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Auto Insurance Reform: Salvation in South Carolina

Each state has a story to tell about its regulation of private passenger automobile insurance. While many common factors affect auto insurance, their particular mix varies among states, leading to different regulatory policies and market outcomes. Auto insurance is a highly salient issue among consumers and voters. Unfortunately, the collision of economic forces and politics has caused troublesome problems in some state auto insurance markets. At the same time, certain states have avoided or mitigated these problems with regulatory and market reforms. Hence there are valuable lessons to learn in examining the regulatory experience in specific jurisdictions.

South Carolina's story of auto insurance problems and subsequent reforms offers hope to other states. High speeds on its rural highways, frequent and severe accidents, and a litigious environment combined to escalate auto insurance costs. The government responded with intensive regulation in an attempt to stem rising premiums and address concerns about unfair treatment of certain drivers. In addition to tight limits on rates and underwriting, South Carolina established the Reinsurance Facility (hereafter referred to as "the Facility") for the residual market, which

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imposed a large subsidy from low-risk and “bad-risk” drivers to medium-risk drivers.¹ Its design and other regulatory factors caused the Facility to balloon to 42 percent of the state’s insured vehicles in 1992 and generate huge deficits borne disproportionately by drivers across the state.

Growing consumer and political dissatisfaction with this situation eventually prompted the South Carolina legislature to enact Senate Bill 254 (1997 S.C. Acts 154), which revamped the regulatory system. Related legislation in 1999 (Senate Bill 399) helped to implement the reform program. Restrictions on rates and underwriting have been eased and the Facility and its subsidy are being phased out.

With most of the reforms becoming effective in 1999, it is too soon to determine their ultimate outcome, but the early prognosis is positive.² The number of insurers writing auto insurance has doubled with implementation of the reforms. Many insurers also have lowered their overall rate levels for auto insurance, reflecting declining claim costs and the easing of restrictions on risk classification and pricing. Some insurers have raised their rates in order to cover high-risk drivers that were previously relegated to the Facility. Consequently, and most important, the Facility is depopulating rapidly.

This chapter begins with a review of the system for auto insurance regulation in South Carolina and its historical antecedents. We then examine the structure of the market over the last decade, before and after reform. This is followed by a historical analysis of market conduct and performance that looks at several outcome measures, including prices, profits, availability, and claim costs. Our analysis includes an initial review of cost drivers that reveals some interesting patterns that warrant further investigation. We conclude by distilling the principal insights from South Carolina’s experience.³

Auto Insurance Regulation in South Carolina

Like most other states, South Carolina utilized a prior approval regulatory system for auto insurance after the enactment of the McCarran-

1. In South Carolina, the Department of Insurance defines “bad-risk” drivers as those with multiple driving violations.

2. We refer to these changes as the “1999 reforms,” reflecting their effective date.

3. A more detailed analysis of the South Carolina experience is provided in Grace, Klein, and Phillips (2001).

Ferguson Act in 1945. The states' imposition of uniform "bureau rates" for the principal property-casualty lines in the postwar years is well documented.⁴ The constraints on price competition gradually eroded over time as insurers gained increasing flexibility to deviate from uniform prices. Some states eventually removed prior approval requirements for auto insurance rates to allow market forces to operate more freely. Other states, including South Carolina, retained prior approval requirements and tightened price limits when costs escalated. In South Carolina, insurers were not required to adhere to mandatory bureau rates, but were required to individually file rates for prior approval.⁵

In 1975 legislation took effect in South Carolina that comprised a number of regulatory provisions that were popular in the more activist states.⁶ These provisions included

- compulsory liability insurance;
- mandatory service requirements for auto insurers;
- establishment of the Reinsurance Facility;
- implementation of a mandatory, uniform merit rating plan; and
- a limited number of designated agents allowed to sell insurance directly through the Facility.⁷

However, these regulatory provisions proved to be problematic in the years ahead. Subsequent legislative and regulatory tinkering made some improvements but failed to fully solve the problems. This led to the comprehensive restructuring in 1999 (based on legislation enacted in 1997). Below we review the most important elements of South Carolina's regulatory system and how they were modified in comparison with other jurisdictions. Figure 4-1 provides a historical timeline of key developments in South Carolina auto insurance regulation.

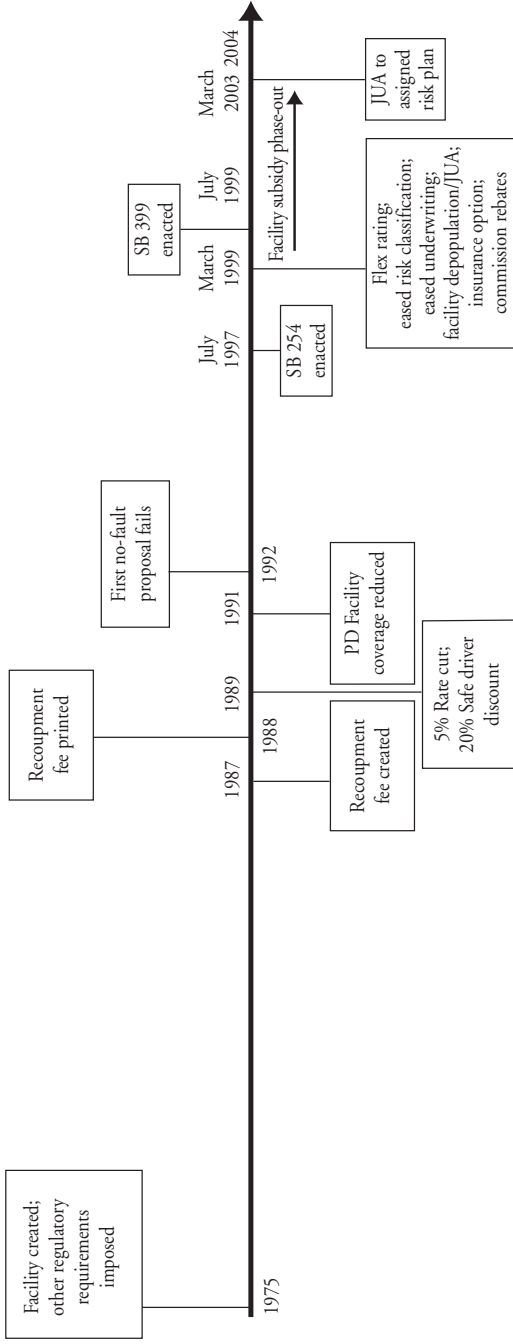
4. Joskow (1973); Hanson, Dineen, and Johnson (1974).

5. Until the early 1990s, insurers could voluntarily adopt rates (by reference) filed by advisory organizations and approved by the insurance department. In the early 1990s, South Carolina, like other states, moved to a prospective loss cost system. (See subsequent discussion.)

6. The use of a reinsurance mechanism for the residual market went beyond what most states established.

7. These were agents authorized to place insureds directly with the Facility. They were not subject to enforcement of the field underwriting requirements generally required of "voluntary market agents," nor were they compelled to properly classify insureds and charge the appropriate rate.

Figure 4-1. *Timeline of Auto Insurance Reforms, South Carolina, 1975–2003^a*



a. Abbreviations: PD, property damage liability. JUA, joint underwriting association.

Regulation of Price Levels

South Carolina required the prior approval of all private passenger auto insurance rates until 1999. At first glance the pre-1999 South Carolina system might appear similar to that of other prior approval states (see table 4-1). The South Carolina law contained the standard prohibitions against excessive, inadequate, and unfair rates. Insurers also were prohibited from employing socially unacceptable criteria in pricing and underwriting, such as race and religion. Insurers were required to file and receive regulatory approval of their auto insurance rates before they could be put into effect. Advisory organizations also played their typical role in submitting advisory loss costs for regulatory approval (full rates prior to 1991), which insurers could reference in their individual rate filings.⁸

There were some additional restrictions in South Carolina that were shared only with the most “activist” prior approval states (summarized in table 4-1 and discussed below). It also is necessary to look beyond statutes and regulations to the policies, procedures, and actions that enforced them. A number of observers have noted that regulatory stringency can vary greatly among states with similar systems.⁹ In this respect, it appears that South Carolina enforced tighter price ceilings than the average prior approval state. This is reflected in the disposition of advisory loss cost filings. Table 4-2 shows that for bodily injury liability (BIL) coverage, regulators reduced advisory loss cost increases to a greater degree in South Carolina than in other states.

The apparent greater stringency of South Carolina regulation is also reflected in the Conning and Company rankings of states in terms of their insurance regulatory environments.¹⁰ In periodic surveys conducted from 1984 to 1991, South Carolina’s score declined from 3.2 to 2.4, and it ranked forty-fifth among fifty-one jurisdictions, indicating that insurers had a very negative view of its regulatory climate. In the 1994 survey, South Carolina’s score improved to 4.5, and its rank rose to forty-first—better, but nothing to boast of.

On March 1, 1999, a “flex rating” system went into effect in South

8. The rating bureaus of the post-McCarran era were transformed into advisory organizations in the 1960s as most states moved away from mandatory bureau rate systems. Advisory organizations file advisory rates (prospective loss costs after 1992) and policy forms with regulators that are subject to prior approval in most states. Insurers may adopt approved advisory rates or loss costs by reference.

9. Klein (1986); Cummins, Phillips, and Tennyson (2000).

10. See Conning (1984, 1987, 1991, and 1994). Conning surveys in 1984, 1987, 1991, and 1994 use a relatively consistent approach in evaluating states’ overall regulatory environment.

Table 4-1. *Key Auto Insurance Regulatory Provisions in South Carolina*

<i>Provision</i>	<i>Pre-reform</i>	<i>Post-reform</i>
Rates		
Filing and approval	Prior approval	Flex rating ^a
Risk classification	Restricted	Increased flexibility
Public rate hearings	Yes	No
Limits on underwriting	Highly restricted	Eased
Agent rebates	Disallowed	Allowed
Residual market		
Mechanism	Reinsurance Facility	JUA → assigned risk plan ^b
Subsidized	Yes	No
Compulsory insurance	Yes	No

a. See subsequent discussion.

b. JUA, joint underwriting association.

Carolina as one of its regulatory reforms. Under the new system, insurers do not need prior approval to implement rate changes (increases or decreases) that are less than or equal to 7 percent. Rate filings for more than a 7 percent change must still receive prior approval. Also, insurers are limited to one “flex” rate change (not requiring prior approval) during any twelve-month period. The insurance department also has approved larger rate changes, allowing insurers to differentiate their rate structures and risk portfolios.¹¹

Restrictions on Rate Structures

Another issue with South Carolina’s previous regulatory system was its constraints on risk classification and rating. While it is not uncommon for prior approval states to place some limits on insurers’ rate differentials between risk classifications and geographic areas, South Carolina went further. Prior to Act 154, South Carolina statutes authorized the director of insurance to promulgate uniform classification systems, merit-rating plans, and rating territories and require insurers to grant safe driver discounts of no less than 20 percent. Rate differentials between territories also

11. In a competitive market, auto insurers tend to differentiate themselves in terms of the stringency of their underwriting standards and the characteristics of the drivers they insure. This specialization facilitates efficient, risk-based pricing of auto insurance and encourages drivers to lower their risk to qualify for lower rates.

