FACTORS ASSOCIATED WITH DIFFERENCES IN THE INCIDENCE OF UNINSURED MOTORISTS

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EXECUTIVE SUMMARY

Uninsured motorist (UM) insurance covers losses caused by drivers who have no insurance or leave the scene and cannot be reached for insurance information (such as a hit-and-run accident). The average state UM rate (percentage of drivers uninsured) in the United States was 13.4 percent in 2009, it decreased to 11.9 percent in 2010, and has remained near 12.0 percent in recent years. Despite the rather flat incidence of uninsured motorists in recent years, rates vary considerably across states. In any given year, the UM rate ranges from a low of approximately 5 percent to a high of over 25 percent; about a quarter of U.S. states have rates below 9 percent, and roughly another quarter have rates above 14 percent.

The purpose of this study was to investigate the factors associated with differences in UM rates across years and states. We began by noting that differences in UM rates have been greater across states than across years. We began with a set of economic factors (income and consumption, employment, and education), policy variables (requirements for UM coverage, penalties for driving without insurance, minimum policy limits, and the presence of a no pay, no play statute), an assessment of the favorability of each state's tort liability system towards business, and year variables.

We found that economic factors (particularly differences in income, education, and unemployment rates) explained a large share of the differences in state UM rates. The findings concerning income suggest that automobile insurance may be a good consumers forgo when choices must be made among competing economic necessities (particularly among low-income families). The correlation with education may indicate that, despite efforts to standardize auto insurance products and make them more understandable, insurance purchases continue to be complex for individuals with less education. The finding that UM rates are higher in states with higher unemployment rates suggests that automobile insurance may be a purchase consumers forgo when confronting difficult economic circumstances. Controlling for the other variables in the analysis, UM rates were found to be lower in states that require UM coverage. The finding that UM rates are higher in states with less-business-friendly tort liability systems may indicate a higher reporting of UM accidents (relative to the reporting of bodily injury [BI] accidents) than in states with more-active consumer-advocacy groups. Finally, while the statistical significance was weak, there are indications that when controlling for the economic, policy, and state considerations, UM rates have been increasing in recent years. The upward trend might not be evident in the observed UM rates, however, because the steady increase in economic factors over the period (which could have contributed to tempering the UM rate) may have offset the increase in UM rates.

While certain insurance-related policy controls may encourage maintaining appropriate coverage and discourage forgoing it, attention to economic factors and state tort liability systems may have as much of an impact on controlling UM rates as any particular set of insurance policy controls.

INTRODUCTION

UM insurance covers losses caused by drivers who have no insurance or leave the scene and cannot be reached for insurance information (such as a hit-and-run accident). The average U.S. state UM rate was 13.4 percent in 2009, it decreased to 11.9 percent in 2010, and has remained near 12.0 percent in recent years.[1]

The present study extends a 2017 Insurance Research Council study on uninsured motorists.[2] The previous study described the prevalence of UM rates across states from 1976 through 2015. The purpose of this study is to investigate the factors associated with the differences in UM rates across years and states. Despite the rather flat all-states UM rates in recent years, UM rates vary considerably across states. In any given year, state UM rates range from a low of approximately 5 percent to a high of over 25 percent; about a quarter of U.S. states have rates below 9 percent, and roughly another quarter have rates above 14 percent. The focus of the present study is to use economic conditions (including income, education, and employment status), insurance public policy considerations, and controls for state tort liability system to evaluate differences in the incidence of UM rates across states and years.

THE PERCENTAGE OF DRIVERS DRIVING UNINSURED

Table 1 presents a summary of UM rates from 2009 through 2015. The 50-state average UM rate was 13.4 percent in 2009, then decreased to 11.9 percent in 2010, and has remained between 12.0 percent and 12.2 percent through 2015, the most recent year for which data are available.[3]

Despite little recent change in UM rates, rates continue to vary considerably across states. In any given year, UM rates range from a low of approximately 5 percent to a high of greater than 25 percent. Roughly a quarter of the states have rates below 9 percent, and another quarter have rates above 14 percent. In 2015, the 50-state average was 12.2 percent, ranging from 4.5 percent in Maine to 26.7 percent in Florida. About one-quarter of the states had a UM rate below 8.5 percent, and the median was 11.5 percent. Roughly a quarter of the states had a rate of at least 15.1 percent. Generally, these patterns were consistent from 2009 through 2015. A first conclusion is that while the 50-state average UM rate has changed little in recent years, there are significant differences across states. Furthermore, the state UM

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[1]Average countrywide UM rates discussed here differ from the countrywide UM rates published by the Insurance Research Council (IRC). IRC countrywide UM rates are produced by calculating a single rate from the combined experience in all states, whereas the U.S. average UM rate discussed in this report is the simple average of the individual state UM rates.

[2]Insurance Research Council, *Uninsured Motorists, 2017 Edition*, (Malvern, Pa: Insurance Research Council, 2017).

[3]The UM rate is a measure of the percentage of motorists who are uninsured. The UM rate is developed using the ratio of the number of claims for uninsured motorists to the number of claims for bodily injuries. The development of this measure and its underlying assumptions are discussed in *Uninsured Motorists, 2017 Edition*.

rankings have remained rather consistent across years: states in the first quartile (with a low UM rate) tend to consistently be among the states with the lowest UM rates, and the inverse is also true.

TABLE 1: UNINSURED MOTORIST RATES FOR 50 STATES – 2009-2015

UM Rate	2009	2010	2011	2012	2013	2014	2015
Average	13.4	11.9	12.0	12.2	12.0	12.0	12.2
Lowest state	4.5	3.8	4.0	3.9	5.0	5.0	4.5
Highest state	28.0	23.7	24.2	25.9	25.5	26.7	26.7
Average UM Rate by Rank							
1-10	6.9	5.9	6.0	6.1	6.4	6.3	6.6
11-20	10.4	8.8	8.8	8.9	9.1	9.0	9.2
21-30	12.5	11.0	11.0	11.4	11.5	11.2	11.5
31-40	15.3	13.9	13.9	14.2	13.5	13.5	14.0
41-50	21.8	19.9	20.2	20.4	19.1	19.7	19.6

Note: the UM rates are unweighted state averages.

ECONOMIC FACTORS

INCOME AND CONSUMPTION

Given the pressures to cover the costs of basic housing, food, and other essentials, low-income or unemployed individuals may choose to forego auto insurance coverage or stop making payments after securing the initial obligatory coverage. Consequently, it can be expected that lower incomes and unemployment could inhibit individuals from retaining auto insurance. We used family income levels, the percentage of individuals below the poverty level, and unemployment rates to evaluate whether income levels influence UM rates.[4] For background, the percentage of income individuals spent on automobile insurance was also included in this investigation of income and consumption variables, but this variable was not included in the regression analyses.[5]

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[4]Other income-related measures that were considered for the present analyses included median household income, percentage of households with incomes less than $10,000, and percentage of families and households with incomes less than $15,000. The 2009–2015 state average changes and correlations with UM rates were similar to the measures in Table 1 (with the correlations for the other measures slightly less than the correlations in the table).

