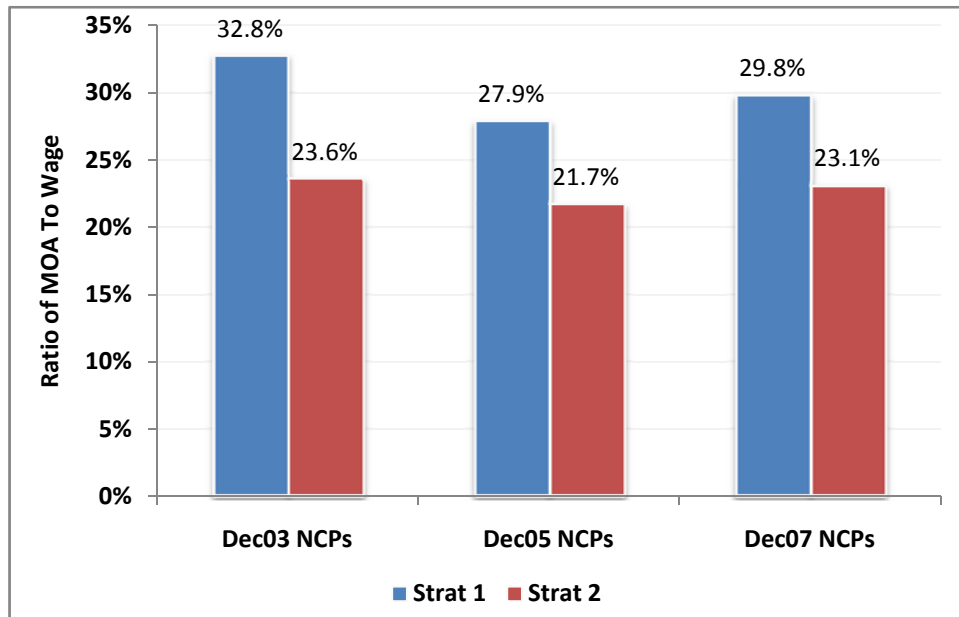
1 Introduction

Arrears, or child support debt, is a large and growing problem in Washington State and across the nation. By the end of Federal Fiscal Year 2009 (FFY2009), the total amount of child support arrears in Washington State had reached nearly \$1.8 billion. Studying debt and payment patterns across different types of child support cases can help to identify the underlying causes of arrears growth. Washington's Arrears Stratification project, funded by the Office of Child Support Enforcement (OCSE) 1115 Grant, sought to build the evidence base necessary to develop such practical debt management tools for caseworkers.

1.1 Background

The work reported here updates and extends previous work done under OCSE Grant #90-FD-0027. We will briefly introduce our previous work on arrears in this section. The original work was reported in 2003 as "Determining the Composition and Collectability of Child Support Arrearages - Volume 1: The Longitudinal Analysis (Formoso, 2003), and Volume 2: The Case Assessment (Peters, 2003)." The longitudinal analysis (V1) was based on individuals, using a cohort of 241,731 noncustodial parents (NCPs) selected as all active NCPs in the third calendar quarter of 1995 (95Q3). Division of Child Support (DCS) records from 93Q4 to 97Q2 were used to look at debt behavior of the cohort in the study. Four common payment patterns were identified for the sampling required for the case assessment study (V2): steadily increasing debt, steadily decreasing debt, unchanging debt, and intermittent with both increasing and decreasing debt and at least four separate spells of debt behavior. Part of the work reported in V1 involved development of neural network and decision tree models to predict debt growth outcomes and collectability. Using these models we were able to predict with good accuracy whether debt would increase, decrease, or remain unchanged.

Figure 1.1 illustrates the debt classification scheme in the V1 study. Out-of-State NCPs are not considered because we do not have data on their earnings or possible barriers to payment. The study found that below about \$1,400 monthly wage, support obligations of NCPs have on average been set far above the level that would prevent arrearage growth. The study also found that arrearage tended to grow when monthly order amounts were set above about 20% of gross monthly earnings. On the contrary, above \$1,400 monthly wages, support obligations have on average been set far below the level where arrearage would grow. The debt increase for this group of NCPs was avoidable and collectible. Barriers to payment were used to classify total debts as collectible or uncollectible for NCPs with monthly wage under \$1,400. Documented barriers include NCPs with history of grants/public assistance usage; NCPs with multiple IVD cases as NCP; NCPs who also had at least one IVD case on which they were the CPs; NCPs with drugs/alcohol problems; NCPs with disability; NCPs with limited English proficiency. Low

Figure 2.5 Ratio of MOA To Wage for Strat 1 and Strat 2 NCPs, by Cohort

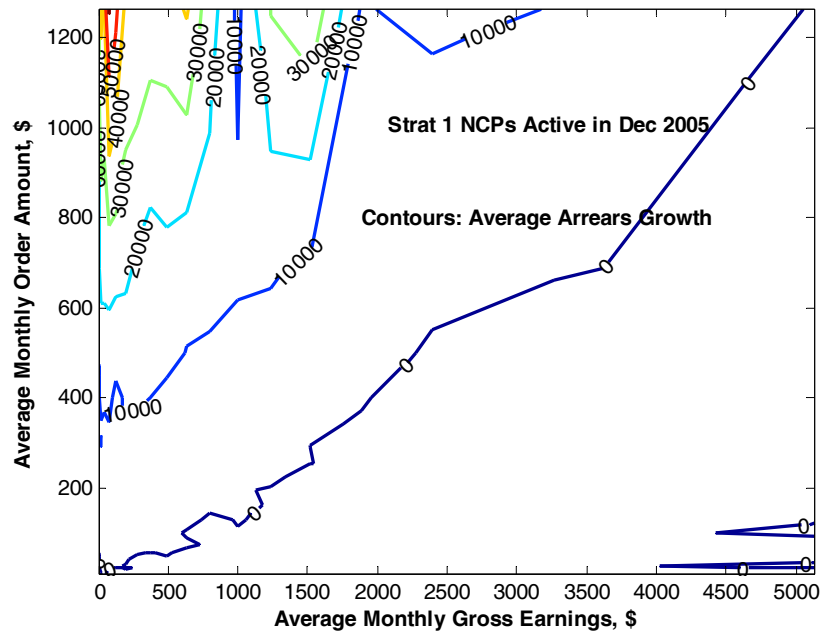
When only arrears are due, payments by strat 3 NCPs (DSHS use) are about half of payments by strat 4 NCPs (no DSHS use) and strat 3 payments are a smaller percentage of wages and a smaller percentage of average debt. The vast majority of strat 3 and strat 4 NCPs have gross monthly wages less than \$1,400.

3 Relationship between Arrearage Growth, Earnings, and Monthly Order Amount by Stratum

In this section we focus on how arrearage growth relates to the interaction of earnings and current support in strat 1 and strat 2, where MOA > \$0. The relationships inform the risk factor selection presented in the next section. Strat 1 and strat 2 include the majority of NCPs in the study groups – 185,055 out of 208,588 for Dec03 and 191,501 out of 217,428 for Dec05. We will highlight the similarities and differences between NCPs who use other DSHS services and those who do not.

After checking the relationship of debt growth, earnings, and MOA for Dec03 and Dec05 cohorts, we found that the observed relationships are quite stable over time. Therefore, we only show the relationship for Dec05 NCPs in this section. The results of Dec03 NCPs can be found in Appendix III-1. Figure 3.1 shows contours of arrearage growth in relation to earnings and current support for strat 1 NCPs (MOA > \$0 and DSHS use). The lower right section in the figure – higher earnings and lower MOA – represents decreasing debt and the upper left section – lower earnings and higher MOA – represents increasing debt, with the zero (0) contour representing the relation between earnings and MOA where arrearage does not change.

Figure 3.1: Contours of Debt Growth for Dec05 Strat 1 NCPs



The contours are estimates and cannot be considered exact, but they do provide a reasonable picture of how arrears growth changes with earnings and MOA. While the locations of arrearage growth contours have changed since the original work (Formoso, 2003) the location of the zero contour has been quite stable, with only minor differences between the original work (Formoso, 2003), the Dec03 NCPs, and the Dec05 NCPs. Detailed information about how the contour charts were created is in Appendix IV-1.

Although strat 2 NCPs have similar pattern of how arrearage growth relates to earnings and MOA with strat 1 NCPs, They show difference in debt growth distribution over earnings and MOA (see Figure 3.2). At equivalent monthly earnings, the contours of arrears growth occur at somewhat lower MOA for strat 1 NCPs (red contours). For example, the contour for strat 1 average arrears growth of \$10,000 is essentially the same as the \$5,000 growth contour for strat 2 (blue contour). While the two zero contours are nearly the same up to about \$2,500 earnings, above that the strat 2 zero contour occurs at a higher MOA relative to earnings.

Figure 3.2: Superimposed Contours of Debt Growth for Dec05 Strat 1 & 2 NCPs

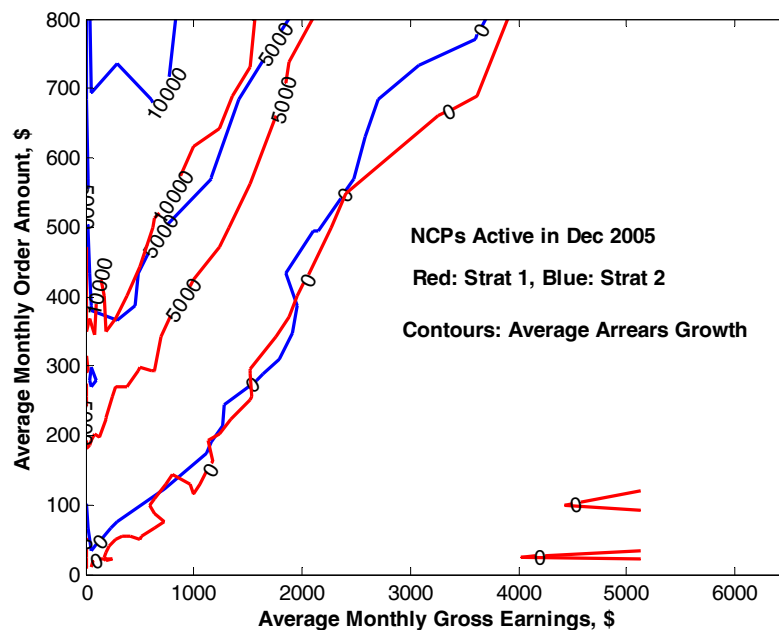
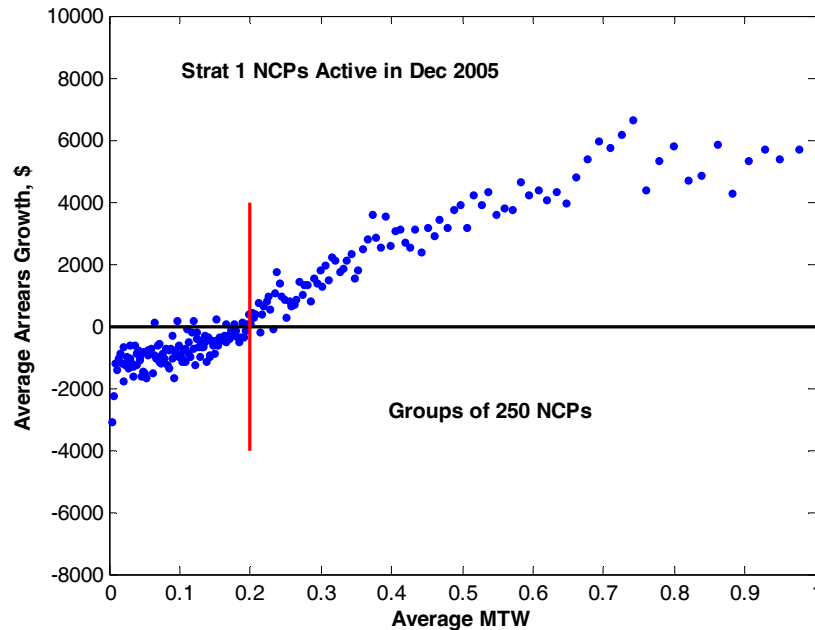


Figure 3.3 shows that strat 1 NCPs cross over into arrearage growth when MOA is 20% of earnings on average. Above about 24% MOA To Wage ratio (MTW) all data points show arrearage growth.

