Broker monitoring of premium adequacy: the role of contingent commissions

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Published online: 31 Mar 2014.

To cite this article: Mark J. Browne, Lan Ju & Zhiyong Tu (2014) Broker monitoring of premium adequacy: the role of contingent commissions, Applied Economics, 46:20, 2375-2386, DOI: 10.1080/00036846.2014.902020

To link to this article: http://dx.doi.org/10.1080/00036846.2014.902020

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Broker monitoring of premium adequacy: the role of contingent commissions

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Contingent commissions, which are payments made by an insurer to brokers based on the volume and profitability of insurance placed with the insurer, have been criticized as damaging to the relationship between the insured and its broker. The argument is made that contingent commission payments encourage brokers to select insurers for their clients based on the potential to earn contingent commissions, rather than on the needs of the insured. We argue that contingent commission payments, which while directly paid by the insurer are ultimately paid by the insured through higher premiums, are beneficial to insureds because they provide an incentive for the broker to place their coverage with an insurer that is charging an adequate premium. We contend that although inadequate premiums are perhaps good for the insured in the short term, in the longer term, inadequate premiums will result in price hikes or coverage restrictions that are harmful to the insureds. Our empirical analysis demonstrates that insurers who pay contingent commissions experience less price fluctuation over the underwriting cycle than insurers who do not pay contingent commissions in the US property and casualty insurance industry.

Keywords: contingent commission; insurance underwriting cycle

JEL Classification: G22; N22

I. Introduction

Contingent commissions have received considerable public attention since 14 October 2004 when NY Attorney General Eliot Spitzer brought a legal action against the five largest brokerage firms over their business practices, including their use of contingent commissions. Since then, a number of large insurers and brokers have cutback on the use of contingent commissions. In spite of the negative publicity contingent commissions have received in recent years, they have been widely used in many insurance markets and for many years.1

A contingent commission is a payment made by an insurer to a broker that is based on the volume of business the broker places with the insurer and the profitability of that business. In addition to possibly receiving a contingent commission, brokers are commonly paid direct commissions upfront by the insurer. Direct commissions are typically determined as a percentage of the premium paid for insurance coverage. An agent’s compensation is usually the sum of these two.

In a competitive market for broker’s services, there is some level of agent compensation that is the market equilibrium. The insured values a low price for coverage

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1 Cohick and Bartz (2005) report that insurance companies have paid contingent commissions for at least the last 50 years.
in the current period, but also values the insurer being sufficiently financially strong to pay claims should they arise and to renew coverage with comparable terms and rates in future years. On average, accuracy in pricing and consistency in the availability of coverage is beneficial to insureds. Brokers make significant investments in pricing competency. They employ actuarial staffs, invest in advanced technologies and methodological expertise and amass considerable data. Brokers work with many insureds and insurers, thus they are in a unique position to evaluate risk and the adequacy of pricing. We expect that brokers sacrifice direct commission income for indirect commission income (contingent commissions) to signal that the pricing of risk is adequate. Further, we expect, but do not demonstrate in this article, that the tradeoff between direct commissions and contingent commissions reflects the risk associated with receiving contingent commissions. That is, when there is greater risk surrounding pricing adequacy, the broker will demand greater potential contingent commission income per dollar of direct commission sacrificed. If the pricing of risk is too low, the insurer will lose money on the risks insured and a contingent commission will not be paid.

Table 1 reports variation in contingent commission payments by line of coverage in 2003. The table reveals that contingent commissions are paid in many lines of insurance. These include both commercial and personal lines insurance. There is considerable variation in the percentage of total commission income attributable to contingent commissions, with a low of 2.00% associated with private passenger automobile insurance and a high of 24.37% associated with credit insurance. The ratios of contingent commission payments to total commission payments associated with commercial casualty insurance and reinsurance were the second and third largest across lines of insurance in 2003, 11.84% and 11.67%, respectively. The fact that large contingent commission payments are associated with coverages sought by sophisticated purchases of insurance – insurance companies, in particular, in the case of the reinsurance line – suggests that they serve an important role in contracting. We contend that the payments encourage brokers to ensure that insurance is priced adequately, which is important to minimize costly disruptions in the future availability of coverage.

Prior research has reported episodes of pricing inadequacy followed by disruptions in the availability of insurance coverage. Harrington and Danzon (1994) write that insurance industry analysts believe there was significant price cutting in general liability insurance in the early 1980s with rates being charged that were insufficient, given the information available when coverage was bound. Various reasons have been offered for why this occurred, including a possible emphasis in the industry at the time on market share rather than profits.

The Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce of the US House of Representatives (1990) reports that premiums in the property and casualty insurance market are volatile and cyclical with alternating periods of high premiums and low premiums. The report notes that, in some periods, insurers are willing to accept underwriting losses in hopes of earning sufficient interest income to offset the losses. Increasing underwriting losses and poor investment returns in time result in higher rates and reduced availability of insurance coverage.

