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An empirical study of on-line tax filing acceptance model: Integrating TAM and TPB

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This study integrated theory of planning behavior (TPB) and technology acceptance model (TAM) to investigate the determinants affecting taxpayers' on-line tax filing. According to the Global e-Government Study of Brown University in the United States, Taiwan's ranking was the world's first in 2002. Hence, this study sampled 422 online taxpayers in Taiwan and questionnaire-based empirical study was used to collect data. The empirical results showed that: (1) Attitude was the primary factor affecting on-line tax filing, but "attitude" was also affected by "perceived usefulness", "perceived ease of use", "tax equity", "social norm", and "moral norm"; (2) Both TAM and TPB could be successfully integrated to explain online tax filing behaviors, and correlations were found between TAM factors and TPB factors; (3) Finally, we built a best-fitted model for on-line tax filing. This model would be the reference for establishing e-government.

Key words: Theory of planning behavior (TPB), technology acceptance model (TAM), tax equity, social norms, moral norms.

INTRODUCTION

The use of internet has been widespread and has been more diversified. The value-added of internet will relatively be increased which also benefits the users (Pavlou et al., 2007; Barako et al., 2008). As a result, there are more and more corporations or organizations wish to transmit information or trade via internet (Chi et al., 2007; Haque et al., 2009). E-service is the term referring to the provision of customer services via the internet (Prins and Verhoef, 2007) which is valued by government in every country (Efebera et al., 2004; Briggs, 2008). E-government's prime object is promotion of executive efficiency and innovation of governmental services through good command of the trends of modern information and communication technologies (Fu et al., 2006). On the other hand, government's major target is enhancing quality of affair service in order to support governmental evolution and its progress towards citizen-directed smart government. Many countries have an important task in their e-governments, internet taxation service (Horst et al., 2007; Briggs, 2008). Given rapid development of internet

technology, information transmission through internet and safety mechanism of identity authentication have been well developed (Haque et al., 2009), and so on-line tax filing is becoming more acceptable among citizens of many countries. According to the data released by SBC communications, 73% of users aged 18 - 30 had their tax filing via internet in U.S.A. Almost three quarters of young people tend to use on-line tax filing which is more convenient and quicker than traditional paper tax-filing. On-line tax filing has been an important e-service area for the U.S. Government. In contrast with traditional time-consuming taxation mode through hard copy sent by post, internet taxation takes about 30 min in average (Efebera et al., 2004). For taxpayers who have Citizen Digital Certificates, they can download their tax statement and finish tax declaration within 5 - 10 min. In this way they save the inconveniences of declaring tax at the entity counters of the taxation authority.

The government in Taiwan has also launched the electronic government (e-government) policy to encourage citizens file tax via internet. According to the Global e-Government Study of Brown University in the United States, Taiwan's ranking was the world's first in 2002. With the rapid growth of internet technology,

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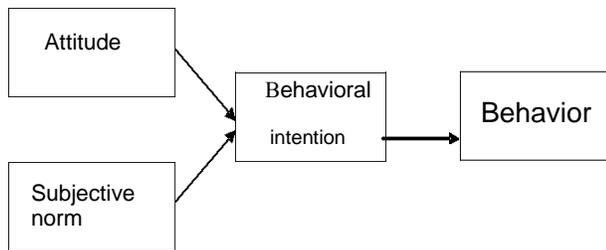


Figure 1. Theory of reasoned ACTION.
Resource: Fishbein, M., and I. Ajzen. 1975. *Belief, attitude, intention, and behavior: an introduction to theory and research*. MA: Addison-Wesley, p. 302.

Taiwan citizens believe in the security system of information transmission and identity authentication on the internet. The use of on-line tax filing has been increasing every year. There was 1,713,441 pieces of on-line tax filing for individual income tax in 2007. It accounted for 45.31% of the total tax filing in nationwide. The percentage of corporations using on-line tax filing even reached 96.97%. However, the percentage of individual taxpayers using on-line tax filing for income tax is less than the corporations. To sum up, it is an important research issue to investigate the factors affecting individual taxpayers on their acceptance behavior of on-line tax filing.

Most prior studies examine the effect of equity perceptions on taxpayers' tax compliance intentions. Equity perceptions include vertical (Jackson and Milliron, 1986), horizontal, and exchange equity (Moser et al., 1995). However, these studies only focus on personal perceptions and neglect the importance of social environmental factors affecting taxpayers' tax compliance intentions. In recent studies by Efebera et al. (2004) apply the theory of planned behavior (TPB) to explore the determinants of on-line tax filing which include subjective norms and legal sanctions. Hsu and Chiu (2004) decompose TPB into internet self-efficiency, perceived risk, perceived playfulness and perceived controllability. The empirical results suggest that users' e-service continuance intention is determined by internet self-efficiency and satisfaction. Fu et al. (2006) on the other hand, focus on the intention of on-line tax filing. They extend the concept of TPB as the main framework, and they also propose that the perception of information technology would affect taxpayers to file tax on-line. To sum up, the empirical results of the above-mentioned literatures prove that TPB could be applied to explain the behavioral process of human being engaged in or accepted e-government service.

The purpose of this study is to discuss the factors affecting taxpayers to accept on-line tax filing. While prior literatures have advanced the understanding of acceptance on-line tax filing, this paper contributes to extant literatures in five ways. First, we integrate TPB and

technology acceptance mode (TAM) to elucidate factors which affect taxpayers' acceptance for online tax filing.