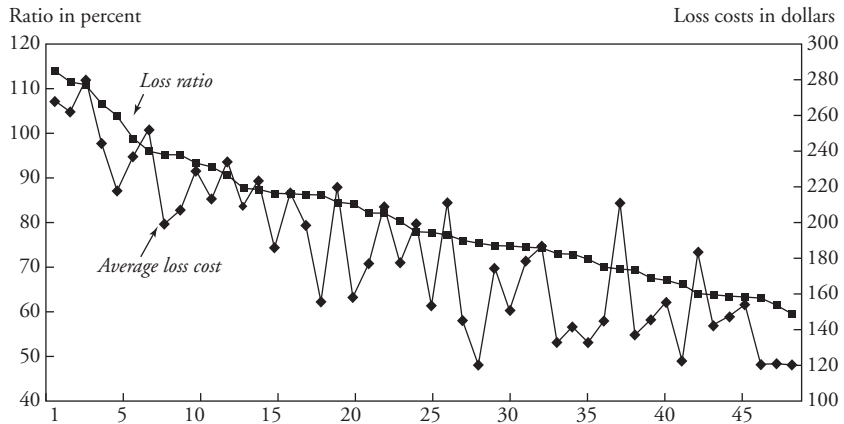
Table 4-2. *Advisory Loss Cost Filings for BIL, South Carolina versus Other States, 1991-99*

Year	Other states																			
	South Carolina percent change						Loss cost increases						Loss cost decreases							
	Indicated	Filed	Implemented	N ^a	Mean ^b	Indicated	Filed	Implemented	N	Mean	Indicated	Filed	Implemented	N	Mean	Indicated	Filed	Implemented	N	Mean
1991	33.9	33.9	23.0	39	13.7	30	12.2	30	30	11.9	6	-3.0	6	6	-3.0	6	-3.0	6	6	-3.0
1992	...	...	...	30	11.6	28	10.5	25	25	8.3	15	-7.7	15	15	-7.7	15	-7.7	15	15	-7.7
1993	...	...	...	16	14.3	15	9.9	13	13	8.1	27	-6.3	27	27	-6.3	27	-6.3	27	27	-6.3
1994	8.9	8.9	4.0	24	10.5	20	10.7	19	19	9.5	22	-6.1	22	22	-6.1	22	-6.1	22	22	-6.1
1995	2.4	2.4	1.1	33	9.2	30	7.4	30	30	7.4	12	-3.9	12	12	-3.9	12	-3.9	12	12	-3.9
1996	-10.7	-10.7	-10.7	22	7.4	21	6.4	20	20	6.4	22	-6.1	22	22	-6.1	22	-6.1	24	24	-6.1
1997	-14.9	-14.9	-14.9	4	8.5	3	2.7	3	3	2.7	42	-10.5	40	40	-10.4	39	-10.6	39	39	-10.6
1998	...	...	...	4	3.3	4	3.3	4	4	3.3	40	-10.3	38	38	-10.7	36	-10.7	36	36	-10.7
1999	-10.3	-10.3	-10.3	3	3.3	3	3.3	1	1	3.3	40	-9.2	38	38	-9.5	35	-9.3	35	35	-9.3

Source: Insurance Services Office (ISO), unpublished data.

a. Number of states in sample. Total of forty-seven states represented.

b. Percent.

Figure 4-2. *South Carolina Counties Ranked by Loss Ratio, BIL 1993–98*

Source: South Carolina Department of Insurance, unpublished data.

were capped. Furthermore, merit rating was limited to a three-year experience period. An analysis by the National Association of Independent Insurers (NAII) indicated that in 1989 South Carolina was one of fourteen states with some form of explicit restriction on class or territorial rates for auto insurance.¹²

Rate compression occurs when regulators constrain price differentials between risk classifications or territories. To provide some preliminary evidence, consider figure 4-2, which reveals a direct relationship between average loss costs and loss ratios by county (BIL experience combined for 1993–98): premiums increase less than proportionately with average loss costs. This pattern is consistent with rate compression although not conclusive.¹³

The constraints on pricing and underwriting caused several problems. It limited insurers' flexibility in tailoring their pricing structures so that they might charge premiums corresponding to a driver's relative risk and expected loss. In practice this tended to prevent insurers from charging adequate rates to high-risk drivers. This contributed to the state's large residual market, despite a mandatory service—"take-all-comers"—

12. Diana Lee, NAII, in a letter to Helen Doerpinghaus, University of South Carolina, November 14, 1989.

13. As losses tend to fluctuate relative to premiums, one would expect loss ratios to be positively associated with loss costs.

requirement.¹⁴ It also diminished incentives for high-risk insureds to improve their safety and hence would be expected to contribute to higher loss costs and exacerbate market and political pressures. “Forgiveness statutes,” allowing drivers to expunge violations on their driving records in many counties, further compromised risk-based pricing. Finally, there was a perceived inequity in how the system’s costs were allocated among different groups of drivers.

The easing of pricing constraints was one of the important reforms that became effective in 1999. Act 154 repealed the statutes for uniform classifications, merit rating, and rating territories, and the safe driver discount, although it also added a requirement that insurers provide an “appropriate” premium reduction for drivers age fifty-five and older who complete an approved driver training course.¹⁵ Insurers are now allowed to file their own rating plans, and the Insurance Services Office (ISO) also is allowed to file its regular classification system. This should allow insurers to charge higher and more adequate rates for high-risk drivers and possibly lower rates for low-risk drivers. In turn, this should allow the market to function more freely and efficiently and improve incentives for safety.

Approach to Residual Market

South Carolina’s residual market facility played a pivotal role in motivating regulatory changes. The Facility was somewhat unusual (in auto insurance) in that it utilized a reinsurance approach, a type of mechanism used by only two other states for auto insurance (New Hampshire and North Carolina). The policies of residual market insureds were serviced by voluntary market insurers who ceded all premiums and losses to the Facility and were compensated for servicing the policies. Insurers also were required to establish special statistical data reporting systems to track policies ceded to the Facility, further adding to their costs.

The problem with a reinsurance approach to residual markets is that servicing carriers bear the full cost of any loss control expenditures on Facility insureds, but they do not directly benefit from any resulting sav-

14. Insurers were required to accept insurance applications from any licensed driver, rather than exercising underwriting guidelines or discretion that might result in the rejection of applications from certain drivers who failed to meet an insurer’s preferred underwriting standards. At the same time, an insurer could fully reinsure such drivers through the Facility.

15. Also, while insurers may file their own territorial plans, a rating territory may not be smaller than a county.

ings in claim costs. This diminishes servicing carriers' incentives to optimize loss control expenditures for Facility insureds, and they will be induced to under-invest in loss control measures. Also, designated agents who place insureds directly in the Facility are paid a fee to adjust the claims of these insureds. As this fee is a percentage of the claim amount, designated agents have little incentive to control claim costs—in fact, they have an incentive to inflate them. This can create a significant moral hazard problem and lead to higher loss costs, as demonstrated by several studies and explored later in this chapter.¹⁶

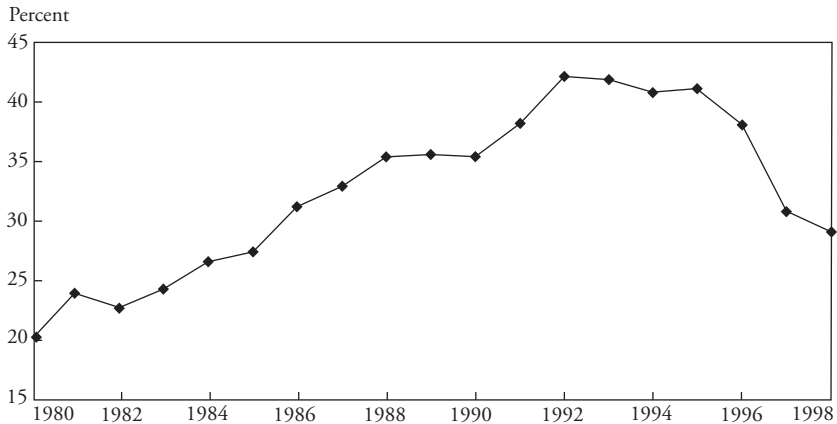
It also is apparent that the Facility rates, determined by regulators, were severely inadequate to cover its costs. There was a desire to maintain Facility rates that were “comparable” to voluntary market rates, but this became untenable because the Facility was subject to severe adverse selection. At least a couple of factors would have contributed to this. First, limits on Facility rates and relatively lax eligibility requirements led higher risk drivers to choose the Facility over the voluntary market when they had that option. Also, as explained above, certain agents were allowed to place insureds directly in the Facility, allowing drivers to enter by choice rather than through their rejection or cession by an insurer in the voluntary market.

Insurers also were induced to pass drivers to the Facility because of the limits on risk classification in the voluntary market.¹⁷ The territorial and driver-class plan mandated by the state did not allow companies to price insureds according to their relative risk as indicated by their characteristics. This, coupled with suppression of overall rate levels, meant that insurers could identify insureds that would be expected to have greater claim costs than those contemplated in the regulated rate for a given class. Hence insurers were encouraged to cede these insureds to the Facility.

Because of these factors, the Facility grew rapidly and incurred large deficits that were assessed back against the voluntary market. Figure 4-3 plots the Facility market share from 1980 to 1998. The proportion of vehicles insured through the Facility increased from 20 percent in 1980 to 42 percent in 1992 and then decreased to 29 percent by 1998. The Facility's deficit and burden on the voluntary market moved in a similar pattern. Annual operating losses rose above \$200 million in 1995 and then began

16. Harrington and Pritchett (1990) discuss this problem for the auto insurance market in South Carolina. Klein, Nordman, and Fritz (1993) and Danzon and Harrington (1998) also find evidence of this problem in workers' compensation insurance where reinsurance facilities are used for the residual market.

17. This is explained by Harrington and Pritchett (1990).

Figure 4-3. *Reinsurance Facility Market Share, 1980–98*

Sources: AIPSO (2001); South Carolina Department of Insurance, unpublished data.

to decline. The cumulative deficit incurred by the Facility through 1999 was \$2.4 billion. These deficits were covered initially by assessments against voluntary market insurers and subsequently, starting in 1988, by recoupment fees (explained below) charged directly to insured drivers.

Suppression of both voluntary and Facility rates prompted some insurers to exit or retrench from the South Carolina auto insurance market in the 1980s. It also retarded the development of a viable voluntary nonstandard auto insurance market that could have covered high-risk drivers. These forces contributed to rapid growth in the Facility as the voluntary market shrank and the number of agents allowed to write coverage directly through the Facility increased.

In 1988 the system was changed to allow insurers to cover all Facility losses through a “recoupment fee,” a direct surcharge to all policyholders.¹⁸ The basic fee in 1988–89 for all coverages was \$73 per vehicle: \$40 for liability, \$11 for personal injury protection, \$18 for collision, and \$4 for comprehensive coverages. Drivers who accumulated points for driving violations were required to pay specified multiples of the basic recoupment fee, which were increased in subsequent revisions of the fee schedule. For example, in 1998–99, a driver with no points paid a \$44.32 recoupment fee, a driver with two points paid \$830.20, and a driver with 5 points paid \$2,075.50. A driver convicted of driving under the influence (DUI) paid \$4,151.

18. Prior to the 1999 reforms, the recoupment fee was based on an insured’s driving violations.

One important advantage of changing to the recoupment fee was that it made the subsidy to the Facility visible to drivers. Reinsured drivers also were required to pay this fee, which decreased the subsidy to Facility insureds. In essence, the direct burden of covering residual market deficits was moved from insurers to insureds. This ultimately helped catalyze the political support necessary for regulatory reforms. However, a given driver still did not know whether he was reinsured through the Facility. Also, Harrington and Pritchett argue that many drivers who paid the recoupment fee still received a subsidy. In essence, the basic structural problems that plagued the Facility were not fixed. Its size and deficits continued to grow, as did the recoupment fee paid by all insureds, particularly for those with driving violations.

Consequently, changing the residual market mechanism became a focal point of the reform legislation. Under the new law, the reinsurance Facility is being phased out over a three-year period that began March 1, 1999. Restrictions have been imposed on insurers' cessions to the Facility. Further, Facility rate levels for liability coverages will gradually be allowed to reach adequate levels, with annual rate increases limited to 10 percent. The recoupment fee has been capped and will be gradually phased out.

The Reinsurance Facility is being temporarily replaced by a joint underwriting association (JUA) and will ultimately be replaced by an assigned risk plan in 2003. A JUA was established as an intermediate step to ease the transition and avoid assigning a large number of drivers to insurers until the voluntary market had time to recover. Eligibility for the JUA has been tightened, and procedures have been implemented to channel as many drivers as possible into the voluntary market.

Market Structure Trends in South Carolina

South Carolina has a medium-size market for auto insurance, large enough to support numerous insurers and options to consumers. However, its pre-1999 regulatory climate depressed the number of companies supplying auto insurance.

