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**JOURNAL AND OTHER ARTICLES**

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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**FORECAST SALES OF SEMICONDUCTOR INDUSTRY IN TAIWAN****CHENG-WEN LEE****PROFESSOR****DEPARTMENT OF INTERNATIONAL BUSINESS****CHUNG YUAN CHRISTIAN UNIVERSITY****TAIWAN** **TSAI-LUN CHO****RESEARCH SCHOLAR****COLLEGE OF BUSINESS****CHUNG YUAN CHRISTIAN UNIVERSITY****TAIWAN****ABSTRACT**

*In the recent years, semiconductor industry has developed well, representing Taiwan the prosperity of the electronics industry. Semiconductor industry have IC design, IC manufacturing and IC packaging and testing. In order to maintain the world accounting rate Taiwan's IC packaging and testing industry the world's first, accurate prediction of product sales, is not only reducing costs, but also is better able to control the budget, trace market trends. Main purpose of this study is established the sales forecasting model, understanding the sales status of the Semiconductor Industry in Taiwan. The research range is the sales volume of Taiwan's Semiconductor Industry starting from 1999 year until year 2014, using Exponential Smoothing and ARIMA model is used to forecast and also analyze the data. In the end we will use Alpha Significance in order to measure the accuracy of model, moreover, finding more fit models. The research results show that Exponential Smoothing Holt's model is better than ARIMA in ASSY plant sales and ARIMA (0, 1, 0) is better than Exponential Smoothing in TEST plant sales.*

**KEYWORDS**

ARIMA, Exponential Smoothing, Forecast Sales, Semiconductor Industry.

**INTRODUCTION**

In the recent years, IC assembly industry has developed well; it has played a leading role in the whole supply chain of semiconductor industry. The output value was ranked number one in the world according to Department of Statistics Ministry of Economic Affairs. The past literature shows that Semiconductor industry represents a country and the prosperity of the electronics industry. The semiconductor industry is divided into wafer design, wafer fabrication, packaging, testing and so on, their study was to explore the field of the semiconductor industry, science and technology research program on personnel training. Supply and demand is balanced development and use exponential smoothing method, which is the easiest and the most logical approach to the temporality of the information, and the prediction is true (Lee et al. 2010). Also Chiu et al. (2014) explored the performance evaluation perspective, the impact of the financial storm on each individual sector of the semiconductor industry, as IC design, IC manufacturing and IC packaging and testing and Fang et al. (2014) explore Taiwan's IC packaging and testing industry, how a high degree of global competition pressure, operating performance, industry management and planning capacity can direct, to maintain the world accounting rate the world's first.

Organizational profits will reduce because of the increase for difference between standard cost and actual cost when judged wrong with regard to standard output and actual output (Hsieh et al. 2013). Thus sales forecast is an important phenomenon. According to Huang et al. (2013) prediction accuracy is the most important because the accurate prediction of product sales not only reduce costs, but also better controls the budget, trace market trends. As above mentioned points helped us in sparking the idea of this study. The purpose of this study is establishing the sales forecasting model, understanding the sales status of the Semiconductor Industry in Taiwan, to help reduce costs, control the budget, trace market trends.

**OBJECTIVES**

The following are the objectives set for the present study:

1. To established the sales forecasting model in ASSY
2. To established the sales forecasting model in TEST

**REVIEW OF LITERATURE**

We sort out the methods to be used from IBM SPSS Statistics and otexts Forecasting: principles and practice. Time series forecasting is often useful to specify exactly what information we have used in calculating the forecast.  $y^t|t-1$  to mean the forecast of  $y_t$  taking account of all previous observations. Similarly,  $y^{T+h}|T$  means the forecast of  $y_{T+h}$  taking account of  $y_1, \dots, y_T$ .

**EXPONENTIAL SMOOTHING MODELS**

Exponential smoothing models (Gardner, 1985) is divided into two kinds seasonal or non-seasonal. If data is of cyclical component, it can be to use as seasonal models. We use 3 kinds of models as follows:

**1. Simple Exponential smoothing model**

This model is suitable no trends or no cyclical. Level is it's only smoothing parameter. Simple exponential smoothing and ARIMA models is similar to it: self-return order of the autoregressive part 0, degree of first differencing involved 1, order of the moving average part 1.

