

## Estimating the Total Productivity Growth of Insurance Companies Listed in the Iraqi Stock Exchange

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### Abstract:

The study aimed to measure the growth of total productivity in the insurance companies listed in the Iraqi Stock Exchange for the period 2005-2014. By employing the Malmquist total productivity index, which is widely used to estimate total factor productivity, which consists of two parts, the first is technological change and the second is due to the technical efficiency change. The study sample included five insurance companies listed in the Iraqi Stock Exchange for the period (2005-2014). The data for the study were obtained from the Iraqi Stock Exchange website.

The results showed that there was a negative growth of Iraqi insurance companies during the studied period and the negative growth rate reached 15% according to the Malmquist total productivity index. This negative growth is due to the decrease in productivity growth by 21% and the decline of technological development by 11%, although two companies registered a positive growth according to the index, but the general average shows the weak performance of insurance companies and the decline in their financial role during the period of study, which may be due to the weakness of financial depth and shallowness in Iraq.

**Key words:** Insurance companies, Iraqi Stock Exchange, Malmquist productivity index.

### 1.1 Introduction

Recognition the importance of insurance for the extended process of reproduction in the economy and society, and for individuals at the same time, it is the economic sector that provides protection for all, on the one hand, compensation for the potential losses and the face of unexpected risks in the case of receipt on the other hand, which provides Investments or financial investments to expand economic and social activity and develop the wealth of society, it can also protect companies and individuals from bankruptcy

in potential exposures. Which is working as form of risk management used primarily to hedge against possible contingent, uncertain losses, which cover any quantifiable risk (Sujahangir, 2016).

Along with the evidence that is confirming the role of this sector in economic growth by improving the investment climate and enhancing a mixture of activities than would be undertaken with the absence of an active risk management institutions (Brainard, 2008: 4). The task of such companies varies depending on the type of it which includes provide protection against the probable risk of loss, the distribution of risk among several insured persons, and provides certainty of payment and certainty benchmarks of each loss. As well as secondary functions with a more widely impact on the economy which includes the sense of security among the industrialists and many products and services are produced and sold only if adequate liability insurance is available to cover their investments and the forced savings through fact that the premium that was paid is accumulated and is returned to the assured (Ndenka , 2014).

The problem of this study springs from the fact that insurance companies serves in economy as financial intermediaries. They bear risk and these risks partly depend on the insurer's ability to anticipate the frequency magnitude of the risk they promise to cover. They transfer resources from those who would save to those who will invest. From this fact comes the importance of measuring the growth of total productivity in the five insurance companies listed in the Iraqi Stock Exchange (ISX) for the period 2005-2014 employing the Malmquist total productivity index.

The Objectives of the study is to assist the growth of Iraqi insurance companies that are registered in (ISX) and defining the factors effecting this growth in the scope of this study which covers five insurance companies that are Al-Ahlia, Al-Ameen, Al-Dar Alsalaam, Al-khaleej, and Al-Hamraa.

## 2.1 Literature Review

### 2.2 *History of insurance companies in Iraq*

Some historians note that the Babylonian era saw some form of insurance on the loan contract on ships as stated in the law of Hammurabi in 2250 BC, which provides protection against non-payment of the loan amount when the loss of the sea voyage as a result of accidents arising from the dangers of the sea (Abdulla, 2008). The history of insurance activity in Iraq in its current form does not exceed a century if we adopted the date of entry of foreign companies to work in Iraq in 1920 or from the issuance of the first Iraqi national law to supervise the insurance companies no. (74) In 1936 (Kamal, 2011).

In the period following the Second World War, with the growing national financial potential of capitalism, the first Iraqi insurance company was formed with Iraqi capital share of 40% and foreigner share of 60%. With the growth of oil revenues and the establishment of the Council of Reconstruction (1950), the state entered the insurance field for the first time with the establishment of the National Insurance Company in 1950. The July 1958 revolution marked an important turning point in the development of insurance in Iraq. Two Iraqi companies were established: Baghdad Insurance Company

in 1958 and the Iraqi Insurance Company in 1959. Then four other private companies were established. In 1960, the Iraqi Reinsurance Company (a mixed company) was established in a national bid to strengthen the insurance market and develop its own capabilities and limit the export of foreign currency to buy reinsurance protection from abroad. (Al-Thakafaaljadedda, 2008)

### ***2.3 Main land marks of these companies***

For Iraq, the contribution of the insurance sector to the formation of fixed capital has not been studied. And that its contribution is weak and declined after the deterioration of this sector since the US occupation of Iraq in 2003, as the size of insurance premiums collected for insurance companies does not exceed a few million dollars.

