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**Is Independent Agency Distribution System More Revenue Efficient? A Data  
Envelope Analysis**

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## Introduction

Over the past 30 years, economists have continuously disputed over the efficiency of independent agency system. Previous research consistently find that independent agents are less cost efficient than its direct selling and exclusive agents counterparts (Joskow (1973), Cummins and VanDerhei (1979), Barrese and Nelson (1992), Kim, Mayers and Smith (1996), Berger, Cummins and Weiss (1997)). The existence of the independent agency system in the insurance market is therefore explained either by the market imperfection that emphasizes the price regulation, low dissemination of information/asymmetric information, and high search cost; or by the higher quality of service of the independent agents.

Existing researches explain the higher cost of the independent agency system from the following perspectives: (1) the agent theory, which suggests that the independent agent system tends to have less agents-policyholder conflicts but more insurer-agents conflicts, and can protect customers from exploitation by the insurers. It predicts that firms that use independent agency will specialize in the high-services high-price policies, and the agents receive rents for their services. (Mayers and Smith (1981), Barrese and Nelson (1992) and Kim, Mayers and Smith (1996); (2) the search cost theory, which argues that customers and insurers who have higher search cost go with the independent system while those with lower search cost chooses the direct writers, given every insurer charges a zero-profit price and sells a single product, (Posey and Yavas (1995); (3) the asymmetric information on risk level hypothesis, which shows that different distribution systems work as a risk-screening system, and the independent agency is preferred when agent information about policyholders is important for risk classification (Regan and Tennyson (1996); (4) the transaction cost explanation, which argues that independent agency have advantages when products are complex, underlying uncertainty is higher or relationship specific investment is less important (Regan (1997); (5) the “self-selection” theory, which show that in equilibrium the safer insureds choose direct underwriting, whereas the riskier ones choose independent agents. Therefore the agent system is more costly than direct underwriting because of self-selection rather than inefficiency (Venezia, Galai and Shapira (1999). In general, these theories and hypotheses all suggest that independent agency and other distribution systems exist for their different customers with their specialties.

However, these explanations about the cost-inefficiency of the independent agency still have not explained its survival in the market. In the end, the higher costs have to be compensated by higher revenues for a firm to survive the competition. There are some works that have touched this issue. Barrese, Doerpinghaus and Nelson (1995) find some evidence that independent agency system provides superior service in the private passenger automobile insurance, but they also find that independent agency has been losing market share, which hints that the service differential cannot compensate the greater cost of coverage. Berger, Cummins and Weiss (1997) address the question by a comprehensive cost-profit efficiency analysis, showing that in the 1980s, though independent agency system is less cost efficient than direct-writers, the profit efficiency difference between the two system is much smaller than the cost efficiency difference, implying that independent agency system tends to provide high-quality services, and therefore, are compensated by additional revenues.

Despite these explanations about the survival of the independent agency system, it is still puzzling that the independent agency is losing its market share over time. The independence agency's market share declined from 69 percent in 1970 to 59 percent in 1990.<sup>1</sup> The market share shrank further during the 1990s, as shown in table 1. The total market share by independent agency and brokerage

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<sup>1</sup> See

Barrese, James, Helen I. Doerpinghaus, and Jack M. Nelson, 1995, Do Independent Agent Insurers Provide Superior Service? The Insurance Marketing Puzzle, *Journal of Risk and Insurance* 62, 297-308. We should pay attention that the independent agency is not separated from the brokerage system during this time period.

dropped to 51.1 percent in 2002. Given the increasing market share of brokerage in this time period, the net decrease in market share of the independent agent system is even more dramatic. This raises the questions again whether independent agency system does provide superior services in the market, and if so, why it continues to lose market share over the past 30 years.

