

Full Length Research Paper

Has low-paid advantage of Chinese factory disappeared after the explosion of labor revolution?

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This research employs the Social Cognitive Theory (SCT) and the Fuzzy Theory (FT) with the Multiple Criteria Decision Making (MCDM) methodology to evaluate four hierarchical relations for the purpose of initiating an innovative strategy that addresses the domino effect of the labor revolution currently transpiring in the hypercompetitive Chinese manufacturing industry. First, the most contributed conclusion is that the “change original business at the raising compensation policy” (CBRCP) is the best choice for Taiwanese manufacturers operating in China because it is the highest scores of three assessed measurements in the CBRCP. This conclusion further indicates that manufacturing enterprises have little leverage, in the interim, but to increase employment compensation and benefits to satisfy the demands from the ongoing Chinese labor revolution even though it brings about an incremental expenditure in their manufacturing costs. In response, many of the Taiwanese manufacturing enterprises have or are reconsidering shifting their manufacturing factories from the developed coastal Chinese cities to the developing interior subordinate cities or outside of China to the undeveloped low-pay countries in the Southeastern Asia region such as Vietnam, Laos, Myanmar, and so on. However, this employment revolution completely conforms to the economic development policies of the Chinese government because it increases the average level of employment compensation and develops the interior subordinate cities in order to diminish the poverty gap among cities. The second conclusion is that the Chinese laborers have shifted their focus from solely on salary to other workplace factors such as employee benefits, work safety, location, and job satisfaction. Further, a significant number of the questionnaires from the laborers clearly pointed out an expressed desired to move back to their hometowns because of generally the lower cost of living but they wish to retain their current compensation levels. Additionally, throughout the review of relative literatures, in terms of macroeconomic consideration, these enterprises can choose to transfer the increment cost of compensation to the final customer in the form of higher prices to enhance or maintain profits but this may affect the balance of the world’s inflation-control mechanism.

Key words: China labor revolution, Social cognitive theory (SCT), Multiple criteria decision making (MCDM).

INTRODUCTION

In order to cut down labor expenditures, Taiwanese manufacturers have been setting up manufacturing factories in China since the early 1950s, which was earlier than and the most of America, European and Japanese international companies and the Chinese government’s economic revolution policies of the 1980s. In terms of cultural advantages, Taiwan manufacturers have grown at a rapid pace in China which has not only

brought wealth to Taiwan but it has also brought the coastal Chinese cities from an agricultural economy to an industrial and business economy. With the economic development and educational popularization in China, Chinese laborers have shifted from accepting the company’s stated wages to determining how much compensation they should obtain from their respective employers. The rising power of laborers due to China’s labor revolution has had immense cost pressures on the Taiwanese manufacturers in China. With the objective of increasing the average level of income and completing the integrity of the employment structure in China, the Chinese government issued the first employment law in

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2008 called the “law of the people’s Republic of China on employment contracts”¹. The features of this employment law introduced the regulation of a minimum wage system that corrected past unfair and inconsistent wage structures used by employers. The new law also established protection in the recruitment contract system whereby laborers can demand permanent employment after two stints of temporary contract work with the same company. This paramount employment law has directly facilitated Chinese laborers to request more employment benefits and bonuses, which has also resulted in some laborers moving back to their rural hometowns because of the lower standard of living. Consequently, many strikes by Chinese laborers have taken place in at least seventeen east-coast provinces in China. These laborers were striking their requirements. One of the most serious employment conflicts was at a large manufacturer, Foxconn International Holdings², which experienced a series of high-profile suicides by their employees. Through the constant deliberate reporting by Chinese mass media, this employment conflict soon fully convulsed the entire world because these employees did not hesitate to utilize death as a means to announce what they wanted. At end of this conflict, Foxconn had no choice but to increase their laborers’ wages. These strikes have forced Taiwanese manufacturers to consider a series of operational strategies in order to confront the tough challenges of the domino effect of the labor revolution in China by addressing the following questions:

(1) Is there an alternative for handling the incremental payroll cost caused from the rise of worker protests; (2) Is

¹ Law of the People’s Republic of China on employment contracts “has been formulated in order to improve the employment contract system, to specify the rights and obligations of the parties to employment contracts, to protect the lawful rights and interests of employees and to build and develop harmonious and stable employment relationships.” (Law of the people’s Republic of China on employment contracts, Article. There are eight features in this employment law: (a) Employers have to take social responsibilities, (b) scope of application in law covers all employees in China, (c) the vacation and holidays are necessary elements in employment contract, (d) the distinct definition of employment content and contract form in order to avoid illegal recruitment, (e) the clear explanation of rights and interests of employment, (f) employers are supposed to make unlimited-period employment contract with the employees who have worked over ten years, (g) employers are supposed to give the complete protection to the employees who are in a trial period, and (h) the completely explanation of duty to each level of China’s employment department.

²The Foxconn International Holdings (“Foxconn”) was first founded in Shenzhen, China in 1988 and currently is a multinational business group anchored by the Hon Hai Precision Industry Co. Ltd. Hon Hai was founded in 1974 as a manufacturer of plastic products (notably connectors) by Terry Gou, who remains as its owner and CEO. As of 2007, the company and its subsidiaries owned plants in the Czech Republic, Hungary, Mexico, Brazil, India, and Vietnam. In terms of production description, Foxconn produces the Mac mini, the iPod, the iPad, and the i-Phone for Apple Inc.; Intel-branded motherboards for Intel Corp.; various orders for American computer manufacturers Dell and Hewlett-Packard; motherboards for UK computer manufacturer Zoostorm; the PlayStation 2 and PlayStation 3 for Sony; the Wii for Nintendo; the Xbox 360 for Microsoft, cell phones for Motorola and Nokia, the Amazon Kindle, and Cisco equipment. (Reference from Foxconn Corporate).

it worthwhile to continue manufacturing in China; and (3) Is there a better investment decision in other countries with a significant pool of low-paid laborers and lenient employment regulations such as Vietnam, Thailand or Laos?