[5]For the present analyses, most measures are from the American Community Survey (ACS) database. This database is an annual extensive survey of U.S. households. Some measures from the ACS database are also available from the Bureau of Labor Statistics (BLS) database, although there are minor differences due to differences in data gathering and statistical methods. Some measures are available only from the ACS, and when both ACS and BLS measures were available, we used the ACS measures for consistency.

The purpose of the present regression analyses was to investigate the association between differences in UM rates and a set of explanatory variables. As reported below, there is a correlation between UM rates and the amounts paid for automobile insurance. However, this association may be circular; that is, it may be that high UM rates may lead insurers to charge more for automobile insurance, while charging more for automobile insurance may cause higher UM rates.

The first three rows of Table 2 show income and consumption measures: median income, per capita disposable income, and per capita consumption. The fourth row shows the average amount paid for automobile insurance as a percentage of income. The statistics in Table 2 are for 350 data points: 50 states over seven years (2009-2015). Table 2 presents the individual-year averages from 2009 through 2015, the average over that span, and each variable's 2009-2015 increase. The 2009-2015 average median income was $64,000, and average state median income increased 12.5 percent in that time frame. The 2009-2015 average per capita disposable income was $38,300, and it saw an 18.2 percent increase over the seven years. The 2009-2015 average per capita consumption increased 19.6 percent from 2009 through 2015, reaching $35,200 in 2015.

Table 3 presents the 50-state 2009-2015 average, the standard deviation for the 350 data points, the coefficient of variation, the minimum and the maximum values for variable. The 2009-2015 average is brought forward from Table 2. The standard deviation, coefficient of variation, and minimum and maximum values are presented to provide dispersion statistics for each variable. The correlations in the last column are provided for an initial evaluation of the relationship between the variable and UM rates.

Each income and consumption variable (the first three rows in Table 3) was inversely associated with UM rates, with correlations between -0.334 and -0.375. Generally, these measures would explain between 11 percent and 14 percent of the differences in UM rates across states and years.[6] The bottom row in Table 3 presents the amount paid for automobile insurance as a percentage of personal income. Across the 50 states and 7 years, the lowest expenditure was 1.0 percent of income (Wyoming, 2013), the highest was 2.9 percent (Louisiana, 2010), and the state annual average was 1.5 percent. There is a positive correlation between the UM rate and the percentage of personal income paid for automobile insurance (0.406).

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[6]In two-variable regression analyses, the explained amount (commonly referred to as the R-square) is the square of the correlation between the two variables. In this case, the -0.365 correlation between UM rates and median family income implies that 13 percent of the differences in UM rates could be explained by differences in median family income.

TABLE 2: ANNUAL STATE AVERAGES FOR INCOME AND CONSUMPTION MEASURES

Income and Consumption Measure	2009	2010	2011	2012	2013	2014	2015	State Annual Average	2009-2015 change
Median family income*	61.7	61.3	62.4	63.8	65.2	66.8	69.4	64.4	12.5%
Per capita disposable income*	35.2	35.8	37.4	39.0	38.8	40.3	41.6	38.3	18.2%
Per capita personal consumption*	32.1	33.0	34.4	35.3	36.1	37.3	38.4	35.2	19.6%
Auto insurance premium as percentage of income	1.53%	1.51%	1.53%	1.53%	1.51%	1.53%	1.51%	1.52%	-1.3%

* In thousands of dollars.
Note: the summary statistics are the 50-state averages (unweighted).

TABLE 3: SUMMARY STATISTICS AND CORRELATIONS BETWEEN UM RATES AND INCOME AND CONSUMPTION MEASURES

Income and Consumption Measure	State Annual Average	Standard Deviation	Coefficient of Variation	Minimum	Maximum	Correlation with UM Rates
Median family income*	64.4	10.4	16.1	45.5	91.6	-0.365
Per capita disposable income*	38.3	6.0	15.6	27.7	57.3	-0.334
Per capita personal consumption*	35.2	5.2	14.7	25.0	50.0	-0.375
Auto insurance premium as percent of income	1.5	0.4	24.9	1.0	2.9	0.406

* In thousands of dollars.
Note: the summary statistics and correlations are for 350 data points (50 states, 7 years [2009-2015]).

In addition to the income variables, five poverty measures were also considered as measures of individuals' ability to pay for automobile insurance. Because income constraints may cause low-income families and households to forego automobile insurance, a positive correlation between the UM rate and the amount of poverty in a state was expected. The five poverty measures considered in the present analyses concerned the percentage of families (or households) with incomes of less than $10,000 or 15,000 and the percentage of households below the poverty line.

For each poverty measure, Table 4 presents the 50-state averages for each year from 2009 through 2015, as well as the average for that range. Over those years, the percentage of families and households with incomes below $10,000 and $15,000 decreased, with most of the decrease occurring in 2014 and 2015. Approximately 5 percent of families have incomes below $10,000 and approximately 8 percent have incomes below $15,000. Approximately 7.5 percent of households have income below $10,000 and 13 percent have incomes below $15,000. Approximately 15 percent of households have incomes below the

federal poverty level. Generally, each measure shows improvement (decreasing trend) over the 2009-2015 years, and especially the last two years.

TABLE 4: ANNUAL STATE AVERAGES FOR POVERTY MEASURES

Poverty Measure	2009	2010	2011	2012	2013	2014	2015	State Annual Average
Percentage of families with incomes less than $10,000	4.6	4.8	4.8	4.8	4.7	4.5	4.1	4.6
Percentage of families with incomes less than $15,000	7.9	8.1	8.2	8.0	7.7	7.4	6.9	7.8
Percentage of households with incomes less than $10,000	7.7	7.6	7.7	7.5	7.4	7.2	6.8	7.4
Percentage of households with incomes less than $15,000	13.4	13.5	13.6	13.2	12.8	12.5	11.8	13.0
Percentage of households with incomes below the poverty level	13.8	14.7	15.2	15.2	15.1	14.8	14.2	14.7

Note: the summary statistics are the 50-state averages (unweighted).

Table 5 presents the 50-state seven-year averages and the dispersion measures. The last column in Table 5 presents the correlations between the poverty measures and UM rates. The correlations between the poverty measures and UM rates are higher (between 0.41 and 0.51) than the correlations between income and consumption measures in Table 3 (between 0.33 and 0.38). The correlations indicate that between 17 percent and 26 percent of the differences in UM rates could be explained by one of the poverty measures.

TABLE 5: CORRELATIONS BETWEEN UM RATES AND POVERTY MEASURES

Poverty Measure	State Annual Average	Standard Deviation	Coefficient of Variation	Minimum	Maximum	Correlation with UM Rates
Percentage of families with incomes less than $10,000	4.6	1.3	28.0	2.3	8.7	0.512
Percentage of families with incomes less than $15,000	7.8	2.1	27.5	3.6	14.1	0.507
Percentage of households with incomes less than $10,000	7.4	1.8	23.8	3.3	12.4	0.451
Percentage of households with incomes less than $15,000	13.0	2.9	22.0	7.0	21.0	0.410
Percentage of households with incomes below the poverty level	14.7	3.2	21.8	8.2	24.2	0.498

Note: the summary statistics and correlations are for 350 data points (50 states, 7 years [2009-2015]).

