

# Relationship quality and cross-buying in varying levels of category similarity and complexity

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Numerous studies have shown satisfaction and trust are the crucial antecedents of loyalty. However, the relationship between satisfaction, trust and cross-buying is not as simple as expected. Studies on the effects of satisfaction and trust on cross-buying show mixed results. Thus, this study aims to examine the separate moderating effect of category similarity and category complexity on the relationship between satisfaction, trust and cross-buying. We then examine the joint moderating effects of category similarity and category complexity on the relationship. The results indicate that the relative effects of satisfaction and trust on cross-buying vary based on different category similarity and complexity. The findings add new insight to our understanding of contingent relationships in cross-buying evaluations.

**Keywords:** cross-buying; satisfaction; trust; category similarity; category complexity

## Introduction

In the fiercely competitive financial services environment, a bank has already become a multi-services provider. For example, in Europe, banks have developed the bancassurance model for distributing insurance products (Gardener et al., 1999). In the US, banks, insurance companies, and securities firms can exist in a financial holding company under the Gramm-Leach-Bliley Act of 1999 (Johnston & Madura, 2000). One of the reasons behind a financial holding company is to provide one-stop shopping to cross-sell various products. Not only will one-stop shopping add convenience of time and effort for clients (Berry et al., 2002; Seiders et al., 2000), but also increase the possibility of cross-selling various products to existing clients (Debling, 1998; Lymberopoulos et al., 2004; Ngobo, 2004; Srinivasan et al., 2002).

Many traditional banks have offered varying levels of similar and complex product categories to implement cross-selling strategies (Gardener et al., 1999; Howcroft et al., 2003b). In general, category similarity will facilitate the transfer of attributes from the core categories to the extension categories (Aaker & Keller, 1990; Lei et al., 2004). Furthermore, a given service provider

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can be closely associated with specific product categories (Inman et al., 2004). For example, insurance products are more associated with insurance companies than banks (Howcroft & Beckett, 1996). Therefore, if service providers offer new products that are dissimilar to their core categories, these image conflicts will cause an inconsistency between the core and extension categories and negatively affect cross-buying (Ngobo, 2004). The underlying rationale is that clients will not believe in a service provider's ability to provide high quality on all the products it offers. However, it is interesting to find that some dissimilar but simple products, such as auto insurance policies and mutual funds, are already being successfully sold through bank channels. In contrast, it has turned out to be more difficult than expected that dissimilar and complex products can be sold from banks. Life insurance and unit trusts are not strongly associated with banks (Howcroft & Beckett, 1996) and it is difficult for bank clients to assess those products' attributes (Howcroft et al., 2003b; Patterson, 2000). Thus, clients will face greater uncertainty when cross-buying complex and non-traditional banking products through bank branch networks (Beckett, 2000).

Prior studies examining the effects of trust and satisfaction on cross-buying or share of wallet (similar to the concept of cross-buying in this study) have drawn mixed results. For example, Crosby et al. (1990) found that relationship quality (satisfaction and trust) has no effect on sales effectiveness (one of the sales effectiveness scale items is a cross-selling index). Verhoef et al. (2002) found that satisfaction and trust do not affect cross-buying. On the other hand, Selnes (1998) and Bendapudi & Berry (1997) found that trust has an effect on relationship enhancement (e.g. buying additional services). In this study, we expect that those mixed results may result from ignoring the moderating effects of category similarity and complexity. Prior research reveals that the association of a service provider and a given category depends on the clients' perceived similarity between a service provider and a product category (Inman et al., 2004). We expect that category similarity and complexity affect clients' cross-buying evaluation process. Therefore, the effects of satisfaction and trust on cross-buying are moderated by category similarity and complexity.

To cross-sell varying levels of similar and complex product categories, banks need to adopt appropriate strategies to increase the willingness of existing clients to cross-buy various products. The primary focus of this study is to understand whether the effects of satisfaction and trust on cross-buying are moderated by category similarity and complexity separately. Second, we examine the joint moderating effects of category similarity and complexity on the relationships of satisfaction, trust and cross-buying. The rest of the paper is organised as follows. First, we outline the framework and hypotheses. Then, we explain research methodology and the results of an empirical study. Finally, a discussion of the implications and directions for future research are offered.

## **Theoretical background and conceptual framework**

### ***Cross-buying***

Cross-buying from a service provider as opposed to maintaining a relationship with a service provider has been growing in importance (Bolton et al., 2004; Keiningham et al., 2003; Li et al., 2005; Ngobo, 2004; Verhoef, 2003; Verhoef & Donkers, 2005; Verhoef et al., 2001, 2002). In fact, cross-buying seems to be a more complex decision-making process relative to customer retention decisions (Selnes, 1998; Verhoef et al., 2001). Cross-buying can be considered as a measurement of relationship enhancement (Bendapudi & Berry, 1997; Selnes, 1998),

customer share development (Verhoef, 2003), the breadth of the relationship (Bolton et al., 2004) and relationship extension (Verhoef & Donkers, 2005).

### ***Relationship quality***

Prior research conceptualises relationship quality as a construct consisting of trust and satisfaction (Crosby et al., 1990). Relationship quality is defined in this study as a client's satisfaction with and trust in a bank. Relationship quality has been found to be associated with increased sales for a service provider (Peterson, 1995). Similarly, Park & Kim (2001) found that relationship quality affects the purchase intention of brand extensions. Next, this study briefly expands on these two important dimensions of relationship quality.