In order to comprehensively discuss employment conditions in China, the Social Cognitive Theory (“SCT”) is applied in this research paper to analyze the desires of China’s laborers in the interactive dependence among three principal elements of individual cognitivism, individual behaviorism and environmental observatitism. The knowledge and cognition of the individuals are not only obtained from personal studying or experience but also formed from the influence of social relationships. On the contrary, personal behaviors are reflected on the comprehensive integration among individual cognition, knowledge, education, life-experience and the impact of society. Moreover, in terms of qualitative and quantitative methodology, the Multiple Criteria Decision Making (“MCDM”) methodology examines the four essential relations based on the concept of the Analytical Network Process (“ANP”) in order to induct the innovative business strategy for both researchers and managers by providing the most effective and efficient strategies to survive in the hypercompetitive Chinese manufacturing industry after the domino effect of labor revolution.

RELATED LITERATURE OF WORK

This research mainly employs the Social Cognitive Theory (“SCT”) with Multiple Criteria Decision Making (“MCDM”) consisting of Factor Analysis (“FA”) for the organized and collected evaluation-criteria from general questionnaires, Analytical Network Process (“ANP”) for the surveyed and cross-analyzed expert’s opinions and Fuzzy Analytical Network Process (“FANP”) and Grey Relation Analysis (“GRA”) for avoid research linguistic vagueness, to evaluate the four (4) innovative types of operational human-resource strategies which results from two mainly considered relationship between employment-compensation policy and factor location. These consists of (1) constantly run business at the same employment-compensation policy (“CRSECP”); (2) keep original business at the raising compensation policy (“OBRCP”); (3) change original business at the same compensation policy (“CBSCP”); and (4) change original business at the raising compensation policy (“CBRCP”). This will assist in selecting the best potential innovative strategy in the hypercompetitive Chinese manufacturing industry.

Literature on research theories

Due to the discussion of the definition of job satisfaction of employees in contemporary society, Hoppock (1935) articulately addressed the categorical concept and

definition of job satisfaction in his published book, "Job Satisfaction". He not only defined job satisfaction as the comprehensive subjective comments which consisted of the physical and psychological perceptions regarding the surrounding work environment of the employee's comprehensive and subjective responses but he also discovered that the higher the job position, the more the job satisfaction. Further, there are many researches that concentrate on the structure of job satisfaction because higher job satisfaction affirmed need-hierarchy theory that there are always desires in everyone's mind and these are different hierarchies but also everyone is constantly pursuing higher hierarchical need after satisfied lower hierarchical need. There are five needs in Maslow (1943) which consists of physiological need, safety need, love/belonging need, esteem need and self-actualization need. In addition, Smith et al. (1969) redefined job satisfaction by including job content, job position, job payment, job environment, colleagues' relationships and promotion system. Alderfer (1969) further refined Maslow's hierarchy theory to express the new ERG theory which contains the following needs: existence need, relation need and growth need. There are two main differences between Maslow's hierarchy theory and Alderfer's need theory. Alderfer (1969) deemed that motivation characteristics are included in each hierarchical need and the discouragement feature are comprised into each hierarchical need because people are going to pursue lower hierarchical need if they all fail to aspire to higher hierarchical need. Subsequently, base on the Maslow's and Alderfer's theories, Herzberg (1966) advocated the two-factor theory (Motivation-Hygiene theory) which included the factors of hygiene and motivation. The comparison among Maslow's, Alderfer's, and Herzberg (1996) theories are presented in Table 1.

Literature on research methodology

Spearman (1927) first invented (Factor Analysis) FA which evaluates correlation coefficient among each analytical variable in order to acquire communality between each factor. Moreover, Sheppard (1996) addressed that the analytical dimension of FA consists of two principle factors: common factor (or latent factor) and unique factor in order to construct validity to categorize FA into two typical factor analyses: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). In addition, Sheppard mentioned the sequence of FA and cluster analysis through differentiating segmentation and dimensionality of assessable variables by factor scores. Darlington et al. (1973) expressed the component analysis and common FA which are two principle structures and analyses, to prompt two similarities of problems in FA because of analytical data format. First, the variable is same with two groups, for example: "the same set of measures might be taken on men and women, or on treatment and control groups and then, the question

arises whether the two factor structures are the same." Another is two conditions or sets of variable in the one group, for example: "two test batteries might be given to a single group of subjects, and questions asked about how the two sets of scores differ. Or the same battery might be given under two different conditions" (Richard et al., 1973). Additionally, Richard addressed that four research problem examples which can be measure by FA: "how many different factors are needed to explain the pattern of relationships among these variables, what is the nature of those factors, how well do the hypothesized factors explain the observed data and how much purely random or unique variance does each observed variable include" (Richard et al., 1973). The FA originated from the mental philosophical researches from 1900s and in statistics, it is inductively created to handle the complex analysis with complex factors because there are a lot of indirectly observed potential influenced factors in the discussion of mental philosophical researches. Specially, these potential factors are supposed to be organized to common influenced factors (oblique factors) or uncommon influence factors (orthogonal factors) and based on the patterns of linear combination of these organized common factors, the multilateral analyses are discussed around the research problems. Hence, the linear combination Equation (1) is able to present that K numbers of common potential factors are organized from the L numbers of general influenced factors (the M numbers are more than the K numbers). The directly observed influenced factors are presented as y_1, y_2, \dots, y_k , directly unobserved influenced factors are presented as x_1, x_2, \dots, x_k and the constants are showed as w_{ij} which presented the factor loading in FA and means weights of overall influenced factors under linear combination equation to be following Equation (1):