EMPLOYMENT STATUS

Employed people can expect a steady stream of income, which should provide a better opportunity to afford automobile insurance. We used the percentage of people employed (also known as the employed-to-population ratio), the percentage of people in the labor force (also known as the labor force participation rate), and the unemployment rate to evaluate whether employment status influences UM rates. The analyses also included employed-people and labor force participation rates for people below the poverty level. We expected an inverse association between the employed-people and labor force participation rates and UM rates—that is, UM rates would be lower in states and years with higher employed-people or labor force participation rates because a larger share of the population would be employed or seeking employment and, consequently, have more income available to maintain automobile insurance. By contrast, we expected a positive association between unemployment rates and -UM rates. In this case, the higher the unemployment rate (the larger the share of the labor force unemployed), the more individuals likely to not have income available to maintain automobile insurance (the higher the UM rate).

Table 6 presents the 50-state averages of the employment measures for each year from 2009 through 2015, as well as the average for those years. From 2009 through 2015, the percentage of families and households with incomes below $10,000 and $15,000 decreased, with most of the decrease occurring in 2014 and 2015. Over that seven-year period, the percentage of people employed, the percentage in the labor force, and the percentage of people below the poverty level employed or in the labor force (the first four rows in Table 6) were rather constant. During this period, the unemployment rate decreased, especially in the three most recent years.

TABLE 6: ANNUAL STATE AVERAGES FOR EMPLOYMENT AND LABOR FORCE STATUS

Employment and Labor Force Status	2009	2010	2011	2012	2013	2014	2015	State Annual Average
Percentage of the population employed (16 years and older)	59.4	58.2	58.2	58.6	58.8	59.2	59.4	58.8
Percentage of the population in labor force (16 and older)	66.0	65.0	64.7	64.5	64.2	63.9	63.6	64.6
Percentage of the population below the poverty level who are employed	38.4	37.1	37.4	38.0	38.5	39.6	39.2	38.3
Percentage of the population below the poverty level who are in the labor force	54.0	54.0	54.2	53.3	52.6	51.9	50.4	52.9
Unemployment rate (16 and older)	9.1	9.9	9.4	8.5	7.7	6.7	5.9	8.2

Note: the summary statistics are the 50-state averages (unweighted).

For each measure, Table 7 presents the seven-year 50-state average, the dispersion statistics, and the correlation with UM rates. On average, approximately 59 percent of people 16 years and older were employed, ranging from 49.0 percent (West Virginia, 2015) to 67.6 percent (North Dakota, 2012). Approximately 65 percent of people 16 years and older were in the labor force (that is, employed or actively looking for work), ranging from 52.9 percent (West Virginia, 2015) to 71.6 percent (Alaska, 2010). The correlation with UM rates was -0.502 for the percent of people 16 years and older who were employed and -0.437 for the percent of people 16 years and older who were in the labor force. These correlations suggest that differences in the percent-employed measure could explain 25 percent of the variation in UM rates, and the differences in labor force participation rates could explain 19 percent of the variation in UM rates.

Among people below the poverty level, the employed and labor force participation rates were lower, there was more variability, and the correlations with UM rates were lower. Approximately 38 percent of people below the poverty level are employed and the coefficient of variation was 13.8 (compared with 59 percent and 7.1, respectively, for all people). Approximately 53 percent of people below the poverty level were in the labor force and the coefficient of variation was 8.6 (compared with 65 percent and 5.8, respectively, for people 16 years and older). The correlation with UM rates was -0.286 for the percentage of people below the poverty level employed and -0.151 for the percentage of people below the poverty level in the labor force (compared with -0.502 and -0.437, respectively, for people 16 years and older).

Generally, higher percentages of employed people and higher percentages of people in the labor force were associated with lower UM rates. Further, the association was stronger for all people than for people

below the poverty level, and the association was stronger for the percentage of people employed than for the percentage of people in the labor force. This pattern may be explained by the fact that employed people have stronger income streams than people in the labor force (because some people in the labor force are not employed) and that the 16 years and older population captures information on a larger share of people than people below the poverty level.

The last row in Table 7 concerns the unemployment rate for people 16 years and older. For the seven years in the analysis, the state unemployment rates averaged 8.2 percent, ranging from 2.6 percent (North Dakota, 2013) to 15.1 percent (Michigan, 2010).[7] The 28.5 coefficient of variation indicates a larger relative variation in unemployment rates across the 50 states and seven years than the variation for the percentage of employed people or for labor force participation rates. The correlation between UM rates and unemployment rates was weaker (0.386) than the correlations between the percentage of employed people and labor force participation rates for people 16 years and older (-0.502 and -0.437, respectively).

TABLE 7: CORRELATIONS BETWEEN UM RATES AND EMPLOYMENT AND LABOR FORCE STATUS

Employment and Labor Force Status	State Annual Average	Standard Deviation	Coefficient of Variation	Minimum	Maximum	Correlation with UM Rates
Percent of the population employed (16 years and older)	58.8	4.2	7.1	49.0	67.6	-0.502
Percent of the population in the labor force (16 and older)	64.6	3.8	5.8	52.9	71.6	-0.437
Percentage of the population below the poverty level who are employed	38.3	5.3	13.8	27.4	53.9	-0.286
Percentage of the population below the poverty level who are in the labor force	52.9	4.6	8.6	38.2	65.5	-0.151
Unemployment rate (16 and older)	8.2	2.3	28.5	2.6	15.1	0.386

Note: the summary statistics and correlations are for 350 data points (50 states, 7 years [2009-2015]).

[7]As elsewhere in this report, the 8.2 percent average state unemployment rate is the simple average for the 50 states, which is very likely different from an average that would consider differences in the number of employed people and labor-force participants across states.

LEVEL OF EDUCATION

Individuals with less education may find auto insurance to be a complex consumer product whose value is difficult to understand (information considerations). Comparing different insurers' prices and products may also be difficult. We investigated the level of education for people 18 to 24 years old and for people 25 years or older. If younger, less-educated people are more likely to be involved in UM accidents (whether as uninsured people or in hit-and-run accidents), then we might expect a strong association education levels and UM rates—that is, UM rates are higher in states with higher percentages of 18-to-24-year-olds with less than a high school diploma. The education levels of people 25 years and older were measured to provide a broad population measure.