TPB includes factors such as perceived behavioral control, subjective norms and attitude, while TAM includes perceived usefulness and perceived ease of use. This paper further explores an important perspective, the correlation between these theories, which is neglected by previous studies. Second, related studies about "subjective norms" emphasize merely on the effect of "social norms" (Hsu and Chiu, 2004; Fu et al., 2006), but neglect factor of personal "moral norm" proposed by Randall and Gibson (1991). It is a contribution of this paper to contain moral norm, as it is not only a belief of an individual taxpayer's perspective, but also an antecedent which affect subjective norms. Third, from the aspect of cognitive psychology, belief is the major factor which affect attitude (Sternberg, 2005). As set forth above, social norms and moral norms are both believes, so this paper deduced, based on literatures, that social norms and moral norms are major antecedents which affect attitude. This proposition compensates the previous researches only on the impact of tax equity perceptions to attitude, rather than the correlation with belief antecedents and attitude. Fourth, although Fu et al. (2006) indicate the importance of the perceptive factors towards information technology, no explanations are accounted for the correlation between these factors and TPB factors (perceived behavioral control). This paper reasons the relationship among these factors based on relative literatures, which is another contribution of this paper. Fifth, previous studies mostly aim to discuss issues which affect tax compliance intentions (Moser et al., 1995; Efebera et al., 2004) or on-line tax filing intention (Hsu and Chiu, 2004; Fu et al., 2006; Ramayah et al., 2009), while the issue whether subsequent taxation behaviors of taxpayers appeared or not are not discussed. Therefore, this paper includes "on-line tax filing behaviors" to supplement the insufficiency of previous studies. Summing up of the foregoing, this paper not only integrates the perspectives of TPB and TAM to discuss the factors which affect taxpayers' on-line tax filing, but also focuses on the insufficiency of previous studies to add new variables and discussion about causality between factors. Finally, the on-lone tax filing acceptance model is proposed. The empirical results could provide the government improvements on the current e-government operation and a reference for future policy-making.

LITERATURE REVIEW

Theory of planned behavior (TPB)

Early studies mainly focus on theory of reason action (TRA) as identified by (Fishbein and Ajzen, 1975), shown in Figure 1; explaining that individuals adopt or take

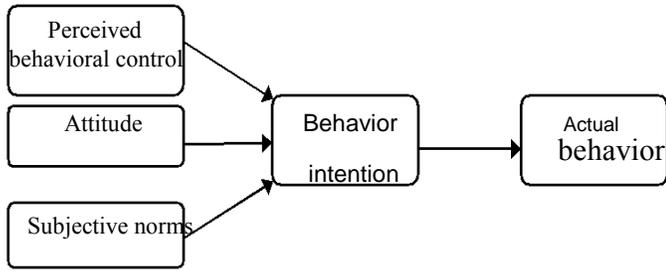


Figure 2. TPB model.

Resource: Ajzen I (1985). From intention to actions: a theory of planned behavior. In: Kuhl J, Beckmann J (eds). Action-control from cognition to behavior. Springer-Verlag Berlin Heidelberg, p.14.

certain behavioral activities. TRA is based on the fundamental variables of attitude and subjective norm.

The two variables are seen to have a positive effect on individuals' behavioral intentions, which positively induce individuals' actual action. Attitude is an individual's positive or negative evaluation of self-performance of a particular behavior. The concept is the degree to which performance of the behavior is positively or negatively valued. Subjective norm is an individual's perception about particular behavior, which is influenced by the judgment of significant others (e.g., parents, spouse, friends, teachers). Behavioral intention is an indication of an individual's readiness to perform a given behavior and it is assumed to be immediate antecedent of behavior. However, the basic hypothesis of TRA states that the occurrence of behavior is based on volitional control of one's willpower (Fishbein and Ajzen, 1975). Thus, the behavior occurs mostly from one's willing. An individual would make behavior decision according to one's preference. Therefore, the situation of losing self-control occurs when individuals face uncontrollable factors such as a lack of external resources, opportunities, or capacity. At the same time, TRA is not sufficient to explain and predict the resulting behavior. Thus, Ajzen (1985) modifies TRA and further proposes the theory of planned behavior (TPB). Ajzen (1985) proposes TPB to explain and predict human behavior patterns. TPB extends the theoretical framework of TRA and adds perceived behavioral control to account for individuals' uncontrollable factors (Figure 2). TPB is founded the three factors as perceived behavioral control, attitude, and subjective norms. Hence, behavioral intention is influenced by perceived behavioral control, attitude, and subjective norms. Actual behavior is, in turn, determined by behavioral intention. Among all, perceived behavioral control refers to individual's perceived ease or difficulty of performing the particular behavior. Figure 2 shows the TPB model.

In recent years, the use of internet has been widespread and has been more diversified. Studies on TPB applying on electronic commerce have increased. Tan and Teo (2000) integrate TPB and diffusion of

innovation theory to investigate the factors that affect people's intention towards using internet banking. Empirical results show that attitude and perceived behavior control would positively affect people's intention to use internet banking. In the subsequent studies, Huang et al. (2006) find that TPB indeed can be explained the people's behavioral intention of on-line tax filing. Hsu et al. (2006) review users' continual behavior towards internet shopping by longitudinal investigation, which not only employ TPB factors (attitude, subject norms and perceived behavior control) but also integrate expectation disconfirmation theory to construct the research model. The empirical results show that subjective norms, attitude, and perceived behavior control are the major factors affecting consumers' continuous intention of internet shopping. The above research viewpoint focuses on the social aspect rather than personal view. In terms of subjective norms, those studies only emphasize on social norms but neglected individual's internal factors like moral norms. In addition, equity concept which is respected by accounting scholars (Jackson and Milliron, 1986; Moser et al., 1995; Efebera et al., 2004) is also omitted in the pre-factors. To sum up, the empirical results of the above-mentioned literatures prove that TPB could be applied to explain the behavioral process of human being engaged in or accepted information technology.