### ***The effect of satisfaction on cross-buying***

Oliver (1980) defined satisfaction as a function of a cognitive comparison of expectations prior to consumption with the actual experience. This process is often referred to as the disconfirmation paradigm, whereby clients make a post-purchase comparison between pre-purchase expectations and actual performance received (Oliver, 1980). When actual performance exceeds expectations, positive disconfirmation occurs and leads to satisfaction, while actual performance below expectations results in negative disconfirmation and dissatisfaction. Two conceptualisations of satisfaction can be distinguished: transaction-specific and cumulative satisfaction (Anderson et al., 1994). Evaluation of cumulative satisfaction is based on the firm's past, current, and future performance. In contrast, transaction-specific satisfaction may provide specific diagnostic information about a particular service encounter.

Highly satisfied clients, in general, are likely to buy additional products (André & Saraiva, 2000; Bloemer et al., 2002; Edvardsson et al., 2000; Jamal & Naser, 2002; Matzler et al., 2005; Westlund et al., 2005). Reynolds & Beatty (1999) evidenced a positive relationship between satisfaction and share of purchases. Meanwhile, Mägi (2003) found that satisfaction has a positive effect on share of wallet. However, it was suggested that satisfaction has a smaller effect on cross-buying than customer retention (Bolton et al., 2004). Furthermore, it was found that satisfaction does not have a significantly positive effect on cross-buying (Verhoef et al., 2001, 2002) and customer share development (Verhoef, 2003). According to their findings, lower satisfaction may result in a reduction in the number of products purchased, but higher satisfaction will not necessarily result in additional purchases. In other words, satisfaction with existing services does not necessarily lead to additional cross-buying. In fact, researchers have questioned the relationship between satisfaction and loyalty. For example, Homburg & Giering (2001) showed personal characteristics, such as variety seeking, age, and income, moderate the relationship between satisfaction and loyalty. Verhoef et al. (2001) found that the effect of satisfaction on cross-buying increases with relationship length. To gain a better understanding the relationship between satisfaction and cross-buying, we will examine the moderating effects of category similarity and complexity.

### ***The effect of trust on cross-buying***

Based on Morgan & Hunt (1994), trust is defined as the integrity, honesty and confidence that one party perceives in the other. Doney & Cannon (1997) defined trust as a two-dimensional construct: the perceived credibility and benevolence. Moreover, Johnson & Grayson (2005)

developed two dimensions of trust. Cognitive trust is the client’s confidence in relying on a service’s competence and reliability. Affective trust is based on the feelings generated and the degree to which one party perceives care and concern from the other. In addition, Garbarino & Johnson (1999) stated that trust in an organisation is the confidence in the quality and reliability of products offered. Indeed, trust is generally viewed as a critical element in the development of an enduring desire to maintain a long-term relationship (Crosby et al., 1990; Doney & Cannon, 1997; Garbarino & Johnson, 1999; Johnson & Grayson, 2005; Morgan & Hunt, 1994; Sharma & Patterson, 1999).

Johnson & Grayson (2005) found that cognitive trust has a positive effect on sales effectiveness (similar to the concept of cross-buying in this study). However, relationship quality was not found to affect sales effectiveness (Crosby et al., 1990). Similarly, Verhoef et al. (2002) reported that the relationship between trust and cross-buying is not significantly associated because trust is only important for clients in choosing a new service provider. In addition, due to the fact that financial service providers usually maintain a trustworthy reputation, that reduces the effect of trust on the cross-buying of such products. In contrast, it was argued by Selnes (1998) that as clients purchase more products in the relationship, they simultaneously increase their dependence on the service providers. Consequently, clients need to trust their service providers and feel confident in their dealings with them (Ambler et al., 2002). In other words, trust has an important role in extending the scope of the relationship (Bendapudi & Berry, 1997; Selnes, 1998). Those mixed results may be due to different dependent measures (cross-buying, sales effectiveness and relationship enhancement) or different independent variables (trust and relationship quality). Besides different measurements of the constructs, Verhoef et al. (2002) investigated the moderating effect of relationship age on the relationship between trust and cross-buying, but did not find any moderating effect. However, no research has explicitly examined the moderating effects of category similarity and complexity on the relationship between trust and cross-buying. Thus, there is a need for research that further examines the relationship between cross-buying, satisfaction and trust under varying levels of category similarity and complexity.

Next, we will develop a model that incorporates contingent variables between relationship quality (trust and satisfaction) and cross-buying. In other words, the relationships between relationship quality and cross-buying are moderated by category similarity and complexity. The conceptual framework is illustrated in Figure 1.

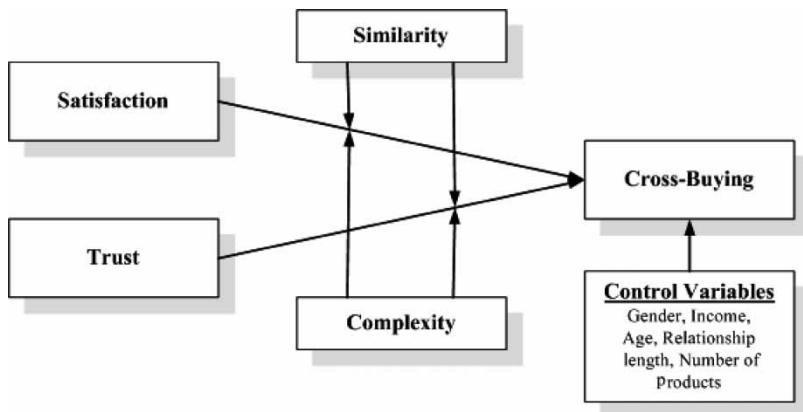


Figure 1. Conceptual model.

