

THE EFFECTS OF PERMANENT PARTIAL DISABILITY ON CLAIM DISPOSITION
AGREEMENTS

by

BRANDY L. TODD

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Dr. ~~Jessica~~ Greene, Chair of the Examining Committee

5/27/10

Date

Committee In Charge

Dr. Jessica Greene, Chair

Dr. L. Leete

Dr. R. Irvin

Accepted by:

Dean of the Graduate School

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Increasingly, workers' compensation (WC) insurers are turning to *claim disposition agreements* (CDA) as a means of reducing costs. CDAs are agreements between injured workers and insurers that close claims for a lump sum payment in lieu of other payments to which workers may be entitled. Intuitively, CDA payment amounts are expected to vary in response to changes in WC benefit levels. Models for decision-making processes related to lump sum versus benefit streams suggest the opposite. This thesis examines the relationship between CDA amounts and *permanent partial disability* (PPD) using two models. The first model utilizes individual claim information before and after a legislated benefit increase in the state of Oregon. The second model examines aggregate claims and payments made over a 16-year period from 1990 through 1995.

CURRICULUM VITAE

NAME OF AUTHOR: Brandy Todd

PLACE OF BIRTH: Lodi, California

DATE OF BIRTH: January 20, 1977

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene
Oregon State University, Eugene

DEGREES AWARDED:

Master of Public Administration, 2010, University of Oregon
Bachelor of Science, Sociology and Political Science, 2001, University of Oregon

AREAS OF SPECIAL INTEREST:

Public Management
Science Policy
STEM Outreach and Education

PROFESSIONAL EXPERIENCE

Research Administrator, Oregon Center for Optics, University of Oregon,
Eugene, 2006-2010
Research Secretary, Institute of Neuroscience, University of Oregon, Eugene,
2004-2006
Map & Aerial Photography Manager, MAP Library, University of Oregon,
Eugene, 2000-2003

GRANTS, AWARDS AND HONORS

Outstanding Officer of Administration, University of Oregon, Eugene, OR
2010

LaserFest on the Road in support of the *Optical Science Discovery Program*,
American Physical Society, 2010

Academic Excellence Award in support of the *Optical Science Discovery
Program*, Office of Institutional Equity and Diversity, University of
Oregon, Eugene, OR, 2009-2011.

Magna cum Laude, University of Oregon, 2001

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CHAPTER I

INTRODUCTION

Workers' Compensation (WC) insurance is a form of social welfare required and regulated by individual states. WC is administered as insurance premiums attached to payrolls (Weil, 2001). The purpose of WC insurance is to protect workers from earnings losses resulting from on-the-job injuries and to stabilize the cost of payments in order to insulate employers from catastrophic monetary judgments. WC laws release employers from liability for on-the-job injuries as long as employers pay for WC insurance and obey state health and safety laws (Durbin & Kish, 1998). Rising costs of WC have been a concern since the mid 1970's when a number of reforms were enacted (Durbin & Kish, 1998). Despite considerable policy attention throughout the 1980's and 1990's costs have continued to grow and insurers and employers have sought ways to contain costs (Campolieti, 2004; Dembe, 2001; Durbin & Kish, 1998; Huang, Baldwin, & Conway, December 2006).

One method of cost containment is a Claim Disposition Agreement (CDA), also known as *compromise and release*. In exchange for a lump sum payment, the injured employee waives his/her right to ongoing disability payments. Ostensibly, the goal of a CDA is to reduce the need for expensive litigation and the administrative costs of

issuing payments for an indefinite amount of time. However, some researchers contend that CDAs are used by insurers to pressure vulnerable claimants into accepting less compensation than they would be entitled to if the claim were fully adjudicated (Thomason & Burton, 1993).

CDAs are used most often in cases of Permanent Partial Disability (PPD), in which a worker has an injury that has been determined to be permanently impairing (but not precluding all work), resulting in continued earnings loss or cases in which the insurer is very certain of an inevitable determination of PPD. PPD injuries vary widely and can include, but are not limited to: loss of limb, loss or reduction of sense, restricted range of motion, or chronic pain. Cases of PPD are among the most difficult to measure for earnings losses (Durbin & Kish, 1998).

PPD covers a wide range of physical impairment, which may or may not impact the ability to return to work and the performance of the worker upon return. PPD is complicated by the fact that though injuries are considered to be permanent in nature, they may or may not permanently impair earnings capacity. A worker may incur a PPD injury that prevents return to the duties he/she performed prior to injury but does not preclude retraining for work of comparable or better pay. A worker may incur a PPD injury that allows the worker to return to work with modified duty. Injuries may occur that do not substantially impair work performance, but do in some way impact physical ability, which may also impact enjoyment of activities outside of work that the employee participated in prior to injury. For these reasons, when assessing the damage done by a PPD injury,

claimants and insurers must consider not only lost wages but future productivity and personal activities that may be impacted. In most cases where PPD is determined or presumed, the worker does in fact return to work (usually in the same position) after a suitable recovery period (Manley, 2010). Permanent total disability, in which the worker is unable to return to work after recovery, is rare (Manley, 2010). Once a determination of PPD is made, it is possible to reopen PPD cases for reassessment if improvement or deterioration are found later on (CBS, 2008).

The above mentioned characteristics make CDAs attractive to insurers who wish to limit adjudication costs and to claimants with an aversion to bureaucracy.

Given the implicit relationship between PPD and CDAs, how sensitive should we expect CDAs to be to changes in PPD benefit levels? Much of the literature on WC focuses on how final disability ratings are arrived at, on the broader impacts of on-the-job injuries to society, and the rising costs of WC. There has been very little empirical examination of CDAs. This study will help to fill this void by analyzing the relationship between a potential stream of WC benefits and negotiated CDAs on real claims processed in the state of Oregon. The question being, is there a quantitatively measureable relationship between PPD payments and negotiated CDA amounts and if so, what is the nature of the relationship?

In order to form a coherent framework for thinking about CDAs I rely on research in the area of decision-making gleaned from economics and psychology.

Oregon

An opportunity to examine the relationship between PPD payments and CDA amounts arises in Oregon. In 1996 the Oregon legislature raised the benefit cap on PPD and other WC benefit payments under Senate Bill 369 (hereafter referred to as SB369). The increase for PPD benefits went into effect midway through the fiscal year. Changes in other benefits went into effect at the beginning of the fiscal year. CDAs are a substitute for other forms of benefits, primarily PPD. The time lag between benefit increases offers us the opportunity to isolate and measure the effect of PPD rates on CDA amounts. First, I will examine aggregate claims data for a period of 16 years before and after SB369. Then, I will compare CDA settlement amounts for claims six months before and after the PPD benefit increase. In order to isolate the effects of PPD on CDA amounts I will control for demographic factors (age, gender and education), and job factors (time loss and pre-injury wage).