Danzon et al. (2004) report that in the early 2000s, the market was in crisis: rates in some states increased 60%; the largest writer at the time, the St. Paul Companies, and several other sizable writers withdrew from the market; insurers scaled back on the coverage they offered; and some medical malpractice writers became insolvent. Harrington et al. (2008) report that the medical malpractice insurance market has exhibited pricing volatility over time with prices at times falling and at other times rising

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Table 1. Contingent commissions by line in 2003

<table>
<thead>
<tr>
<th>Line</th>
<th>Contingent commission as % of total commission (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All lines combined</td>
<td>9.77</td>
</tr>
<tr>
<td>Reinsurance companies</td>
<td>11.67</td>
</tr>
<tr>
<td>Non-standard auto predominating</td>
<td>2.23</td>
</tr>
<tr>
<td>Private passenger auto predominating</td>
<td>2.00</td>
</tr>
<tr>
<td>Private passenger auto and homeowners predominating</td>
<td>9.75</td>
</tr>
<tr>
<td>Surplus lines predominating</td>
<td>8.00</td>
</tr>
<tr>
<td>Commercial auto predominating</td>
<td>1.57</td>
</tr>
<tr>
<td>Medical malpractice predominating</td>
<td>-4.78</td>
</tr>
<tr>
<td>Workers compensation predominating</td>
<td>6.79</td>
</tr>
<tr>
<td>Commercial casualty predominating</td>
<td>11.84</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>-2.04</td>
</tr>
<tr>
<td>Property predominating</td>
<td>6.89</td>
</tr>
<tr>
<td>Fidelity and surety predominating</td>
<td>4.67</td>
</tr>
<tr>
<td>Credit predominating</td>
<td>24.37</td>
</tr>
<tr>
<td>Financial guaranty predominating</td>
<td>0.87</td>
</tr>
<tr>
<td>Mortgage guaranty predominating</td>
<td>3.96</td>
</tr>
<tr>
<td>Accident and health predominating</td>
<td>3.01</td>
</tr>
<tr>
<td>State funds predominating</td>
<td>3.95</td>
</tr>
</tbody>
</table>

Source: These data are reported in, ‘Contingent Insurance Commissions: Implications for Consumers,’ by J. Robert Hunter, published by the Consumer Federation of America, 26 January 2005.

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2 These data are reported in, ‘Contingent Insurance Commissions: Implications for Consumers,’ by J. Robert Hunter, published by the Consumer Federation of America, 26 January 2005.
sharp. They provide empirical evidence that the crisis was proceeded by a period of inadequate pricing.

The current paper provides a rationale for the prevalence of contingent commissions in the insurance industry. Empirical evidence is reported, which is consistent with contingent commissions providing an incentive for brokers to monitor price adequacy. Our analysis finds that insurers who pay contingent commissions price insurance with greater stability over the course of the underwriting cycle than insurers who do not. While the insurance underwriting cycle has been widely studied in the academic literature, the relationship between the insurance underwriting cycle and compensation of market intermediaries has to date received little to no consideration. The insurance industry underwriting cycle is the movement in profitability the industry experiences over time. The cycle is characterized by swings in the profitability of underwriting insurance. Soft markets in the cycle are periods during which insurance is relatively less expensive, coverage is widely available and underwriting is less profitable. In contrast, during hard market phases in the cycle, insurance is relatively more expensive, there is less coverage availability and underwriting is more profitable.

Figure 1 plots the historical trend of the insurance underwriting cycle for three distinct composites from 1997 to 2009 based upon the NAIC data set (See Table 2). From Fig. 1, we can clearly see that the insurance industry during the period of our analysis, 1997–2009, experienced two soft markets characterized by relatively low underwriting profits and a hard market (2001–2004) characterized by relatively high underwriting profits. It is easy to see that the composite that includes insurance companies with contingent commission payments has the smoothest cycle, which provides direct evidence of the buffering effect of the contingent commission. Moreover, the brokered property and casualty line is flatter than the line representing all writers of property and casualty coverage, but more volatile than the line representing those property and casualty insurers who pay contingent commissions. This suggests that the payment of contingent commissions plays a role in dampening the insurance underwriting cycle.

The following section provides a review of related literature. Section III further develops the hypothesis and discusses model specifications of this study. Section IV reports our empirical tests. We review our findings in the final section.

II. Related Concepts and Literature

Contingent commission

Contingent commissions are commonly used by insurers to compensate brokers as an additional incentive arrangement. In general, there are two basic types of contingent commissions, volume-based and profit-based. Volume-based contingent commissions are awarded to brokers when the business they place exceeds a specified threshold. Profit-based contingent commissions are awarded based on the profitability of the insurance business produced by brokers. Profitability is often measured by the loss ratio of the business. If not specially noted, the contingent commission studied in this work refers to the profit-based type.

The appendix shows a sample calculation to determine the contingent commission payable to brokers by one insurance carrier based on a profit bonus matrix. Once the loss ratio is sufficiently low and the premium volume is sufficiently high relative to a threshold, larger volumes of premiums written and lower loss ratios are associated with greater contingent commissions being paid. The design of this profit bonus matrix illustrates that brokers cannot rely solely on premium volume to earn a contingent commission since the book of business needs to be profitable regardless of its size. Moreover, since the amount payable is based on the current year’s underwriting performance of a book of business placed by a broker, contingent commissions are typically paid at the end of a particular underwriting year.

