Estimating the Willingness to Pay for Online Banking Services by SMEs Engaged in International Trade

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ABSTRACT

The objective of this dissertation is to determine the important attributes of online banking services for SMEs as well as the value of the services to them. Of particular interest are the attributes relevant to SMEs engaged in international trade. A choice experiment method is used to value the attributes of online banking services namely travel time saved, waiting time saved, unlimited 24/7 accessibility, and a high level of security. The data were collected through face to face nterviews of 400 SMEs financial managers/owners from the Free Trade Zones of the United Arab Emirates (UAE). Using mixed logit estimation models, the results of this research show that 24/7 accessibility to banking services and a high level of security are highly valued by these enterprises. If these attributes are missing over 93 percent of the value of the service to the SME owners are lost. On average the WTP for high-quality service is $451.07 and vary from $163.31 per month for those firms not involved in international trade to $736.26 per month for those SMEs who export in excess of 25 percent of what they produce. Another method which is used to estimate the WTP is CVM. An interval regression model is used to identify company characteristics affecting WTP. The results indicate an average WTP for online banking of $518.50 per month. Firms engaging in international trade value these services at least 10% more than those with only domestic operations. Other variables that significantly affect WTP include the number of employees and the transportation cost of using traditional branch banking.

Keywords: Online banking services, willingness to pay, choice experiments, mixed logit model, contingent valuation method, interval regression.

ÖZ

Bu tezin amacı, KOBİ'ler için internet bankacılık hizmetlerinin önemli niteliklerini ve KOBİ'lere verilen hizmetlerin değerini belirlemektir. Özellikle uluslararası ticaretle uğraşan KOBİ'ler ile ilgili niteliklere özel ilgi gösterildi. İnternet bankacılık hizmetlerinin önemli niteliklerinden olan seyahat süresinden tasarruf, bekleme süresinden tasarruf, 7/24 sınırsız erişilebilirlik ve yüksek düzeyde güvenlik niteliklerine değer verebilmek amacıyla seçim deney yöntemi kullanılmıştır. Veriler, Birleşik Arap Emirlikleri Serbest Ticaret Bölgesinden, 400 KOBİ finansal yöneticisi veya sahipleri ile yüz yüze görüşme yoluyla toplandı. Bu araştırmanın sonuçları, karma logit kestirimi modelleri kullanılarak, bankacılık hizmetlerine 24/7 erişilebilirliğin ve yüksek bir güvenlik seviyesinin bu şirketler tarafından çok değerli bulunduğunu göstermektedir. Bahsi geçen nitelikler olmasaydı, KOBİ sahiplerine sunulan hizmetin değerinin yüzde 93'ünden fazlası kaybedilecekti. Ortalama olarak yüksek kaliteli hizmet için ödeme istekliliği aylık 451.07 Dolar, uluslararası ticarete katılmayan firmalar için aylık 163,31 Dolar ve ürettikleri ürünün yüzde 25'inden fazlasını ihraç eden KOBİ'ler için ise aylık 736,26 Dolar olarak belirlenmiştir. KOBİ'lerin ödeme istekliğini tahmin etmek için sürekli değerlendirme yöntemi de kullanılmıştır. Ödeme istekliğini etkileyen şirket özelliklerini belirlemek için bir aralık regresyon modeli kullanılmıştır. Sonuçlar, internet bankacılık hizmeti için aylık ortalama 518.5 Dolar ödeme istekliliği olduğunu göstermektedir. Uluslararası ticaret yapan firmalar sadece yurt içinde faaliyet gösteren firmalara kıyasla internet bankacılık hizmetlerine en az % 10 daha fazla değer veriyor. Firmaların ödeme istekliliğini önemli ölçüde etkileyen diğer değişkenler çalışan sayısı ve geleneksel şube bankacılığını kullanmanın ulaşım maliyetidir.

Anahtar Kelimeler: internet bankacılık hizmetleri, ödeme istekliliği, seçim deneyleri, karışık logit modeli, sürekli değerlendirme yöntemi, aralıklı regresyon.

DEDICATION

To My Parents

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Chapter 1

INTRODUCTION

1.1 Introduction

Banking services can be considered as the largest industry which serves for all sections of the society (Al-Marri et al., 2007). The quality of these services is very important in the economy especially for the firms that provide goods and services.

Providing a low cost, secure, and easy to access banking services is crucial for countries economic growth. It is highlighted when the issue of the role of small and medium-sized enterprises comes in, particularly for the countries within which numerous multinational companies operate.

Online banking brings many advantages to SMEs. Many formerly in-branch transactions can now be performed through the internet at a lower cost. These include account balance inquiries, money transfers, periodic payments, and foreign exchange transactions. The most important benefit of online banking is that bank accounts can be controlled by the owners or financial managers of the SMEs (Riyadh et al., 2009).

While there are many studies that identify the important attributes of online banking for customers in developed countries, no research to date has attempted to quantify

the value that small and medium-sized enterprises (SMEs) place on the various qualities of online banking services.

In the present research we attempted to model the factors that affect online banking services as well as the value of the services to the SMEs that engaged in international trade, the concept which is getting a high value over time given that the nature of the world economy is changing and banks can be considered as an important accelerator for these changes.

This study contributes to how the quality changes in banking services will change the consumer surplus in developing countries and what actions need to be applied to improve economic surplus in this part of the world. It adds to the existing literature by quantifying, in monetary terms, the economic value that these firms place on such services. Furthermore, particular attention is given to the importance of international trade activities on the determination of the value of these services to SMEs. We utilized two methods namely choice experiments and contingent valuation methods to estimate the willingness to pay for online banking by SMEs operating in the UAE free trade zones.

1.2 Banking Service Revolution

According to Chou and Chou (2000) banking industry started its revolution from the 1970s by introducing telephone banking as “home banking” and then in the 1980s, the medium of home banking changed from telephone to cable TV. Both means had the drawback of one-way communication which was solved by the introduction of the personal computer, later.

1.3 Drawbacks of Traditional Banking

In order to perform their banking transactions using traditional banking, the owners or senior managers of SMEs have to spend time and incur transportation costs to travel to bank branches and sometimes have to wait in a line for service. Alternatively, they may hire a specific employee whom they trust to carry out these duties. If any mistakes are made, staff have to refer back to the bank in order to correct them. In principle, most of these costs can be eliminated through online banking.

1.4 International Trade in the UAE and the Role of SMEs

It has been found that international trade tends to increase economic growth (Schneider, 2005), and in many countries, SMEs perform a significant role in international trade (Knight, 2001). In this context, online banking can be a positive element in facilitating international trade (Rahman et al., 2012). Banks providing online banking services to SMEs enable them to deal with international business transactions at a much-reduced cost.