**2. Holt's Exponential smoothing model**

This mode is suitable for a linear trend and no cyclical. Its smoothing parameters are level and trend, and are not limited by the value of each other. Holt's model is more common than the Brown's model, but huge data for computing time will be longer. Holt's exponential smoothing and ARIMA model is similar in that: order of the autoregressive part 0, degree of first differencing involved 2, and order of the moving average part 2.

**3. Brown's Exponential smoothing model**

This mode is suitable for a linear trend and no cyclical trend. Its smoothing parameters are level and trend and all are assumed to be equal. According to Brown's special observation mode from Holt's model. Brown's exponential smoothing and ARIMA model is similar in that perspective: order of the autoregressive part 0, degree of first differencing involved 2, and order of the moving average part 2, and Moving average second order coefficient is equal first order of half coefficient square.



**ARIMA MODEL**

ARIMA also known as Box-Jenkins (Jenkins, 1994). If it combines differencing with auto regression and a moving average model, we obtain a non-seasonal ARIMA model. Non-seasonal is special cases of the ARIMA model as shown in the following Table 1.

**TABLE 1: NON-SEASONAL ARIMA MODEL**

|                               |   |
|-------------------------------|---|
| ARIMA(p,d,q)                  | p= order of the autoregressive part;d= degree of first differencing involved;q= order of the moving average part. |
| ARIMA(0,0,0)                  | White noise   |
| ARIMA(0,1,0) with no constant | Random walk   |
| ARIMA(0,1,0) with a constant  | Random walk with drift  |
| ARIMA(p,0,0)                  | Autoregression  |
| ARIMA(0,0,q)                  | Moving average  |

**RESEARCH METHODOLOGY**

**DATA SOURCE**

This study in order to construction of the semiconductor industry sales forecast model, quote Department of Statistics, Ministry of Economic Affairs, Industrial Production Statistics of the announcement of 1999 to 2014, sales of semiconductor industry in Taiwan as shown in Table 2, as a model of the raw data.

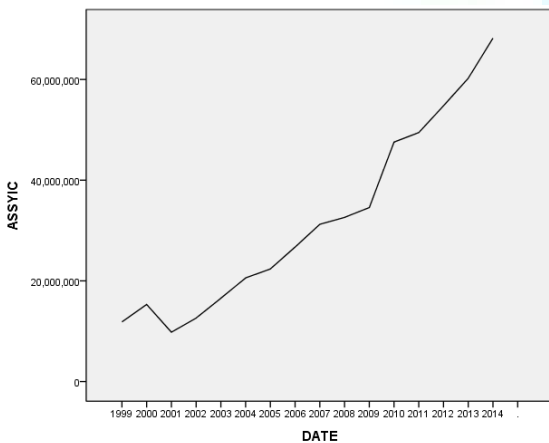
**TABLE 2: SALES OF SEMICONDUCTOR INDUSTRY**

| YEAR | ASSY plant (K) | TEST plant (K) | YEAR | ASSY plant (K) | TEST plant (K) |
|------|----------------|----------------|------|----------------|----------------|
| 1999 | 11,852,496     | 5,998,734      | 2007 | 31,230,934     | 76,073,108     |
| 2000 | 15,318,612     | 9,720,382      | 2008 | 32,607,257     | 72,084,186     |
| 2001 | 9,800,247      | 12,298,427     | 2009 | 34,567,873     | 56,737,142     |
| 2002 | 12,626,752     | 24,607,512     | 2010 | 47,569,529     | 71,995,155     |
| 2003 | 16,555,335     | 31,517,355     | 2011 | 49,453,755     | 70,099,770     |
| 2004 | 20,584,032     | 41,826,636     | 2012 | 54,775,923     | 68,042,475     |
| 2005 | 22,371,952     | 54,468,346     | 2013 | 60,242,097     | 65,529,789     |
| 2006 | 26,718,263     | 64,560,354     | 2014 | 68,193,998     | 73,398,940     |