$$y_k = w_{k1}x_1 + w_{k2}x_2 + \dots + w_{kL} + n_k \quad (1)$$

After the FA, the ANP approach is utilized to assess patterns, criteria (factors), and sub-criteria. The initiation of ANP is expressed by the research journal of Saaty (1980), professor of University of Pittsburgh which is utilized for handling the more complex research questions are not solved by Analytic Hierarchy Process (AHP). Because of the original decision hypothesis principle (variable) of the AHP defined to the "independence", the AHP is reconsidered for its fundamental theory by some scholars and decisive leaders because the relationships between patterns, criteria, sub-criteria and selected candidates are not certain "independence". Saaty (1980) delivered the new research methodology, positive reciprocal matrix and supermatrix, to pierce out this limited hypothesis in order to carry on more complex hierarchical analysis by collecting expert's opinion through the Delphi method and brainstorm approach under the comprehensive, limited-resource and difficult-decision environment.

Table 1. A comparison among Maslow's, Alderfer's and Herzberg's theories.

Maslow (1943) Need-hierarchy theory
<p>Physiological need:</p> <ul style="list-style-type: none"> - Physiological need is to meet physical requirements such as food, clothing, shelter, recreation, sleeping etc.
<p>Safety need:</p> <ul style="list-style-type: none"> - Safety need is to offer security protection in order to prohibit people from suffering fears, anxiety, anarchy, nervousness, hazard and menace.
<p>Love/belonging need:</p> <ul style="list-style-type: none"> - Love/belonging need is to build closed relationships between individuals and groups in order not to avert people from solitude, strangeness but also to be a part of society.
<p>Esteem need:</p> <ul style="list-style-type: none"> - Esteem need is not only for maturity, self-respect which results from capacities, confidences, autonomy, relatedness, competence and etc. but also for respect from public that cause from reputation, ambition etc.
<p>Self-actualization need:</p> <ul style="list-style-type: none"> - Self-actualization need is to achieve personal goals, develop individual potentials, complete people's growth in order to integrate themselves, such as comprised of autonomy consideration, innovative thinking, humanness, democracy etc.
<p>Alderfer (1969) ERG theory</p>
<p>Existence need:</p> <ul style="list-style-type: none"> - Basic need is a kind of a substance form consisted of food, clothing, recreation, shelter, sleeping, job, social welfare etc.
<p>Relation need:</p> <ul style="list-style-type: none"> - Relation need is to share personal thinking, feeling and desire to related people who can be colleagues, family, friends etc.
<p>Growth need:</p> <ul style="list-style-type: none"> - Growth need is for individual creation or personal growth.
<p>Herzberg (1996) Two-factor theory</p>
<p>Hygiene Need:</p> <ul style="list-style-type: none"> - Needs out of job scope, such as security, self-identification, self-actualization, social recognition etc.
<p>Motivator Need:</p> <ul style="list-style-type: none"> - needs in job scope, such as job environment, job content, job relationship, job compensation, job benefits etc.

The assumption of AHP approach is based on the fact that the criteria and sub-criteria is independent of each other but more researchers discovered the situation in which there are two kinds of relationships between criteria and sub-criteria: internal/external dependency and feedback, for dealing with the more complicated research problems. According to the above reason, there is another new approach, ANP, which was created for dealing

with more complicated research problems. Subsequently, the primary critical points in the ANP are the Consistency Ratio (C.R.) by calculating the Consistent Index (C.I.) and the Random Index (R.I.). The acceptable regulation is that the evaluated numbers of C.R. and C.I. both are necessary smaller than 0.1. According to the characteristics of the ANP, the ANP method can be utilized to carry on the major twelve kinds of assessable research

fields that includes setting priority, generating a set of alternatives, choosing a best policy alternative, determining requirements, allocating resources, predicting outcomes, risk assessment, measuring performance, system design, ensuring system stability, optimization, planning and conflict resolution.

In traditional mathematics, there is the two-side (correct or incorrect) logical positivism to solve the accurate research problems. However, in terms of the uncertain and fuzzy research problems, the Zadeh (1965) induced the fuzzy set which is based on two characteristics (membership degree and membership function) of the fuzzy set theory in order to substitute the crisp set of traditional mathematics which can set up the uncertain and fuzzy research problems. Further, based on the doctrine of Zaheh’s fuzzy theory, Deng (1989) further expressed the more complete and innovative theory - Grey System Theory (“GST”). He applied the associated approach, structure measure and model-making method to induce grey system which is located between block system and white system, in order to integrate the indefinite research data to become useful research data which achievement reach the research purposes of managerial control, decision-making, and foreseeing. The main goal of GST is not only to calculate the level of relation between each influenced factors in order to handle the patterns of uncertain research problems or circumstances but also to use the trend-level among uncertain and incomplete information of each influenced factor to quantify the level of relation in order to assess the dependence or independence relations between each influenced factor in Equations (2), (3) and (4).

