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Advanced DEMATEL Technic Illustrate Contemporary Fintech Development

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Abstract

FinTech have revolutionized applications and redefined the digital economy in recent years. However, there remains a gap in the academic literature regarding core factors that influence the development of internet finance. This research proposes an internet finance development evaluation model with 8 dimensions, namely, Commercial Benefit, Convenience, Trust, Cost, User Profile, Substitution, Competitiveness, and Regulation, based on literature survey. Three DEMATEL methods are empirically validated on Taiwan internet finance environment, through either the DEMATEL technique or a validity index comparison. The theoretical results found that the Balanced DEMATEL model has the best performance, the Commercial Benefits and start-up Cost are the key factors that will influence the willingness of banks to newly enter the internet finance business, and the Trust dimension of Security and providing multi-functional system that meet consumer needs are highly importance. The practical finding also suggest the financial authorities should open up market for non-banking corporations in order to enhance innovation services and internet finance managers should integrate local financial services with local characteristics to increase competition power. This study can provide local governments and countries that are developing Internet finance with guidelines when formulating internet finance development policies and marketing strategies, especially for emerging market.

JEL classification numbers: G20
Key word: Balanced DEMATEL, FinTech, Internet finance, Banking, Taiwan

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1. Introduction

E-commerce with its characteristics of convenience, low cost, and speedy transactions has fundamentally reshaped the internet finance industry and has rapidly developed over the past decade. In recent years, the internet network has replaced newspapers and television. The social media websites Facebook and Line have experienced explosive growth. Mobile Apps have created a new lifestyle characterized by “mobile phone overuse”. The digital age has tremendously impacted on people's daily lives. In the banking industry, a bank customer no longer has to visit the bank. The development of internet finance has had a great impact on both banking marketability and structural transforming. King (2012) mentioned that the bank customer’s behavior has transitioned through four stages. These stages are the social media stage, the mobile devices stage, the mobile payment stage, and the final stage. A bank is no longer regarded as a place to which you go, but banking is something you do. The marketability of social media from Facebook and LINE cannot be ignored. Mobile devices have become people's daily necessities. Mobile payment have changed e-commerce transaction behavior, and the banking industry is in need of a structural transformation to adopt to customer needs in this digital age.

Internet banking systems in developed countries like the United States, Great Britain, Canada, Austria, and France are rapidly developing. However, in developing countries, internet finance is still considered to be an innovative financial service. The acceptance of internet finance will be influenced by different countries and will depend on their different cultural backgrounds, social environment and ethnic differences (Venkatesh et al., 2012).

In fact, global internet financial development has since 2008 consisted of a heavy flow of investment into Finance and Technology (FinTech). Such investment increased from $ 1 billion US dollars in 2008 to 40 billion US dollars in 2013. In the year of 2014, there was a large increase to $ 12.2 billion US dollars, of which the United States accounted for nearly 80%, followed by Europe with 12%, while the whole of Asia only accounted for 6% (Hong Kong Edge, 2015). London and New York are obviously the global leaders in FinTech. These two cities account for 90% of the investment and income making up the global FinTech share.

Global internet financial development is not entirely limited to the developed countries. Developing countries or undeveloped countries where finance is not well established are more dependent on a successful internet finance platform. At the same time, developing countries may also be able to profit from the financial experience of developed countries, in that they may at times rapidly deploy online banking or internet banking application. When given the opportunity to implement a "leapfrog" form of development, developing countries will gain more benefit from internet

financial services in comparison with developed countries (Fonchamnyo, 2013). For example, although Africa has no physical banking entities in most regions, where there is high internet coverage penetration, there is also high degree of internet finance development, particularly in mobile banking.

Taiwan internet financial has evolved more slowly than in other countries, but the banking industry has been impacted by the new trend of Bank 3.0, Finance Technology (FinTech) and Taiwan's regulation. The Financial Supervisory Commission (Taiwan), proposed the creation of a "digitized financial environment 3.0" in 2015 and also unveiled a financial technology grand office in September 2015 to promote the transformation of financial institutions. However, the key factors that influence the present internet finance development need to be discovered. The government, financial sector, and academic still need to further explore those factors and it is this that has provided the motivation for our study.

This study aims to explore the key factors that influence the development of internet finance through a case study on Taiwan's internet finance environment. This research reviews the related literature to establish dimensions, factors and also examines the causal and effect relationship between factors through Tradition DEMANTEL, Generalized DEMANTEL and Balanced DEMANTEL (Liu et al., 2016).

The main purposes of this study start from establishing an internet finance development evaluation model through a literature survey. Examining an evaluation model through three different DEMATEL methods and also validating different indexes comparison. Empirical validation of the evaluation model based on Taiwan as a study object through a Balanced DEMATEL assessment. And exploring the core factors that influence internet finance development to provide local government, developing countries and banking sector with guidelines when formulating internet finance development policies and marketing strategies.

2. Literature Review

Developed countries like the United States, Great Britain, Canada, Austria, and France, their internet banking systems are rapidly developing during the past decade. However, for developing countries, their internet finance is still considered an innovative financial service industry. Acceptance for internet finance will be influenced by different countries and will depend on their different cultural background, social environment and ethnic differences (Venkatesh et al, 2012).

Ismail & Osman (2012) study the level of retail bank customers that use online banking whether will influence electronic banking development at Sudan. Study result indicated that individual with higher income, with a computer account, and with

internet experience, would tend to use online banking services. The study also found, there was not enough evidence of any significant in gender, marital status, education level and occupation differences on utilizing online banking. Their result shows that cultural background, the environment and ethnic differences may be the factors that greatly influence the development of internet finance. In a developing country like Nigeria, internet finance consists of business innovative models. The rapid development of internet technology has had a huge impact on people's daily lives, as well as on a banking business model. Local customer are concerned that key factors influencing internet finance development are information infrastructure, ease of use, technology usefulness and the platform security problem (Yousafzai, 2012). Fonchamnyo (2013) observed on southern region of Saharan Africa, researcher see that commercial banks are attempting to introduce an online banking system to improve business operations, reduce costs, improve efficiency, and also provide consumers with more convenient services. Developing countries should profit from the financial experience of developed countries, to deploy online banking or internet banking application rapidly. With a chance to implement a "leapfrog" development, developing countries will gain more benefit from financial services of the internet business in comparison with developed countries. (Fonchamnyo, 2013)

There are many research concern the factors influencing internet finance development, In Machogu & Okiko (2015) study of Jordan, survey investigated the customers of a commercial bank who had e-banking services. The result was that customer were concerned with the factors of easy access, reliability, design, cost / fees / charges, the electronic banking equipment, privacy / risk / and verification. Those factors are all associated with customer satisfaction. The result also demonstrated that technology created business innovation and transformed the business model, thus allowing local banks to provide innovation service through an internet finance platform. Lai & Ahmad (2015) conducted a Technology Acceptance Model (TAM) research of exploring perceptions of Malaysia customer internet finance and mobile banking services, empirical results show that convenience, design, perceived risk, perceived usefulness and perceived ease of use are the factors to be considered in the internet financial services development stage. Aliyu et al (2013) evaluate the customers' satisfaction with banking services, the research resulted in 5 relative factors, which are cost, convenience, security, online banking and customer service. An investigation of which factors that will affect the Thailand customer behavioral intentions when using online banking. Study proved that quality management and trust are both very important attributes. Online banking not only provides banking services anytime and anywhere, but also reduces costs. A research result found that system quality and service quality influence the degree of trust of a typical Thailand

customer to begin to use online banking service, but there was a negative influence on the information quality variable (Namahoot & Laohavichien, 2015, Xue et al, 2011).

