

AGE AND GENDER EFFECTS ON AUTO LIABILITY INSURANCE PAYOUTS

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ABSTRACT

We examine the relationship between claimant demographic characteristics (specifically, gender, age, and marital status) and the relative size of automobile third-party settlements. We present three possible theories to explain differences in payouts associated with gender and age: variations in risk attitudes, variations in negotiating costs, and discrimination. Results of empirical testing are consistent with differences in settlement amounts, particularly with respect to gender. These differences are examined and discussed along with suggestions for future research.

INTRODUCTION

The automobile is one of the most widely owned major assets in the United States. It is also the most likely source of individual liability. In 2002, more than 18.3 million accidents occurred on U.S. roads and highways, involving in excess of 30 million vehicles, injuring over 2.9 million, and killing more than 42,000. (U.S. Census Bureau, Statistical Abstract of the United States 2004-05). Automobile liability claims affect many Americans, both claimants and defendant drivers, and the consequences of settlement decisions are far reaching. Auto liability settlement amounts are influenced by many factors such as the claimant's degree of fault in causing the accident, the extent of the claimant's bodily injury, state negligence rules, and attorney involvement. Our purpose here is to investigate whether claimant demographics (namely, gender and age) also affect third-party payments.

Other economic research to date provides reasons for potential differences in claimant payouts, namely, variations in claimant risk attitude, differences in negotiating preferences, and outright discrimination. The prior literature provides evidence of risk-aversion differences as a function of gender and age. Levin, Snyder, and Chapman (1988), Powell and Ansic (1997), Jianakoplos and Bernasek (1998), Sunden and Surette

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(1998), and Schubert et al. (1999), in fact, all find that women are more risk averse than men in a variety of financial (i.e., speculative) decision-making contexts. Halek and Eisenhauer (2001) find greater relative risk aversion for women and the elderly for both pure and speculative risks. Brown (1987) and Riley and Chow (1992) also find greater relative risk aversion for the elderly.

Prior studies also provide evidence of negotiation differences as a function of gender and age. Stuhlmacher and Walters (1999) show that women are more conflict averse in dispute settlement and negotiate less successful outcomes than men. Others provide evidence consistent with greater negotiation costs for women and the elderly, resulting in preferences for shorter negotiations with relatively lower payoffs holding other factors constant (see, e.g., Gallos, 1993; Graddy and Pistaferri, 2000). In a variety of other studies, gender, marital status, and sometimes age are used simply as control variables.

Doerpinghaus, Schmit, and Yeh (2003) test for gender and age effects on fault determination in automobile liability claims. They find that female, elderly, and youthful drivers are assessed higher levels of fault, even after controlling for other relevant factors such as driving violations, type and severity of injury, and legal jurisdiction. We take their study one step further to test whether women, elderly, and youthful (as well as married) claimants receive different payments for similar injuries. Fault assessment would be just one factor in payment determination. We also include a joint estimation with time-to-settlement.

For this purpose, we follow Picard (2000), Crocker and Tennyson (2002), and Loughran (2003) in developing a theoretical model of third-party (i.e., liability) claims payment. Our model accommodates lower payments to risk-averse claimants, those with higher negotiating costs, or those who are subject to discrimination *ceteris paribus*. The testable implication of the theory is that third-party insurance claims settlement amounts should be lower at the margin for claimants with greater relative risk aversion and/or higher negotiating costs. Based on evidence in the existing economic literature, we use gender and age as proxies for risk-aversion and negotiating preferences. Gender and age also are demographic characteristics subject to discrimination.

We test our hypothesis using accident data from the 1997 Insurance Research Council (IRC) Closed Claim Survey, which contains extensive information on claims closed within a 2-week period during 1997 across multiple insurers whose business represents approximately 60 percent of all personal automobile insurance sold in the United States. We focus on bodily injury liability claims for two-car accidents in which the claimant receives payment from the insured driver's insurer. Our empirical results across models are consistent with the prediction of less generous payment for female and unmarried claimants.

In the next section, we present a model for claims settlement behavior. Next, we discuss the potential effects of claimant gender, claimant age, and discrimination on settlement amounts. In the following section, we describe the empirical model we use to test our hypotheses and present results of the estimation. In the final section, we summarize our findings and discuss implications for future research.

THEORETICAL MODEL

Following Picard (2000), Crocker and Tennyson (2002), and Loughran (2003), we develop a model of claims payment for compensating third-party claimants and test it with automobile liability claims data. Our model predicts that risk-averse claimants as well as those with higher negotiating costs receive lower claim payments from insured defendant drivers *ceteris paribus*. Following the literature on risk aversion and negotiating costs, we use age and gender to identify classes of claimants with relatively greater risk aversion and negotiation costs. Our model also accommodates the possibility that age and gender discrimination play a role in determining claim payment amounts.

In our model, an injured claimant in a two-party automobile accident seeks payment for bodily injuries from the defendant driver's insurer based on the claimant's economic damages, Ω . The claim may also include noneconomic damages. Economic damages (i.e., special damages such as medical expenses and lost wages) are documented and known to both the claimant and the defendant driver's insurer. On the other hand, noneconomic damages, (i.e., general damages, such as pain and suffering, loss of companionship, and mental anguish) are not easily documented and may only be known to the claimant. Generally speaking, we anticipate that the claimant's perceived claim value of the loss will exceed that of the insurer, in part because of difficulty in valuing general damages.

The liability claim payment can be modeled as

$$P = x + \tilde{G}(y - x), \quad (1)$$

where x is the insurer's perceived value of the claim and y is the claimant's perceived value. One might consider x as the economic damages and y as the combined economic plus noneconomic damages of the claim, but such precision in definition is unnecessary for the model. The quantity $(y - x)$ reflects the claimant's excess demand beyond the insurer's valuation of the claim. The random variable, G , ranges from 0 to 1 and is the settlement multiplier, determined by social, cultural, and legal factors that are beyond the control of the claimant. Here, G is the source of uncertainty in claim negotiations.

Our hypothesis is that claimant risk aversion and negotiating costs will affect the claimant's willingness to settle the claim. Uncertainty about G results in risk-averse individuals settling for lower amounts in exchange for certainty of payment. Negotiation time costs and the psychic costs of confrontation also negatively affect claim value (see, e.g., Stuhlmacher and Walters, 1999).

The claimant's net payment after negotiation is thus

$$P_n = P - c(y - x)^2, \quad (2)$$

where c is the negotiating cost parameter (such that higher values of c imply higher negotiating costs). The net payment equation suggests that, for any given negotiating

cost parameter, the greater the difference between the claimant's and insurer's perceived claim value, the higher the cost in the settlement process.¹

The claimant's optimal claim value, y , is determined by expected utility maximization, where utility is a function of the net payment, P_n . The higher expected net payment yields higher utility, while the volatility of the net payment generates disutility for risk-averse claimants. We express the claimant's expected utility as

$$EU(P_n) = EP_n - r\text{Var}(P_n), \quad (3)$$

where r is the claimant's risk-aversion parameter (such that higher values of r imply a higher level of risk aversion, i.e., the uncertainty of the net claim payment would give the more risk-averse claimant greater disutility).