Technology acceptance model (TAM)

Davis, Bagozzi, and Warshaw (1989) propose TAM to explain the conceptual model that users' intention or accept degree toward information system or new technology. As shown in Figure 3, TAM is constructed on the foundations of perceived usefulness and perceived ease of use. Perceived usefulness refers individual believe improve the degree of job performance through using particular new technology and information system. Perceived ease of use indicates how ease individual learn how to operate or use new technology or information system (Davis et al., 1989; Gefen et al., 2003). The model place more emphasis on perceived ease of use would positively affect perceived usefulness. Exogenous variables such as environment are also the antecedent that induces perceived usefulness and perceived ease of use. Thus, TAM is based on both important perceptive factors as perceived usefulness and perceived ease of use. TAM is widely applied on the researches of information technology. Liu and Arnett (2000) examine the significant variables to build a successful website based on TAM theory. Gefen et al. (2003) combine TAM and trust to propose an integrate model for explaining online consumer behavior. Pavlou (2003) proposes e-commerce acceptance model of online consumers by separating applying experiment designs and survey. Follow-up studies such as Horst, Kuttschreuter and Gutteling (2007) discuss whether or not the government of Netherlands should serve the public with electronic government like

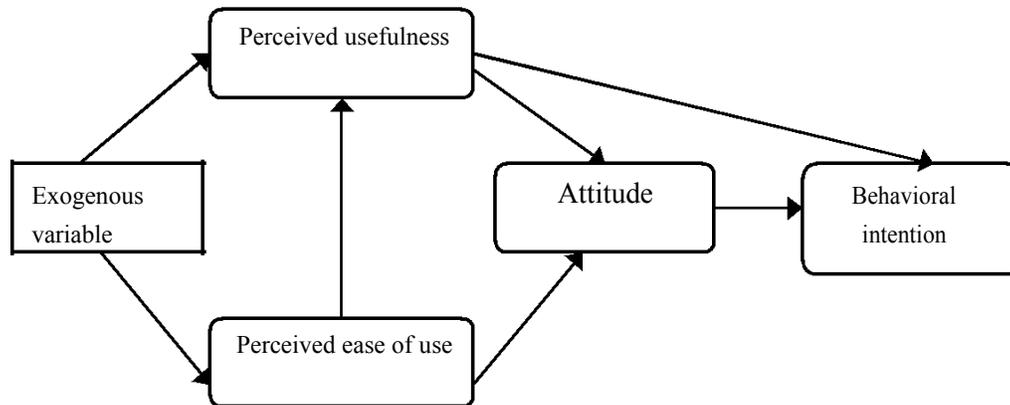


Figure 3. Technology acceptance model.
 Resource: Davis FD, Bagozzi RP, and Warshaw PR (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8): p. 985.

other countries do. The study integrates TAM factors, the experiences of the public, perceived risk and faith. The empirical results show that the premise of e-government is that people fully trust the governmental organization and that they highly identify with information technology. As the result of the empirical study, scholars find TAM is not only to apply to examine new information technology accept intention or behavior, and further to ensure TAM suitable for the explanation of online user behavior issues (Liu and Arnett, 2000; Gefen et al., 2003; Pavlou, 2003; Horst et al., 2007).

On-line tax filing

General speaking, there are three ways to file tax which are manual filing, on-line tax filing and two-dimensional bar code tax filing (Efebera et al., 2004; Briggs, 2008). This study focuses on on-line tax filing that is defined as individual taxpayers or companies file their taxes via internet. To analyze in a practical aspect, American Institute of Certified Public Accountants (AICPA) has already announced to provide WebTrustSM website security assurance service for the on-line tax filing system (Gray and Debreceny, 1998). In other words, internet security assurance service has provided American on-line tax filing system with reasonable guarantee of secure transaction mechanisms, such as information disclosure, transaction transmission, information privacy, in order to reduce perceived risk of taxpayers' on-line tax filing.

Because governments in various countries pay high attention to the electronic services, there are many studies on on-line tax filing. For examples, Warkentin et al. (2002) discuss the factors affecting the public to use e-government services, including cultural variables, trust, perceived risk, and perceived behavioral control. However, this research is a descriptive paper which only carries out the theme but lack of empirical investigation on

the feasibility of the research framework. Hsu and Chiu (2004) investigate the acceptance model of the public toward e-government service based on TPB. The empirical result shows that taxpayers' continuance intention is determined by TPB factors (self-efficacy, perceived controllability) and satisfaction. In further studies, Efebera et al. (2004) employ TPB to explore the determinants of on-line tax filing which include subjective norms and legal sanctions. The contributions of this literature are to (1) increase the importance of low-income individual taxpayer in tax compliance model; (2) add vertical, horizontal and exchange equity as the new variables that affect the intension of tax compliance. This paper continues its view. The on-line tax filing acceptance model of taxpayers can be explained effectively with the integration of TPB factors (perceived behavioral control and subjective norms) and tax equity perceptions (horizontal, vertical and exchange equity). Fu et al. (2006) believe that the Taiwan government still needs the help of information technology in multi-aspect. They integrate partial TPB factors and partial TAM factors to investigate the determinants affecting taxpayers on the choice of tax filing methods.

Empirical results show that perceived usefulness is one of the TAM factors affected on-line taxes filing intention; while subjective norms and self-efficacy are the TPB factors affected on-line tax filing intention. Even so, this study examines either their correlation between TPB factors and TAM factors or the influence of attitude on on-line tax filing intention. Thus, the paper integrates both TAM and TPB in order to effectively explain the on-line tax filing acceptance model of individual taxpayers. On the other hand, complete determinants are added in the research model, including TAM factors (perceived ease of use, perceived usefulness, and behavioral intention), TPB factors (attitude, perceived behavioral control and subjective norms), tax equity and moral norms. Besides, this study also explains the relationship among the factors

based on relative literatures and hypothesis reasoning.