Market Concentration

Table 4-3 tracks the number of insurance companies and groups in South Carolina over the period 1990-99. The number of insurer groups selling auto insurance dropped from 56 to 45 by 1998. In the Southeast

Table 4-3. Market Concentration, South Carolina versus Southeast Region, 1990-99

Year	South Carolina				Southeast region ^a				Average HHI
	Unaffiliated companies ^b	Companies in groups ^b	Groups ^c	HHI ^d	Unaffiliated companies	Companies in groups	Groups		
1990	2	78	56	1,195	15	184	99	1,082	
1991	1	66	55	1,337	15	185	97	1,146	
1992	2	54	45	1,454	13	183	96	1,129	
1993	2	49	40	1,470	15	184	97	1,137	
1994	2	48	41	1,476	13	182	96	1,129	
1995	3	53	46	1,529	12	181	92	1,125	
1996	4	51	45	1,538	11	184	93	1,136	
1997	5	55	43	1,556	11	188	89	1,100	
1998	4	61	45	1,540	8	194	87	1,085	
1999	4	104	55	1,493	10	197	82	1,057	

Source: National Association of Insurance Commissioners (NAIC), 1999 unpublished data.

a. Southeast region includes Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia.

b. Companies writing \$100,000 or more in auto premiums each year.

c. Includes companies in groups plus unaffiliated singles.

d. Herfindahl-Hirschman index.

region (Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia), the average number of auto insurers declined marginally from 99 to 87.¹⁹ While there were enough insurers in South Carolina to sustain workable competition, consumers had fewer choices. We should note that certain other southeastern states—Georgia and North Carolina—are also perceived to have relatively stringent auto insurance regulation.

The lower number of insurers contributed to higher market concentration in South Carolina, although it is probably not the sole cause. Table 4-3 also presents Herfindahl-Hirschman index (HHI) values for South Carolina's auto insurance market and compares them against regional averages over the last decade. In South Carolina, the HHI increased from 1,195 in 1990 to 1,540 in 1998.²⁰ In comparison, the regional average HHI remained relatively constant over this period and was 1,085 in 1998. Concentration in South Carolina did not reach a level that would generate concern about adequate competition, but it was an adverse trend exacerbated by regulation.

Fortunately, the trend toward fewer insurers and greater concentration reversed in 1999 with the implementation of regulatory and market reforms. The number of insurer groups (including unaffiliated single companies) selling auto insurance in South Carolina increased to 55 in 1999. The reforms also induced many groups to increase the number of their affiliated companies, expanding the options available to consumers. The number of insurance companies in the market doubled from 96 in 1998 to 192 in 1999, a remarkable turnaround in a short period of time.

Changes in the market shares of the leading insurer groups are also interesting. Table 4-4 indicates the premium volume and market shares of the top twenty insurers in 1999 and their positions in 1990 and 1995. The top three insurers—State Farm, Allstate, and Nationwide—have retained their rankings and increased their market share to a combined 60 percent over the decade. Several insurers, including Progressive, joined the top twenty during this period. Because insurers were able to cede unprofitable business to the Facility, larger insurers were able to sustain operations in the state with retention of low-risk insureds and servicing fees from the Facility. Some smaller and nonstandard insurers may have encountered greater difficulty in sustaining operations in this environment.

19. Unless indicated otherwise, the term "insurer" refers to an insurer group consisting of multiple insurance companies as well as to single companies that do not belong to a group.

20. The Herfindahl-Hirschman index is equal to the sum of the squared market shares of all firms in the market. Higher values indicate greater concentration.

Table 4-4. Change in Market Share, Top Twenty Auto Insurers in South Carolina, Selected Years, 1990-99^a
Units as indicated

Insurer	1999			1995			1990		
	DPW ^b	MS ^c	Rank	DPW	MS	Rank	DPW	MS	Rank
State Farm	492,538,487	30.8	1	402,598,169	32.3	1	268,251,658	28.1	1
Allstate Ins. Grp.	285,173,482	17.8	2	179,403,434	14.4	2	115,343,189	12.1	2
Nationwide	159,869,863	10.0	3	112,240,980	9.0	3	90,070,076	9.4	3
South Carolina Farm Bureau Mutual	94,950,158	5.9	4	83,890,758	6.7	5	n.a.	n.a.	n.a.
United Services Automobile Asn. Grp.	73,336,364	4.6	5	68,345,685	5.5	6	39,215,267	4.1	7
Royal & Sun Alliance USA	71,456,299	4.5	6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Berkshire Hathaway	68,418,185	4.3	7	30,716,887	2.5	8	n.a.	n.a.	n.a.
Seibels Bruce Grp.	61,107,485	3.8	8	65,415,861	5.3	7	55,540,966	5.8	5
American Modern Ins. Grp.	29,873,164	1.9	9	20,319,297	1.6	12	8,842,398	0.9	18
Citigroup	26,878,041	1.7	10	1,821,247	0.1	27	400,714	0.0	48
Auto-Owners Grp.	23,467,084	1.5	11	20,303,170	1.6	13	19,094,584	2.0	11
State Auto Mutual Grp.	22,454,133	1.4	12	21,412,530	1.7	11	17,175,907	1.8	12
CNA Ins. Grp.	22,200,612	1.4	13	24,221,611	1.9	10	n.a.	n.a.	n.a.
Great American Property & Casualty	17,731,300	1.1	14	14,078	0.0	53	1,683,134	0.2	34
Horace Mann Grp.	15,392,424	1.0	15	15,662,631	1.3	14	24,384,133	2.6	10
Companion LIC	14,193,491	0.9	16	29,849,502	2.4	9	3,075,806	0.3	29
Progressive Grp.	12,907,880	0.8	17	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hartford Fire & Casualty Grp.	11,023,875	0.7	18	2,359,701	0.2	26	3,405,900	0.4	27
Selective Ins.	9,266,012	0.6	19	9,401,878	0.8	15	9,288,069	1.0	17
Interfinancial	8,172,334	0.5	20	1,652,027	0.1	30	5,711,990	0.6	23

Source: See table 4-3.

n.a. Not available.

a. Top twenty as of 1999.

b. DPW, direct premiums written in dollars of given year.

c. MS, market share in percent.

Table 4-5. *Entries and Exits, South Carolina, 1990–99^a*

<i>Period</i>	<i>Entities at start of year</i>		<i>Entries</i>		<i>Exits</i>		<i>Net change</i>	
	<i>Number</i>	<i>Change^b</i>	<i>Number</i>	<i>Change</i>	<i>Number</i>	<i>Change</i>	<i>Number</i>	<i>Change</i>
1990	56	n.a.	4	n.a.	5	n.a.	-1	n.a.
1991	55	-2	5	25	15	200	-10	900
1992	45	-18	1	-80	6	-60	-5	-50
1993	40	-11	4	300	3	-50	1	-120
1994	41	3	9	125	4	33	5	400
1995	46	12	6	-33	7	75	-1	-120
1996	45	-2	3	-50	5	-29	-2	100
1997	43	-4	5	67	3	-40	2	-200
1998	45	5	19	280	9	200	10	400
1999	55	22	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: See table 4-3.

n.a. Not available.

a. Calculated on a group and unaffiliated single basis. All entities counted with greater than \$100,000 direct premiums written in private passenger auto lines of business.

b. In percent.

Entry and Exit

A reasonable flow of insurers in and out of a market facilitates competition and helps ensure an adequate supply of coverage. In a “normal” market that is “workably competitive,” one would expect to see a small number of insurers both entering and exiting the market over time. Insurers that fail to respond to consumer needs efficiently and with reasonable profits would be expected to leave the market. New insurers entering the market can help respond to growing demand, promote innovation, lower prices, and pressure incumbent firms to improve. Even the threat of potential entry can foster market discipline. A high rate of exit can occur due to fierce competition, but it also can be caused by restrictive regulation and related market problems.

The experience in South Carolina appears to be influenced by restrictive regulation. Table 4-5 tracks market entries and exits in South Carolina over the last decade. Exits outpaced entries until 1997, when reform legislation moved forward and was enacted. One early indicator of the reform legislation’s effects is the high number of entries into the South Carolina auto insurance market. As of August 2000, 105 new companies had entered the state’s auto insurance market since March 1999. This is a

clear indication that many more insurers believe the reforms will make it viable for them to write auto insurance in the state.

Prices and Profitability

Coincident with the March 1, 1999, effective date for the statutory changes, the Insurance Services Office filed new advisory loss costs and insurers filed new rating plans. ISO filed for an overall statewide 18.5 percent *decrease* in advisory loss costs, and it appears that at least some insurers also filed rate level decreases.²¹ At first blush this might seem curious if insurers were subject to regulatory rate suppression and distortion prior to 1999. However, loss costs were declining in South Carolina as part of a national trend, although not as rapidly as in other jurisdictions.

Another indicator of general pricing activity are average premiums or expenditures on auto insurance in South Carolina compared with other states, as shown in table 4-6. In South Carolina, the average auto insurance premium increased from \$616 in 1991 to \$766 in 1998, a faster pace than in other Southeast states.²² While this trend may seem to contradict the data on advisory loss cost and insurer rate filings, it is not inconsistent. Statistical data provided by the Department of Insurance reveals that the average premium for voluntary market insureds was \$612 in 1993 and \$621 in 1998, a 0.3 percent average annual growth rate. On the other hand, average premiums for Facility insureds increased from \$649 to \$981, an average annual growth rate of 9.1 percent.

Three historical measures of insurers' profitability can be used to judge rate adequacy. Loss ratios in South Carolina have remained higher than the national and regional averages but have declined in recent years to a more sustainable level, as shown in figure 4-4a. The state's loss ratio decreased from 90 percent in 1990 to 75 percent in 1998. Correspondingly, profits on insurance transactions, as a percentage of earned premiums, increased from -13 percent to -6 percent (figure 4-4b). The voluntary market loss ratio remained relatively stable over this period and was 64.6 percent in 1998. On the other hand, the Facility loss ratio increased from 97.3 percent in 1993 to 108 percent in 1996 and then fell to 70.9 percent in 1998.

21. The overall liability loss cost change was -12.5 percent and the overall physical damage loss cost change was -30.3 percent.

22. Based on data from the National Association of Insurance Commissioners (1999b).

Table 4-6. *Average Auto Insurance Premiums, South Carolina, Countrywide, and Other Southeast States, 1991-98*
Dollars, except as noted

Year	South Carolina		Countrywide		Other Southeast states						
	Value	Change ^a	Value	Change	Ala.	Fla.	Ga.	N.C.	Va.	Average	Change
1991	615.89	...	685.56	...	560.41	727.60	677.73	522.39	603.11	618.25	...
1992	655.07	6.4	711.75	3.8	590.57	739.81	636.48	541.07	570.62	615.71	-0.4
1993	684.10	4.4	730.39	2.6	604.07	753.94	664.85	528.43	564.07	623.07	1.2
1994	680.80	-0.5	740.38	1.4	610.52	702.28	696.83	547.08	561.66	623.67	0.1
1995	675.93	-0.7	757.56	2.3	632.24	778.70	726.15	576.83	559.45	654.67	5.0
1996	698.30	3.3	780.11	3.0	661.62	823.65	761.75	594.79	608.87	690.14	5.4
1997	732.92	5.0	798.91	2.4	703.43	833.50	787.53	652.46	628.51	721.09	4.5
1998	766.23	4.5	797.23	-0.2	719.72	814.82	803.18	664.06	630.12	726.38	0.7
1991-98	...	24.4	...	16.3	...	...	...	...	...	...	17.5
Average	...	3.2	...	16.3	...	...	...	...	...	...	2.4

Source: NAIC (1999b).

a. Change expressed in percent.