From Equations (1) and (2), we find that

$$EP_n = x + \mu_G(y - x) - c(y - x)^2 \quad (4)$$

and

$$\text{Var}(P_n) = \sigma_G^2(x^2 + y^2), \quad (5)$$

where μ_G and σ_G^2 represent the mean and variance of the settlement multiplier, respectively, as perceived by the claimant.²

The claimant chooses y to maximize the expected utility:

$$\max_y EU = x + \mu_G(y - x) - c(y - x)^2 - r\sigma_G^2(y^2 + x^2). \quad (6)$$

$$\text{s.t. } y - x \geq 0. \quad (6a)$$

The first-order condition requires

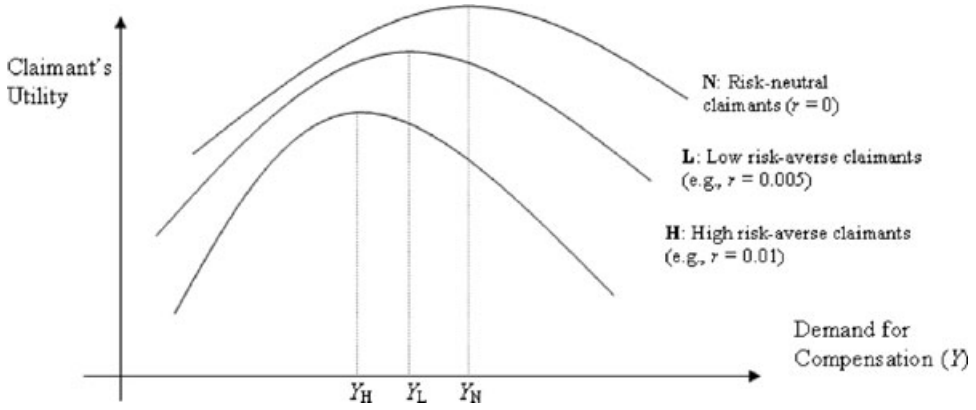
$$\mu_G - 2c(y - x) - 2ry\sigma_G^2 = 0. \quad (7)$$

The first term in Equation (7) reflects the marginal benefit to the claimant of demanding higher amounts (i.e., the claimant's conjecture about the value of the settlement multiplier), and the second and third terms in Equation (7) reflect the two components of the marginal cost of demanding more compensation. These two components are: first, negotiation costs via higher attorney fees, time costs, confrontation costs, and other costs; and second, the cost of uncertainty inherent with risk aversion.

¹ The quadratic assumption is used for the sake of simplicity (see Picard, 2000).

² A nonnegative condition should satisfy, that is, $E(P_n) \geq 0$. Hence, the range of the cost parameter c should be specified as $\frac{[\mu_G y + (1 - \mu_G)x]}{(y - x)^2} > c > 0$. If the claimant's negotiating cost parameter c is so large that negotiation is not justifiable, then he/she will simply take x , to avoid a negative net payment.

FIGURE 1
The Claimant's Utility and Optimal Demand



The claimant makes an optimal demand, y , determined by the trade-off between the claimant's expected payment (expectations about G) and costs of negotiating and risk.

Rearranging terms, we find the optimal demand for the claimant is

$$y^* = \frac{\frac{1}{2}\mu_G + cx}{c + r\sigma_G^2}. \quad (8)$$

Figure 1 provides a graphical representation of the claimant's utility and optimal compensation "demand amount." The second-order condition is satisfied for claimants with nonnegative negotiating cost and risk-aversion parameters.

If we insert the claimant's optimal demand for settlement into Equation (1), we get:

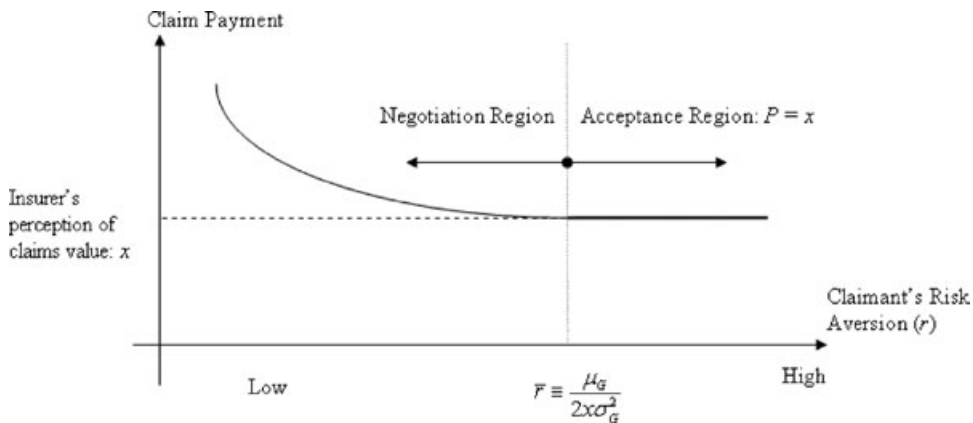
$$P|_{y=y^*} = x + \tilde{G}(y^* - x) = x + \tilde{G} \left(\frac{\frac{1}{2}\mu_G - rx\sigma_G^2}{c + r\sigma_G^2} \right). \quad (9)$$

From Equation (9) we observe, as expected, that higher c and r will lead to lower settlement amounts. In other words, the theoretical model predicts that the claim payment, P , is a decreasing function of the negotiating cost parameter c , and the degree of risk aversion r . Figure 2 shows the relationship between claimant risk aversion and the payment amounts. Empirically, we expect more risk-averse claimants as well as those with greater negotiating costs to receive lower claim settlements *ceteris paribus*.³ We rely on existing evidence that risk aversion and negotiating costs differ by age and gender to employ these variables as proxies.

³ The value $\bar{r} \equiv \frac{\mu_G}{2x\sigma_G^2}$ indicated in Figure 2 is obtained from the boundary condition (6a), which requires that $y^* \geq x$. In other words, $r \leq \frac{\mu_G}{2x\sigma_G^2} \equiv \bar{r}$. That is, an interior solution ($y^* > x$) will be achieved only if r is less than $\bar{r}$. If the claimant's level of risk aversion is so high that it is greater than or equal to $\bar{r}$, then the boundary condition will apply and the claimant will demand for x ($y^* = x$) rather than negotiating for a higher claim settlement.

FIGURE 2

The Final Claim Payment Versus Claimant's Risk Aversion



Alternatively, it is possible that observed differences associated with age and gender are due instead to discrimination. The random variable G allows for this possibility. If discrimination exists, the realized G value for men would be higher than that for women on average. Similarly, G would be higher for middle-aged claimants than for elderly claimants on average. It is important to note that both explanations, risk aversion and negotiation preferences as well as discrimination effects, lead to the same testable hypotheses, namely, that women and the elderly receive less because of higher r (risk aversion), higher c (confrontation aversion), and lower realized G (social, cultural, and legal factors important in liability compensation cases). For some classes of claimants, more than one factor may affect payment.