The history of private insurance companies goes back to the beginning of last century which was terminated after passing of nationalization decisions and laws in 1964 specially the law of economic institutions no. (98) For 1964. There were nine national insurance companies and fifteen international insurance companies or a branch effected by nationalization. All of these local, Arab and foreign insurance companies were connected to the economic institutions that were established under this law by the General Insurance Company.

With the increase of oil revenues after the nationalization of foreign oil companies share in Iraqi oil sector in 1972, the demand for insurance increased to record levels during the was known "explosive development plan", especially in marine insurance on goods and engineering insurance on projects. (althakafaaljadedda, 2008)

The beginning of the 1980s noticed the issuance of the compulsory motor insurance law No. 52, which was then a very advanced step based on the principle of assuming liability for damage without relying on proof of the driver's liability, as well as the birth of the Arab Fund for war risk insurance the dangers of war on ships heading to the Gulf during the first Gulf War (1980-1988).

### ***2.4 Current statue of insurance companies***

There are two main government owned companies; these are National insurance company, Al-Iraqia insurance company which were established according to Act No. 56 of 1950. Upon issuance of the public companies Act No. 22 for the year 1997 and in accordance with the requirements of the above Act the company became state companies that belong to the Iraqi Ministry of Finance.

The scope of this study will involve the five private insurance companies that are currently registered and trading at (ISX), Al-Hamraa, Al-Ameen, Ahliya for, Al-Salam, and Gulf. These companies were established at 2000 and listed at (ISX) right after it was established according to Order #74 on April 18, 2004 and began trading on June 24, 2004 except for the Gulf for insurance which was established at

2004 and listed on 2008. Their capital at establishment varies between 300,000,000- 1,000,000,000 ID as noted in table below:

Table (1)

Main indicators of Iraqi Privet insurance companies in 2015

|                                    | Al-Ameen      | Al-Salaam     | Ahliya        | Gulf          | Al-Hamraa     |       |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|-------|
| Share turnover ratio               | 23.76         | 3.09          | 3.16          | 20.04         | 14.41         |       |
| Earnings per share (ID)            | 0.096         | 0.063         | -             | 0.029         | 0.147         |       |
| Ownership rate (%)                 | 89.31         | 94.90         | 79.99         | 93.74         | 68.69         |       |
| Interest repetition                | 8.05          | 16.03         | -             | 12.41         | 4.34          |       |
| Trading rate                       | 8.21          | 19.53         | 4.66          | 15.89         | 1.98          |       |
| Book value (ID)                    | 1.159         | 1.412         | 1.110         | 0.940         | 1.295         |       |
| Working capital                    | 3,409,167,493 | 4,934,300,271 | 2,542,536,614 | 1,897,834,557 | 2,883,727,677 |       |
| Market capitalization (Million ID) |               | 2626          | 3544          | 1250          | 7200          | 3,200 |
| Profit distributed (%)             | -             | -             | -             | -             | -             |       |

Source: <http://www.isx-iq.net/isxportal/portal/companyGuideList.html>

It can be noted from table (2) that the Iraqi privet sector didn't have any problem in providing the needed liquidity which is an important issue in insurance companies. The lack of liquidity in insurance funds and investments directly affects insurance companies' position and therefore their profitability, because it later causes the inability to meet some obligations towards policyholders. Later to a financial deficit or failure. The paid assets to privet sector amounted to 84% of the total amount of (199440) million ID, but this percentage didn't reflect on other indicators of insurance activity with a very limited percentage in total production at market price with 25.4%, and we can see that the development of net profit that both public and privet sector in insurance companies of amount 37406.9, 12399.8 million ID respectively, which reflect the increase in the share of the insurance activity in the total amount. This reflects the contribution of economic assets to the composition of the result of exploitation, i.e., the calculation of the contribution of each monetary unit invested as assets in the composition of the result of exploitation.