In 2010 the ratio of imports plus exports (of goods and services) to gross domestic product (GDP) in the UAE was around 147% (World Trade Organization, 2012). The UAE's annual trade statistics indicate that this ratio has been growing over recent years. It is the policy of the UAE to expand its international trade sector as a catalyst for the growth of the country's economy. This is implemented by establishing free-trade zones, improving infrastructure, and supporting projects that will improve its competitive position in the international market (World Trade Organization, 2012). SMEs – companies with fewer than 250 employees and revenue

of less than US$68 million – are considered to be the main pillar of the UAE's economy and a critical element in its economic growth.

The potential of online banking as an input to economic growth is evaluated here by studying firms operating in the Free Trade Zones of the United Arab Emirates (UAE), the center of trade in the Middle East. These firms operate in countries with different weekdays and different public holidays from those in the rest of the world. This can be considered a barrier to SMEs' access to international markets. Online banking helps to address this problem, as it is available 24 hours a day and 7 days a week.

Another feature of online banking is its availability to business operators regardless of their location. Online banking can improve the productivity of SMEs, and this, in turn, will affect their competitiveness as exporters (Wengel and Rodriguez, 2006).

The SMEs operating in the Free Trade Zones of the UAE are the focus of the empirical investigation of this study. The owners of these firms represent a wide range of nationalities from both developed and developing countries. At the time when our field research was conducted, the banks in the UAE provided inadequate online banking services to these enterprises. Hence, they constitute an ideal laboratory for measuring the willingness to pay (WTP) for online banking services by SMEs. The magnitude of WTP as expressed by these SMEs is an indication of the economic value of this innovation.

1.5 Business Online Banking Services

Business online banking offers secure and easy access to banking services, enabling the online payment of bills, receipt of funds, and funds transfer at a lower cost to the

customer than that of traditional banking. Most SMEs in developing countries face a range of challenges. On the one hand, they are often required to conduct their business without a proper financial infrastructure to operate efficiently, and on the other hand, they have to satisfy their customers' preferences. Online banking services can help them to save time (Calisir and Gumussoy, 2008). This is particularly the case for SMEs engaging in international trade, where wire transfers and opening letters of credit are needed. In the absence of a high-quality online banking system, these are time-consuming and, hence, expensive transactions for the firm. We would expect to find that such firms are willing to pay a premium for access to online banking services.

The use of online banking means that owners/managers or specific employees of SMEs do not have to spend time and pay transportation costs to go to a bank branch and then wait in a queue to perform their banking transactions. In addition to the savings in time and cost, online banking services give the owner/manager the opportunity to check the firm's transactions and available cash, anytime and anywhere. The online service also increases the satisfaction levels of the SMEs' customers and suppliers, since they can pay and be paid for their business transactions online and receive notification for every transaction.

One of the most important problems that banks' clients face is internal bank fraud. Cummins et al., (2006) reported that in the USA, 23.2% of bank accounts faced some type of internal fraud. Apart from the above-mentioned advantages, online banking provides accessibility that gives SME owners/managers the ability to check their bank accounts frequently and, hence, to detect more quickly any mistake or fraudulent behavior on the part of bank personnel.

Electronic banking reduces the operational costs of banks (Jordan and Katz, 1999; and Polatoglu and Ekin, 2001) and individual transaction costs (Jayawardhena and Foley, 2000). According to Jayawardhena and Foley (2000), the cost of a simple transaction performed using the traditional bank branch is 11 times more than one performed through online banking. Another study (The Dominion, 2001) found that the cost to a bank of an online transaction is $0.05, while the same transaction through a bank branch costs $1.

We tried to identify the determinants and measure the WTP by SMEs for secure online banking services that are available 24/7. It is a common belief that strong SME performance speeds up economic growth and decreases poverty (Beck et al., 2005). Engagement in international trade becomes an important feature of SMEs, as these firms often have lower cost and are more productive (Bernard et al., 2007). Providing low-cost banking services would serve to improve further the competitive position of these firms.

A common problem in transition countries is that the laws and regulations governing online banking have lagged behind the advances in technology that are now available to provide this service. In many such countries, the government needs to modernize the banking regulations to allow banking customers and banks to enjoy the economic benefits of this innovation. This motivation should be particularly strong in the case of banks providing online banking services to SMEs engaged in international trade. Wire transfers and opening of letters of credit are important components of the financial transactions of such enterprises and are expensive in terms of time and effort for both the customer and the bank when carried out as in bank transactions.

1.6 The Valuation Methods

To estimate the strength of business preferences toward the attributes of nonmarket products, one can utilize two types of stated preference research methods, namely contingent valuation and choice experiments (CE) (Adamowicz et al., 1998). This is the first study of which we are aware that measures the WTP for online banking services using CE and CV methodologies.

Because of the cosmopolitan nature of the operators of the SMEs in our sample and the wide range of trading activities they undertake, the results of this study are relevant to governments and banking regulators worldwide who are seeking ways to improve the business environment of this sector.

1.7 Outline of the Dissertation

This dissertation is designed as follows. Chapter 2 includes a literature review. The most commonly used valuation methods to estimate consumers' willingness to pay for an improved or a new good or service are explained in this chapter which are contingent valuation and choice experiment methods.

Chapter 3 is devoted to experimental design. The required steps in generating choice sets such as selecting the attributes and attribute levels of the service, the design strategies, and the alternative services are explained in this chapter.

The questionnaire development is presented in chapter 4. The results of the pilot and main studies are reported in this chapter along with the revised parts of the initial questionnaire.

Chapter 5 is dedicated to the results of the CVM survey. Using an interval regression we first model the sample SMEs willingness to pay for business online banking service as a function of socio-demographic variables and then estimate the average value of the service to the firms with and without international trade given the three different costs of transportation and number of employees.

The results of the CE study are reported in chapter 6. After modeling the utility as a function of the attributes of banking services we estimate marginal willingness to pay for the attributes, average willingness to pay for online banking under four different scenarios, and average willingness to pay for the four scenarios of the firms with four different conditions namely: the firms with and without international trade, with a level of imports more than 15% of their sales, and with a level exports more than 25% of their sales.

In chapter 7, we compare the results of the two methods namely CV and CE methods and propound the policy implications of the results.