Empirical analysis allows us to test for differences in claim payments amount but not disentangle the cause of the difference *per se*. Future research using more detailed data regarding the claiming process can offer a more complete picture of the role demographic factors play in decision making under uncertainty. For example, data used by Derrig and Rempela (2005) to consider settlement decisions at various stages in negotiations would be valuable for a follow-on study. They had access to specific demands and responses for a sample of automobile claims and were able to assess the relevance of a variety of claim and claimant factors on decisions to settle or continue on with the negotiations. They do not, however, possess data on demographic characteristics for purposes of pursuing this particular question. Postsettlement surveys of people who have been in claiming situations represent another source of information about factors affecting decision making under uncertainty. In addition to demographic information, the surveys could request information on the importance of other sources of income, concern over ultimate payment, reactions to the negotiating process itself, the influence of attorneys, spouses, and others, and similar types of information.

GENDER, AGE, AND DISCRIMINATION EFFECTS

Research on differences in risk attitudes and negotiating costs as a function of gender and age has been limited to date. More attention has been given to the role of discrimination in these areas. Here we summarize Doerpinghaus, Schmit, and Yeh's

2003 review of the relevant literature, augment what they provide, and add a section on the role of discrimination.

Gender Effects

Prior studies provide evidence of gender differences with respect to both risk aversion and negotiation preferences. With respect to risk aversion, experimental studies provide evidence of greater relative risk aversion among women than men (Levin, Snyder, and Chapman, 1988; Powell and Ansic, 1997). Empirical evidence further suggests that women prefer moderate payoffs with certainty to relatively higher payoffs with uncertainty (Sorrentino, 1992; Jianakopulos and Bernasek, 1998). Halek and Eisenhauer (2001) find greater relative risk aversion for women in pure as well as speculative risks. It is well known that risk-averse individuals are willing to pay more for insurance, but little is known about how risk preferences affect claiming behavior. Given greater risk aversion in other areas of financial decision making, we expect that women will be more risk averse with respect to claims settlement as well, preferring certain moderate payoffs to uncertain higher payoffs.

With respect to negotiation preferences, prior research finds differences between men and women. Stuhlmacher and Walters (1999) show that women are more conflict averse in dispute settlement and negotiate less successful outcomes than men. Gallos (1993) offers some evidence that women experience more self-doubt about their perceptions than men, which exacerbates the tendency to accept a low settlement decision. Graddy and Pistaferri (2000) show that women may be relatively more concerned with interpersonal perceptions (e.g., being perceived as fair or reasonable) than with maximizing economic outcome. Furthermore, a number of authors have shown that pervasive stereotypes create expectations about behavior that in turn encourages behaviors that confirm such expectations (see Snyder, Tanke, and Berscheid, 1977; King, Miles, and Kniska, 1991; Matheson, 1991). A woman, for example, might believe that being "womanly" includes being more conservative, thus risk averse, and take actions consistent with that characterization.

Given the evidence to date on risk aversion and negotiation preferences in other areas of financial decision making, we expect that female claimants settle for relatively lower automobile liability claims payment controlling for other factors. Doerpinghaus, Schmit, and Yeh (2003) found differences in fault assessment between men and women, consistent with this hypothesis. They did not, however, test for actual differences in claim payment, which is where the financial consequence of decision making is reflected.

Age Effects

Prior research provides some evidence of the effects of age on financial decision making. Brown (1987) finds that relative risk aversion in wealth is highest for the elderly. Riley and Chow (1992) examine asset allocation decisions and show that risk aversion declines until age 65 at which point it increases. Zuckerman (1994) and Barsky et al. (1997) provide evidence of age-related risk-aversion differences as well. Halek and Eisenhauer (2001) show decreasing relative risk aversion until age 65 at which point relative risk aversion increases and becomes greater than at other ages. Economic theory predicts that older people will demonstrate greater financial risk

aversion because the cost of risk is greater at older ages due to a shorter horizon within which to recover from adverse circumstances (see Fuchs, 1982; Posner, 1995). Other factors may also underlie these age effects. The elderly have experienced war and economic depression that can affect relative risk aversion. They may have an outdated referent point for the value of a dollar and overvalue a settlement offer relative to younger negotiators. Given the existing evidence in financial decision making, we expect elderly claimants to accept lower liability settlements controlling for other factors.

There is little prior research on the effect of youthful age (defined here as less than 22 years old) on financial decision making. We expect that relatively less negotiating experience would negatively affect youthful claimant settlement amounts controlling for other factors (most notably for accident fault of youthful claimants). Alternatively, youthful claimants with low time costs and longer time horizons from which to recover from adverse circumstances may be relatively more willing to extend negotiation on the chance of a higher payoff, all else equal.

Discrimination Effects

Civil rights law defines discrimination as disparate treatment of individuals on the basis of race, gender, age, religion, or ethnic origin. There is a rich literature on the evidence and economics of discrimination in the lending and labor markets (see, e.g., Ladd, 1998; Darity and Mason, 1998; Yinger, 1998). Most of the literature on discrimination in insurance markets focuses on race, specifically, insurance availability (Klein, 1997), price (Harrington and Niehaus, 1998), and service (Chan, 1998). The effect of discrimination on claims settlement amounts, however, has not been examined elsewhere.

In his seminal work Becker (1957) explains economic discrimination in terms of prejudiced individuals having a "taste for discrimination" that carries with it an economic cost. Given the added cost of an unfounded bias in a competitive market, economic theory predicts that discrimination should eventually disappear. Arrow (1972) offers an alternative market-based explanation known as "statistical discrimination," which posits that observable and discriminatory characteristics are used as proxies for unobservable characteristics. The theory predicts that discrimination will eventually disappear because agents who are able to distinguish among individuals without use of discriminatory proxies will gain market power.

Empirical evidence however indicates that discrimination, nonetheless, persists in labor and lending market. For example, even when mortgage applicants have nearly identical credit histories and future income potentials, an applicant of color is more likely to be denied the mortgage or offered one at a higher rate. Therefore, more recent studies suggest that a purely economic model is not sufficient to describe market behavior since decision making is highly context dependent. Inclusion of social and psychological factors is needed to model the effect of bias on economic outcomes (see, e.g., Coate and Loury, 1993; Arrow, 1998; Akerlof and Kranton, 2000). Here we allow for the possibility that risk preferences, negotiation preferences and patterns, and/or discrimination may explain differences in settlement amount. Using gender and age as proxies we find evidence of systematic differences in claims payment, but as noted

above the data do not allow us to disentangle the effects of risk aversion, negotiation skill, or discrimination *per se*.