The analytical goal belongs to efficient goal and satisfies the maximized analytical goal (the Larger the better, LTB):

$$x_i^* = \frac{x_i^{(0)}(k) - \min x_i^{(0)}(k)}{\max x_i^{(0)}(k) - \min x_i^{(0)}(k)} \tag{2}$$

The analytical goal belongs to cost goal and satisfies the minimized analytical goal (the smaller the better, STB):

$$x_i^* = \frac{\min x_i^{(0)}(k) - x_i^{(0)}(k)}{\max x_i^{(0)}(k) - \min x_i^{(0)}(k)} \tag{3}$$

The analytical goal belongs to specific goal (nominal the best):

$$x_i^* = 1 - \frac{|x_i^{(0)}(k) - OB|}{\max \{ \max [x_i^{(0)}(k)] - OB, OB - \min [x_i^{(0)}(k)] \}} \tag{4}$$

s.t. $x_i^{(0)}(k)$ represents original data

x_i^* represents date after grey relation system analysis

$\min x_i^{(0)}(k)$ represents the minimum of original data

$\max x_i^{(0)}(k)$ represents the maximum of original data.

In the hierarchical relations in the last level, each potential supplier has to fit match each assessable sub-criterion matched in each evaluated criterion through pairwise compared criteria of each sub-criteria following. Hence, each expert will give the weights (W_1, W_2, \dots, W_n) of each pattern, criteria, and sub-criteria and based on the concept of two-triangles de-fuzzy, the total fuzzy assessable numbers are calculated by Equation (5).

$$\text{Total fuzzy assessable numbers} = \sqrt[n]{\prod_{i=1}^n W_i} \tag{5}$$

In order to reflect the comparative score for the three types of corporate demand patterns, Equation (14) is applied to compute the comprehensively comparative related priority weight W (eigenvector) in the matrix. Consequently, the appropriate relations is selected by calculating the Comparatively Synergized Index (“CSI”) which combines the “weighted product” (Sheu et al., 2004) and the “numbers of similarity measure (S (A, B)).” Further, in terms of defuzzification from the aspect of effective order, the similarity measure (“S (A, B)”) is utilized by carrying out the calculation of symmetrical triangular fuzzy numbers between two measured vectors ($A_1 = (c_1, a_1, b_1)$ and $A_2 = (c_2, a_2, b_2)$) (Yang et al., 2005).

$$S[V_1, V_2] = \begin{cases} 1 \\ \exp(-d^2 / \alpha), \text{ if} \\ V_1 \neq V_2 \end{cases} \tag{6}$$

where

$$d^2(A_1, A_2) = (a_1 - a_2)^2 = \left[\frac{((c_1 + a_1) - (c_2 + a_2))^2}{4} \right] + \left[\frac{((b_1 + a_1) - (b_2 + a_2))^2}{4} \right]$$

$$\alpha = \frac{(D^* + D_*)}{2} + \frac{(|c_1 - c_2| + |b_1 - b_2|)}{8}, D^* = \frac{|(a_1 + b_1) - (a_2 + b_2)|}{2}$$

$$, D_* = \frac{|(a_1 + c_1) - (a_2 + c_2)|}{2}$$

RESEARCH APPROACH

In order to effectively evaluate the integrity and uncertainty, the MCDM are utilized by employing a collection of surveyed data from the opinions of empirical interviewees and experts for achieving retrospective cross-sectional analysis of the relations among the Taiwanese manufacturers from two estimated indicators of two-factor theory. This approach do not only characterizes the overall research design and research specification of analytical methodology but also measures the comparison between each appraised attitude, criterion, sub-criterion and candidate. Besides, the application of three estimated approaches is used in this research by steps.

First step is applied by FA. The 278 questionnaires out of 500 sent were completed by laborers who are presently employed in