Chapter 2

LITERATURE REVIEW: METHODOLOGIES TO ESTIMATE WILLINGNESS TO PAY FOR ONLINE BANKING SERVICES

2.1 Introduction

In chapter 1 we investigated the drawbacks of traditional banking services, the importance of international trade, and the role of SMEs in international trade. We discussed the existing banking services for the SMEs in the UAE free trade zones and described the methodologies and goal of this research. In this chapter, we will explain different theories and methodologies used to estimate consumers' valuation of a product and the welfare impact of a change in quality.

Consumers' willingness to pay for a product can be estimated employing two main techniques: revealed preference (RP) technique and stated preference (SP) technique (Louviere, 2000). A revealed preference technique evaluates the respondents' consumptive uses for a market and non-market goods while a stated preference technique looks for the participants' decision about a contingent market with a newly introduced or an improved product (non-market products) (Pearce 2002).

2.2 The Theory Behind the Welfare Effect of A Quality Improvement

In the case of quality improvement for a service, economists measure the welfare effect of the action and estimate the monetary value of that improvement. Welfare

impact of quality improvement can be derived by estimating the willingness to pay or the willingness to accept (WTA). For a case such as banking services, the value of improved online banking service to consumers may be calculated by estimating the change in consumers' utility from U_0 to U_1 when the quality of the services changes from X_0 to X_1 (Silberberg and Suen, 2001).

Consumer's maximum willingness to pay for quality improvement can be estimated by calculating compensating variation (CV) (O'Brien and Viramontes, 1994) which is actually equivalent to consumers' surplus in monetary value. The value of CV is equal to the amount that must be subtracted from a consumer's income in order to keep her/him on her/his initial utility after an improvement in the quality of a product (Hicks, 1939).

Subtracting CV from consumer's income the new indirect utility obtained from the new quality of the product will be equal to its initial utility. This action can be shown in the consumer's indirect utility function:

$$V\ (P_0, X_0, Y\ )\ =\ V\ (P_0,\ X_1, Y - CV) \tag{2.1}$$

where Y is the consumer's income P_0 is the initial price and V(.) is the consumer's indirect utility function. Compensating variation can be also derived using expenditure function as follow:

$$CV = e(P_0, X_0, U_0) - e(P_0, X_1, U_0) \tag{2.2}$$

where e(.) is consumer's expenditure function. Consumer's minimum WTA for quality improvement can be estimated by calculating equivalent variation (O'Brien and Viramontes, 1994). Equivalent variation (EV) is the amount of money that should be given to a consumer in order to change his/her initial utility to a level that

would occur if the quality improvement had happened. EV can be derived from consumer's indirect utility function as follow:

$$V\ (P_0, X_0, Y\ +\ EV)\ =\ V\ (P_0,\ X_1, Y) \tag{2.3}$$

It can also be computed using the consumer's expenditure function:

$$EV = e(P_0, X_0, U_1) - e(P_0, X_1, U_1) \tag{2.4}$$

Utilizing the above-mentioned formulas the value of the WTP will not be equal to the value of WTA for quality improvement (Hanemann, 1991; Zhao and Kling, 2004; Biel et al., 2006). Most studied on quality improvement found a higher value for the WTA than WTP.

2.3 RP Technique

Revealed preference technique applies different methods to estimate the WTP for an improved service. These methods are averting expenditure, travel cost, hedonic price, cost of illness, and direct demand estimation each of which has its own drawbacks but most widely utilized method is averting expenditure (AE) (Ozbafli, 2012).

Direct demand estimation technique is rarely utilized since it requires a set of information such as quantity and price of service sold which are hardly available. Averting expenditure method is used to estimate the value of environmental and other public goods to consumers. The results of some studies on environmental goods show that even though a major part of the cost of low-quality public goods cannot be averted but averting expenditure method leads to estimate a lower bound of the total expenditure (Um et al., 2002). Cournat and Porter (1981) in their study concluded that the estimated WTP resulted from an AE method may or may not be a lower boundary or it may be even an upper boundary.

2.4 State Preference Technique

Stated preference technique applies two methods to estimate consumers' willingness to pay: contingent valuation (CVM) and choice experiment (CE) methods.

2.4.1 Contingent Valuation Method

CVM was introduced theoretically in 1947 and first applied in practice in 1963 (Venkatachalam, 2004). In this method, a hypothetical market for a new or improved product is created and the participants in this contingent market are directly asked to express their willingness to pay for the product.

CVM is a tool that is commonly used to estimate the economic value of environmental and public goods, to compare actual and hypothetical WTP, and to measure welfare (Hanemann, 1984; Seip and Strand, 1992; Blaine et al., 2003; Bosetti and Pearce, 2003; Zhongmin et al., 2003; Nomura and Akai, 2004; Mahieua et al., 2012; and Ozbafli and Jenkins, 2015). This research technique has been used to examine non-environmental issues, such as improved services (Saz-Salazar and Garcia-Menendez, 2001; Kim, 2005; Ajayi, 2006; Cawley, 2008; Lindhjem and Navrud, 2011).

CVM is also used to estimate the willingness to accept (WTA) for environmental goods and in marketing studies aimed at estimating the value to consumers of new products (Amigues et al., 2002). However, the reliability and validity of this method have been criticized by some scholars (Hausman, 1993; Diamond and Hausman 1994; and Hausman, 2012).

Venkatachalam (2004) in his review on CVM studies, elicited the most frequently mentioned drawbacks of the method which affect its accuracy and consistency as follow:

- The discrepancy between willingness to pay (WTP) and willingness to accept (WTA): CVM uses either WTP or WTA to estimate the change in consumer surplus for an improved service while the value of this two measures is often different as a result of income effect (Willig, 1976). WTA is usually greater than the WTP as equivalent variation (EV) is applied to estimate WTA and compensating variation (CV) is utilized to estimate WTP. Hanemann (1991) stated that if the income elasticity of a public good is high the value of WTP and WTA for the good will be much different otherwise they are close to each other. He concluded that the difference between the two values can be due to the substitution effect as well. Many researchers do believe that the estimated values of WTP and WTA are different but they disagree on the magnitude of the difference between these two. Therefore as a conclusion WTP is a better measure of consumer surplus in contingent valuation surveys.
- Embedding or scope effect: scope effect refers to the variation in the value of WTP for a public conditional on whether it is estimated as a part of a package or itself only (Kahneman and Knestch, 1992), or the values are different in different geographical areas. The results of CVM studies indicate the different magnitude of variations. For example, Kahneman and Knestch (1992) found a statistically significant difference among the WTP for the public good in three different packages. However, questionnaire development, selected sample, and statistical tools used in the surveys affect the results (Smith, 1992).