As with the other measures in this study, there were relatively small differences in the overall and the 50-state averages from 2009 through 2015 but notable differences in cross-state averages. Table 8 presents the percentages of people 18 to 24 years old and people 25 or older with no high school diploma (or GED), only a high school diploma (or GED), or more than a high school diploma from 2009 through 2015. Table 9 presents the 2009-2015 summary statistics for that period. The results are similar for both age groups. Among people 18 to 24 years old, 15 percent had not received a high school diploma, 30 percent had received only a high school diploma, and 55 percent had more than a high school diploma. The variability across states (as measured by the coefficients of variation and the differences between the minimums and maximums) was greater among the less-than-high-school group. For 18 to 24 year olds, the rate with less than a high school diploma ranged from 6.3 percent (Hawaii, 2015) to 23.9 percent (Nevada, 2009), the rate with only a high school diploma ranged from 22.0 percent (North Dakota, 2010) to 40.7 percent (Hawaii, 2010), and the rate with more than a high school diploma ranged from 42.0 percent (Nevada, 2010) to 69.5 percent (North Dakota, 2010).[8]

The last column presents the correlations between the three levels of education and UM rates. Generally, states with higher percentages of people with no high school diploma tend to have higher UM rates. The correlation between UM rates and the percentage of people with no high school diploma was 0.458 among 18-to-24-year-olds and 0.475 among those 25 and older. Conversely, states with higher percentages of people with more than a high school diploma tend to have lower UM rates. The correlations were -0.396 among 18-to-24-year-olds and -0.317 among those 25 or older. In sum, there appears to be a correlation between the average level of education in a state and that state's UM rate. Taken in isolation, the correlations indicate that the differences among people with less than a high school diploma might explain between 21 percent and 23 percent of the variation in UM rates. The implication

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[8]Among people 25 or older, the education-level ranges were from 6.4 percent (Montana, 2015) to 20.2 percent (Texas, 2009) for those with less than a high school diploma, from 20.6 percent (California, 2012) to 41.6 percent (West Virginia, 2010) for those with only a high school diploma, and from 41.6 percent (West Virginia, 2010) to 69.5 percent (Colorado, 2015) for those with more than a high school diploma.

for public policy is that initiatives to reduce the incidence of high school dropouts or to educate people without a high school diploma about automobile insurance may help reduce UM rates.

TABLE 8: ANNUAL STATE AVERAGES FOR PERCENT OF PEOPLE BY LEVEL OF EDUCATION

Level of Education	2009	2010	2011	2012	2013	2014	2015	State Annual Average	2009-2015 change
Percent of people 18 to 24 years with:									
Less than high school	15.8	16.1	15.1	14.4	14.3	13.6	13.3	14.7	-2.5
High School	30.8	30.0	29.9	30.1	30.1	30.9	31.0	30.4	0.2
Greater than high school	53.4	53.9	55.0	55.5	55.6	55.5	55.7	54.9	2.3
Percent of people 25 years and older with:									
Less than high school	13.1	12.9	12.5	12.0	11.8	11.5	11.3	12.2	-1.9
High School	29.7	29.7	29.5	29.3	29.0	29.0	28.8	29.3	-1.0
Greater than high school	57.1	57.5	58.0	58.7	59.2	59.5	60.0	58.6	2.8

Note: the summary statistics are the 50-state averages (unweighted).

TABLE 9: CORRELATIONS BETWEEN UM RATES AND LEVEL OF EDUCATION

Level of Education	State Annual Average	Standard Deviation	Coefficient of Variation	Minimum	Maximum	Correlation with UM Rates
Percent of people 18 to 24 years with:						
Less than high school	14.7	3.1	21.1	6.3	23.9	0.458
High School	30.4	3.1	10.2	22.0	40.7	0.140
Greater than high school	54.9	4.7	8.6	42.0	69.5	-0.396
Percent of people 25 years and older with:						
Less than high school	12.2	3.2	26.2	6.4	20.2	0.475
High School	29.3	3.9	13.3	20.6	41.6	0.041
Greater than high school	58.6	5.4	9.2	41.6	69.5	-0.317

Note: the summary statistics for the years 2009 through 2015 are for 50 states.

STATE STATUTES AND REGULATIONS

States use several statutory provisions and regulations to, from one perspective, discourage individuals from driving without insurance and, from a contrasting perspective, to ensure funds are available to pay for losses caused by individuals who operate automobiles without coverage. Four measures were used in the present analyses to capture the various provisions in state statutes and regulations: (1) coverage requirements for losses caused by an uninsured motorist, (2) penalties for driving without insurance, (3) required minimum limits for bodily injury and physical damage coverages, and (4) whether the state had a no pay, no play provision. While the provisions concerning UM coverage and no pay, no play laws are binary (either a state does or does not have the provision), there were a variety of provisions for minimum limits and penalties for driving without insurance. For each measure, the discussion below summarizes the various approaches observed across the states between 2009 and 2015. With a few exceptions, statutory provisions and regulations did not change over the seven years, so it can be assumed that drivers understood the provisions as well as can be expected.[9]

UNINSURED MOTORIST INSURANCE COVERAGE REQUIREMENTS

Nineteen states required automobile insurance policyholders to purchase a separate coverage for medical losses and property damage (PD) caused by an uninsured motorist.[10] Table 10 presents the UM rate for states requiring and not requiring UM coverage. Generally, for 2009 through 2015, the UM rate was approximately 4 percentage points lower in states that required UM coverage. For 2009-2015, the average UM rate was 14.1 for states not requiring UM insurance coverage and 9.2 for states requiring UM insurance coverage.

TABLE 10: UM COVERAGE REQUIRED – NUMBER OF STATES AND UM RATES 2009-2015

UM Coverage Required	Number of States	2009	2010	2011	2012	2013	2014	2015	2009-2015
All	50	13.4	11.9	12.0	12.2	12.0	12.0	12.2	12.2
No	31	15.3	14.0	14.1	14.3	13.6	13.7	13.7	14.1
Yes	19	10.3	8.5	8.5	8.8	9.3	9.2	9.7	9.2

Note: the summary statistics are the unweighted state averages.

[9]Changes to statutory provisions and regulations (such as with coverage requirements, penalties for driving without insurance, minimum limits, or a no pay, no play statute) may take time to become known by drivers in a state. The period between enactment and awareness of a new statutory provision or regulation could affect the statistical association between a particular provision or regulation and the UM rate.

[10]These states are Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, North Dakota, Oregon, South Carolina, South Dakota, Vermont, Virginia, West Virginia, and Wisconsin.

PENALTIES

While it was illegal in all 50 states to drive a vehicle that was not insured,[11] the penalties for doing so differed across the states. For the present analysis, states were arranged into two groups according to the penalty for driving an uninsured vehicle. States in which the fine was less than $100 and license suspension was not mandatory were assigned to the low-penalty group. States in which the fine was $100 or more and license suspension was mandatory were assigned to the high-penalty group.

- Low penalty: fine less than $100 possible, license suspension not mandatory
- High penalty: mandatory fine greater than $100 and/or mandatory license suspension is mandatory

Information on penalties was available for only one year (2014); consequently the penalty information for that year was applied to all seven years. Twenty-four states had a low penalty, and 26 states had a high penalty.[12] Table 11 presents the UM rates for each group. States with low penalties for driving without insurance tend to have higher UM rates. For each year, the UM rate was higher for states with low penalties, and the 2009-2015 average for this group (12.8 percent) was approximately 1 percentage point greater than the average UM rate for states with high penalties (11.7 percent). Although many other considerations may be in play, UM rates were generally lower in states with high penalties for driving without automobile insurance.