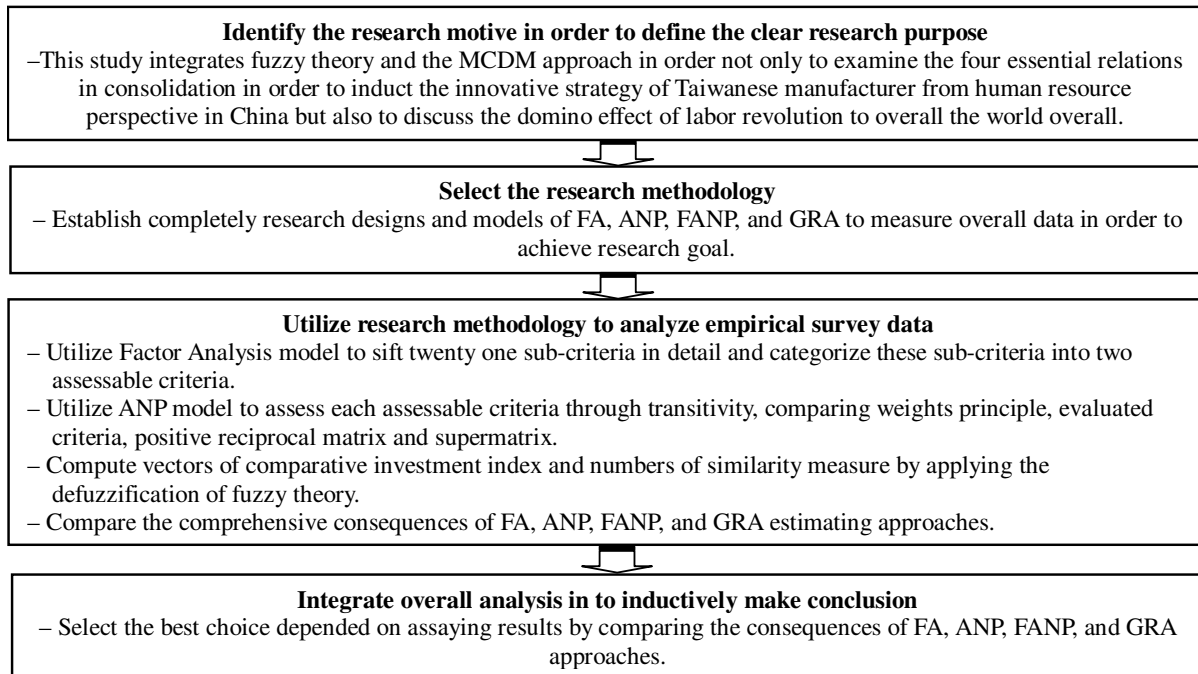


Figure 1. The research design framework.

various industries in China in order to organize the assessed hierarchy by distinguish each the related-impacted factor from collecting influenced elements.

Dalkey and Helmer (1963) expressed that there are the least errors of validity and reliability in the Delphi method when the collected questionnaires are, at least, over 20% of the total surveyed data. Hence, the next step in the MCDM approach was to collect a second questionnaire from twelve experts. The twelve experts consisted of five managers who have over ten years of working experience in China, two directors who have over twenty years of working experience for Taiwan companies listed in the Taiwan Stock Exchange with operations in China and five scholars with at least 10 years of extensive research in Chinese employment practices. T

he research design framework is presented in Figure 1, which consists of four principle research design steps: identifying, selecting, utilizing and integrating. Overall research steps includes identifying the motivation, selecting the methodology, utilizing methodology to analyze empirically collected data and to appraise overall assessable criteria through applying Delphi method in order to make a comprehensive conclusion and suggestion.

Research measurement model

Gordon and Turner (1997) addresses the typical measurement statistics process. After FA, overall related-impacted factors are categorized into four groups which match the four theories and then, according to the patterns of ANP approach, these related-impacted factor-groups are decomposed as third hierarchy of criteria of assessment according to second hierarchy of three patterns of employees' demand. The related-impacted factors are also decomposed as fourth hierarchy of sub-criteria of each criterion. The framework of the best innovative strategy with the higher compensation in hypercompetitive China environment is described in Figure 2 (Saaty, 1996).

Further, in terms of the ANP model, "once the pairwise comparison is conducted and completed, the local priority vector w (eigenvector) is computed as the unique solution" (Sheu et al., 2004) and the w is the represented priority vector w (relative weights). Additionally, Meade and Sarkis (1998) invented the two-stage algorithm as presented in Equation (7).

$$Rw = \lambda_{\max} w \text{ and } w_i = \frac{\sum_{j=1}^m \left(\frac{R_{ij}}{\sum_{i=1}^m R_{ij}} \right)}{m} \quad (7)$$

In each pair-wise comparison, the consistency of compared factors will match transitivity in order to fulfill the representativeness of collected expert's opinion. The C.I which is exactly considered in each pairwise comparison calculated matrix and the C.R which is estimated with C.I. and R.I obtained from the statistic table of random index figure, are expressed in equation (8)

$$C.I. = \frac{\lambda_{\max} - n}{n - 1} \text{ and } C.R. = \frac{C.I.}{R.I.}$$

Research specification of analytical data and assessable criteria

In terms of the representativeness of the efficient model of three analytical approaches through establishing fuzzy transitivity, comparing weights principle, evaluating criteria, and estimating positive reciprocal matrix and supermatrix, research data source must collectively and statistically consist of all impacted expert's opinion related to each assessable criteria. According to the assessable characteristics of the ANP model, the pairwise comparison of the

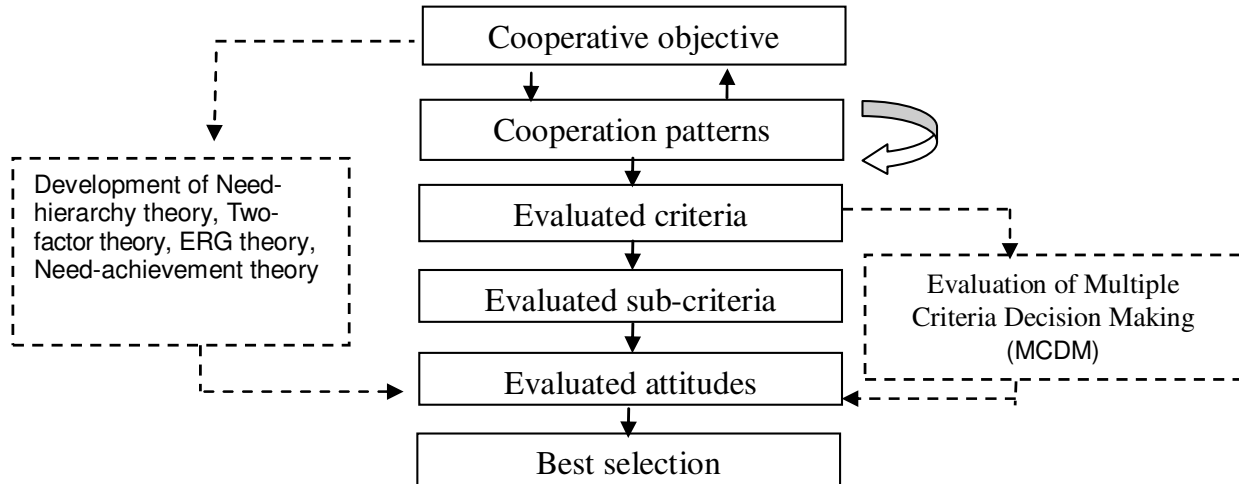


Figure 2. The initial research framework matched the ANP.

