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PRODUCTIVITY OF NON-LIFE INSURANCE INDUSTRY; REFLECTIONS OWNERSHIP STRUCTURE

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ABSTRACT

Productivity growth in financial institutions, which are one of the most important economic institutions in every country, is a fundamental step toward economic development. According to the classical economists, Iranian non-life insurance industry do not have desirable Productivity, because most Share of them are governmental. So In this paper we want to address and compare Productivity in government and private non-life insurance industry. With Tornquist productivity Index, We examined the Productivity in a sample of Iranian non-life insurance industry over 2004 to 2015 periods in 10 of non-life insurance firms (including government and private insurance). Productivity in government non-life insurance industry is higher than Productivity in private non-life insurance industry.

KEYWORDS: Non-Life Insurance Industry, Productivity, Private, Government

INTRODUCTION

Performance measurement and benchmarking are a major theme in contemporary research on insurance companies. Ownership structure can also affect firm performance. It is generally expected that non-state firms tend to be more efficient than state ones. This has been found in many other studies in sectors other than insurance. Some earlier studies also found that state-owned enterprises were outperformed by non-state enterprises in the industrial sector.

The focus of this paper is to examine the efficiency issues based on existing data. It aims to calculate the Productivity scores of the major Non-life insurance companies and identify the key determinants of efficiency scores. Non-life insurance industry sector in Iran differs from its counterparts in many developing and emerging market countries. The recent financial crisis led to difficulties in much conventional non-life insurance industry across the Globe. Therefore, research in the field of non-life insurance industry seems necessary to remove barriers in Productivity the industry. The question arises whether non-life insurance industry are efficient? What is the Productivity of non-life insurance industry with different ownership? The non-life insurance industry system in Iran, like the countries presently in transition from central planning to market based economies. In the last five years, Iran`s government-owned non-life insurance industry have undergone a remarkable privatization program that is distinct from the experience of other transition countries, This process has followed. The resulting changes in the ownership of Iranian non-life insurance industry raise important questions: In particular, what role does private ownership play in non-life insurance industry' performance compared to state ownership? To address this question we employ DEA methodology and Tornquist productivity Index. During recent years, implementation of general policies of "the 44th Principle of the Iranian Constitution" has refreshed Iranian financial

markets and economic environment. Three decades after the beginning of privatization in the world, it began seriously in Iran upon "notification of general policies of the Principle 44 of the Constitution", and considering new Rules and statutory policies including "The Future Outlook of the Islamic Republic of Iran in the Next Two Decades". As the result, 80% of the government commercial non-life insurance industry shares should have been privatized. A filed study should be done to see the effectiveness of private non-life insurance industry. Our study of Productivity provides a better understanding of market competitiveness and profitability.

LITERATURE REVIEW

In the literature, there are many studies of technical efficiency based on the insurance industry. In the early 1990s, econometric methods were used on US insurance. Cummins and Weiss (1993) focus on cost efficiency of US life insurers. Yuengert (1993) studies the measurement of efficiency in life insurance. Gardner and Grace (1993) assess X-efficiency in the US life insurance industry. This research links firm efficiency to institutional and economic conditions in the US life insurance industry. All these studies suggested that the industry encountered rising prices and financial difficulties. However their frontier cost functions cannot provide sufficient insights into output price efficiency. Klumpes (2004) uses Fourier flexible form econometric methodology to compute cost and profit efficiency of alternative distribution systems for 40 UK life insurers in 1994–1999. The results suggest that IFA-based firms are less cost and profit efficient than are AR/CR-based firms and that these efficiencies are sensitive to the type of product and other firm characteristics (size and organizational form). The DEA approach has been adopted in many US insurance studies since 1990. Increasing globalization of the insurance industry in the early 1990s aroused an interest in studying insurance at the international level. Much of the early research is devoted to macroeconomic studies of the relationship between insurance and economic development, especially in developed countries. Additionally, evolution of the European Communities into the European Union in 1992 motivated a spate of productivity and efficiency comparisons of EU member countries. Some early research studies the efficiency of international insurance markets and recognizes the importance of regulation in these markets. For example, Weiss (1991) employs a non-frontier approach to examine the productivity of property-liability insurers in the United States, West Germany, Switzerland, France, and Japan from 1975 to 1987. She documents considerable diversity between the sample countries. Rai (1996) examines the cost efficiency of insurance companies in a sample of 11 developed countries, finding that inefficiencies vary by country, size, and specialization.