Figure 3.3: Debt Growth Relates to the MOA/Wages Ratio – Strat 1 Dec05 NCPs⁷



Strat 2 NCPs have similar pattern as strat1 NCPs except that on average conversion into arrearage growth occurs somewhat above 20% MTW. All data point above about 28% MTW show arrearage growth. This is consistent with findings in the original work (Formoso, 2003). In the Figure similar to Figures 3.3 and 3.4 in the original work (Formoso, 2003) all data points above 20% MTW showed growth in arrears.

⁷ NCPs are ordered by MTW with averages taken in groups of 250 NCPs.

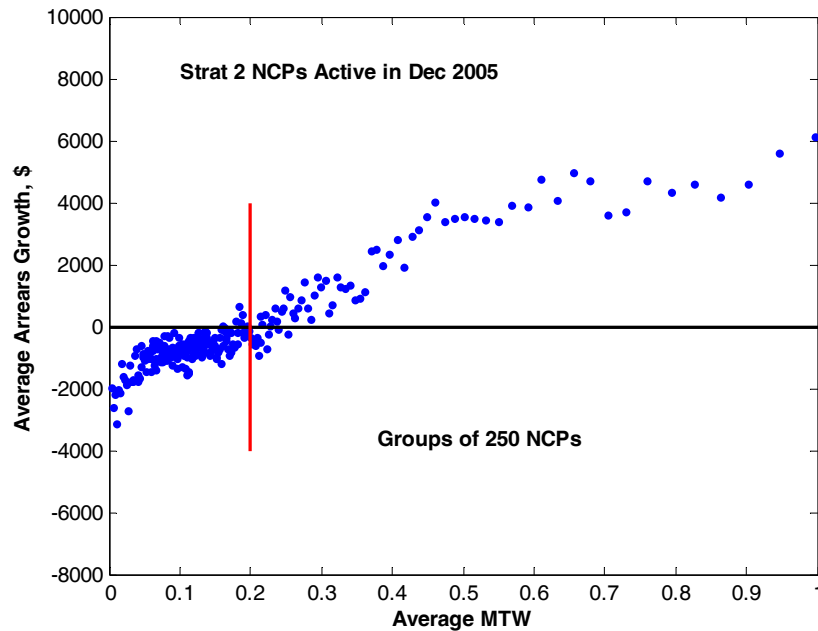
Figure 3.4: Debt Growth Relates to the MOA/Wages Ratio – Strat 2 Dec05 NCPs⁸

Figure 3.5 superimposes the actual setting of strat 1 MOA relative to earnings on the strat 1 contour diagram from Figure 3.1. The setting of MOA crosses into the region of arrearage growth at about \$1,400 gross monthly earnings. This relationship also applies to Strat 2 NCPs.

Figure 3.6 compares MOA for strat 1 and strat 2 NCPs. Up to about \$3,000 monthly earnings, MOA is set lower relative to earnings for strat 1 NCPs than that for strat 2 NCPs strat 1 average MOA is set lower than strat 2 average MOA.

⁸ NCPs are ordered by MTW with averages taken in groups of 250 NCPs.

Figure 3.5: Actual MOA and Contours of Debt Growth for Dec05 Strat 1 NCPs⁹

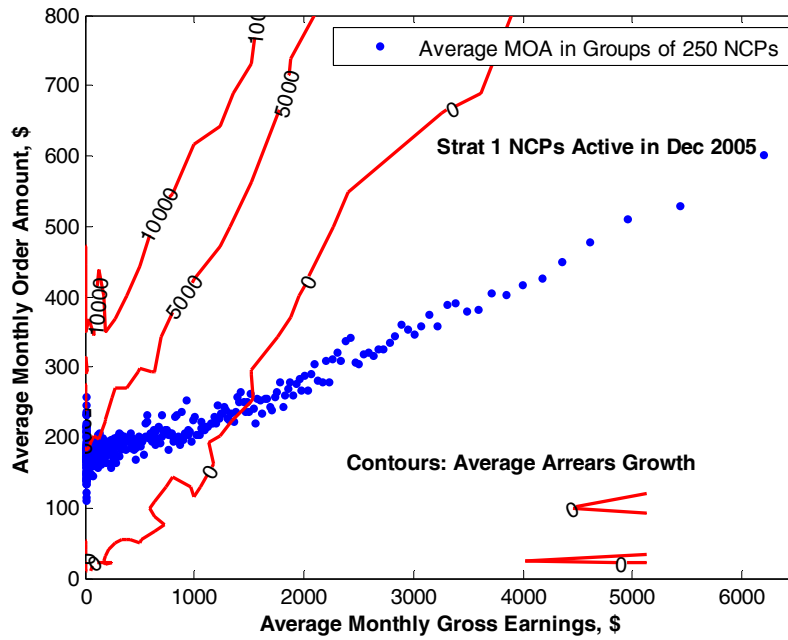
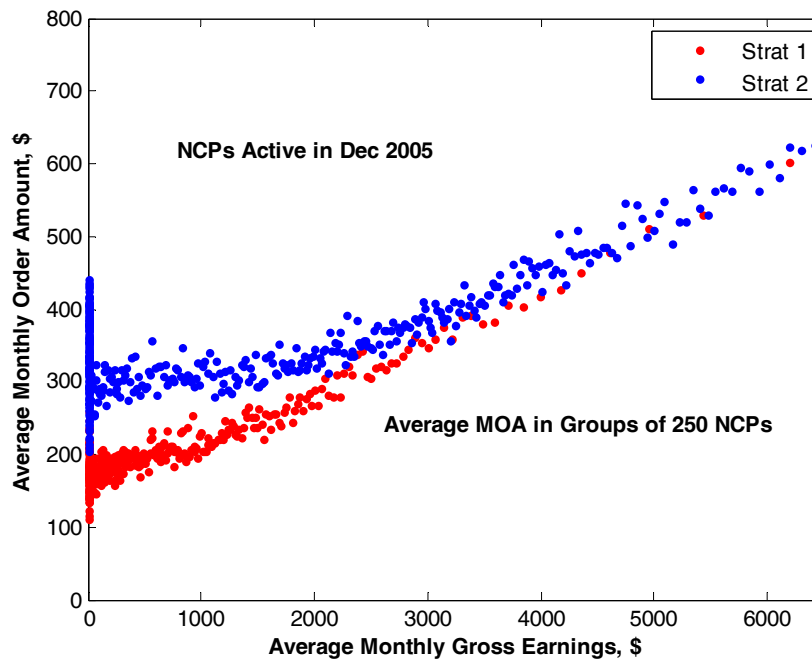


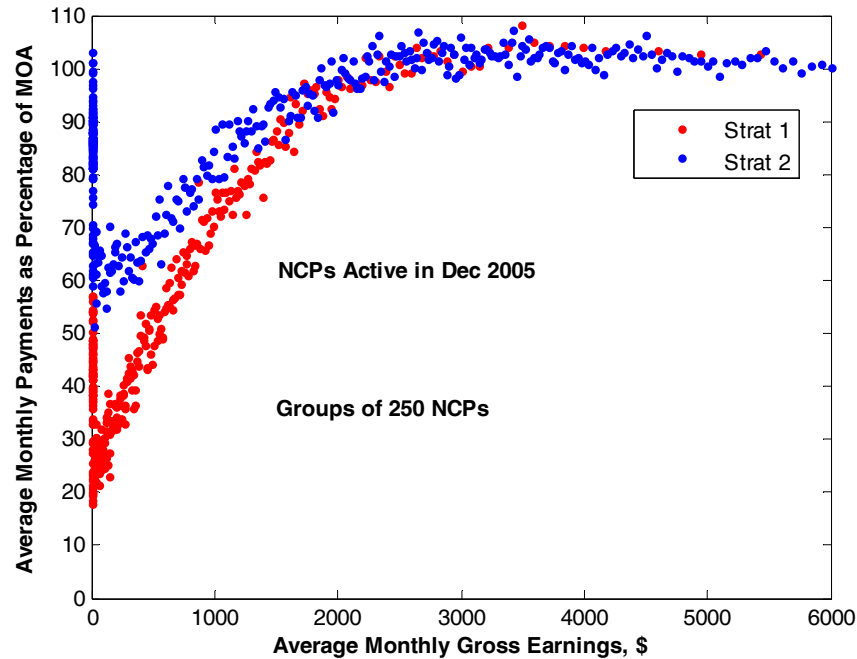
Figure 3.6: Comparing Actual MOA for Dec05 Strat 1 & Strat 2 NCPs



⁹ For actual MOA NCPs are ordered by earnings with averages taken in groups of 250 NCPs.

On average strat 1 NCPs also make lower payments relative to MOA than strat 2 NCPs (see Tables 2.2 – 2.4). Figure 3.7 shows that at low earnings strat 1 NCPs pay a lower percentage of MOA than strat 2 NCPs, even though strat 1 MOAs are lower as seen in Figure 3.6. The data points for the two strata appear to merge above \$3,000 monthly earnings. At equivalent low earnings, even though current support is lower, strat 1 NCPs are paying a smaller fraction of current support than strat 2 NCPs.