Oregon is an excellent laboratory for this quasi-experiment due to some of the unique features of WC law in the state. The Oregon system of WC is markedly less litigious than most other states. The claims process is explained clearly to claimants, payments are made voluntarily by insurers in a timely fashion (in most cases), and the state agency that oversees WC in Oregon participates actively in the process to ensure smooth processing of claims (Boden & Victor, 1994). Furthermore, the State of Oregon does not allow claimants to release insurers from medical benefit payment (CBS, 2008; ODCBS, 2006). In this system, it is far less likely that claimants will feel

pressured to accept CDAs that are unreasonably low or require heuristic calculations of future medical expenses.

Cognitive Economic Models of Claimant Decision Making in Individual Present Value Calculations

When negotiating a CDA, the worker must consider the difference between a potential stream of payments that closely resembles income earned from work and a lump sum payment that more closely resembles a windfall payment such as an inheritance, gift or winnings from a game of chance. In standard accounting practice, the lump sum amount is known as the *present value* of the payment stream (typically known as an annuity).

The Standard Formula for Present Value of Stream Payments

The standard formula of the present value of a payment stream is:

$$PV = [PMT/i] * [1 - 1/[1+i]^n]$$

Where:

PV = Present Value of a payment stream

PMT = The amount of each payment

i = the interest rate

n = the number of periods the payment is to be made

In the case of a bond, annuity or other investment vehicle, *i* is the interest earned on the principle investment.

The Role of Time Value of Money and Uncertainty in Decision Making

Present Value is a specific case of the Time value of money (TVM). TVM is a concept employed by economists, psychologists and policy makers when assessing the value of commodities (e.g. money, time commitments, favors, etc) over time. The base idea is relatively simple; people tend to value items/payments made in the present more highly than in the future (Fishburn & Rubinstein, 1982; Frederik, Loewenstein, & O'Donoghue, 2002). In order to accede to a delayed payment, individuals demand a premium (usually in the form of interest) in addition to the base amount proposed. For example, an individual may be willing to accept \$110 in six months in lieu of \$100 today, but not \$105 in six months.

Economists and policy makers typically use interest rates in the market as the default *individual discount rate*. Individual discount rates, however, have been shown to be far more volatile and specific. The individual discount rate will determine at which point the individual is indifferent to a payment now or in the future. Research has shown that an accurate estimate of an individuals implicit discount rate is difficult to elicit, even in controlled laboratory settings (Coller & Williams, 1999).

The following are important characteristics of individual discount rates that complicate the discussion of CDA acceptance:

- 1) Discount rates vary from person to person and over lifetime Children in particular have notoriously high discount rates, approaching infinite

among very young children, as demonstrated by an inability to self-regulate (Fishburn & Rubinstein, 1982).

- 2) Individual discount rates vary from circumstance to circumstance (Chapman & Elstein, 1995; Ciarns, 2006). For example, individual discount rates for money have been shown to be different from discount rates for medical care (Chapman & Elstein, 1995).
- 3) Discount rates will change with context and introduction of new information (Coller & Williams, 1999).
- 4) Individuals are not indifferent to uncertainty and have different preferences for resolution of uncertainty (Ahlbrecht & Weber, 1996).

Individual preferences around TVM and uncertainty will influence the decisions that claimants make with regard to CDA acceptance. The data at hand do not permit us to measure or infer individual claimant preferences.

A Modified Formula for the Present Value of PPD Payments

Due to the above-mentioned, variable characteristics of individual discount rates, I propose the following modification to the standard formula for present value of a stream of payments:

$$PV = [PMT/i] * [1 - 1/[1+i']^n]$$

The important difference in this version of the present value formula is i' .

$$i' = i + \alpha + \beta + \chi + \nu$$

Where:

i = The interest rate that would ordinarily be determined in the market for product similar to a CDA.

α = An adjustment for age (presumed to be negative for the very young and the elderly).

β = An adjustment for circumstance which would include the type of claim and the treatment the claimant received from the employer and insurer. For example claimants who feels poorly treated might bargain more aggressively or a claimant with a higher tolerance for discomfort might not bargain as aggressively as a claimant with lower tolerance.

χ = An adjustment for information for example, a claimant with a good understanding of the potential benefits he/she is entitled to may bargain more or less aggressively than a poorly informed claimant. Claimants may also be influenced by information not directly related to their claim, for example, a report in the press about the corporate practices of the insurer in areas unrelated to the issue at hand might influence claimant behavior.

v = An adjustment for individual tolerance for uncertainty. An individual with high tolerance for uncertainty would likely have a positive modifier to interest for this term, whereas, an individual with low tolerance for uncertainty would have a negative modifier.

In summary, the implicit discount rate for CDA negotiation will vary from person to person depending on age, circumstance, information and tolerance for uncertainty. There are other factors that will influence individual decision-making processes with regard to CDAs but cannot be included in a model for the individual discount rate.

Fairness versus Personal Benefit

Individuals are also very sensitive to perceived fairness. They will incur unnecessary cost in order to pursue revenge or forgo benefits that they feel are significantly unequal (Rabin, 1998). If a worker feels that his/her claim is not being treated equally as compared to similar cases, he or she will be more likely to engage legal counsel and pursue compensation in the courts, even if the risk of receiving less in the end is high. In these cases, we would expect to see lower acceptance of CDAs.

Stream of Income versus Lump Sum Payments

Presumably, insurers offer CDAs because they believe that they can lower costs by eliminating full adjudication and ongoing benefit administration. CDAs may be attractive to insurers in cases where the injury is clear-cut and a final determination of PPD seems certain. CDA may also be attractive in cases where the insurer believes that the claim is disingenuous (nuisance claim) but will cost more to adjudicate than a small lump sum payment will cost.