Fenn et al. (2008). In their efficiency comparison of insurers from 36 countries, Eling and Luhnen (2010a) find steady technical and cost efficiency growth in international insurance markets from 2002 to 2006. Bertoni and Croce (2011) investigate the drivers of productivity in the life insurance industries of five European countries (Germany, France, Italy, Spain, and the United Kingdom). They find increased productivity is mostly due to innovation in best practices, which is attributable to technological change.

Chen et al. (2008) focus on the development of the Chinese life insurance sector and find that domestic insurers have better performance than foreign joint ventures. Cummins, Weiss, and Zi (1999) investigate the relationship between organizational form and efficiency. They test agency-theoretic hypotheses about organizational form, including the managerial discretion and expense preference hypotheses. Cummins and Zi (1998) compare frontier efficiency methods using US life insurance data. Both papers wish to justify model factors and the use of claims as an output, and investigate firm characteristics. The relationship between mergers and acquisitions, scale economies and efficiency in the US life insurance industry are explored by Cummins, Tennyson, and Weiss (1999). One of few European insurance industry

studies is found in Fecher, Kessler, Perelman, and Pestieau (1993) who measure efficiency in the French life insurance industry using a DEA as well as an econometric model. Hardwick (1994) and Brown (2000) both look at scale and scope economies in the UK life assurance industry. Diacon (2001) reports the efficiency of UK general insurance companies. The study uses the variable returns to scale formulation and the results indicate that the UK general and composite insurance companies have the potential to be among the most efficient in Europe. The industrial efficiency is another research direction. Donni and Fecher (1997) evaluate the efficiency and productivity in fifteen European insurance industries. Despite research in the field of insurance industry efficiency, there are no specific studies about the insurance industry productivity.

PRODUCTIVITY

Productivity is known as the combination of two elements: Efficiency and Effectiveness (Productivity= Efficiency + Effectiveness). Productivity growth calculation methods include methods of measuring productivity, using input – output, value added index, Kendrick index, Elementary index, Malmquist Index, Tornquist index.

Related Ownership and Productivity

Though many studies on industry in transition nations exist, such as on Croatia (Kraft and Tirtiroglu, 1998); (Jemric and Vujcic, 2002), the Czech Republic (Matousek and Taci, 2002) (Weill, 2003), Hungary (Hasan and Marton, 2003), and Poland (Nikiel and Opiela, 2002) ;(Weill, 2003), the results of these studies, which primarily examine the association of industry ownership and its performance and efficiency, are not the same. For instance, Hasan and Marton, Jemric and Vujcic, and Weill find that non-life insurance industry efficiency is positively related to foreign ownership as opposed to state ownership, while Nikiel and Opiela observe that foreign industry are less profitably efficient than domestic private industry. Further, Kraft and Tirtiroglu believe that newly established industry are less efficient but offer better profit performance than either privatized or state-owned industry, whereas Jemric and Vujcic find that new industry are more efficient.

Three recent multi-country studies consider the relationship between ownership and efficiency in transition countries. Grigorian and Manole (2002) use DEA to estimate industry efficiency in seventeen countries from 1995 to 1998; in addition to our eleven countries, these include Russia and five other countries that were former Soviet republics. These authors find strong evidence that foreign controlling ownership is associated with greater efficiency and some weak evidence that improving prudential rules is also associated with greater efficiency. Yildirim and Philippatos (2002) estimate efficiency with both SFA and the distribution-free approach using data from 12 transition countries from 1993 to 2000; These authors find that private-owned industry are more cost-efficient but less profit-efficient than other industry in these transition countries . So industry `s ownership is effective on the performance of industry.