Kundu & Datta (2014) conducted a study at India, research explored the relationship of service quality and the key factors of system usefulness, site aesthetics, ease of use, technical performance, reliability, privacy, trust, enthusiasm, and custom made. That result indicated that customer satisfaction improved customer loyalty. In addition to assessing the key factors that impact a consumer use of internet finance, the Indian researchers established a research model with the factors of comparative advantage, perceived usefulness, perceived ease of use, trust, security, legal issues, behavior, subject norm and image (Safeena et al, 2014). Ismail & Osman (2012) research found that 11 key factors influence the Sudan customer use of internet banking which include breakdown frequency of an ATM, an ATM and electronic point of sale (EPOS), inability of access the Internet, technical problems of report mechanism, an inconvenient location, blurred legislation of electronic transactions protection, and both prevention and handling of transaction processing errors problems. A research of South Africa investigated the key factors that influence the customer perception of internet banking service quality. The 7 key factors of online banking which affect customer perception of service quality are included: trust, response speed, ease of use, access accessibility, satisfaction, speed and accuracy, and contact (Dhurup et al, 2014). Paschaloudis & Tsourela (2014) exam Greece bank of an internet finance quality through a conceptual model had the 7 factors of efficiency, system, usefulness, satisfaction, privacy, enthusiasm, compensation. Mangin & Bourgault (2014) study financial environment in Canada, result showed the 3 key factors which caused to local customers accept internet banking were risk, security and trust.

This study summarized the relevant factors from the literature review, and concluded that the key factors that influence the internet finance development are Commercial Benefit, Convenience, Trust, Cost, User Profile, Substitution, Competitiveness, and Regulation.

Table 1: Summary of the Factors of Internet finance Development Evaluation Model

Dimensions	Factors	Reference
Commercial Benefit	Relative advantage, Transaction Fees and Charges, Return of investment	Balasubramanian et al., 2014, Dhurup et al., 2012, Ismail & Osman, 2012, Ahmad & Al-Zu'bi, 2011, Karimzadeh & Alam, 2012, Singhal & Padhmanabhan, 2008, Lichtenstein & Williamson, 2006, Curran, 2005, Tarhini et al., 2015, Machogu & Okiko, 2015, Safeena et al., 2014, Søilen et al., 2013, Aliyu et al., 2013, Fonchamnyo, 2013, Namahoot & Laohavichien, 2015, Xue et al, 2011
Convenience	Perceived ease of use, Perceived usefulness, Convenience, Accessibility, Perceived Awareness, User friendliness, Usability, Guidelines and instructions of e-banking, Design & Speed, Efficiency, Real time access, Content	Tarhini et al., 2015, Ahmad & Al-Zu'bi, 2011, Lai & Ahmad, 2015, Srivastava, 2007, Singhal & Padhmanabhan, 2008, Lichtenstein & Williamson, 2006, Vijayendra & Renuka, 2015, Omotayo & Adebayo, 2015, Machogu & Okiko, 2015, Chin & Ahmad, 2015, Namahoot & Laohavichien, 2015, Illia et al., 2015, Paschalodudis & Tsourela, 2014, Mangin et al., 2014, Tsai et al., 2014, Safeena et al., 2014, Yayaa et al., 2013, Søilen et al., 2013, Aliyu et al, 2013, Ismail & Osman, 2012, Fonchamnyo, 2013, Lai & Ahmad, 2015, Paschaloudis & Tsourela, 2014, Kundu & Datta, 2014, Dhurup et al., 2014
Trust	Security, Trust, Privacy, Responsiveness, Risk, Assurance, Accuracy, Protection, Reliability, Perceived credibility	Haque et al., 2009, Ahmad & Al-Zu'bi, 2011, Karimzadeh & Alam, 2012, Srivastava, 2007, Singhal & Padhmanabhan, 2008, Lichtenstein & Williamson, 2006,Tarhini et al., 2015, Machogu & Okiko, 2015, Vijayendra & Renuka, 2015, Omotayo & Adebayo, 2015, Machogu & Okiko, 2015, Chin & Ahmad, 2015, Namahoot & Laohavichien, 2015, Illia et al., 2015, Safeena et al., 2014, Paschalodudis & Tsourela, 2014, Yayaa et al., 2013, Søilen et al., 2013, Aliyu et al., 2013, Ismail & Osman, 2012, Lai & Ahmad, 2015, Paschaloudis & Tsourela, 2014, Mangin & Bourgault, 2014, Kundu & Datta, 2014, Dhurup et al., 2014
Cost	Start-up Cost, Economic, Management,	Karimzadeh & Alam, 2012, Lichtenstein & Williamson, 2006, Safeena et al., 2014, Aliyu et al., 2013
User Profile	Customer satisfaction & attitude, Loyalty, Fulfilment, Knowledge, Culture, Social environment, Ethnic differences, WOM, Subject norm, Image	Ismail & Osman, 2012, Venkatesh et al., 2012, Haque et al., 2009, Ahmad & Al-Zu'bi, 2011, Karimzadeh & Alam, 2012, Srivastava, 2007, Fonchamnyo, 2013, Lichtenstein & Williamson, 2006, Tarhini et al., 2015, Vijayendra & Renuka, 2015, Omotayo & Adebayo, 2015, Machogu & Okiko, 2015, Illia et al., 2015, Paschalodudis & Tsourela, 2014, Yayaa et al., 2013, Paschaloudis & Tsourela, 2014, Safeena et al., 2014, Dhurup et al., 2014
Substitution	Availability, Location of E-bank and ATM, Anytime and anywhere banking facility, Infrastructure	Haque et al., 2009, Ahmad & Al-Zu'bi, 2011, Karimzadeh & Alam, 2012, Singhal & Padhmanabhan, 2008, Lichtenstein & Williamson, 2006, Tarhini et al., 2015, Vijayendra & Renuka, 2015, Omotayo & Adebayo, 2015, Machogu & Okiko, 2015, Chin & Ahmad, 2015, Namahoot & Laohavichien, 2015, Paschalodudis & Tsourela, 2014, Mangin et al., 2014, Tsai et

		al., 2014, Safeena et al., 2014, Yayaa et al., 2013, Ismail & Osman, 2012, Namahoot & Laohavichien, 2015, Xue et al., 2011, Dhurup et al., 2014
Competitiveness	Relevant market share, Relative advantage, Banking Issue	Karimzadeh & Alam, 2012, Tarhini et al., 2015, Lichtenstein & Williamson, 2006, Safeena et al., 2014, Vijayendra & Renuka, 2015, Søilen et al., 2013
Regulation	Law, Legislation, Regulation, Rules	Haque et al, 2009, Safeena et al., 2014, Ismail & Osman, 2012