- Sequencing effect: It may happen when the participants are asked about their willingness to pay for two or more goods and the stated willingness to pay may differ depending on the order of the goods (Samples and Hollyer, 1990). This error may be the result of the substitution and income effect (Carson et al., 2001). There are two ways to address this effect: 1- before asking the WTP questions the respondents are informed about the procedure of the interview, 2- the respondents are given the opportunity of revising their responses at the end of the interview (Mitchell and Carson, 1989).
- Information effect: this effect depends on the respondents' initial information along with the provided information about the subject. To address this effect, the questionnaire developer must provide appropriate information about the subject to ensure that the respondents fully understand the subject.
- Elicitation effect: using different techniques such as payment cards a researcher tries to elicit consumers' willingness to pay for a product. Payment card technique enables a researcher to elicit consumers' maximum WTP but the value of the WTP may be faced by range or centering bias as the approach provides ranges of potential values.
- Hypothetical bias: the market in CVM studies is a hypothetical market, not a real one, thus there may be a hypothetical bias. This bias refers to the difference between the WTP value result from a CVM study and the actual WTP. The occurrence of this bias depends on the respondents' awareness of the intended product (Cumming et al, 1986).
- Strategic bias: this bias happens if the participants do not state their actual WTP for some strategic motivations. They may understate their WTP because they believe the good will be priced based on their answer or overstate it if they think

their stated WTP does not affect the price but influences the supply of an improved product positively.

In this application to the measurement of the WTP for online banking services, the usual problems of consistency and accuracy of the contingent valuation method are not as serious as found in many other studies. This study uses CVM to elicit the SMEs' valuation of online banking which cannot be considered as a public good. In many of the CVM studies, the method is used to estimate the consumers' non-use value[1] (Diamond, 1996) of a public good which is not purchased by the consumers directly (Diamond and Hausman, 1994). As online banking service is a private good (not a public good) and the results of the survey can be compared with the actual demand in other available markets for online banking service (Diamond, 1996). Hence, we can have more confidence in the CV method to estimate accurately the willingness to pay for this service.

2.4.1.1 Theoretical Structure of the CV Method

To determine customers' WTP for a new good or improved service, economists create a contingent market and ask participants about their WTP for that product. Such research entails two types of questions: open-ended and dichotomous. One type of open-end question is sequential binding, in which the participant response may be oral or using payment cards—that is, respondents are asked to indicate the highest value they would be willing to pay by selecting one of a range of payment cards (Cameron and Huppert, 1989).

The first step in conducting our research was to identify the market or customers. Our contingent market in the UAE free zones was comprised of 400 SMEs, most of

[1] Non-use value refers to the value of the good that will be used in the future not now.

which were engaged in international trade. The owners/managers of these SMEs were invited to participate in our hypothetical market for online business banking services, using payment cards. Cameron and Huppert (1989) compared two approaches to estimating WTP, namely ordinary least square (OLS) and maximum likelihood (ML). According to their findings, the OLS approach yields inaccurate results because the interval midpoints are used as the stated WTP, producing inconsistent parameter estimates (Voltaire, 2015). We, therefore, used the ML method.

In such studies where the dependent variable does not have a specific observed value—rather, its value lies within a continuous interval—interval regression models may be used to estimate the parameters in the CVM. For example, Loureiro and Hine (2002) utilized a multiple bounded probit model "to quantify factors affecting consumer preferences among organic, GMO-free, and Colorado-grown potatoes". Voltaire (2015) used a switching interval regression to analyze WTP for new products. Other interval methods are regression quantile techniques (Lee and Tanaka, 1999) and a censored regression model (Cameron, 1991).

Maximum likelihood interval estimation method*:* The payment card system is widely used as a means of establishing WTP for a non-market product, while the ML approach has been found to be an appropriate means of interval estimation (Voltaire, 2015). In this study, we used the Cameron and Huppert's (1989) model to estimate SMEs' WTP for an online banking service, from data collected using payment cards. Unlike their log form, we used a linear form of the willingness to pay. We define the lower and upper boundaries of the payment card chosen by the respondent as t_{li} and t_{ui}, respectively, and assume that respondents' actual WTP lies between these

two values (Loureiro and Hine, 2002). Therefore WTP will lie within t_{li} and t_{ui}, according to the general assumption.

$$E\big((wtp \mid x_i)\big) = g(x_i, \beta) \tag{2.5}$$

and,

$$g(x_i, \beta) = x'_i\beta \tag{2.6}$$

Therefore:

$$WTP = x'_i\beta + u_i \tag{2.7}$$

where u_i is distributed normally with mean 0 and standard deviation, σ, and x'_i is a vector of independent variables that influence the SME's WTP for different service attributes, the characteristics of the owner or the SME's business activities. After standardizing the pair of thresholds, we obtain:

$$pr(WTP_i \subseteq (t_{li}, t_{ui})) = pr\left(\frac{t_{li} - x'_i\beta}{\sigma} < z_i < \frac{t_{ui} - x'_i\beta}{\sigma}\right) \tag{2.8}$$

where z_i is the standard normal random variable. After some manipulation, equation (2.8) can be written as:

$$pr\big(WTP_i \subseteq (t_{li}, t_{ui})\big) = \Phi(z_{ui}) - \Phi(z_{li}) \tag{2.9}$$

where Φ is the cumulative standard normal density function. The joint probability of *n* independent observations is equal to the log-likelihood function as follows:

$$\log L = \sum_{i=1}^{n} log\,[\Phi(z_{ui}) - \Phi(z_{li})] \tag{2.10}$$

By estimating equation (6), one can establish the value that consumers place on a good or service (Loureiro and Hine, 2002).

2.4.2 CE Method

CE has been used to study the rationality of choice behavior, with researchers using a variety of approaches to design intricate choice sets (Hensher, 2006). Using CEs, a researcher can construct a hypothetical market for a good or service. Experimental design allows researchers to generate groups of choice sets with the desired

properties. Respondents are typically asked to choose between alternative goods or services with different levels of attributes (Balcombe et al., 2015).

Unlike CVM, this method provides the chance of estimating the marginal effect of each attribute of the service which actually shows the trade-off between the attributes. The attributes are the characteristics of the product or service that affect consumers' decisions. Utilizing this method allows the economic welfare effect of the attributes to be estimated. Although this method is used to estimate the WTP for a variety of public goods and health care programs (Goett et al., 2000; Ryan and Gerard, 2003; Alfnes et al., 2006; Scarpa and Willis, 2010; Potoglou and Kanaroglou,2007; Olesen et al., 2010; Van Loo et al., 2011), there is no study done on online banking services evaluation.