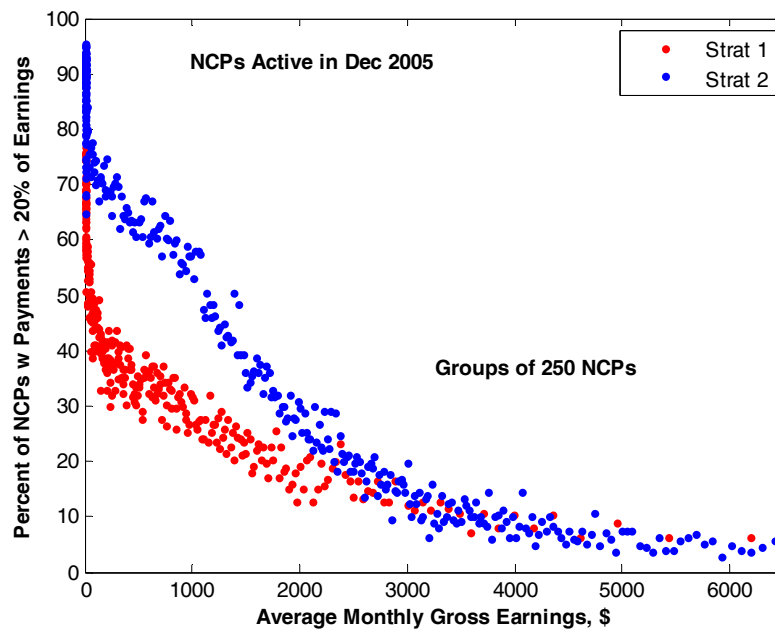
Figure 3.7: Comparing Percentage Payments for Dec05 Strat 1 & Strat 2 NCPs¹⁰



An interesting difference is seen in Figure 3.8 when we compare the percentage of NCPs paying more than 20% of earnings in strat 1 and strat 2. At very low earnings (approximately \$30 monthly), the strat 1 data crosses the 50% line while at the same earnings level about 80% of strat 2 NCPs are paying more than 20% of earnings. The strat 2 data crosses the 50% line at approximately \$1,500 monthly earnings. From very low earnings to above \$3,000 monthly earnings strat 2 NCPs are much more likely to be paying a larger portion of income towards child support than strat 1 NCPs.

¹⁰ Average Payments for each group of 250 NCPs are divided by average MOA from Figure 3.6.

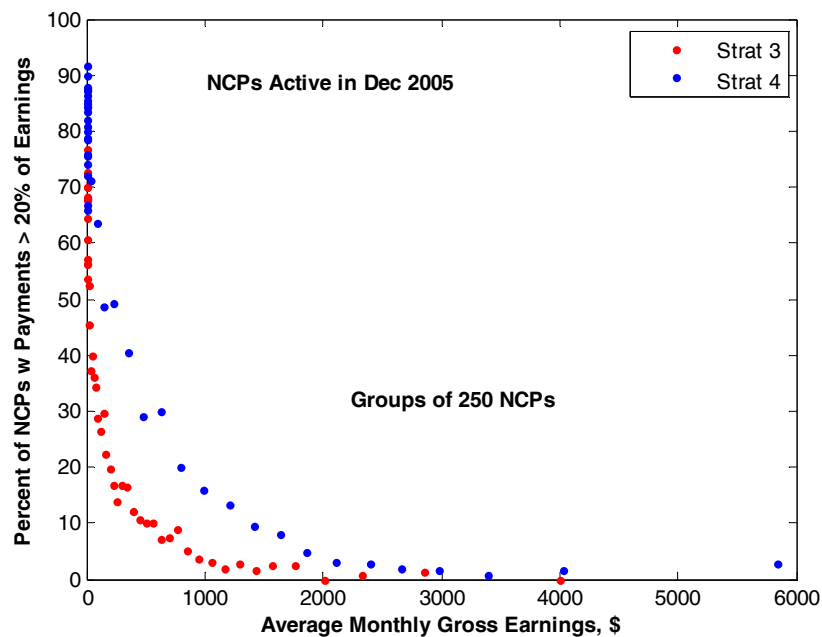
Figure 3.8: Comparing Percentage of NCPs Where Payments Exceed 20% of Wages for Dec05 Strat 1 & Strat 2 NCPs¹¹



Similar as NCPs with current support, arrear only NCPs without using other DSHS services (Strat 4) are also more likely to be paying a larger portion of income towards child support than NCPs using other DSHS services (strat 3). The data in Figure 3.9 is more sparse than the data in Figure 3.8, but the same pattern exists. The data for strat 4 NCPs consistently lie above the data for strat 3 NCPs.

¹¹ NCPs are ordered by earnings with percentages taken in groups of 250 NCPs.

Figure 3.9: Comparing Percentage of NCPs Where Payments Exceed 20% of Wages for Dec05 Strat 3 & Strat 4 NCPs¹²



This section illustrated the relationships between debt growth, earnings, and MOA, and suggests dramatic arrearage growth when MOA exceeds 20% of NCP earnings and NCP earnings below \$1,400 per month. The findings here will help to build the risk score system in the next section.

¹² NCPs are ordered by earnings with percentages taken in groups of 250 NCPs.

4 Development of Risk Score System

4.1 Risk Factors

The relationships between arrearage growth, earnings, and MOA illustrated in the last section provide support to the risk score system developed in this section. We consider six risk factors associated with NCPs: use of DCS services, use of other public services, the relation of current support to earnings, earnings below a threshold, debt above a threshold, and incarceration history. We next show how the six factors included in the calculation of risk score individually affect outcomes.

1) Use of DCS services

The extent of DCS service use is measured by the number of open cases. Payment outcomes deteriorate as the number of cases for the NCP increases. Figure 4.1 shows the rapid decline in payments as a percentage of MOA with increasing cases. NCPs with only one case pay an average of 85.2% of current support, NCPs with two cases pay an average of 72.3% of MOA, and NCPs with three cases pay an average of 59.6% of MOA. Data points become erratic at higher case numbers because these points include only small numbers of NCPs. See Appendix IV-2 for detailed information.

Figure 4.1: Payment Outcomes Relate to Number of NCP Cases

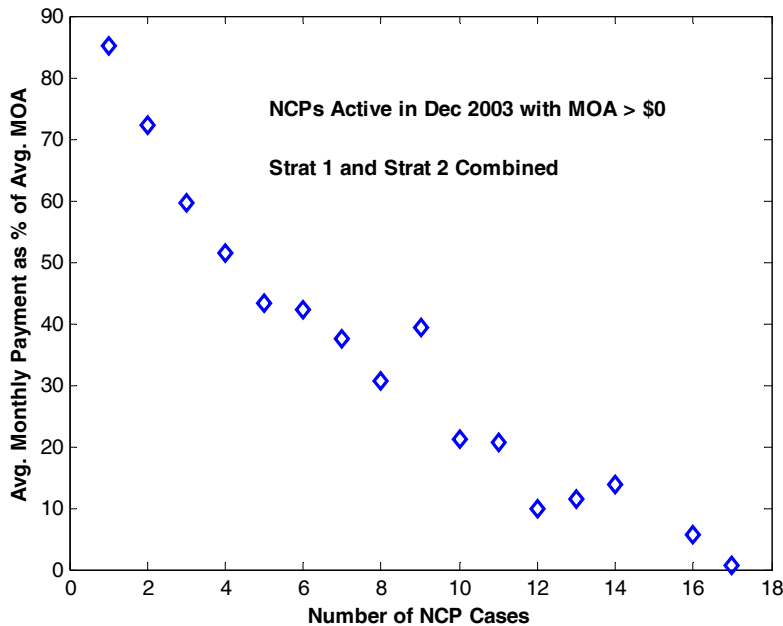


Figure 4.1 exposes an important pattern by suppressing variability (each data point in the chart represents a group of NCPs with a range of percentage payment), but the relationship between payment outcomes and number of cases is also statistically significant at the individual level (see Appendix IV-2).

Figure 4.2 shows that as number of cases increase, on average, MOA to wage ratio increases which leads to the increase of total arrears. We also found that NCPs with multiple cases are more likely to have incarceration history and tend to use more of the other DSHS services. Each of these factors indicates that NCPs with more cases have less ability to pay.

Figure 4.2 Total Arrears Relate to Number of Cases

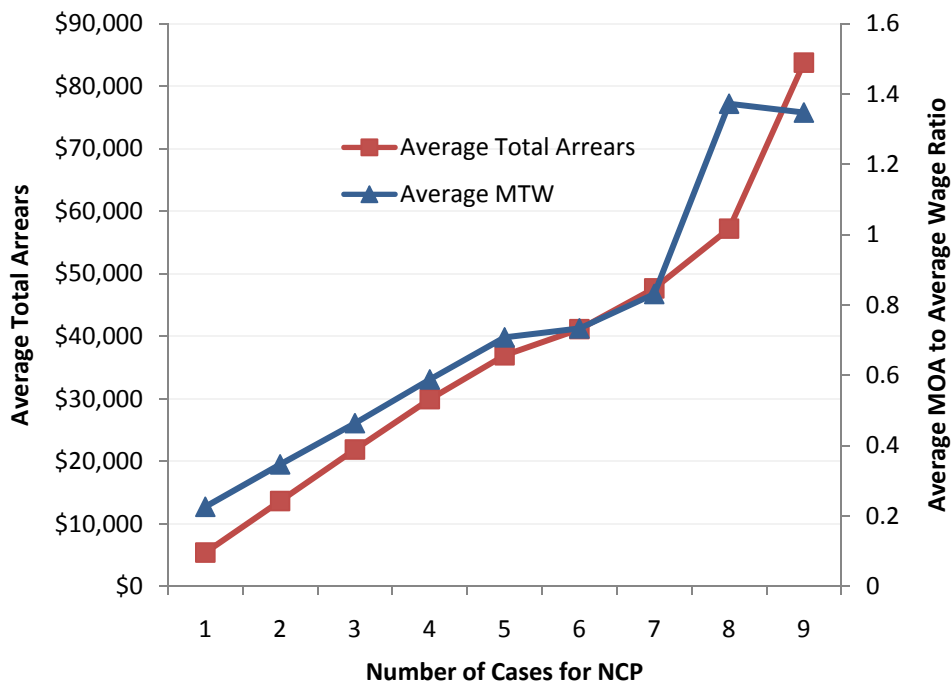


Table 4.1 compares the total arrearage for NCPs with a single case to NCPs with multiple cases. In approximate terms, 20% of NCPs have multiple cases but they carry nearly as much debt as the 80% of NCPs who have single cases.