3. Methodology

The DEMATEL method is used to construct an evaluation performance model involving complicated causal and effect relationships between different factors by using matrices or digraphs visualization. It is designed to helps identify and clarify the core problems and directions for improvement to assist in decision making and the planning of strategies (Detcharat & Pongpun, 2013, Tzeng & Huang, 2011)

The traditional DEMATEL approach has been wildly adopted in research for establishing evaluation criteria for bank supervision in China (Tsai, et al., 2016), a merger and acquisition (M&A) valuation model established to evaluate the performance of three Taiwanese banks (Lee, 2013), and a study on the mobile telecommunication industry in Taiwan (Lee & Hsieh, 2011) to analyze the adoption of an integrated DEMATEL on technology acceptance model (Lee, et al., 2010). Traditional DEMATEL has also been used to evaluate and rank technology innovation capabilities (TICs) criteria in order to provide practical insight (Detcharat, et al., 2013 & 2015).

Some researcher use the Traditional DEMATEL technic in relation to environment issue to proposes a portfolio evaluation model for environmental supplier development programs (ESDPs), to consider low carbon management (Dou, et al, 2015), to examine high-technology product manufacturers' balance profits and environmental performance (Tsai, et al., 2015), and to evaluate green supplier development programs at a telecommunications systems provider (Fu, et al., 2011)

The Traditional Decision Making Trial and Evaluation Laboratory (DEMATEL) can be used to resolve complex and difficult problems, and it has been widely used as one of the best tools to solve the cause and effect relationship among the evaluation factors. The purpose of the DEMATEL is to examine the relationship between factors and to apply matrix computation to derive the causal relationship between the factors and degree to which the factors influence one another.

However, the indirect relation of a traditional DEMATEL is always far greater than its direct relation, because the indirect relation matrix is not normalized as in the case

of the direct relational matrix, and for this reason the traditional DEMADEL tends to be unfair and inaccurate. The generalized (shrinkage) DEMATEL and the balanced DEMATEL statistical approach were proposed by one of the authors at 2016. The balance coefficient and variation coefficient are thus provided, and the balance coefficient can be used to evaluate the degree of balance between indirect influences and direct influences of the DEMATEL.

To evaluate and compare the heterogeneous balance-variation pair-wise of coefficients for different DEMATEL approaches, the author has proposed an integrated validity index to evaluate different DEMATEL approach by combining balanced coefficients and variation coefficients.

Traditional DEMATEL, Generalized DEMATEL and Balanced DEMATEL approaches performed by following equations.

3.1 Traditional DEMATEL

The procedure for the traditional DEMATEL method is briefly introduced below:

3.1.1 Calculate the initial direct relation matrix Q

N experts are asked to evaluate the degree of direct influence between two factors based on a pair-wise comparison. The degree to which the expert e perceived factor i effects on factor j is denoted as

$$q_{ij}^{(e)}, e=1,2,..,N\ .\ \ q_{ij}^{(e)} \in \{0,1,2,3,4\},\quad i,\ j=1,2,...,.n \tag{1}$$

For each expert e, an individual direct relation matrix is constructed as

$$Q_e = \left[q_{ij}^{(e)} \right]_{n\times n}, e=1,2,..,N,\ \ q_{ii}^{(e)}=0, i=1,2,...,n \tag{2}$$

We can obtain their average direct relation matrix, called the initial direct relation matrix Q as follows

$$Q=\left[q_{ij} \right]_{n\times n}=\frac{1}{N}\sum_{e=1}^{N} Q_e,\ \ q_{ij}=\frac{1}{N}\sum_{e=1}^{N} q_{ij}^{(e)}\quad ,\ \ i,\ j=1,2,...,.n \tag{3}$$

3.1.2 Calculate the direct relation matrix A

$$A=\left[a_{ij} \right]_{n\times n}=\lambda^{-1}Q,\ \ \lambda=\max_{1\le i,\ j\le n}\left\{ \sum_{j=1}^{n} q_{ij}, \sum_{i=1}^{n} q_{ij} \right\} \tag{4}$$

where $a_{ii}=0, i=1,2,...,n,\quad 0\le a_{ij}\le 1, i\ne j, i, j=1,2,...,n$

and $$0\le \sum_{i=1}^{n} a_{ij}, \sum_{j=1}^{n} a_{ij} \le 1,\ \ i,\ j=1,2,...,n \tag{5}$$

3.1.3 Calculate the indirect relation matrix B and the total relation matrix T

Based on Markov chain theory, we have

$$\lim_{k\to\infty} A^k = 0_{n\times n} \tag{6}$$

The indirect relation matrix

$$B = \left[b_{ij}\right]_{n\times n} = \lim_{k\to\infty}\left[A^2 + A^3 + ... + A^k\right] = A^2\left(I - A\right)^{-1}, \tag{7}$$

The total relation matrix

$$T = \left[t_{ij}\right]_{n\times n} = A + B = \left[\left(a_{ij} + b_{ij}\right)\right]_{n\times n} \tag{8}$$

3.1.4 Calculate the relation degree and prominence degree of each factor

$$r_i = \sum_{j=1}^{n} t_{ij},\ c_i = \sum_{k=1}^{n} t_{ki},\quad i = 1,2,...,n \tag{9}$$

The value of r_i denotes the total dispatch for both the directly and indirectly effects, that factor i has on the other factors, and the value of c_i indicates the total receive for the both directly and indirectly effects, that factor i has on the other factors.

The relation degree of factor i is denoted as $x_i = r_i - c_i,\quad i = 1,2,...,n$ (10)

The prominence degree of factor i is denoted as $y_i = r_i + c_i,\ i = 1,2,...,n$ (11)

The relation prominence matrix is denoted as $\left(x_i, y_i\right)_{i=1}^{n}$ (12)

3.1.5 Set the threshold value (α)

For eliminating some minor effects elements in matrix T to find the impact-relations map, the suggested threshold value is as below: (Liu et al., 2015)

$$\alpha_Y = \frac{1}{n^2}\sum_{i=1}^{n}\sum_{j=1}^{n} t_{ij} \tag{13}$$

3.1.6 Build a cause and effect relationship diagram

3.2 Generalized DEMATEL

The indirect relation of a traditional DEMATEL is always far greater than its direct relation, that is unbalanced and unfair, because the indirect relation matrix is not normalized as is the direct relation matrix.