Figure 4-4a. *Loss Ratios, 1990–99*

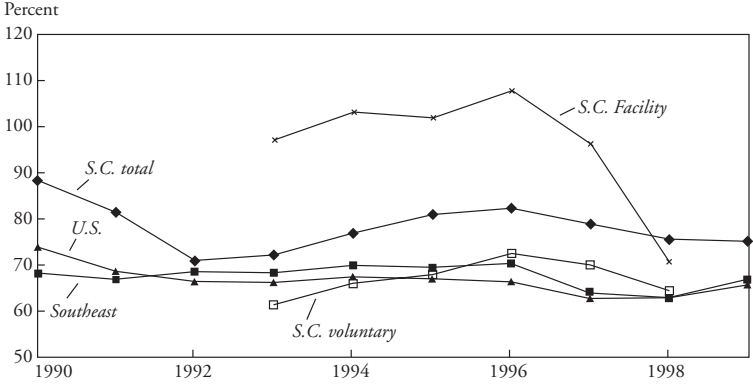


Figure 4-4b. *Profit on Insurance Transactions, 1990–99*

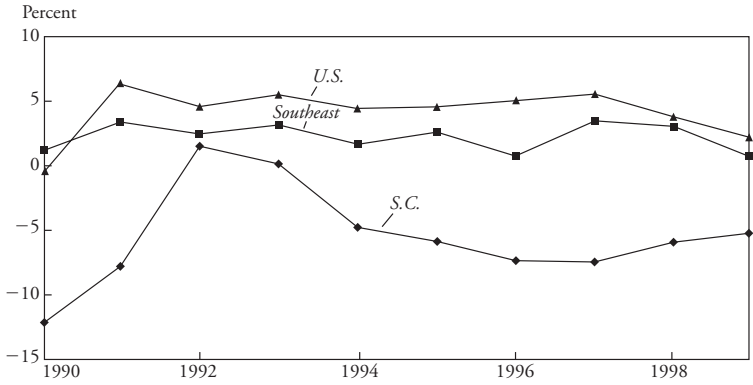
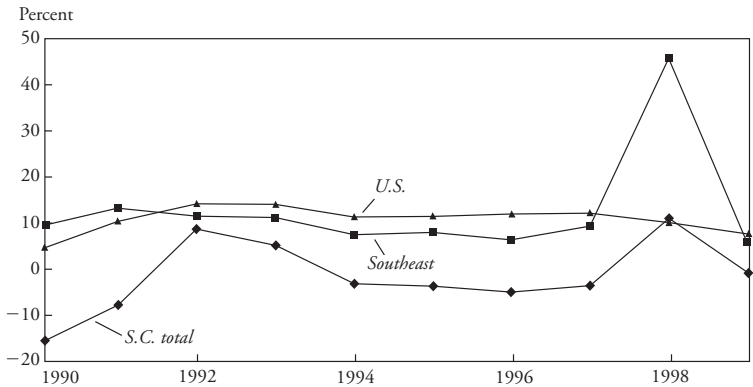


Figure 4-4c. *Rate of Return on Net Worth, 1990–99*



Source: NAIC (1999a); South Carolina Department of Insurance, unpublished data.

Finally, the estimated rate of return on net worth increased from -15 percent to 10 percent (figure 4-4c).

Availability

The availability of auto insurance is as important as its cost. With a residual market mechanism, the issue is not whether most drivers can obtain insurance but rather what options are available to them and their affordability. Some also might question whether residual market insureds receive the same quality of service as voluntary market insureds, although insurers may disagree that there is a difference. If rates are suppressed, insurers will be inclined to decrease their voluntary market writings, either forcing or encouraging drivers to secure coverage through the residual market. A large residual market creates problems for insurers and insureds. Operating deficits in residual market mechanisms and the subsidies necessary to cover them can burden the voluntary market and exacerbate the growth of the residual market. Drivers who choose to operate vehicles without liability insurance also are a concern if they lack sufficient financial resources to compensate people they harm.

Residual Market

The residual market problem is clearly evident in the South Carolina experience. Table 4-7 presents statistics on the volume of business in the Reinsurance Facility and its operating performance from 1993 to 1999. As shown earlier in figure 4-3, the Facility's share of insured vehicles continued to escalate from its inception and peaked at 42 percent in 1992. By 1995 the Facility insured more than 1 million private passenger vehicles. Its volume and market share then began to decline but still constituted almost 30 percent in 1998. The South Carolina Facility dwarfed the residual market mechanisms in most other jurisdictions, which rarely accounted for more than 1 to 2 percent of a state's insured vehicles. Massachusetts, New Jersey, and North Carolina are other states that have had large residual markets.

The Facility's operating results worsened with its growth. Its net operating loss (excluding revenues from recoupment fees) reached \$200 million annually by 1995, approximately 40 percent of its earned premiums. By the end of 1999, the Facility had compiled a cumulative deficit of \$2.4 billion.

Because of regulatory restrictions on risk-based pricing, it would be reasonable to surmise that certain driver groups would more likely be rein-

Table 4-7. *Operating Statistics for Reinsurance Facility, 1993–98*^a

Thousands of dollars, except as noted

Year	Earned premiums	Losses incurred	Net UW results ^b	Net operating results		Residual MS ^d
				Amount	EP ^c	
1993	495,840	454,537	-143,236	-144,229	-29.1	41.8
1994	495,894	511,187	-194,354	-195,987	-39.5	40.6
1995	491,299	527,458	-197,694	-200,677	-40.8	41.0
1996	489,278	531,108	-200,006	-201,527	-41.2	37.9
1997	487,022	481,818	-152,842	-154,238	-31.7	30.7
1998	482,372	445,187	-115,959	-117,137	-24.3	29.3
1999	134,763	122,200	-30,878	-31,540	-23.4	n.a.

Source: AIPSO (2001).

n.a. Not available.

a. Results do not include offset of recoupment fees.

b. UW, underwriting.

c. EP, earned premiums, in percent.

d. MS, market share, in percent.

sured through the Facility than other groups. This is consistent with the geographic distribution of the Facility's share of insured vehicles. (See section on "Contributing Factors.") Interestingly, the Facility tends to account for a greater share of a county's vehicles in less densely populated areas. This appears contrary to the typical experience in many urbanized states.²³ If territorial base rates for lower-income, rural areas were compressed by regulators, it could have contributed to relatively more Facility placements from rural counties.

It appears that South Carolina's reform program is having its desired effect on shrinking the residual market. In 1998 the number of drivers added to the Facility averaged roughly 100,000 per month. In 1999 this figure dropped to 15,000–20,000.²⁴ Only sixty new policies had been written through the JUA as of September 1999. As of December 31, 1999, only 58,000 vehicles were insured in the Facility.

This rapid depopulation has been accompanied by significant improvement in the Facility's operating results. The operating deficit dropped to \$21 million for fiscal year 1999 and will decline further with the movement toward adequate rates. Rate adequacy and depopulation reinforce each

23. See Klein (1996) and Harrington and Niehaus (1998).

24. R. Kevin Dietrich, "Insurance Reform Spurs Competition," *The State*, September 5, 1999; "Insurance Groups Double on Market since New Law," *Sun News*, August 1, 1999.

Table 4-8. *Ratio of Uninsured Motorist to BIL Claims, South Carolina, 1993–98*

<i>Year</i>	<i>UM claims^a</i>	<i>BIL claims</i>	<i>Ratio</i>
1993	10,510	59,373	0.177
1994	12,106	65,937	0.184
1995	14,600	74,296	0.197
1996	16,575	76,996	0.215
1997	18,022	75,261	0.239
1998	16,271	64,644	0.252

Source: South Carolina Department of Insurance, unpublished data.

a. UM, uninsured motorist.

other and will ultimately confine the residual mechanism to the limited role it should play in a healthy marketplace.

Uninsured Motorists

Some additional indication of the availability (and implicitly the affordability) of auto insurance is provided by estimates of the number of uninsured motorists. A high number of drivers without insurance or other means to pay for damages they cause to others contributes to higher uninsured motorists premiums for those drivers who carry this coverage and externalizes costs to other parties. South Carolina has had a relatively high percentage of uninsured drivers despite its mandatory service and compulsory insurance requirements.²⁵ Even with these provisions, some drivers may attempt to avoid buying insurance because of its relatively high cost. Under the old system, some drivers facing high recoupment fees because of their driving records may have been especially inclined to forgo insurance.

It is difficult to produce precise estimates of the number of uninsured drivers, but the relationship of the number of uninsured motorists claims to the number of BIL claims provides some indication. Table 4-8 shows that the ratio of uninsured motorists claims to BIL claims in South Carolina has steadily increased from 0.177 in 1993 to 0.252 in 1998. Since Facility insureds generally experienced the greatest premium increases,

25. Consistent with this picture, a national study ranked South Carolina seventh among states in terms of the ratio of uninsured motorist claims to BIL claims (22 percent) for the period 1989–95 (Insurance Research Council, 1999c).

they may have been more likely to drop their insurance coverage, a phenomenon that would be consistent with studies of other auto insurance markets.²⁶

Claim Costs and Factors

The cost of auto insurance claims and the factors that affect the frequency and severity of claims are important areas for investigation. First, rising costs tend to pressure the marketplace and can cause conflicts between insurers and regulators. Second, risk selection and the pricing of auto insurance influence drivers' incentives to prevent or mitigate losses.²⁷ Third, the tendency for people to file claims and lawsuits, the kind and severity of damages claimed, and the incidence of claim fraud affect costs and, in turn, can be affected by regulation. If regulation or other constraints distort insurance pricing, they can contribute to an escalating cycle of higher loss costs and regulatory conflicts. In this section we examine claim cost trends and conduct regression analyses of several factors contributing to claim costs.

Claim Trends

The cost of liability insurance is driven by the number and severity of accidents, the cost of injuries, the filing of claims, and the amount of litigation over accidents. South Carolina has a relatively high fatal accident rate of 2.6 per million vehicle miles driven, which ranks fifth among the states.²⁸ High speeds on its rural highways and poor road conditions are probably significant factors. Also, South Carolina's traffic laws appear to be more lenient than in other states.²⁹ Over time, fatal accident rates have declined countrywide and in South Carolina (to a lesser degree), partly due to safer vehicles and a crackdown on drunk drivers. At the same time, motorists are driving more miles, and severe accidents may remain a problem, even if they rarely involve fatalities.

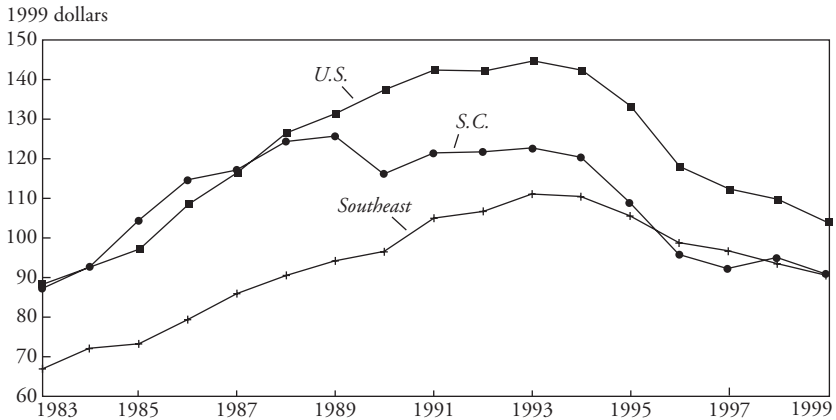
Figures 4-5 through 4-11 plot trends in average loss costs, claim fre-

26. See Smith and Wright (1992).

27. For example, if drivers have reduced safety incentives, they may drive at higher speeds or be less likely to use safety belts. See Cummins and Tennyson (1992); Derrig and others (2000).

28. This information comes from the National Highway Safety Administration.

29. See Insurance Information Institute (2000).

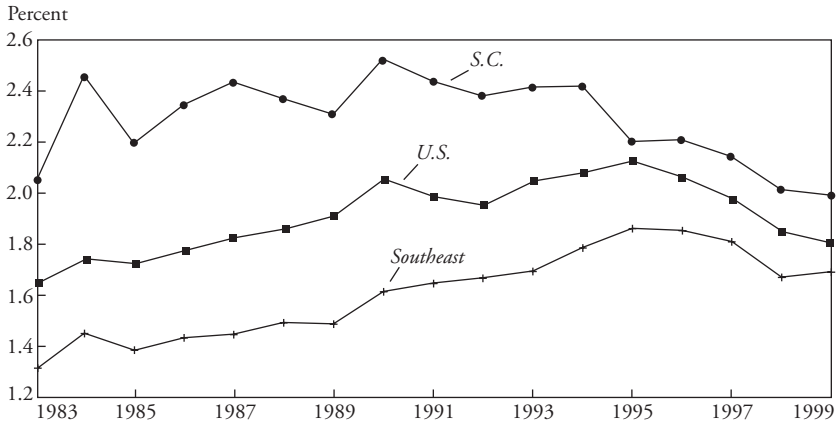
Figure 4-5. *Average Loss Cost, 1983–99*

Source: National Association of Independent Insurers (NAII), Fast Track Monitoring System.

quency, and claim severity, by type of liability coverage for South Carolina, the region, and countrywide. All dollar amounts have been converted to “1999 dollars” to facilitate comparison. It appears that bodily injury liability (BIL) loss costs, driven by the frequency of BIL claims, constitute the most significant problem in South Carolina. Figure 4-5 indicates that the average BIL loss cost per exposure (earned car-year) in South Carolina steadily increased from under \$90 in 1983 to \$126 in 1989. The average loss cost declined in 1990, stabilized, and then began to decline further in 1994 back down to \$90 in 1999. This trend has generally followed those in the Southeast and countrywide. Subsequent to 1987 the level of BIL loss costs in South Carolina has been lower than the countrywide average. However, the state’s BIL loss costs exceeded the regional average until they began to converge in 1996.