Literature on wage and lump sum compensation shows that workers treat a steady wage stream (such as PPD benefits) differently from a lump sum payment (such as a CDA settlement). Workers adapt their standard of living to a change in

their steady pay stream rapidly and make decisions from the level they consider to be the current status quo (Kahneman & Thaler, 1991; Rabin, 1998). Given the amount of time it takes to settle WC claims even with a CDA, it is reasonable to assume that workers will have adapted to their new, lower earnings level and will view the CDA as a windfall payment. Research has shown that individuals yield greater utility from windfall payments than from an equal increase to regular wages (Kahneman & Thaler, 1991). They are also more likely to simultaneously splurge on extravagances *and* save money from a windfall payment, without increasing their overall standard of living. PPD payments, on the other hand, tend to be distributed in a stream, resembling steady salary disbursements. As such, claimants may not rationally link CDA payment size (a lump sum) to PPD benefit rates (a steady stream).

A lump sum payment, which has been shown empirically to provide more pleasure to recipients, may be more attractive than a steady income stream, to which recipients readily adapt. Because consumers view lump sum payments differently from a stream of income, they may view CDA payments as inherently better and may not equally value an increase in PPD to the CDA amount. CDAs also offer the advantage of ending a bureaucratic process that many individuals find distasteful.

Sensitivity to Payment Amount

Individuals are not particularly adept at determining the value of very high or low numbers. CDA payments can be quite large, in excess of several years worth of salary. As the numbers increase, individuals are less sensitive to important

differences than they are at lower levels (Rabin, 1998). In this case, it is likely that claimants will more readily accept large lump sum payments than lower streams of payment, even if the payment is not commensurate with increases in potential PPD benefits (Camerer & Kunreuther, 1989). In cases where a large CDA offer is made, we would expect CDA amounts to be unresponsive to increases in PPD benefits.

Rational Versus Irrational Decision Making

I have outlined a number of factors that may influence an individual's assessment of the PV of his/her PPD claim. This project will seek to determine if individuals are making rational connections between the PPD payments to which they may be entitled and the CDAs they negotiate. It is important to consider how *rational* is defined in this context. Some of the factors discussed above have a clear basis in logical behavior, that is, they account for the characteristics and needs of the claimant in manner that is consistent with individual satisfaction. Some factors seem to influence PV decisions in ways that are not consistent with individual satisfaction. Other factors have the potential to influence decisions in manner both consistent and inconsistent with individual satisfaction.

For this discussion, I consider factors that work in a manner consistent with satisfaction to be rational and factors that work against individual satisfaction to be irrational. For example age, *relevant* information and tolerance for uncertainty are considered to be rational factors. Claimant response to fairness, sensitivity to very large and small payment amounts, response to *irrelevant* information and bias toward lump sum payments are considered to be irrational factors.

If the net effect of irrational factors outweighs the net effect of rational factors the expected relationship between PPD payments and CDA amounts may not be evident in quantitative analysis. If individuals are, on balance, irrational in their approach to CDA negotiation, no relationship will be observed.

Attorney Preferences

Claimants and insurers are not the only parties influencing CDA acceptance. The typical claimant who negotiates a CDA is represented by legal counsel. Attorneys who work with WC claimants are paid *on contingency*, that is, they receive a percentage of the final settlement amount (Manley, 2010). This provides a powerful motive for attorneys to select clients with a high likelihood of settlement. Attorneys must carefully manage their portfolio of cases to balance high investment clients (cases that will require more hours and court appearances) with low investment clients. Attorneys have an incentive to advise clients to accept CDAs quickly with a minimal investment of attorney time. An experienced attorney can easily calculate how many more hours of labor will be required to elicit a particular CDA amount and if those hours exceed the marginal benefit to the attorney (a percentage of the increased payment). Lawyers are governed by a code of ethics and legal requirements that they serve their clients best interest and pursue the matter at hand as far as the client directs. However, there is a severe power imbalance in the client attorney relationship due to information asymmetries. Clients are likely to follow the lead of their legal counsel (Ellmann, 1987). Furthermore, studies of real estate agents (bound by similar ethical and legal requirements) have shown that

agents will invest more time and effort in selling their own homes, where they reap the full benefit of an increased sale price than they will when selling a clients home where they realize only a small percentage of the increased sale price (Levitt & Syverson, 2008).

Attorney preference is another factor influencing CDA acceptance that cannot be controlled for with the information available.

Predictions

Given the above discussed factors, I estimate that in cases where the claimant feels substantially wronged (Rabin, 1998), no CDA will be negotiated so the increase in PPD rates will have no effect. In cases where the claimant is making a “nuisance claim” the claimant is likely to take what is offered. This amount will not likely be sensitive to PPD rate increases, as the amount the insurer is willing to pay is based on administrative costs rather than potential PPD payments. In cases of genuine PPD where the claimant feels fairly treated, but for whatever reason, is averse to pursuing full adjudication, I expect increases in PPD rates to have a moderate effect on CDA amounts due to the environment in which CDAs are negotiated. That is, the Oregon State system with its clearly defined benefit formulas and careful regulation of insurers along with attorney behavior will result in consistent and predictable CDA amounts based on expected PPD benefits. I expect these effects to be tempered by the above-discussed decision-making characteristics of individuals and attorney self interest. So while I expect the data to show a relationship between PPD and CDA, I

hypothesize that the underlying relationship will not be one that maximizes claimant settlement amounts.

The Quasi Experiment

Using a quasi-experimental approach, I examine the relationship between CDAs and the alternative, regular permanent partial disability payments from the insurer. I use two methods to examine this relationship. The first method utilizes an analysis of aggregate time series data of CDA settlements and PPD payments over a sixteen year period from 1990-1995. This analysis will verify or reject the assumption based in the literature that PPD is a driving factor behind CDA settlements and determine the degree of this relationship in Oregon.

The second method examines individual claims before and after a legislative increase to PPD payments. This analysis will examine individual claims with and without PPD payments to determine if the relationship (if any) between PPD benefit levels and CDA amounts is consistent across these two groups.

CHAPTER II

METHODOLOGY

This study analyzes the relationship between CDA amounts and the alternative, regular permanent partial disability payments from the insurer. Two methods are employed: aggregate claims analysis and individual claims analysis.

Method 1 – Aggregate Analysis

I will use time series analysis of sixty-four quarters (16 years) worth of aggregate claims data to analyze CDA settlements as a function of PPD payments and controls that account for claim volume, insurer type, and legislative period and correcting for time trends and serial autocorrelation as necessary. The purpose of this analysis is to determine if, as asserted in the literature, PPD claims are driving CDA settlements.

The Data

The data for this analysis was drawn from the Worker Compensation Database provided by the Oregon Department of Consumer and Business Services (DCBS). Observations were recorded by fiscal quarter for a period of 16 years (64 quarters) between 1990-2006. The data is further segregated by WC insurer type (see below), yielding 256 total observations.