For this study, we designed different choice sets with hypothetical scenarios related to two alternative banking services. In addition to the two alternative services, we included the consumers' current banking services as the status quo option.

The most important attributes evaluated in this study were identified through a literature review, focus group interviews, and a pilot study. Previous researchers have identified the key attributes that people are seeking in an online banking service, such as accuracy, speed, user-friendliness, convenience, accessibility, awareness, reliability, usefulness, and trust (Liao and Cheung, 2002; Yousafzai, et al., 2003; Sohail and Shanmugham, 2003; Akinci et al., 2004; Centeno, 2004; Lichtenstein, 2006; Eriksson and Nilsson, 2007). Other attributes that have been found to be important for consumers' satisfaction include security, convenience, cost saving, ease of use, privacy, quality of internet connection, user involvement,

availability of features, pre-adoption knowledge, and creation of offline environment (Calisir and Gumussoy, 2008; Padachi et al., 2008; Poon, 2008; Vatanasombut et al., 2008; Woldie et al., 2008; Al-Somali et al., 2009; Hassanuddin et al, 2012).

2.4.2.1 Theoretical Context for CE Methodology

Utility functions indicate consumers' preferences for goods and services and are assumed to be an increasing function of the quantities of those items (Li and Mattsson, 1995). The benefits of any services or goods increase the utility for the users. Thus, in order to measure the impact of online banking services, one should apply a utility function that measures the level of satisfaction without, U^0, and with, U^1, the services. The difference between these utility levels is the gain (loss) that consumers experience from the consumption of these services or goods.

The decision maker always has to make a trade-off among goods and services, since there are some constraints, such as a limited budget. Selecting between numerous products depends on the preferences of the decision maker. If there are *i*= 1, … , *I*, alternatives that a decision maker q (which can be an individual or a firm) must choose from, then the utility function would be *Uqi*. Since a decision maker theoretically chooses the services or goods to maximize utility, he or she selects the alternative i when $U_{qi} > U_{qj} \quad \forall i \neq j$. The whole part of the utility gained from choosing an alternative cannot be observed except for the utility gained from the specified attributes of the alternative. Thus the utility function can be written as:

$$U_{qi} = V_{qi} + \varepsilon_{qi} \tag{2.11}$$

where V_{qi} is the observable part of the utility which is a function of the attributes of the product. ε_{qi} contains all the features that cannot be observed, are unknown, and it

is assumed to be independently identically distributed(IID). There is a finite number of alternatives, *i*= 1, 2, …, *I*.

According to Train (2009), the probability that individual q will choose alternative i is:

$$P_{qi} = Pr\left(U_{qi} > U_{qj} \quad \forall\, i \neq j\right) \tag{2.12}$$

$$= Pr\left(V_{qi} + \varepsilon_{qi} > V_{qj} + \varepsilon_{qj} \quad \forall\, i \neq j\right) \tag{2.13}$$

$$= Pr\left(\varepsilon_{qj} - \varepsilon_{qi} < V_{qi} - V_{qj} \quad \forall\, i \neq j\right) \tag{2.14}$$

$$P_{qi} = Pr\left(\varepsilon_{qj} < \varepsilon_{qi} + V_{qi} - V_{qj} \quad \forall\, i \neq j\right) \tag{2.15}$$

Since ε_{qi} is unknown, it should be treated as a random variable. Thus, the choice probability is the integral of $P_{qi} \mid \varepsilon_{qi}$ over all values of ε_{qi} weighted by its density. Since ε_{qi} in this case is assumed to be an independently identically distributed extreme value, its density is:

$$f\left(\varepsilon_{qi}\right) = e^{-\varepsilon_{qi}} e^{-e^{-\varepsilon_{qi}}} \tag{2.16}$$

and its cumulative distribution is:

$$F\left(\varepsilon_{qi}\right) = e^{-e^{-\varepsilon_{qi}}} \tag{2.17}$$

ε's are assumed to be IID therefore if they were known the probability would be a product of the individual cumulative distributions as follow:

$$P_{qi} \mid \varepsilon_{qi} = \prod_{j \neq i} e^{-e^{-\varepsilon_{qj}}} \tag{2.18}$$

But ε's are unknown, so the choice probability is the integral of $P_{qi} \mid \varepsilon_{qi}$ over all value of ε_{qi}:

$$P_{qi} = \int \left(\prod_{j \neq i} e^{-e^{-\left(\varepsilon_{qi} + V_{qi} - V_{qj}\right)}} \varepsilon_{qj} \right) \left(e^{-\varepsilon_{qi}} e^{-e^{-\varepsilon_{qi}}}\right) d\varepsilon_{qi} \tag{2.19}$$

The logit choice probability is then:

$$P_{qi} = \frac{e^{V_{qi}}}{\sum_j e^{V_{qj}}} \tag{2.20}$$

V_{qi} is assumed to be a linear function of the attributes:

$V_{qi} = \beta' x_{qi}$ where x_{qi} is a vector of attributes observed by respondent i and β' is a vector of the coefficients.

$$\text{thus } P_{qi} = \frac{e^{\acute{\beta}' x_{qi}}}{\sum_j e^{\acute{\beta}' x_{qj}}} \tag{2.21}$$

The willingness to pay for an attribute can be found by taking the ratio of the coefficient of an attribute to the coefficient of the related cost. According to Gronberg and Reed (1994):

$$MWTP_k(x) = \frac{\frac{\partial V(x)}{\partial k}}{\frac{\partial V(x)}{\partial C}}, \quad k = 1, 2, 3, \ldots, I \tag{2.22}$$

where $MWTP_k(x)$ is the marginal WTP for attribute 'k' of commodity 'x', V(x) is observed utility obtained from commodity 'x', and 'c' is the additional cost imposed on the commodity due to quality improvement.

Therefore:

$$MWTP_k(x) = \frac{\beta_k}{\beta_C} \tag{2.23}$$

Logit and multinomial logit models are restricted by IIA (independence from irrelevant alternative) assumption that is the odd ratio of any two alternatives does not depend on any alternative other than those two. Mathematically:

$$\frac{P_{qi}}{P_{qk}} = \frac{\frac{e^{V_{qi}}}{\sum_j e^{V_{qj}}}}{\frac{e^{V_{qk}}}{\sum_j e^{V_{qj}}}} = \frac{e^{V_{qi}}}{e^{V_{qk}}} = e^{V_{qi} - V_{qk}} \tag{2.24}$$

where 'i' and 'k' are the two alternatives.