EMPIRICAL ESTIMATION

To test the hypothesis that demographic characteristics affect third-party claim payment, we analyze bodily injury liability claims handled by automobile insurers using the 1997 IRC Closed Claim Survey data. The initial data set of all bodily injury liability claims closed within the 2-week period during which the survey was conducted by participating insurers yields 17,367 observations involving two-vehicle accidents. Following Loughran (2003), we focus only on tort states, thus omitting all observations from no-fault and add-on states, which reduces our sample to 9,592. The many differences across no-fault and add-on states yield noncomparable liability claims, some of which are on top of a threshold, others that must meet a verbal definition of "severe," etc. We then remove 2,971 non-third-party and nondriver claimants, and remove 48 cases in which the reported claimant is less than 14 years of age, resulting in 6,573 observation points. Missing values on claimant employment status (1,600), medical, and wage loss (26) further reduce the data set to 4,947. For the joint estimation with time-to-settlement, another 177 observations are lost, leaving a sample of 4,770 for that model. As reported below, we conducted the analysis on a variety of models to determine the effects of these missing values, consider alternative explanations, and test the accuracy of our results. Across all of these models, female claimants receive statistically lower payment. The models reported in detail here are those we believe best balance the need for a representative sample with the need to control for as many influencing factors as possible, given the available data. Table 1 presents the independent and dependent variable definitions and expected signs of the estimated coefficients, and Table 2 presents the variable summary statistics. First we use an ordinary least squares (OLS) regression without consideration of the effect of time-to-settlement. Secondly we use a joint estimation of payment with time-to-settlement, relying on Schmit and Yeh (2003) for the estimation of settlement duration. We follow Kessler (1995) in using a full information maximum likelihood (FIML) joint estimation method. In both the OLS and the FIML joint estimation (we will refer to the FIML as a "joint estimation" for the remainder of the article), we find similar demographic effects on claim payment. Both are reported below. With the joint estimation model we primarily discuss payment effects (rather than time-to-settlement) because that is the focus of our research.

Payment Equation and Variable Measures

We model claimant payment as

$$P_i = \alpha + D_i \Delta + F_i \phi + S_i \Sigma + H_i \Upsilon + M_i \lambda + e_i,$$

where

P_i = natural logarithm of total claimant payment for the i th claim;

α = intercept term;

D_i = measures of claimant demographic characteristics;

TABLE 1

Variable Definitions and Expected Signs of the Estimated Coefficients

Variable Name	Variable Definition	Expected Sign
<i>Ln(TotalPayment)</i>	Ln(\$ total claim payment)	n/a
<i>CFemale</i>	1 if claimant female, 0 else	–
<i>CElderly</i>	1 if claimant > 65 years, 0 else	–
<i>CYouth</i>	1 if claimant < 22 years, 0 else	–
<i>CYoungFemale</i>	1 if claimant female and < 22, 0 else	–
<i>CMarried</i>	1 if claimant married, 0 else	?
<i>DFault</i>	% defendant driver at fault in accident	+
<i>LnMedExp</i>	Ln(\$ medical expenses claimed)	+
<i>LnWageLoss</i>	Ln(\$ lost wages claimed)	+
<i>Hospital</i>	1 if hospital stay required, 0 else	+
<i>Sprains</i>	1 if claimant sprain, 0 else	–
<i>Laceration</i>	1 if claimant laceration, 0 else	?
<i>Fracture</i>	1 if claimant fracture, 0 else	?
<i>Disfigurement</i>	1 if claimant disfigurement, 0 else	?
<i>Concussion</i>	1 if claimant concussion, 0 else	?
<i>OtherInjury</i>	1 if claimant has other injury, 0 else	?
<i>NoInjury</i>	1 if claimant has no injury, 0 else	–
<i>PermanentDisability</i>	1 if claimant permanently disabled, 0 else	+
<i>TemporaryDisability</i>	1 if claimant temporarily disabled, 0 else	+
<i>Attorney</i>	1 if claimant uses an attorney, 0 else	?
<i>CFemaleAttorney</i>	1 if female claimant uses attorney, 0 else	+
<i>Filed</i>	1 if lawsuit filed and settled before trial, 0 else	?
<i>Trial</i>	1 if lawsuit filed and settled during trial, 0 else	?
<i>Verdict</i>	1 if lawsuit tried to verdict, 0 else	–
<i>Lawsuit</i>	1 if lawsuit filed, 0 else	?
<i>IME</i>	1 if independent medical examiner used, 0 else	+
<i>LocationMetro</i>	1 if accident occurs in metro area, 0 else	+
<i>PolicyLimits</i>	1 if claim reaches policy limit; 0 else	–
<i>Unemployed</i>	1 if claimant unemployed, 0 else	?
<i>ModifiedRule</i>	1 if state uses modified liability rule, 0 else	+
<i>MetroPop</i>	% of state population in metro areas	?
<i>EmployedPop</i>	% of state population employed	?
<i>NoHealthInsPop</i>	% of state population with health insurance	+
<i>LnTime</i>	Ln(No. of days from the accident report date to the final claim payment date)	–

Δ = a vector of regression coefficients for claimant demographic characteristics;

F_i = insured defendant driver fault for the i th claim;

ϕ = a regression coefficient for defendant driver fault;

S_i = measures of claim severity for the i th claim;

Σ = a vector of regression coefficients for claim severity measures;

H_i = a vector of other claim characteristics associated with the i th claim;

TABLE 2
Summary Statistics for Dependent and Independent Variables Full Sample

Variable Name	Mean	Median	Std Dev	Min	Max
<i>LnTotalPay</i>	8.15	8.25	1.31	2.48	12.61
<i>CFemale</i>	0.54	1.00	0.49	0.00	1.00
<i>CElderly</i>	0.05	0.00	0.22	0.00	1.00
<i>CYouth</i>	0.15	0.00	0.36	0.00	1.00
<i>CYoungFemale</i>	0.09	0.00	0.26	0.00	1.00
<i>CMarried</i>	0.38	0.00	0.48	0.00	1.00
<i>DFault</i>	97.42	100.00	10.82	0.00	100.00
<i>LnMedExp</i>	7.08	7.36	1.65	0.00	11.92
<i>LnWageLoss</i>	2.85	0.00	3.35	0.00	13.82
<i>Hospital</i>	0.02	0.00	0.15	0.00	1.00
<i>Sprains</i>	0.89	1.00	0.31	0.00	1.00
<i>Laceration</i>	0.11	0.00	0.31	0.00	1.00
<i>Fracture</i>	0.03	0.00	0.18	0.00	1.00
<i>Disfigurement</i>	0.01	0.00	0.11	0.00	1.00
<i>Concussion</i>	0.02	0.00	0.15	0.00	1.00
<i>OtherInjury</i>	0.25	0.00	0.43	0.00	1.00
<i>NoInjury</i>	0.01	0.00	0.08	0.00	1.00
<i>PermanentDisability</i>	0.04	0.00	0.19	0.00	1.00
<i>TemporaryDisability</i>	0.28	0.00	0.45	0.00	1.00
<i>Attorney</i>	0.48	0.00	0.50	0.00	1.00
<i>CFemaleAttorney</i>	0.25	0.00	0.43	0.00	1.00
<i>Filed</i>	0.15	0.00	0.36	0.00	1.00
<i>Trial</i>	0.01	0.00	0.05	0.00	1.00
<i>Verdict</i>	0.01	0.00	0.08	0.00	1.00
<i>IME</i>	0.04	0.00	0.20	0.00	1.00
<i>LocationMetro</i>	0.55	1.00	0.50	0.00	1.00
<i>PolicyLimits</i>	0.01	0.00	0.11	0.00	1.00
<i>Unemployed</i>	0.23	0.00	0.42	0.00	1.00
<i>ModifiedRule</i>	0.53	1.00	0.50	0.00	1.00
<i>MetroPop</i>	78.45	81.10	16.56	27.70	96.60
<i>EmployedPop</i>	63.52	63.40	3.16	51.60	71.40
<i>NoHealthInsPop</i>	16.60	17.90	4.17	8.80	25.60
<i>LnTime</i>	5.160	5.31	1.18	0.00	8.02
<i>N</i> = 4,947					

