

Strategic Decision Analysis for Capacity Expansion with Migration for Semiconductor Assembly Industry

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Abstract—This paper aims to understand strategic decision-making for capacity expansion via the use of the analytic network process, and to investigate further the difference in policies for capacity expansion in a situation of capacity migration. As the government's westward policy slackens, and industries strive for business growth, higher profits competency, they have moved their products and capacity to China as they realize the larger labor population, lower production cost, easier land access and additional premium policies there, a phenomenon termed capacity migration. This study focuses on how semiconductor assembly industries make capacity expansion strategies while facing capacity migration. As most strategic analysis methods cannot provide actual manipulation methods, this research aims to build a multi-principle strategy model that can provide operable methods for abstract decisions. Findings of this study reveal that in the industrial environment where there is capacity migration, the semiconductor assembly industry should consider the Preemption Strategy when making capacity expansion strategic decisions.

Keywords: capacity migration, capacity expansion strategy, semiconductor assembly industry, multi-principle strategic decision

I. Introduction

Semiconductor industries in Taiwan are much slower in development and globalization compared to other countries due to the governmental restrictions of silicon wafer technology in addition, production migration. The semiconductor assembly industry is one of the most competitive industries, and for the sake of survival has long before established an international network excluding China. It was not until year 2006 when the government called off the various restrictions did Taiwan's semiconductor assembly industry complete its worldwide network. Competition between assembly industries worldwide is extremely fierce, not only competing for better quality and lower prices but also for capacity and market

leadership. As the government's westward policy slackens, and enterprises strive for business growth, higher profits competency, they have moved their products and capacity to China as they realize the larger labor population, lower production cost, easier land access and additional premium policies there, a phenomenon termed capacity migration.

Semiconductor assembly industry is an original equipment manufacturing service industry, it depends solely on customer orders, and its capacity needs fluctuate continuously depending on the changes in orders received, market needs and storage qualities, hence the difficulty in deciding capacity strategies. Therefore, the semiconductor assembly industry focuses not only on the information flow between upstream and downstream factories but, more importantly, capacity usage strategies. An accurate capacity strategy heightens a company's competency and profit, and in the case of the semiconductor market across the strait, how to manipulate capacity migration is a significant decision in the sense that a company's capacity is its weapon and directly related to investment strategies. This is crucial to a company's success.

In the recent years, semiconductor assembly industry in Taiwan face heightening labor costs, lack of land and the growing voices of environmentalists; there is also a global trend of further international labor division. For sake of business continuity, many enterprises have invested and built factories overseas, particularly in China where both culture and language are similar to those in Taiwan. China has in particular attracted special attention from transnational corporations because of its great labor population, large land mass, abundant resources and many business possibilities. As a result, many semiconductor assembly industries in Taiwan are gradually turning to China for investment and at the same time moving Taiwan's resources such as capacity, technology, management staff etc. there. Major enterprises like Intel, IBM, NXP, NEC, Mitsubishi, Motorola etc. are in particularly, investing in China and building factories there, in the hopes of dominating the market and creating greater profits.

Most research conducted in the past focused only on capacity expansion and neglected the associated migration and interaction across the strait. Due to the lack of any analytical method to assist in the decision making of whether to move to China or not, capacity expansion poses a much more complicated issue as enterprises face the capacity migration across the strait. This study hopes to establish a set of principles to guide industries in the

strategic decision making regarding capacity expansion facing the phenomenon of capacity migration across the strait.

To achieve the aforementioned goal, this study sets about working on the following four subtopics: (1) Analysis and generalization of capacity migration through interviewing related experts. (2) Investigation of the relationships between “strategic action”, “technology evolution”, “organization environment”, “enterprise environment” and “capacity migration” by discussing Burgelman’s four key elements of strategy. (3) Study of the relationships between different principles and aspects via the use of the analytical network process. (4) Analysis of capacity expansion strategies in the light of capacity migration across the strait, so that industries can make the most suitable strategic decision after evaluating such a phenomenon.

II. Literature Review

This section investigates the importance and influence of capacity strategies on a business’s organization through studying various papers and interviewing related experts, and further discusses the challenging capacity problems that semiconductor assembly industries now face Taiwan and China interact frequently under the environment of capacity migration.

Capacity expansion includes not only the increase of capacity or production, but also the expansion of factories, acquisition of equipment, setting up of branch companies and increase in load bearing; it also includes the management of related factories’ facilities, staff and technology (Lieberman, 1987).