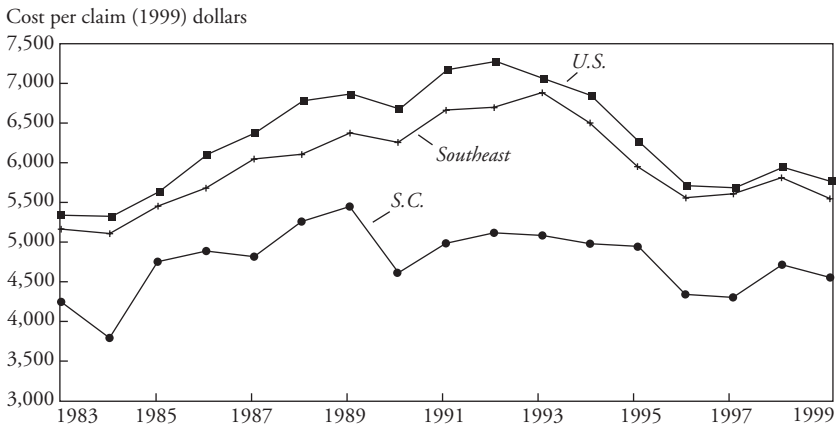
Figures 4-6 and 4-7 decompose the frequency and severity elements of average BIL loss costs. The data indicate clearly that the frequency and not the severity of BIL claims is the cause of South Carolina’s relatively high BIL costs. The frequency of BIL claims (claims per 100 exposures) in South Carolina has consistently exceeded the countrywide and regional averages. By contrast, the severity of BIL claims (dollars per claim) has remained considerably below the regional and national averages. The state’s BIL frequency came closer to that of other states after 1994, when it dropped faster than regional and national trends. In South Carolina, BIL frequency peaked at 2.5 claims per 100 exposures in 1991 and fell to its

Figure 4-6. *BIL Frequency, 1983-99*^a



Source: NAII, Fast Track Monitoring System.
 a. Frequency = claims per 100 exposures.

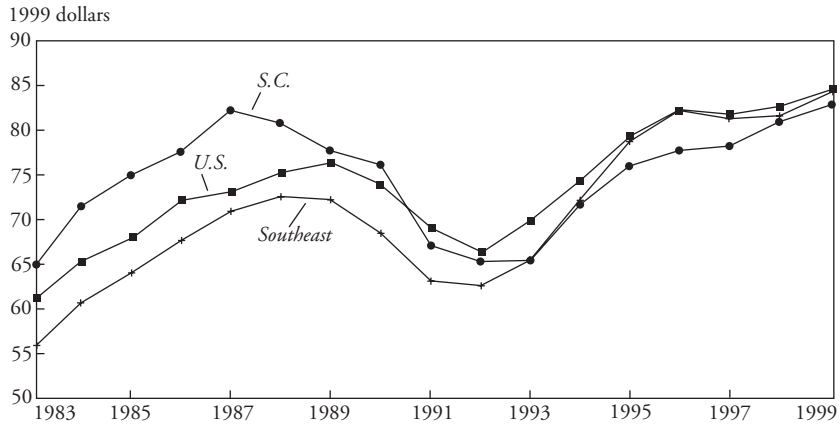
Figure 4-7. *BIL Severity, 1983-99*



Source: NAII, Fast Track Monitoring System.

lowest level, 2.0, in 1999. By comparison, in 1999 the national average was 1.8, and the regional average was 1.7.

Declining BIL claim frequency may be due to improved safety features in vehicles, such as air bags and antilock brakes, which have benefited South Carolina as well as other states. Still, the state's frequency of BIL

Figure 4-8. *PDL Average Loss Cost: 1983–99*

Source: NAI, Fast Track Monitoring System.

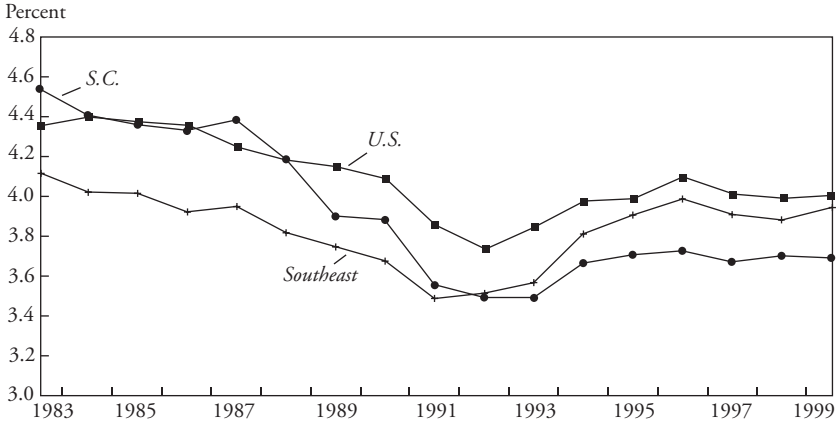
claims remains higher than other states, which could be influenced by the nature of its auto accidents—their tendency to involve bodily injuries and the severity of these injuries—as well as the tendency of accident victims to file claims and possibly lawsuits.

Examining property damage liability (PDL) claims experience provides further insights, as shown in figures 4-8 through 4-10. South Carolina's average PDL loss cost exceeded that of other states until 1992, when it fell into line with the regional and countrywide averages. The trend of South Carolina PDL loss costs has generally mirrored that of other states: costs increased till the late 1980s, fell, and then began to climb again in 1994–95. The average PDL loss cost reached its highest level in 1999 at around \$83 in South Carolina, regionally, and nationwide. Hence escalating PDL costs do not appear to be specific to South Carolina; rather, they are a problem contributing to higher premiums across the country. One possible explanation for this phenomenon is that while vehicles have become safer, they also have become more expensive to repair after an accident.³⁰ Furthermore, the severity of PDL claims, not their frequency, has been the major cost driver (see figures 4-9 and 4-10).

It also is interesting to examine the ratio of BIL claims to PDL claims, shown in figure 4-11. A high BIL/PDL ratio could be caused by a high

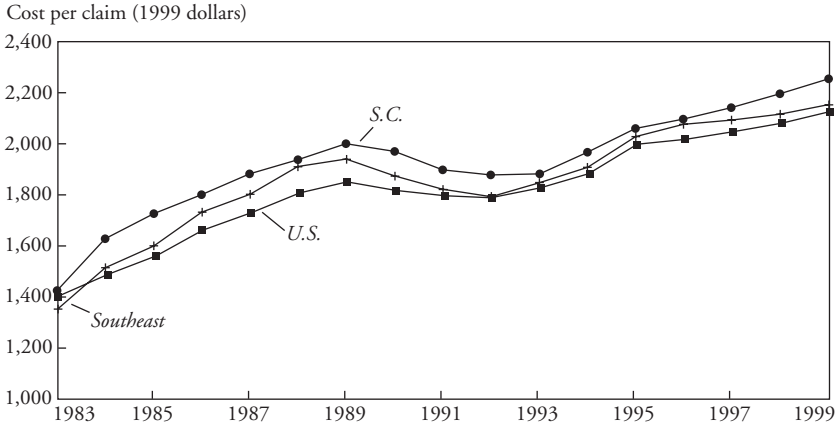
30. For example, if air bags deploy even in a minor accident, they have to be replaced. Also, vehicles are being designed to absorb more of the force from a crash and transmit less of it to occupants.

Figure 4-9. *PDL Frequency, 1983-99*^a



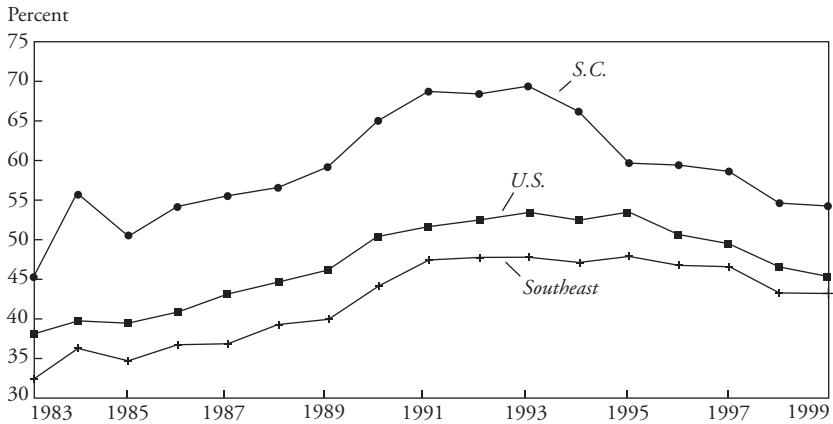
Source: NAI, Fast Track Monitoring System.
 a. Frequency = claims per 100 exposures.

Figure 4-10. *PDL Severity, 1983-99*



Source: NAI, Fast Track Monitoring System.

proportion of severe accidents causing bodily injuries, greater tendency to file claims for bodily injuries, or both. We see that this ratio is considerably higher in South Carolina than in other Southeast states and country-wide. It reached its peak near 70 percent in 1993 and has since declined to less than 55 percent in 1999. This is still 10 percentage points higher than the BIL/PDL claim ratio in other states.

Figure 4-11. *Ratio of BIL to PDL Claims, 1983–99*

Source: NAI, Fast Track Monitoring System.

Possible Contributing Factors

A rigorous examination of auto insurance cost drivers is beyond the scope of this chapter, but it is useful to consider empirical evidence on some possible factors that warrant further investigation. In addition to traffic laws, driving conditions, driving behavior, and the accidents that result, the tendency to file and litigate claims could contribute to higher costs.

A review of auto insurance claims closed in 1997 revealed that 44 percent of bodily injury liability claims in South Carolina involved an attorney, ranking South Carolina eighteenth among the forty states with tort or add-on systems.³¹ In this same survey, 80 percent of BIL claims dollars paid in South Carolina went to claimants represented by an attorney, ranking it thirteenth among the forty states. An associated survey of 180,000 households in 1998 indicated that 41 percent of South Carolina survey respondents filing auto insurance claims hired an attorney, ranking it eighteenth among forty-nine states and the District of Columbia (Hawaii was excluded). While these figures may not seem especially abnormal as they are only moderately above median levels, South Carolina's higher than average litigation incidence appears to be uncustomary among states with larger rural populations.

Then there is the issue of claim fraud, which is a significant problem

31. See Insurance Research Council (1999a and 1999b).

countrywide. A broad definition of claim fraud would include “padding” claims arising from real injuries as well as the filing of claims when there are no injuries or even an accident. The high ratio of BIL to PDL claims in South Carolina could be one indicator of what some experts have labeled “excessive claiming.”³² Hard data on claim fraud by state are not readily available, but anecdotes indicate that it is a concern in South Carolina. The state’s attorney general recently instigated an insurance fraud project as one of his office’s major initiatives.

While the literature suggests that higher auto insurance loss ratios and a greater tendency to file liability claims are more urban than rural phenomena, there is a curious alternative pattern among South Carolina’s counties.³³ In table 4-9 the BIL loss ratios tend to be higher in the state’s rural counties, a departure from the more common pattern in other states. Table 4-9 also reveals that the Facility market share and BIL/PDL claim ratio are higher in less densely populated areas, which also tend to have higher unemployment rates and lower household incomes. The positive association of loss ratios, residual market penetration, and BIL/PDL claim ratios with areas of low population density is contrary to expectation. Table 4-9 further indicates that rural counties had a greater percentage of collisions involving bodily injuries (based on state collision statistics) and alcohol, factors that also may contribute to the state’s geographical pattern of claims.

Using econometric analysis, we examine four phenomena of interest: loss cost inflation; the residual market share; “excessive claiming” or fraud; and the demand for insurance. With pooled cross-sectional (county level) and time series data for the period 1993–98, we estimate several models that help to explain these phenomena. Our data set consists of statistical information on premiums and losses, by coverage (BIL and PDL), county, and voluntary and nonvoluntary markets. Our data also include several other demographic and economic variables available by county.³⁴ Table 4-10 lists all the variables used and their sources.