Patterns of employee’s demand 1	1	2	3	4	5	Patterns of employee’s demand 2
	Equal-----Extreme important					
Criteria of assessment 1	1	2	3	4	5	Criteria of assessment 2
	Equal-----Extreme important					
Sub-criterion of each criterion 1	1	2	3	4	5	Sub-criterion of each criterion 2
	Equal-----Extreme important					
Selected candidate 1	1	2	3	4	5	Selected candidate 2
	Equal-----Extreme important					

Figure 3. The evaluation scale of pair-wise assessment.

evaluation characteristics, criteria and attribution at each level are evaluated with respect to the related interdependence and importance from equal importance(1) to extreme importance (5) as shown in Figure 3.

Based on the principle of consistency ratio, the pairwise comparison matrix can be accepted when the number of C.R. is equal or smaller than 0.01. Further, the research data source in this research is derived from the scholars and experts who understand the measurement employment performance and satisfaction and are employed in China’s employment market. Further, Figure 4 hierarchically expresses the relations among pattern, criteria, and sub-criteria. This criterion in this research is then used to identify and analyze the consistency of four kinds of innovative strategies.

(1) Hygiene factor indicators: For the overall reflection of the employees’ desires through the effective evaluation in performance, according to comprehensive concepts and expert’s discussion, a total of eleven sub-criteria are categorized in two estimated groups. The eleven sub-criteria are Job Achievement (JA), Job Challenge (JC), Job Duty (JD), Job Environment (JE), Job Recognition (JR), Job Satisfaction (JS), Work Benefits (WB), Work Compensation (WC), Performance Bonus (PB) Overtime-work Buckshee (OB) and Promotional Channel (PC).

(2) Motivators factor indicators: In terms of ensuring the arising of employees’ performance and satisfaction in the workplace and based on expert’s opinion, the ten assessable sub-criteria are organized in two groups and pondered over in the criterion of qualitative and quantitative review: Commissioner’s Appreciation (CA), Colleague’s Cooperation (CC), Subordinate Respect (SR),

Family Supporting (FS), Performance Evaluation (PE), Experience Accumulation (EA), Personal-knowledge Growth (PG), Team-work-ability Growth (TG), Training Opportunity (TP) and Work-capacity Growth (WG).

EMPIRICAL ANALYSIS

In order to clearly and completely present the empirical assessment processes, there are four evaluated steps described as follows:

First Step: Factor Analysis. In terms of the reliability, the Cronbach α of surveying questionnaires was 0.751 which means the reliability of questionnaires could present the population of users after the measurement of FA by collecting 278 completed questionnaires out of total of 500 questionnaires sent to China’s employees that makes the twenty one assessable sub-criteria be categorized further into four groups as expressed in Figure 4. Further, the results of the Kaiser-Meyer-Olkin (KMO) was 0.751 which was bigger than 0.7 and significance was 0.0064 which was smaller than 0.05 that means the collected data is suitable for the Factor Analysis (FA) and the relationship and reflection between