For overcoming this drawback, an external shrinkage coefficient of the indirect relation matrix, d, was provided to construct a better indirect relation matrix, and a generalized DEMATEL theory is obtained below: (Liu et al., 2016)

$$B_d = \left[b_{ij}^{(d)} \right]_{n\times n} = dA^2 \left(I - dA \right)^{-1},\ d \in \left[\frac{1}{2}, 1 \right] \tag{14}$$

$$T_d = \left[t_{ij}^{(d)} \right]_{n\times n} = A + B_d = \left[\left(a_{ij} + b_{ij}^{(d)} \right) \right],\ d \in \left[\frac{1}{2}, 1 \right] \tag{15}$$

The indirect relation matrix with shrinkage coefficient d, with a value between 0.5-1. If d=1, the new DEMATEL $\left(A, B_d \right)$ is just the traditional DEMATEL *(A, B)*. If d=0.5 · then $\max_{1\le i,j\le n} \left\{ \sum_{j=1}^{n} b_{ij}^{(d)}, \sum_{i=1}^{n} b_{ij}^{(d)}, \right\} \le 1$, and the new DEMATEL $\left(A, B_d \right)$ is feasible, since its indirect relation influence is no longer greater than its direct relation influence.

3.3 Balanced DEMATEL

The Generalized DEMATEL approach has not resolved the balanced coefficient problem. The indirect matrix and total matrix need to be normalized in order to obtain the balance coefficient. This approach is referred to as the Balanced DEMATEL.

If $A = \left[a_{ij} \right]_{n\times n}$ direct relation matrix, and $B = \left[b_{ij} \right]_{n\times n} = A^2 \left(I - A \right)^{-1}$,

$$\mu = \max_{1\le i,j\le n} \left\{ \sum_{j=1}^{n} b_{ij}, \sum_{i=1}^{n} b_{ij} \right\} \tag{16}$$

The normalized indirect relation matrix, B_N is defined by

$$B_N = \left[b_{ij}^{(N)} \right]_{n\times n} = \mu^{-1} B = \left[\left(\mu^{-1} b_{ij} \right) \right]_{n\times n} \tag{17}$$

The normalized total relation matrix is defined as

$$T_N = \left[t_{ij}^{(N)} \right]_{n\times n} = A + B_N = \left[\left(a_{ij} + \mu^{-1} b_{ij} \right) \right]_{n\times n} \tag{18}$$

Liu's balance coefficient is expressed as follows:

$$\beta\left(A, B \right) = \frac{2\sqrt{\mu}}{1+\mu} \qquad 0 \le \beta\left(A, B \right) \le 1 \tag{19}$$

Note that $\mu = 1 \Leftrightarrow \beta\left(A, B \right) = 1,\ \mu \ne 1 \Leftrightarrow \beta\left(A, B \right) < 1$

The internal shrinkage coefficient is defined below:

Definition *Internal shrinkage coefficient of the inderect relation matrix,* γ_δ

Let $A = \left[a_{ij} \right]_{n\times n}$ be the direct relation matrix of a DEMATEL, and $B = A^2 \left(I - A \right)^{-1}$

$$A^m = \left[a_{ij}^{(m)} \right]_{n\times n} = \left[\sum_{k=1}^{n} a_{ik}^{(m)} a_{kj} \right]_{n\times n},\ \delta^{(m)} = \max_{1\le i,j\le n} \left\{ \sum_{j=1}^{n} a_{ij}^{(m)}, \sum_{i=1}^{n} a_{ij}^{(m)} \right\} \tag{20}$$

If $\gamma_\delta = \underset{m\in N}{Sup} \left[\left(\delta^{(m)} \right)^{-1} \delta^{(m+1)} \right] \le 1$, then γ_δ is the internal shrinkage coefficient of indirect relation matrix B.

Some important properties of the external and internal shrinkage coefficients are

provided as follows:

Theorem 1. *Important properties of the* shrinkage coefficients *of a DEMATEL*

$(a)\ A=\left[a_{ij}\right]_{n\times n}=\left[a_{ij}^{(1)}\right]_{n\times n},\ A^{m+1}=\left[a_{ij}^{(m+1)}\right]_{n\times n}=\left[\sum_{k=1}^{n}a_{ik}^{(m)}a_{kj}\right]$

$a_{ii}=0,\ i=1,2,\ldots,n,\ a_{ij}\geq 0,\ i\neq j,\ i,j=1,2,\ldots,n,$

$(b)\ \delta^{(m)}=\max_{1\leq i,j\leq n}\left\{\sum_{j=1}^{n}a_{ij}^{(m)},\sum_{i=1}^{n}a_{ij}^{(m)}\right\},\ m\in N,\ \delta^{(1)}=1,\ \gamma_{\delta}=\sup_{m\in N}\left[\left(\delta^{(m)}\right)^{-1}\delta^{(m+1)}\right]\leq 1$

$(c)\ B_d=\left[b_{ij}^{(d)}\right]_{n\times n}=dA^2\left(I-dA\right)^{-1},\ d\in[0.5,1],\ d\ \textit{is the external shrinkage coefficient}$

$(d)\ \mu_d=\max_{1\leq i,j\leq n}\left\{\sum_{j=1}^{n}b_{ij}^{(d)},\sum_{i=1}^{n}b_{ij}^{(d)}\right\},\ \mu_1=\mu$

$\Rightarrow (i)\ \ \delta^{(m+1)}\leq\delta^{(m)}\leq 1,\ m\in N\ (ii)\ \mu=\lim_{t\to\infty}\sum_{m=2}^{t}\delta^{(m)}\ (iii)\ \mu<1\Rightarrow\mu_d<1\ \ (iv)\ \gamma_{\delta}<0.5\Rightarrow\mu<1$

Note that:

(a) From (i) and (ii) of Theorem 1, we know that the traditional DEMATEL is always unbalanced.

(b) From (iii) and (iv) of Theorem 1, we know that if $\mu<1$, then we obtain no Balanced DEMATEL for taking any external shrinkage coefficient.