Capacity expansion strategies have direct impact on whether an industry can maintain competency and continuous profit and growth, making them a key factor regarding whether business continuity is possible. The quick changing environment of the market today, competition and interaction between similar industries, appearance of new markets and variation in customer needs, added on to the long preparation and high costs of capacity expansions, all make the capacity strategic decision making all the more difficult for a industry.

Capacity expansion is extremely important to an enterprise and is a weapon in competition. Whether a capacity strategy succeeds or not is directly decisive of an

enterprise's future development. A mistake in making capacity related decisions result in waste or insufficiency, both of which lowers a industry's competency and cause great losses, even forcing an enterprise to close down business. Therefore, the best application of a capacity strategy is a very important issue for ensuring a company's advantages and strengths.

From studying various papers and interviewing related experts, it can be found that there are five major types of capacity expansion strategies as Lieberman introduced in 1987, which include the Preemption Strategy, Coordination Strategy, Insulation Strategy, Timing Strategy and Merger & Acquisition Strategy. The Preemption Strategy aims to fully prepare one's capacity and enter the market before other competitors do, and thus dominating a larger percent the market. The Coordination Strategy proposes that enterprises increase coordination between competitors by expanding one's capacity, and through coordination and communication prevent capacity supply exceeding demands because of competitive expansion, which can result in instability and chaos of market prices, from which no one can profit but only lose. The application of the Insulation Strategy involves the integration of upstream and downstream factories, so that one may react and adjust efficiently to the fluctuation of upstream raw materials' or components' prices and change in product demands.

The Timing Strategy aims to be fully informed about the product's market or market environment and accurately forecast the future market, so that the best capacity expansion investment can be made and heighten a business's profits and competency. The Merger & Acquisition Strategy suggests acquiring other competitors to rapidly increase capacity and market occupation, shorten necessary time for related capacity, staff and technology pre-procedures, in order to maintain one's advantages in competition.

Capacity management is a very important and influential issue in any industry or enterprise, whose strengths are usually evaluated according to one's prime costs, transport speed, product quality guarantee and production flexibility. In manufacturing industries, there are many ways for capacity usage and manipulation, and the clever application of capacity strategies to strengthen one's competency is a common goal of all industries (Jan, 2001).

The globalization of industries led to and catalyzed the international development of the manufacture industry (Pontrandolfo, 1999) (Yavuz & Kenneth & Nitin, 2007). The reasons for enterprises to set up production facilities and capacity globally include customs and trade benefits, cheap labor, governmental funds, lower production costs, customer and supplier

orientation and excellent technicians (Ferows,1997) (Yavuz & Kenneth & Nitin, 2007). The location for a transnational capacity setup is an important and cautious strategy for an enterprise, for building new facilities, capacity required higher prime costs, and it is not always the best time for such an expansion. Furthermore, the effects of capacity expansion on a transnational business's production and competency can last decades. Therefore, scholars have always heatedly discussed the strategic decision on the location for new capacity.

The strategic decision on capacity expansion investments is the most difficult and complicated an international enterprise can make, it involves considering many factors for example expansion time, expansion scale, impact of products and production site. Similarly, many outer circumstances also influence strategic capacity decision, including the condition of the main market and forecast of the future market, the different advantages of different factory sites, all of which make such a decision even harder to make (Nirupam et al.,2007).

The present semiconductor industry is a complicated and large supply-demand chain composed of the storage, distribution, wafer manufacture, assembly and testing. The main factors in consideration for its capacity expansion include minimum production costs, high customer satisfaction, shortest production time, high on-time delivery rate and high quality (Ovacil, 1995).

The already highly risky capacity expansion strategies are made even more complicated and influential by capacity migration strategies, and the geography and others characteristics of Taiwan and China made assembly-testing companies that shared markets across the strait more competent than other international companies did. This study referred to papers and observed industries, and generalized strategies into the following four: the Preemption Strategy, the Coordination Strategy, the Insulation Strategy and the Timing Strategy. Most enterprises understand and apply these expansion strategies, and have also worked on adjusting the facilities and capacity arrangement across the strait, but are at a lost for a systematic method for strategic decision making when needed. Semiconductor capacity expansion demanded to be strategically decided in a short time and require a large amount of money, and if a decision is based solely on intuition, it may result in great losses. Therefore, this study hopes to come up with an efficient method for capacity expansion strategic decision making in Taiwan and China that is beneficial to the long-term competition between assembly industries from all over the world.