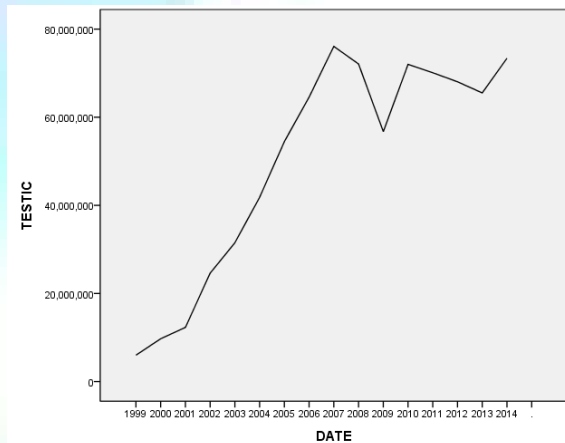
**RAW DATA ANALYSIS**

Before establishment of a model, we need to understand the nature of the data. From Figure (1) ASSY plant and Figure (2) TEST plant sequence diagram based on the data in Table 2 drawn a line chart of annual sales volume. The line shows upward trend, and no equidistant peak, indicating no periodic variation data.

**FIGURE 1: ASSY PLANT LINE CHART**

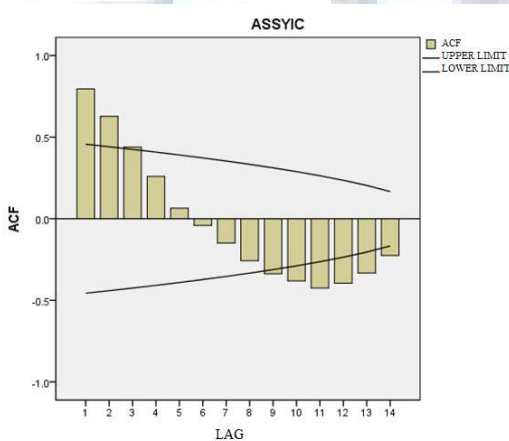


**FIGURE 2: TEST PLANT LINE CHART**



Related time series itself and partial self-correlation, can check whether the information is cyclical. Figure 3 and Figure 4, shows that self-correlation function displays the peak fall significantly at the end of a long index containing 1 - is a typical time series. However, this ASSY and TEST plant no significant peak, indicating that the data is not cyclical component. Check the partial self-correlation function can provide more reliable conclusions. From Figure 5 and Figure 6, show that Partial self-correlation function of the gap is no significant peak, it could be sure that the data is not an annual periodic component.