There is scant research to date on the use of contingent commissions. Cummins and Doherty (2006) applies the Rothschild and Stiglitz (1976) adverse selection model in asserting that brokers can efficiently reduce adverse

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3 Table 2 summarizes three series of combined ratios for the whole property and casualty (P/C) insurance industry and two composites that consist of brokered P/C lines and P/C lines associated with positive contingent commissions respectively. Combined ratios are calculated using the NAIC (National Association of Insurance Commissioners) data. The combined ratio is the sum of the loss ratio and the expense ratio. The loss ratio is calculated by dividing an insurer’s incurred losses plus loss adjustment expenses (LAE) by the insurer’s earned premiums. The expense ratio is calculated by dividing an insurer’s administrative expenses by the insurer’s written premiums. The loss ratio and the combined ratio are commonly used measures of profitability in the insurance industry.

4 There exists a fair degree of variation among the contingent commission arrangements offered by different insurers. In addition, some insurers consider other factors beyond volume and profitability – such as growth, retention, business renewal rates, or a combination of these – in calculating contingent commission payments.

5 This practice first appeared in the 1990s when it was incorporated in placement service agreements (PSAs) and marketing service agreements (MSAs). Large brokers use these plans more frequently than small or regional brokers (Source: ‘Placement Service Agreements: Big Brokers under Fire’ Advisen Briefing, 26 April 2004).

6 The information is from CNA 2006 Addendum to Agency Agreement.
selection problems and that contingent commissions can align the interests of insureds and the insurance company.

In contrast to Cummins and Doherty (2006), who focus mostly on larger-sized intermediaries, Carson et al. (2007) focus on smaller-sized intermediaries (independent agents). They argue that contingent commission arrangements can benefit policyholders in terms of affordability and availability of coverage, but no quantitative analysis is presented in their research.

Regan and Kleffner (2010) empirically examine the role of contingent commission practices in property and casualty insurer underwriting performance. They find that insurers who pay a higher proportion of contingent commissions relative to their total expense payments are associated with lower loss ratios and combined ratios. The variability of loss ratios and combined ratios is also a decreasing function of insurers’ contingent commission payments. Their research findings are consistent with one part of our hypotheses, but their data period is relatively short and they do not examine the role of contingent commissions in the context of the underwriting cycle.

Colquitt et al. (2011) examine the determinants of whether insurers pay contingent commissions and the extent of awarding payments. They find organizational structure matters; specifically, mutual insurers are more likely to use contingent commission arrangements than stock insurers after controlling for other effects.

Insurance underwriting cycle

The insurance underwriting cycle is often described as an alternating process of soft markets and hard markets. During a soft market, insurers try to expand their business and increase their market share through price cutting and by offering generous insurance coverage. Not surprisingly, insurers’ profits per unit of insurance sold are relatively lower during a soft market. Conversely, during a hard market, insurers raise their prices, limit coverage availability, and consequently enhance their profits.

There has been extensive theoretical work discussing various hypothesized reasons for the existence of the underwriting cycle; nonetheless, there is little consensus with respect to which theory best explains the cycle. At present, it appears that no single hypothesis can explain thoroughly the insurance cycle per se. Empirical work has not been definitive on the cause of the underwriting cycle either. Below we summarize several main streams of the underwriting cycle literature.

Venezian (1985) has argued that institutional rigidities are the cause of the underwriting cycle. He contends that systematic errors in projecting premium levels on the basis of prior loss experience generates fluctuations in profitability in the insurance industry. Smith and Gahin (1983) and Smith (1984) also provide evidence consistent with this hypothesis.
Another stream of research on the cycle is based on the rational expectations or institutional intervention hypothesis in the context of a perfect market. An underlying premise in this body of work is that financial capital can adjust instantly and without cost to market conditions (see, for instance, Cummins and Outreville, 1987). It is hypothesized that the cycle results from frictions in the market arising from regulation. Some studies argue that the existence of the cycle results from rate regulation. For instance, lags inherent in the prior approval process may tend to increase the volatility of underwriting results. Supportive evidence has been found in the US and Canadian automobile insurance markets (Outreville, 1990; Tennyson, 1993; Leadbetter et al., 2008).

In contrast with the above, the capacity constraint theory is based on the assumption that the capital market is not perfect; in contrast, capital cannot move immediately and without cost into and out of the insurance market. To date, there have been numerous articles focusing on this theory, including Winter (1988, 1991, 1994), Niehaus and Terry (1993), Gron (1994), Doherty and Garven (1995), and Doherty and Posey (1997). According to this theory, shocks to capital by events such as large catastrophe losses result in the cycle.

Harrington and Danzon (1994), Cagle and Harrington (1995), and Cummins and Danzon (1997) extend the capacity constraints hypothesis by incorporating insurers’ default risk into the analysis and focusing on its endogenous effect on the price of insurance.