Model Specification and Variables

I use time series analysis of panel data to determine if there is a relationship between aggregate CDA amounts and aggregate PPD payments by fiscal quarter. These amounts are the final totals paid for all claims initiated in within the selected quarter. Payments may have been made over a period of several months or even years. That is, CDA and PPD totals for the first quarter of 1990 include all payments made on claims that were *opened within that quarter*, not the total amounts paid out *during* that quarter.

The model used for this analysis is:

EQUATION 1. $\text{Log}(\text{total CDA}) = a + b1*\text{log}(\text{total PPD}) + b2*\text{ADC Count} + b3*\text{PPD Count} + b4*\text{CDA Count} + b5*\text{time} + b6*\text{insurer} + B7*\text{legislative period}$

The variables examined are the *total CDA* amounts paid, the amount of *total PPD* paid for claims from the subject quarter, the total number of disability claims made in the subject quarter (*ADC Count*), the total number of PPD claims (*PPD Count*), the total number of CDAs negotiated (*CDA Count*), a variable to describe *time* change, dummy variables for *insurer* (4 categories), and dummy variables for *legislative period* (7 categories) changes in PPD payment levels.

Logarithmic Transformation

In cases where data are not normally distributed or are non-linear in nature, it is standard procedure to transform the variables. Dollar figures are some of the

values typically transformed. For this analysis I transform the data for total CDA and total PPD using the log of the total dollar amount.

Insurer

Employers in Oregon have the choice of purchasing workers compensation insurance from the state chartered non-profit SAIF, from private insurance companies or of self-insuring. SAIF is the largest single insurer issuing 50% of WC policies in Oregon and covering over 500,000 of the 1.5 million employees in Oregon (Oregon, 2010; SAIF, 2010). A very small minority of employers have not purchased insurance and are considered non-complying. For the purpose of this analysis, quarterly observations have been divided into four insurer categories: SAIF, Private, Self and Noncomplying. Dummy variables for each insurer type are included in the analysis with SAIF as the reference point.

Legislative Periods

The Oregon legislature periodically reviews and revises permanent partial disability statutes. Typical revisions include administrative changes, adjustments to the state average weekly wage, and increases in PPD award amounts by body part type. Based upon changes to state average weekly wage (SAWW) (which influence some PPD award calculations) and percentage increases to body part types, I have identified seven distinct legislative periods, which might influence PPD award amounts. These periods are represented by dummy variables. Each period is exclusive. A table of legislative periods can be found in Appendix A.

Autocorrelation in Time-Series Data Analysis

Time series data is often subject to problems of autocorrelation. The presence of serial autocorrelation will be checked using the Durbin-Watson test. If the Durbin-Watson statistic value is above the critical range serial autocorrelation will not be indicated. If the value is below the critical range it will be necessary to correct of autocorrelation.

Expected Results

I expect that total PPD amounts will be predictive of total CDA amounts. I expect the coefficient of PPD to be positive and significant. According to the current literature and DCBS, PPD claims are a major driver of CDA settlements. If no relationship is evident it will be necessary to revisit the fundamental assumptions of this study.

Method 2 – Individual Analysis

An opportunity for individual claim comparison arose in 1996 when the Oregon legislature raised the benefit cap on PPD and other benefit payments under Senate Bill 369 (hereafter referred to as SB369). The increase for PPD benefits went into effect January 1, 1996. Implementation of changes in other WC benefits went into effect six months earlier on July 1, 1995.

CDAs are a substitute for other forms of benefits, primarily PPD. The time lag between benefit increases offers us the opportunity to isolate and measure the effect of PPD rates on CDA amounts. We will compare CDA settlement amounts for claims six months before and six months after the PPD benefit increase.

Analysis will involve bivariate and multivariate analysis of individual claims data in order to determine any relationship between PPD benefit levels and CDA settlement amounts. In order to isolate the effects of PPD on CDA amounts, I will control for demographic factors (age, gender and education) and pre-injury wage.

The Data

The data for this analysis was drawn from the Worker Compensation Database provided by the Oregon Department of Consumer and Business Services (DCBS). The data set included 2062 claims, 1113 made prior to the benefit increase and 949 after the increase. These periods were as follows:

Pre-benefit change: injury dates 7/1/95 through 12/31/95; CDAs approved from 1/1/96 through 12/31/99

Post-benefit change: injury dates 1/1/96 through 6/30/96; CDAs approved from 7/1/96 through 6/30/00

The six-month lag from the implementation of changes in other benefits and the implementation of changes in PPD benefits was intended to reduce the impact of claim processing changes created by the benefit increases. This six-month window provides the opportunity to examine PPD claims without concern that CDA settlements are effected by other benefit changes. Approximately 1% of eligible claims were excluded from the data set due to administrative delays. Also excluded from the data were claims with permanent total disability and claims with fatalities due to their infrequency and high associated costs. Also dropped from the analysis were two claims in which negative payouts for PPD were recorded.

The four-year window following the injury dates should encompass between 80 and 90 percent of the CDAs ultimately expected to arise from that period, based on lag times from injury to resolution for FY 1999 CDAs.

Insurers are not required to report periodic payments made to claimants who negotiate a CDA prior to claim closure. Closure of a claim happens when a determination is made as to whether the injury resulted in PPD or not. In cases of CDA settlement without closure, the data do not include information about PPD or timeloss payments.

Model Specification and Variables

I begin by using bivariate analysis to examine CDA sensitivity to PPD benefit increase in individual claims. This analysis describes the means of the variables *CDA amount, PPD paid, time loss days, age, pre-injury wage, gender, and education level* before and after the PPD rate increase. Henceforth I will refer to this final variable as the post-benefit indicator.

Two scenarios for bivariate analysis are employed. These scenarios are 1) claims for which claimants received PPD payments prior to the negotiation of the CDA and 2) claims which were closed prior to the negotiation of a CDA and therefore did not have any reported timeloss or PPD payments. CDAs can be negotiated for a number of reasons, not only as a substitute for PPD payments. CDAs may be negotiated in lieu of reopening a claim in which a previously settled injury has worsened, to close what insurers deem to be nuisance claims and for various other undisclosed reasons. It is important to separate claims for which PPD has been

determined from those that have not in order to isolate the effect of changes in PPD benefits on the relevant CDA amounts. Presumably, PPD rates would not affect CDA amounts for nuisance and other non-PPD related claims.