Productivity Calculation Methods

We adapt the multi-stage DEA approach introduced by Fried, Schmidt, and Yaisawarng (1999). After using it Tornquist productivity index for the private sector and the public sector insurance are calculated separately. Tornquist index with the help of Malmquist index to make it possible to calculate the efficiency of one single decision maker unit. Therefore, in this study we use Tornquist index which is designed by Malmquist index. The index is calculated as follows for a single decision maker unit.

- Total factor productivity Change Index (TFPCH)
- Technical change Index (ECHCH)
- Efficiency Change Index (EFFCH)
- Scale Efficiency change Index (SECH)
- Pure Efficiency change Index (PECH)

Which the index of efficiency changes is achieved by multiplying the index of scale efficiency and management efficiency and total factor productivity Change Index and is obtained by multiplying Technical change Index.

The Performance of computing productivity growth in the non-life insurance industry in country using Tornquist Index and DEA Method

Given the shortage of Statistics and information (Low duration), we examine the productivity growth assuming constant returns to consider the efficiency of the non-life insurance industry, separating government and private.

- First, we examine the outputs and inputs of non-life insurance industry for the model and given the outlook for the non-life insurance industry, we consider goals as output.
- Each year, we assume an equivalent to a firm then suppose we have j firms that each of which contains n input and m outputs. Matrix n*j of inputs is shown by X and matrix m*j of outputs by Y as well as input and output vectors Xi and Yi represent the ith firm. So, the output model of shaft and yield to the constant scale is considered as equation (1).

$$
\begin{aligned}
&(EFF_p =) Maxz = \frac{U^T Y_p}{W^T Y_p} \\
&S.T: \\
&U^T Y_i - W^T X_i \le 0 \\
&W^T X_p = 1 \\
&W \ge \varepsilon, U \ge \varepsilon
\end{aligned}
\tag{1}
$$

Where U and W are weighted vectors of input and output variables respectively. The proposed model for any firms that P = 1, 2... J once run-up to the efficiency of the p-th unit of the objective function value is obtained.

- Using DEA model and partial capture of income and expenses are estimated elasticity's of input and output shaft.

The affinity of input shaft according the formula of $ex_{ip} = \frac{r_{ip} x_{ip}}{\sum_i r_{ip} x_{ip}}, \sum_i ex_{ip} = 1$ and the elasticity of output shaft using

the formula of $ey_{ip} = \frac{q_{ip} y_{ip}}{\sum_i q_{ip} y_{ip}}, \sum_i ey_{ip} = 1$ are measured.

- We assume the data of non-life insurance industry during j year include n input and m output. It is assumed that it

contains the input vector $X^K=(x_1^k,x_2^k,...,x_n^k)$ and Output vector $Y^k=(y_1^k,y_2^k,...,y_m^k)$ in K-th year and comprises

The input vector $X^K=(x_1^k,x_2^k,...,x_n^k)$ and output vector $Y^{K+1}=(y_1^{k+1},y_2^{k+1},...,y_m^{k+1})$ in the K + 1 th year. Therefore, if the non-life insurance industry situation is considered as a firm each year and DEA model is considered with constant returns to scale and output shaft, the following input and output Tornquist index are used.

Tornquist of input shaft of $TQ_x=\prod_{i=1}^{n}(\frac{x_i^{k+1}}{x_i^k})^{ex_i}, \sum_i ex_i=1$: Where the geometric mean is $ex_i^{k+1}=\frac{r_i^{k+1}x_i}{\sum_i r_i^{k+1}x_{ii}}$, $ex_i^k=\frac{r_i^k x_i}{\sum_i r_i^k x_{ii}}$.

Tornquist of output shaft of $TQ_y=\prod_{i=1}^{m}(\frac{y_i^{k+1}}{y_i^k})^{ey_i}, \sum_i ey_i=1$: Where the geometric mean is $ey_i^{k+1}=\frac{q_i^{k+1}y_i}{\sum_i q_i^{k+1}y_{ii}}$, $ex_i^k=\frac{q_i^k y_i}{\sum_i q_i^k y_{ii}}$.