Some studies suggest that the insurance cycle is linked to general economic conditions (see, for instance, Grace and Hotchkiss, 1995). The influence of reinsurance purchases on the cyclical behaviour of primary insurance markets has also been studied (Cummins and Weiss, 2000; Weiss and Chung, 2004; Meier and Outreville, 2006, 2010).7

Gron (1998) has studied the effects of the underwriting cycle on compensation of insurance producers. She finds that average commission rates and the number of insurers represented by independent agents are inversely correlated with the profitability of insurers. Different from her work, we consider whether compensating producers with contingent commissions dampens the underwriting cycle by providing an incentive to producers to monitor price adequacy.

### III. Hypotheses and Model Specifications

The above reasoning predicts insurers who pay contingent commissions price insurance with greater stability over the course of the underwriting cycle than insurers who do not. Besides looking at the likelihood of paying contingent commissions, we further examine the size effect of contingent commission offerings on the pricing volatility of insurers. We anticipate that insurers with more underwriting and, therefore, pricing volatility are less likely to offer contingent commissions. To compensate producers for this potential loss of income, we anticipate insurers who do not pay contingent commissions pay higher traditional commission rates. The traditional commission rate is therefore a proxy that allows us to indirectly test the size effect of contingent commissions on the volatility of underwriting results.

In sum, two hypotheses are tested in this study:

**Hypothesis 1:** The volatility of loss ratios and combined ratios is negatively associated with the likelihood of contingent commissions being paid by insurers, other things equal.

**Hypothesis 2:** The volatility of loss ratios and combined ratios is positively associated with the traditional commission rates offered by insurers, other things equal.

To test the above hypotheses, we measure an insurer’s pricing stability using the volatility of the insurer’s loss ratio and combined ratio over 6 years.8 The insurance underwriting cycle is typically described by the movement of these ratios over time. Coefficients of variation (CV) are calculated to measure the volatility of the loss ratio and the combined ratio. These two measures are specified as:

\[
CV_{\text{of Loss Ratio}} = \frac{\text{stddev}(LR_t, LR_{t+1}, LR_{t+2}, LR_{t+3}, LR_{t+4}, LR_{t+5})}{\text{average}(LR_t, LR_{t+1}, LR_{t+2}, LR_{t+3}, LR_{t+4}, LR_{t+5})}
\]

\[
CV_{\text{of Combined Ratio}} = \frac{\text{stddev}(CR_t, CR_{t+1}, CR_{t+2}, CR_{t+3}, CR_{t+4}, CR_{t+5})}{\text{average}(CR_t, CR_{t+1}, CR_{t+2}, CR_{t+3}, CR_{t+4}, CR_{t+5})}
\]

---

7 Meier and Outreville (2006, 2010) provide a comprehensive survey of the literature on the underwriting cycle.

8 Since prior studies suggest that a typical underwriting cycle is 6-year, we choose this length to calculate the SD of loss ratios and combined ratios.
LR_t indicates an insurer’s loss ratio in a particular year t. Given the above formula, CV_of_Loss_Ratio measures the price/loss ratio volatility in a 6-year window. For instance, for insurer i in 1997, this variable calculates the relative SD for insurer i from 1997 to 2002. We aim at finding whether insurers who pay contingent commissions are associated with smaller CV in loss ratios. If this is so, this would provide evidence that the practice of paying contingent commissions did motivate brokers to place business with less volatile insurers that implicitly price more adequately.

Similarly, CR_t is an insurer’s combined ratio in a particular year t. We aim at finding whether insurers who pay contingent commissions are associated with smaller CV in combined ratios. If this is so, this would provide evidence that the practice of paying contingent commissions can dampen the insurance cycle.

One of our variables of primary interest is Contingent_Commission_Dummy. Contingent_Commission_Dummy is a binary variable indicating whether positive contingent commissions are paid to brokers by an insurer in a particular year. It is valued at 1 if positive contingent commissions are awarded, and 0 otherwise. A negative relationship between this variable and our dependent variables would provide support for hypothesis 1.

The other variable of primary interest is Traditional_Commission. It is the ratio of total traditional commissions paid to brokers by insurers to total premiums written. It is an aggregate measure of the traditional commission rate paid by an insurer. Because of data limitations, we are not able to obtain by-line commission rates at this point. The expected sign is positive, as suggested by hypothesis 2.

Our control variables largely follow the prior literature. Size is the natural logarithm of an insurer’s total assets. Other things equal, we expect that size is correlated with greater expertise in insurer operations, including underwriting and claims adjudication, and thus we anticipate the company size is negatively correlated with the pricing variability of the insurer over the course of the underwriting cycle.

ROA is the ratio of net income to total assets for an insurer. Prior literature suggests that ROA can be considered an overall firm performance measure (See, for instance, Maury, 2006). We hypothesize that insurers with higher ROA ratios, which suggest better firm performance, display less severe variability in loss ratios or combined ratios since they are more likely to maintain a sufficiently high profit level of which the underwriting profit is a critical source.