Scenario 1 is the subset we wished to examine in order to determine if PPD benefit levels affect CDA amounts. The claims identified in scenario 1 are the ones about which the most is known. These are the result of PPD related injuries. As such, it is anticipated that these claims will most closely follow our model predictions. The claims in scenario 2 certainly include claims that would have been determined to merit PPD payments, had a CDA not been negotiated prior to claim closure. However, the data in this scenario also includes claims that would not have yielded PPD determinations. Given the limitations of the data set, it is not possible to separate the PPD claims from non-PPD claims in scenario 2. Less is known about the claims in scenario 2, however, these claims are of interest because they may more closely fit the intended use of CDAs. That is, the CDA is negotiated prior to claim closure, thereby reducing litigation and payment administration costs. Claims that were closed without PPD prior to CDA settlement (343) were excluded from the analysis.

I then conduct multivariate regression analyses of these data for a clearer understanding of the underlying relationships. Multivariate analysis of the primary variables (PPD Paid and CDA Amount) controlling for demographic, injury and wage effects will provide a better understanding of changes in claims before and after SB369. Finally, I will examine CDA amounts controlling for PPD payments,

demographic factors and wage effects before and after the benefit change. This will show if there is relationship between PPD and CDA and if that relationship changes post SB369.

Three multivariate regression models are used to examine claims in the two scenarios. The first model examines the relationship between PPD payments before and after the benefit change.

EQUATION 2. $\log(\text{PPD Paid}) = \text{constant} + b1*\text{post-SB369} + b2*\text{time loss days} + b3*\text{age} + b4*\log(\text{weekly wage}) + b5*\text{gender} + b6*\text{education level}.$

The dependent variable is the log of the amount PPD Paid. The independent variable is the post benefit indicator. This relationship can only be examined in the 1160 cases with a determination of PPD prior to CDA settlement. A positive significant coefficient for the independent variable (post-SB369) will mean that PPD payment amounts were higher in the post benefit period. I expect PPD benefits to be higher in the post benefit period due to the legislated increase in benefits.

The next analysis examines CDA amounts before and after the benefit change and is divided into two categories: claims with PPD (N=1160) and unclosed claims without PPD (N=902).

EQUATION 3A. $\log(\text{CDA Amount}) = \text{constant} + b1*\text{post-SB369} + b2*\text{time loss days} + b3*\text{age} + b4*\log(\text{weekly wage}) + b5*\text{gender} + b6*\text{education level}.$

EQUATION 3B. $\log(\text{CDA Amount}) = \text{constant} + b1*\text{post-SB369} + b2*\text{age} + b3*\log(\text{weekly wage}) + 4*\text{gender} + b5*\text{education level}.$

The dependent variable for these two models is the log of the CDA Amount. The independent variable is the post benefit indicator. A significant, positive coefficient for the post benefit indicator will mean that CDA amounts were higher in the post benefit period. A significant, negative coefficient for the post benefit indicator will indicate that CDA amounts were lower in the post benefit period.

The analysis of the model defined in Equation 3b is crucial for our understanding of CDA settlements. The ideal CDA settlement for a PPD related claim would occur before any payment of benefits, thereby minimizing insurer cost and claimant time. These claims are of particular interest to DCBS.

If no significant relationship is found on the independent variable (post SB369) in this analysis, then there is no difference between CDA amounts in the pre and post periods. I expect to find a positive, significant relationship for claims in scenario 1, meaning that CDAs are higher in the post benefit period. I also expect to find a positive significant relationship for claims in scenario 2, but I expect the coefficient to be smaller than the claims in scenario 1. Claims in scenario 2 are mixed PPD and non PPD claims, also, less is known about these claims.

The final model combines the first two models to test the sensitivity of the *CDA amount* to PPD benefit increases by analyzing claims in which PPD was awarded prior to CDA settlement (N=1160). The model used for these claims is:

EQUATION 4. $\log(\text{CDA Amount}) = \text{constant} + b1*\text{post-SB369} + b2*\log(\text{PPD Paid}) + b3*\text{interaction term} + b4*\text{age} + b5*\log(\text{weekly wage}) + b6*\text{gender} + B7*\text{education level}$

The dependent variable is the amount of CDA awarded. The independent variable is the post benefit indicator

The control variables used in these regression analyses are *PPD Paid* (total amount of PPD payments made by the insurer), an *interaction* variable to test any relationship between the post benefit indicator and the PPD payment, claimant *age* at the time of injury, *weekly wage* of the individual at time of injury, *gender*, and *education level* of the claimant at the time of injury. *Time-loss days* (number of work days lost while the claimant was supported on temporary disability) was omitted from this final analysis due to over specification. The inclusion of PPD Paid in the model accounts for injury severity over the long term. Inclusion of the short term injury severity variable (timeloss days) is no longer necessary and would result in over-specification if used.

This final model is the key model for fully understanding the relationship between PPD payments and CDA amounts. The claims analyzed here provide the most information about this relationship and will allow for more reliable conclusions. I expect to observe a positive, significant coefficient for PPD Paid and no significant relationship of the post benefit indicator. I do expect CDA amounts to be higher in the post period, however, controlling for PPD payments should eliminate this relationship. A significant coefficient for the post benefit indicator would mean that another, unaccounted for factor is influencing CDA amounts differently between the pre and post periods.

Interaction term

Because the amount of the average PPD reported in the second period is expected to increase due to the legislative change, there is a chance of interaction between the post benefit indicator and the PPD amounts reported. To check for this an interaction variable is introduced into the model. If the interaction term proves significant, it will mean that the relationship between PPD and CDA changes from the pre period to the post period. This would mean that claimant behavior was not consistent across legislative periods and would indicate that claimants are not making rational connections between PPD payments and CDA amounts. If the interaction term is not significant then there is no danger of interaction between PPD and the post benefit indicator and the interaction term will be discarded from the analysis.