Table 4.1 NCPs with Single Cases vs. NCPs with Multiple Cases

Dec03 NCPs	Singe Case	Multiple Cases
Total number of NCPs	161,833	39,997
% of NCPs	80.2%	19.8%
Total number of custodial families involved	161,833	100,370
Total number of children involved	254,721	110,805
Total Arrearage over 48 Months	\$874 Million	\$708 Million
% of Total Arrearage	55.2%	44.8%

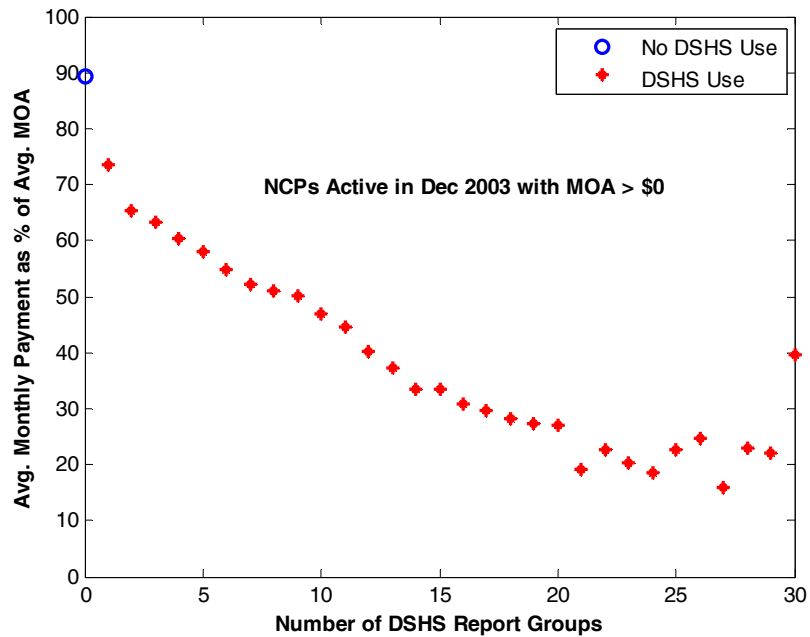
2) Use of Public Services

NCP use of other public services is clearly linked to poor payment outcomes. The CSDB contains a wealth of information on public service use. We obtain this information by month rolled up at what is called the report group level. Each report group gathers together similar services within a DSHS sub-agency, with 70-80 report groups overall in DSHS. For each NCP, for each month of public service use, we obtain the report groups used, the number of service events in each report group, and the cost of services used in each report group. While CSDB production lags current time by one or two years, we have found strong correlations in service use across years, and that CSDB data as much as five years old can relate to outcomes (see Appendix II). For this reason we use four years of public service use data in stratification and risk score.

With our CSDB data we can measure extent of use by number of service months, number of service events, service costs, or number of report groups. All of these measures show the same thing – any use of services, even only one month of service, is linked to poorer payment outcomes. We have chosen to use the number of report groups, reasoning that use of a wider range of services indicates a wider range of problem issues with less likelihood of resolution. The integer nature and smaller range of the number of report groups is also analytically useful.

As an example, Figure 4.3 shows how average payments as a percentage of average monthly order amount (MOA) decrease with increasing number of report groups used. Data points above 20 report groups are erratic because these points include only small numbers of NCPs. See Appendix IV-3. When MOA is more than \$0, with no groups used (blue circle in Figure, no other DSHS services used, strat 2 NCPs) payments are 89.3% of MOA, but when just one group is used (first red star on chart, use of other DSHS services, strat 1) payments are 73.6% of MOA; this is almost a sixteen percentage point drop in payments on obligations.

Figure 4.3 exposes an important pattern by suppressing variability (each data point in the chart represents a group of NCPs with a range of percentage payment), but the relationship between payment outcomes and extent of public service use is also statistically significant at the individual level (see Appendix IV-4).

Figure 4.3: Payment Outcomes Relate to Extent of Use of Public Services

3) Relations Between MOA and Earnings

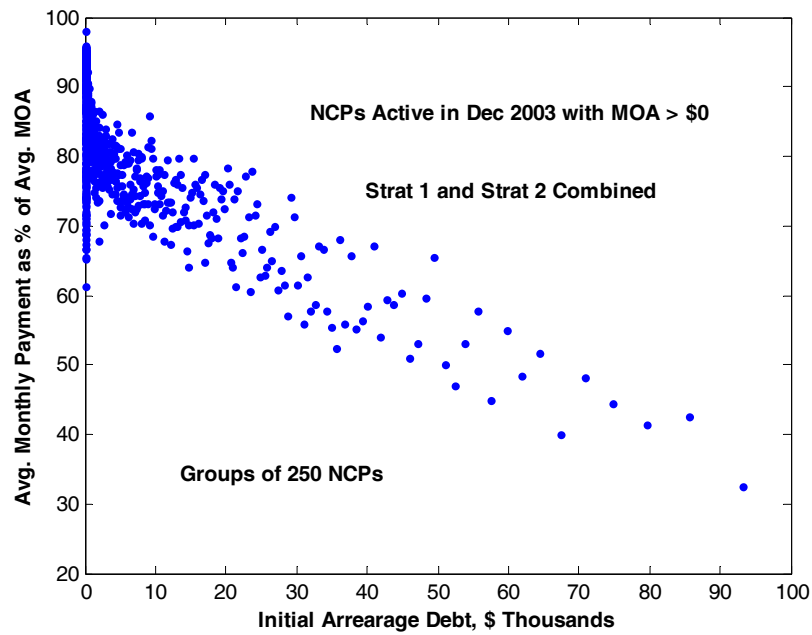
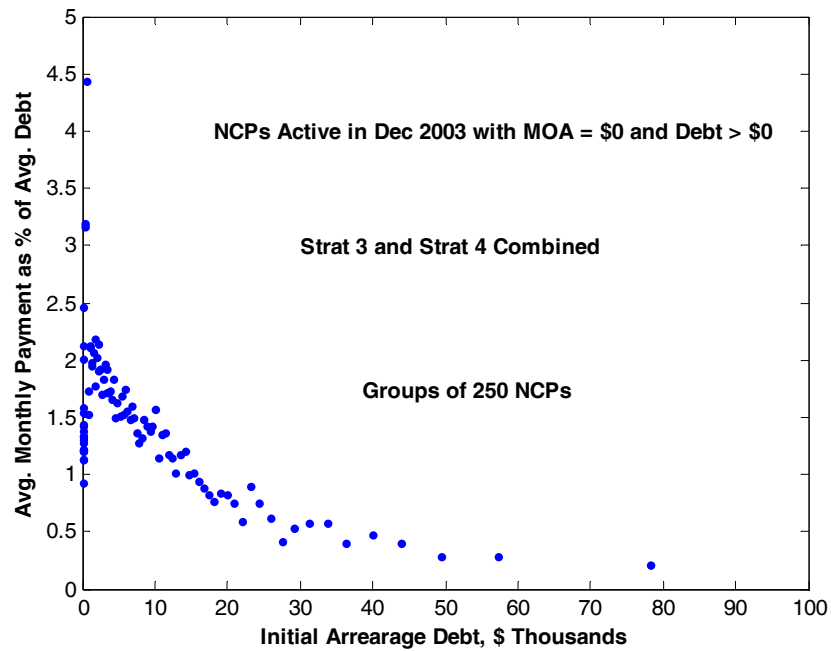
The last section demonstrated that arrearage growth generally occurs when MOA is above 20% of earnings. Therefore, MOA at 20% of earnings will be used in defining risk scores.

4) Low Wage

The last section demonstrated that arrearage growth can be expected when NCPs have average monthly gross earnings less than \$1,400. This value will be used as a threshold in defining risk scores.

5) High Debt

If the NCP has a high arrearage debt at the beginning of the observation period this most likely means that low payments relative to obligation have been made in the past. This behavior is also likely to continue. Figure 4.4 shows that higher debt at the beginning of the 48-month period relates to lower payments on MOA during the 48 month period for NCPs with current support due. Figure 4.5 shows that this is also the situation for NCPs who only owe arrears.

Figure 4.4: Payment on MOA Relates to Initial Debt for Dec03 Strat 1 and Strat 2 NCPs**Figure 4.5: Payment on Arrears Relates to Initial Debt for Dec03 Strat 3 and Strat 4 NCPs**

Figures 4.4 and 4.5 expose important patterns by suppressing variability (each data point in the chart represents a group of NCPs with a range of percentage payment), but the relationship between payment outcomes and initial debt is also statistically significant at the individual level (see Appendix IV-4).

6) Incarceration History

For Dec03 NCPs we used incarceration records from March 2002 to June 2004. Of the 259,412 NCPs with December 2003 active cases 3,303 had incarceration records in the 28 month period. Although incarceration history is not common, payment outcomes are significantly lower with incarceration history.

NCPs with DOC records have higher debt, make more costly use of other DSHS services, have lower wages, and pay a lower fraction of MOA. Overall, NCPs with incarceration history paid 19.9% of MOA while NCPs without incarceration history paid 83.7% of MOA.

NCPs with DSHS service history are more likely to also have DOC history. The percent of NCPs with incarceration history in strat 1 (DSHS service use) is about double that in strat 2 (no DSHS service use) and the percent of NCPs with incarceration history in strat 3 (DSHS service use) is higher than in strat 4 (no DSHS service use). These differences are statistically significant with $p < 0.0001$.

Table 4.2 compares Dec03 NCPs with and without incarceration history in the four strata. All differences within stratum are t-test significant at the $p < 0.0001$ level, except for strat 4 as indicated in the table footnotes. Payment as a percent of current support due drops from 65.3% to 28.0% in strat 1 and from 91.4% to 33.9% in strat 2. Payment as a percent of average arrearage debt drops from 3.3% to 0.5% in strat 3 and from 3.5% to 0.6% in strat 4.

Table 4.2: The Effect of Incarceration History

	strat 1		strat 2		strat 3		strat 4*	
	No DOC	DOC	No DOC	DOC	No DOC	DOC	No DOC	DOC
num NCPs	76,045	2,183	106,040	787	12,071	240	11,156	66
Avg. Pmt	\$137	\$34	\$327	\$45	\$46	\$20	\$99	\$30
Avg. MOA	\$223	\$192	\$365	\$202	\$0	\$0	\$0	\$0
Avg. Debt	\$9,059	\$17,467	\$6,041	\$18,166	\$8,094	\$11,842	\$9,848	\$12,168
Pct. Pmt #	65.3%	28.0%	91.4%	33.9%	3.3%	0.5%	3.5%	0.6%

- percent payment calculated at the individual level as payment/MOA in strat 1 and strat 2 and as payment/debt in strat 3 and strat 4; Pct. Pmt analysis restricted to NCPs with less than 500% payment.

* - t-test significance: Avg. Pmt $p=0.02$, Avg. Debt not significant, Pct. Pmt $p=0.03$.

4.2 Risk Score

We developed the risk score based on the risk factors analyzed in section 4.1. There are correlations between the factors and this makes it difficult to determine the true magnitude of effect for each factor. We make no claim that this is the best possible ranking system. However, what we do have does show good discrimination in ranking NCPs for likelihood of poor payment outcomes. Attempts at weighting factors did not improve discrimination.

The risk score for each NCP is the sum of:

- 1) Number of NCP cases,
- 2) Number of CSDB report groups (each group counted only once)
- 3) High MOA – wage ratio (MTW) indicator:
 - a) =0 when average MOA is 20% or less of average wages
 - b) =1 when average MOA is more than 20% of average wages
 - c) =2 when average MOA is more than 40% of average wages
- 4) Low wages indicator:
 - a) =0 when average wages are \$1,400 or higher
 - b) =1 when average wages are less than \$1,400
 - c) =2 when average wages are less than \$250
- 5) High debt indicator:
 - a) =0 when average TARRS is \$10,000 or less¹³
 - b) =1 when average TARRS is more than \$10,000¹⁴
 - c) =2 when average TARRS is more than \$17,000¹⁵
- 6) Department of Corrections (DOC) status:
 - a) =0 when no DOC record
 - b) =1 if DOC record

¹³ Initial debt less than \$8,000 was used for Dec07 NCPs.