RBC measures an insurer’s capital adequacy level. It is the ratio of total adjusted capital to authorized control level risk based capital. Insurers with more adequate capital are expected to be associated with lower relative variability of loss ratios or combined ratios, all else equal. It is reasonable to assume that firms with greater RBC are more financially prepared for the potential adverse capital shocks, which might accompany a hard market. A negative relationship is therefore expected. An alternative hypothesis is that firms that anticipate more variability in their financial results hold more capital as a buffer against risk. In this case, a positive relationship between the RBC ratio and price variation would be expected.

Following the work of Berger et al. (2000), Cummins and Nini (2002), and Liebenberg and Sommer (2008), we include both a line-of-business Herfindahl index and a geographic Herfindahl index in our models to control for the effects of diversification on insurer performance. Line-of-Business_Herfindahl is the standard line-of-business Herfindahl index, which indicates an insurer’s business concentration in a particular year. This index is calculated by the formula,

$$\text{Line-of-Business Herfindahl Index} = \sum L \left( \frac{\text{DPW}_L}{\text{TPW}} \right)^2$$

where DPW_L is the amount of direct premiums written in a particular property and casualty line and TPW is the amount of total premiums written across all property and casualty lines, 31 lines in total are reported by the NAIC. Higher values of the Herfindahl index for an insurer indicate greater concentration in the business they write. The range of this index is between 0 and 1.

Geographic_Herfindahl is the standard geographic Herfindahl index, which measures an insurer’s geographic concentration by state in a particular year. Similar to the calculation formula of line-of-business Herfindahl index, the geographic Herfindahl index is defined by the formula,

$$\text{Geographic Herfindahl Index} = \sum S \left( \frac{\text{DPW}_S}{\text{TPW}} \right)^2$$

where DPW_S is the amount of direct premiums written in a particular state and TPW is the amount of total premiums written in all 50 states in the United States. The higher the geographic Herfindahl index, the more geographically concentrated are an insurer’s writings. The range of this index is also between 0 and 1. Berger et al. (2000) argue that diversification should result in less volatility in profitability, particularly in personal lines. Alternatively, focused firms may have an informational advantage in lines in which they specialize. This may result in their outperforming diversified insurers in profitability and having greater stability in underwriting results over time (Cummins and Nini, 2002; Liebenberg and Sommer, 2008).

Stock is an indicator variable that takes the value 1 if the insurer is a stock company, and 0 otherwise. Stockholder-
owned insurers are expected to have a greater level of underwriting variability relative to insurers with alternative ownership structures (see, for instance, Lamm-Tennant and Starks, 1993). This suggests that the sign of Stock should be positive.

Group is an affiliated dummy variable, valued at 1 if an insurer is affiliated with a group, and 0 otherwise. Insurers affiliated with groups may have greater expertise in underwriting and pricing practice than stand alone companies. Therefore, the expected sign of Group is negative, other things equal.

Year is a series of year dummy variables that range over the study period, 1997–2004. Year indicator variables for _1997 through _2003 are included in the models with year 2004 being the reference year.

To summarize, our models can be written as follows:

\[ CV_{of\, Loss\, Ratio} = \alpha + \beta_1 \text{Contingent\_Commission\_Dummy} + \beta_2 \text{Line-of\_Business\_Herfindahl} + \beta_3 \text{Geographic\_Herfindahl} + \beta_4 RBC + \beta_5 ROA + \beta_6 \text{Size} + \beta_7 \text{Stock} + \beta_8 \text{Group} + \gamma \text{Year} + \epsilon \]  
(3.1)

\[ CV_{of\, Combined\, Ratio} = \alpha + \beta_1 \text{Contingent\_Commission\_Dummy} + \beta_2 \text{Line-of\_Business\_Herfindahl} + \beta_3 \text{Geographic\_Herfindahl} + \beta_4 RBC + \beta_5 ROA + \beta_6 \text{Size} + \beta_7 \text{Stock} + \beta_8 \text{Group} + \gamma \text{Year} + \epsilon \]  
(3.2)

\[ CV_{of\, Loss\, Ratio} = \alpha + \beta_1 \text{Traditional\_Commission} + \beta_2 \text{Line-of\_Business\_Herfindahl} + \beta_3 \text{Geographic\_Herfindahl} + \beta_4 RBC + \beta_5 ROA + \beta_6 \text{Size} + \beta_7 \text{Stock} + \beta_8 \text{Group} + \gamma \text{Year} + \epsilon \]  
(3.3)

\[ CV_{of\, Combined\, Ratio} = \alpha + \beta_1 \text{Traditional\_Commission} + \beta_2 \text{Line-of\_Business\_Herfindahl} + \beta_3 \text{Geographic\_Herfindahl} + \beta_4 RBC + \beta_5 ROA + \beta_6 \text{Size} + \beta_7 \text{Stock} + \beta_8 \text{Group} + \gamma \text{Year} + \epsilon \]  
(3.4)

All variables used in this study are summarized in Table 3.

IV. Data and Empirical Results

In the present study, we empirically test the hypotheses using unbalanced panel data from 1997 to 2009, a time period covering alternating soft and hard markets. For the purpose of calculating the CV of loss ratios and combined ratios that allows a 6-year window, the data actually used in our regression models are from 1997 to 2004. All data are from the NAIC data set for corresponding years. The NAIC data set includes annual statement information supplied yearly to state insurance departments and allows us to analyze firm-specific effects in the context of insurance profit cycles.

