

USING NEGATIVE P -VALUE IN GM (1, 1) TO OBTAIN BETTER PRODUCTION FORECAST IN INDUSTRY DOWNTURN

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ABSTRACT

In this paper, we used negative p -values in GM (1, 1) to obtain better production forecasts when Taiwan's semiconductor industry production went down in 2001. The p -value is a parameter in GM (1, 1) and is usually set as 0.5 to proceed with production forecasts. We found if the past data showed the growth trend, the forecast of the next point would follow the trend. But if we allow the p -value to become negative, we could make the better forecast when the industry downturn happened.

FORECAST TAIWAN SEMICONDUCTOR PRODUCTION WITH GM (1, 1)

According to GM (1, 1) and the data adopted, this study forecasted 2001 Taiwan semiconductor industry production. We forecasted Taiwan's semiconductor industry production of 2001 with different p -values and calculated the value of the residual errors of GM (1, 1). We could have the best forecast when the p -value was set at -0.2. The error rate is 2.35% which is superior to 105.93% when p -value was set at 0.5. From figure 1, we also found that adopting negative p -values in GM (1, 1) resulted in better forecasts when industry downturn happened.

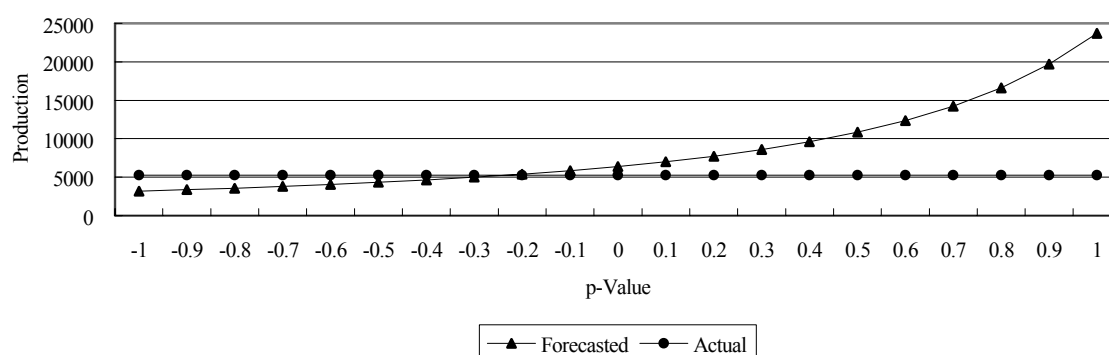


Figure 1. The production forecasts under different p -values

This study made an enhancement to the traditional Grey forecasting model, which customarily fix the p -value at 0.5 or other positive values smaller than 1, by changing the p -value from positive to negative when the industry downturn happened.