¹⁴ Initial debt more than \$8,000 was used for Dec07 NCPs.

¹⁵ Initial debt more than \$15,000 was used for Dec07 NCPs.

The average risk scores for the four labeled strata in Figures 2.2 and 2.4 flow diagrams are given in Tables 2.2 and 2.4.

Figure 4.6 presents percentage payment on MOA for in-state NCPs with MOA more than \$0, comparing NCPs with and without DSHS use (strat 1 and strat 2, respectively). At low risk scores the results are nearly identical for the two groups, but at risk score of around 7, NCPs with no DSHS service use begin to show a lower percentage payment than NCPs with DSHS use. While Table 2.2 showed that strat 2 NCPs on average paid a higher percentage of MOA than strat 1 NCPs, this is because strat 2 NCPs generally have lower risk than strat 2 NCPs (3.7 vs. 10.8 from Table 2.2). The relationship of payment on MOA and risk score for Dec05 NCPs is similar to that of Dec03 NCPs even though at low risk, payments as a percentage of MOA are a little higher than seen in Dec03 NCPs (Figure 4.7).

Figure 4.6: Payment on MOA Is Related to Risk Score for Dec03 Strat 1 & Strat 2 NCPs

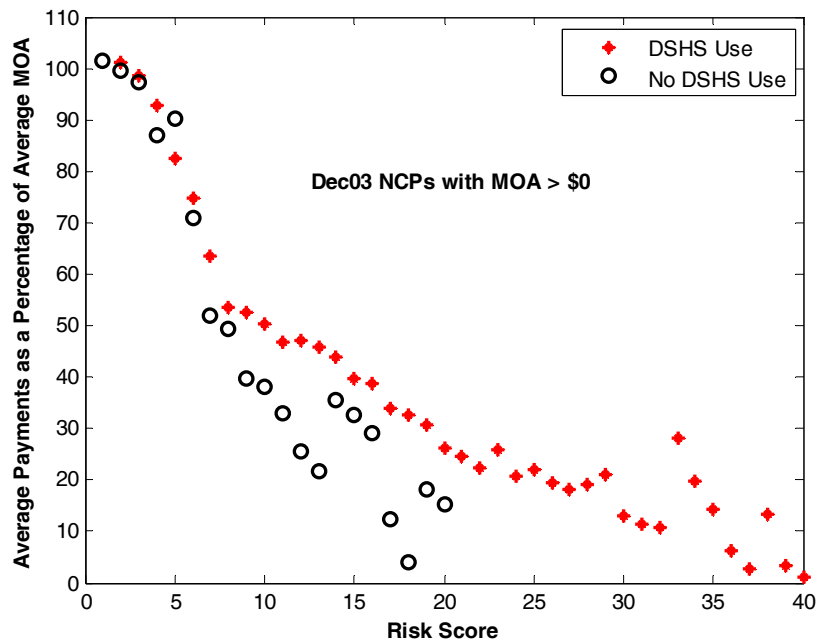
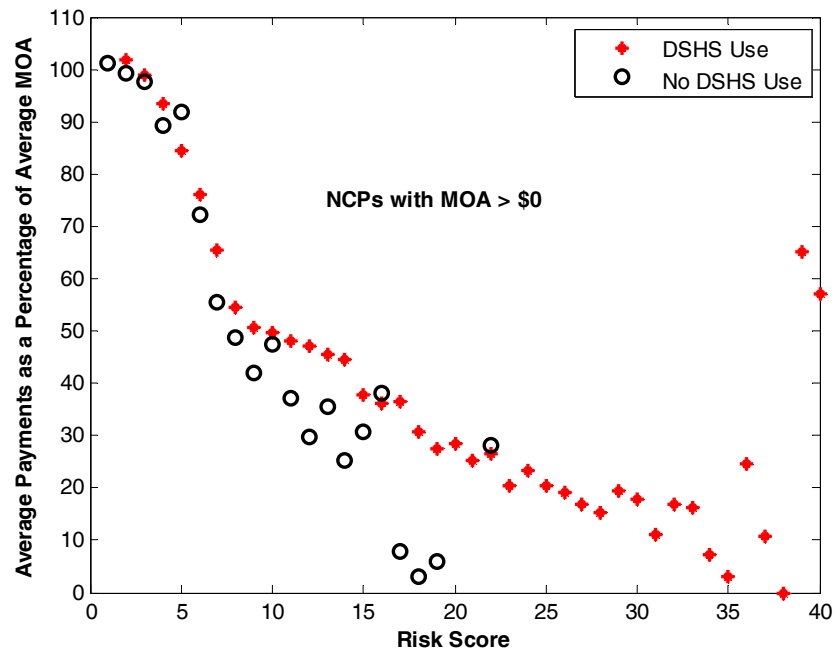


Figure 4.7: Payment on MOA Is Related to Risk Score for Dec05 Strat 1 & Strat 2 NCPs

The consequences of the reduction in percent payment for strat 2 NCPs are seen in Figure 4.8 where arrearage growth over the 48 months for strat 1 NCPs levels off at under \$5,000 as risk score increases, while arrearage growth for strat 2 NCPs continues to climb to over \$40,000 as risk score increases. This trend also holds true for Dec05 NCPs (Figure 4.9).

Figure 4.8 Arrearage Growth Is Related to Risk Score for Dec03 Strat 1 & Strat 2 NCPs

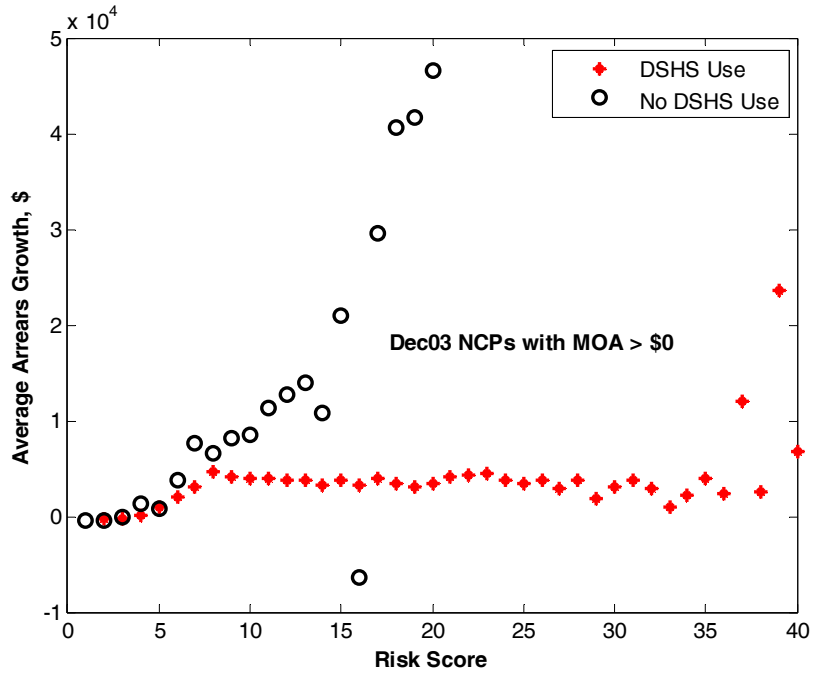


Figure 4.9: Arrearage Growth Is Related to Risk Score for Dec05 Strat 1 & Strat 2 NCPs

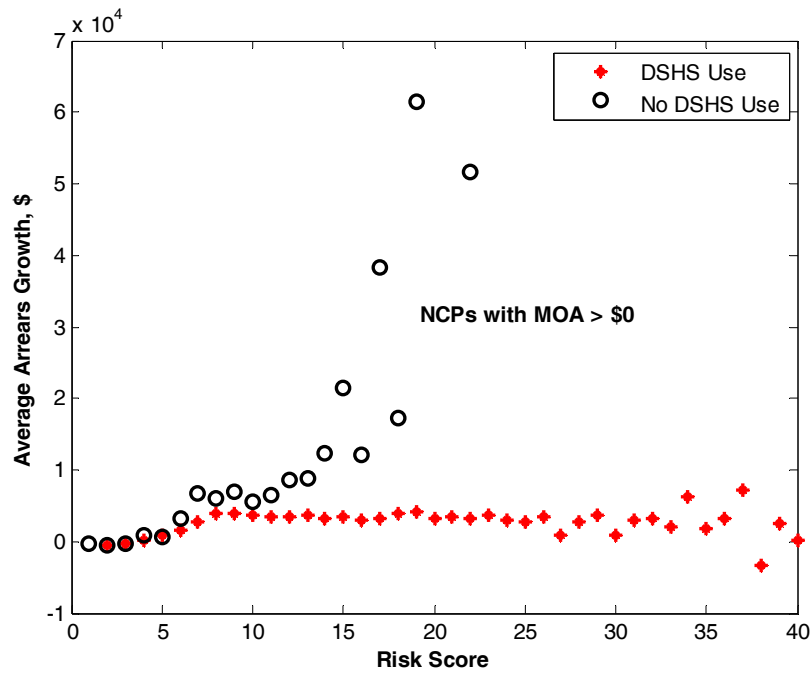
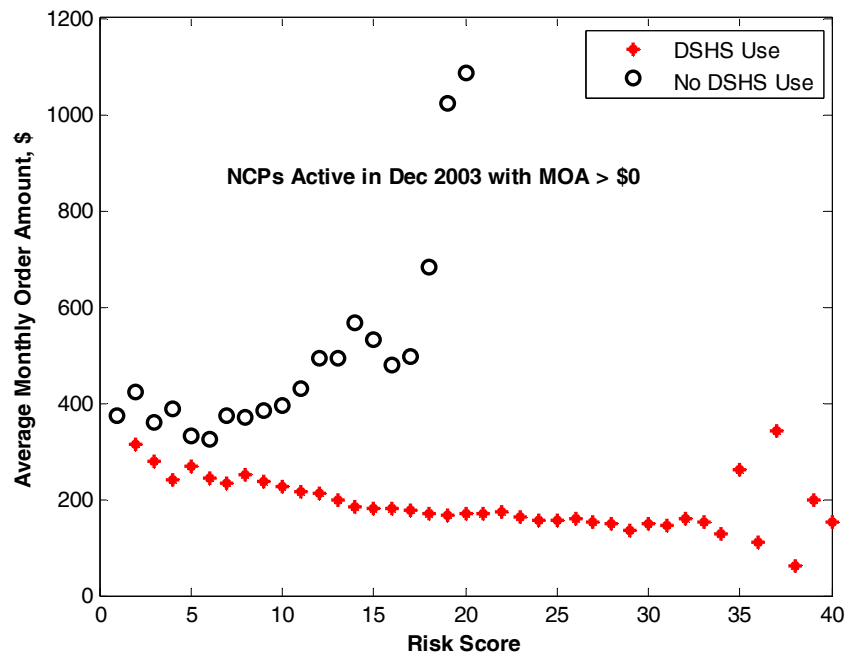


Figure 4.10 shows that as risk score increases MOA for strat 1 NCPs decreases but MOA for strat 2 NCPs generally increases.