- Total factor productivity growth during the transition from year k to year k + 1, is obtained by the output shaft Tornquist division on the input shaft Tornquist according to equation (2).

$$TFPG_{k,k+1}=\frac{TQ_y}{TQ_x} \quad (2)$$

- Changes in efficiency during the transition from year k to year k+1 is obtained by efficiency division of year k+1 on the efficiency division of year k according (3).

$$EC_{k,k+1}=\frac{EFF_{k+1}}{EFF_k} \quad (3)$$

- Technology changes by dividing the total factor productivity growth on efficiency changes is obtained according to equation 4.

$$TC_{K,K+1}=\frac{TFPG_{K,K+1}}{EC_{K,K+1}} \quad (4)$$

Now, we will explain:

Performance Computing and Productivity Growth

Since the number of years is low, Performance in condition of variable returns has deviation. For this purpose, the result of the technical efficiency with assumptions of constant return (That is equal to administrative efficiency) is investigated by WIN4Deap Software. The Investigation is since 2004 to 2015

Now to study Total factor productivity growth elasticity's, it was calculated by the DEA model. We assume that n years of non-life insurance industry are existence. Consider a model with constant Scale. Suppose that the objective function row, in calculation model of efficiency for p year of the non-life insurance industry is according to equation (5):

$$EFF_p = \frac{\sum_j q_{jp} y_{jp}}{\sum_i r_{ip} x_{ip}} = \frac{TR_p}{TC_p} \tag{5}$$

Which EFF is p unit that shows the relationship between total costs and total income? Therefore we have equation (6):

$$(TR_p = EFF_p * (TC_p) \tag{6}$$

So the elasticity of i in total income is calculated according to equation below:

$$TR_p = EFF_p * \sum_i r_{ip} x_{ip}$$

$$\frac{\partial TR_p}{\partial x_{ip}} = EFF_p * r_{ip} \tag{7}$$

$$ex_{ip} = \frac{\partial TR_p}{\partial x_{ip}} * \frac{x_{ip}}{TR_p} = EFF_p * r_{ip} * \frac{x_{ip}}{EFF_p * \sum_i r_{ip} x_{ip}} = \frac{r_{ip} x_{ip}}{\sum_i r_{ip} x_{ip}}$$

$$ex_{ip} = \frac{r_{ip} x_{ip}}{\sum_i r_{ip} x_{ip}}, \sum_i ex_{ip} = 1$$

The elasticity of output j in total is according to (8):

$$(TR_p = EFF_p * (TC_p) \tag{8}$$

$$\sum_j q_{jp} y_{jp} = EFF_p * TC_p$$

$$\frac{\partial TC_p}{\partial y_{jp}} = \frac{q_{jp}}{EFF_p}$$

$$ey_{jp} = \frac{\partial TC_p}{\partial y_{jp}} * \frac{y_{jp}}{TC_p} = \frac{q_{jp}}{EFF_p} * \frac{y_{jp}}{(\frac{\sum_j q_{jp} y_{jp}}{EFF_p})} = \frac{q_{jp} y_{jp}}{\sum_i q_{jp} y_{jp}}$$

$$ey_{jp} = \frac{q_{jp} y_{jp}}{\sum_i q_{jp} y_{jp}}, \sum_j ey_{jp} = 1$$

The Tornquist indicators of output t and input shaft which reflects the change in output and calculate factors during the two years that the results show in Table 1.

Table 1: Tornquist Input and Output Indicators in 2005-2015

1-1-in Government Insurance

Year	Tornquist Output Shaft	Tornquist Input Shaft
2005	1.111	1.029
2006	1.081	1.009
2007	1.040	1.079
2008	1.040	1.039
2009	1.151	1.009
2010	1.081	1.049
2011	1.232	1.139
2012	1.101	1.019
2013	1.040	1.079
2014	1.040	1.039
2015	1.030	1.169

1-2-in Private Insurance

Year	Tornquist Output Shaft	Tornquist Input Shaft
2005	1.0222	1.0206
2006	1.0108	1.0101
2007	1.0624	1.0647
2008	1.052	1.052
2009	1.0806	1.0706
2010	1.0908	1.0881
2011	1.1207	1.1116
2012	1.0132	1.0122
2013	1.027	1.0281
2014	1.1456	1.1455
2015	1.0556	1.0631

Since the growth of total factor productivity by dividing the 2 Tornquist output based on the input shaft, Productivity growth numbers obtained in the table 2