In this paper, we try to answer this question by doing a cost-revenue efficiency analysis, using data from the US property-liability insurance industry during the sample period 1993-2002. Differing from Berger, Cummins and Weiss (1997), this paper uses the non-parametric Data Envelopment Analysis (DEA) method to estimate a firm's cost and revenue efficiency. This paper separates the independent agency system from brokerage, which enables us to get a "pure effect" of the independent agency. In addition, in this paper, we try to establish a relationship between the adoption of certain marketing system and the realization of a firm's optimal operating scale (both input-oriented and output-oriented). We expect that our results will differ from that of Berger, Cummins and Weiss (1997), due to the revolution in marketing following the technology revolution, especially the rise of internet use and e-business during our sample period, in which many believe the independent agency has been facing the greatest challenges ever in the history of the US insurance industry.

The paper proceeds by discussing the marketing environment changes during the 1990s and early 2000s, and their potential impact on the cost and revenue efficiency of firms using different distribution systems. Section 3 describes the sample selection procedure, summary statistics of the sample, and the methodology used in the paper. Section 4 presents the efficiency differences among different distribution systems. Section 5 provides cross-sectional time-series analysis to test the efficiency difference among different distribution systems after controlling for the characteristics that may affect the choice of a distribution system such as the organizational form, firm size, product mixture and underwriting risk of a firm. A probit analysis is used to test the self-selection theory of different distribution system. The final section summarizes the results and concludes.

## **Data and Methodology**

### **Data Sources**

Insurance company information is from the National Association of Insurance Commissioners (NAIC) insurance company annual report database, property-liability insurance industry. The distribution system information is from the Best's Key Rating Guide (BKR).

### **Sample Period**

The sample period for the study is 1993-2002.

### **Methodology**

Use data envelopment analysis (DEA) (see Cooper, Seiford and Tone (2000), Thanassoulis (2001)) to measure efficiency, such as allocative, technical, cost, and revenue efficiency, and the returns to scale of firms.

Use Panel data regression to test the relationship between various efficiencies and distribution systems.

Use probit panel data analysis to predict the selection of a distribution system.

**Appendix:****Table 1. Market share by distribution system**

| Distribution system                        | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|--|------|------|------|------|------|------|------|------|------|------|
| <b>Market share by premium written (%)</b> |      |      |      |      |      |      |      |      |      |      |
| Direct Selling                             | 43.6 | 43.5 | 43.9 | 43.4 | 43.8 | 45.1 | 40.3 | 40.7 | 39.9 | 38.6 |
| Independent Agent                          | 42.3 | 42.8 | 41.4 | 41.2 | 41.5 | 40.1 | 44.3 | 41.4 | 43.9 | 41.9 |
| Brokerage                                  | 5.3  | 5.5  | 5.9  | 6.4  | 6.5  | 6.3  | 6.8  | 6.2  | 7.0  | 9.1  |
| Other (Mixed system)                       | 8.9  | 8.2  | 8.8  | 9.0  | 8.3  | 8.5  | 8.7  | 11.7 | 9.2  | 10.4 |
| Sum of Independent Agent and Brokerage     | 47.5 | 48.3 | 47.3 | 47.6 | 47.9 | 46.4 | 51.1 | 47.6 | 50.9 | 51.1 |
| <b>Percent of firms (%)</b>                |      |      |      |      |      |      |      |      |      |      |
| Direct Selling                             | 19.5 | 19.8 | 19.1 | 22.8 | 22.6 | 22.3 | 18.8 | 17.6 | 16.8 | 16.3 |
| Independent Agent                          | 46.6 | 46.0 | 45.7 | 49.1 | 48.8 | 48.0 | 43.9 | 43.0 | 41.3 | 41.4 |
| Brokerage                                  | 5.9  | 5.8  | 5.9  | 5.7  | 6.0  | 5.8  | 5.2  | 4.7  | 4.7  | 5.2  |
| Other (Mixed system)                       | 28.0 | 28.4 | 29.3 | 22.4 | 22.6 | 23.9 | 32.2 | 34.8 | 37.2 | 37.1 |

Source: calculated from the NAIC database-property and liability insurance industry and Best's Key Rating Guide (BKR).

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