In this paper, we can always obtain the Balanced DEMATEL by normalizing its indirect relation matrix as follows:

Definition, Balanced DEMATEL with normalized indirect relation matrix

If $A=\left[a_{ij}\right]_{n\times n}$ is the direct relation matrix, $B=\left[b_{ij}\right]_{n\times n}=A^2\left(I-A\right)^{-1}$ and

$$\mu=\max_{1\leq i,j\leq n}\left\{\sum_{j=1}^{n}b_{ij},\sum_{i=1}^{n}b_{ij}\right\} \tag{21}$$

The normalized indirect relation matrix, B_N is defined by

$$B_N=\left[b_{ij}^{(N)}\right]_{n\times n}=\mu^{-1}B=\left[\left(\mu^{-1}b_{ij}\right)\right]_{n\times n} \tag{22}$$

The normalized total relation matrix is defined as

$$T_N=\left[t_{ij}^{(N)}\right]_{n\times n}=A+B_N=\left[\left(a_{ij}+\mu^{-1}b_{ij}\right)\right]_{n\times n} \tag{23}$$

The Relation-Prominence of the DEMATEL$\left(A,B_N\right)$ is defined as

$$R(A,B_N)=\left(x_i^{(N)},y_i^{(N)}\right)_{i=1}^{n}=\left(r_i^{(N)}+c_i^{(N)},\ r_i^{(N)}-c_i^{(N)}\right)_{i=1}^{n} \tag{24}$$

$$r_i^{(N)}=\sum_{j=1}^{n}t_{ij}^{(N)},\ \ c_i^{(N)}=\sum_{i=1}^{n}t_{ij}^{(N)}$$

3.4 Liu's Validity Index

To evaluate and compare the heterogeneous balance coefficient and variation coefficient for different DEMATEL approach, a validity index is proposed as follow. A larger coefficient value represents greater discriminant power and better performance.

Liu's validity coefficient

$$V_L\left(A, B_d\right) = 1 - \frac{1}{1 + 5\sqrt{\sum_{i=1}^{n}\sqrt{\left(x_i^{(d)} - \bar{x}_d\right)^2 + \left(y_i^{(d)} - \bar{y}_d\right)^2}}} \tag{25}$$

$$\bar{x}_d = \frac{1}{n}\sum_{j=1}^{n} x_i^{(d)},\ \bar{y}_d = \frac{1}{n}\sum_{j=1}^{n} y_i^{(d)} \tag{26}$$

The Traditional DEMATEL, Generalized DEMATEL and Balanced DEMATEL approaches are compared and validated through a case study of Taiwan's internet finance environment as follows by using either the DEMATEL technique comparison or the validity index comparison.

3.5 Implementation: Taiwan as a Study Object

This study aims to explore the key factors that influence the development of internet finance through a study of Taiwan's internet finance environment. The research framework consists of a literature survey, statistical analysis and the measurement assessment of an evaluation model performed using a five-stage analysis procedure of the data to ensuring that the findings are derived from a well-constructed instrument possessing sound psychometric properties. Stage one, literature survey to establish evaluation model for explore the key factors that influence the development of internet finance. Stage two involves the implementation of a Taiwan case study, which begins with an analysis of demographic information to realize the characteristics of the data collected. In stage three, three different DEMATEL methods and a validity index assessment are compared. In stage four, Balanced DEMATEL is performed to measure the cause and effect relationship. Stage five provides cause and effect relationship diagram.

3.5.1 Survey and Sampling

In order to measure instrument development, a questionnaire was developed based on the operational definitions of the dimensions and divided into three categories. Category 1, focused on structured questions to measure the development of Taiwan's internet finance opinions. Category 2 consisted of DEMATEL questions to measure

the cause and effect relationship among the factors. Category 3 considered the Demographic information. Because the subjects of this study were confined to native Taiwanese internet finance experts, the questionnaire hence was written in Chinese using traditional Chinese characters.

The selection of internet finance experts was based on the following criteria. First, experts who with internet finance working experiences were selected. Second, experts who were involved in internet finance research were chosen. Third, experts with e-commerce management experience and who were familiar with internet finance business were selected.

Internet finance experts were separated into banking group and non-banking group to understanding the differences based on their awareness. A total 31 internet finance experts participated in this research, 11 from banking sector, and 20 from the non-banking sector. This survey meet the requirement of a minimum 7 observation sample for the DEMATEL survey. An interview survey conducted from March 3rd to April 3rd, 2016 was adopted, and the final survey obtained of 31 valid samples.

3.5.2 Demographic Information

According to the descriptive statistics based on the demographic information from the samples, 64.52% of the participants were in non-banking group category, 35.48% of banking group, the gender majority of 77.42% were male, 41.94% were over 51 years old and 55% were 31-50 years old. 41.94% of the participants had an education level with a bachelor degree, 45.16% had master degree, and 70% participants had more than 15 years of working experience. 41.94% were internet finance researcher and 45.16% were lecturers in internet finance. As for their internet finance experience, 38.70% had 5-7 year of internet finance business experience and the remaining 61.3% had 1-4 years of experience. The demographic result show that the participants were Taiwan internet finance experts who meet our research requirements.

4. Empirical Results & Analysis

4.1 Comparison Result through Three DEMATEL Approach and Validity Index

The questionnaires are separated into the Banking group and the Non-banking group and the initial direct relation matrix was established. The direct relation matrix was generated by normalized the initial direct relation matrix where the sum of row and column was not greater than 1. The direct relation matrix as following Table 2 and Table 3.

Table 2: The direct relation matrix of Banking group

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0	0.148	0.154	0.144	0.128	0.118	0.121	0.138	0.951
Convenience	0.118	0	0.134	0.144	0.128	0.138	0.118	0.141	0.921
Trust	0.154	0.148	0	0.134	0.121	0.128	0.141	0.134	0.961
Cost	0.167	0.138	0.148	0	0.131	0.131	0.131	0.128	0.974
User Profile	0.121	0.121	0.144	0.111	0	0.128	0.131	0.134	0.892
Substitution	0.134	0.141	0.141	0.128	0.134	0	0.141	0.131	0.951
Competitiveness	0.148	0.134	0.131	0.134	0.121	0.141	0	0.148	0.957
Regulation	0.157	0.151	0.138	0.128	0.121	0.144	0.141	0	0.98
Column Sum	1	0.98	0.99	0.925	0.885	0.928	0.925	0.954	

Table 3: The direct relation matrix of Non-banking group

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0	0.136	0.121	0.116	0.121	0.111	0.134	0.127	0.864
Convenience	0.137	0	0.137	0.104	0.121	0.112	0.136	0.109	0.856
Trust	0.137	0.117	0	0.116	0.124	0.116	0.132	0.122	0.864
Cost	0.147	0.122	0.109	0	0.101	0.101	0.126	0.107	0.812
User Profile	0.146	0.131	0.119	0.106	0	0.119	0.112	0.111	0.843
Substitution	0.147	0.136	0.127	0.106	0.111	0	0.116	0.114	0.856
Competitiveness	0.149	0.134	0.127	0.111	0.114	0.126	0	0.114	0.874
Regulation	0.136	0.136	0.137	0.124	0.112	0.122	0.127	0	0.894
Column Sum	1	0.911	0.878	0.781	0.802	0.806	0.883	0.804	

The indirect relation matrix is obtained by using the power methods from the direct relation matrix. The value of indirect relation matrix from Traditional DEMATEL is always far greater than its direct relation matrix, cause the unbalance calculation of the total relation matrix, thus the Traditional DEMADEL is unfair and inaccuracy. Generalized DEMATEL and the Balanced DEMATEL statistical approach were proposed by the authors at 2016, the authors using the shrinkage coefficient and the normalized indirect relation matrix to improve the unbalance problem.