**Table (2)**

Total Financial analysis Indicators of insurance activity for 2014

| Indicators                       | (public and privet sector) |   | (million ID)  |      | Total of sectors |
|----------------------------------|----------------------------|---|---------------|------|------------------|
|                                  | Public sector              | % | Privet sector | %    |                  |
| Paid assets (capital)            | 32000.016.0                |   | 167440.0      | 84.0 | 199440.0         |
| Total production at market price | 90096.274.6                |   | 30622.925.4   |      | 120719.1         |
| Intermediate usage               | 34149.679.3                |   | 8888.8        | 20.7 | 43038.3          |

|                                   |             |             |              |
|-----------------------------------|-------------|-------------|--------------|
| Total added value at market price | 55946.772.0 | 21734.128.0 | 77680.8      |
| Net profit                        | 37406.975.1 | 12399.824.9 | 49806.7      |
| Compensation of employees         | 26598.982.7 | 5562.3      | 17.3 32161.2 |
| Operation net                     | 25875.365.4 | 13702.534.6 | 39577.8      |

Source: CSO (2016): report of financial and annalistic indicators for fiscal activities of public and privet sectors for 2014, central Statistical Organization, ministry of planning, p 19.

### 3 Measuring the overall productivity according to the Malmquist index

Malmquist index is considered as one of the econometric types which was first introduced by Malmquist in 1953 (Malmquist, 1953). ). This index was improved by Fare et al (1985) to be used to measure the development of productivity for enterprises that use multiple inputs and outputs. In 1994, Fare et aland others (Fare et al, 1994a) put the Malmquist productivity index, which is widely used to estimate the total productivity growth of the total factor productivity, which consists of two parts: the first represents technology change and the second is due to the technical efficiency change.

To illustrate the Malmquist index formula we assume:

The two preceding variables represent the input and output vectors respectively for each production enterprise  $i$  in time period of  $t$ . If we have a group of enterprises that have many inputs and outputs are presented by  $(X_t, Y_t)$ , and we suppose that  $S_t$  represents the efficiency level of the input  $X_t$  and output  $Y_t$ . The Malmquist productivity change index (MPI) will be according to (Fare et al, 1994a, p. 71):

(1)

Where:

$M_0$  Malmquist productivity index

$D_0$  Distance function

$(x_{t+1}, y_{t+1})$  productivity index in time  $t+1$

$(x_t, y_t)$  productivity index in time  $t$

$t$  level of technology in current time

$t+1$  level of technology in subsequent time

and the value of: present technical efficiency change index (EI).

The value of:

Present technical change index (TI), and according to that total productivity change is the result of multiplying technical efficiency change index (EI) by technology change index (TI).

If the value of the Malmquist productivity change index (MPI) is greater than one, it indicates an improvement in productivity, but if the value of the index is less than one, it means low productivity.

Fare (Fare et al., 1994b) shows that the technical efficiency change index consists of two parts, namely

the Management efficiency change (MI) and the of scale efficiency change (SI), i.e. the change of technical efficiency comes through:

Technical efficiency change = Management efficiency change (MI) multiplied by scale efficiency change (SI)

The breakdown of the of the Malmquist Productivity Index into the above components contributes to the explanation of the reasons for the improvement in productivity or the decline of the enterprises involved in the assessment, for example, a number of enterprises may experience a decline in productivity at the same rate over a given period of time, but the reasons for this decline may vary from one institution to another, one of which may be due to the weakness of technological development and therefore the weakness of investments, the other might be due to the weakness of the activity of the enterprise and limited production capacity, but other ones may be the result of the inability of the management to work well or incompetence. This shows the importance of applying the Malmquist Productivity Index to explain the reasons for improving or decreasing productivity in identical enterprises.

#### 4 Application of the Malmquist index to Iraqi insurance companies

##### 4.1 Study sample and data sources

The study included (5) insurance companies for the period 2005-2014 registered in the Iraqi Stock Exchange. Data were obtained from the Iraqi Stock Exchange website ([www.isx-iq.net/](http://www.isx-iq.net/)). Two inputs were identified (capital and total expenses) and two outputs (revenues and profits). Table (3) shows the descriptive statistics of the sample companies.