LOSS COST INFLATION A key issue is how restrictive regulation serves to inflate loss costs. Suppression and compression of rates for all or certain

32. Insurance Research Council (1994); Abrahamse and Carroll (1999).

33. See Insurance Services Office and National Association of Independent Insurers (1988) for an analysis of auto insurance costs in large urban areas compared to nonurban areas.

34. Data on some economic and demographic variables were not available by year. In such instances, we used data for the year most closely corresponding to our sample period.

groups of drivers distort price signals and diminish incentives for safety and controlling losses. Thus our primary interest is to test the hypothesis that counties with large Facility market shares will have higher loss inflation rates. There are two reasons to suspect this relationship exists. First, suppression of rates for drivers in the Facility weakens their incentives to drive safely and may encourage more risky behavior. It is possible that drivers providing the subsidies, in the form of recoupment fees, will have increased incentives to minimize risky behavior. However, the combined effect of these two factors in a county is indeterminate. Second, although insurers no longer are financially liable for the losses of drivers ceded to the Facility, they do adjust their claims. As discussed earlier, this would be expected to reduce servicing carriers' incentives to control claim costs. Thus for both reasons we expect the growth rate in liability loss costs will be higher in counties with a greater percentage of the drivers in the Facility.

To test the hypothesis that loss growth rates for BIL and PDL claims will be a function of the size of the residual market in the county, we estimate the following regression equation:

$$\ln(G_{ijt}) = a + \theta R_{ijt} + \beta' X_{ijt} + \varepsilon_{ijt},$$

where $\ln(G_{ijt})$ is the natural logarithm of the ratio of losses incurred per exposure unit in line of insurance i in county j for year t relative to the value of the same variable in year $t - 1$; R_{ijt} is the percent of exposure units in line of insurance i in county j for year t insured by the Facility; X_{ijt} is a set of control variables expected to differentially influence liability growth rates across each county; a , θ , and the vector β' are estimated parameters; and ε_{ijt} is the error term. We estimate the loss growth equations separately for BIL and PDL and separately for voluntary and Facility vehicles.

There are five variables in our tests to control for other factors likely to influence the growth rate in losses. First is a variable equal to the level of losses incurred per exposure unit for a given coverage. This variable is lagged one year as we hypothesize that current growth rates will be a decreasing function of the prior year's average loss level.

The second control variable is the median household income in the county. The reason for including this variable depends on the coverage we are investigating. Household income was included in the PDL growth rate regressions because we expect that high-income households will tend to own more expensive vehicles, which would have a positive effect on the growth of PDL losses. For BIL, higher income individuals will have a higher

Table 4-9. Bodily Injury Claim Costs and Economic Variables by County in Descending Order of Loss Ratio

Percent, except as noted

County	BIL 1993-98		Facility		Bodily injury claim Frequency ^c	BIL/PDL claims 1993-98	Median household income ^a	Unem- ployment rate	Population density ^d	Vehicle density ^d	Collisions involving	
	Loss cost ^a	Loss ratio	MS 1998 ^b	Bodily injury							Alcohol	
Clarendon	268.25	114.1	40.0	3.43	7,830	102.8	17,645	10.0	46.9	25.3	33.8	8.0
Allendale	262.51	111.5	43.4	3.97	6,604	107.5	15,013	8.6	28.7	12.7	53.4	5.8
Dillon	280.06	110.9	50.2	4.28	6,546	124.8	18,365	10.1	71.9	36.9	37.1	5.7
York	244.90	106.6	26.2	2.76	5,668	63.2	31,288	5.5	156.3	129.7	30.4	5.1
Lee	218.70	104.2	38.4	4.10	5,329	115.6	18,174	6.5	45.0	24.4	36.9	7.6
Marlboro Co.	237.73	99.0	38.1	3.51	6,764	105.6	17,825	12.5	69.3	35.3	47.9	6.1
Marion	252.39	96.2	52.7	3.71	6,803	111.5	19,226	12.4	24.6	13.5	32.5	5.9
Chester	199.95	95.4	34.0	3.67	5,441	87.9	23,054	13.5	55.4	33.8	36.6	4.0
Union	208.06	95.3	25.8	2.49	5,380	64.4	21,526	9.3	59.9	36.9	39.6	5.7
Hampton	229.69	93.6	40.6	3.17	7,242	104.0	18,615	8.6	32.5	17.1	23.7	5.7
Georgetown	213.92	92.6	33.9	3.28	6,523	86.7	23,981	8.6	56.8	32.2	41.6	4.4
Darlington	234.68	90.8	33.7	3.34	7,018	94.0	22,642	7.9	110.1	64.1	46.1	8.4
Colleton	209.93	88.0	43.1	3.68	5,710	108.8	20,617	8.1	32.5	18.3	37.8	5.3
Berkeley	223.97	87.7	36.5	3.43	6,536	80.3	29,106	4.7	117.1	69.7	35.2	4.9
Lancaster	186.55	86.8	32.2	3.22	5,795	79.7	25,320	8.7	99.3	64.7	33.2	6.0
Jasper	217.35	86.7	40.8	3.16	6,879	88.1	18,071	5.8	24.2	11.9	25.9	4.5
McCormick	199.00	86.5	29.3	3.21	6,191	97.4	18,068	11.0	61.2	29.5	47.4	7.5
Edgefield	156.73	86.5	25.1	2.50	6,274	69.8	23,021	6.0	36.6	22.7	40.7	5.4
Florence	220.28	84.8	33.8	3.55	6,206	85.5	24,264	5.9	143.1	82.9	35.6	4.6
Barnwell	159.12	84.4	26.2	2.69	5,906	84.9	23,501	14.2	37.0	22.2	44.3	5.5
Orangeburg	177.68	82.4	33.9	3.34	5,325	91.0	20,216	8.3	76.7	42.9	34.3	5.3
Dorchester	209.44	82.4	30.1	3.31	6,325	77.5	30,764	4.7	144.5	90.3	28.8	3.4
Fairfield	178.01	80.6	41.3	3.30	5,394	95.2	21,484	11.8	32.5	18.3	43.5	5.4
Pickens	199.91	78.2	22.5	2.19	5,517	54.8	26,336	5.3	189.1	127.6	29.4	7.0

Calhoun	154.38	77.9	34.7	2.68	5,764	84.0	23,750	9.2	33.6	21.5	42.4	8.1
Horry	211.57	77.5	32.5	3.07	6,894	73.1	24,959	7.7	127.0	79.9	29.7	4.6
Anderson	146.19	76.1	19.8	2.40	6,102	62.4	25,748	6.6	202.2	141.3	33.1	4.2
Abbeville	121.33	75.6	24.9	2.16	5,621	65.3	23,170	8.3	47.0	31.6	38.8	6.6
Cherokee	151.83	75.0	26.5	2.54	5,979	66.2	24,655	6.9	113.2	71.2	37.1	6.1
Bamberg	179.03	74.6	35.9	3.41	5,244	95.9	17,496	10.6	43.0	20.9	39.3	4.0
Saluda	187.27	74.4	25.7	2.11	6,529	66.0	22,176	4.8	36.3	24.2	33.4	3.9
Laurens	133.81	73.1	26.2	2.56	5,222	69.9	24,905	6.6	81.5	51.9	37.7	4.8
Aiken	142.38	73.0	22.4	2.50	5,700	64.0	29,994	4.9	112.7	75.7	32.6	4.7
Williamsburg	133.83	71.9	51.6	3.56	6,883	106.7	18,409	8.9	60.9	20.1	41.9	7.9
Kershaw	145.78	70.1	29.5	2.34	6,235	69.5	28,282	8.6	40.1	40.2	36.1	5.8
Charleston	211.31	69.8	31.2	3.56	5,930	77.2	26,875	4.9	321.7	180.2	37.7	3.1
Spartanburg	138.07	69.4	25.1	2.80	5,244	66.4	26,941	5.5	279.7	185.6	32.1	5.4
Sumter	146.60	67.7	33.4	3.37	6,177	87.3	22,387	9.4	132.8	82.2	31.1	4.6
Greenwood	123.43	66.4	25.4	2.18	5,669	54.7	23,584	7.1	130.6	85.4	29.9	3.6
Beaufort	183.74	64.2	25.0	2.42	7,584	64.7	30,450	4.2	113.2	86.0	28.6	3.6
Greenville	143.11	64.0	26.2	2.62	5,459	59.1	29,088	4.9	404.3	274.9	24.3	3.7
Lexington	148.17	63.6	24.4	2.68	5,522	65.7	32,914	4.1	239.1	169.8	31.6	4.7
Chesterfield	154.77	63.5	36.5	2.66	5,820	85.3	21,069	5.9	48.3	29.7	39.1	9.0
Newberry	121.31	63.3	26.5	1.95	6,233	64.6	23,405	5.5	52.6	34.9	30.1	5.8
Oconee	121.76	61.7	19.6	2.09	5,816	61.2	25,723	7.7	92.0	65.7	34.0	5.8
Richland	121.06	59.8	29.8	3.54	5,296	72.5	28,848	4.6	377.4	220.7	29.1	3.3
Total	...	...	...	...	...	...	1,082,950	...	...	...	...	...
Weighted average	156.16	67.3	29.0	...	...	63.2	...	...	113.9	71.9	32.6	4.6
Mean	174.88	75.0	100.0	3.01	6,090	100.0	23,542	7.7	105.2	66.4	35.7	5.4

Sources: S.C. Department of Insurance, unpublished data; S.C. Department of Public Safety (2001); Bureau of the Census, *Statistical Abstract 2000*.

a. Dollars

b. MS, market share.

c. Frequency—number of claims incurred/100 car-years earned.

d. Per square mile.

Table 4-10. *Variables Used in Regression Analyses*

<i>Variable</i>	<i>Data years</i>	<i>Source</i>
Year	...	...
County name	...	...
County land area in square miles	...	CCDB
Total resident population	1993–96	CCDB
Percent of population		
Male	1993–96	CCDB
Age 15–19	1993–96	CCDB
Age 20–24	1993–96	CCDB
Age 65+	1993–96	CCDB
Below poverty level	1993	CCDB
Household language not English	1990	CCDB
Living in rural area	1990	CCDB
Number of vehicle thefts	1993–95	CCDB
Number of serious crimes	1993–95	CCDB
Number of households	1990	CCDB
Median household income	1990	CCDB
Civilian unemployment rate	1993–96	CCDB
Percent service establishments offering legal services	1992	CCDB
Number of registered vehicles: 1998	1998	SCDC
Number of registered vehicles: 1990	1990	SCDC
Number of registered vehicles: interpolated	1993–98	...
Percent bodily injury exposures in Facility	1993–98	SCDI
Percent property damage exposures in Facility	1993–98	SCDI
BIL claims per exposure unit	1993–98	SCDI
PDL claims per exposure unit	1993–98	SCDI
Ratio: BIL frequency to PDL frequency	1993–98	SCDI
Earned premium per exposure unit		
All coverages	1993–98	SCDI
All coverages, private market	1993–98	SCDI
All coverages, Facility	1993–98	SCDI
BIL losses		
Per exposure unit	1993–98	SCDI
Per exposure unit, private market	1993–98	SCDI
Per exposure unit, Facility	1993–98	SCDI
PDL losses		
Per exposure unit	1993–98	SCDI
Per exposure unit, private market	1993–98	SCDI
Per exposure unit, Facility	1993–98	SCDI

Source: Bureau of the Census, *County and City Data Book* (CCDB); South Carolina Department of Commerce (SCDC), unpublished data; South Carolina Department of Insurance (SCDI), unpublished data.

opportunity cost of visiting the doctor. Therefore we expect income to be negatively related to the growth of BIL losses.

The third control is a population density variable equal to the total population in the county divided by the number of square miles in the county. BIL losses are expected to grow faster in densely populated counties because the costs of goods and services have increased there at a greater rate.

The number of legal establishments divided by the number households in the county was included to control for the likelihood of attorney involvement in the claims process. As discussed above, previous research indicates that attorney involvement tends to increase the size of damage awards. We expect persons with greater access to legal counsel will be more likely to engage a lawyer for auto liability claims, which will tend to increase the cost of these claims. Also, a larger supply of lawyers might prompt some to more actively offer their services to persons involved in auto accidents. This effect should be greater for BIL than for PDL as there is greater opportunity to inflate BIL claims.³⁵

Finally, we included year indicator variables to control for year-specific shocks or effects that could be important given the changing attitudes toward the automobile insurance system in South Carolina over this time period.