## Development of hypotheses

### *The moderating effect of category similarity*

A strong brand that has successfully extended into a variety of products can often positively affect clients' acceptance of those new products (Aaker & Keller, 1990). Similarly, clients who purchase one product from a service provider may be willing to extend their relationships for additional products (Ambler et al., 2002). Bolton et al. (2004) proposed that category similarity moderates the effect of satisfaction on cross-buying. Meanwhile, Harrison & Ansell (2002) found that clients seem to be more willing to cross-buy similar product categories from the same service provider. This implies that clients would like to believe in the service providers' ability to provide high quality for similar product categories. In this study, insurance and investment products cross-sold from banks are defined as low similarity product categories. In contrast, traditional banking products, such as cheque accounts and mortgages, are defined as high similarity product categories.

We expect that the effect of satisfaction on cross-buying is enhanced for financial service providers offering very similar products. The underlying rationale is that the greater the perceived similarity, the more clients are likely to rely on the existing satisfaction attitude toward service providers to infer the attributes of extension categories (Lei et al., 2004). Generally, bank clients usually buy different products at two or more separate financial institutions. This multiple financial institution usage limits the effect of satisfaction on dissimilar cross-buying. We expect that satisfaction will not motivate clients to cross-buy dissimilar product categories because decisions about dissimilar cross-buying might be affected more by the attractiveness of alternatives or perceived financial risks (Howcroft & Beckett, 1996; Howcroft et al., 2003a; Lam & Burton, 2005). Hence:

Hypothesis 1: Satisfaction will have a stronger effect on cross-buying under the condition of high category similarity rather than low category similarity.

Similar cross-buying entails a relatively low level of perceived risk, and thus trust should be less important in similar cross-buying as compared with dissimilar cross-buying decisions. In contrast, Park & Kim (2001) found that relationship quality (trust and commitment) affect the intention for dissimilar extensions. The underlying rationale is that when clients regard their service providers as trustworthy, the perceived risks with service providers are reduced (Selnes, 1998). Furthermore, when clients face uncertainty associated with a lack of knowledge regarding product categories, trust can facilitate clients' adopting dissimilar product categories. Lymberopoulos et al. (2004) indicated the most important reason why clients prefer to cross-buy insurance products from their banks is trust. Similarly, Johnston & Madura (2000) also supported the argument that banks are usually perceived by clients to have integrity and honesty, which would enhance their ability to cross-sell insurance products. Thus, we hypothesise the following:

Hypothesis 2: Trust will have a stronger effect on cross-buying under the condition of low category similarity rather than high category similarity.

Bolton et al. (2004) argued that clients' satisfaction has a positive effect on similar cross-buying. The rationale is that clients are familiar with similar product categories and they easily transfer the perceived quality of the original categories to the extension categories. Prior studies have shown that service quality is positively related to satisfaction (Bou-Llusar et al., 2001; Caruana, 2002; Hsieh & Hiang, 2004). Thus, satisfaction will have a positive stronger effect on cross-buying under the condition of high category similarity. Thus, we expect satisfaction to have a stronger effect on similar cross-buying than trust.

However, low category similarity makes clients question a service provider's competence and ability to cross-sell extension categories, and it is difficult to evaluate perceived quality. Thus, clients need to have confidence in their service providers, and thus more reliance on trust. We therefore expect that trust will have a stronger effect on dissimilar cross-buying than satisfaction.

Hypothesis 3: Satisfaction will have a stronger effect than trust on cross-buying under the condition of high category similarity.

Hypothesis 4: Trust will have a stronger effect than satisfaction on cross-buying under the condition of low category similarity.

### *The moderating effect of category complexity*

Due to the fact that category complexity has an effect on clients' evaluation processes, we expect satisfaction and trust have varying effects on cross-buying under the condition of different category complexity. In this study, category complexity is defined as the extent to which clients perceive complexity and lack an understanding of the products' attributes (Devlin, 1998). As indicated by Devlin (2001), traditional banking products and basic insurance are perceived as relatively simple, while life assurance, pensions, unit trusts, investment products are perceived as complex. If products are characterised by a high level of complexity, clients will prefer a channel with which they are familiar or have had purchasing experiences (Black et al., 2002). For example, one channel selection study found that complex products, such as life and health-care insurance, result in a greater demand for traditional insurance company channels rather than bank network channels (Dumm & Hoyt, 2003). High category complexity implies that clients find it difficult to evaluate perceived quality (Patterson, 2000; Devlin, 1998). As a result, clients may lack confidence in their judgments and consequently are likely to perceive a higher risk in cross-buying complex products (Burnham et al., 2003). Given the need for trust in any risky situation (Coulter & Coulter, 2003), it is very important that a relationship of mutual trust between clients and service providers exists (Tam & Wong, 2001). Thus, we hypothesise the following:

Hypothesis 5: Trust will have a stronger effect on cross-buying under the condition of high category complexity rather than low category complexity.

Satisfaction is a function of a cognitive comparison of expectations prior to consumption with the actual experience (Oliver, 1980). Under the condition of low complexity, clients are able to perform a comparison of expectations and experience (Andreassen & Lindestad, 1998). Their cross-buying evaluations are more easily based on a cognitive evaluation of previous purchase experience. Thus, we feel that satisfaction with the existing products would cause clients to cross-buy simple product categories for the same bank. However, when category complexity increases, given the clients' lack of experience and the weaker or more ambiguous expectations for those product categories (Johnson et al., 1996), clients are less capable of evaluating comparisons of expectation and actual experience. Therefore, the effect of satisfaction on cross-buying will be reduced. We therefore propose the following hypothesis:

Hypothesis 6: Satisfaction will have a stronger effect on cross-buying under the condition of low category complexity rather than high category complexity.