γ = a vector of regression coefficients for claim characteristics;

M_i = a vector of state control variables for the i th claim;

λ = a vector of regression coefficients for the state control variables;

e_i = the random error term;

Absent significant imperfections, we anticipate generally similar claim payments for claims with generally similar economic characteristics (such as accident fault assignment, injury severity, etc.). The purpose of our research is to test whether

claimant demographic characteristics affect payment amounts. We control for the relative fault of the two parties, the severity of the injury, possible involvement of an attorney, other claim characteristics, state jurisdictional effects, and other state factors including the prevalence of health insurance, state employment percentages, and other economic conditions (see Table 1 for the expected sign of the coefficient estimate for the independent variables).

Given the theoretical and empirical literature to date we expect lower claims settlement amounts for women, youth, and the elderly. Following Riley and Chow (1992) and Halek and Eisenhauer (2001), we expect risk aversion to decline with age up to age 65, resulting in lower settlements for the very young and the elderly. We expect middle-aged claimants to have a negotiating advantage over younger parties, resulting in lower settlements for the very young and the elderly. To test these expectations, we use the binary variable *CFemale*, equal to 1 for a female claimant and 0 for a male claimant, to designate gender. Three binary variables measure age factors: one to identify elderly claimants (*CElderly*), one to identify claimants under age 22 (*CYouth*), and an interaction term for young female claimants (*CYoungFemale*). We anticipate negative coefficients on each of these variables. We control for marital status (*CMarried*) and the expected sign of the estimated coefficient is indeterminate. A married woman might make claim decisions jointly with her husband and therefore not demonstrate the same level of risk aversion in claim payments.⁴ Furthermore, the potential availability of a second income might allow for more prolonged negotiations, yielding larger claim payments. Alternatively, the need for larger payments may be less (if there is spousal income), leading to lower settlement amounts.

Our control variables include a measure of fault (*DFault*) equal to the claims adjuster's assessment of the relative fault of the insured driver who is being sued by the claimant. We anticipate a positive relationship between the insured driver's assessed fault and the claimant's payment, controlling for other factors. Driver fault should be an important determinant in claim payment because of the application of comparative negligence rules where claimants receive higher payments the less they contributed to the accident and injury. Fault assessment is a percentage out of 100. For the two-vehicle accidents included in our study, whatever percent fault is unassigned to the insured driver is assigned to the claimant. Doerpinghaus, Schmit, and Yeh (2003) specifically tested for differences in claim adjuster assessment of fault across demographic characteristics and found that women, elderly, and youthful claimants all are assessed fault at higher rates than their counterparts.⁵ Because a vast majority of claims are settled rather than tried to verdict, assessed fault is an estimate provided by the claims adjuster rather than the courts.

We control for injury severity as well. Severity can be measured both in terms of the size of economic loss and the extent of treatment. Economic loss is measured by the

⁴ In preliminary tests we included an interaction term for married female claimants and found virtually no change in the results.

⁵ Doerpinghaus, Schmit, and Yeh (2003) accounted for the very few (under 50 observations in our sample) instances in which the claims adjuster did not assign a full 100 percent of the fault to the two parties. They used a measure equal to assessed driver fault relative to total assessed accident fault whereas here we simply use assessed driver fault. We ran the estimation using both measures with no change in results.

natural logarithm of medical expenses claimed (*LnMedExp*) as well as the natural log of lost wages claimed (*LnWageLoss*).⁶ We expect both variables to have positive coefficient estimates, controlling for other factors. The wage loss claim may or may not include anticipated future wage loss, and given the generally higher wages of men than women, this could be influential in our results. We conducted all of the analyses with the claimant's weekly wage as a controlling variable and continued to find the statistically significant negative results for female claimants. Because inclusion of weekly wage resulted in the loss of a substantial portion of the sample as well as multicollinearity (e.g., with the wage loss variable) we do not report the model with weekly wage included.⁷ Extent of treatment may also be influential as a severity factor and is measured by whether the claimant requires a *Hospital* stay because of the resulting injuries. We expect a positive coefficient estimate for *Hospital*.

We control for type of injury. *Sprains*, for instance, are more difficult to prove than other injuries and therefore are often associated with greater levels of negotiations. We would anticipate lower payments for sprains, everything else held constant. Other injury categories in the data set include *Laceration*, *Fracture*, *Disfigurement*, *Concussion*, *OtherInjury*, and *NoInjury*. We omit all observations of fatalities because of their severe nature and rare occurrence. Most claims involve multiple injury types and thus there is no hold-out group.

We expect that a claimant disability also will affect claim payment. A *PermanentDisability* is expected to yield higher payment than a *TemporaryDisability*, which is expected to yield a higher payment than no disability (the hold-out category).⁸

Claimant use of an attorney also is expected to influence claim payment amount. The decision to employ an attorney may indicate that the claim is more contentious, leading to lower payment because of the difficulty of argument and extensive negotiating costs. Alternatively, the use of an attorney may yield greater payment because the attorney is more expert in dealing with the legal system, which may lessen a claimants' risk estimate, and provides a buffer that may lessen negotiating costs to the claimant. The expected value of the coefficient estimate for *Attorney* is ambiguous. We include an interaction term *CFemaleAttorney* to control for the effect of legal counsel on female claimants. We also conduct our analysis using a subsample of claims where there was no attorney involvement to allow for the possibility that attorney involvement confounds claimant demographic effects on payout.

Some auto claims result in relatively lengthy negotiations and protracted legal proceedings. Extended negotiation indicates divergence in opinion between the two parties about claim value. We expect that a claim that is *Filed* in court differs from one that is not filed. We anticipate that claims taken to *Trial* involve relatively more

⁶ Some claims have zero medical expenses or wage loss. In these cases, we follow Derrig and Weisberg (2003) and give the variable the measurement of 1 for the log to function properly.

⁷ We thank a referee for the suggestion that we include weekly wage.

⁸ Because of the potential differential in future wage loss between men and women, as noted above, we also ran the analysis without permanent disability claims. There were no significant changes in results.

negotiation, and those that reach *Verdict* the greatest degree of negotiation.⁹ The claimant's willingness to engage in legal proceedings (i.e., going to trial or allowing the court to make a judgment) is consistent with relatively less risk aversion and greater preference for negotiation.¹⁰ Given that the insurer has extensive experience with the legal process, we expect a negative relationship between protracted legal proceedings and payment amounts.