**FIGURE 3: ASSY PLANT ACF**



**FIGURE 4: TEST PLANT ACF**

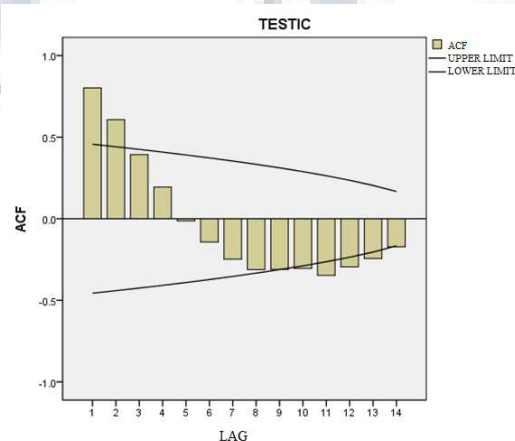


FIGURE 5: ASSY PLANT PACF

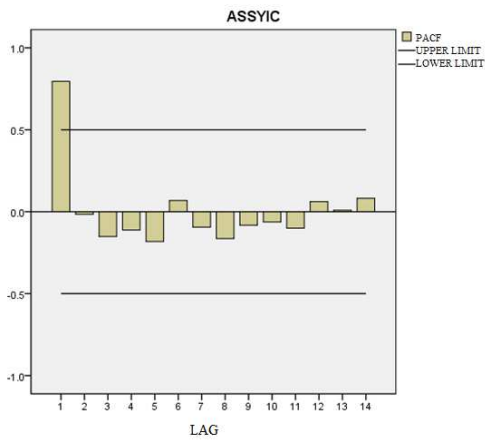
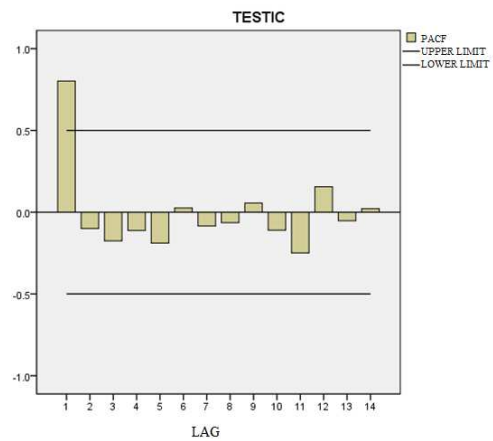


FIGURE 6: TEST PLANT PACF



**METHODOLOGY**

Based on raw data analysis result that ASSY plant and TEST plant data is not an annual periodic component. As we use Exponential Smoothing and ARIMA model to sales forecast, choose the 4 kinds to compare and analysis, that are Simple Exponential Smoothing, Holt's Exponential Smoothing, Brown's Exponential Smoothing and ARIMA (0, 1, 0).

**EMPIRICAL RESULT**

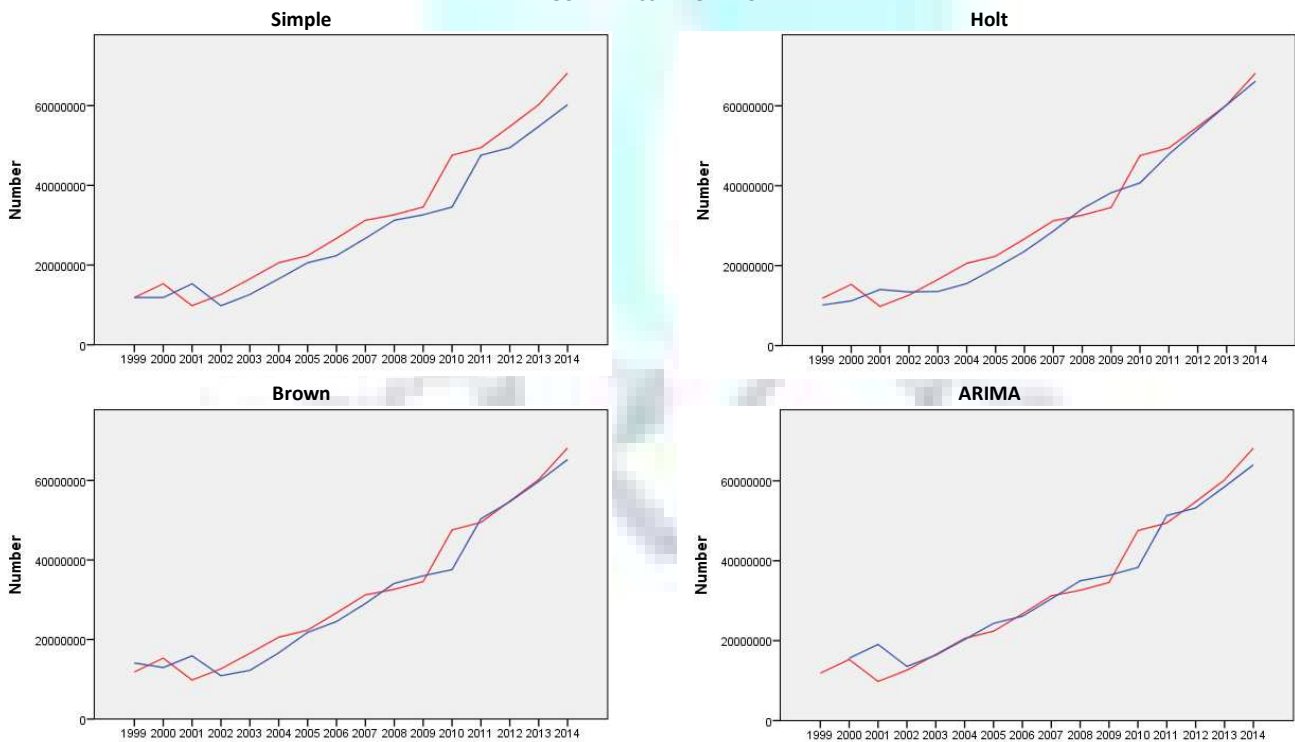
**Sales forecasting model in ASSY plant**