This research aim to validate the three DEMATEL methods through a case study in Taiwan. The indirect relation matrix of banking group of Traditional DEMATEL, Generalized DEMATEL and Balanced DEMATEL are compared as following Table 4 and the non-banking group as following Table 5. The result show that the Balanced DEMATEL has the best performance.

Table 4: The DEMATEL Comparison of Banking Group

The Indirect Relation Matrix of Banking Group (Traditional DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	2.317	2.26	2.276	2.148	2.064	2.154	2.147	2.205	17.571
Convenience	2.241	2.217	2.217	2.088	2.008	2.091	2.089	2.144	17.096
Trust	2.317	2.281	2.317	2.17	2.085	2.172	2.162	2.227	17.731
Cost	2.342	2.31	2.325	2.211	2.107	2.197	2.19	2.254	17.937
User Profile	2.175	2.14	2.151	2.035	1.964	2.033	2.025	2.084	16.607
Substitution	2.299	2.26	2.277	2.15	2.062	2.165	2.141	2.206	17.559
Competitiveness	2.313	2.279	2.296	2.164	2.08	2.164	2.174	2.218	17.688
Regulation	2.358	2.322	2.342	2.21	2.122	2.208	2.201	2.283	18.046
ColumnSum	18.362	18.07	18.201	17.176	16.492	17.183	17.128	17.621	

The Indirect Relation Matrix of Banking Group (Generalized DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.128	0.115	0.115	0.109	0.106	0.112	0.111	0.113	0.908
Convenience	0.117	0.122	0.114	0.105	0.103	0.106	0.108	0.109	0.884
Trust	0.117	0.116	0.128	0.111	0.108	0.112	0.11	0.115	0.916
Cost	0.117	0.119	0.119	0.121	0.108	0.113	0.113	0.117	0.927
User Profile	0.113	0.111	0.109	0.106	0.107	0.104	0.103	0.106	0.859
Substitution	0.119	0.116	0.117	0.111	0.105	0.119	0.109	0.114	0.908
Competitiveness	0.118	0.118	0.119	0.111	0.107	0.11	0.119	0.112	0.914
Regulation	0.119	0.118	0.121	0.114	0.11	0.112	0.112	0.126	0.933
Column Sum	0.949	0.934	0.941	0.888	0.853	0.888	0.885	0.911	

The Indirect Relation Matrix of Banking Group (Balanced DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.126	0.123	0.124	0.117	0.112	0.117	0.117	0.12	0.957
Convenience	0.122	0.121	0.121	0.114	0.109	0.114	0.114	0.117	0.931
Trust	0.126	0.124	0.126	0.118	0.114	0.118	0.118	0.121	0.966
Cost	0.128	0.126	0.127	0.12	0.115	0.12	0.119	0.123	0.977
User Profile	0.118	0.117	0.117	0.111	0.107	0.111	0.11	0.113	0.904
Substitution	0.125	0.123	0.124	0.117	0.112	0.118	0.117	0.12	0.956
Competitiveness	0.126	0.124	0.125	0.118	0.113	0.118	0.118	0.121	0.963
Regulation	0.128	0.126	0.128	0.12	0.116	0.12	0.12	0.124	0.983
Column Sum	1	0.984	0.991	0.935	0.898	0.936	0.933	0.96	

Table 5: The DEMATEL Comparison of Non-Banking Group

The Indirect Relation Matrix of Non-Banking Group (Traditional DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.763	0.688	0.668	0.601	0.617	0.62	0.67	0.616	5.242
Convenience	0.74	0.698	0.659	0.598	0.612	0.614	0.664	0.615	5.199
Trust	0.746	0.692	0.681	0.601	0.616	0.618	0.67	0.617	5.242
Cost	0.703	0.652	0.633	0.58	0.587	0.587	0.635	0.586	4.963
User Profile	0.727	0.673	0.653	0.589	0.616	0.603	0.659	0.606	5.125
Substitution	0.737	0.682	0.661	0.597	0.614	0.625	0.668	0.614	5.198
Competitiveness	0.751	0.695	0.674	0.608	0.625	0.623	0.693	0.626	5.295
Regulation	0.77	0.709	0.686	0.618	0.638	0.636	0.693	0.65	5.4
Column Sum	5.938	5.488	5.314	4.791	4.923	4.926	5.352	4.931	

The Indirect Relation Matrix of Non-Banking Group (Generalized DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.117	0.098	0.096	0.086	0.088	0.089	0.095	0.087	0.758
Convenience	0.106	0.106	0.093	0.087	0.087	0.088	0.094	0.089	0.752
Trust	0.107	0.1	0.104	0.086	0.088	0.089	0.096	0.088	0.758
Cost	0.099	0.094	0.092	0.088	0.085	0.085	0.091	0.084	0.718
User Profile	0.103	0.096	0.094	0.085	0.093	0.086	0.096	0.087	0.741
Substitution	0.105	0.097	0.095	0.086	0.089	0.095	0.097	0.088	0.751
Competitiveness	0.107	0.1	0.097	0.088	0.09	0.089	0.106	0.09	0.765
Regulation	0.111	0.102	0.098	0.088	0.092	0.091	0.1	0.099	0.78
Column Sum	0.857	0.793	0.768	0.693	0.712	0.712	0.774	0.713	

The Indirect Relation Matrix of Non-Banking Group (Balanced DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.128	0.116	0.113	0.101	0.104	0.104	0.113	0.104	0.883
Convenience	0.125	0.118	0.111	0.101	0.103	0.103	0.112	0.104	0.876
Trust	0.126	0.116	0.115	0.101	0.104	0.104	0.113	0.104	0.883
Cost	0.118	0.11	0.107	0.098	0.099	0.099	0.107	0.099	0.836
User Profile	0.122	0.113	0.11	0.099	0.104	0.102	0.111	0.102	0.863
Substitution	0.124	0.115	0.111	0.101	0.103	0.105	0.113	0.103	0.875
Competitiveness	0.127	0.117	0.113	0.102	0.105	0.105	0.117	0.105	0.892
Regulation	0.13	0.119	0.115	0.104	0.107	0.107	0.117	0.11	0.909
Column Sum	1	0.924	0.895	0.807	0.829	0.83	0.901	0.83	

To evaluate and compare the heterogeneous balance-variation pair-wise nature of the different DEMATEL approaches, this study have proposed an integrated validity index to evaluate three different DEMATEL methods by combining the balanced coefficient and variation coefficient. The result of comparison are shown in Table 6. For the Banking group the coefficient is 0.913 and for the Non-banking group it is 0.927, showing that the Balanced DEMATEL approach has the largest coefficient value representing the largest discriminatory power and the best performance.