Studies on capacity expansion strategies in the past focus on capacity planning and calculation. However, to respond to the trend and dynamics of the market and the slackening of the government's Westward Policy, this research concentrates on how semiconductor assembly industries' policy makers should decide on a good capacity expansion strategy to strive for a business's growth, heightening profits and maintaining competency.

III. Research model

This paper first established that the focus is the capacity strategies concerning capacity migration across the strait, and accordingly consider each factor in the making of strategic decisions via the use of an Analytic Network Process (ANP) in hopes of coming with the best capacity expansion strategy.

This study uses the Analytic Network Process, which is based on the Analytic Hierarchy Process (AHP) and but includes feedback mechanisms, to solve problems concerning various principles' dependency, forecast the accurate relationships between each principle, goal and plan via the acquisition of ratio scales, and further make the best strategic decision. Shu-Hsing & Amy & W.L (2005) used both the AHP and ANP method to analyze the input and output of multistep processes in a research on the best product combination, and, together with the suggested priorities from experts, came up with the best product combination. The AHP and ANP method were used in semiconductor industries to assess a manufacture industry according to different product combinations.

First, the AHP model is established, and after interviewing related experts and conducting questionnaire surveys the dependent and payback relationships between main strategies and principles are observed, and the research framework is adjusted accordingly. After the second survey, various choices are added, and aspects, principles and strategies are compared in pairs in search of the best choice of schemes.

Referring to Yee Dah Huang's (2006) ANP method, this study breaks the capacity expansion strategy analysis of semiconductor assembly industries into the following steps:

1. Goal and framework establishment: Examine how considerations for capacity migration by assembly industries affect capacity expansion across the strait, in the hopes of establishing a network for an analytic network process.
2. Determination of subjects for questionnaire survey: For better application of the results of this study, two surveys were carried out regarding the subjective factors that cause capacity expansion, with the first survey directed for policy makers in semiconductor industries, and the second directed for capacity related workers.
3. Comparison of principles: From the first survey conducted in this study, together with the interviews with experts, the main effect of capacity expansion strategies on capacity migration can be concluded and adjustments on the research framework can be made. The second survey included different strategy choices, and hopes to find the interdependence of different aspects by comparing different principles and issues.
4. Establishment of a super matrix: Calculate the super matrix before and after weighting via the assistance of the Super Decision software in comparing principles and affirming coherency. Calculate the weighted matrix and from it find the extreme super matrix, in accordance to which the best plan can be found.

Expansion strategies in the case of capacity migration are closely related to an enterprises business and competency. Therefore, we further discuss the factors of consideration that affect a capacity expansion decision. These factors can be categorized into four main aspects, according to Burgelman (1996) and Chiung-Wen Hsu and others, and they are the following: strategic action, technological evolution, organization environment, enterprise environment and capacity migration, which are studied in the paper.

1. Product Strategy

Product strategy refers to industries choosing a product that is profitable and advantageous according to the enterprise's specialties or advantages in certain resources, so that the least resources are used for the greatest profit.

2. Process capability

The process capability is a criterion used to assess whether a product's quality characteristics reach the level of customers' requests. Kane pointed out that process capability indicators are a simple and unit-less language. The definition of each indicator are as follows:

$$C_p = \frac{USL - LSL}{6\sigma}$$

$$C_{pk} = \min \left\{ \frac{USL - \mu}{3\sigma}, \frac{\mu - LSL}{3\sigma} \right\}$$

μ is the manufacture process average, σ is the manufacture process standard deviation,

USL is the upper specified limit; LSL is the lower specified limit

3. New technology ability

The technology mentioned here refers to the new methods or technology for producing the same product, which often accompanies with the shortening of production time, the heightening of product quality or the lowering of prime costs. Therefore, when an industry decides whether to expand its capacity or not, its decision is often influenced by the expectations of new technology.

4. Equipment capability

Chieh Yu Shen (2003) facility capability is directly related to a product's performance in competition, the better equipped the industry, the more efficient the production, the higher quality the products and the lower the prime costs. The capability of equipment is evaluated by its generality and how commonly used it is, the more commonly used a machine is the less funds are needed for capacity expansion and the more flexible capacity resources can be used.