Table 2: The Growth of Total Factor Productivity in 2003-2013

Year	Total Productivity Growth in Private Insurance	Total Productivity Growth in Government Insurance
2005	1.002	1.07972
2006	1.001	1.071071
2007	0.998	0.964205

2008	1.000	1.00129
2009	1.009	1.141141
2010	1.002	1.030268
2011	1.008	1.081959
2012	1.001	1.080394
2013	0.999	0.964205
2014	1.000	1.00129
2015	0.993	0.881394

Changes in performance efficiency are gained by dividing two of the DEA in a year .the result show in table 3.

Table 3: Changes in Performance Efficiency

Year	Efficiency in Private Insurance	Efficiency in Government Insurance
2005	0.9897	1.02897
2006	1.0541	1.00899
2007	0.9880	1.07892
2008	1.0178	1.03896
2009	1.0163	1.00899
2010	1.0216	1.04895
2011	0.9106	1.13886
2012	1.0156	1.01898
2013	1.1142	1.07892
2014	0.9281	1.03896
2015	0.9641	1.16883

By dividing the productivity growth on growth performance, obtained technology changes due to the table 4.

Table 4: Changes Caused by Technology in 2005-2015

Year	Technology Changes in Private Insurance	Technology Changes in Government Insurance
2005	1.012	1.049322
2006	0.949	1.061528
2007	1.010	0.893676
2008	0.983	0.963742
2009	0.993	1.130974
2010	0.981	0.98219
2011	1.107	0.950037
2012	0.986	1.06027
2013	0.897	0.893676
2014	1.078	0.963742
2015	1.030	0.754082

By DEA and Tornquist indicators, the total factor productivity growth of the non-life insurance industry in 2004 to 2015, and were divided to changes in technical efficiency and technological change. However it should be noted that TC>1, Then mentioned unit during a period (two years) have been technological advances and when TC <1 this is reversed. And EC>1, Then mentioned unit during a period (two years) has increased efficiency and whenever EC <1 efficiency decreased. Total factor productivity growth over a mean period (two years) and less, show negative total productivity growth.

CONCLUSIONS

Over the last 20 years, many efficiency studies on the insurance industry have been published. However,

productivity studies are limited. This study contributes to the field by providing new information on the productivity of insurance private and government companies in Iran for the period 2004–2015. Calculation of productivity growth in the non-life insurance in government and private insurance industry shows that Efficiency change and technological change has been irregular process and has experienced negative growth during the period of sanctions. The results show that directly comparing productivity in the government insurance higher than comparing productivity in the private insurance. Our results imply that specific environmental conditions influence insurance industry productivity. So Private ownership by itself is not sufficient to insure non-life insurance industry efficiency in transition countries because we find no statistically evidence of an adverse effect of government ownership relative to private ownership.

REFERENCE

1. Abedifar,p., 2000. “The estimation of Iran’s bank industry technical efficiency”, M.A. thesis-Allameh Tabatabaee University presses.
2. Amel, D., Barnes, C., Panetta, F., Salleo, C., 2004. Consolidation and efficiency in the financial sector: a review of the international evidence. J. Bank. Financ. 28, 2493–2519.
3. Anderson, S., de Palma, A., 1992.Multiproduct firms: a nested logit approach. J. Ind. Econ. 40 (3), 261–276.
4. Argentesi, E., Filistrucchi, L., 2007. Estimating market power in a two-sided market: the case of newspapers. J. Appl. Econ. 22 (7), 1247–1266.
5. Ashenfelter, O., Hosken, D., 2010. The effect of mergers on consumer prices: evidence from five mergers on the enforcement margin. J. Law Econ. 53 (3), 417–466.
6. Ashenfelter, O., Hosken, D., Weinberg, M., 2009. Generating evidence to guide merger enforcement. Compet. Policy Int. 5 (1), 57–75.
7. Ashenfelter, O., Hosken, D., Weinberg, M., 2011. The Price Effects of a Large Merger of Manufacturers: A Case Study of Maytag-Whirlpool. Bryn Mawr College.
8. Baker, J., Shapiro, C., 2008. Reinvigorating horizontal merger enforcement. In: Pitofsky, R. (Ed.), Where the Chicago School Overshot the Mark: The Effect of Conservative Economic Analysis on Antitrust. Oxford University Press.
9. Barros, C.P., Barroso, N. Borges, M.R., 2005b. Measuring efficiency in life insurance industry with a stochastic frontier model, mimeo.
10. Barros, C.P., Barroso, N., Borges, M.R., 2005a. Evaluating the efficiency and productivity of insurance companies with a Malmquist Index: a case study for Portugal. Geneva Pap. Risk Insur: Theory Pract. 30 (2), 244–267.
11. Barros, P.P., 1996. Competition effects of price liberalization in insurance. J. Ind. Econ. 44(3), 267–287.
12. Battese, G.E., Coelli, T.J., 1992. Frontier production functions, technical efficiency and panel data: with application to paddy farmers in India. J. Prod. Anal. 3, 153–169.
13. Biener C., Eling, M., Hendrik Wirfs J., (2016), The determinants of efficiency and productivity in the Swiss