Several other claim characteristics affect payment amount. Derrig and Weisberg (2003) provide evidence that the presence of an independent medical exam (*IME*) corresponds to higher claim payment. Presence of an *IME* may reflect a lower likelihood of fraud and therefore greater willingness on the part of insurers to pay the claim.

We control also for accident location (*LocationMetro*). Note that the location variable corresponds to the accident location and may or may not correspond to the claimant's residence location. A metropolitan claimant may travel to a rural area and have an accident there or vice versa. There is some belief that more fraud occurs in metropolitan areas than in rural areas. In metropolitan locations, people are less likely to know one another and therefore more likely to be willing to make a claim, even if potentially without merit. Where fraud is more likely to exist, insurers are less generous in their claim payment, reducing settlement amounts. A negative coefficient for *LocationMetro* is anticipated.

We control for the effect of insurance *PolicyLimits* on claims payment. Because our sample comes from insurer data, the policy limit will cap the claim value reported. Those claims that reach the policy limits are designated as the value 1, and all others are 0. We also did the analysis with a censored Tobit to account for the policy limit effect and found in essence the same results. We report the OLS version so that we can incorporate it into the joint estimation with time-to-settlement.

We control for claimant employment status. *Unemployed* is a binary variable equal to 1 for claimants who are unemployed (and 0 otherwise). If unemployed claimants receive lower payments because their claimed special damages do not include wage loss, we would expect a negative coefficient estimate here, although tempered by the inclusion of wage loss and weekly wage in the equation. Cummins and Tennyson (1996), however, find evidence of a "lottery effect" where unemployed claimants receive relatively higher payments. This may be due to "hold out" behavior where claimants have little to lose by waiting for a larger settlement.

We expect state differences across claim payments and use several independent variables to control for this.¹¹ Automobile liability rules are governed primarily by state law, and economic and social conditions (which in theory may affect claiming behavior) vary by state as well. We control for differences in comparative negligence

⁹ Because results from a court verdict may differ from negotiated settlements, we also conducted the analysis without those claims closed through verdict. We do not find any substantial difference in results.

¹⁰ Note that we control for size of claim since size is likely to affect willingness by both the claimant and insurer to settle.

¹¹ Note that we estimated the models controlling for state effects (rather than for only these four state variables) with virtually no change in the results.

law (*ModifiedRule*), the percentage of the population that lives in metropolitan areas (*MetroPop*), the percentage of the state population that is employed (*EmployedPop*), and the percentage of the state population without health insurance (*NoHealthInsPop*). We anticipate higher payment in modified (rather than pure) states because of the effect of the fault thresholds. We also expect a positive relationship between the percentage of the population without health insurance and claim payment because of the need by claimants to rely on auto payments for medical expenses. The sign of the estimated coefficients for the control variables, *MetroPop* and *EmployedPop*, are indeterminate.

Another potential contributing factor to the outcome is the duration of negotiation. We would anticipate that risk-averse individuals and those who find negotiating costly will settle more quickly. To consider this influence, we conduct a joint estimation of claim payment and time-to-settlement as defined by Schmit and Yeh (2003). We follow Kessler (1995) in using an FIML joint estimation method.

EMPIRICAL FINDINGS

Table 3 presents results of the OLS estimation with the dependent variable equal to the natural logarithm of the total claims payment. The adjusted R^2 is 0.7310. In Table 4 we present results of the joint estimation of time-to-settlement and claim payment.

The coefficient estimate for *CFemale* is negative and statistically significant at the 0.01 level for the OLS analysis and at the 0.05 level for the joint estimation. The evidence here is consistent with female claimants receiving lower claims payment given our controls.¹² There is no evidence of a statistically significant difference in payment for elderly claimants in either model, whereas youthful claimants show lower payments at the 0.10 level in the OLS analysis and higher payment at the 0.10 level in the joint estimation. Because of the weak significance regarding youthfulness, we consider the results virtually 0, likely affected by claim duration. The control variable *CMarried* is positive and statistically significant at the 0.01 level in the OLS analysis and 0.10 level in the joint estimation, consistent with a scenario in which married claimants have alternative income sources and in-house assistance (the spouse) on which they can rely for protracted claim negotiations. Overall, our results suggest differences in payment as a function of claimant gender and marital status.

The coefficient estimate for *DFault* is positive as expected and statistically significant at the 0.01 level for both analyses. Where the defendant driver is more at fault, claimants receive relatively more, *ceteris paribus*. The strength of this result lends credibility to our findings.

The coefficient estimates for *LnMedExp* and *LnWageLoss* also are positive and statistically significant in the OLS; wage loss shows no statistical significance in the

¹² Interpretation of the coefficients is complicated. To calculate an example of economic significance assume that for two claimants, a male and a female, all exogenous characteristics equal 0 except for the minimum values of *MetroPop* (27.70), *EmployedPop* (51.60), and *NoHealthInsPop* (8.80). Following the OLS result in Table 3 the *TotalPay* for the male would be 32.5670161 and for the female would be 29.6748534. In this simplified scenario the female receives about 91 percent of what the male receives.

TABLE 3

OLS Regression: Dependent Variable = Ln(Total Claim Paid) Full Sample

Variable Name	Coefficient	Std Error
Intercept	4.081	0.29***
<i>CFemale</i>	-0.093	0.03***
<i>CElderly</i>	0.044	0.05
<i>CYouth</i>	-0.076	0.04
<i>CYoungFemale</i>	0.078	0.06
<i>CMarried</i>	0.108	0.02***
<i>DFault</i>	0.009	0.00***
<i>LnMedExp</i>	0.491	0.01***
<i>LnWageLoss</i>	0.069	0.00***
<i>Hospital</i>	0.351	0.07***
<i>Sprains</i>	0.061	0.04
<i>Laceration</i>	0.107	0.03***
<i>Fracture</i>	0.506	0.06***
<i>Disfigurement</i>	0.464	0.09***
<i>Concussion</i>	0.165	0.06***
<i>OtherInjury</i>	0.148	0.02***
<i>NoInjury</i>	-0.138	0.12
<i>PermanentDisability</i>	0.545	0.06***
<i>TemporaryDisability</i>	0.171	0.02***
<i>Attorney</i>	0.409	0.03***
<i>CFemaleAttorney</i>	0.102	0.04***
<i>Filed</i>	0.060	0.03
<i>Trial</i>	0.103	0.21
<i>Verdict</i>	-0.523	0.12***
<i>IME</i>	0.194	0.05***
<i>LocationMetro</i>	-0.042	0.02**
<i>PolicyLimits</i>	-0.268	0.09***
<i>Unemployed</i>	0.101	0.03***
<i>ModifiedRule</i>	-0.154	0.03***
<i>MetroPop</i>	-0.001	0.00
<i>EmployedPop</i>	-0.009	0.00**
<i>NoHealthInsPop</i>	-0.012	0.00***
Adjusted R^2	0.731	
$N = 4,947$		

Significant at 0.05; *significant at 0.01.

joint estimation. These economic losses are relatively easy to document and are less subject to fraud than are noneconomic losses. As expected larger economic losses result in higher claim payment. According to the OLS analysis, claimants with injuries resulting in a hospital stay receive higher claim payments than those that are not hospitalized. The type of injury also is a factor in payment amount. The coefficient estimates for lacerations, fractures, and disfigurement are positive and statistically significant. The coefficient estimate for *Sprains*, however, is not statistically significant. Sprains are relatively more susceptible to fraud, leading to greater reluctance by insurers to pay claims.