Figure 4.10: MOA Is Related to Risk Score for Dec03 Strat 1 & Strat 2 NCPs



However, as Figure 4.11 shows, earnings levels are lower for strat 2 NCPs at comparable risk scores, except for one data point at risk score 19 (the lowest risk score is 2 in strat 1 so there is no comparison for risk score 1 in strat 2).

Figure 4.11: Earnings Are Related to Risk Score for Dec03 Strat 1 & Strat 2 NCPs

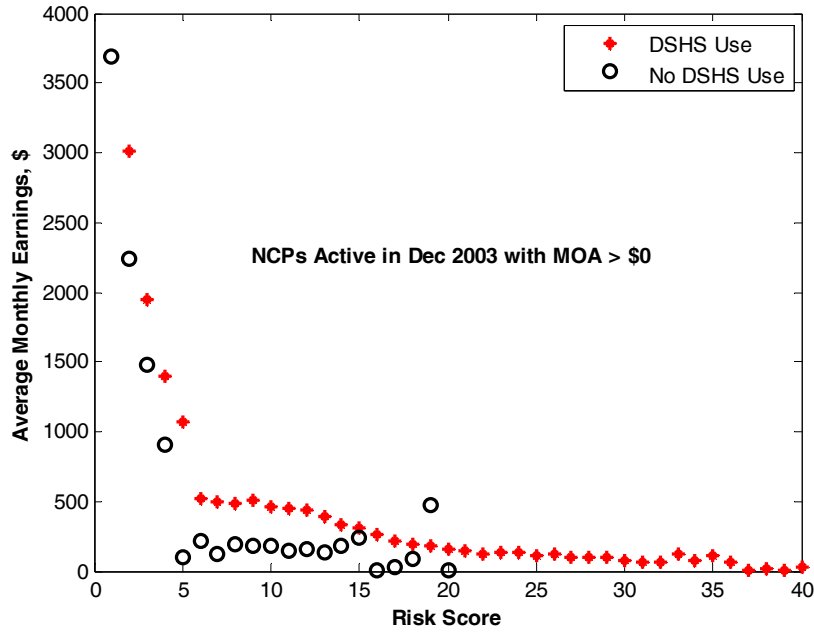
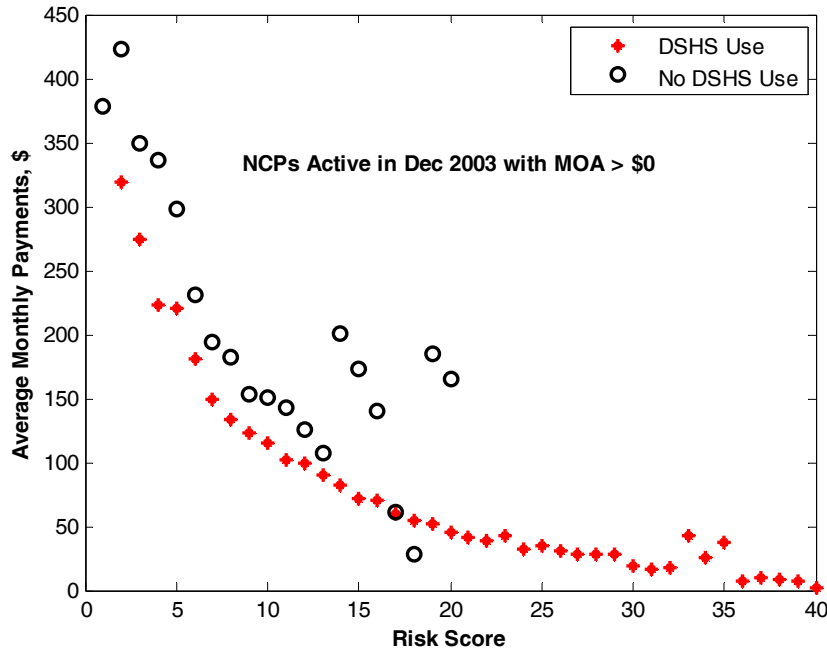


Figure 4.12 shows that payment amounts by strat 2 NCPs are higher than payments by strat 1 NCPs but payments are not enough higher to meet substantially higher MOAs. But since earnings are lower in strat 2 these NCPs are paying a higher portion of earnings towards child support than comparable risk NCPs in strat 1.

Figure 4.12: Payments Are Related to Risk Score for Dec03 Strat 1 & Strat 2 NCPs



This may suggest that the child support system is accommodating hardships for NCPs with DSHS use by setting lower MOAs, but not recognizing hardships for NCPs with no use of DSHS. Since there are 49,536 strat 2 NCPs with risk score 5 or higher this could be a serious problem. For strat 2 NCPs with risk score 5 or higher the total initial debt was \$434.5 million and the total debt growth over the 48 month period was \$140.8 million. This totals to \$575.3 million at the end of the 48 months and may be mostly uncollectible debt, or, at best marginally collectible debt.

When we compare the components of risk score for strat 1 and strat 2 NCPs with risk score between 5 and 14, strat 1 NCPs gain a higher risk score mainly by increasing the number of DSHS report groups accessed, but strat 2 NCPs gain a higher risk score by increasing risk in all other risk components.

For strat 3 and strat 4 NCPs, since no current support is due, we use payments as a percentage of average TARRS to measure payment outcomes. In Figure 4.13, at comparable scores, percent payment is always lower in strat 4 (the lowest risk score is 2 in strat 3 so there is no comparison for risk score 1 in strat 4). Figure 4.14 shows the similar trend for Dec05 NCPs.

Figure 4.13: Payment on Debt Is Related to Risk Score for Dec03 Strat 3 & Strat 4 NCPs

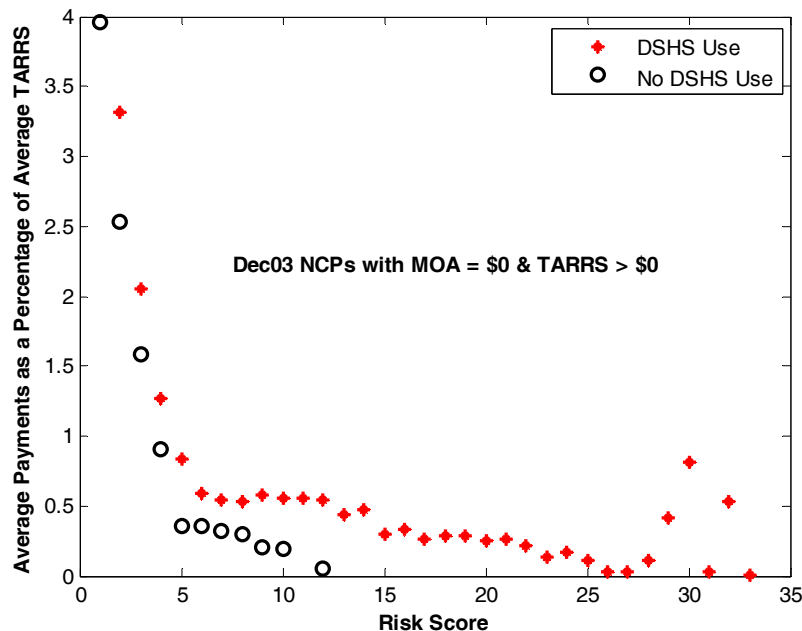
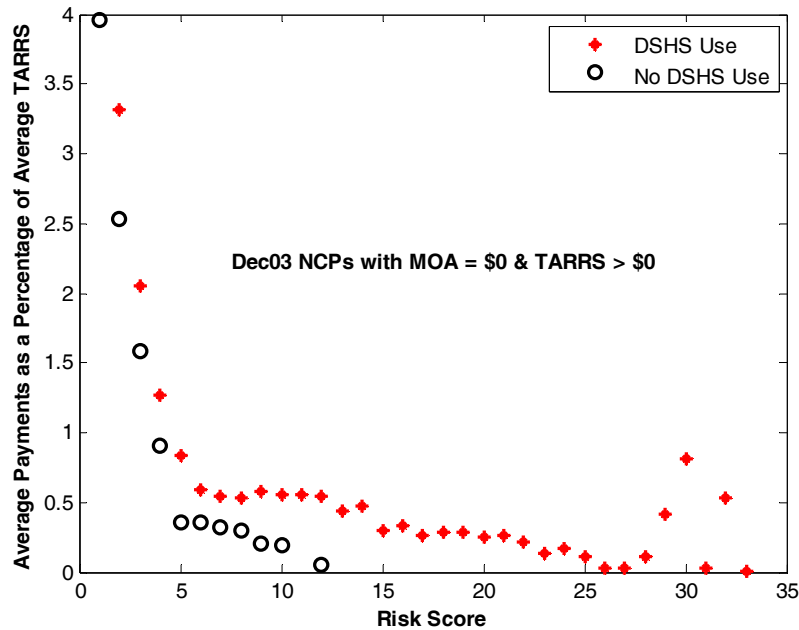


Figure 4.14: Payment on Debt Is Related to Risk Score for Dec05 Strat 3 & Strat 4 NCPs



However, as Figure 4.15 shows, the level of debt paid off by strat 3 NCPs does not change much with risk score, but strat 4 NCPs actually pay off more debt as risk score increases. Above risk score 7 for strat 4 NCPs the data points may not be meaningful because of the low numbers of NCPs. While strat 4 NCPs are paying a smaller percentage of debt than strat 3 NCPs, their debt is much larger. This is why they can be paying a smaller percentage but a larger amount. Similar trend for Dec05 NCPs is shown in Figure 4.16.