insurance industry , European Journal of Operational Research 248 703–714

14. Black, M., Crawford, G., Lu, S., White, H., 2004. A Virtual Stakes Approach to Measuring Competition In Product Markets, mimeo.
15. Blanchard, O., & Giavazzi, F. (2003). Macroeconomic effects of regulation and deregulation in goods and labour markets. Quarterly Journal of Economics, 118(3), 879–907.Bloom, N., Sadun, R., & Van Reenen, J. (2012). Americans do IT better: US multinationals and the productivity miracle. American Economic Review, 102(1), 167–201.Bloom, N., Genakos, C., Sadun, R., & Van Reenan, J. (2012). Management practices across firms and countries. Academy of Management Perspectives, 26(1), 12–33.Boardman, A. E., & Laurin, C. (2000). Factors affecting the stock price performance of share issued privatizations. Applied Economics, 32(11), 1451–1464.Boardman, A. E., Laurin, C., Moore, M. A., & Vining, A. R. (2009). A cost–benefit analysis of the privatization of Canadian National Railway. Canadian Public Policy, 35(1), 59–83.
16. Boardman, A. E., & Vining, A. R. (2012). A review and assessment of privatization in Canada. SPP Research Papers,5(4), 1–31.Bortolotti, B., D'Souza, J., Fantini, M., & Megginson, W. L. (2002). Privatization and the sources of performance improvement in the global telecommunications industry. Telecommunication Policy, 26(5/6), 243–269.Bortolotti, B., & Faccio, M. (2009). Government control of privatized firms. The Review of Financial Studies, 22(8), 2907–2939.
17. Brown, J. D., Earle, J. S., & Telegdy, A. (2006). The productivity effects of privatization: Longitudinal estimates from Hungary, Romania, Russia and Ukraine. Journal of Political Economy, 114(1), 61–99.Cavaliere, A., & Scabrosetti, S. (2008). Privatization and efficiency: From principals and agents to political economy. Journal of Economic Surveys, 22(4), 685–710.Chong, A., & López-De-Silanes, F. (2004). Privatization in Latin America: What does the evidence say? Journal of the Latin America and Caribbean Economic Association, 4(2), 37–94.Clark, G. R. G., Cull, R., & Shirley, M. M. (2005). Bank privatization in developing countries: A summary of lessons and findings. Journal of Banking and Finance, 29(8), 1905–1930.Corneo, G., & Rob, R. (2003). Working in public and private firms. Journal of Public Economics, 87(7/8), 1335–1352.Cook, P., & Uchida, Y. (2008). The performance of privatized enterprises in developing countries. Journal of Development Studies, 44(9), 1342–1353.Curvo, A., & Villalonga, B. (2000). Explaining the variance in the performance effects of privatization. Academy of Management Review, 25(3), 581–590.
18. Cameron, A.C., Trivedi, P.K., 2005. Micro econometrics: Methods and Applications. Cambridge University Press.
19. Carlton, D., 2009. Why we need to measure the effect of merger policy and how to do it. Compet. Policy Int. 5 (1), 77–90.
20. Coelli, T., 1995. Estimators and hypothesis tests for a stochastic frontier function: a Monte Carlo analysis. J. Prod. Anal. 6, 247–268.
21. Crandall, W., Winston, C., 2003. Does antitrust policy improve consumer welfare? Assessing the evidence. J. Econ. Perspect. 17 (4), 3–26.
22. Cummins, J.D., Rubio-Misas, M., 2006. Deregulation, consolidation and efficiency: evidence from the Spanish

insurance industry. J. Money, Credit, Bank. 38 (2), 323–355.