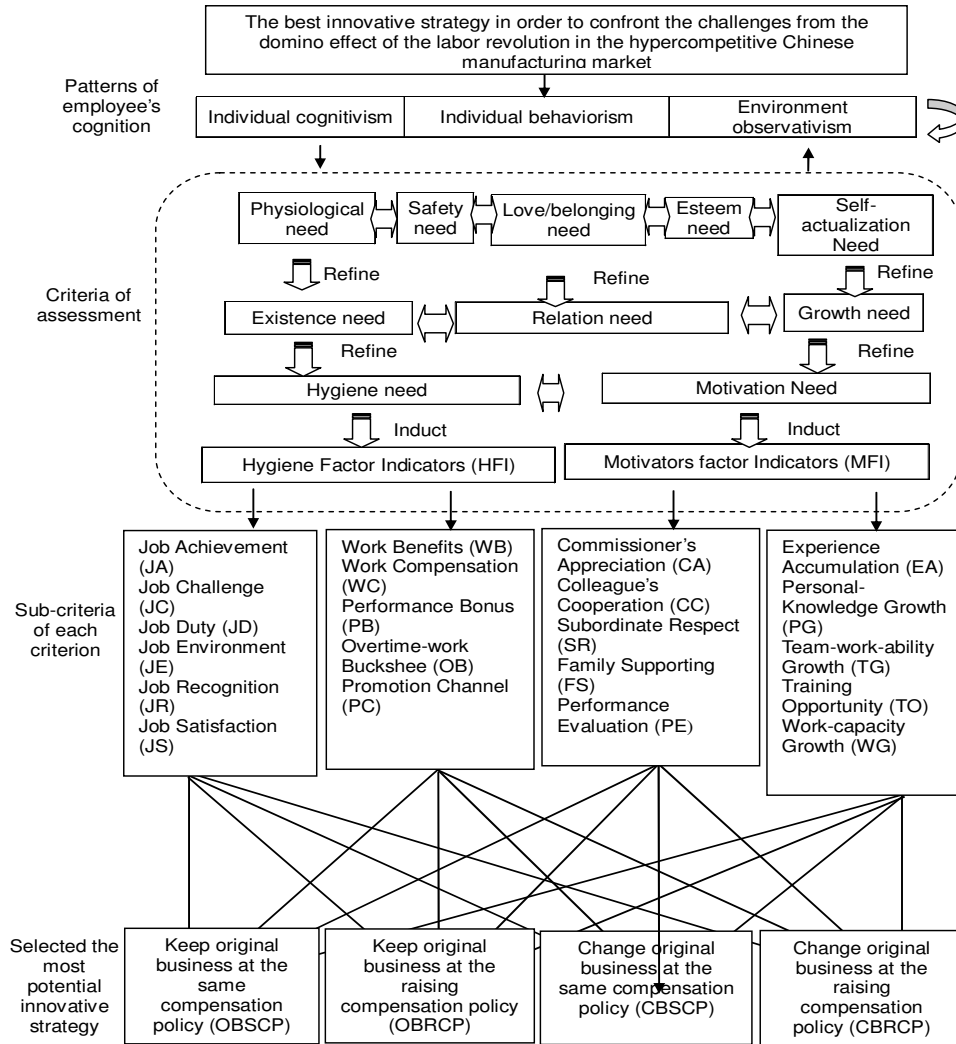


Figure 4. Relationship for characteristic, criteria, sub-criteria and selected candidates.

each factor and the other variables and these sub-criteria are categorized into main two factors in Table 2.

Second Step: ANP approach. The ANP model was applied in the empirical analysis to assess the best innovative strategy with the higher compensation in a hypercompetitive Chinese manufacturing environment for Taiwanese companies by considering transitivity and consistency of selection among the best potential relations. The survey scale of expert's opinion was from 1 to 5 which represented the degree of importance between two comparative factors among pattern, criteria and sub-criteria. In the hierarchical relations in the last level, each potential innovative strategies had to fit match each assessable sub-criterion matched in each evaluated criterion through pairwise compared performance of each relation. In order to reflect the comparative score for three kinds of relations, Equation (9) was applied to compute the comprehensively comparative related priority weight

w (eigenvector) in the matrix. Consequently, the appropriate relation was selected by calculating the CSI (D_i) (Sheu et al., 2004) which was defined by:

$$D_i = \sum_{j=1}^s \sum_{k=1}^{kj} P_j T_{kj} R_{ikj}$$

Where, the importance of related priority, D_i , was weight w (eigenvector) for assessable criterion j; T_{kj} was the importance of related priority weight w (eigenvector) for assessable attribute k of criterion j and R_{ikj} was the important potential relation i on the attribute k of criterion j. Additionally Table 3 expressed the overall outcome of complete importance of related priority weights w (eigenvector) as presented in Table 3 by utilizing Equation (9).

Table 2. Factor analysis among independent variable of communalities.

Innovative interface technologies	Initial	Extraction
JA	1	0.738
WC	1	0.512
JC	1	0.671
CA	1	0.722
CC	1	0.517
JS	1	0.858
FS	1	0.757
JD	1	0.668
PE	1	0.703
SR	1	0.611
TG	1	0.759
PG	1	0.798
WB	1	0.821
PC	1	0.715
JE	1	0.652
JR	1	0.795
PB	1	0.659
EA	1	0.679
WG	1	0.761
OB	1	0.684
TO	1	0.615

Table 3. Employee's demand comparative index computed for three kinds of potential relations under the lowest operational expenditure by ANP.

Criteria (hygiene factor indicators / motivation factor indicators)	OBSCP	OBRCP	CBSCP	CBRCP
	Evaluated score*	Evaluated score*	Evaluated score*	Evaluated score*
Investment comparative index	0.1262	0.1388	0.1541	0.1652

* Evaluated score is measured by the weights-ANP, weights-FA of the sub-criteria.

Consequently, Table 3 reflected the three relations in the CSI. The highest evaluated score of 0.1652 was the relation of the change original business at the raising compensation policy through the estimated analysis of ANP approach.

Third step: Fuzzy ANP approach. However, the results under the ANP evaluation indicated that the original business with a raising compensation policy (CBRCP) was the best employment policy for enterprises impacted by the domino effect of the labor revolution currently transpiring in the hypercompetitive Chinese manufacturing market. Nevertheless, in order to clearly penetrate linguistic amphiboly and to promote degree of satisfaction, the fuzzy theory was utilized to deeply survey the ulterior results of questionnaires. Table 4 presented the vectors of the CSI and numbers of similarity measure of three relations, based on function Equation (6) of

similarity measure ($S(A,B)$) of defuzzification processes and the overall outcome of complete importance of related priority weights w (eigenvector) of Table 4.

As a result of the defuzzification assessing processes, the highest vector of the CSI was (0.1332, 0.1417, 0.166) in "CBRCP" and the highest of number of similarity measure is (1.1655) in "CBRCP" as well. Oppositely, the majority of most experts' opinion considered that "CBRCP" was the best performed consolidated employment policy under the potential innovative strategy for Taiwanese manufacturers which were running businesses in China that completely equivalent with the results of evaluated scores of the FANP. Hence, through the amendment of fuzzification, the evaluated score was more closed to the linguistic comment of experts.

Forth step: GRA approach. Further, in order to distinctly approach the linguistic experts' comment and to

Table 4. Employee's demand comparative index computed for three kinds of potential relations by FANP.

Criteria (Hygiene factor indicators / motivation factor indicators)	OBSCP	OBRCP	CBSCP	CBRCP
	Evaluated score*	Evaluated score*	Evaluated score*	Evaluated score*
Vectors of synergized investment comparative index*	(0.0869,0.098,0.1124)	(0.0938,0.1072,0.1218)	(0.1197,0.127,0.1506)	(0.1332,0.1417,0.1665)
Numbers of similarity measure**	0.951	0.97	0.989	1

*Based on the extension principle of defuzzy, the fuzzy assessable numbers are measured by the function Equation (9) and then, standardization.**Based on the defuzzy concept of Yang et al., (2005) The numbers of similarity measure (S (A, B)) are calculated by the function Equation (6) as well as presented by calculating the standardization.