Expected Results

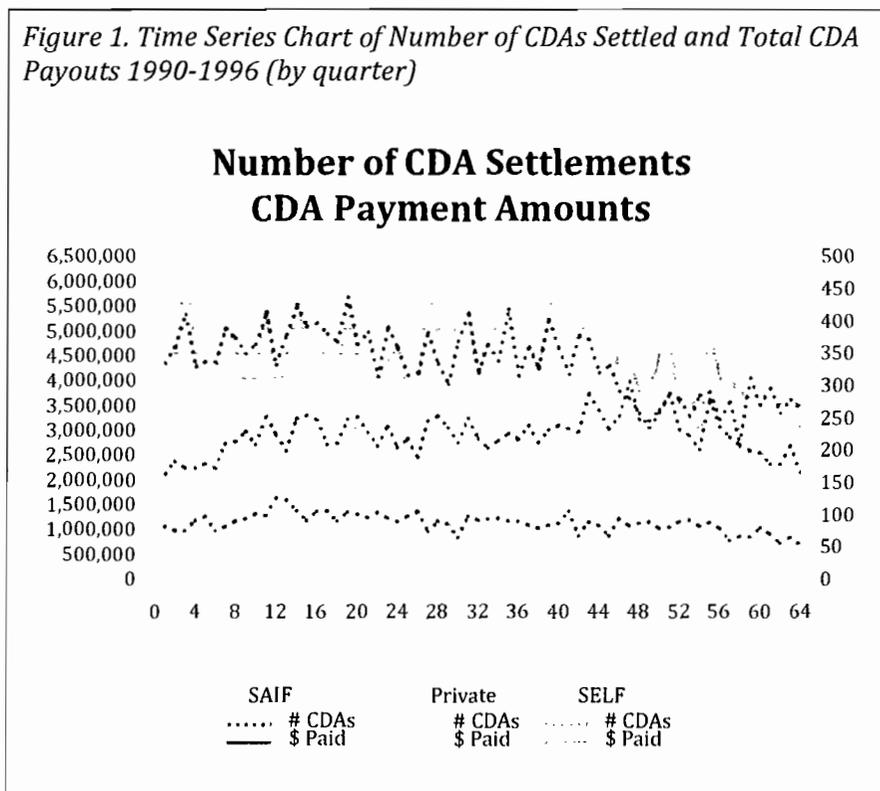
In summary, in bivariate analysis I expect to see that CDA amounts and PPD amounts will be significantly, positively different in the post benefit period. Multivariate analysis of PPD claims is expected to yield a positive significant coefficient, as are analyses of CDAs for scenario 1 and 2 (though I expect 2 to have a lower magnitude of effect). In the final model (combing analysis of PPD and CDA) I expect to see no significant relationship on the post benefit indicator and a positive significant relationship between PPD and CDA amounts.

CHAPTER III

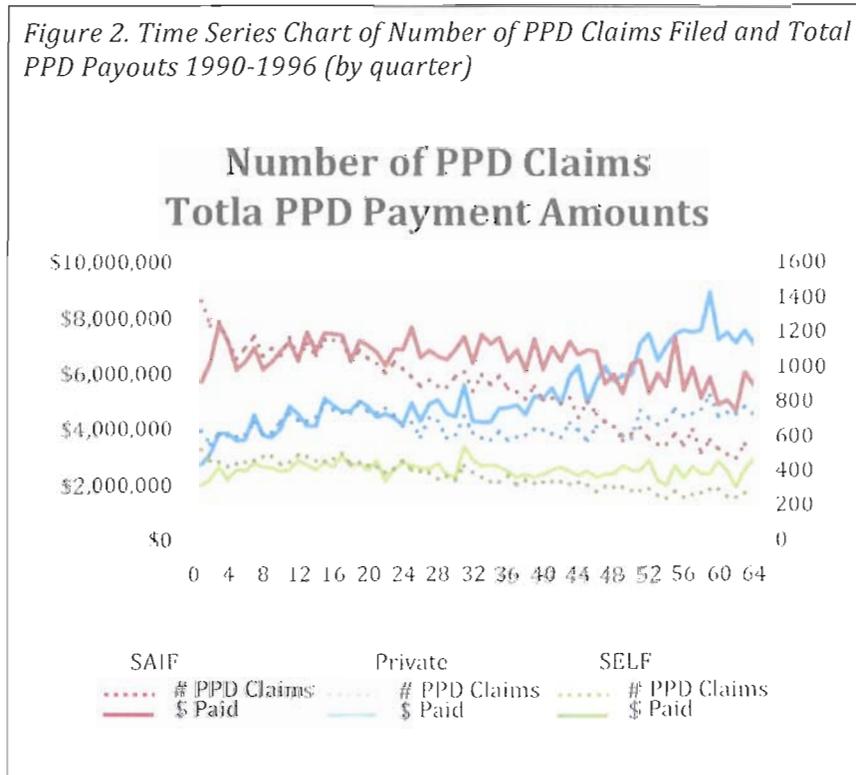
RESULTS

Method 1 – Aggregate Data

Visual inspection of the data shows that trends are consistent within insurer type, though different across insurers. Figures 1 and 2 shows time series charts over the 64 fiscal quarter period from 1990-2005 separated by insurer. Claims from workers employed by Non-complying firms are omitted due to low numbers.



As shown in Figure 1, as the total number of CDA settlements negotiated goes down (as they do in the case of Private and Self insuring organizations) so to do the total payment amounts for these categories. Likewise, as the number of settlements goes up (as in the case of SAIF claims) so do payments.



A similar inspection of PPD Claims and Payments shows that claims and payments go down for Private and Self insuring organizations and up for organizations insured by SAIF.

Analysis of aggregate data (Equation 1) seeks to illuminate whether CDA amounts and PPD amounts move together over time. No causality can be inferred from the analysis presented here, however, a result indicating that CDA and PPD are linked, would support the assumption that PPD claims are driving CDAs. As table 1

shows, this is the case. PPD is found to be a significant, positive predictor of CDA awards in the aggregate analysis.

Table 1. Time Series Analysis of CDA Amounts by Fiscal Quarter

	Log(CDA Amount) Settlements N=256
Log(Total PPD Paid)	0.304***
Total Disability Claims Accepted	0.000
Total PPD Claims Accepted	-0.001*
Total CDAs negotiated	0.003***
Time Trend Variable	-0.003
SAIF	-
Private	0.012
Self	-0.196**
Non-complying	-1.239***
Legislative Period 1	-
Legislative Period 2	-0.024
Legislative Period 3	-0.056
Legislative Period 4	-0.063
Legislative Period 5	0.031
Legislative Period 6	0.139
Legislative Period 7	0.119
Adjusted R-squared	0.929
Durbin Watson Statistic	1.940†

*p<.05 ** p<.01 ***p<.001

†Durbing-Watson Critical Range 1.667-1.920

The number of accepted disability claims is not a predictor of CDA amounts, however, the number of PPD claims and the number of CDAs negotiated are significant predictors of CDA amounts. The only other significant relationships found are on the dummy variables for Self insured employers and Non-complying insurers. This indicates a significant difference between claims originating in companies that are self insured versus claims originating from SAIF insured organizations. This is not particularly surprising giving the nature of organizations that might seek to self insure, that is organizations with the administrative and financial capacity to set

aside reserves to cover WC claims, to administer claims and the inclination to do so. Likewise, the very small number and nature of non-complying firms is expected to differ from the norm. It is noteworthy that the differences between SAIF and the Self insured and non-complying employers are negative implying that these insurers are either more effective at weeding out false claims, or less generous to claimants. Legislative period was not found to be predictive of CDA amounts.