Liability growth rate models are estimated using weighted least squares since we anticipate larger and more populous counties to experience less random fluctuation in their auto insurance losses from year to year. The square root of the number of registered vehicles in a county is used as our weight for these regressions. To moderate the effects of extreme values, all equations were estimated using the natural logarithm of each explanatory variable and the dependent variable.

Table 4-11 presents the loss cost inflation regression results estimated separately for BIL and PDL coverages and voluntary and Facility markets for the years 1994–98. The primary variable of interest, the percent of the market insured by the Facility, is significantly and positively related to the growth rate for BIL losses in both the Facility and voluntary markets. This result is consistent with the hypothesis that suppressed residual market rates reduce safety incentives for Facility drivers in a county. This result also is consistent with insurers having reduced incentives to control the cost of claims involving Facility insureds.

Interestingly, the estimated relationship between the size of the Facility

35. Property damages should be fairly easy to verify, but alleged bodily injuries are more difficult to verify or challenge.

Table 4-11. *Loss Cost Inflation Regression, All South Carolina Counties, 1994-98^a*

<i>Independent variable</i>	<i>Dependent variable</i>			
	<i>Bodily injury liability</i>		<i>Property damage liability</i>	
	<i>Voluntary market</i>	<i>Facility market</i>	<i>Voluntary market</i>	<i>Facility market</i>
Intercept	6.861*** (1.871)	11.081*** (1.377)	1.868* (1.001)	1.560* (0.817)
BIL loss per exposure unit _{<i>t-1</i>} voluntary market	-0.696*** (0.081)	...	...	...
BIL loss per exposure unit _{<i>t-1</i>} Facility	...	-0.863*** (0.050)	...	...
PDL loss per exposure unit _{<i>t-1</i>} voluntary market	...	...	-0.501*** (0.060)	...
PDL loss per exposure unit _{<i>t-1</i>} Facility	...	...	...	-0.554*** (0.053)
Percent BIL exposure units in Facility	0.420*** (0.124)	0.468*** (0.093)	...	...
Percent PDL exposure units in Facility	...	...	0.080 (0.065)	0.075 (0.055)
Median household income	-0.288 (0.189)	-0.525*** (0.146)	0.041 (0.108)	0.101 (0.092)
Number legal establishments per household	0.107** (0.049)	0.112*** (0.038)	0.034 (0.029)	0.023 (0.025)
Population density	0.098** (0.045)	0.105*** (0.035)	0.047* (0.028)	0.084*** (0.023)
Year indicator = 1995	-0.080 (0.059)	-0.211*** (0.043)	-0.093*** (0.036)	-0.076** (0.031)
Year indicator = 1996	0.130** (0.056)	-0.112** (0.044)	-0.034 (0.036)	-0.046 (0.032)
Year indicator = 1997	0.063 (0.062)	-0.142*** (0.048)	-0.066 (0.040)	-0.048 (0.035)
Year indicator = 1998	-0.063 (0.066)	-0.496*** (0.051)	-0.066 (0.042)	-0.187*** (0.037)
Adjusted <i>R</i> ² (percent)	62.7	78.5	33.5	54.2

Source: Authors' calculations based on data from sources listed in table 4-10.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

a. The dependent variable in each model is the natural logarithm of the ratio of losses incurred per exposure unit in year t relative to year $t - 1$. Except for the year indicator variables, the independent variables are all included in logarithmic form. The model was estimated using weighted least squares with the weight equal to the square root of the number of registered vehicles in the county. Standard errors are in parentheses.

market and the BIL inflation rate is similar in both the voluntary and Facility markets. This outcome could be consistent with the following interpretations. First, the reduced incentives for safety by Facility insureds might increase the number of accidents between themselves and voluntary market drivers, thus driving up the cost for drivers in both markets. This seems like a plausible explanation given the large number of Facility insureds in many counties over this time period (often greater than 40 percent of the market). Second, other structural problems in the county may be driving BIL growth rates higher, and the large size of the Facility market could be the outcome of those problems and not necessarily a causal factor. Based upon conversations with industry officials and after considering other research that has addressed the same question using other data, this second phenomenon seems less likely to be the driver of loss cost inflation and more likely to be the outcome of suppressed rates for certain classes of drivers.³⁶

The Facility market share is not significantly related to the growth rate for PDL claims, which differs from the result for BIL. One possible explanation is that the subsidy to the Facility for PDL was not as great as the subsidy for BIL. The difference in subsidy levels could induce insureds to purchase higher BIL limits relative to PDL limits, which would contribute to higher BIL costs.³⁷ Another possibility is that PDL claims are easier to verify and more difficult to pad than BIL claims. Thus the reduced incentives insurers have to control loss costs may have a smaller impact on the PDL portion of a claim since property damages are less costly to verify.

The log of the number of lawyers per capita is positive and significant in the BIL regressions but not significant in the PDL growth rate regressions. Thus there is some evidence that a greater supply of legal services increases the growth rate of BIL claim costs.

The log of median household income variable is significant only in the BIL growth rate regression for the Facility market, providing only mixed support for the hypothesis that individuals with lower opportunity costs are more likely to engage in excessive claiming behavior. There is no support for the hypothesis that PDL growth rates were higher for counties with higher incomes. Finally, population density is significantly positive in all of the regressions, implying that liability loss costs rose more rapidly in urban areas.

The year indicator variables suggest there was a slight downward trend in loss growth rates consistent with nationwide trends for this time period.

36. See Danzon and Harrington (2000).

37. Butler (1994) finds a similar effect between increases in benefit levels and the growth rates for workers' compensation insurance costs.

The main difference across each model is that the year dummy variables indicate that BIL growth rates in the Facility market experienced a strong decrease in 1998 as the depopulation of the Facility began to accelerate.

FACILITY MARKET SHARE Our research and that of others suggest that the residual market plays a role in increasing claim costs if its rates are inadequate.³⁸ Furthermore, as mentioned earlier, the reinsurance mechanism used by South Carolina decreased insurers' incentives to spend money to control loss costs in the claims adjustment process. The next set of regressions examines factors that may have contributed to a higher proportion of vehicles being reinsured through the Facility. Accordingly, we estimate an ordinary least squares regression where the dependent variable for the analysis is the log of the percent of BIL exposures in the Facility. The regression was estimated over the full set of observations by county for the years 1993–98.

The independent variables in our model measure several economic and demographic factors. One question motivating the specification of our model is whether there was a tendency for regulators to compress rates more for lower income areas of the state, which could contribute to a higher Facility market share in these areas. High costs of automobile insurance can induce some drivers to forgo the insurance market and drive as uninsured motorists. Research suggests that subsidizing low-income drivers might enhance efficiency to the extent that it induces them to purchase coverage, eliminating or significantly reducing the externality created by uninsured motorists.³⁹ We include two variables to test this "income redistribution" hypothesis: the percentage of county population with income below the poverty line and the percentage of county population living in a rural area. We expect positive signs on both estimated coefficients.

Three variables are included to control for high-risk drivers hypothesized to have a greater likelihood of being involved in an accident or in filing a claim: the percentage of the county population that is male, the percentage of the population aged fifteen to twenty-four, and the "serious" crime rate. The crime rate variable equals the number of serious crimes reported to police divided by the population of the county. We expect all three variables to have positive coefficients to the extent that insurers subject to price suppression are unable to charge adequate rates to cover the

38. See Danzon and Harrington (1998).

39. Smith and Wright (1992).

costs associated with underwriting drivers more likely to experience accidents or file claims because of these factors.

The percentage of the population older than sixty-five was also included for two reasons. First, although the number of accidents per miles driven by drivers after age sixty-five tends to increase, older drivers also drive less than younger ones. Thus we predict the number of accidents involving older drivers is likely to be lower, all else equal. Second, it is possible that insurers are less likely to cede older drivers to the Facility to the extent the driver has had a long relationship with the insurer. For both reasons we expect the sign on this variable to be less than zero.

As before, we include year indicator variables to control for year-specific effects. The Facility market share decreased over our sample period as incremental regulatory improvements were made and comprehensive reform legislation was enacted in 1997. Also, consistent with our earlier tests, the independent variables and the dependent variable were estimated in logarithmic form to minimize the potential for outliers to significantly impact the coefficient estimates.

Data from the estimated regression shown in table 4-12 lend support to our hypotheses. Both the log of the percentage of the population living below the poverty line and the log of the percentage of population living in rural areas were strongly positive. This is consistent with our expectation that regulators used the Facility to restrict rates more in rural, low-income areas in an effort to keep insurance affordable for their residents.⁴⁰ To the extent that this limited rates for drivers in these areas, they would be recipients of a subsidy. The subsidy would be expected to attract more drivers to the Facility (through designated agents), and the compression of voluntary market rates would prompt insurers to cede more drivers to the Facility.

The log of the percentage of males in the population is positive and statistically significant, consistent with the observation that males tend to be higher risk and the hypothesis that a greater percentage of male drivers would be ceded to the Facility. Interestingly, the log of the percentage of the population age fifteen to twenty-four was negative and significant. One possible explanation for this result, which is contrary to our hypothesis, may be that younger drivers are more likely to forgo any insurance coverage, including coverage in the Facility, to the extent they are “judg-

40. However, this does not conflict with the hypothesis that regulators may attempt to limit rates for low-income urban areas. Urban poverty may be a more significant problem in some states and rural poverty a bigger problem in others, such as South Carolina.

Table 4-12. *Size of the Facility Market Regression, All South Carolina Counties, 1993–98^a*

<i>Independent variable</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>t statistic</i>	<i>p value</i>
Intercept	0.2942	0.2831	1.0394	.2996
Percent population below poverty line	0.4106	0.0283	14.4917	.0000
Percent population in rural area	0.1738	0.0211	8.2255	.0000
Percent population age 15–24	–0.1168	0.0701	–1.6676	.0966
Percent population age 65+	–0.2898	0.0474	–6.1096	.0000
Number serious crimes per population	0.0788	0.0196	4.0300	.0001
Percent population male	1.1398	0.2824	4.0353	.0001
Average premium voluntary/ Facility market ratio	0.8876	0.1262	7.0349	.0000
Year indicator = 1994	–0.0014	0.0258	–0.0547	.9565
Year indicator = 1995	–0.0349	0.0265	–1.3149	.1897
Year indicator = 1996	–0.0386	0.0274	–1.4085	.1602
Year indicator = 1997	0.0049	0.0484	0.1019	.9189
Year indicator = 1998	0.0018	0.0595	0.0305	.9757
Adjusted R^2 (percent)	74.8			

Source: Authors' calculations based on data from sources listed in table 4-10.

a. Dependent variable is the natural logarithm of the ratio of bodily injury exposure units in the Facility divided by the total number of bodily injury exposures in both the voluntary and Facility markets. All independent variables were included in logarithmic form except the year indicators.

ment proof.”⁴¹ The percentage of the population age sixty-five or older was significantly negative, consistent with our expectations. The log of the number of serious crimes per capita is significantly positive, supporting the hypothesis that insureds in high-crime areas are likely to have higher loss costs, which induces insurers to cede these drivers to the Facility.

EXCESSIVE CLAIMING AND FRAUD Next, we investigate why the ratio of BIL claims to PDL claims is relatively high in South Carolina. The average ratio of BIL frequency to PDL frequency over the time period 1983–99 was 59 percent in South Carolina compared to 47 percent for the Southeast region. Our model identifies factors that contributed to the relatively high number of BIL claims in the state. The dependent variable

41. See Shavell (1986).

is the commonly used measure of (the log of) the ratio of BIL to PDL claims. We hypothesize this ratio is affected by variations in the nature of the auto accidents that occur, as well as the tendency for people to file claims, legitimate or not.

A measure of vehicle density is used to control for the types of accidents that occur in a county. Vehicles traveling in densely populated areas are less likely to do so at speeds that would lead to more serious accidents. Since minor accidents are likely to cause only property damage, we expect the ratio of BIL frequency to PDL frequency to be negatively related to vehicle density.⁴² Two proxies for vehicle density are tested separately: the number of registered vehicles per capita and the number of registered vehicles per household. Both variables are tested since it is not clear which is the better proxy for the actual density of vehicle miles driven per mile of roadway. The a priori expectation is that both variables will be negatively related to the ratio of BIL to PDL claims.