Table 5. Grey set system for level of importance.

Level of important (Language powers)	Equal	Little important	Important	Very important	Extreme important
Figure of grey set system	0.091	0.283	0.5	0.717	0.919

Table 6. Employee's demand comparative index computed for four kinds of potential innovative strategy by GRA.

Criteria (hygiene factor indicators / motivation factor indicators)	OBSCP	OBRCP	CBSCP	CBRCP
	Evaluated score*	Evaluated score*	Evaluated score*	Evaluated score*
Investment comparative index in the GRA	0.1613	0.177	0.1955	0.2107

* Evaluated score is measured by the weights-ANP, weights-FA of the sub-criteria which resulted from the comparatively synergized index estimated by function Equations (2), (3) and (4).

comparatively emend evaluated scores, this research not only utilized the five-level quantified figures of evaluation scale between languages of interviewees of pairwise in assessment of Chen and Hwang (1992) as expressed in Table 5 but also estimated the Grey Relation Approach (GRA) by applying the Equation (7) as presented in Table 6. Equation (7) was utilized to satisfy two analytical research situations: analytical goal belong efficient goal and satisfies the maximized analytical goal and analytical goal belongs cost goal and satisfies the minimized analytical goal. Furthermore, in order to calculate the total score of these three kinds of relations, the organized grey relation coefficient resulted from the calculation after transformation the qualitative data of survey interviewees' opinions to the quantitative data. Finally, the identification of research goals, the identified coefficient (δ) was settled as 0.5. The grey relation was the equal weights among analytical influenced, and therefore, the Equation (9) was utilized for the five times of usage: first usage time for calculating the weights of grey relation coefficients between three assessable patterns, second usage time for computing the weights of grey relation coefficients between three assessable criteria, third usage time for count up the weights of grey relation coefficients between twenty one sub-criteria which

matched in two criteria group, fourth usage time for figuring the weights of grey relation coefficients for the current five theories and finally, in fifth usage time, in order to avoid the errors, the aggregate the weights of grey relation coefficients was divided for the sorted score of the CSI of three relations as expressed in Table 6. Table 6 presented the calculating processes and consequences: the CSI of "CBRCP" was 0.2107 which was the highest score of four kinds of relations order to satisfy the employees' desires.

Conclusion

In a hypercompetitive and baptism-by-fire manufacturing business environment in China, Taiwanese manufacturers have successfully manipulated resources not only to cut down manufacturing expenditures but also to create most profits in order to strengthen their competitive advantages to achieve continual survival. This research may motivate Taiwanese manufacturers to undertake their best innovative strategy with the higher compensation levels. The contention of this research, therefore, not only focuses on the original central concept of five theories but also concentrates on the current laborers'

demands during the selection of the best potential innovative strategy by utilizing the novel MCDM approach. Furthermore, there are three main assessable criteria which cover key-points of evaluating the best investment competitive relation in the Chinese laborers' desires after discussing the domino effect of labor revolution to the overall world. One of the crucial results from this research was that the "change original business at the raising compensation policy (CBRCP) was the best choice for Taiwanese manufacturers by utilizing ANP (0.1652), FANP (1) and GRA (0.2107) approaches.

Further, the desires of Chinese laborers are reflected in the results from the collection of 278 completed questionnaires and from the opinions of twenty academic and survey experts which resulted in two essential conclusions in this research. First, the Chinese laborers have shifted their focus from solely on salary to other workplace factors such as employee benefits, work safety, location, and job satisfaction. Further, a significant number of the questionnaires from laborers indicated an expressed desired to move back to their hometowns because of generally lower cost of living but they wish to retain their current compensation levels. Additionally, the score of the investment comparative index of "CBSCP" is higher than "OBRCP" which indicates that current laborers in China currently value work location more than compensation. Based on cross-analysis of surveying data and new employment-regulation in China, the low-paid Chinese factories are rapidly disappearing after this explosion of Chinese labor revolution because the Chinese employees commence to pursue higher payments and compensation. Hence, in response, many of the Taiwanese manufacturing enterprises have or are reconsidering shifting their manufacturing factories from the developed coastal Chinese cities to the developing interior subordinate cities or outside of China to the undeveloped low-pay countries in the Southeastern Asia region such as Vietnam, Laos, Myanmar, and so on.

This employment revolution completely conforms to the economic development policies of the Chinese government because the Chinese government has endeavored to increase the average level of employment compensation and to develop the interior subordinate cities in order to diminish the poverty gap among cities. Nevertheless, throughout the relative literature reviews, in terms of macroeconomic consideration, these enterprises can choose to transfer the increment cost of compensation to the final customer in the form of higher prices for more profits but may affect the balance of the world's inflation-control mechanism. For this reason, the employment reforms in China has not only resulted in a change in innovative strategy from Taiwanese manufacturers but has also led to a shake-up in the world-disinflation-control balance under the domino effect of the labor revolution. The next step beyond this research is to collect additional empirical macroeconomic data to develop a more comprehensive evaluation model that takes

into consideration more in-depth vertical measurement and horizontal assessment methodologies in order to develop added comprehensive and effective managerial strategies for surviving in this momentous, dynamically-changing and lower-profit Chinese manufacturing industry.

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