We see Table 3, ASSY plant for Exponential Smoothing mode, and which to Holt's Alpha is 0.253 Significance, is the best sales forecasting model ASSY plant. From Figure 7 show that Observations and fit, we find the Holt's more close in 2014.

TABLE 3: ASSY PARAMETERS, INCLUDING SIGNIFICANT PREDICTOR

| ASSY            |                | Estimate    | SE          | T     | Significance |
|-----------------|----------------|-------------|-------------|-------|--------------|
| Simple          | Alpha (levels) | 1.000       | .275        | 3.632 | .002         |
| Holt            | Alpha (levels) | .273        | .230        | 1.191 | .253         |
| Brown           | Alpha (levels) | .506        | .107        | 4.715 | .000         |
| ARIMA (0, 1, 0) | Constant       | 3756100.133 | 1006448.840 | 3.732 | .002         |
|                 | Difference     | 1           |             |       |              |

FIGURE 7: ASSY MODEL CHART



Note. red line is Observations, blue line is fit.

From Table 4 show that ASSY is actual value in ASSY plant, and 4 kinds of models ( Simple Exponential Smoothing, Holt's Exponential Smoothing, Brown's Exponential Smoothing and ARIMA) predicted value. We find that Holt (66169646) > Brown (65268666) > ARIMA (63998197) > Simple (60241986), and Holt is more accurate to actual value (68193998).

TABLE 4: ASSY PREDICTED VALUE

| YEAR | ASSY     | Simple   | Holt     | Brown    | ARIMA (0, 1, 0) |
|------|----------|----------|----------|----------|-----------------|
| 1999 | 11852496 | 11852567 | 10141245 | 14097945 |                 |
| 2000 | 15318612 | 11852496 | 11193942 | 12956801 | 15608596        |
| 2001 | 9800247  | 15318541 | 14034549 | 15906526 | 19074712        |
| 2002 | 12626752 | 9800359  | 13431374 | 10884468 | 13556347        |
| 2003 | 16555335 | 12626694 | 13546061 | 12246167 | 16382852        |
| 2004 | 20584032 | 16555255 | 15526622 | 16654857 | 20311435        |
| 2005 | 22371952 | 20583950 | 19450267 | 21783977 | 24340132        |
| 2006 | 26718263 | 22371916 | 23588828 | 24536551 | 26128052        |
| 2007 | 31230934 | 26718175 | 28639973 | 29054295 | 30474363        |
| 2008 | 32607257 | 31230842 | 34252385 | 34126527 | 34987034        |
| 2009 | 34567873 | 32607229 | 38256506 | 36013377 | 36363357        |
| 2010 | 47569529 | 34567833 | 40693114 | 37585242 | 38323973        |
| 2011 | 49453755 | 47569264 | 47899294 | 50363934 | 51325629        |
| 2012 | 54775923 | 49453717 | 54075194 | 54668316 | 53209855        |
| 2013 | 60242097 | 54775815 | 60209250 | 59770178 | 58532023        |
| 2014 | 68193998 | 60241986 | 66169646 | 65268666 | 63998197        |