As discussed earlier, the Facility market share may be positively related to the ratio of BIL to PDL claims as it reduces insureds' incentives to avoid accidents or to avoid filing excessive claims due to restrictions on risk based pricing. In addition, insurers have diminished incentives to investigate questionable claims since they would not benefit from any resulting savings in claim costs. For both reasons we expect the Facility market share to be positively related to the ratio of BIL to PDL claims.

Two independent variables were included to control for the opportunity cost of filing a claim or, in the extreme, of participating in fraudulent claiming behavior: countywide unemployment rate and median household income. We expect a positive sign on the unemployment rate variable (lower opportunity cost of time) and a negative sign on the median household income variable (higher opportunity cost of time).

Finally, we include two variables designed to test the hypothesis that the costs of participating in organized schemes to file auto insurance claims will be lower for individuals who live in tight-knit communities: the percentage of households using a primary language other than English and the percentage of the population living in a rural area. Positive signs on both variables would be consistent with this hypothesis.

Table 4-13 displays the regression results. Of primary interest for this study is the coefficient on the Facility market share variable. The estimated sign is positive and significant in all four regressions, providing additional

42. See Cummins and Tennyson (1992).

Table 4-13. *Excessive Claiming Regression, All South Carolina Counties 1993–98^a*

<i>Independent variable</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Intercept	1.8590* (0.974)	5.5423*** (1.218)	5.0054*** (1.402)	9.0632*** (1.734)
Unemployment rate	0.0932*** (0.034)	0.1115*** (0.034)	0.1322*** (0.039)	0.1574*** (0.039)
Number registered vehicles per capita	-0.5657*** (0.127)	...	-0.5017*** (0.123)	...
Number registered vehicles per household	...	0.1193 (0.178)	...	0.1475 (0.176)
Percent population in rural area	0.0623** (0.027)	-0.0163 (0.044)	5.3136*** (1.865)	6.3491*** (1.963)
Percent BIL exposure units in Facility	0.5418*** (0.061)	0.5523*** (0.061)	0.4363*** (0.068)	0.4209*** (0.073)
Percent population with primary language not English	0.0404 (0.035)	0.0907** (0.037)	0.0524 (0.034)	0.0975*** (0.035)
Median household income	-0.1592* (0.096)	-0.4884*** (0.137)	-0.4604*** (0.136)	-0.8329*** (0.183)
Interaction term: (Rural pop.) × (Median household inc.)	...	...	-0.5117*** (0.182)	-0.6200*** (0.192)
Year indicator = 1994	0.1181*** (0.035)	0.0921** (0.036)	0.1136*** (0.033)	0.0879** (0.035)
Year indicator = 1995	0.2556*** (0.037)	0.2028*** (0.040)	0.2512*** (0.037)	0.2003*** (0.040)
Year indicator = 1996	0.2892*** (0.038)	0.2031*** (0.043)	0.2742*** (0.037)	0.1901*** (0.042)
Year indicator = 1997	0.3847*** (0.043)	0.2663*** (0.051)	0.3505*** (0.042)	0.2318*** (0.052)
Year indicator = 1998	0.3717*** (0.050)	0.2204*** (0.062)	0.3249*** (0.049)	0.1727*** (0.064)
Adjusted R ²	0.7154	0.6991	0.7228	0.7108

Source: Authors' calculations based on data from sources listed in table 4-10.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

a. Dependent variable is the natural logarithm of the ratio of BIL claims to PDL claims. All independent variables in logarithmic form except year indicators. Standard errors are shown in parentheses.

support for the hypothesis that the Facility reduced incentives for both insureds and insurers to control the filing of BIL claims. The coefficient is economically meaningful because a 10 percent increase in the size of the Facility would lead to a 4 to 5 percent increase in the number of BIL claims filed per PDL claim.

There also is strong support for the opportunity cost hypothesis as the unemployment rate is positive and significant in each regression and the income variable is negative and significant in each regression. There is only mixed support for our hypothesis concerning the costs of organizing excessive or fraudulent claiming behavior in a tight-knit community. The variable concerning percent of population with other than English as their primary language is positive in all four regressions but only significant in the models that use the number of vehicles per household as the vehicle density proxy (models 2 and 4). The percentage of the population living in rural areas is not statistically significant in models 1 and 2. However, this changes when we add a variable for the interaction of median household income and rural population in models 3 and 4. In this formulation the rural population variable becomes significantly positive and the interaction term is significantly negative. Thus it is possible that people living in rural areas are more likely to file claims, all else equal, but this tendency is mitigated as income rises.

Finally, the number of vehicles per capita is negative and significant, consistent with the hypothesis that accidents tend to be more frequent but less severe in areas with higher traffic density. The number of vehicles per household measure is insignificant in both regressions. The difference in results across vehicle density proxies suggests that these measures may be imperfect proxies and that other variables, like the percentage of miles driven in urban areas, might be a better measure of traffic density and more closely correlated with the average speed of automobiles involved in accidents.

DEMAND FOR INSURANCE The final set of analyses is designed to estimate the relationships between the price of automobile insurance and demand for coverage in the voluntary market and the Facility. As suggested by previous studies, the size of the welfare loss due to the distortion of prices by regulation will depend upon how sensitive the demand for insurance is relative to changes in price.⁴³ Likewise, attempts to reduce the price of insu-

43. Blackmon and Zeckhauser (1991); Jaffee and Russell (1998).

rance can be welfare enhancing to the extent the price reductions encourage uninsured motorists to purchase insurance.⁴⁴ Thus it is important to account for consumers' sensitivity to price.

So that our work is comparable with prior research, we use insurance demand equations similar to those employed by Jaffee and Russell.⁴⁵ Specifically, the dependent variable in our analysis is the (log) number of insured exposure units per household in either the voluntary market or the Facility. The independent variables are median household income and population density (variables that should be related to the use of alternative transportation) and other variables designed to serve as proxies for the effective price of insurance in both the voluntary and involuntary markets. Price is calculated as the premium per exposure unit for all insurance coverages in either the voluntary or Facility market. All dollar amounts have been converted to real (1998) dollars using the Consumer Price Index.⁴⁶

The results reported in table 4-14 are very similar to those reported by Jaffee and Russell using data from the California auto insurance market. The first two models use the ratio of prices between the voluntary and Facility markets and suggest both markets are sensitive to pricing differences between them. Specifically, the estimated coefficient on the insurance premium ratio in the voluntary market regression is -0.477 , suggesting that a 1 percent increase in the ratio between voluntary and Facility market premiums will reduce the amount of insurance purchased in the voluntary market by 0.477 percent. Likewise, a 1 percent increase in the insurance price ratio will increase the amount of Facility market insurance by 1.8 percent. The same elasticity estimates reported by Jaffee and Russell were -0.72 in the voluntary market and 2.3 in the residual market, respectively.

One can draw further insights into the price elasticity of insurance by estimating demand where the prices for voluntary and Facility market insurance are included separately. In the voluntary market regression (fourth column), the own-price elasticity is -0.69 while the Facility market pre-

44. Smith and Wright (1992).

45. Jaffee and Russell (1998).

46. The specification used by Jaffee and Russell is slightly different than the one reported here. Specifically, Jaffee and Russell scale the dependent and income variables by population and not by the number of households. We use households because it seems reasonable to assume that the purchase of automobile insurance is a household decision. In addition, Jaffee and Russell's measure of congestion was the percentage of the population using public transportation. This variable is arguably a better proxy for access to alternative forms of transportation. Unfortunately, we were unable to obtain a similar measure in South Carolina. Finally, our effective premium variables contain all coverages and not just the mandatory BIL and PDL coverages.

mium elasticity is 0.30. Thus a 1 percent increase in the premiums in both markets would reduce by -0.39 percent the amount of private market insurance demanded as indicated by the difference between the two elasticities. Likewise, a 1 percent increase in the premiums in both markets would increase the amount of Facility market insurance by 0.40 percent.⁴⁷ A Wald test rejects the null hypothesis of equal elasticities for the two price variables at the 1 and 5 percent levels in the voluntary and Facility market insurance demand regressions, respectively. Thus the results shown in table 4-14 provide further evidence that the demands for insurance in both the voluntary and Facility markets were sensitive to price in the same market as well as the price in the cross-market. In addition, the net effect of price increases in both markets had a significant impact on the amount of insurance purchased in the Facility relative to the amount purchased in the voluntary market.

Conclusions

From the mid-1970s through 1998, South Carolina intensively regulated auto insurance. Rate levels and structures were restricted, insurers' underwriting discretion was limited, and large cross-subsidies were channeled through its residual market. Contrary to political expectations, but consistent with economic theory, these regulatory measures worsened market conditions. The distortion of economic incentives escalated costs and prices and caused the residual market to balloon. All drivers were surcharged to cover residual market deficits, and surcharges were especially severe for insureds with multiple points for driving violations. This led to growing public dissatisfaction with the existing system.

After several earlier attempts failed, the legislature was successful in enacting a comprehensive regulatory reform package that became effective in 1999. South Carolina's prior approval system was replaced by flex rating, and restrictions on risk-based pricing and underwriting were substantially eased. The Reinsurance Facility and its large subsidies are being phased out and replaced temporarily by a JUA and ultimately by an

47. Again, these estimates are very close to those shown by Jaffee and Russell (1998). Specifically, they report that the voluntary market insurance own-price elasticity was -0.84 and the cross-elasticity was 0.42. The own-price elasticity in the assigned risk market was -1.9 and the cross-elasticity was 2.5. Interestingly, Jaffee and Russell report the difference between the own-price elasticity and the cross-elasticity was not significant at the 5 percent level in either the voluntary or assigned risk markets.

Table 4-14. *Demand for Insurance Regression, All South Carolina Counties 1993–98^a*

<i>Independent variable</i>	<i>Voluntary market</i>	<i>Facility market</i>	<i>Voluntary market</i>	<i>Facility market</i>
Intercept	-11.3301*** (0.758)	-1.4427 (1.246)	-8.2022*** (1.230)	-4.9621** (2.043)
Median household income	1.1624*** (0.081)	0.2031 (0.132)	1.0910*** (0.082)	0.2834** (0.137)
Population density	-0.1233*** (0.019)	-0.1655*** (0.031)	-0.1022*** (0.019)	-0.1892*** (0.032)
Ratio: voluntary/Facility market premium	-0.4771*** (0.174)	1.8010*** (0.286)	...	...
Voluntary market premium	...	...	-0.6931*** (0.184)	2.0441*** (0.305)
Facility market premium	...	...	0.3000* (0.180)	-1.6017*** (0.299)
Year indicator = 1994	0.0041 (0.037)	0.0510 (0.060)	0.0020 (0.036)	0.0534 (0.060)
Year indicator = 1995	0.0785** (0.037)	0.0740 (0.062)	0.0614* (0.037)	0.0933 (0.062)
Year indicator = 1996	0.1010*** (0.038)	0.1043 (0.063)	0.0734* (0.039)	0.1354** (0.064)
Year indicator = 1997	0.0986 (0.067)	0.3633*** (0.110)	0.1252* (0.066)	0.3334*** (0.110)
Year indicator = 1998	0.1198 (0.082)	0.4705*** (0.135)	0.1669** (0.082)	0.4174*** (0.137)
Adjusted R^2 (percent)	61.5	32.8	62.8	35.9

Source: Authors' calculations based on data from sources listed in table 4-10.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

a. Regression performed using two-stage least squares. Dependent variable is the natural logarithm of the number of earned exposure units, for the particular market, relative to the number of households in the county. The average premium variables equal the total earned premium for all coverages, for the particular market, relative to the number of earned exposure units in the county. All variables, except the year indicators, are included in logarithmic form. Standard errors are shown in parentheses.

assigned risk plan required to charge adequate rates. This means that the hated recoupment fees have been substantially curtailed and will ultimately be eliminated for “clean” drivers. Compulsory liability insurance requirements also have been modified to allow some drivers to meet their obligations through means other than insurance.

With most of the reforms becoming effective in 1999, it is too soon to determine their ultimate outcome, but the early prognosis is positive. The number of insurers writing auto insurance has doubled with the implementation of the reforms. Many insurers have implemented more refined risk classification and pricing structures, as well as alternative policy options for consumers. It also appears that overall rate levels have continued to fall, possibly reflecting declining claim costs as well as the easing of restrictions on risk-based pricing. At the same time, many of the insureds that were previously subsidized are probably paying higher premiums. Most important, the Facility is depopulating rapidly.

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