METHODOLOGY

Research model

Apart from integrating the concept of TAM and TPB, this study also considers tax equity and norms factors. According to the literature review, we know that perceived behavioral control, attitude and subjective norms are the determinants affecting behavioral intention (on-line tax filing intention); and on-line tax filing intention affects on-line filing actual behavior. Based on the model of TAM, perceived usefulness and perceived ease of use are considered as factors affecting attitude. We further discuss the relationship between perceived usefulness, perceived ease of use and perceived behavioral control based on relative literatures and hypothesis reasoning. Moreover, most of the studies emphasize on social norms, but we also cite moral norms proposed by Randall and Gibson (1991). We examine the impact of social norms, moral norms on subjective norms. Furthermore, we reason the influence of social norms and moral norms on attitude. To sum up, we believe that attitude is the key factor affecting taxpayers' intention of on-line tax filing. Finally, we propose an on-lone tax filing acceptance model of taxpayers, as shown in Figure 4.

Research hypotheses

The relationship between TAM factors and TPB factors

Perceived behavioral control roots from the interaction degree from users' perception on modification, adjust and usage of orders in information system (Hoffman and Novak, 1996). Thus, the contents and information completeness of on-line tax filing system would be able to satisfy and response the needs from the users. The higher degree of perceiving usefulness from on-line tax filing system would make taxpayers perceive that the system can increase the tax filing efficiency and convenience. On the other hands, the convenience and promptness that on-line tax filing system brings will increase taxpayers' perception of tax filing efficiency. Taxpayers will then have positive attitude toward on-line tax filing behavior. When the users perceive the usefulness of on-line tax de system is higher, their attitude will be affected positively. The study formulates the following hypotheses as above mentioned.

H₁: Perceived usefulness will be positively related to perceived behavioral control.

H₂: Perceived usefulness will be positively related to attitude.

When taxpayers understand or learn the on-line tax filing system quicker, the filing efficiency and accuracy will be increased. Taxpayers can complete tax filing quicker (perceived usefulness) when they perceive the ease of use of the system is higher (Fu et al., 2006). Hence, perceived ease of use is the determinant of perceived usefulness. Besides, taxpayers are able to complete the filing easier if the government provide a more user-friendly on-line tax filing system (simple operation, easy-to-understand interface, and check the tax exemptions automatically) (Ramayah et al., 2009). The possibility of using on-line tax filing will be increased at the same time. Thus, this paper infers that higher perceived ease of use will produce perceived behavioral control. On the other hands, taxpayers will know the advantages of the system only if it is easy to operate (Warkentin et al., 2002). They will also have a positive attitude toward the system. When users perceive that the system is easy to operate, they will have more positive attitude. This study formulates the following hypotheses as above mentioned.

H₃: Perceived ease of use will be positively related to perceived usefulness.

H₄: Perceived ease of use will be positively related to perceived behavioral control.

H₅: Perceived ease of use will be positively related to attitude.

The relationship between tax equity and attitude

Tax equity perceptions include vertical (Jackson and Milliron, 1986), horizontal, and exchange equity (Moser et al., 1995). Vertical equity refers to the perceived tax burden as compared to the lower income taxpayers (Jackson and Milliron, 1986). Individual taxpayer's taxation burden could be equalized and moreover the positive attitude of taxpayers against taxation would be induced if the government regulate same tax amount for taxpayers who have same income, property, or taxing ability. Besides, horizontal equity refers to the taxpayers' equity of the tax burden as compared to other taxpayers with equivalent economic means (Moser et al., 1995; Efebera et al., 2004). If the government regulate differential taxation scales for taxpayers' with different taxing ability, that is, high-income taxpayers afford higher tax amount and low-income taxpayers afford lower one, then taxpayers' evaluation and confidence in the fair taxation system would be enhanced (attitude). Exchange equity refers to the perceived benefits taxpayers receive relative to the taxes they pay (Efebera et al., 2004). If the government make proper use of the tax revenue in infrastructure, environment emphasis, and ecology conservation so as to improve quality of living environment for our people and enhance competition of our nation, the people will represent trust and satisfaction to government. This will also promote positive response tendency of the people against government's proper use of tax revenue, continuous confidence, and emotional intensity, thus convince taxpayers to obey government's policy objective and to accomplish the bounden duties assigned by the nation. This paper proposes the below hypothesis:

H₆: Tax equity will be positively related to attitude.

The relationship between norms and TPB factors

Norms can be divided into two factors: social norms (Beck and Ajzen, 1991) and normal norms (Randall and Gibson, 1991). Social norms refer to the pressure from society when an individual is engaging in target behavior and change his behavior due to the pressure (Beck and Ajzen, 1991). Taxpayers' perception of on-line tax filing will be affected by stronger external environment. For instance, the government compels the taxpayers to use on-line tax filing, or taxpayers wish to match the social or group in terms of unity, social culture, family, friend, neighborhood, colleagues, etc. From the aspect of cognitive psychology, belief is the major factor which affect attitude (Sternberg, 2005). As set forth above, social norms is the belief, so this paper deduces that attitude will be more positive when the social norms are stronger. Besides, relative researches indicate that social pressures and reference groups affect taxpayers' belief significantly (Fishbein and Ajzen, 1975; Beck and Ajzen, 1991). In other words, the cause taxpayers who are affected by external groups could sometimes not be able to control their perception of on-line tax filing but in fact limited by the social atmosphere and advise of stakeholders (Fishbein and Ajzen, 1975). In sorts, social norms positively affect subjective norms.