23. Cummins, J.D., Xie, X., 2008. Mergers and acquisitions in the US property-liability insurance industry: productivity and efficiency effects. J. Bank. Financ. 32, 30–55.
24. D' Souza, J., Megginson, W. L., & Nash, R. (2005). Effect of institutional and firm-specific characteristics on post-privatization performance: Evidence from developed countries. Journal of Corporate Finance, 11(5), 747–766.
25. Dafny, L., 2009. Estimation and identification of merger effects: an application to hospital mergers. J. Law Econ. 52 (3), 523–550.
26. Ennsfeller, K.C., Lewis, D., Anderson, R.I., 2004. Production efficiency in the Austrian insurance industry: a Bayesian examination. J. Risk. Insur. 71 (1), 135–159.
27. Fang, Y., Hasan, I., & Marton, K. (2011). Bank efficiency in South-Eastern Europe: The role of ownership, market power and institutional development. Economics of Transition, 19(3), 495–520.Ghosh, S. (2010). How did state-owned banks respond to privatization? Evidence from the Indian experiment. Annals of Public and Cooperative Economics, 81(3), 389–421.Gonzáles-Páramo, J. M., & De Cos, P. H. (2005). The impact of public ownership and competition on productivity. Kyklos, 58(4), 495–517.
28. Fuller, d., Kudlyak, m., khagvasuren, D., (2014), Productivity insurance: The role of unemployment benefits in amulti sector model, Journal ofEconomicDynamics&Control4739–53
29. Klumpes, P. J. M. (2004). Performance benchmarking in financial services: Evidence from the UK bank industry. Journal of Business, 77(2), 257−273.
30. Li, S., Liu, F., & Whitmore, G. A. (2001). Comparative performance of Chinese commercial banks: Analysis, findings and policy implications. Review of Quantitative Finance and Accounting, 16(2), 149−171.
31. Lijphart, A. (2012). Government forms and performance in thirty-six countries. New Haven/London: Yale University Press. Lin, J. Y., Cai, F., & Li, Z. (1998). Competition, policy burdens, and state-owned enterprise reform. American Economic Review, 88(2), 422–427.Martimort, D. (2006). An agency perspective on the costs and benefits of privatization. Journal of Regulatory Economics, 30(1), 5–44.McKenzie, M., & Keneley, M. (2011). Privatization and performance: The case of four Australian financial institutions. Annals of Public and Cooperative Economics, 82(3), 313–334.Megginson, W. L., & Netter, J. M. (2001). From state to market: A survey of empirical studies on privatization. Journal of Economic Literature, 39(2), 403–452.Mourougane, A., & Vogel, L. (2008). Speed of adjustment to selected labour market and tax reforms OECD Economics Department Working Paper, #647. OECD Publishing. Nellis, J. (2012). The international experience with privatization: Its rapid rise, partial fall, and uncertain future SPP Research Papers. Calgary, Alberta: School of Public Policy, University of Calgary. Otchere, I. (2009). Competitive and value effects of bank privatization in developed countries. Journal of Banking and Finance, 33(12), 2373–2385.
32. Pourkazemi, M. h., heidari, k., 2002. "A DEA approach to assessing Iran's power stations efficiency". Modares Humanities Quarterly. Vol 1 pp 35-53
33. Wanke, P, Pestana Barros C., (2016), Efficiency drivers in Brazilian insurance: A two-stage DEA meta frontier-

data mining approach, Economic Modeling 53 , 8–22

34. YAO , S., HAN, Z., FENG G., (2007), On technical efficiency of China's insurance industry after WTO accession, China Economic Review 18 , 66–86