Overall, our sample consists of 4553 observations. It is an unbalanced panel data structure with 925 individual insurers. 3067 observations are associated with positive contingent commission payments, accounting for approximately 67.36% of the sample. We include in our sample all insurers who report a positive value for total assets, a positive value for net premiums earned (NPE) and a positive value for net premiums written (NPW). Insurers who report negative values for contingent commission payments are also not included. Missing values for any of the variables in our models preclude an insurer from being included in our sample.

Descriptive statistics are reported in Table 4. The table includes the mean, SD, minimum value, first quartile value, median, third quartile value and maximum value for each variable. The CV of the loss ratio (CV of Loss_Ratio), which is the dependent variable in our test equations, has a SD of 0.31 and a mean of 0.18. The CV of the combined ratio (CV of Combined_Ratio)
has a SD of 0.16 and a mean of 0.12. The average traditional commission rate in our sample is 13.35% with a SD of 0.13. Within our sample, approximately 66% are stock insurers and 71% are group-affiliates.

Table 4. Summary statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
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<td>4553</td>
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<td>0.0724</td>
<td>0.1100</td>
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<td>8.8764</td>
<td>17.2709</td>
<td>18.6006</td>
<td>19.9271</td>
<td>25.1589</td>
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<tr>
<td>Group</td>
<td>4553</td>
<td>18.6454</td>
<td>1.8813</td>
<td>8.8764</td>
<td>17.2709</td>
<td>18.6006</td>
<td>19.9271</td>
<td>25.1589</td>
</tr>
</tbody>
</table>

9 The lines of insurance are fire, allied lines, farmowners multiple peril, homeowners multiple peril, commercial multiple peril, mortgage guaranty, ocean marine, inland marine, financial guaranty, medical malpractice-occurrence, medical malpractice-claims made, earthquake, group accident and health, credit accident and health (group and individual), other accident and health, workers’ compensation, other liability-occurrence, other liability-claims made, products liability-occurrence, products liability-claims made, private passenger auto liability, commercial auto liability, auto physical damage, aircraft (all perils), fidelity, surety, burglary and theft, boiler and machinery, credit, international and reinsurance lines. We choose aggregate write-ins for other lines business as the reference line in our empirical models.
Table 5. Empirical results by 2SLS – Contingent_Commission_Dummy as the variable of primary interest, Various_Line as IVs

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1) 2SLS Random-effects</th>
<th>(2) 2SLS Random – effects</th>
<th>(3) 2SLS Pooled OLS</th>
<th>(4) 2SLS Pooled OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV_of_Loss_Ratio</td>
<td>-0.189** (-2.91)</td>
<td>-0.0987** (-2.83)</td>
<td>-0.0363 (-0.71)</td>
<td>-0.0411 (-1.84)</td>
</tr>
<tr>
<td>CV_of_Combined_Ratio</td>
<td>0.0747 (1.70)</td>
<td>0.0551* (2.44)</td>
<td>0.194** (4.35)</td>
<td>0.0740*** (3.88)</td>
</tr>
<tr>
<td>Contingent_Commission_Dummy</td>
<td>0.0665 (-0.83)</td>
<td>0.0144 (0.35)</td>
<td>-0.140 (-1.74)</td>
<td>-0.00142 (-0.04)</td>
</tr>
<tr>
<td>Geographic_Herfindahl</td>
<td>0.00126*** (3.30)</td>
<td>0.000618** (3.23)</td>
<td>0.00202* (2.16)</td>
<td>0.00147*** (3.74)</td>
</tr>
<tr>
<td>RBC</td>
<td>-0.0000554 (-0.40)</td>
<td>-0.0000199 (-0.30)</td>
<td>-0.0000934*** (-4.60)</td>
<td>-0.00000246 (-0.20)</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.0104* (-1.99)</td>
<td>0.000711 (0.27)</td>
<td>-0.0153*** (-4.51)</td>
<td>-0.006618 (-0.33)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.00346 (-0.19)</td>
<td>0.00592 (0.62)</td>
<td>-0.00813 (-0.71)</td>
<td>0.00560 (0.91)</td>
</tr>
<tr>
<td>Stock</td>
<td>0.0460 (2.57)</td>
<td>0.0252** (2.60)</td>
<td>0.0308** (3.53)</td>
<td>0.0195*** (4.44)</td>
</tr>
<tr>
<td>Group</td>
<td>-0.000346 (-0.19)</td>
<td>0.00592 (0.62)</td>
<td>-0.00813 (-0.71)</td>
<td>0.00560 (0.91)</td>
</tr>
<tr>
<td>_1997</td>
<td>-0.0294* (-2.33)</td>
<td>-0.0286*** (-4.66)</td>
<td>-0.00662 (-0.03)</td>
<td>-0.00945 (-1.00)</td>
</tr>
<tr>
<td>_1998</td>
<td>-0.0316* (-2.51)</td>
<td>-0.0235*** (-3.84)</td>
<td>-0.0164 (-1.37)</td>
<td>-0.0135 (-1.53)</td>
</tr>
<tr>
<td>_1999</td>
<td>-0.0134 (-1.06)</td>
<td>-0.00786 (-1.28)</td>
<td>0.0134 (0.83)</td>
<td>0.00217 (0.22)</td>
</tr>
<tr>
<td>_2000</td>
<td>-0.0126 (-0.97)</td>
<td>-0.00557 (-0.88)</td>
<td>-0.00397 (-0.32)</td>
<td>0.000702 (0.07)</td>
</tr>
<tr>
<td>_2001</td>
<td>0.000320 (0.02)</td>
<td>0.000508 (0.08)</td>
<td>0.0147 (0.90)</td>
<td>0.00273 (0.23)</td>
</tr>
<tr>
<td>_2002</td>
<td>0.00298 (0.22)</td>
<td>-0.000499 (-1.47)</td>
<td>0.0161 (0.89)</td>
<td>-0.00650 (-0.61)</td>
</tr>
<tr>
<td>_2003</td>
<td>-0.0101 (-0.82)</td>
<td>-0.0179** (-3.00)</td>
<td>-0.00309 (-0.24)</td>
<td>-0.0174* (-2.01)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.473*** (3.85)</td>
<td>0.136 (2.10)</td>
<td>0.417** (3.19)</td>
<td>0.0965 (1.66)</td>
</tr>
</tbody>
</table>