TABLE 4
Joint Estimation of Time-to-Settlement and Claim Payment

Variable Name	Ln(Total Claim Paid)		Ln (Time)	
	Coefficient	Std Error	Coefficient	Std Error
Intercept	-1.64	0.42***	1.96	0.10***
CFemale	-0.13	0.05**	0.06	0.03**
CElderly	-0.00	0.12	-0.03	0.39
CYouth	0.07	0.04		
CYoungFemale	0.04	0.05		
CMarried	0.04	0.02		
DFault	0.01	0.00***		
LnMedExp	0.10	0.01***		
LnWageLoss	-0.00	0.00		
Hospital	0.08	0.07		
Sprains	0.01	0.03		
Laceration	0.12	0.03***		
Fracture	0.45	0.06***		
Disfigurement	0.35	0.07***		
Concussion	0.19	0.07***		
OtherInjury	0.11	0.02***		
NoInjury	-0.32	0.10**		
PermanentDisability	0.41	0.05***		
TemporaryDisability	0.12	0.02***		
Attorney	-1.04	0.10***	0.73	0.03***
CFemaleAttorney	0.07	0.04		
Filed	-0.41	0.04***	0.22	0.02***
Trial	-0.40	0.09***		
Verdict	-1.06	0.06***		
IME	0.05	0.03		
LocationMetro	-0.09	0.05	0.02	0.02
PolicyLimits	-0.55	0.08***		
Unemployed	-0.20	0.06***	0.13	0.03***
ModifiedRule	-0.13	0.03***		
MetroPop	-0.00	0.00***		
EmployedPop	-0.01	0.00***		
NoHealthInsPop	-0.01	0.00***		
CFault			0.30	0.13***
CFault2			-0.13	0.10***
LnTotalLoss			0.34	0.01***
LnAge			0.07	0.02***
LnTime	1.84	0.07***		
Log likelihood	-10,487.3			
N = 4,770				

Significant at 0.05; *significant at 0.01.

Disability is also an important determinant of claim payment. As expected, the coefficient estimates for temporary and permanent disability are positive and statistically significant.

TABLE 5

Summary Statistics for Dependent and Independent Variables for the Subsample With No Attorney Involvement

Variable Name	Mean	Median	Std Dev	Min	Max
<i>LnTotalPay</i>	7.46	7.52	1.19	2.48	11.51
<i>CFemale</i>	0.56	1.00	0.49	0.00	1.00
<i>CElderly</i>	0.05	0.00	0.23	0.00	1.00
<i>CYouth</i>	0.16	0.00	0.37	0.00	1.00
<i>CYoungFemale</i>	0.10	0.00	0.30	0.00	1.00
<i>CMarried</i>	0.41	0.00	0.49	0.00	1.00
<i>DFault</i>	98.62	100.00	6.90	0.00	100.00
<i>LnMedExp</i>	6.27	6.51	1.70	0.00	11.62
<i>LnWageLoss</i>	2.62	0.00	3.03	0.00	13.82
<i>Hospital</i>	0.01	0.00	0.10	0.00	1.00
<i>Sprains</i>	0.87	1.00	0.33	0.00	1.00
<i>Laceration</i>	0.11	0.00	0.31	0.00	1.00
<i>Fracture</i>	0.02	0.00	0.14	0.00	1.00
<i>Disfigurement</i>	0.01	0.00	0.09	0.00	1.00
<i>Concussion</i>	0.02	0.00	0.14	0.00	1.00
<i>OtherInjury</i>	0.19	0.00	0.40	0.00	1.00
<i>NoInjury</i>	0.01	0.00	0.11	0.00	1.00
<i>PermanentDisability</i>	0.01	0.00	0.08	0.00	1.00
<i>TemporaryDisability</i>	0.22	0.00	0.42	0.00	1.00
<i>Lawsuit</i>	0.01	0.00	0.08	0.00	1.00
<i>IME</i>	0.01	0.00	0.09	0.00	1.00
<i>LocationMetro</i>	0.49	1.00	0.50	0.00	1.00
<i>PolicyLimits</i>	0.01	0.00	0.11	0.00	1.00
<i>Unemployed</i>	0.21	0.00	0.41	0.00	1.00
<i>ModifiedRule</i>	0.56	1.00	0.50	0.00	1.00
<i>MetroPop</i>	76.78	81.10	16.81	27.70	96.60
<i>EmployedPop</i>	63.76	63.84	3.30	51.60	71.40
<i>NoHealthInsPop</i>	16.30	15.90	4.15	8.80	25.60
<i>LnTime</i>	4.54	4.67	1.15	0.00	7.55
<i>N</i> = 2,561					

The OLS evidence suggests that use of an attorney positively affects claim payment amounts. When conducting a joint estimation with time-to-settlement, however, the attorney variable shows a statistically significant negative coefficient. As reported by Browne and Schmit (2004), claims taking longer to settle also tend to involve attorneys. In both analyses we observe that women who employ attorneys receive higher payments. This result is consistent with the hypothesis that attorneys buffer the risk aversion and negotiating preferences of female claimants.

We also conducted the analysis only using the sample of 2,561 observations in which no lawyer was employed by the claimant. Summary statistics for this sample are provided in Table 5 and results in Tables 6 and 7. Female claimants continue to show lower payments, whereas unmarried (rather than married) claimants now show

TABLE 6

Subsample of Claims With No Attorney Involvement OLS Regression:
Dependent Variable = $\ln(\text{Total Claim Paid})$

Variable Name	Coefficient	Std Error
Intercept	3.508	0.45***
<i>CFemale</i>	-0.073	0.03**
<i>Celderly</i>	0.033	0.07
<i>Cyouth</i>	-0.075	0.06
<i>CyoungFemale</i>	0.058	0.08
<i>Cmarried</i>	0.125	0.03***
<i>Dfault</i>	0.007	0.00***
<i>LnMedExp</i>	0.469	0.01***
<i>LnWageLoss</i>	0.101	0.01***
<i>Hospital</i>	0.474	0.16***
<i>Sprains</i>	0.142	0.05***
<i>Laceration</i>	0.091	0.05
<i>Fracture</i>	0.700	0.11***
<i>Disfigurement</i>	0.871	0.17***
<i>Concussion</i>	0.166	0.11
<i>OtherInjury</i>	0.130	0.04***
<i>NoInjury</i>	-0.122	0.14
<i>PermanentDisability</i>	0.712	0.19***
<i>TemporaryDisability</i>	0.117	0.04***
<i>IME</i>	0.310	0.16
<i>LocationMetro</i>	0.017	0.03
<i>PolicyLimits</i>	-0.506	0.29
<i>Unemployed</i>	0.147	0.04***
<i>ModifiedRule</i>	-0.158	0.04***
<i>MetroPop</i>	0.001	0.00
<i>EmployedPop</i>	-0.004	0.01
<i>NoHealthInsPop</i>	0.006	0.01
Adjusted R^2	0.6408	
$N = 2,561$		

Significant at 0.05; *significant at 0.01.

positive payments in the joint estimation. Most of the remaining coefficients show signs and statistical significance similar to the OLS and joint estimation on the full sample. We do not discuss these results further here.