Clients are likely to perceive higher risks when product categories are complex because the difficulty in understanding the product categories leads to uncertainty (Burnham et al., 2003). In this respect, we think that trust rather than satisfaction will be used in complex product

categories evaluation because clients are willing to believe that the service providers are reliable and have high integrity (Morgan & Hunt, 1994). Thus, we believe that clients who trust their banks will be less concerned about perceived risks and subsequently cross-buy complex products. For simple product categories, less risk concern is involved in the quality evaluation and clients' cognition may be increased. Thus, clients are more capable of evaluating the attributes of such product categories. We expect that clients who are satisfied with their banks will transfer the existing satisfaction level into the belief that their banks can provide other satisfying product categories. Thus, the effect of satisfaction on cross-buying is stronger than that of trust on cross-buying under the condition of low category complexity. We therefore propose the following hypotheses:

Hypothesis 7: Satisfaction will have a stronger effect than trust on cross-buying under the condition of low complexity.

Hypothesis 8: Trust will have a stronger effect than satisfaction on cross-buying under the condition of high complexity.

### ***The joint moderating effects of category similarity and complexity***

We have developed hypotheses concerning the moderating effect of category similarity and complexity separately. We further expect that joint moderator interactions have more effects on cross-buying. As argued earlier, complex and dissimilar cross-buying may create perceptions of higher risk and entail new purchasing decisions with higher uncertainty because clients are less capable of evaluating various attributes of those product categories (Söderlund & Julander, 2003). On the other hand, clients may sequentially cross-buy product categories from traditional banking product categories to non-traditional banking product categories and from simple banking product categories to complex product categories in their banks (Harrison, 1994; Li et al., 2005). Thus, sequential cross-buying can enhance their relationships with banks (Li et al., 2005). It was suggested that trust develops over time and plays a less important role at the beginning of relationship development (Doney & Cannon, 1997). In other words, trust develops as a result of the gradual enhancement of the relationship through the experience of mutual reliance. Thus, we expect trust in dissimilar and complex cross-buying is especially important and clients under these situations rely heavily on trust because the uncertainty and risk may be reduced largely by trust.

When clients lack well-formed expectations as well as performance regarding dissimilar and complex product categories, thus we expect that the effect of satisfaction on cross-buying will be very small. However, under the joint conditions of low category similarity and low category complexity, uncertainty and risk are reduced and clients are more able to compare the expectations and actual performance. Thus, compared with the joint conditions of low category similarity and high category complexity, the effect of satisfaction on cross-buying will be increased and the effect of trust on cross-buying will be reduced. Hence:

Hypothesis 9: Trust will have a significantly stronger effect than satisfaction on cross-buying under the joint conditions of high category complexity and low category similarity.

Hypothesis 10: Trust and satisfaction will have equal effects on cross-buying under the conditions of low category complexity and low category similarity.

In contrast, due to the fact that clients are more capable of evaluating the attributes of low complexity and high similarity categories, we believe the effect of satisfaction on cross-buying will be stronger than that of trust on cross-buying. Turning to the joint conditions of

high category similarity and high category complexity, in spite of high category similarity, category complexity will reduce the effect of satisfaction on cross-buying and increase the effect of trust on cross-buying. Therefore, the relative importance of satisfaction is likely to decline and trust is likely to increase as category complexity increases. Hence, the following is hypothesised:

Hypothesis 11: Satisfaction will have a significantly stronger effect than trust on cross-buying under the joint conditions of low category complexity and high category similarity.

Hypothesis 12: Satisfaction and trust will have equal effects on cross-buying under the joint conditions of high category complexity and high category similarity.

### ***Control variables***

According to Homburg & Giering (2001), client characteristics such as age, income and variety seeking are found to be important moderators of the relationship between satisfaction and loyalty. Similarly, Harrison & Ansell (2002) used survival analysis to predict cross-selling opportunity and found that the affluent, female, and older clients tend to be more likely to purchase a second product. Devlin (2002) found that females are likely to choose a mortgage from a bank where they already have an account. Meanwhile, Li et al. (2005) examined the sequential purchase of multiple financial products at the same bank. The order of eight financial products is from basic to complex products, and it was found that older, richer and male clients progress more quickly along the continuum.

Intuitively, financial service providers can easily cross-sell products to loyal clients (Zeithaml et al., 1996). However, typical bank clients have at least more than one bank relationship (Farquhar, 2004). Thus, the total number of services purchased from other service providers has a negative influence on cross buying. In general, when clients have already had more services with different service providers, the probability of cross-buying may decrease because clients' needs may already be filled (Verhoef et al., 2001). In addition, it has been suggested that clients may have a ceiling for the number of financial products that they are willing to have from any one company (Debling, 1998). As a result, not all clients accept the idea of one-stop shopping for financial services under a single roof. In addition, it is likely that clients will increase the number of products used in a long-term relationship (Garland, 2002; Liang & Wang, 2006). For example, a relationship with a bank might begin with a cheque, and develop to loans or some investment instruments (Bell et al., 2005). However, Verhoef (2003) found that the relationship length has an effect on customer retention but no effect on customer share development. Interestingly, Verhoef et al. (2001) found that relationship length moderates the relationship between satisfaction and cross-buying.