Table (3) descriptive statistics scale for sample companies (Iraqi Dinar ID)

| factor             | Minimum | Maximum  | Mean    | Std. Deviation |
|--------------------|---------|----------|---------|----------------|
| Al-Ameen Revenues  | 198.68  | 2014.22  | 2891.25 | 472.1          |
| Profits            | 36.95   | 622.91   | 214.16  | 182.53         |
| Assets             | 885.24  | 6353.62  | 3219.17 | 1778.91        |
| Expenditures       | 152.45  | 743.95   | 455.19  | 175.23         |
| Ahliya revenues    | 553.59  | 1439.94  | 849.9   | 290.1          |
| profits            | 25.33   | 296.82   | 150.96  | 81.12          |
| Assets             | 2128.31 | 5369.61  | 3558.39 | 1366.14        |
| Expenditures       | 412.72  | 1213.4   | 728.23  | 265.74         |
| Al-Hamraa revenues | 1349.74 | 15048.52 |         | 6534.03        |
| profits            | 8.78    | 1073.86  | 457.31  | 414.74         |
| Assets             | 580.71  | 7065.19  | 2950.33 | 1993.85        |
| Expenditures       | 1015.08 | 13820.98 |         | 5966.42        |
| Gulf revenues      | 141.05  | 989.87   | 402     | 256.11         |

|                    |               |                |                     |        |
|--------------------|---------------|----------------|---------------------|--------|
| profits            | 6.01          | 53.38          | 25.74               | 12.88  |
| Assets             | 2022.434172.3 | 2849.841032.81 |                     |        |
| Expenditures       | 133.2         | 919.26         | 405.94              | 274.57 |
| Al-Salaam revenues |               | 510.24         | 2014.221033.34419.4 |        |
| profits            | 105.25        | 315.83         | 210.03              | 65.38  |
| Assets             | 2364.2        | 7664.1         | 4979.131783.16      |        |
| Expenditures       | 374.91        | 1623.65779.65  | 349.69              |        |

Source: Yearly reports of Iraqi insurance companies for the period 2005-2014

From table (3) we can see that there is a clear discrepancy between the companies in terms of outputs or inputs, the highest average revenue, profits and expenses were in the share of Al-Hamraa Company, respectively (6534, 457 and 5966) million ID, The lowest average income and profits of Gulf Company amounted to JD (402, 25) million, respectively, the highest average assets value was to Al-Salaam company which amounted to (4979) million ID, while the average assets of Al-Hamra Company was JD (2950) million and the lowest average expenses was of Salam Company were (405) million ID.

#### 4.2 presenting and analyze results

Data Envelopment Analysis Program (DEAP) was used in order to obtain Malmquist indicators for the changes of productivity and its various components (EI, TI, MI, CMI, MPI) for sample companies during the period 2005-2014. Table (4) and Figure (1) show the evolution of indicators of productivity components.

Table (4)

evolution of indicators of productivity components for the period 2005-2014

| year | EI    | TI    | MI    | SI    | MPI   |
|------|-------|-------|-------|-------|-------|
| 2006 | 2.046 | 0.894 | 1.321 | 1.549 | 1.828 |
| 2007 | 0.616 | 1.237 | 0.776 | 0.795 | 0.763 |
| 2008 | 0.973 | 0.659 | 0.947 | 1.027 | 0.641 |
| 2009 | 0.82  | 1.557 | 1.125 | 0.729 | 1.276 |
| 2010 | 1.287 | 0.356 | 0.765 | 1.681 | 0.459 |
| 2011 | 0.408 | 3.119 | 0.711 | 0.573 | 1.271 |
| 2012 | 3.344 | 0.299 | 1.918 | 1.743 | 0.999 |
| 2013 | 0.461 | 0.644 | 0.682 | 0.676 | 0.297 |
| 2014 | 0.761 | 1.521 | 1.109 | 0.686 | 1.158 |
| mean | 0.948 | 0.895 | 0.984 | 0.964 | 0.849 |

Source: outputs of DEAP program

We can see from table (4) and figure (1) that:

- There is a clear fluctuation in the components of the total productivity in the Iraqi insurance companies for the period (2006-2014), for example the growth of technical efficiency amounted to 3.05 in 2006 and then became 0.95 in 2014, while technological growth amounted to 0.89 and 0.9 for the same years. While the Malmquist Total Productivity Index reached 1.81 and 0.85 respectively. This gives an impression of a negative trend for overall productivity growth in the Iraqi insurance companies during the period 2006-2014. This may be due to the impact of the overall economic activity in Iraq by the sharp decline in prices of crude oil in the international market in 2014 and its impact on all economic sectors, including the financial sector.
- The results show that the mean Malmquist index for total productivity is less than one in the Iraqi insurance companies and was almost (0.85), which means that there is a total productivity regression of 15%, and technically the reasons for the decrease in total productivity can be explained by decrease the technical productivity growth to approximately (0.95), and the decrease in technology change which reached (0.89). The results also show that the decline in technical efficiency was attributed to the decline in the management efficiency, which reached an average of 0.98 and the decline in productivity growth of (0.9).

### Figure (1)

Development of the components of the total productivity in the Iraqi insurance companies for the period (2006-2014)

Source: from data of table (4)

It is important to note the indicators of overall productivity growth in Iraqi companies individually, table (5) and figure (2) show average growth in components of total productivity in Iraqi insurance companies.

### Table (5)

average growth in components of total productivity in Iraqi insurance companies

| firm       | EI    | TI    | MI    | SI    | MPI   |       |
|------------|-------|-------|-------|-------|-------|-------|
| Al-Ameen   |       | 0.738 | 1.061 | 0.79  | 0.935 | 0.784 |
| Ahliya 1   |       | 0.856 | 1.015 | 0.986 | 0.856 |       |
| Al-Hamraa  |       | 1.174 | 0.9   | 1.008 | 1.165 | 1.056 |
| Gulf       | 1.122 | 0.955 | 1.07  | 1.049 | 1.071 |       |
| Al-Salaam  |       | 0.788 | 0.737 | 1.067 | 0.739 | 0.581 |
| Mean value |       | 0.948 | 0.895 | 0.984 | 0.964 | 0.849 |

Source: outputs of DEAP program

From the results of the previous table and figure, we find that Al-Hamra and Gulf Companies achieved positive growth in the average of (1.05, 1.07) respectively, according to the Malmquist index of total



productivity, while the other companies of (Al-Amin, Al-Ahli, Salam) reached (0.78, 0.86 and 0.58) respectively, and we can note that the least total productivity growth was the share of Al Salam. We also find that Al Ahlia company has achieved a stable growth in the technical efficiency index of 1.0, but it achieved negative growth in the index of total productivity and this is due to the low growth in technological development amounted to (0.86), which means that this company has good management efficiency but it has a problem in the Technological change side.

Figure (2) The average productivity growth in Iraqi insurance companies

Source: Data of table (5)

### 5.1 Conclusions

The activity of private insurance companies in Iraq is one of the most recent activities in the field of insurance services since it started its work in 2000 which is very new compared to the public insurance companies, but we find that the private insurance companies contributed to about 84% of the paid assets (capital) for the total insurance activity in Iraq. However, the contribution of the private insurance sector to the value added does not represent 28% of the total value added of the insurance activities in 2014, and this can be attributed to the lack of confidence in the private insurance companies by the public and the customers.

Malmquist index is one type of the econometric types and was first introduced by the Swedish statistician Malmquist in 1953. This index was developed by Fare (Fare et al, 1985) to be used to measure the overall productivity growth of institutions that use multiple inputs and outputs. Malmquist for productivity is a very important tool in explaining the reasons for improvement or decline in productivity in the homogeneous institutions involved in the assessment.

The results showed that the Malmquist Total Productivity Index amounted to 1.81 in 2006 and then became 0.855 in 2014. This gives an impression of a negative trend for overall productivity growth in the Iraqi insurance companies during the period 2006-2014. This may be due to the impact of the overall economic activity in Iraq by the sharp decline in prices of crude oil in the international market in 2014 and its impact on all economic and the weakness of financial depth and shallowness in Iraq

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