The Durbin-Watson test yielded a value outside of the critical range, and therefore, autocorrelation is not indicated.

Method 2 – Individual Data

Bivariate Analysis

Bivariate analysis showed that, on average, workers determined to have PPD claims who accepted a CDA pre-SB369 (scenario 1) were male, 39 years in age at the time of injury and had just eleven years of formal education (see table 2). This makes intuitive sense, as jobs most likely to result in serious injuries are manual labor positions that do not require formal education. The average weekly wage of these claimants at the time of injury was \$445. This range is lower (about 15%) than the State Average Weekly Wage (SAWW) of \$515 for Oregon in 1996 (Helmer, 1997). Claimants in this category lost an average of 196 days of labor due to injury.

The same group in the post SB369 period was, on average, male, 40 years in age and had eleven years of formal education. The average weekly wage of these claimants was \$451, also about 15% less than SAWW. Claimants in this group lost an

average of 191 days of labor due to injury. The differences between claimants are for most measures small, and only significant in the case of age.

There is a significant difference in PPD payments of \$1,591 between the pre and post claims. This is expected, given the benefit increase. There is no increase in CDA Amounts from the pre to post period. If claimants are connecting PPD benefits to CDAs we should observe a significant increase in CDA Amounts in the post period.

Table 2. Bivariate Analysis for all Individual Claims before and after SB-369

	Claims Resulting in CDA N=2062			
	Claims with PPD Determined N=1160		Claims without PPD Determined Prior to Closure N=902	
	Pre N=642	Post N=518	Pre N=471	Post N=431
CDA Amount	12,185	12,876	12,304	14,640
Total PPD Paid	9,485	11,076**	-	-
Time-loss Days	196	191	-	-
Age	39	40*	38	39
Pre-injury Wage	445	451	322	334
Male	70	70	66	65
Female	30	31	34	35
Years formal Education	11	11	10	10
No Diploma	33%	36%	41%	40%
High School Diploma	67%	64%	59%	60%
Some College	26%	29%	28%	29%

*p<.05 ** p<.01 ***p<.001

Bivariate analysis showed that on average workers who accepted CDAs prior to claim closure (scenario 2) during the pre-SB369 period were male, 38 years in age at the time of injury and had just ten years of formal education. The average weekly wage of these claimants at the time of injury was \$322. This range is substantially lower (about 33%) than SAWW. The same group in the post SB369 period was, on

average, male, 39 years in age and had ten years of formal education. The average weekly wage of these claimants was \$334, also about 33% less than SAWW. The differences between claimants in the pre and post periods are small.

As with the scenario 1 claims no significant change in CDA amounts is observed is observed in scenario 2. This shows consistency between the two groups, though the result is not as expected. Controlling for demographic characteristics and severity of injury between claims in the pre and post periods may yield the expected results.

Regression Analysis

Table 3 shows the results of the regression to examine the effects of the benefit change on PPD amounts (Equation 2). Unsurprisingly, after controlling for severity of injury (timeloss days), age, wage, gender and education, there was a significant, positive change in benefits between the two periods. Time-loss days and age at time of injury were also significant, positive factors. Data for this regression could only be analyzed roughly half the total cases, as no PPD benefits were reported for claimants who negotiated CDAs prior claim closure.

Table 3. Analysis of PPD Payments before and after SB-369

	Log(Total PPD Paid) N=1160
Post Benefit Indicator	0.067**
Time-loss Days	0.001***
Age	0.004***
Log(Pre-injury Wage)	0.004
Male	0.035
Years formal Education	-0.002
Adjusted R-squared	0.176

*p<.05 ** p<.01 ***p<.001

Table 4 shows the results of the regression to examine the effects of the benefit change on CDA amounts. Two different regressions are examined in this table. The first regression examines claims with a determination of PPD prior to settlement (Equation 3a). The second examines claims with out PPD and without closure prior to settlement (Equation 3b).

Table 4. Analysis of CDA Settlements

	Log(CDA Amount) in Claims with PPD N=1160	Log(CDA Amount) In Claims without PPD N=902
Post Benefit Indicator	-0.029	0.043
Time-loss Days	0.001***	-
Age	0.005***	0.003
Pre-injury Wage	0.105**	0.283***
Male	0.111***	0.175***
Years formal Education	0.002	0.002
Adjusted R-squared	0.142	0.244

*p<.05 ** p<.01 ***p<.001

Consistent with the bivariate analysis, there is no significant change in CDA amounts on the post-benefit indicator for claims in scenario 1 or scenario 2. This result is the only multivariate analysis for claims in scenario 2.

Taken together the two analyses examining the effects of the benefit change on PPD and CDA , would seem suggest that claimants do not rationally connect PPD benefit increases to CDA amounts. PPD benefits increase in a significant, positive fashion but CDA amounts do not. However, in order to develop a more accurate picture of claimant behavior, it is necessary to combine these two models.

The third analysis tests the relationship between CDA amounts and the benefit change, controlling for PPD payments made. This analysis (Equation 4) uses only the 1160 claims in which PPD is reported (table 5).

Table 5. Regression Analysis for Individual Claims

	Log(CDA Amount) in Claims with PPD payments N=1160
Post Benefit Indicator	-0.061*
Total PPD Paid	0.514***
Age	0.003*
Pre-injury Wage	0.107**
Male	0.097**
Years formal Education	0.003
Adjusted R-squared	0.207

*p<.05 ** p<.01 ***p<.001

Here a significant change in CDA amounts is observed in the period after the increase in PPD benefit rates, however the coefficient is negative, indicating that CDA settlements were lower in the post period. The amount of PPD benefits paid, the time-loss days, age, weekly wage prior to injury and gender, are all positive, significant predictors of CDA settlement amounts.

The interaction term was not significant, thus there is no concern that the post benefit indicator and PPD paid are interrelated. The magnitude and direction of the change in the post benefit indicator are small and negative, meaning that CDAs are not sensitive to increases in PPD funding levels. However, because the interaction term is not significant and PPD is a significant positive predictor of CDA amounts, we must conclude that *the relationship, between PPD and CDAs does not change between*

the pre and post periods. That is, CDA settlements in the post benefit period do reflect increases that match the PPD benefit change.