Although we focus on trust and satisfaction in cross-buying, previous research suggests that demographic variables (age, gender and income), relationship length and the total number of products purchased from other service providers also affect cross-buying. In this study, we control those variables to provide a stronger test of the theory developed in our model.

## **Methodology**

### ***Pretest to distinguish similar and complex categories***

The varying levels of category similarity and complexity development were conducted in a focus group consisting of three managers from a bank, an insurance company and a securities



firm. First, 32 products were provided as target products. Then, based on the popularity and purchase frequency of each product in Taiwan, only 20 products remained in this study and they were then divided by varying levels of category similarity and complexity. We used a saving account as the original product, in that a saving account is the most basic and popular banking product in Taiwan. In addition, banks can usually utilise a saving account to cross-sell other financial products because clients' saving accounts in the bank play an important role in the money transmission mechanism among product categories (Howcroft et al., 2003a). Among 20 financial products, ten of them were quite similar to a saving account, and others were dissimilar to a saving account. In addition, mortgage and installment loans, investment products, life and healthcare insurance, and foreign exchange are seen as more complex. On the other hand, basic banking accounts, mutual funds, auto and personal liability insurance are simple product categories because most clients can easily understand their attributes. In summary, four extensions were generated as follows: Category 1 (low category complexity and high category similarity), Category 2 (low category complexity and low category similarity), Category 3 (high category complexity and high category similarity), Category 4 (high category complexity and low category similarity).

In this study, 103 EMBA students were asked to judge category similarity and complexity on a seven point scale (from totally disagree to totally agree). Two items were used: 'The skills of the bank in providing a cheque and a saving account are closely related', 'A cheque account is a particularly complex financial product'. The results showed that there was a significant difference between low and high complexity categories ( $F = 886.10$ ,  $p < 0.01$ ), and between low and high similar categories ( $F = 687.27$ ,  $p < 0.01$ ). For the detailed results, our pretest showed that Categories 1 and 3 were high similarity categories ( $M = 6.43$  and  $5.32$ , respectively), and Categories 2 and 4 were low similarity categories ( $M = 2.2$  and  $1.23$ , respectively). In addition, Categories 1 and 2 were low complexity categories ( $M = 1.43$  and  $1.6$ , respectively), and Categories 3 and 4 were high complexity categories ( $M = 4.82$  and  $6.21$ , respectively). The four categories are shown in detail in Table 1.

Table 1. Proposed categories.

Category complexity	Category similarity	
	High	Low
High	Category 3 Mortgage Installment loan Money market Overdraft Foreign exchange	Category 4 Structured note Term life insurance Long term care insurance REITs Annuity
Low	Category 1 Cheque account CDs Credit card Safety deposit box rental Domestic remittance	Category 2 Mutual fund Bond Travel insurance Auto insurance Personal liability insurance

**Data collection and sample**

A single cross-sectional survey was conducted to gather data in this study. Our sample included individual clients with a saving account with a bank in Taiwan. A total of 564 questionnaires were collected. After removing 58 incomplete responses, the final sample size was 506. The sample was also partitioned according to category similarity and complexity for the purpose of moderator analysis. The sample size was  $n = 280$  for the high similarity categories, and  $n = 226$  for the low similarity categories. In addition, the sample was  $n = 269$  for the low complexity categories and  $n = 237$  for the high complexity categories. In order to ensure that the respondents of different categories were comparable, the respondents were matched in terms of age, income, gender, education, and length of relationship. Chi-square tests indicated no significant difference on age, income, gender, length of relationship among four categories. The sample characteristics are presented in Table 2.

**Measures and validation**

This study used scale development procedures suggested by Churchill (1979). Measures for all constructs were from the existing literature. All constructs used a 5-point Likert-type scale. To measure satisfaction, we adapted items from Verhoef et al. (2001). For the measurement of trust, we adapted items from Morgan & Hunt (1994) and Doney & Cannon (1997). We measured cross-buying by counting the number of products of each product category purchased and then summed to form a single item. In this study, three marketing practitioners reviewed the initial items and the definitions of the constructs. According to their suggestions, several items

Table 2. Respondent demographics of four categories.

Demographic profile	Percentage of sample			
	Category 1	Category 2	Category 3	Category 4
<b>Gender</b>				
Female	52.2	46.3	58.9	50.9
Male	47.8	53.7	41.1	49.1
<b>Age</b>				
Less than 30 years old	19.7	21.1	24.1	8.8
Between 30 and 39 years	42.1	43.1	30.4	39.4
Between 40 and 49 years	28.0	23.6	31.2	39.5
50 years and over	10.2	12.2	14.3	13.2
<b>Income</b>				
Less than US\$ 10,000	24.8	12.2	10.7	14.9
US\$10,000–\$15999	31.2	32.5	33.9	25.4
US\$16,000–\$25999	30.6	24.4	32.1	34.2
US\$ 26000 –\$35999	8.3	19.5	13.4	18.4
US\$ 36000 and over	5.1	11.4	9.8	7.0
<b>Relationship of length</b>				
Less than 5 years	40.8	30.9	44.6	36.0
Between 5 and 9 years	42.0	45.5	31.3	45.6
Between 10 and 19 years	15.9	21.2	27.1	17.5
20 years and over	1.3	2.4	4.5	0.9

were adapted to suit the banking environment. The questionnaires were pretested by 103 EMBA. Two items were dropped due to low Cronbach's alpha and loading of exploratory factor analysis.