5. Product similarity

This refers to the similarity between the different products, if a product is too similar with any other on the market it may be replaced easily. The high replaceability of a product often is a great disadvantage in competition and often results in elimination from the market. Thus, how to maintain irreplaceability, high competency and attraction are goals that every business must continuously strive for.

6. Pay-back period

This is the length of time needed for an enterprise or company to earn back the total funds used in a particular investment; the shorter the pay-back period the better, of course, for this means greater profits, but how to shorten the pay-back period is a difficult issue.

7. Rate of return on investment (ROI)

The rate of return on an investment is the ratio of the returns of an investment before taxation divided by total assets of the business. In simpler terms, it is the ratio of the profit and the funds required for creating that profit. For example, for two enterprises that make investments with the same risks, the business with the higher ROI is one with a better ability to profit and one that is advantageous in its administration efficiency.

8. On-time delivery

On-time delivery is the rate of meeting customers' demanded delivery time. The methods of satisfying customer demand are many, for example expanding capacity, increasing stock are all common strategies; however, one must keep in mind the prime costs required.

9. Lead time

This refers to the time needed for the pre-processes of a product's manufacture, involving the acquisition of materials, preparation of related mechanics etc. Under the condition of not affecting the product or service's quality, the lead-time is best as short as possible.

10. Capacity utilization

Capacity utilization is the rate of which a capacity related facility is involved in productions, which is usually the higher the better. According to related research, a product's price changes with capacity utilization, as in year 2001 when the semiconductor industry was affected by market recession and the capacity utilization rate dropped from over 100% in year 2000 to only 40%. Because of this, enterprises lowered the prices of products in the hopes of attracting more orders to increase capacity utilization so that prime costs may be lowered.

11. Cycle time

This refers to the time needed to produce a product; shortening of cycle time can heighten a factory's production rate and thus strengthen the enterprise's ability to profit. Therefore the control of production cycle time is extremely important to a factory.

12. Customer satisfaction

This is the extent of how satisfied customers are with the industry's product, service and other aspects, which of course is directly relative to whether a customer is willing to order from or cooperate with the company.

13. Product costs

Product costs include labor, facility, land, materials, power supply etc, the lower the product costs are the bigger the possibility of profit for an enterprise.

14. Market share

An industry can increase market shares, meet higher needs and maintain better capacity efficiency by increasing capacity supply. In other words, make greater profits with lowest product costs. The formula for market share calculation is as follows (Chen, 2006):

$$s_i = \frac{q_i}{\sum q_i}$$

s_i equals market share,

q_i is the production of a factory in the market,

$\sum q_i$ equals the total production of the entire industry

Frederix (1996) believes that the reasons for capacity management are to achieve 100% order delivery, minimum stock level, minimum lead time, better capacity efficiency and minimum product costs, yet these indicators are often dependent or in conflict with each other. For example, lead-time can be shortened via a major expansion of capacity, but this lowers capacity usage rate and increase production costs (Ling, 2005). In addition, Murty (1995) proposes that when upstream and downstream industries do not have uniform goals, it may result in longer preprocessing time, lower capacity usage efficiency and customer

dissatisfaction with delivery. Therefore when making strategic decisions regarding capacity expansion all the aforementioned factors must be considered (Ling, 2005), and the following is a list of factors affecting the making of such a decision that are concluded from documents mentioned before.

15. Product life cycle

Wu et al. (2005) mentioned that because industrial environment is extremely unstable nowadays and the product cycle time is ever shorter, especially in high asset-demanding industries such as hi-tech industries, capacity investment and management are all the more important; and furthermore, how an enterprise uses limited capacity resources in creating the greatest profits can reveal how competent the enterprise is. The concept of the Product Life Cycle (PLC) was proposed by Dean (1950) when he discussed about product prices; he believes that products go through birth, aging and death just like humans, hence a product's life cycle can be further divided into four major stages: the introduction stage, the growth stage, the maturity stage and the decline stage.

16. Equipment delivery

Whether or not the delivery of capacity equipment meet the needs of capacity plans is extremely important, particularly in hi-tech industrial environments. If delivery is delayed new product entry in the market will be forced to postpone and customers may order elsewhere, which, in addition to the short life cycles of hi-tech products and frequent fluctuations of market prosperity, all result in great losses of a business.

17. Growth of market needs

This refers to the future change in market needs for a product, an important aspect to consider when industries make decisions on whether to increase investment or not. But because the markets needs are extremely changeable and dynamic, this is something that industries need to investigate and study carefully.