N = 4553

Notes: t statistics in parentheses.
* p < 0.05, ** p < 0.01, *** p < 0.001.

Table 6 reports empirical results for the models testing the relationship between the payment of contingent commissions and price stability. Models 1 and 2 report 2SLS, random-effects estimations, while models 3 and 4 report 2SLS, pooled OLS estimations. The variable of primary interest in all of the models is the indicator for whether insurer i paid contingent commissions in year t.

Table 6. Empirical results by 2SLS – Traditional_Commission as the variable of primary interest, Various_Line as IVs

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(5) 2SLS Random -effects</th>
<th>(6) 2SLS Random – effects</th>
<th>(7) 2SLS Pooled OLS</th>
<th>(8) 2SLS Pooled OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV_of_Loss_Ratio</td>
<td>0.605*** (3.49)</td>
<td>0.120 (1.43)</td>
<td>1.283*** (5.84)</td>
<td>0.163* (2.30)</td>
</tr>
<tr>
<td>CV_of_Combined_Ratio</td>
<td>0.125*** (4.02)</td>
<td>0.0985** (6.38)</td>
<td>0.209** (9.44)</td>
<td>0.100*** (10.93)</td>
</tr>
<tr>
<td>Traditional_Commission</td>
<td>0.0230 (0.29)</td>
<td>0.0485 (1.25)</td>
<td>-0.114 (-1.62)</td>
<td>0.0204 (0.67)</td>
</tr>
<tr>
<td>Geographic_Herfindahl</td>
<td>0.00151*** (3.83)</td>
<td>0.000755*** (3.93)</td>
<td>0.00306** (3.24)</td>
<td>0.00171*** (4.17)</td>
</tr>
<tr>
<td>RBC</td>
<td>-0.0000988 (-0.74)</td>
<td>-0.0000370 (-0.56)</td>
<td>-0.000132*** (-5.29)</td>
<td>-0.00000953 (-0.77)</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.0168*** (-2.85)</td>
<td>-0.0171 (-0.60)</td>
<td>-0.0181*** (-4.89)</td>
<td>-0.00814 (-0.45)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.00277 (1.32)</td>
<td>0.0215* (2.12)</td>
<td>-0.00398 (-0.44)</td>
<td>0.0156*** (3.43)</td>
</tr>
<tr>
<td>Stock</td>
<td>-0.00887 (-0.45)</td>
<td>0.00372 (0.39)</td>
<td>0.00375 (0.27)</td>
<td>0.00419 (0.69)</td>
</tr>
<tr>
<td>Group</td>
<td>-0.0292* (-2.40)</td>
<td>-0.0262*** (-4.38)</td>
<td>-0.0136 (-0.63)</td>
<td>-0.00934 (-1.00)</td>
</tr>
<tr>
<td>_1997</td>
<td>-0.0286* (-2.35)</td>
<td>-0.0211*** (-3.53)</td>
<td>-0.0226 (-1.52)</td>
<td>-0.0127 (-1.44)</td>
</tr>
<tr>
<td>_1998</td>
<td>-0.0153 (-1.25)</td>
<td>-0.00708 (-1.17)</td>
<td>0.00143 (0.08)</td>
<td>0.000740 (0.07)</td>
</tr>
<tr>
<td>_1999</td>
<td>-0.0108 (-0.86)</td>
<td>-0.00361 (-0.58)</td>
<td>-0.0151 (-0.99)</td>
<td>0.000311 (0.03)</td>
</tr>
<tr>
<td>_2000</td>
<td>-0.00378 (-0.28)</td>
<td>-0.000509 (0.08)</td>
<td>0.00321 (0.16)</td>
<td>0.00255 (0.21)</td>
</tr>
<tr>
<td>_2001</td>
<td>0.00690 (0.54)</td>
<td>-0.00700 (-1.11)</td>
<td>0.0142 (0.71)</td>
<td>-0.00579 (-0.54)</td>
</tr>
<tr>
<td>_2002</td>
<td>0.00744 (-0.62)</td>
<td>-0.0166** (-2.82)</td>
<td>0.00188 (0.12)</td>
<td>-0.0159 (-1.81)</td>
</tr>
<tr>
<td>_2003</td>
<td>0.543*** (2.77)</td>
<td>0.0692 (1.16)</td>
<td>0.266** (2.81)</td>
<td>0.0316 (0.69)</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td>0.979 (1.00)</td>
<td></td>
</tr>
</tbody>
</table>