Finally, we tested the measurement model using confirmatory factor analysis. CFA revealed a relatively good fit to the data (chi-square (42) = 68.12,  $p = 0.01$ , GFI = 0.97, AGFI = 0.96, CFI = 0.99, PNFI = 0.75, RMR = 0.02), thus confirming the efficacy of our measurement model. In assessing reliability, we examined the Cronbach alpha and composite reliability for each of the constructs. The Cronbach alpha of satisfaction and trust were greater than 0.80, supporting the reliability of the measurement. In addition, all composite reliability estimates were greater than 0.80, and all average variance extracted (AVE) estimates were greater than 0.50 (Fornell & Larcker, 1981).

As evidence of convergent validity, all of the items had significant loadings on their respective construct (Anderson & Gerbing, 1988). Discriminant validity can be assessed for two constructs by constraining the estimated correlation parameter between two constructs to 1.0 and then performing a chi-square difference test on the values for the constrained and unconstrained model. We found a significantly lower chi-squares value for the unconstrained model, thus indicating that discriminant validity is achieved.

## Results

We used hierarchical regression analysis to test our hypotheses. At first, only five control variables were entered. Then, the main effect variables were entered along with the control variables. The moderating effects in the hypotheses were assessed by subgroup analysis (Arnold, 1982). The procedure adopted was to divide the total sample into two groups on the basis of high/low category similarity and complexity. In addition, the Chow (1960) test was performed to test the significant differences in the regression coefficients under different product categories. To further investigate the different effects of satisfaction and trust on cross-buying under the different product categories, we compared the unstandardised coefficients by the  $t$  test (Arnold, 1982). Homoscedasticity is particularly important in subgroup analysis to ensure groups are equivalent (Patterson, 2000). Thus, we used the Levene test for equality of variances of satisfaction and trust across high/low similarity and complexity. The results of the Levene test showed no evidence of unequal variances.

The first control variable, the number of products purchased from other service providers, had a negative effect on cross-buying in most categories except the joint conditions of high category similarity and low category complexity. Relationship length had a significant effect on cross-buying under the condition of high category similarity ( $\beta = 0.03$ ,  $p < 0.05$ ) and high category complexity ( $\beta = 0.02$ ,  $p < 0.05$ ). However, relationship length had a significant effect on cross-buying under the joint conditions of high category similarity/low category complexity ( $\beta = 0.05$ ,  $p < 0.05$ ) and high category similarity/high category complexity ( $\beta = 0.04$ ,  $p < 0.05$ ). Age had a totally different effect on cross-buying under different category similarity. Income only had a significant effect on cross-buying in some categories. Finally, gender was not a significant predictor of cross-buying in all categories.

Referring to Table 3, satisfaction had a stronger effect on cross-buying ( $\beta = 0.62$ ,  $p < 0.05$ ) under the condition of high category similarity rather than low category similarity ( $\beta = 0.10$ ,  $p > 0.05$ ). On the other hand, trust had a stronger effect on cross-buying ( $\beta = 0.71$ ,  $p < 0.05$ ) under the condition of low category similarity rather than high category similarity ( $\beta = 0.28$ ,  $p < 0.05$ ). A Chow test ( $F = 28.96$ ,  $p < 0.01$ ) provided evidence that the slopes of the two regression models were significantly different. To further investigate the significance

Table 3. Regression results.

Dependent variable: Cross-buying	High category similarity				Low category similarity			
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
Control variables:								
The number of products	-0.34	-5.15	-0.18	-3.00	-0.33	-4.02	-0.15	-2.15
Relationship length	0.05	2.93	0.03	2.02	0.02	2.18	0.01	1.08
Gender	-0.18	-1.45	-0.20	-1.84	0.04	0.33	0.06	0.60
Income	0.05	0.90	0.09	1.78	0.14	2.42	0.07	1.50
Age	0.02	2.45	0.02	2.64	-0.02	-2.59	-0.02	-2.90
Main effects								
Satisfaction			0.62	8.00			0.10	1.38
Trust			0.28	3.64			0.71	10.35
R-square	0.18		0.38		0.15		0.44	
R-square		0.20				0.19		
F value		44.55**				57.37**		
Chow Test				28.96**				

\*\* $p < .01$ .

of Hypothesis 1 and Hypothesis 2, we compared the unstandardised regression coefficients by the  $t$  test (Arnold, 1982). The results also indicated that the effect of satisfaction on cross-buying was significantly stronger under the condition of high category similarity rather than low category similarity ( $p < 0.05$ ). Hypothesis 1 was thus supported. The results showed that the effect of trust on cross-buying was significantly stronger under the condition of low category similarity rather than high category similarity ( $p < 0.05$ ). Therefore, Hypothesis 2 was also supported. In addition, satisfaction had a stronger effect on cross-buying ( $\beta = 0.62, p < 0.05$ ) than did trust ( $\beta = 0.28, p < 0.05$ ) under the condition of high category similarity. Furthermore, under the condition of low category similarity, trust had a stronger effect ( $\beta = 0.71, p < 0.05$ ) than satisfaction ( $\beta = 0.10, p > 0.05$ ) on cross-buying, thus supporting Hypothesis 3 and Hypothesis 4.