18. Number of competitor

The more competitors there are the greater challenge a manufacturer face; on the other hand, the more competitors mean that there is possible profit in this area. How to stand out amidst the fierce competition is a challenge for every business.

19. Existence of a predominant manufacturer

This refers to whether a leading manufacturer can influence market needs or price changes. Predominant manufacturers are usually more competent than second line manufacturers of the same industry, and often attract more customers than other competitors.

20. Import ratio

The import ratio is the proportion of products imported from overseas; this will also affect an industry's decisions on capacity expansion as higher import ratios mean higher dependence on imported goods, and therefore less space for expansion of industries in the country.

Regarding the effects of an enterprise's actual business condition and competitors' capacity expansion on the making of capacity expansion strategies, enterprises themselves can refer to the four strategies that Lieberman (1987) proposed and the Merger & Acquisition Strategy that this study suggests:

1. Preemption Strategy

This strategy involves completing capacity expansion before other competitors for acquiring greater market shares. Particularly in the case of capacity migration, the application of the Preemption Strategy in a highly demanded market such as China can cause other competitors to give up if the market has already been dominated, thus heightening the industry's competency.

2. Coordination Strategy

The Coordination Strategy is distinctly different from the Preemption Strategy. The Coordination Strategy aims to coordinate with competitors through capacity expansion, so that losses from every business in the industry due to over investment and chaos in market prices can be prevented. Take the new market in China for example; facing capacity migration and expansion, competitors rush to expand their capacity in the hopes of

heightening market shares and profit, yet this often results in imbalance of supply and demand i.e. oversupply, which causes the fall of product prices and the increase of prime cost burdens. Therefore, to prevent a price war, leading enterprises often conduct a massive expansion of capacity, which will cause anxiety among competitors about market needs and environment, and thus increase coordination and interaction between them.

3. Insulation Strategy

The Insulation Strategy hopes to minimize the effects of fluctuation of market needs and product prices through integration of upstream and downstream industries. In the semiconductor industry, Intel has forward integrated with the computing system, and this can decrease the effects of change in the IC market. Other IC users such as IBM propose that backward integration policies, compared with other enterprises' conditions, enabled IBM to manage the semiconductor enterprise they control. In the example of the semiconductor assembly industry, the most frequently used methods of discouraging other competitors to enter a particular product field include mastering key materials, technology or capacity. It is often observed that assembly factories integrate upstream, such as cooperating with baseplate manufacturers, or even through acquisition, so that other competitors that require the same baseplate material cannot meet their needs or are forced to acquire their materials at higher costs. This is the Insulation Strategy.

4. Timing Strategy

When an enterprise hold large amounts of information or is highly capable of forecasting, this strategy can be applied to expand at the best time according to the fluctuations of market needs. To strive of the greatest profits, enterprises should aim to buy at the lowest costs and sell at the highest prices according to this strategy regarding the buying and selling of assets. The forecasting ability of market change and movement is the key to mastering the best timing for expansion, especially when facing capacity migration.

As technology evolves and new products replace old ones, the traditional lead frame products cannot meet the needs of electronic products that are more sophisticated every day. They require more intrinsic circuits and better electronic signals. The next products to appear are plastic baseplate products, and as electronic products are already closely linked to daily life, it was decided to expand capacity for BGA products in 1996 with the strong support of

information on market needs etc. The expansion of capacity after mastering market environment and other information is the so-called Timing Strategy.

5. Merger & Acquisition Strategy

Merging and acquisition for the purpose of rapid expansion of capacity or market in a particular area or country are common phenomena in the semiconductor industry. For example, in year 2004, the fourth biggest semiconductor assembly manufacturer ChipPAC and STATS, the fifth largest, merged into STATS-ChipPAC to expand capacity, increase market shares and heighten competency. After merging, STATS-ChipPAC replaced SPIL to become the third biggest semiconductor assembly industry in the world. Another example is ASE, for the sake of a quick rise in business volume and capacity this company acquired Motorola's assembly factories in Chungli and Korea in 1999, NEC's assembly factory in Japan, in 2003 and Chinese assembly factory AGC in 2006.

This research first evaluates all the factors that affect capacity expansion strategies under capacity migration, then pick out the more influential and weighted factors through interviewing experts and the AHP survey method.