TABLE 11: PENALTIES FOR DRIVING WITHOUT INSURANCE – NUMBER OF STATES AND UM RATES 2009-2015

Penalty	Number of States	2009	2010	2011	2012	2013	2014	2015	2009-2015
All	50	13.4	11.9	12.0	12.2	12.0	12.0	12.2	12.2
Low	24	14.0	12.7	12.7	13.0	13.0	12.5	12.8	12.8
High	26	12.8	11.1	11.4	11.5	11.7	11.6	11.6	11.7

Note: the summary statistics are the unweighted state averages.

[11]Drivers in New Hampshire may demonstrate personal financial responsibility as an alternative to purchasing insurance.

[12]The twenty-six states with a high penalty were Alaska, Arizona, Colorado, Delaware, Hawaii, Illinois, Iowa, Kansas, Maine, Maryland, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oregon Pennsylvania, South Dakota, Utah, Virginia, and West Virginia.

MINIMUM LIMITS

The state minimum insurance coverage amounts for bodily injury and property damage were analyzed for as a measure of the financial responsibility requirements for automobile insurance. The expectation was that high minimum insurance coverage requirements would create higher rates for the minimum-insurance requirements, and the higher rates would impose greater financial stress on individuals and cause more individuals to be uninsured.

The state minimum insurance requirements for per person bodily injury/per accident bodily injury/property damage were gathered from the Property Casualty Insurance Association of American (PCIAA), which compiled information from the Insurance Information Institute Fact Book for various years. The various minimum insurance requirements were arranged into three groups - low, medium, and high minimum requirements:

- Low=15/30/10, 15/30/5, 10/20/10, 15/30/25, 12.5/25/7.5
- Medium=25/50/25, 25/50/15, 20/40/10, 25/50/10, 25/50/20, 20/40/15, 20/40/5, 25/40/10
- High=50/100/25, 50/100/15, 30/60/15, 30/60/10, 30/60/25, 25/65/15

Table 12 presents the number of states and the average UM rates for each group. Over the 2009-2015 years, approximately two-thirds of the states were in the medium-requirements group, with the other one-third approximately evenly split between low- and high-requirements groups. During these years, 8 to 9 states had low minimum insurance requirements, 33 to 36 states had medium minimum requirements, and 5 to 8 states had high minimum requirements.

For the years 2009 through 2015, the UM rate was highest for states with the low insurance minimum requirements (13.2 average in the last column) and slightly lower for states with medium insurance requirements (12.4 average); however, the difference is entirely due to years 2012-2015, and especially 2013-2015 where the differences between the low and medium groups were almost 2 percentage points. Except for 2015, the UM rate was 2 percentage points lower for states with high minimum insurance requirements. The UM rate was much lower for states with high minimum insurance requirements (9.9 average).

TABLE 12: MINIMUM LIMITS – NUMBER OF STATES AND UM RATES 2009-2015

Minimum Limits	2009	2010	2011	2012	2013	2014	2015	2009-2015
Number of States								
Low	9	9	9	9	9	8	8	8-9
Medium	36	35	33	34	34	35	35	33-36
High	5	6	8	7	7	7	7	5-8
UM Rates								
Low	13.4	12.2	12.4	13.0	13.8	13.8	13.9	13.2
Medium	13.8	12.3	12.4	12.5	11.9	12.0	12.1	12.4
High	10.5	9.3	9.8	9.9	9.9	10.0	10.4	9.9

Note: the summary statistics for UM rates are the unweighted state averages.

NO PAY, NO PLAY

Some states prohibit uninsured motorists from receiving non-economic damages (such as for pain and suffering) even if the uninsured motorist is not at fault. In these states, damages are limited to physical damages and medical expenses. A no pay, no play statute may provide an incentive for motorists to maintain automobile insurance so that their damages are not limited to physical and medical expenses, and consequently, we may observe lower UM rates in states with a no pay, no play statute.

State no pay, no play status was determined using various PCIAA publications. For the present analyses, we split the states into those without a no pay, no play statute and those with one. Eight states had no pay, no play laws from 2009 through 2015.[13] Kansas and Oklahoma did not have a no pay, no play law from 2009 through 2011 but did have one from 2012 through 2015. The other 40 states did not have no pay, no play laws from 2009 through 2015.

Table 13 presents the number of states with a no pay, no play statute and the UM rate for each group. Although the UM rate was lower in 2009 and 2010 for states with a no pay, no play statute, in 2015 the UM rate was higher for the 10 states with a no pay, no play statute. For the 2019-2015 years, there was little difference in the UM rates. For states without a no pay, no play statute, the average UM rate was 12.3; for states with a no pay, no play statute, the average UM rate was 12.1.

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[13]The eight states were Alaska, California, Iowa, Louisiana, Michigan, New Jersey, North Dakota, and Oregon.

TABLE 13: NO PAY, NO PLAY LAWS – NUMBER OF STATES AND UM RATES 2009-2015

No Pay, No Play Law	2009	2010	2011	2012	2013	2014	2015	2009-2015
Number of States								
No	42	42	42	42	40	40	40	40-42
Yes	8	8	8	8	10	10	10	8-10
UM Rates								
No	13.5	12.0	12.0	12.2	12.0	12.0	12.1	12.3
Yes	12.8	11.5	11.9	12.2	11.8	12.0	12.5	12.1

Note: the summary statistics for UM rates are the unweighted state averages.

STATE TORT LIABILITY SYSTEMS

Since 2002, the U.S. Chamber Institute for Legal Reform has conducted 11 surveys to "explore how fair and reasonable the states' tort liability systems are perceived by U.S. businesses." For the period under analysis here, reports were published for surveys conducted in 2010, 2012, and 2015. We associated the results from the 2010 survey with the 2009–2010 UM experience, results from the 2012 survey with the 2011 and 2012 UM experience, and results from the 2015 survey to the 2013, 2014, and 2015 UM experience.[14]

The survey participants were a large national sample of in-house general counsel, senior litigators or attorneys, and other senior executives at companies with at least $100 million in revenue and who indicated that they were knowledgeable about litigation matters and had recent litigation experience in each state they evaluated. Participants were asked to grade each state on ten key elements and to give an overall performance grade.[15] The responses for each key element were aggregated, and these responses and the overall performance grade were aggregated to develop a state liability score. The rankings of the key elements and the state liability scores were highly correlated. For example, Delaware

[14]The surveys were conducted in the year in which the results were published. For example, the 2012 report provided results for interviews conducted from March through June 2012, and the 2015 report provided results for interviews conducted from March through June 2015. We associated the 2011 and 2012 UM experience with the 2012 survey results because we expected that the 2012 survey results would capture the survey responders' perceptions of the state tort liability environment for 2011 and 2012. Similarly, we used the results from the 2015 survey for the 2013 through 2015 because we expected that the 2015 survey responses would best capture the UM experience from 2013 through 2015.