Figure 4.15: Arrearage Growth Is Related to Risk Score for Dec03 Strat 3 & Strat 4 NCPs

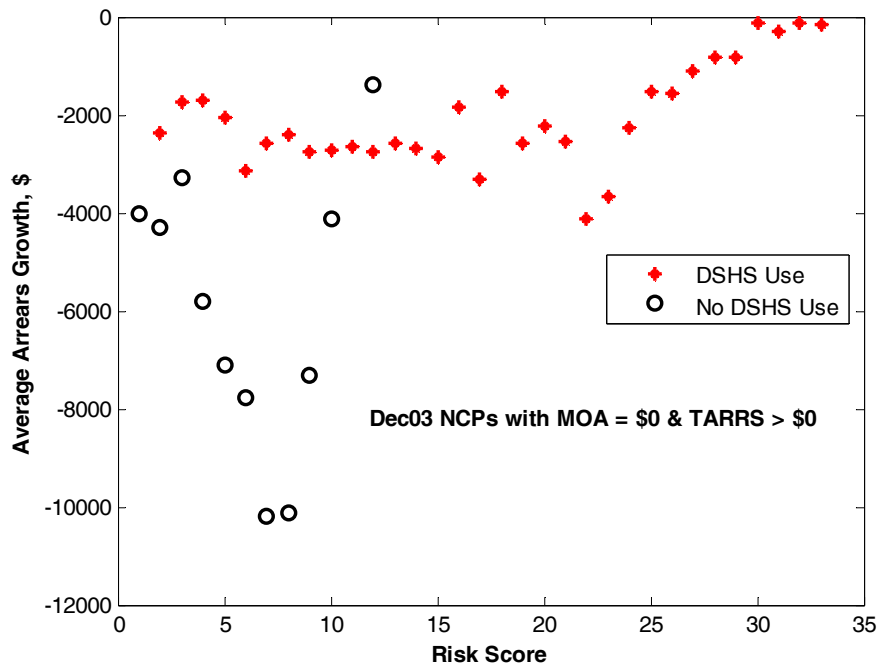


Figure 4.16: Arrearage Growth Is Related to Risk Score for Dec05 Strat 3 & Strat 4 NCPs

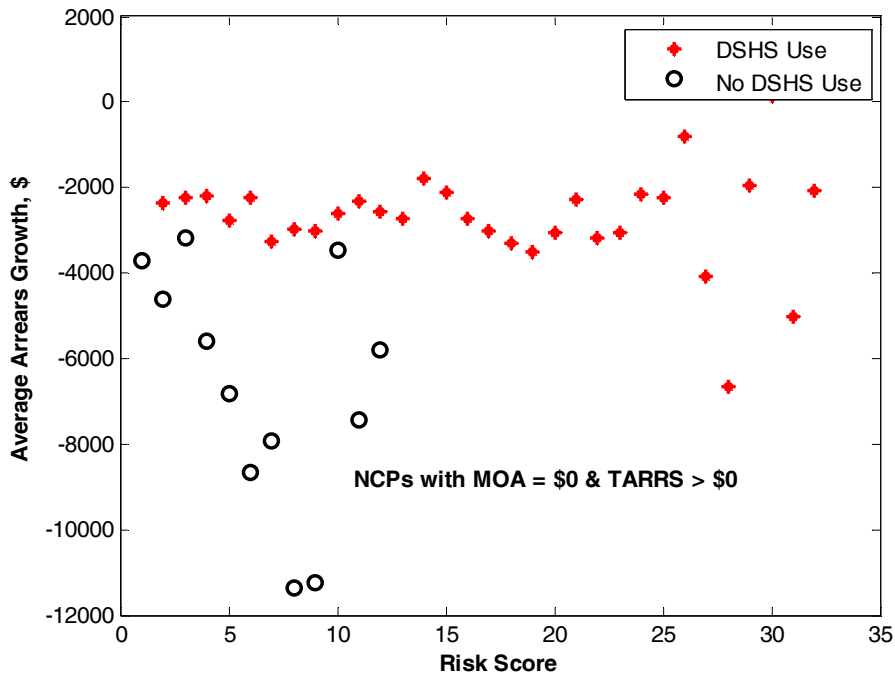
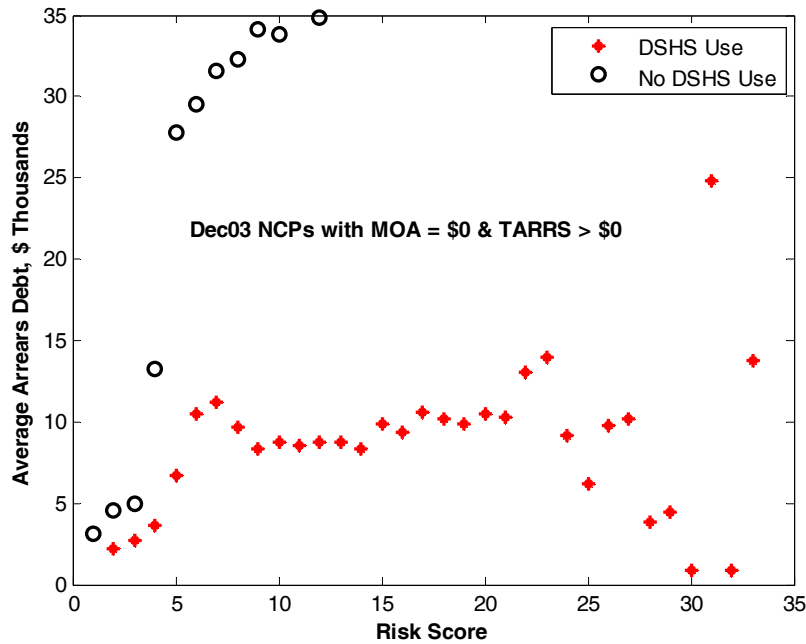


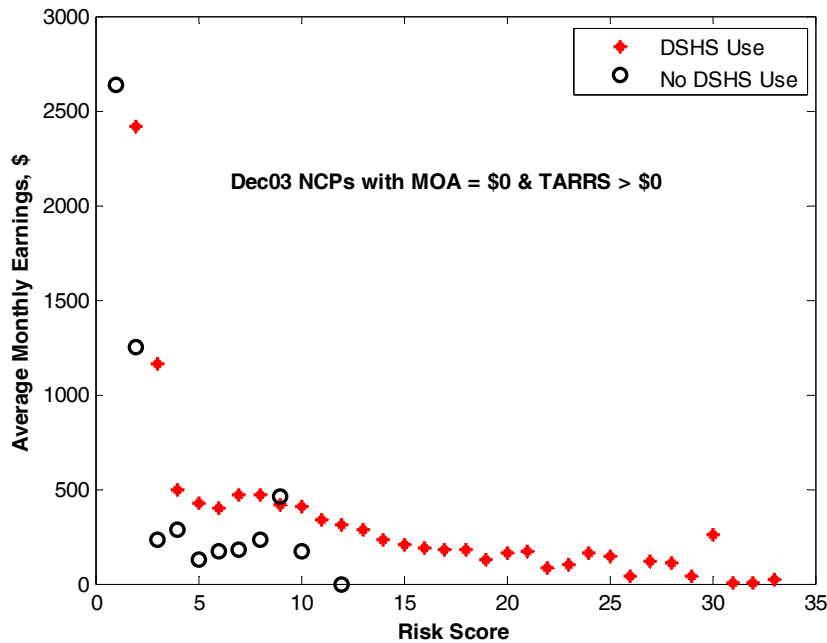
Figure 4.17 shows that average debt levels off for strat 3 NCPs but continues to increase for strat 4 NCPs as risk score increases. Strat 4 average debt becomes over three times strat 3 average debt.

Figure 4.17: Average Debt Is Related to Risk Score for Dec03 Strat 3 & Strat 4 NCPs



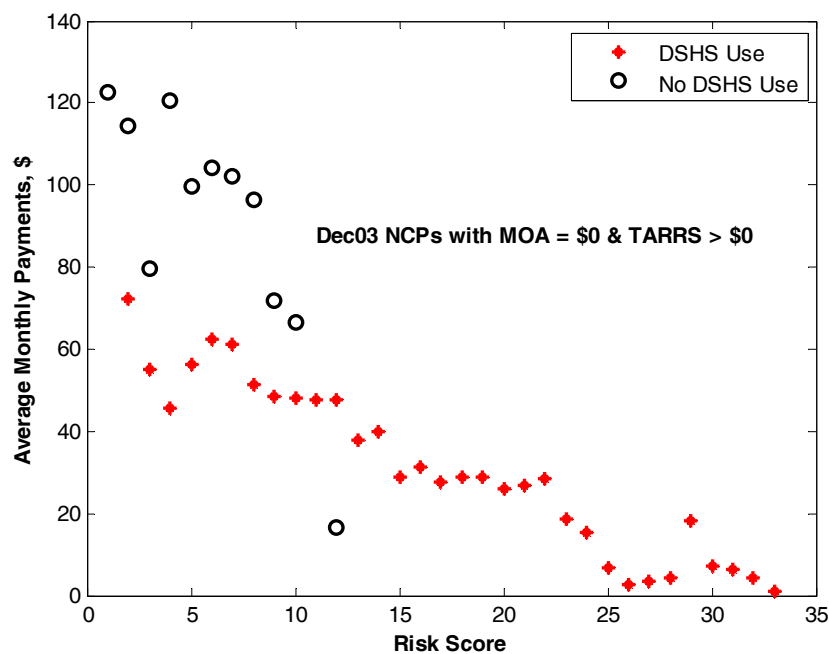
In Figure 4.18 we see that average earnings at comparable risk score are lower for strat 4 NCPs, except for the data point at score 9.

Figure 4.18: Earnings Are Related to Risk Score for Dec03 Strat 3 & Strat 4 NCPs



But in Figure 4.19 we see that payments at comparable risk score are higher for strat 4 than for strat 3, except for the final strat 4 data point.

Figure 4.19: Payments Are Related to Risk Score for Dec03 Strat 3 & Strat 4 NCPs



Our risk score is potentially very useful in managing child support arrearage debt. In the analysis presented above risk score has allowed us to identify high risk NCPs in strat 2 whose circumstances may suggest the necessity of a downward modification of current support. The risk score can also identify NCPs where a more aggressive collections approach may improve payment outcomes.

5 Spells of Arrearage Change

This section will examine another NCP characteristic, payment pattern, through checking their spells of arrear change¹⁶. The timing of payments is critically important for custodial family well-being—children must be fed and cared for every day. Stable and dependable support payments can help custodial families build stability into their lives. Our past work has shown that greater custodial family self-sufficiency and cost avoidance in other areas of public support programs can be attributed to full regular payments of child support (Formoso, Liu, & Welch, 2008; Formoso, 2007; Formoso, 2004). Reductions in costs for Medicaid, Food Stamps, and TANF attributable to full regular payments of child support for custodial families were estimated to be \$114 million in SFY07 (July 2006 to June 2007). In Washington State, cost avoidance has been larger than cost recovery from retained support since SFY01. From a social service point of view the timing of payments may be more important than the amount collected. For NCPs we look at spells of arrearage change and determine periods of time with beneficial payment patterns and periods of time with detrimental payment patterns.

In our original study of arrearage growth (Formoso, 2003) we looked at spells of arrearage change and determined the duration as well as debt change of each spell. We found that the most common spell sequences were alternating spells of increasing debt and decreasing debt. For Dec03 NCPs 79% of spells of increasing debt are terminated by a spell of decreasing debt, and 61% of spells of decreasing debt are terminated by a spell of increasing debt. For Dec05 NCPs 80% of spells of increasing debt are terminated by a spell of decreasing debt, and 53% of spells of decreasing debt are terminated by a spell of increasing debt.

Table 5.1 compares debt change exhibited by Dec03 and Dec05 NCPs. The cohort of 95Q3 NCPs¹⁷ are also included to show the spell of debt change over the time. The debt increase due to spells of increasing debt are not very different in the three time periods, but the debt decrease due to spells of decreasing debt provide a larger offset to debt growth in the two later periods. Even though the study period is longer for Dec03 and there are more NCPs total debt growth is considerably smaller than for the 95Q3 study. There are even more NCPs in the Dec05 study but total debt growth is smaller than in the Dec03 study.