Table 6: The Validity Index Comparison

The Validity Index	Traditional DEMATEL	Generalized DEMATEL	Balanced DEMATEL
Banking group	0.689	0.912	0.913
Non-banking group	0.808	0.923	0.927

4.2 Result of Balanced DEMATEL Analysis

The Balanced DEMATEL analysis was performed through four steps. The first step was to obtain the total relation matrix through the Balanced DEMATEL method. The result are shown in Table 7 that follows for the Banking group and Table 9 for the Non-banking group. The second step is to calculate the prominence degree(D+R)and relation degree (D-R) from the sum of each row and column, for which the result are shown in Table 8 for Banking group and in Table 10 for Non-banking group. The third step is to prepare a cause and effect relationship diagram, (D+R) as the horizontal axis, (D-R) as the vertical axis and then map the data set to the diagram. Step four is to determine a threshold value and produce the cause and effect diagram. The prominence degree (D+R) represents the degree of importance of the internet finance platform. If the relation degree (D-R) is positive, it demonstrates that this dimension belongs to the cause group which indicates that this dimension has a higher degree of influence on the other dimension on internet finance platform. If the value is negative, it means that this dimension belongs to the effect group which will be significantly influenced by the other dimension on the internet finance platform. The result are shown in Figure 1 for Banking group and Figure 2 for Non-banking group.

4.2.1 Banking group

Table 7: The Total Relation Matrix for Banking Group (Balanced DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.126	0.271	0.278	0.261	0.24	0.235	0.238	0.258	1.908
Convenience	0.24	0.121	0.255	0.258	0.237	0.252	0.232	0.258	1.852
Trust	0.28	0.272	0.126	0.253	0.235	0.246	0.259	0.256	1.926
Cost	0.295	0.264	0.274	0.12	0.246	0.251	0.25	0.251	1.951
User Profile	0.24	0.238	0.261	0.222	0.107	0.239	0.241	0.248	1.796
Substitution	0.26	0.264	0.265	0.245	0.247	0.118	0.258	0.251	1.907
Competitiveness	0.274	0.259	0.256	0.252	0.235	0.259	0.118	0.268	1.921
Regulation	0.286	0.277	0.265	0.248	0.237	0.264	0.261	0.124	1.963
Column Sum	2	1.964	1.981	1.86	1.783	1.864	1.857	1.914	

Table 8: The prominence degree (D+R) and The relation degree (D-R) for Banking group

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation
D	1.908	1.852	1.926	1.951	1.796	1.907	1.921	1.963
R	2	1.964	1.981	1.86	1.783	1.864	1.857	1.914
D+R	3.908	3.817	3.908	3.811	3.58	3.771	3.778	3.877
D-R	-0.092	-0.112	-0.055	0.091	0.013	0.043	0.063	0.049

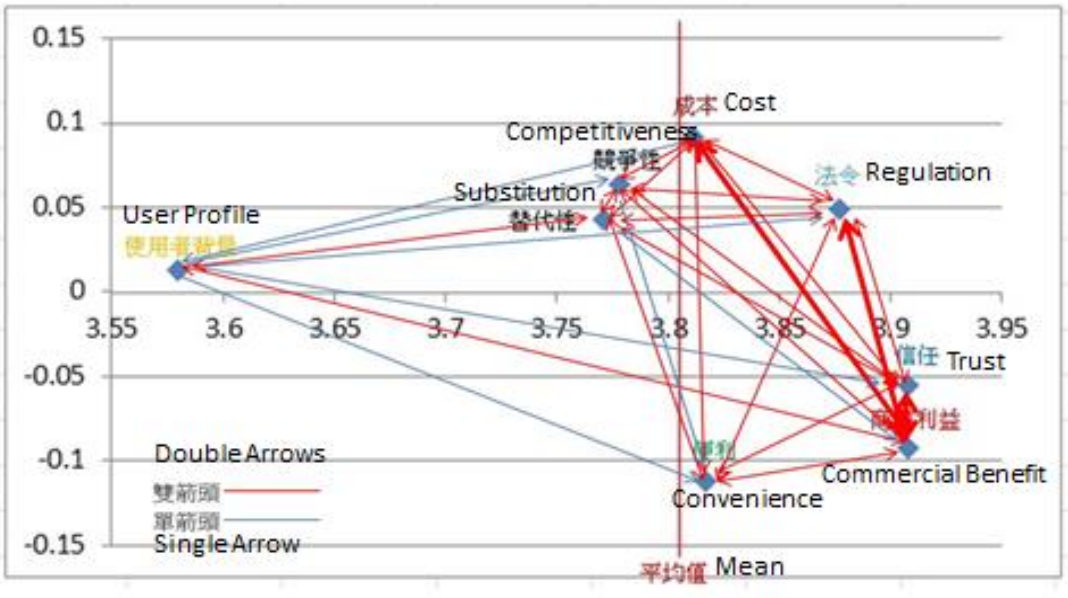

Figure 1: cause and effect relationship diagram for Banking group

(Threshold value = 0.238)

For the Banking group, the results show that the degree of prominence for the Commercial Benefit and Trust have larger value, which means that they are more

important than the other dimensions on internet finance platform, followed by Regulation, Convenience and Cost dimension. For the relation degree where D-R>0, the results demonstrate that the Cost dimension has a higher degree of influence on other dimension on internet finance platform, and is followed by Competitiveness, Regulation, Substitution and User Profile. On the other hand, for the relation degree where D-R<0, the results demonstrate that the Convenience dimension has a higher degree of influence on other dimensions on internet finance platform, and is followed by the dimension of Commercial Benefit and Trust.

As for the results from combining the prominence and relation degrees, the Banking group considers Commercial Benefit and Trust to be the most importance dimensions in term of the development of the internet finance platform. The Cost dimension has a higher degree of influence on the other dimension. Commercial Benefit is highly influenced by Cost, Regulation and Trust dimension.

4.1.2 Non-banking group

Table 9: The Total Relation Matrix for Non-Banking Group (Balanced DEMATEL)

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation	Row Sum
Commercial Benefit	0.128	0.251	0.233	0.217	0.224	0.215	0.247	0.231	1.747
Convenience	0.262	0.118	0.248	0.205	0.224	0.216	0.248	0.212	1.732
Trust	0.263	0.234	0.115	0.217	0.228	0.22	0.245	0.226	1.747
Cost	0.266	0.232	0.216	0.098	0.199	0.199	0.233	0.206	1.648
User Profile	0.268	0.244	0.229	0.205	0.104	0.221	0.223	0.213	1.706
Substitution	0.272	0.25	0.239	0.206	0.214	0.105	0.228	0.217	1.731
Competitiveness	0.276	0.251	0.241	0.213	0.219	0.231	0.117	0.219	1.766
Regulation	0.265	0.255	0.253	0.228	0.22	0.229	0.244	0.11	1.804
Column Sum	2	1.835	1.773	1.588	1.632	1.635	1.784	1.634	

Table 10: The prominence degree (D+R) and The relation degree (D-R) for Non-Banking Group