Other the other hands, moral norms refer to an individual decides to engage in a target behavior, he will first be affected by personal internal moral and conscience and then lead his behavior (Randall and Gibson, 1991). If the taxpayers have positive moral norms, they have the faith to pay tax according to law. Therefore, individual moral orientation determines his/her perspective and evaluation of

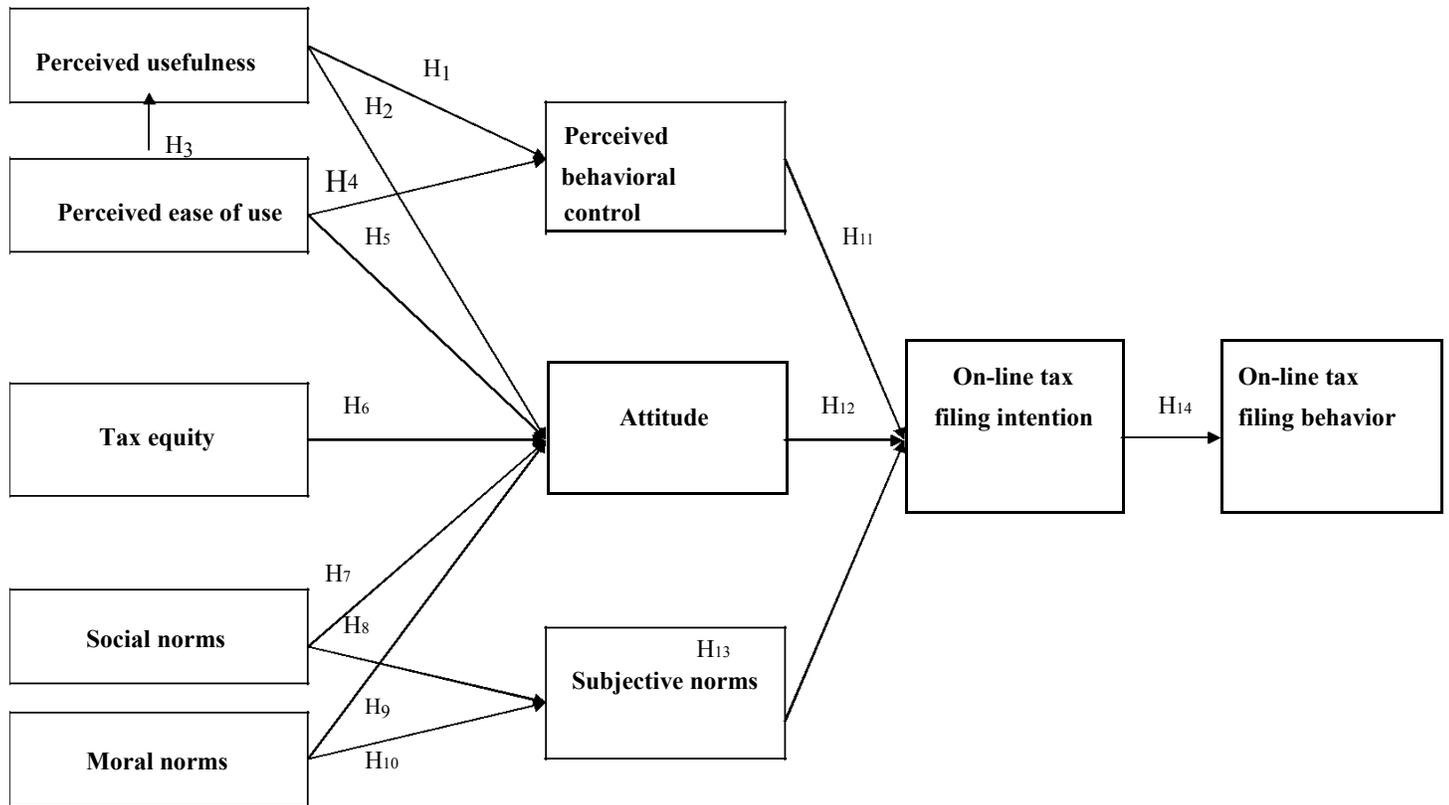


Figure 4. Research model.

specific events. In addition, the more a person has positive internal moral norms, such as being against tax evasion, declaring actual tax amount, and agreeing with government's policy, the more such belief directly affects individual's subjective norms against taxation. To sum up, this study formulates the following hypotheses as above mentioned

- H₇: Social norms will be positively related to attitude.
- H₈: Social norms will be positively related to subjective norms.
- H₉: Moral norms will be positively related to attitude.
- H₁₀: Moral norms will be positively related to subjective norms.

The determinants of on-line tax filing intention and behavior

If information system is established with well-equipped IT infrastructure, such as search engine, safety mechanism, users' perceived control would increase (Mathwick and Rigdon, 2004). Hence, the on-line tax filing offers excellent IT infrastructure and transaction safety would avoid the inconvenience commuting to internal revenue service (IRS). When taxpayers have positive perception of on-line tax filing, which means they have sufficient understanding about on-line tax filing and are able to operate the system. Perceived behavioral control is affected positively and behavioral intention of on-line tax filing will increased as well. Besides, when taxpayers have more positive attitude toward the on-line tax filing system provided by the government, they believe they can be benefited by the system (such as enjoying fast, accurate, convenient service without queuing and also having the tax refund quicker). Hence, behavioral intention of using the system in the future will be more positive. Taxpayers can be affected by external factors such as pressure from the society, opportunities,

co-workers, security problem, social practices or time in deciding to use on-line tax filing (Horst et al., 2007). Thus, the behavioral intention of using on-line tax filing in the future is positively affected when the taxpayers are facing greater external environment control. Finally, taxpayers can learn that there is positive behavioral intention behind the advantages and benefits of the on-line tax filing system provided by the government. There will be positive influence of the actual behavior happen in the future. This paper proposes the below hypotheses:

- H₁₁: Perceived behavioral control will be positively related to on-line tax filing intention.
- H₁₂: Attitude will be positively related to on-line tax filing intention.
- H₁₃: Subjective norms will be positively related to on-line tax filing intention.
- H₁₄: On-line tax filing intention will be positively related to on-line tax filing behavior.

Measurements

With respect to the measurement of the variables (see Appendix), perceived ease of use and perceived of usefulness were measured using a revised 11-item scale developed by Pavlou (2003) and Gefen et al. (2003).