Referring to Table 4, satisfaction had a stronger effect on cross-buying under the condition of low category complexity ( $\beta = 0.66, p < 0.05$ ) rather than high category complexity ( $\beta = 0.20, p < 0.05$ ). On the other hand, trust had a stronger effect on cross-buying under the condition of high category complexity ( $\beta = 0.57, p < 0.05$ ) rather than low category complexity ( $\beta = 0.19, p < 0.05$ ). A Chow test ( $F = 42.22, p < 0.01$ ) showed the slopes of the two regression models are significantly different. In addition, the results of the  $t$  test also indicated that the effect of satisfaction on cross-buying was significantly stronger under the condition of low category complexity rather than high category complexity ( $p < 0.05$ ), and the effect of trust on cross-buying was significantly stronger under the condition of high category complexity rather than low category complexity ( $p < 0.05$ ). Therefore, Hypothesis 5 and Hypothesis 6 were supported. Furthermore, under the condition of low category complexity, satisfaction had a stronger effect on cross-buying ( $\beta = 0.66, p < 0.05$ ) than did trust ( $\beta = 0.19, p < 0.05$ ). In contrast, under the condition of high category complexity, trust had a stronger effect ( $\beta = 0.57, p < 0.05$ ) than satisfaction ( $\beta = 0.20, p < 0.05$ ) on cross-buying, thus supporting Hypothesis 7 and Hypothesis 8.

The results in Table 5 supported Hypothesis 9. That is, under the joint conditions of high category similarity and low category complexity, satisfaction ( $\beta = 0.50, p < 0.05$ ) had a stronger effect than trust ( $\beta = 0.19, p < 0.05$ ) on cross-buying. In contrast, trust had a stronger effect on

Table 4. Regression results.

Dependent variable: Cross-buying	High category complexity				Low category complexity			
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
Control variables:								
The number of products	-0.93	-11.09	-0.67	-8.35	-0.40	-6.65	-0.24	-4.60
Relationship Length	0.04	4.00	0.02	2.59	0.04	2.42	0.02	1.46
Gender	0.02	0.20	0.04	0.37	-0.10	-0.82	-0.13	-1.33
Income	0.12	2.31	0.10	2.27	0.03	0.57	0.01	0.25
Age	0.01	-0.53	-0.01	-1.02	0.01	1.23	0.01	1.48
Main effects								
Satisfaction			0.20	2.70			0.66	9.95
Trust			0.57	7.67			0.19	2.82
R-square	0.44		0.58		0.20		0.45	
R-square		0.14				0.25		
F value		37.27				59.59**		
Chow Test				42.22**				

\*\* $p < .01$ .

cross-buying ( $\beta = 0.60, p < 0.05$ ) than did satisfaction ( $\beta = 0.05, p > 0.05$ ) under the joint conditions of low category similarity and high category complexity. Thus, Hypothesis 11 was also supported. The Chow test ( $F = 106.84, p < 0.01$ ) confirmed that the slopes of the regression models in categories 1 and 4 were significantly different.

The results in Table 6 supported Hypothesis 10 and Hypothesis 12. Satisfaction and trust had equal effects on cross-buying under joint conditions of high category similarity and high category complexity (satisfaction:  $\beta = 0.32, p < 0.05$ ; trust:  $\beta = 0.33, p < 0.05$ ) and low category similarity and low category complexity (satisfaction:  $\beta = 0.31, p < 0.05$ ; trust:  $\beta = 0.27,$

Table 5. Regression results.

Dependent variable: Cross-buying	High category similarity Low category complexity				Low category similarity High category complexity			
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
Control variables:								
The number of products	-0.12	-1.82	-0.05	-0.92	-0.47	-5.22	-0.31	-4.13
Relationship Length	0.08	4.28	0.05	3.24	0.03	1.87	0.02	1.10
Gender	-0.10	-0.82	-0.11	-0.98	-0.06	-0.47	0.05	0.53
Income	0.17	2.56	0.14	2.32	0.18	2.75	0.08	1.55
Age	0.01	1.72	0.02	2.48	-0.01	-1.43	0.01	-0.56
Main effects								
Satisfaction			0.50	5.79			0.05	0.71
Trust			0.19	2.41			0.60	7.63
R-square	0.29		0.46		0.41		0.62	
R-square		0.17				0.21		
F value		22.50**				30.26**		
Chow Test				106.84**				

\*\* $p < .01$ .

Table 6. Regression results.

Dependent variable: Cross-buying	High category similarity High category complexity				Low category similarity Low category complexity			
	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>
Control variables:								
The number of products	-0.52	-5.18	-0.35	-3.48	-0.24	-3.03	-0.15	-2.20
Relationship Length	0.06	3.08	0.04	2.37	0.03	2.31	0.02	1.34
Gender	0.14	0.91	0.04	0.28	-0.15	-1.26	-0.18	-1.75
Income	0.13	2.00	0.18	2.78	0.10	1.77	0.08	1.72
Age	0.01	1.03	0.01	0.46	-0.01	-1.85	-0.01	-2.01
Main effects								
Satisfaction			0.32	2.99			0.31	4.29
Trust			0.33	2.88			0.27	3.59
R-square	0.32		0.42		0.16		0.39	
R-square		0.10				0.23		
F value		9.84**				19.43**		
Chow Test				1.81, ns at $p < 0.05$				

\*\* $p < 0.01$ .

$p < 0.05$ ). The Chow test ( $F = 1.81, p > 0.05$ ) confirmed the slope of the regression models in Categories 2 and 3 to be equal.