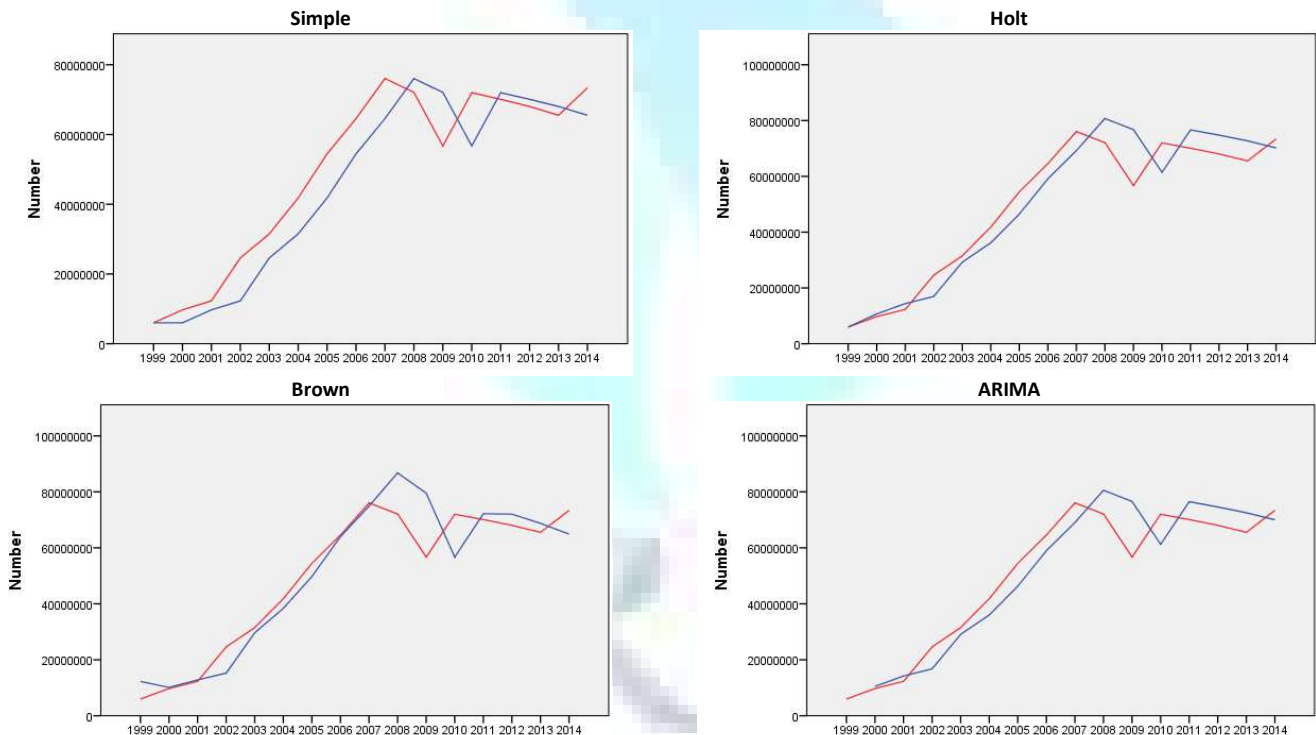
SALES FORECASTING MODEL IN ASSY PLANT

We see Table 5, TEST plant for ARIMA (0,1,0) mode, and in which constant is 0.056 Significant, it is the best sales forecasting model TEST plant. From Figure 8 show that Observations and fit, we find the ARIMA more close in 2014.

TABLE 5: TEST PARAMETERS, INCLUDING SIGNIFICANT PREDICTOR

| TEST            |                | Estimate    | SE          | T     | Significance |
|-----------------|----------------|-------------|-------------|-------|--------------|
| Simple          | Alpha (levels) | 1.000       | .263        | 3.800 | .002         |
| Holt            | Alpha (levels) | .999        | .292        | 3.418 | .004         |
| Brown           | Alpha (levels) | .617        | .113        | 5.445 | .000         |
| ARIMA (0, 1, 0) | Constant       | 4493347.067 | 2157724.885 | 2.082 | .056         |
|                 | Difference     | 1           |             |       |              |

FIGURE 8: TEST MODEL CHART



Note. red line is Observations, blue line is fit.