The multinomial logit (MNL) model has been utilized in many studies, but researchers have gradually discovered that the assumption of IIA might not always hold. In other words, certain attributes may affect the utility of some individuals differently than they affect others. Hence, the IIA assumption that requires that an

attribute affects each individual utility, in the same way, might reduce the accuracy of the research results. Therefore, the mixed logit (ML) model, which relaxes this restriction, has also been used (Chang and Jayson, 2011).

The assumption in the mixed logit model is that choice makers identify the features of the alternatives, evaluate the attributes of each alternative compared to the others, and select the alternative that maximizes their utility (Shaw and Ozog, 1999). Since consumers have different tastes and preferences, one should utilize the random coefficient attributes of the individuals. Thus, the utility function is:

$$U_{qi} = V_{qi} + \varepsilon_{qi} = \acute{\beta_q} x_{qi} + \varepsilon_{qi} \tag{2.25}$$

where $\acute{\beta_q}$ is the vector of the coefficients for the attributes that vary over individuals. To find the probabilities using mixed logit, one must integrate the probabilities of logit over the coefficients of the density function (Train, 2009). As has been shown above, the probability of individual *q* choosing alternative *i* is:

$$P_{qi}^{L}(\beta_q) = \frac{e^{\acute{\beta_q} x_{qi}}}{\sum_j e^{\acute{\beta_q} x_{qj}}} \tag{2.26}$$

Therefore, the probability (P_{qi}^{ML}) that an individual q chooses alternative i is calculated from the mixed logit as:

$$P_{qi}^{ML} = \int P_{qi}^{L}(\beta_q) f(\beta) d\beta \tag{2.27}$$

$$P_{qi}^{ML} = \int \left(\frac{e^{\acute{\beta} x_{qi}}}{\sum_j e^{\acute{\beta} x_{qj}}} \right) f(\beta) d\beta \tag{2.28}$$

The integral can be estimated using software such as NLOGIT, which applies maximum likelihood techniques. The advantage of CE over CVM is that in addition to the average overall WTP, the marginal willingness to pay for each attribute can be estimated. Despite this advantage, many studies count some errors similar to those we mentioned for CVM. For instance, Alpizar et al. (2003) mentioned some

problems with the CE method such as sequencing effect, strategic bias, information effect, and hypothetical bias.

Therefore there are always some problems with the two methods which are the only methods used to evaluate non-market commodities. These problems should not lead to stop measuring the value of these types of commodities. Some scholars proposed the remedies to minimize the errors for the CE method. For example, to minimize hypothetical bias, Hensher (2010) proposed the use of a pivoted design and different parameters for the contingent alternatives.

2.5 Review of Selected Study on Online Banking Services

Different facets of online banking have been studied by researchers in this field. Aladwani (2001) investigated the characteristics of online banking from the point of view of both banks and consumers. He concluded that for consumers the service is faster, easier to use, and more reliable than traditional banking. From the point of view of banks, he showed that the service improves their image and competitive position, establishes a valuable market, reduces operating and administrative cost, and decreases the number of employees required.

Some of the studies on online banking have considered the reasons for the adoption of online banking, while others have identified the main reasons that online banking has been rejected. For example, Martins et al. (2014) found that the important determinants for online banking adoption are performance and ease of effort, social influence, and perceived risk. Yiu et al. (2007) found a positive relationship between personal innovativeness and perceived risk with online banking adoption. Yousafzai

et al. (2003) found the most important reasons for online banking adoption to be trust and security.

Al-Somali et al. (2009) found the determinants of online banking adoption to be consumers' perception of the quality of the internet connection, consumers' awareness of e-banking services, perceived usefulness, and perceived ease of use. In addition to findings on the adoption of online banking, Eriksson and Nilsson (2007) identified perceived usefulness and satisfaction to be two important reasons for customers to continue their use of e-banking.

Sathye (1999) identified some obstacles to online banking, namely concerns about security and the lack of awareness about online banking. Kuisma et al. (2007) concluded that the rejection of online banking is often caused by psychological concerns, such as the absence of an official receipt, and functional barriers, such as a lack of computer skills and the absence of information on the nature of online banking.

Studies have also been undertaken to identify the reasons why some banks are successful in implementing online banking. Shah and Siddiqui (2006) found the main factor to be the re-engineering of the managerial structure of the bank in order to accelerate the decision-making procedure and to integrate online banking with the other service delivery channels.

To the best of our knowledge, this is the first study to estimate the willingness to pay for business online banking, employing the CVM using payment cards and CE method.

Chapter 3

CHOICE EXPERIMENTS DESIGN

3.1 Introduction

In the previous chapter, we discussed the different methods to estimate the economic effect of an improvement in the quality of a good or service. In the present chapter, we will explain the required steps for experimental design, the different strategies used to develop an experimental design along with the selected strategy for this study. Then we will construct the choice sets for the CE part of the survey instrument (questionnaire). These steps are very important as the experimental design is the main pillar of a choice analysis. The design should be appropriate in order to get accurate parameters estimates which will result in suitable policy implications.

The basic theoretical issue used in the stated choice experiment is utility theory, which states the consumers' utility for a good or service is a function of the good or service characteristics. Thus, the first important issue in experimental design is to identify the commodity characteristics to form the utility function. These characteristics are called *attributes*. Each attribute has different levels which are the values of the attribute. Each attribute level is called treatment and an arrangement of the attributes, each with a single level is called treatment combination or profile. A treatment combination, then, defines the characteristics of an alternative in a choice set.

In an experiment, a researcher is looking for the response of the utility to a change in the level of some attributes. The manipulation of the levels is a statistical design, which is called experimental design (Hensher et al., 2015). This statistical design allows the planner to eliminate many other influences (Louviere et al., 2000).

According to Hensher et al., (2005) to design the survey instrument (a questionnaire) using choice experiment one needs to follow several different steps as follow:

- Define the objective
- Define the derivers
- Determine experimental design strategy
- Generating experimental design
- Allocating attributes to design column
- Reduce the number of choice sets that the respondents face
- Constructing choice sets using software
- Develop a questionnaire with a different version of choice sets. These steps are explained in this chapter.

3.2 Define the Objective

Generating a choice set is one step of experimental design. The first step is to define the problem and to identify the reason that the research has been undertaken. In our study, we wish to estimate the willingness to pay for online banking. Therefore the research questions are:

1- What are the current banking alternative services?

2- What are the characteristics of banking services?

3- What are the features of the new service that make it attractive?

4- Why are banking services important?

5- Who are the banking services customers?

6- What conditions affect the use of alternative banking services?

7- What is the average willingness to pay for improved banking services?

To answer the above questions we decided to utilize stated choice experiments. Therefore we needed to establish a model between the utility and the attributes.