¹⁶ Month-to-month differences in total arrears debt (TARRS) are calculated and assigned to spells of increasing debt, spells of no debt change, spells of decreasing debt, or undetermined spells. Spells of undetermined debt change occur when the NCP has no open case in a month or series of months.

¹⁷ NCPs selected from all active cases in 3rd calendar quarter of 1995 in the V1 study.

Table 5.1: Compare Spells of Debt Change by Cohort

	95Q3*	Dec03	Dec05
# NCPs	241,575	259,412	272,581
# Study Months	45	48	48
Debt Change for Increase Spells, Million \$	\$1,134	\$1,297	\$1,267
Debt Change for Decrease Spells, Million \$	-\$592	-\$989	-\$1,021
Total Debt Change, Million \$	\$543	\$309	\$246

* see Formoso, 2003

Next we look at spell structure for Dec03 NCPs in each of the strata. Table 5.2 compares spells in strat 1 and strat 2 (NCPs with current support due, with/without use of other public services) while Table 5.3 compares spells in strat 3 and strat 4 (NCPs with arrearage debt, no current support due, with/without use of other public services). During the same study period, NCPs in strat 1 spent total 1,714,113 months, or average 22.4 months, in spells of increasing debt while NCPs in strat 2 spent total 1,540,850 months, or average 15.9 months, in spells of increasing debt. Therefore, total debt increase for strat 2 NCPs are \$93 million, or 40.5%, less than the total debt increase for strat 1 NCPs. For arrear only NCPs (strat 3 and strat 4), debt change primarily refers to debt decrease. Strat 4 NCPs spent 23.3 months on average in spells of decreasing debt compared with the average 17.7 months for strat 3 NCPs. Thus, the total debt decrease for strat 4 NCPs are \$22 million, or 71.0%, more than the total debt decrease for strat 3 NCPs.

Table 5.2: Spell Structure for Dec03 NCPs in Strat 1 & Strat 2

strat 1

Spell Type	Avg Time, Months	# NCP	# Spells	Spells/NCP	Total Debt Change, Million \$	Debt Change per NCP, \$	Debt Change per Spell, \$
All Decrease	2.81	68,504	296,460	4.3	-\$304	-\$4,431	-\$1,024
All No Change	4.81	58,454	151,205	2.6	\$0	\$0	\$0
All Increase	5.72	76,652	299,831	3.9	\$531	\$6,922	\$1,770
All UnDetermined	12.08	31,650	39,664	1.3	\$0	\$0	\$0
All Spells	4.77	78,228	787,160	10.1	\$227	\$2,902	\$288

strat 2

Spell Type	Avg Time, Months	# NCP	# Spells	Spells/NCP	Total Debt Change, Million \$	Debt Change per NCP, \$	Debt Change per Spell, \$
All Decrease	2.74	92,988	476,307	5.1	-\$413	-\$4,443	-\$867
All No Change	6.35	88,729	268,353	3.0	\$0	\$0	\$0
All Increase	3.32	96,552	464,567	4.8	\$548	\$5,680	\$1,180
All UnDetermined	12.12	40,190	47,709	1.2	\$0	\$0	\$0
All Spells	4.08	106,827	1,256,936	11.8	\$135	\$1,266	\$108

Table 5.3: Spell Structure for Dec03 NCPs in Strat 3 & Strat 4

strat 3

Spell Type	Avg Time, Months	# NCP	# Spells	Spells/NCP	Total Debt Change, Million \$	Debt Change per NCP, \$	Debt Change per Spell, \$
All Decrease	5.02	10,586	37,338	3.5	-\$44	-\$4,169	-\$1,024
All No Change	6.45	12,013	44,127	3.7	\$0	\$0	\$0
All Increase	1.02	4,341	4,698	1.1	\$14	\$3,113	\$1,770
All UnDetermined	13.79	6,183	8,273	1.3	\$0	\$0	
All Spells	6.26	12,311	94,436	7.7	-\$31	-\$2,487	-\$324

strat 4

Spell Type	Avg Time, Months	# NCP	# Spells	Spells/NCP	Total Debt Change, Million \$	Debt Change per NCP, \$	Debt Change per Spell, \$
All Decrease	5.87	10,240	40,643	4.0	-\$66	-\$6,470	-\$1,630
All No Change	4.85	10,661	43,231	4.1	\$0	\$0	\$0
All Increase	1.02	2,946	3,217	1.1	\$13	\$4,556	\$4,172
All UnDetermined	13.45	5,263	6,478	1.2	\$0	\$0	
All Spells	5.76	11,222	93,569	8.3	-\$53	-\$4,708	-\$565

The difference in total debt change by strata can be explained by the spell structure and the time spent on the different type of spells (Figure 5.4). For strat 1 and strat 2 NCPs with current support due, spells with no change in debt indicate that full payment on current support has been made; thus both spells of decreasing debt and spells with no debt change can be considered beneficial, while spells with increasing debt are detrimental. The ratio of beneficial to detrimental spells is 1.49 for strat 1 NCPs and 1.60 for strat 2 NCPs. When we include the time factor the difference between strat 1 and strat 2 becomes more dramatic. The total time the group spends in a particular spell type is obtained by multiplying the average time by the number of spells. Strat 1 NCPs spend 41.6% of total spell time in beneficial spells, with 0.91 as the ratio of beneficial time to detrimental time. The corresponding numbers for strat 2 NCPs are 58.7% and 1.95. Strat 2 NCPs spend relatively more time in beneficial payment behaviors and relatively less time in detrimental payment behaviors.

Table 5.4 Beneficial to Detrimental Time Ratio by Strata, Dec03 NCPs

	Strat 1	Strat 2	Strat 3	Strat 4
% Beneficial Spells	56.9%	59.2%	39.5%	43.4%
% Detrimental Spells	38.1%	37.0%	51.7%	49.6%
Beneficial Spells/Detrimental Spells	1.49	1.60	0.76	0.88
% Beneficial Spell Time	41.6%	58.7%	31.7%	44.3%
% Detrimental Spell Time	45.6%	30.0%	49.0%	39.5%
Beneficial Spell Time/Detrimental Spell Time	0.91	1.95	0.65	1.12

Table A.12 Time Ratio by Risk Score (Strat 2)

strat 2				
score	Average Months Debt Change			bene/detr time Ratio
	increase	same	decrease	
1	8.6	23.2	10.4	3.9
2	11.5	15.2	15.3	2.7
3	14.6	10.6	17.6	1.9
4	17.2	10.1	15.6	1.5
5	13.1	17.9	10.4	2.1
6	22.9	7.3	14.4	0.9
7	27.8	5.1	12.3	0.6
8	30.3	4.3	12.4	0.5
9	33.7	3.1	10.4	0.4
10	33.3	3.5	10.4	0.4
11	36.8	2.3	8.6	0.3
12	38.7	1.9	7.0	0.2
13	39.3	1.9	6.2	0.2
14	37.1	1.3	8.8	0.3
15	38.3	1.6	8.1	0.3
16	32.0	2.7	11.7	0.4
17	37.5	0.5	7.0	0.2
18	45.6	0.0	2.4	0.1
19	47.0	0.0	1.0	0.0
20	46.0	0.0	2.0	0.0

Table A.13 Time Ratio By Risk Score (Strat 3)

strat 3				
score	Average Months Debt Change			bene/detr time Ratio
	increase	same	decrease	
2	0.6	10.5	19.7	1.8
3	0.5	16.5	17.9	1.1
4	0.4	21.9	14.9	0.7
5	0.4	22.4	16.1	0.7
6	0.3	23.5	16.9	0.7
7	0.4	23.0	17.1	0.7
8	0.4	23.5	14.6	0.6
9	0.4	22.7	15.3	0.7
10	0.4	21.7	16.9	0.8
11	0.4	22.0	17.0	0.8
12	0.4	20.7	17.7	0.8
13	0.4	22.8	15.9	0.7
14	0.4	24.6	14.0	0.6
15	0.3	25.7	13.4	0.5
16	0.3	25.9	12.9	0.5
17	0.3	28.2	11.9	0.4
18	0.4	27.3	12.6	0.5
19	0.3	27.9	10.8	0.4
20	0.4	28.9	9.7	0.3
21	0.3	30.2	10.2	0.3
22	0.4	31.0	9.2	0.3
23	0.3	30.0	10.6	0.3
24	0.4	30.6	7.7	0.3
25	0.4	30.2	4.5	0.1
26	0.4	35.9	2.2	0.1
27	0.6	34.3	4.2	0.1
28	0.2	31.3	6.9	0.2
29	0.4	35.0	7.6	0.2
30	0.6	22.0	8.2	0.4
31	0.0	19.5	17.5	0.9
32	0.0	44.0	4.0	0.1
33	0.0	39.0	1.5	0.0

Table A.14 Time Ratio by Risk Score (Strat 4)

strat 4				
score	Average Months Debt Change			bene/detr timeRatio
	increase	same	decrease	
1	0.4	8.8	24.7	2.7
2	0.3	14.3	23.8	1.6
3	0.3	20.3	18.4	0.9
4	0.2	20.2	23.7	1.2
5	0.2	22.1	22.8	1.0
6	0.2	25.7	20.6	0.8
7	0.2	23.8	22.8	1.0
8	0.3	20.8	26.6	1.3
9	0.5	25.5	21.2	0.8
10	0.3	24.3	22.8	0.9
12	0.0	23.0	25.0	1.1

References

- Formoso, C., 2003. “Determining the Composition and Collectibility of Child Support Arrearages Volume1: The Longitudinal Analysis.”
<http://www.dshs.wa.gov/pdf/esa/dcs/reports/cv011prn.pdf>
- ., 2004. “Beneficial Impacts of Child Support Services on Custodial Family Self-Sufficiency.” <http://www.dshs.wa.gov/pdf/esa/dcs/reports/impacts04.pdf>
- ., 2007. “Cost Avoidance Indicator.” <http://www.dshs.wa.gov/dcs/resources/reports.asp>
- Formoso, C., Liu, Q., and Welch. C., 2008, ‘Regular Child Support Helps State Lower Cost of Welfare Assistance,’ Policy and Practice.
- Office of Child Support Enforcement., 2004. “The Story Behind the Numbers: Who Owes the Child Support Debt?” <http://www.acf.hhs.gov/programs/cse/pol/IM/2004/im-04-04a.pdf>
- Peters, J., 2003. “Determining the Composition and Collectibility of Child Support Arrearages Volume 2: The Case Assessment.”
<http://www.dshs.wa.gov/pdf/esa/dcs/reports/caseassessmentfinal.pdf>
- Sorensen, E., Koball, H., Pomper, K., Zibman, C., 2003. “Examining Child Support Arrears in California: The Collectibility Study.” Urban Institute.
- Virginia Division of Child Support Enforcement., 2007. “The Right Track Project – Customer-Centered Services and Arrearage Management: An Experimental Approach to Support Payment Consistency and Arrearage Reduction for Low-Income Noncustodial Parents. Volumes I and II.”
http://www.dss.virginia.gov/files/about/reports/children/child_support/2007/right_track_final_9-19-08.pdf