[15]The 10 key elements were overall treatment of tort and contract litigation, enforcing venue requirements, treatment of class action suits and mass consolidation suits, damages, timeliness of summary judgment or dismissal, discovery, scientific and technical evidence, judges' impartiality, judges' competence, juries' fairness.

was among the five best states for each key element, Vermont was among the five best states for nine key elements, and Nebraska was among the five best states for seven key elements; these states also had the highest state liability scores. By contrast, Illinois, Louisiana, and West Virginia were among the five worst states for each key element, and California was among the five worst states for eight of them, and these states had the lowest state liability scores.

The top panel in Table 14 presents the average state liability score for 2010, 2012, and 2015. The first row presents the average state liability score, and the next three rows present the scores for the lowest, median, and highest state scores. For each survey, the 50 states were arranged into five groups of ten states each according to the rankings of the state scores. For each survey year, the first group (1–10) presents the average score for the ten states with the highest state scores, the second group for the ten states ranked 11 through 20, and so on.

There are two notable observations regarding the state liability scores in Table 14. First, scores have slightly improved over the three surveys. From an average score of 59.5 in 2010, the averages increased to 62.3 in 2012 and 63.4 in 2015. Much of the increase appears to stem from states with low scores in the 2010 survey. The lowest score increased from 35.1 in 2010 to 46.3 in 2015, and the average score for the 10 states with the lowest scores (states 41–50) increased from 46.4 to 52.8. Second, the state liability scores varied greatly across states, suggesting material differences in the perceptions of state tort liability systems. The top panel shows a 42.1-point difference between the lowest and highest scores from the 2010 survey and a 30.2-point difference from the 2015 survey. In the bottom panel, the differences between the highest quantile (states ranked 1st through 10th) and lowest quantile (states ranked 41st through 50th) were 22.6 points in 2010 and 18.7 points from the 2015 survey.

Table 15 presents the correlation between UM rates and state liability scores. There was an inverse correlation between the state liability scores and UM rates. Across the 50 states and seven years in the analysis, there was a -0.454 correlation between the state liability scores and UM rates, indicating that UM rates were generally lower in states with tort systems considered favorable. Similar levels of correlation were found when looking at the UM rate for the individual years: for the seven years, the correlations between state liability scores and UM rates were between -0.415 and -0.507.

TABLE 14: STATE LIABILITY SCORES

State Liability Score	Survey Year		
	2010	2012	2015
Average	59.5	62.3	63.4
Lowest state	35.1	44.8	46.3
Median	61.6	63.8	65.0
Highest state	77.2	75.8	76.5
State Score Rank			
1-10	69.0	71.4	71.5
11-20	64.4	67.8	67.8
21-30	61.4	63.7	64.8
31-40	56.4	57.8	60.1
41-50	46.4	50.8	52.8

Note: averages are unweighted state averages.

TABLE 15: CORRELATIONS BETWEEN UM RATES AND STATE LIABILITY SCORES

State Liability Score	Correlation with UM Rates	Interpretation
State Liability Score, 50 states, annual for 2009 through 2015	-0.454	UM rates are lower in states perceived to have better tort systems
State Liability Score, 50 states, 2009	-0.415	Inverse correlation between UM rate and State Liability Scores consistent across years
State Liability Score, 50 states, 2010	-0.424	
State Liability Score, 50 states, 2011	-0.507	
State Liability Score, 50 states, 2012	-0.504	
State Liability Score, 50 states, 2013	-0.433	
State Liability Score, 50 states, 2014	-0.466	
State Liability Score, 50 states, 2015	-0.448	

Table 16 presents UM rates for the states arranged by the state liability scores. States with state score ranks 11-20 and 21-30 had similar UM rates, and consequently were grouped into state liability rank 21-40 in Table 16.

TABLE 16: UNINSURED MOTORIST RATES, BY STATE LIABILITY SCORE RANK

State Liability Group	State Liability Rank	2009	2010	2011	2012	2013	2014	2015	2009-2015
1	1-10	10.3	8.9	8.4	8.5	8.1	7.9	8.2	8.6
2	11-20	11.8	10.2	8.6	8.9	10.1	10.0	10.6	10.0
3	21-40	13.4	12.0	12.8	12.9	12.4	12.4	12.5	12.6
4	41-50	18.0	16.4	17.5	17.8	16.7	17.2	17.2	17.3
	Difference from Group 1								
2	11-20	1.5	1.3	0.2	0.4	2.0	2.1	2.4	1.4
3	21-40	3.1	3.1	4.4	4.4	4.3	4.5	4.3	4.0
4	41-50	7.7	7.5	9.1	9.3	8.6	9.3	9.0	8.7

States considered to have favorable tort systems (that is, states with high state liability scores) had lower UM rates. In 2009, the 10 states with the highest state liability scores had an average UM rate of 10.3, the 10 states with the next-highest state liability scores had an average UM rate of 11.8, and the ten states with the lowest liability scores had an average 18.0 UM rate. This relative lowest-to-highest ordering of UM rates was observed in each year. Overall, the average UM rates for the 2009-2015 period were lowest for states considered to have favorable tort systems (8.6) and highest for states considered to have the most unfavorable tort system (17.3).

REGRESSION ANALYSES

The preceding discussion focused on the association between UM rates and a series of economic variables, policy variables, and state tort system indices viewed singly. To varying degrees, these considerations were correlated with UM rates. A series of regression analyses was performed to evaluate the relative impact of a variable while holding constant the impact of the other variables. All regression analyses were performed using the 50 state UM rates for 2009 through 2015.[16]

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[16]There were 350 observations in the regression analyses: 50 states for seven years.

In a simple regression using the UM rates and a control variable for each year, none of the year variables was statistically significant, and the variables explained less than 1 percent of the variation in the UM rates (per the R-squared statistic). The implication is that the differences in the UM rates for 2009-2015 were not explained by a time trend. By contrast, in a regression using the UM rates and a control variable for each state, most state variables were statistically significant, and the 50 state variables explained more than 90 percent of the variation in the UM rates. While it may be interesting to find that state variables are statistically significant in a regression analysis for an outcome such as UM rates, the state variables are likely to be surrogates for other variables, such as differences across states with respect to economic factors, policy variables, state tort systems, and other considerations. To this end, the regression analyses were extended to include the considerations discussed in the preceding section.

Table 17 presents the results from two multiple regression analyses designed to explain differences in UM rates across the 50 states and seven years. The analyses in Table 17 present two perspectives distinguished by the inclusion of the state litigation environment variables. The national model includes economic and policy variables without controls for the state tort system. The results from this model might be viewed as the impact if a national policy were initiated. For example, the impact of income on the UM rate could be viewed as the impact across all states without regard to the impact on an individual state. The state model adds the state tort-system variables to the variables in the national model. The results from this model might be viewed as the impact of a change or difference in an individual state given the state tort environment.[17]

The models are the result of analyzing several combinations of variables described in the preceding section. Because several variables in the preceding discussion are highly correlated, the preliminary analyses worked to identify which variables provided the most interpretable explanation for differences in UM rates. For example, there was a high correlation between median household income and the percentage of families with incomes of less than $10,000 (generally, the higher the median household income in a state, the lower the percentage of families with incomes of less than $10,000.) Winnowing the variables to retain variables that were not highly correlated resulted in including the following economic variables in the final regression analyses: the percentage of families with an income of less than $10,000, the percentage of individuals 18 to 24 years with less than a high school diploma, and the unemployment rate for people 16 years and older. This set of three variables provided a variable for income level, educational level, and employment status in the model.[18]

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[17]Appendix A presents additional national and state models.