3.3 Define the Derivers

The second step is to determine the alternatives, attributes, and attribute levels to be used within the choice experiments. First, we needed to identify a finite list of alternative banking services available to the target customers. We found these alternatives through focus group interviews. We conducted face to face interview with 40 participants. They were either companies' or banks' managers. Once we decide on the alternatives we must identify their attributes and attribute levels. All alternatives may have the same attributes but the level or value of each attribute may differ from one alternative to the other. The attributes and their level must be well defined to the respondents. Since the data were collected through face to face interview we had the chance to explain them appropriately.

One important issue in this step that should be considered is an inter-attribute correlation. That means, there may be a correlation between two or more attributes for the consumer when making a decision. As we will show later, there are no correlations between the attributes in our case.

Once the attributes are identified, the levels of the attributes must be determined carefully. The number of levels may differ from attribute to attribute. Having more levels of attribute raises the amount of information but increases the number of

choice sets at the same time which, in turn, increases the number of questions. Therefore making a decision on the number of levels is an important part of experimental design because the levels of each attribute actually determine marginal utility received from that attribute. Fortunately, the focus group interview helps the researcher to decide on the number of attribute levels and then these levels can be tested through conducting a pilot study.

We determined the attributes and attribute levels applying three ways 1. Literature review 2. Focus group interview that is interviewing the users of online banking and some banks' managers 3. Conducting a pilot study, and selected the most important attributes.

Using those ways to find the attributes and attribute levels, we determined five attributes for banking services, travel time, waiting at the bank, 24/7 accessibility, high security, and percentage change in the monthly charge. For each attribute, we defined some levels. For travel time and monthly charge attributes we considered 4 levels and for waiting at the bank, accessibility, and security attributes 2 levels. Table 3.1 shows the independent variables which are the attributes and their levels.

Table 3.1: Attributes and Attribute Levels of Banking Services

Attribute	Number of levels	Levels
Travel time	4	0 minutes, 10 minutes,20 minutes,30 minutes
Waiting at bank	2	Yes, No
24/7 accessibility	2	Yes, No
High level of security	2	Yes, No
Percentage change in monthly account charges	4	5% higher than current charge, 10% higher than current charge, 15% higher than current charge,20% higher than current charge

Travel time refers to the time that takes for a customer to get to the bank branch. As recommended by the focus group interviews and pilot study, we consider 4 levels for this attribute. The *waiting at bank* attribute reflects whether a customer has to wait at the bank before performing the banking transactions. The *24/7 accessibility* attribute indicates if the online services are accessible to the consumer at all times. The *high level of security* identifies whether online services are provided in a way that is confidential and not subject to fraud. The *percentage change in monthly charge* attribute measures if the consumers are willing to accept a higher monthly charge or to increase their service charges. The choice sets include 4 different percentage levels of increased charges. To identify the levels for travel time attribute we considered the average travel time to get to the bank branch which is 42 minutes.

3.4 Determine Experimental Design Strategy

Once the alternatives, attributes, and attribute levels are determined, the researcher must choose the design strategy. There are several strategies that can be utilized to generate choice sets. A factorial design is a design in which each treatment is combined with all other treatments, given that in each combination or profile each attribute appears with only one level (Louviere et al., 2000). As we mentioned above a treatment refers to an attribute level.

Full factorial is the most common class of design in which generated choice sets include all possible combinations of attribute levels. In this type of design, it is assumed that the factors are independent. Therefore to model the utility the interaction between attributes are not considered.

If we use full factorial treatments in our study, we will have $(4^2)(2^3) = 128$ choice sets to show to participants. However, having 128 questions in the stated preference part of the questionnaire will make it too long and too difficult to implement. To have more information one needs more questions or more choice sets but having a large number of choice sets decreases the quality of information because answering a long questionnaire is tedious for the respondents. Therefore there is a trade-off between the amount of information and quality of information.

The important decision here is how to reduce the number of profiles. The researcher can randomly select a fraction of all treatment combinations, but it makes the design statistically inefficient. In order to reduce the number of profiles in a scientific manner and to decrease inefficiency, we choose orthogonal fractional factorial as an experimental design strategy. That is we utilize a subgroup of all treatment combinations such that the treatments columns are orthogonal (using orthogonal codes each column sum to zero).

An orthogonal design requires that: the correlation between attributes must be zero[2], the attributes must be statistically independent, and the number of times that the levels of the attributes appear within the design must be equal (Hensher et al., 2015).

We assume that all interactions[3] have zero effects and considered only the main effects (MEs). That is each attribute affects consumers' utility directly. According to Louviere et al.,(2000) even though the interactions are sometimes highly significant, but cannot describe the main part of the variance.

[2] Two attributes are said to be correlated if their movements are analogous.
[3] Interaction between two or more attributes refers to the effect of the attributes on utility at the same time.

Considering MEs only and using the specified attributes the observed utility function which is an additive function of the attributes, can take two forms. The first one which is a linear function of specified attributes can be shown as follow:

$$V_i = ASC + \beta_{TT}TT + \beta_W W + \beta_{AC\ 24/7} AC\ 24/7 + \beta_{HS} HS + \beta_{LMC} LMC \qquad (3.1)$$

where, ASC is the alternative-specific constant which indicates the average effect of all variables on utility other than specified attributes. And βs are the coefficients or parameters of the attributes.

TT, W, AC 24/7, HS, and LMC stand for travel time, waiting at the bank, 24/7 accessibility, high security, and the logarithm of the monthly charge, respectively. The second form of the utility is a non-linear function of the attributes. That means each level of the attributes has a particular parameter that should be estimated. Thus the utility function becomes as follow:

$$V_i =$$

$$ASC + \beta_{TT(0\ min)} TT(0\ min) + \beta_{TT(10\ min)} TT(10\ min) + \beta_{TT(20\ min)} TT(20\ min) +$$

$$\beta_{TT(30\ min)} TT(30\ min) + \beta_{W(yes)} W(yes) + \beta_{WT(no)} WT(no) +$$

$$\beta_{AC\ 24/7\ (yes)} AC\ 24/7(yes) + \beta_{AC\ 24/7(no)} AC\ 24/7(no) + \beta_{HS(yes)} HS(yes) +$$

$$\beta_{HS(no)} HS(no) + \beta_{LMC(0\%)} LMC(0\%) + \beta_{LMC}(5\%) LMC(5\%) +$$

$$\beta_{LMC(10\%)} LMC(10\%) + \beta_{LMC(15\%)} LMC(15\%) \qquad (3.2)$$

We form the observed utility as a linear function of the identified attributes (equation 3.1) because we will consider some interaction between the attributes and some socio-demographic variables later. To do so we need to estimate a single parameter for each attribute.