N = 4553

Notes: t statistics in parentheses.
* p < 0.05, ** p < 0.01, *** p < 0.001.
As reported in Table 5, the estimated coefficients on the contingent commission variables in models 1 and 2 are signed negatively and are statistically significant at the 0.01 level. These findings provide support for our hypothesis that insurers who pay contingent commissions experience less volatility in both loss ratios and combined ratios. This suggests that contingent commissions do result in a dampening of the underwriting cycle.

Table 6 reports that the ratio of traditional commissions to premiums written is significantly positively related to price variation in models 5, 7 and 8. These findings are consistent with our hypothesis that insurance companies that offer higher rates of traditional commission exhibit greater volatility in their loss ratios and combined ratios, other things equal.

The estimated coefficients on the line-of-business Herfindahl index are significantly positive in all models except model 1. These results are consistent with our expectation that insurers are able to achieve more stable underwriting results through line diversification. In other words, insurers offering a more focused portfolio of insurance lines tend to experience higher variation in both loss ratios and combined ratios over time. The geographic Herfindahl index is insignificant in all models.

As a measure of capital adequacy, RBC is positively correlated with our dependent variables in all models at various levels of significance. This is consistent with insurers at greater risk of pricing instability, holding more capital as a buffer against that risk. ROA is insignificant in most models.

The variables Size, Stock and Group are included in our models to control for company size, organizational structure and group affiliation, respectively. We find some evidence that larger firms experience less volatility in their underwriting results. Stock companies do show significantly higher levels of volatility in many of our models. Group affiliation is insignificant in all models.

V. Discussion and Conclusion

Contingent commissions, which are payments made by an insurer to brokers based on the volume and profitability of insurance placed with the insurer, have been criticized as damaging to the relationship between the insured and its broker. The argument is made that contingent commission payments encourage brokers to select insurers for their clients based on the potential to earn contingent commissions, rather than on the needs of the insured. We argue that contingent commission payments, which while directly paid by the insurer are ultimately paid by the insured through higher premiums, are beneficial to insureds because they provide an incentive for the broker to place their coverage with an insurer that is charging an adequate premium. We contend that although inadequate premiums are perhaps good for the insured in the short term, in the longer term, inadequate premiums will result in price hikes or coverage restrictions that are harmful to insureds. Our empirical analysis demonstrates that insurers who pay contingent commissions experience less price fluctuation over the underwriting cycle than insurers who do not pay contingent commission in the US property and casualty insurance industry.

The empirical results of this study lend support to the argument that contingent commissions play an important role in insurance markets by providing an incentive for brokers to monitor price adequacy. For insurers, our results provide a positive rationale for the use of contingent commissions. Our evidence suggests that they enhance the stability of underwriting results in the insurance industry. From a regulatory perspective, it is perhaps more reasonable to encourage the proper use of contingent commissions rather than abandon the practice completely, as pricing adequacy is an important goal of insurance regulation.

Future research comparing the monitoring of pricing adequacy by brokers versus regulators is warranted. Consideration in such a study of different forms of rate regulation, including file and use, open competition and prior approval, would be valuable.

References


Broker monitoring of premium adequacy


Sample calculation

Suppose a broker places a book of business with $2 500 000 in written premiums with an insurer in a particular calendar year. The current calendar year limited loss ratio equals 30%. The 2-year loss ratio equals 50%. From the calculation formula listed in the compensation contract:

Contingent Commission payment = Subject Written Premium × Profit Bonus Factor × Profit modifier

If both the current year loss ratio and the two-year loss ratio (unadjusted by the stop loss limit) are greater than 75%, the profit bonus points will be reduced by 50%. In this particular case, the profit modifier equals 1. The profit bonus percentage is 1.92, which is shown in bold in the matrix. The total contingent commission awarded to the broker by this insurer once the underwriting year is closed is determined in the following fashion:

Contingent Commission payment = $2 500 000 × 0.0192 × 1
= $48 000

Limited loss ratio includes a stop loss adjustment, the purpose of which is to reduce upward pressure on the loss ratio imposed by a potential single large-value loss event.

Two-year loss ratio = (Incurred losses during the current calendar year $t + Incurred losses during the prior year $t - 1)/(Earned premiums in $t + Earned premiums in $t - 1)