### Discussion and managerial implications

According to our results, it is not surprising that the number of products purchased from other service providers has a negative effect on cross-buying because clients' demands may already be satisfied. In line with Debling (1998) and Lam & Burton (2005), clients are more concerned about getting the best products and are willing to go to different service providers to get them. Thus, their demands cannot be filled best only by a single financial service provider. Furthermore, prior studies suggest that clients who remain with a service provider for a period of time are willing to cross-buy additional products (Garland, 2002; Liang & Wang, 2006). Similarly, Harrison (1994) argued that clients often buy financial products in a hierarchical order, moving from simple banking products to complex investment products. However, our findings showed that relationship length only has an effect on cross-buying under the condition of high category similarity. In other words, a long-term relationship will increase the number of simple and complex products within high similarity categories. After all, clients' experiences with a service provider will not necessarily result in purchasing various products (Verhoef, 2003). In addition, we find that older clients seem less likely to cross-buy dissimilar product categories than younger clients. This is consistent with the findings that younger clients are willing to view their banks as providers of insurance and investment (Howcroft et al., 2003b). Furthermore, Li et al. (2005) supported the argument and found that older clients with an account at a competing service provider seem not to cross-buy products. This is because it is relatively easy for older clients to switch the existing service provider. To sum up, our findings are in line with Keiningham et al. (2003), arguing that treating all clients as homogeneous has the potential to lead to inappropriate resource allocation. We suggest that there is instead the

opportunity for bank managers to find which segments are more likely to cross-buy various financial products.

Our results provided empirical evidence to support the argument that satisfaction has an effect on similar cross-buying but does not have an effect on dissimilar cross-buying (Bolton et al., 2004). A prior study that has reported no significant effect of satisfaction on cross-buying for an insurance company (Verhoef et al., 2001) may be due to the fact that product categories for cross-buying include insurance and loan products, thus ignoring the moderating role of category similarity. In contrast, our results show that trust, rather than satisfaction, is a relatively more important antecedent of both dissimilar and complex cross-buying. We can speculate that the lack of a significant effect of trust on the number of services purchased found by Verhoef et al. (2002) may be due to the fact that the product categories are all insurance-related products in their study and their study ignores the moderating role of category complexity. As expected, satisfaction and trust have equal effects on cross-buying under the joint conditions of high category similarity/high category complexity and low category similarity/low category complexity. Thus, banks can focus on developing both trust and satisfaction on the part of clients because clients value banks in whom they have trust and with whom they are satisfied, and they are willing to cross-buy other products from such banks.

Thus, if banks want to increase cross-selling for similar and simple product categories, they can aim to satisfy clients through access convenience (Berry et al., 2002), service quality (Bou-Llusar et al., 2001; Caruana, 2002; Hsieh & Hiang, 2004) and price perceptions (Voss et al., 1998). Service quality is particularly crucial in cross-buying similar and simple product categories because traditional banking products are viewed as relatively undifferentiated. In addition, most basic banking products and simple insurance and investment products will be increasingly provided by Internet or telephone banking. Thus, banks should develop complementary channels to increase interactions with clients, and these increased interactions could lead to higher satisfaction and cross-buying (Devlin, 2001; Wallace et al., 2004). Moreover, it was suggested that price is an important factor when purchasing basic products (Devlin, 2001; Howcroft et al., 2003b). Therefore, it is crucial for banks to manage their clients' price perception, thus enhancing the potential for cross-selling simple product categories.

If banks want to increase cross-selling for dissimilar and complex product categories, they can seek to create advantages through comprehensive advice and asset allocation approaches to evaluate more systematically a client's complete financial situation, diversification requirements and risk return appetite. Thus, training salespersons about their different products is essential. The trained salespersons can be perceived as trustworthy in their evidence of expertise or competence, thus developing clients' trust (Crosby et al., 1990; Doney & Cannon, 1997; Johnson & Grayson, 2005). In addition, two-way communication is important for trust to develop because it ensures that clients would like to exchange information about their preference (DeWulf & Odekerken-Schröder, 2003). Consequently, banks can learn more about clients' preferences, and past purchasing behavior, and thus satisfy customer needs more effectively than competitors (Kamakura et al., 2003).

### **Research limitations and directions for future research**

A major limitation of the study is the use of cross-sectional data, making it hard to make strong inferences about cause and effect. Future research should collect data from longitudinal observations. Second, the results were based on a single country. Nevertheless, the applicability of the

findings needs further research. For example, following the passage of the Gramm-Leach-Bliley of 1999, growth of the bank branch network was predicted for the insurance market in the US, while income from insurance sales is still not a significant amount of income for banks (Dumm & Hoyt, 2003). In Taiwan, most banks have the same situation. However, the sales of life insurance from bank branches have had a positive result in Europe. It is possible that clients perceive insurance and banking products as more similar in Europe than in Taiwan and the US. The inconsistency of clients' perceived category similarity of financial products in different countries will influence the moderating effect of category similarity in this study. In addition, this study used perceived firm's ability and skill in providing various products to measure category similarity. Future research can add a complement variable for clients to evaluate category similarity (Aaker & Keller, 1990) because it also has the opportunity to increase sales through cross-selling mortgages with a complementary homeowner insurance product in another category.

Third, there are other alternative moderating variables that can be examined. It has long been proposed that customer knowledge or expertise may affect information and decision-making behavior (Andreassen & Lindestad, 1998; Chiou et al., 2002). In this study, mortgages belong to high complexity category. This is consistent with Howcroft & Beckett's (1996) claim that mortgages are in the middle of complexity. Moreover, it was also suggested that bank loans are more complex, since clients have little ability to cognitively process interest rates, fee schedules, and payment choices (Johnson et al., 1996). However, mortgages fall into the simple category in the study of Devlin (2001). The reasonable explanation lies in the varying degrees of customer knowledge. Thus, additional research might investigate the moderating effect of clients' knowledge.

Finally, it is also possible that satisfaction and trust have nonlinear relationships with cross-buying. For example, Keiningham et al. (2003) suggested that the great positive effect of satisfaction on share of wallet occurs at the upper extreme levels. These issues merit further investigation.

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