The scale of tax equity was adopted from Efebera et al. (2004). Social norms and moral norms were measured using a revised 6-item scale developed by Efebera et al. (2004) and Randall and Gibson (1991). On the other hand, the scale of perceived behavioral control was adopted from Hsu and Chiu (2004). Attitude was measured using a revised 3-item scale from Hung et al. (2006). Finally, the scale of subject norms and on-line tax filing intention

Table 1. Demographic profile of samples (n = 422).

Feature	Description	Samples	Percentage (%)
Gender	Male	190	45
	Female	232	55
Age	Under 20	6	1
	21~30	168	40
	31~40	153	36
	41~50	61	15
	51~60	32	8
	Over 61	2	0
Education level	High school or below	157	37
	University	186	44
	Graduate school or above	79	19
Marital status	Married	169	40
	Single	253	60
Job category	School	43	10
	Chief or staff in private enterprise	187	44
	Military, government, teaching staff (incl. public enterprise)	70	17
	Worker (incl. agriculture, forestry, fishing)	10	2
	Professional and technical staff (e.g. accountant, etc)	46	11
	Owner/dealer of private enterprise (incl. self-employed)	16	4
	Unemployed/retired	19	5
	Others	31	7
Period of using internet	Within 1 year	3	1
	1 year but less than 2 years	8	2
	2 years but less than 3 years	19	5
	3 years but less than 4 years	27	6
	4 years but less than 5 years	18	4
	5 years but less than 6 years	33	8
Over 6 years	314	74	

were adapted from Fu et al. (2006). On-line tax filing behavior was measured using a revised 3-item scale developed by Ajzan (1991).

Data collection and sampling procedure

According to the Global e-Government Study of Brown University in the United States, Taiwan's ranking was the world's first in 2002. Hence, the research objects are taxpayers who have filed tax on-line in Taiwan area.

This study also applies online questionnaires to obtain taxpayers samples. Subjects of this paper are citizens of Taiwan area who have experiences of internet taxation. The questionnaire were made by and distributed through and collected by a questionnaire dedicated website MY3Q (<http://www.my3q.com/>). The questionnaires are posted on many larger taxation websites and taxation forums. Each subject is told to obtain a gift as reward, in order to promote recycle rate. As a result, 448 surveys were returned with 422 valid surveys. Table 1 shows the demographic

profile of the 422 taxpayers. Subjects who returned questionnaires include 190 males and 232 females. In age distribution, 168 subjects aged 21-30 years (40%) which rank the first and are followed by 153 subjects aged 31-40 years (36%). In education state, 44% of subjects are university graduates and followed by junior college (23%). In job property, 187 subjects are department chiefs or employees of private enterprises (44%) which rank the first and followed by 70 subjects with military and governmental posts and teaching jobs (17%). For each questionnaire item, subjects were asked to express the degree to which they agreed with the statements on seven-point Likert rating scale with strongly disagree (1) to strongly agree (7). Structural equation model (SEM) is used to test the hypotheses.

RESULTS

In this study, descriptive statistics analysis (Table 2) and

Table 2. Descriptive statistics.

Variable	Mean	Standard deviation	Cronbach's α value	Factor loading
Perceived usefulness	6.13	0.67	0.92	0.50-0.88
Perceived ease of use	5.76	0.82	0.91	0.53-0.83
Tax equity	3.96	0.63	0.53	0.50-0.53
Social norms	5.45	0.82	0.85	0.60-0.80
Moral norms	5.89	0.77	0.81	0.63-0.89
Perceived behavioral control	5.73	0.84	0.89	0.84-0.88
Attitude	5.95	0.78	0.93	0.84-0.89
Subjective norms	5.67	0.74	0.88	0.75-0.84
On-line tax filing intention	6.03	0.73	0.86	0.76-0.82
On-line tax filing behavior	6.03	0.80	0.86	0.67-0.93

Pearson correlation analysis are employed to analysis the data for the purpose of understanding the sample characteristics and level of correlation among variables. The mean is greater than 3.95 in all variables while the standard deviation is between 0.63 and 0.84. The overall coefficients of reliability are all above the acceptable level of 0.5 (Cuieford, 1965). In terms of Pearson correlation analysis, there is significant correlation between each two variables. The measurement items in the study are also revised or continue using related literatures or research, resulting in good content validity (Kerlinger, 1986). In the aspect of construct validity, the scale is measured by factor analysis. Kerlinger (1986) indicates those items that factor loading is below 0.5 should be deleted. The factor analysis of each aspect is as Table 2, demonstrating all factor loading of each aspect is greater than 0.5. This indicates the measurement scale of the study on construct validity is good. Moreover, the results of confirmatory factor analysis in this study show GFI (goodness-of-fit-index) of model-fit measure is 0.92, NFI (normalized fit index) is 0.94, and CFI (comparative fit index) is 0.91. The model-fit measures of analysis results are close to or above 0.9 standard levels (Bagozzi and Yi, 1988), which means that the convergent validity of the items is within the acceptable range.

In terms of the overall model fit, Bagozzi and Yi (1988) state that the overall model analysis must be conducted based on fit of internal structure of model. The fit indexes are all close to or over the ideal level (e.g. $\chi^2/df = 2.11$, GFI = 0.92, NFI = 0.94, CFI = 0.91, RMR = 0.07, RMSEA = 0.05). The path coefficient and results of hypothesis testing are summarized in Figure 5. Path coefficients in the figure refer the value after standardization. The empirical result demonstrates all hypotheses proposed in this study are supported. Perceived usefulness has a significant positive effect on perceived behavioral control (path coefficient = 0.269**) and attitude (path coefficient = 0.369***), which means that the taxpayers believe on-line tax filing system is able to raise the efficiency and convenience of tax filing. When the taxpayers believe the advantages of the on-line tax filing system which are

timeliness and convenience, the attitude toward on-line tax failing becomes more positive. Besides, perceived ease of use has a significant impact on taxpayers' perceived usefulness (path coefficient = 0.550**), perceived behavioral control (path coefficient = 0.679***) and attitude (path coefficient = 0.226***). The correlation with TAM factors on TPB factors is also significant. In other words, there is correlation with the factors within the two theories. The finding has never been discussed before which is the main contribution in this study.