[18]It was beyond the scope of the present analysis to determine whether the automobile insurance premium was sufficiently independent of the UM rate to be included as an explanatory variable for differences in UM rates. It may be the case that UM rates give rise to higher automobile insurance premiums, in which case the regression analysis would be automobile insurance premium as the outcome measure and UM rates as an explanatory variable.

The regression analyses began with the inclusion of the four policy variables: UM coverage required, the presence of penalties for driving without insurance, minimum limits, and the presence of a no pay, no play statute. In the preliminary regression analyses, the latter two policy variables—minimum limits and the presence of a no pay, no play statute—provided negligible improvements to the explanation of differences in UM rates and were not statistically significant; they were consequently dropped from the final models. The final models included the variable for UM coverage required (where the reference group was states that do not require UM coverage) and the penalties for driving without insurance (where the reference group was states with low penalties).

TABLE 17: MULTIPLE REGRESSION RESULTS – DEPENDENT VARIABLE: UM RATES (PERCENT OF DRIVERS WITHOUT AUTOMOBILE INSURANCE)

Variable	National Model				State Model		
	Coefficient	t-stat			Coefficient	t-stat	
Intercept	3.2422	2.21	*		5.9367	4.25	*
Percent with family income < $10k	1.1059	4.98	*		0.3973	1.77	
Educ less than HS - 18-24 years	0.0978	1.03			0.0840	0.95	
UE rate - 16+ years	0.5519	4.09	*		0.3817	2.77	*
UM insurance cov reqd	-3.5326	-7.72	*		-3.5262	-8.25	*
High penalty for driving w/o insur	-0.3227	-0.78			-0.1854	-0.48	
State Liability Group 2					1.3365	2.19	*
State Liability Group 3					2.1368	3.53	*
State Liability Group 4					5.7003	7.67	*
Year 2010	-2.1565	-2.82	*		-1.8974	-2.69	*
Year 2011	-1.7305	-2.26	*		-1.5290	-2.17	*
Year 2012	-0.8918	-1.15			-0.9009	-1.26	
Year 2013	-0.5987	-0.76			-0.8164	-1.13	
Year 2014	0.2740	0.33			-0.2507	-0.33	
Year 2015	1.3227	1.56			0.4095	0.51	
R-Squared	0.446				0.536		

The state model adds the four groups for state liability rankings to the economic and policy variables (where the reference group was states with the most-favorable rankings for state liability environment). In each model, time-trend variables for the years 2009 through 2015 were included (2009 was reference year).

For each variable, the table provides the coefficient, t-statistic, and an asterisk if the coefficient was statistically significant at the 5 percent confidence level. A finding of statistical significance indicates a 95 percent confidence the variable has a non-zero association with UM rates, and the coefficient is the best estimate for the impact on the UM rate. A discussion of the results from the national and state models follows.

GOODNESS OF FIT/EXPLANATORY POWER

The bottom row in the table presents the proportion of differences in UM rates explained by the variables in the analysis. Economic, policy, and time-trend variables in the national model explained 44 percent (0.446 R-squared) of the differences in UM rates across the 50 states and seven years. Most of this explanation was provided by the economic variables. When only the economic variables were included, the three variables for income, education, and unemployment explained 34.5 percent of the differences in UM rate rates. When only the policy variables were included, the UM coverage requirement and penalty for driving without insurance explained 24 percent of the differences in UM rates. When only the time-trend variables were included, the annual year variables explained only 1 percent of the differences in UM rates. In sum, without considerations for the other variables, economic factors were found to explain more of the differences in UM rates across states and years than policy measures or a time trend. Given the relatively consistent countrywide UM rates from 2009 through 2015 described in the preceding section, it was not surprising that the time-trend variable alone did not explain a significant amount of the differences in UM rates; nevertheless, the inclusion of the time trends was useful for controlling for differences across time that were not captured by the other variables in the analysis.

The state tort variables separately (without the economic, policy, or time-trend variables) explained 35 percent of the differences in UM rates. When the variables for state tort environments were included with the economic, policy, and time-trend variables for the state model (second set of columns in Table 17), 54 percent of the differences in UM rates were explained. In sum, the economic, policy, and time-trend variables explained approximately 45 percent of the differences in UM rates.

ECONOMIC VARIABLES

In the analyses, UM rates (the dependent variable) were expressed as a percentage, and the coefficients can consequently be viewed as a one-for-one impact on UM rates. For example, in the national model, the 1.1059 coefficient for the percentage of families with an income of less than $10,000 indicates that state/year observation with a one-percentage-point-higher percent of families with an income below

$10,000 is associated with a 1.1-point-higher UM rate. This difference may be a difference between two states or the difference between two years in a single state.

The coefficients for each economic variable have the expected signs in both the national and state models. Generally, the higher the percentage of families with incomes of less than $10,000, the higher the percentage of 18-to-24-year-olds with less than a high school diploma. Likewise, the higher the unemployment rate among people 16 years and older, the higher the UM rate. The coefficient for the income variable is statistically significant in the national model, and the coefficients for the unemployment rate variable are statistically significant in both models. The estimated impact of the income variable varies considerably when state litigation-environment variables are included. Without these variables (national model), the impact on the UM rate of a one-percentage-point difference in low-income incidence is 1.1; with the state litigation-environment variables (state model), the estimated impact of the income variable is reduced to 0.4 and is not statistically significant. (We cannot be sure with 95 percent confidence of a nonzero impact on the UM rate). The lower coefficient is due to the correlation between the percentage of individuals with low family incomes and the state litigation index.[19]

The results suggest that, when controlling for other variables, policy initiatives that reduce the incidence of low family incomes, increase the percentage of individuals with a high school diploma, or reduce unemployment rates have the potential to reduce the UM rate.

POLICY VARIABLES

The policy variables for required UM coverage and high penalties for driving without insurance improved the explanatory power. The directional impacts of the coefficients are as expected, and the coefficient for required UM coverage is statistically significant in the national and state models. In the national model, the UM rate is estimated to be 3.5 percentage points lower in states where all motorists are required to purchase UM coverage, and the estimated impact is not materially different in the state model. In states that do not require UM coverage, the cost of UM losses may be included in the base rate such that there may be no material difference in the cost of insurance between states that require and those that do not require UM coverage. However, in states that require UM coverage, policyholders will see the cost broken out in the rates, and this may prompt more attention to the costs of uninsured motorists in these states. This attention may exert pressure on policymakers, regulators, and law enforcement to take more affirmative steps to control the incidence of uninsured motorists.