Table 1 Priorities by super-decisions

Name	Normalized by cluster	limiting
Product strategy	1.0000	0.04856
Process capability	0.1740	0.00784
New technology ability	0.4448	0.02004
Equipment capability	0.0788	0.00355
Product similarity	0.3025	0.01363
Pay-back period	0.0414	0.00763
ROI	0.3458	0.06373
On-time delivery	0.0907	0.01672
Lead time	0.0251	0.00462
Capacity utilization	0.0575	0.01060
Cycle time	0.0465	0.00856
Customer satisfaction	0.2496	0.04602
Product costs	0.1435	0.02645
Market share	0.1699	0.02366
Product life cycle	0.1049	0.01461
Equipment delivery	0.0360	0.00502
Growth of market needs	0.4843	0.06744
Number of competitor	0.0847	0.01180
Predominant manufacturer	0.0687	0.00956
Import ratio	0.0516	0.00719

The purpose of the first survey in this study is as follows. Through questionnaire surveys and interviewing experts, we can conclude on the main factors that influence the capacity expansion strategies of capacity migration, and according to Saaty's (1996) suggestion calculate the geometric average of the surveys via the Super Decision software that Saaty (2003) introduced. Thus, we can get the weighted results in table 1, and the 10 main influential aspects are product strategy, new technological abilities, product similarity, rate of return on investment, customer satisfaction, market share, growth of market needs, governmental policies across the strait, quality difference across the strait and the cultural backgrounds across the strait.

After the first survey, a second survey was designed according to the results from the first. In the second survey, strategy choices were added, and at the same time, different aspects and principles were compared in pairs in search for dependent relationships. The second questionnaire was designed with the hamburger model in Super Decisions, which Saaty (2003) introduced.

This investigation was conducted by explaining the questionnaire to five directors in the semiconductor assembly industry one by one so that each interviewee fully understands the reason for the survey and the meaning of each question.

Below are the geometric mean of data from five surveys, and the common characteristics of each question, which have been assessed by the Super Decision method, are shown together with principle groups and alternative choices.

Lastly, fourteen factors are rated by their importance and a best strategy is concluded via the use of software tools. The most important factor in the strategic decision-making concerning capacity expansion amidst capacity migration of the semiconductor industry across the strait is "customer satisfaction". Through the calculation of Super Decisions, this best capacity expansion strategy in the environment of capacity migration is the Preemption Strategy.

Conclusion

This paper investigates the capacity expansion strategies of semiconductor assembly industries facing capacity migration, and through study of past documents and actual industrial environments establishes a framework that, together with the application of the ANP method, can prove the feasibility of such a capacity expansion model. Many studies on capacity expansion in the past focus on capacity planning and management, yet this study discusses capacity expansion through a multi-goal strategic decision model that can be applied by managers in an actual situation. Not only that, because consideration about capacity planning is often limited to prime costs and neglects the decision making of a strategy, only a multi-goal strategic decision can make an overall evaluation. Decision making models for managers do not require complicated and exact mathematical calculations, as mathematical calculations are often inapplicable in reality and managers assess many actual situations when making a strategic decision; therefore a logic model such as one this paper proposes is easier to apply for any manager.

Strategically expanding capacity is a common way of maintaining one's competency in assembly industries, and investing across the strait provides investors particular advantages. Firstly, leading assembly industries hold a large unused capacity that can deter possible competitors from entering the market. Secondly, besides the competition between assembly industries' worldwide capacity, there is also competition between the capacities of upstream manufacturers. Investing large amounts of assets to control equipment manufacturers is a way of stopping competitors producing related products in any assembly factory around the world. Lastly, in the competition for market shares around the world, expanding a great amount of capacity to dominate the market is a method frequently seen. However, this capacity expansion can cost a fair amount of funds, and if the capacities expanded are not used efficiently, it can cripple a company's financial abilities. If some products' capacity are moved to factories where prime costs are lower, and equipment are moved from Taiwan to China in consideration of global competition and in respond to market needs and competitors' actions, this strategy is commonly termed as a capacity migration strategy.

To provide a systematic method and complete assessment of the benefits of capacity expansion strategies to an enterprise facing capacity migration and considering competitors' response. This study used a multi-principle strategic decision making tool, so that the real

environment can be evaluated from the aspects of the enterprise's management, market environment and capacity migration, hence providing managers with principles and rules to follow when making capacity such a decision.

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