From Table 6 show that TEST is actual value in TEST plant, and 4 kinds of models (Simple Exponential Smoothing, Holt's Exponential Smoothing, Brown's Exponential Smoothing and ARIMA) predicted value. We find that Holt (70213666) > ARIMA (70023136) > Simple (65529925) > Brown (64893099) and Holt is more accuracy to actual value (73398940).

TABLE 6: TEST PREDICTED VALUE

| YEAR | TEST     | Simple   | Holt     | Brown    | ARIMA (0, 1, 0) |
|------|----------|----------|----------|----------|-----------------|
| 1999 | 5998734  | 5998935  | 5997992  | 12254132 |                 |
| 2000 | 9720382  | 5998734  | 10677138 | 10129502 | 10492081        |
| 2001 | 12298427 | 9720181  | 14399512 | 12838220 | 14213729        |
| 2002 | 24607512 | 12298288 | 16978408 | 15229862 | 16791774        |
| 2003 | 31517355 | 24606847 | 29280087 | 29656077 | 29100859        |
| 2004 | 41826636 | 31516982 | 36194139 | 38376707 | 36010702        |
| 2005 | 54468346 | 41826079 | 46500884 | 49766855 | 46319983        |
| 2006 | 64560354 | 54467663 | 59140916 | 64015465 | 58961693        |
| 2007 | 76073108 | 64559809 | 69234984 | 74924380 | 69053701        |
| 2008 | 72084186 | 76072486 | 80746751 | 86786056 | 80566455        |
| 2009 | 56737142 | 72084401 | 76769684 | 79522335 | 76577533        |
| 2010 | 71995155 | 56737971 | 61431114 | 56683477 | 61230489        |
| 2011 | 70099770 | 71994331 | 76665620 | 72186956 | 76488502        |
| 2012 | 68042475 | 70099872 | 74783385 | 72047613 | 74593117        |
| 2013 | 65529789 | 68042586 | 72726117 | 68746299 | 72535822        |
| 2014 | 73398940 | 65529925 | 70213666 | 64893099 | 70023136        |

## CONCLUSION

This study uses the semiconductor industry sales data from 1999 to 2014, in order to construction of predictive models. The research results showed that Exponential Smoothing Holt's model is better than ARIMA in ASSY plant sales and ARIMA (0, 1, 0) is better than Exponential Smoothing in TEST plant sales. However, Observations and fit in the ASSY plant and TEST plant, was found Holt is more accuracy to actual value in 2014. This study is established the sales forecasting model, understanding the sales status of the Semiconductor Industry in Taiwan. We hope it's useful to help reduce costs, control the budget, and trace market trends for Semiconductor Industry.

## REFERENCES

### JOURNALS

1. Ching-Ren Chiu, Chen-Ling Fang, Yi-Fen Chen, (2014), "Evaluating Operating Performance and Productivity of Taiwan's Semiconductor Industry: Using Metafrontier Function", *Service Industry Management Review*, (11), 67-92
2. Gardner, E.S. (1985), "Exponential Smoothing: The State of the Art," *Journal of Forecasting*, Vol. 4, No. 1, pp. 1-38
3. Hsin-Mei Huang, Ying-Fang Huang, Shih-Tao Huang, (2013), "Using Grey Theory to Forecast Sales of Candy Industry in Taiwan ", *Journal of Commercial Modernization*, 7(2), 243-258. doi:10.6132/JCM.2013.7.2.13
4. Hsien-Kuang Fang, Chen-Sheng Chen, Yong-Sheng Su, (2014), " A Study on the Operational Performance of IC Packaging and Testing Industrious in Taiwan", *Journal of Chinese Trend and Forward*, 10(1), 63-65+67
5. Shin-Da Lee, Yu-Ting Cheng, Yu-Han Tsou, (2010), "Human Resourced Development Overview and Forecast of Taiwan' Semiconductor Industry", *Journal of Data Analysis*, 5(2), 155-166.
6. Wei-Shan Hsieh, Ying-Fang Huang, Cheng-Ter Ho, (2013), "A Study of Improvement for Performance in IC Assembly Industry-T Company as Example", *Journal of Commercial Modernization*, 7(2), 199-214. doi:10.6132/JCM.2013.7.2.10

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