Returning to results reported in Tables 3 and 4, we see that before controlling for time-to-settlement, controls for claim disposition suggest larger claim payments for cases that are filed and go to trial relative to those that are settled prior to any filing. For claims that go to verdict, however, the claim payment amount is relatively lower. This result is consistent with prior literature in which asymmetric information appears to lead claimants to pursue claims further in the litigation process than economic rationality would suggest. Our expectation that insurer expertise gives them an advantage in protracted litigation is borne out in the verdict cases but not in the filed claims and those that are settled during the trial. Here perhaps are

TABLE 7

Joint Estimation of Time-to-Settlement and Claim Payment Without an Attorney

Variable Name	Ln(Total Claim Paid)		Ln (Time)	
	Coefficient	Std Error	Coefficient	Std Error
<i>Intercept</i>	-1.90	0.70***	1.75	0.15***
<i>CFemale</i>	-0.17	0.08**	0.09	0.04**
<i>CElderly</i>	-0.11	0.19	0.04	0.11
<i>CYouth</i>	0.06	0.06		
<i>CYoungFemale</i>	0.03	0.07		
<i>CMarried</i>	0.04	0.03		
<i>DFault</i>	0.01	0.00***		
<i>LnMedExp</i>	0.07	0.02***		
<i>LnWageLoss</i>	0.00	0.00		
<i>Hospital</i>	0.02	0.16		
<i>Sprains</i>	0.06	0.04		
<i>Laceration</i>	0.10	0.04**		
<i>Fracture</i>	0.61	0.11***		
<i>Disfigurement</i>	0.72	0.16***		
<i>Concussion</i>	0.13	0.12		
<i>OtherInjury</i>	0.08	0.03**		
<i>NoInjury</i>	-0.34	0.11***		
<i>PermanentDisability</i>	0.50	0.16***		
<i>TemporaryDisability</i>	0.06	0.03		
<i>IME</i>	-0.03	0.07		
<i>LocationMetro</i>	-0.18	0.08**	0.09	0.04**
<i>PolicyLimits</i>	-0.97	0.22***		
<i>Unemployed</i>	-0.16	0.11	0.13	0.06**
<i>ModifiedRule</i>	-0.11	0.04***		
<i>MetroPop</i>	-0.00	0.00		
<i>EmployedPop</i>	-0.01	0.00		
<i>NoHealthInsPop</i>	0.00	0.00		
<i>CFault</i>			0.10	0.35
<i>CFault2</i>			0.02	0.29
<i>LnTotalLoss</i>			0.37	0.02***
<i>LnAge</i>			0.04	0.02
<i>LnTime</i>	1.83	0.09***		
Log likelihood	-5,755.1			
N = 2,476				

Significant at 0.05; *significant at 0.01.

examples of situations where individuals settled early (settle even before filing a legal claim) because of lack of knowledge, risk aversion, and/or aversion to negotiating. When controlling for time-to-settlement, however, we find that settling early leads to higher payments. The time cost of continuing with a claim is demonstrated in this result.

The coefficient estimate for the use of an independent medical examiner is positive and statistically significant in the OLS analysis (at 0.05 level) as expected, corroborating

the findings of Derrig and Weisberg (2003). Use of an *IME* is a positive signal to the insurer that fraud is not an issue, resulting in relatively more generous payment to the insured.

We control for metropolitan location (*LocationMetro*) and payment amount. As expected, the coefficient estimate for *LocationMetro* is negative and statistically significant at the 0.05 level in the OLS analysis and at the 0.10 level in the joint estimation. The coefficient estimate for our control variable for insurance policy limits is negative and statistically significant as expected. Lower limits on insurer liability reduce claim payout with other factors held equal.¹³

We control for the claimant's employment status. The coefficient estimate for *Unemployed* is positive and statistically significant at the 0.01 level. Our result is consistent with Cummins and Tennyson (1996) where the "lottery effect" results in unemployed claimants "holding out" for higher settlements since they have little to lose by waiting.

Controls for state differences include *ModifiedRule*, *MetroPop*, *EmployedPop*, and *NoHelathInsPop*. There is a negative and statistically significant relationship for claimant payment in states with modified comparative negligence rules. Urbanization does not appear to matter here. State employment rates and the extent of health insurance available to the state population are important determinants. There is a negative and statistically significant relationship between employment rates and claim payments and the extent of health insurance and claim payments. This is consistent with pressure to negotiate for higher payments given less employment opportunity and less resource for medical claim reimbursement from private insurance.

IMPLICATIONS AND FUTURE RESEARCH

Results of our study suggest that claimant demographic characteristics matter in insurance claims payouts. The evidence suggests that female claimants receive lower payments than men, controlling for injury severity, wage loss, claimant fault, and a variety of other factors. The results are robust across a variety of empirical model specifications. Our results indicate that differences in earnings, marital status, or attorney involvement do not account for claim payout disparities to women. We also considered different representations of claim disposition and injury categories. Across all models women are shown to receive lower payment than men, holding other factors constant. Our results are consistent with Doerpinghaus, Schmit, and Yeh (2003) who found higher fault assessment by claims adjusters to women for accidents with similar characteristics.

What explains this result? Prior research offers several possible explanations. In other financial decision-making contexts, risk preferences and negotiating costs have been shown to exist by gender. Our results are consistent with greater risk aversion among female claimants and more costly or less effective negotiations by female claimants, other factors held constant. Another possible explanation is that discrimination results in lower payments for female and youthful claimants. Our results are also consistent with this theory, and in fact the longer duration of claims by women would provide

¹³ Note that we also conducted a tobit censored analysis and discovered the same results. This is unsurprising, given that only 61 observations are affected by policy limits.

contrary results to the risk aversion and negotiating cost hypothesis. The available data, however, cause us to pause in making too much of this outcome. We encourage future researchers to seek out data similar to that used by Derrig and Rempala (2005) in which decisions made at various stages of the claim negotiations process can be observed. At this point, we consider the consistent finding in each of our models that female claimants receive lower payment to be the key outcome of our work. Determining exact causes will require extensive future efforts in collection and analysis of appropriate data. We encourage all researchers considering aspects of claim disposition to include gender in their work in order to develop a body of literature that is informative.

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