On the relationship between norms and TPB factors, social norms has positive and significant effect on attitude (path coefficient = 0.108**) and subject norms (path coefficient = 0.506***). Similarly, moral norms has a significant positive impact on attitude (path coefficient = 0.637***) and subject norms (path coefficient = 0.185**). The empirical results indicate that norm factors (social norms and moral norms) have positive impacts on TPB factors (attitude and subject norms). Besides, tax equity also has a significant positive impact on attitude (path coefficient = 0.067*). To sum up, the study proposes that attitude is the primary factor affecting on-line tax filing behavioral intention. Finally, the empirical results also show that on-line tax filing intention is determined by perceived behavioral control (path coefficient = 0.343**), attitude (path coefficient = 0.449**), and subject norms (path coefficient = 0.102**). On-line tax filing intention has a significant positive effect on on-line tax filing behavior (path coefficient = 0.592**). The finding is consistent with that of Ajzen (1985).

CONCLUSION AND IMPLICATIONS

This study mainly continues the viewpoints of TPB and TAM to discuss the determinants affecting taxpayers to use on-line tax filing system. The empirical results show that perceived usefulness and perceived ease of use have a significant positive effect on perceived behavioral control. In past studies, scholars apply TAM to explain and predict human behavior pattern toward information

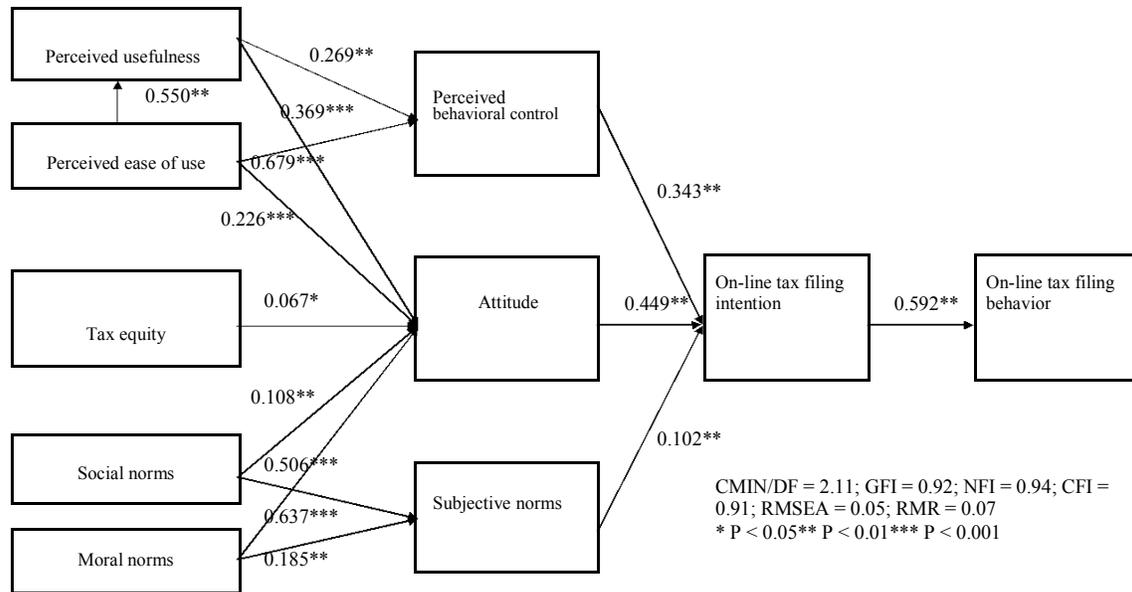


Figure 5. SEM analysis of research model.

technology (Davis et al., 1989; Gefen et al., 2003; Pavlou, 2003; Horst et al., 2007). They all agree that perceived usefulness and perceived ease of use would affect an individual's attitude. However, these researches overlook the influence of perceived usefulness and perceived ease of use on perceived behavioral control. This study infers and finds the correlation among these three factors. This is one of the research contributions. Next, related studies about norms emphasize merely on the effect of social norms (Hsu and Chiu, 2004), but neglect factor of personal moral norms proposed by Randall and Gibson (1991). This study finds that social norms and moral norms are positively related to attitude towards on-line tax filing. The finding is another contribution of this paper to contain moral norms. Third, the empirical results also show that higher tax equity of taxpayers' perception has positive effect on attitude towards on-line tax filing. Hence, the empirical results find that not just the perception of taxpayers on information technology (perceived usefulness and perceived ease of use) affect the attitude of on-line tax filing, but also include the tax equity and norms factors which represent personal viewpoint (moral norms) and external environment viewpoint (social norms). We believe that attitude is the key factor affecting taxpayers' intention of on-line tax filing. Fourth, this study proves that attitude shows positive effect on on-line tax filing intention, and this result matches with the viewpoints of Ajzen (1985); Davis et al. (1989) and Hung et al. (2006). Fifth, past studies only discussed the behavioral intention of on-line tax filing but were lack of further research on the actual behavior. This study supplements the shortage and finds that on-line tax filing intention has a positive effect on actual behavior. Finally, this study finds that integration of TPB and TAM can explain and predict human behavior

pattern of on-line tax filing extensively. Empirical result shows that the goodness of fit of this research model is accepted. Hence we propose the on-line tax filing acceptance model and finds that it could be a reference for the government on practical policy-making.