	Commercial Benefit	Convenience	Trust	Cost	User Profile	Substitution	Competitiveness	Regulation
D	1.747	1.732	1.747	1.648	1.706	1.731	1.766	1.804
R	2	1.835	1.773	1.588	1.632	1.635	1.784	1.634
D+R	3.747	3.567	3.52	3.236	3.337	3.367	3.55	3.438
D-R	-0.253	-0.104	-0.026	0.061	0.074	0.096	-0.018	0.17

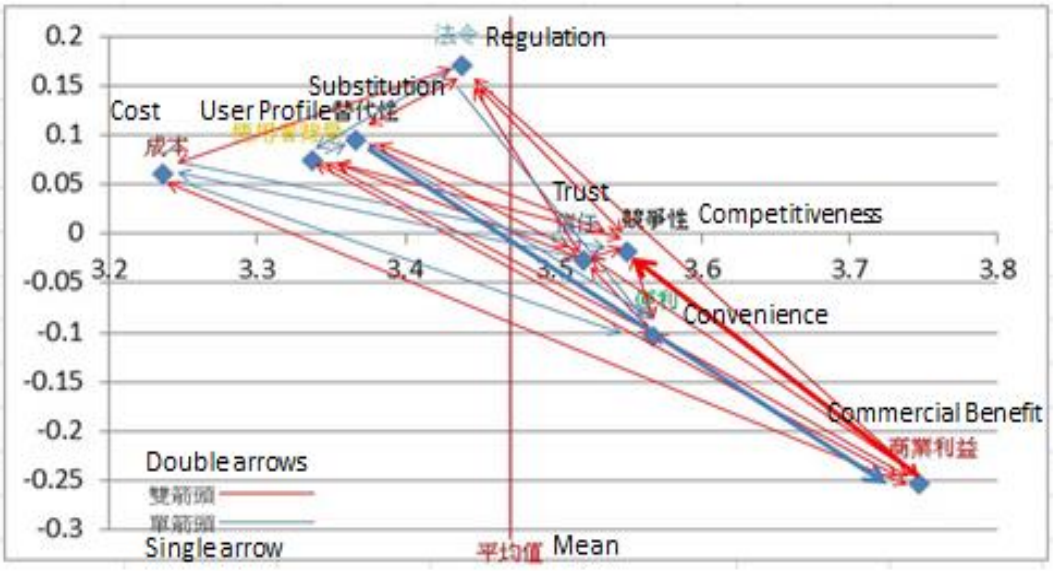

Figure 2: cause and effect relationship diagram for non-banking group
(Threshold value = 0.217)

As for the Non-banking group, the result show that the prominence degree of the Commercial Benefit has the largest value, which means that this dimension is more important than the other on internet finance platform, followed by Convenience, Competitiveness and Trust dimension. Regarding the relation degree where D-R>0, the results demonstrate that the Regulation dimension has a higher degree of influence on other dimensions on internet finance platform, followed by Substitution, User Profile and Cost. On the other hand, as the relation degree where D-R<0, the results demonstrate that the Commercial Benefit dimension has a higher degree of influence on other dimension on internet finance platform, followed by the dimension of Convenience, Trust and Competitiveness.

As the results analysis from combining prominence and relation degree, the Non-banking group considers the Commercial Benefit and Convenience to be the most importance dimension in development of internet finance platform. The Regulation dimension has a higher degree of influence on the other dimensions. Commercial Benefit is highly influenced by Substitution and Competitiveness dimension.

5 Conclusions and Limitation

5.1 Conclusions

This study uses a questionnaire to collect expert opinions. After performing the DEMATEL analysis, the results indicate that banking experts believe Commercial

Benefit and Trust to be the most important dimensions which will impact the operations of Internet finance, followed by Regulation, Convenience and Cost dimensions. The dimension that has the greatest impact on the other is Cost, followed by Competitiveness, Regulation, Substitution and User Profile. Commercial Benefit is the dimension with the most influence dimension on Cost and Regulation dimensions. Furthermore, the Cost and the Regulation dimensions also respectively influence the Commercial Benefit dimensions. On the other hand, Non-banking experts also believe that Commercial Benefit is the most important dimension, followed by Convenience, Competitiveness, and Trust. The dimension that has the greatest impact on the others is Cost, followed by Substitution and User Profile. Furthermore, the dimension of Commercial Benefit has the greatest influence on dimension of Competitiveness. The dimension of Regulation will influence on the dimension of Commercial Benefit. In terms of business practice, Commercial Benefit is the key factors that affects the development of Internet financial in Taiwan. The Cost dimension is an important aspect of its operation, but at the same time the demand of consumers are for Security and providing multi-functional system. Therefore, internet finance 0perators need to cooperate to balance those two aspects to take advantage of the Commercial Benefit. This study provides local governments and Internet finance developing countries with guidelines when formulating internet finance development policies and strategies.

This study establishes an evaluation model with 8 dimensions of the development of internet finance through a literature survey and by examining the cause and effect relationship among constructs through a Balanced DEMATEL. This research also reviews both Banking group and Non-banking group to determine similarities and differences in terms of their perceptions toward to the development of internet finance in Taiwan. The result demonstrate that the Commercial Benefit dimension is the most importance construct which followed by Cost and Regulation. In other words, Commercial Benefit is an important indicator of the operation of the internet finance in Taiwan and the start-up cost influence the Commercial Benefit and Competitiveness. Regarding Taiwan's regulatory issues, the local government of Ministry of Finance and Financial Supervisory Commission should consider opening up the internet finance regulation for marketing purposes in order to provide consumers with convenient financial services and thereby establish an active internet financial market.

Non-banking group experts, who from e-commerce industry have B2C finance business experiences, believe Convenience and Commercial Benefit are important, and that Substitution and Competitiveness will also influence the Commercial Benefit. They consider that innovative service development, a focus on ease of use, usefulness

factors of Convenience will attract the intention of customer to use the services and thereby lead to the establishment of a more competitive internet finance platform.

In spite of Taiwan having a mature finance environment, this study's results indicate that, under the Trust and Convenience condition, consumers in Taiwan demand an internet finance service that is highly efficient and one that provides multi-functional system that meets consumer needs. Therefore, this research would like to suggest that Taiwan's financial authorities actively open up the market to non-banking corporations to participate in the internet finance market in order to enhance the quality of innovation services. The internet finance managers should integrate the local financial services with local characteristics to establish a more competitive internet finance market. This study can provide local governments and developing countries seeking to promote internet finance with guidelines when formulating internet finance development policies and strategies.

5.2 Limitation

1. This research is based on using the internet finance environment in Taiwan as a case study. The cultural differences, financial maturity and consumer habits of different regions may lead to different levels of acceptability of internet finance platform. A further study of key factors that will influence the development of internet finance in different region can be considered.
2. This study suggests that future studies could select a specific internet financial services platform and explore different perspectives for different consumer groups in the future.

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