The negative coefficient for the post benefit indicator must mean that some other, unaccounted for, factor must be pushing down CDA amounts in the post benefit period.

In summary, bivariate analysis showed no significant change in CDA amounts between the pre and post periods, counter to expectations. PPD amounts did increase between pre and post periods as expected. Multivariate analysis of PPD payments showed a significant, positive change, as expected. Multivariate analysis of CDA amounts did not show a significant change between pre and post periods. This result is also counter to expectations. This means, that for scenario 2 claims, we cannot conclude that CDAs are sensitive to PPD amounts. The final multivariate analysis, combining post benefit indicator and PPD to predict CDA amounts yielded significant coefficients for both variables. The coefficient for the post benefit indicator was negative, indicating an unknown, downward effect on CDA amounts. The coefficient for PPD was positive. This is consistent with the other analyses and as predicted.

CHAPTER IV

DISCUSSION

Research into workers' compensation tends to focus on the broad economic impacts to employers and society. Inquiries into the effects of benefit increases focus on the tendency of employees to malingering and employers to improve safety measures. Little or no attention has been paid to how workers make decisions regarding compensation for on-the-job injuries. Psycho-economic models would suggest that workers' treat lump-sum payments far differently from stream of income payments.

The available data do permit exploration of the underlying relationship between PPD and CDA. That is, will a person negotiating a CDA correctly account for their PPD entitlement to yield a fair settlement? Without definitive information that a claim resulting in CDA 1) is in fact PPD related, 2) can be classified as an original or reopened claim, 3) can be assigned an amount of PPD the claimant is entitled to, we cannot examine this relationship. Further complicating the analysis, no reliable measures for individual discount rates, attorney preferences or the nature of the injury are available.

Instead, I examine time series data that track PPD and CDA amounts and the effects of a benefit change on individual CDA amounts.

Aggregate analysis does show a relationship between PPD payments and CDA amounts, confirming the assumption that the two are related in a positive and significant fashion.

Results from the individual analysis do show a relationship between PPD payments and CDA amounts, but only cases with confirmed PPD payments (scenario 1). For those claims without PPD payments (scenario 2), no change in CDA amounts is observed in the post benefit period. If there is a relationship between potential PPD payments and CDA settlement amounts, we would expect to see a significant positive change in this variable.

Why is there an inconsistency between these two groups? First, there is uncertainty between the two groups; that is, I am not able to measure the same things. It is possible, that if an estimated PPD amount were introduced into the model for scenario 2 claims I might observe the same relationship as in the scenario 1 claims.

Scrutiny is another possible issue. Scenario 1 claims are under closer scrutiny by DCBS. Because these claims were determined to be PPD related and PPD payments were made, insurers are required to report more information to DCBS. It is likely that the claimants in these cases have a reasonable understanding of the nature of their injury and the benefits to which they are entitled. Claimants in scenario 2 settled before any determination of PPD. Insurers are not required to

report time-loss information for scenario 2 claims. It is likely that claimants in scenario 2 have less information. DCBS knows very little about these claims, making it difficult for government agents to determine if insurers are treating claimants fairly.

While it is true that Oregon laws prevent insurers from utilizing the more predatory practices witnessed elsewhere, it is still possible that insurers in Oregon are using CDAs to undercompensated workers. It is notable that the average wage of workers in scenario 2 was over 30% lower than that of workers in scenario 1. Perhaps insurers are targeting more vulnerable workers after all.

It is possible that for the workers in scenario 1, where more information about the claim is known, the system of state regulation along with attorney expertise creates a system in which CDA settlements are influenced by PPD amounts. It is also possible that for workers in scenario 2, reduced protections are resulting in poorly negotiated settlements.

Limitations

The data presented in the individual analysis are from a very limited time frame (six months before and after the benefit increase) and as such may mask long-term cyclical trends in CDA amounts. Furthermore, neither the pre nor the post period covers an entire year. In a rural state like Oregon with significant seasonal industry (logging, construction, conservation, agriculture, etc), it is possible that the nature of injuries change throughout the year.

The data set analyzed was limited. Data on time loss days payments made by insurers for PPD and PPD status were not available for claimants who negotiated a CDA before claim closure or determination of PPD status. It is likely that certain types of claims – claims where the nature of the injury was clear and easy to assess or claims where the injury was negligible – were settled quickly to avoid litigation costs.

CHAPTER V

CONCLUSION

The relationship between PPD payments and CDA amounts is complex and encompasses a number of variables not accounted for in currently available data. The analysis presented here raises more questions than it answers and highlights how little is actually known about CDA.

Policy Implications

If workers do not connect potential gains in disability payments to the lump sum payments they accept through CDAs then CDA amounts will remain relatively flat. CDAs will therefore become even more attractive to insurers seeking to reduce costs incurred in fully mediated PPD claims. We would expect to see an increase in the number of CDAs negotiated. Given that PPD payments are among the most common and most expensive component of WC expenditures, an increase in CDAs should dampen the steady increase in WC premiums employers pay. If the primary goal of policy is to reduce WC costs, CDAs may well be an attractive solution. It remains to be seen, however, if claimants make a rational connection between PPD benefits and CDA settlements and if they do, how accurate their estimations of the value of PPD benefits are.

State agencies involved in the WC processes would be well advised to carefully monitor CDA settlements in order to protect workers from predatory practices on the part of insurers. Analysis of CDA type settlements in states with more litigious systems has shown that insurers and legal counsel have significant incentives to take advantage of at-risk workers and recommend settlements far lower than what the worker might otherwise be entitled to.

In states like Oregon, where litigation is low, predatory behavior is discouraged and medical benefits cannot be released, CDAs may be a quick and cost saving approach to negotiating PPD settlements. In the context of this research, however, it appears that CDAs are not in the best interest of claimants. CDA amounts are not consistently responsive to relevant benefit increases and aggregate level analysis shows no relationship between PPD and CDA.

APPENDIX**LEGISLATIVE PERIODS**

<i>Table 6. Legislative Periods</i>	
Period	Time Frame
Period 1	January 1990-June 1994
Period 2	July 1994-June 1995
Period 3	July 1995-December 1997
Period 4	January 1998-December 2001
Period 5	January 2002-December 2004
Period 6	January 2005-June 2005
Period 7	July 2005-December 2005

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