According to the research findings, this study advises government and taxpayers respectively either on management and academy. As far as government, the empirical results show that perceived usefulness and perceived ease of use have positive effect on perceived behavioral control. We suggest the government to set up simple and understandable instruction on the website of IRS. Brochures of on-line tax filing can be issued in quantity before the tax filing season. Advertisements also help to promote the advantages of on-line tax filing. The government should also simplify the operation procedures of the system or arrange specialized staffs at all branches of IRS. These methods can help to enhance the perceived behavioral control on on-line tax filing of taxpayers. Besides, higher tax equity also shows positive effect on attitude towards on-line tax filing. Government should impose tax based on different income level so that every taxpayer is able to afford. Government should also avoid the misuse of tax income because taxpayers should enjoy all entitlements they deserve (public goods, public services and public welfare) (Briggs, 2008). This will enhance the positive attitude of taxpayers. On the other hands, social and moral norms show positive impact on attitude. We suggest that government should raise the knowledge level of Taiwan citizens (such as extension of national education, etc), enhance internet security to reduce the fear of loss caused by on-line tax filing. To raise the trust of taxpayers helps taxpayers to understand the advantages outweigh the disadvantages of on-line tax

filing. A large external influence is formed and will affect the taxpayers rapidly.

Taxpayers will also have more positive attitude towards on-line tax filing. Meanwhile, on-line tax filing allows 24 h data transmission so that taxpayers are not limited by office hour (Warkentin et al., 2002). They can file tax at home without queuing up. This helps to increase the efficiency of tax filing. The on-line tax filing system can also check the tax exemptions automatically, and calculate the tax payable in the most favorable way (Ramayah et al., 2009). The whole process is simple and fast, secure and save time and effort. The system shortens the process and reduces superfluous human resources. The efficiency, effectiveness and service quality of government policy can be raised. Hence, taxpayers should make use of the advantages brought by on-line tax filing. In terms of security problem, we suggest taxpayers to avoid downloading tax filing software or filing tax from unknown websites. Taxpayers should avoid installing P2P share software (such as Foxy, eMule and etc) while filing tax. Personal tax filing data should be removed from the hard discs after tax filing. Anti-virus software or firewall should be installed to protect personal data. In the aspect of research limitations and later study, this study expects to receive 1000 questionnaires. However the actual situation is worse than expected (valid response questionnaires are 422). We suggest following studies can visit senior staffs in enterprises other than using internet questionnaire. The level of knowledge is higher so it is possible to obtain more valid questionnaires. Paper copy questionnaire is another method to collect samples (since we use internet questionnaire, we are unable to test taxpayers who seldom use the internet).

Next, there are still numerous scams or hacking problems on the internet. There could be data leakage during on-line tax filing. We suggest follow-up studies to consider security mechanism (Kim, Steinfield, and Lai, 2008), trust (Pavlou, 2003) and perceived risk (Pavlou and Gefen, 2004) in the research so that the research model can be more mature. Third, this study only focuses on taxpayers who have the experience of using on-line tax filing. We suggest follow-up studies can target taxpayers who have never used the on-line tax filing system to study the comments and acceptance factors of these two groups (have experience of using on-line tax filing system and have no experience in the system). The empirical results can be used in practical situation and also a

reference for government policy-making. This helps the government to improve their shortcomings. The policy goal can be fulfilled if the on-line tax filing service is closer to the public's demands.

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APPENDIX

Perceived ease of use

- 1) I find on-line tax filing system easy to use.
- 2) I find it easy to locate my income information that I need in the on-line tax filing system.
- 3) On-line tax filing system is flexible to interact with.
- 4) It is easy to become skillful at using on-line tax filing system.
- 5) Learning to operate on-line tax filing system is easy.

Perceived usefulness:

- 1) On-line tax filing system improves my performance in tax filing.
- 2) On-line tax filing system enhances my effectiveness in tax filing.
- 3) I think on-line tax filing system is valuable to me.
- 4) The content on on-line tax filing system is useful to me.
- 5) On-line tax filing system is functional.
- 6) Overall, I find on-line tax filing system useful.

Tax equity

- 1) How fair or unfair is the amount of individual income taxes that you pay when compared to people who make more money than you? (1= very unfair; 7= very fair).
- 2) Rich taxpayers pay a large share of their incomes in individual income taxes than do taxpayers like me.
- 3) I pay about the same amount of individual income taxes as other people who make about the same income as I do.
- 4) Most people who earn about the same income as I do pay more taxes than I do.
- 5) How fair or unfair is the amount of individual income taxes that you pay when compared to the amount of services you get back from the government? (1= very unfair; 7= very fair).
- 6) I am satisfied with the amount of benefits I receive from the government compared to the amount of taxes I pay.

Social norms

- 1) My family will expect me to report the additional income from my part-time job in my tax return.

- 2) My significant other will expect me to report the additional income from my part-time job in my tax return.
- 3) My friends will expect me to report the additional income from my part-time job in my tax return.

Moral norms

- 1) I will feel guilty if I do not report the additional income from my part-time job in order to receive a large tax refund.
- 2) It is against my personal principles not to report the additional part-time job income in order to receive a large tax refund.
- 3) It is wrong not to report the additional part-time job income in order to receive a large tax refund.

Perceived behavioral control

- 1) I file tax through the e-file service is entirely up to me.
- 2) I can control the agencies from on-line tax filing system that can access the personal data I supplied.

Attitude

- 1) Using on-line tax filing system would be a foolish idea.
- 2) I like the idea of using on-line tax filing system for tax-filing action.
- 3) Using on-line tax filing system would be a pleasant experience.

Subject norms

- 1) People who influence my behavior would think that I should use the on-line tax filing method.
- 2) People who are important to me would think that I should use the on-line tax filing method.

On-line tax filing intention

- 1) I intend to use the on-line tax filing method for my income tax return next year.
- 2) In choose filing methods for my income tax return, on-line tax filing method is my first priority.
- 3) I would like to recommend on-line tax filing method to my relatives and friends.

On-line tax filing behavior

- 1) I have ever used internet to declare income tax.
- 2) I used internet to declare income tax this year.
- 3) I will continue using internet to declare income tax.