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[19]For states in state liability index group 1, the average percent of families with incomes of less than $10,000 was 3.7 percent; for states in state liability index group 2, 4.0 percent; for states in state liability index group 3, 4.7 percent; and for states in state liability index group 4, 5.9 percent.

The negative coefficient for the high-penalties policy variable suggests that high penalties for driving without insurance may help control the UM rate; however, the negative coefficients for the high-penalty variable are not statistically significant.

STATE TORT LIABILITY SYSTEMS

With the inclusion of the state tort liability system variables (state model), more than half of the differences in UM rates are explained by the variables in the regression analysis. (The R-squared is 0.536.) The unemployment variable continues to be statistically significant, as does the UM-coverage-required variable. Although the coefficients in the state model for income, education, and penalties continue to have the same directional impact as the national model (that is, the coefficients have the same sign), the coefficients are not statistically significant because some of the influence of these variables is captured by the state tort-liability-system variables.

The coefficients for the state liability groups are progressively higher across the groups and are statistically significant. These coefficients indicate that UM rates are higher in states with tort liability systems considered less favorable to business, particularly in the least-favorable states (group 5). For states in group 5, when all other factors are the same, the UM rate is estimated to be 5.3 percentage points higher.

TIME TREND

With 2009 as the reference year, the control variables for 2010 and 2011 are statistically significant, and the pattern of the coefficients suggests that when controlling for the influence of the economic and policy variables and the state tort-liability system, UM rates dropped from 2009 through 2010 but have been steadily increasing since. Although the coefficients for the individual years are not statistically significant, the consistent increase in the coefficients is worth noting.

CONCLUSION

The purpose of this study has been to investigate the factors associated with differences in UM rates across years and states. We began by noting there have been larger differences in UM rates across states than across years. We began with a set of economic factors (income and consumption, employment, and education), policy variables (UM coverage required, penalties for driving with no insurance, minimum limits for bodily injury and physical damage, and the presence of a no pay, no play statute), scores for an assessment of the favorability of state tort liability systems towards business, and year variables.

We found that the economic factors (and particularly differences in income, education, and unemployment rates) explained a large share of the differences in UM rate across states. The income consideration may be an indication (particularly among low-income families) that automobile insurance may be a good consumers forgo when choices must be made among economic necessities. The education consideration may be indication that, despite efforts to standardize and make automobile insurance products more understandable, insurance products continue to be a complex consumer purchase for individuals with less education. The finding that UM rates are higher in states with higher unemployment rates suggests that automobile insurance may be a purchase consumers forgo when confronting difficult economic circumstances. The finding that UM rates are lower in states where UM coverage is required suggests that the explicit attention to the cost of UM accidents to policyholders may prompt more pressure on policymakers, regulators, and law enforcement to take affirmative steps to controlling the incidence of uninsured motorists. The finding that UM rates are higher in states where the tort liability systems are considered less favorable to businesses may indicate a higher reporting of UM accidents (relative to the reporting of BI accidents) in states with more active consumer-advocates groups. Finally, while the statistical significance was weak, there are indications that, controlling for the economic, policy, and state considerations, there has been an increase in UM rates in recent years. The upward trend might not be evident in the observed UM rates, however, because the steady increase in economic factors over the period (which could have contributed to tempering the UM rate) may have offset the otherwise increase in UM.

In sum, while certain policy controls for matters such as requiring uninsured motorists coverage and high penalties for driving without insurance may serve some purposes for encouraging coverage and discouraging non-coverage, attention to economic factors and state tort liability systems may provide as much impact on controlling UM rate as efforts to find a particular set of policy controls.

LIMITATIONS

DATA

In performing this analysis, we relied on publicly available data and other information. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the results of our analysis may not be suitable for the intended purpose.

We performed a limited review of the data used in our analysis for reasonableness and consistency and did not find material defects in the data. If there are material defects, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data that searches for questionable data values and for materially inconsistent relationships. Such a review was beyond the scope of our assignment.

UNCERTAINTY

During the course of our review, we applied generally acceptable statistical procedures. However, due to the uncertainty involved in projecting future events, it is likely that actual results will vary from our projections, perhaps materially. This uncertainty related to the projections in this report is increased due to uncertainty regarding the behaviors of individuals.

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APPENDIX A

RESULTS FROM ALTERNATIVE MULTIPLE REGRESSION ANALYSES

The table below presents the results from five multiple regression analyses. The first three analyses concern the National Model (that is, the analyses performed without the state controls for the tort liability system) and the last two analyses concern the State Model. The results for the full National Model (Analysis 3) and the full State Model (Analysis 5) were discussed in the report. In this appendix, the results are presented when the analyses were performed separately for the economic variables (Analysis 1), the policy variables (Analysis 2), and the state tort liability variables (Analysis 4).

Appendix Table 1: MULTIPLE REGRESSION RESULTS – DEPENDENT VARIABLE: UM RATES (PERCENT OF DRIVERS WITHOUT AUTOMOBILE INSURANCE)

	National Model									State Model					
	Analysis 1			Analysis 2			Analysis 3			Analysis 4			Analysis 5		
Variable	Coeff	t-stat		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat	
Intercept	-1.9065	-1.34		15.6030	22.60	*	3.2422	2.21	*	9.7650	13.51	*	5.9367	4.25	*
Percent with family income < $10k	1.1419	4.84	*				1.1059	4.98	*				0.3973	1.77	
Educ less than HS - 18-24 years	0.3260	3.37	*				0.0978	1.03					0.0840	0.95	
UE rate - 16+ years	0.5378	3.68	*				0.5519	4.09	*				0.3817	2.77	*
UM insurance cov reqd				-4.8575	-9.95	*	-3.5326	-7.72	*				-3.5262	-8.25	*
High penalty for driving w/o insur				-0.7231	-1.52		-0.3227	-0.78					-0.1854	-0.48	
State Liability Group 2										1.4297	2.07	*	1.3365	2.19	*
State Liability Group 3										4.0040	6.71	*	2.1368	3.53	*
State Liability Group 4										8.6427	12.54	*	5.7003	7.67	*
Year 2010	-2.2248	-2.68	*	-1.4874	-1.68		-2.1565	-2.82	*	-1.4874	-1.82		-1.8974	-2.69	*
Year 2011	-1.5836	-1.91		-1.3842	-1.57		-1.7305	-2.26	*	-1.3842	-1.70		-1.5290	-2.17	*
Year 2012	-0.5846	-0.70		-1.1723	-1.33		-0.8918	-1.15		-1.1723	-1.44		-0.9009	-1.26	
Year 2013	-0.2826	-0.33		-1.4305	-1.62		-0.5987	-0.76		-1.4305	-1.75		-0.8164	-1.13	
Year 2014	0.7385	0.83		-1.3871	-1.57		0.2740	0.33		-1.3871	-1.70		-0.2507	-0.33	
Year 2015	1.8655	2.03	*	-1.2011	-1.36		1.3227	1.56		-1.2011	-1.47		0.4095	0.51	
R-Squared	0.345			0.242			0.446			0.356			0.536		

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