The interaction term is a product of two or more variables. An interaction is said to be two-way interaction if we add a variable as a product of two attributes, but there may be considered more than two-way (e.g., tree-/ four-way interactions). Adding all interactions increases the degrees of freedom. Ignoring the interactions may result in a suboptimal design. Instead of adding all interaction terms one can only add some interactions. By applying orthogonal fractional factorial strategy, we assume all interaction terms not to be significant and consider a fraction of main effects only.

3.5 Generating Experimental Design

As it has been explained in the previous step we chose an orthogonal fractional factorial strategy to reduce the number of profiles. In this stage, software needs to be utilized to construct the design. Software such as SPSS or SAS can be used to generate the experimental design.

In this step, numbers are used to code the attribute levels instead of writing their labels. We begin from 0 for the first level and proceed up to the last level. Table 3.2 illustrates the coding.

According to Hensher, et al. (2005) the minimum treatment combinations can be found by (L-1) A+1 where L is the largest level of attributes and A indicates the number of attributes. Using the foregone formula, the minimum treatment combinations for our study is 16 (found by [(4-1) 5] +1). We use the minimum treatment combinations in SPSS version 20 and constructed the orthogonal fractional factorial design with 32 treatment combinations. We place five letters for the five attributes (A for travel time, B for waiting at the bank, C for 24/7 accessibility, D for high security, and E for change in monthly charge). The design is shown in table 3.3.

In this way utilizing orthogonal fractional factorial design we reduced the number of choice sets from128 to 32 choice sets.

Rader than factorial design coding, an alternative coding structure can be used which is called orthogonal coding. In this coding structure, we assign negative and positive numbers (only odd numbers) to the levels of an attribute such that they sum to zero. Table 3.5 shows the orthogonal coding for our study. Then we replaced orthogonal codes for the levels to arrange the profiles and the resulting table is as table 3.5 (see appendix).

3.6 Allocating Attributes to Design Columns

In this stage we enter the name of each attribute in its related column, therefore table 3.4 and 3.5 will be changed to table 3.6 and table 3.7, respectively.

3.7 Reduce the Number of Choice Sets that the Respondents Face

As we mentioned above the number of choice sets increases exponentially as the number of attributes or attribute levels increases, which causes a large number of questions in a questionnaire. As the number of questions rises, respondents will refuse to participate in the survey or if participate, will not answer all the questions which create missing value in the data set. In the other hand, a larger number of questions is tedious to answer which causes unreliability.

In this stage to further reduce the number of choice sets, we utilized a blocking method. Thus we added a column to the design headed by blocking. To define a blocking column in SPSS we need to introduce an additional attribute named blocking. The levels of this new attribute should be equal to the largest levels of existing attributes. The largest level of attributes in our case is 4. Thus the last

column of the designed table is assigned to attribute blocking. Table 3.8 illustrates the profiles with the blocking column. Then the table should be sorted by the blocking column from the smallest to the largest level. Table 3.7 shows the sorted version of table 3.6.

Based on the levels in the blocking column there are 4 distinguished segments in the table above. Therefore, the treatment combinations can be divided into four different versions according to these four segments. We called the first part version 1, second part version 2, third part version 3, and the fourth part version4. Each version has 8 treatment combinations. Each treatment combination can be used in a choice set as characteristics of an alternative. Hence following this method we further reduced the number of choice sets from 32 to 8 to be shown to each participant. The treatment combinations are shown in table 3.10. As Table 3.10 shows, the last column is not an actual attribute but the design blocking column. It is an instrument that helps us to segment the treatment combinations scientifically.

3.8 Constructing Choice Sets

These 32 treatment combinations actually create the profiles for one service, which we called Service 1. In order to make a choice, a consumer needs at least two choices, therefore we include another service and call it service 2. To create the profiles for service 2, we apply a shifted design technique (Bunch et al., 1996).

To generate the treatment combination for the second service we add 5 columns to table 3.5 for 5 attributes of service 2. To set each attribute level of each profile for the new service we use the mirror image of its counterpart for service 1.

For the 2-level attributes namely waiting at the bank, 24/7 accessibility, and high security, we replace each 0 with 1 and each 1 with 0. For 4-level attributes namely travel time and monthly charge we replace each: 0 with 3, 3 with 0, 2 with 1, and 1 with 2. The profiles for the two improved services are shown in table 3.11 in factorial codes and in table 3.12 with the attributes.

When generating choice sets an important issue is that a level of an attribute should appear the same number of times as other levels of that attribute to have a balanced design which is the case in our design (for the 4-level and 2- level attributes each level appears 8 and 16 times, respectively). Level balance is one of the four criteria to generate an optimal design. The second property of an optimal design is the design orthogonality. In this case, the design is orthogonal since the design strategy is orthogonal fractional factorial and the sum of the orthogonal codes for each column is zero for both services. The third property is minimum attribute-level overlap which requires each attribute level to appear once in each choice set. The last property is the utility balance. Most of the time there is a trade-off between two criteria.

Huber and Zwerina (1996) considered utility balance as an important object that the researcher should notice, that means the probability of choosing the alternatives should be equal in each choice set, thus there is no dominant or inferior alternative in the choice set and the respondents are practically indifferent among those alternatives.

To test whether any alternative is dominant in the choice sets we applied code-sum difference technique (Carlsson and Martinsson, 2008). We calculated the sum of the codes for each profile of service 1 and service 2, and consider the absolute value of

the code-sum difference between the two alternatives in each choice set. Since in previous step we coded the attribute levels from more desirable to less desirable levels the minimum code-sum is 0 and the maximum is 9, therefore, a value above four shows dominance in the choice set Table 3.13 shows the code-sum difference of all profiles.

Table 3.13 indicates 10 values above 4. To ensure that there was no such a problem in other choice sets, we checked all choice sets and found the dominance only in 6 choice sets which were profile 13, 15, 17, 18, 20, and 22. In this stage, we must amend the utility gaps that will lead to a collapse in orthogonality. As we mentioned above, here we have to accept this trade-off between the two properties.

To amend the problem we changed the level of change in monthly charge attribute of those profiles for service 1 and service 2. Table 3.14 shows the revised profiles.

3.9 Develop CE Section on the Questionnaire with a Different Version of Choice Sets

This stage forms the utility function as a function of the attributes and is a basis for parameters estimation. In a stated choice experiment, consumer choice behavior is examined in a hypothetical market. Consumers are asked to state their choices among some different alternatives. The market is not an actual market and the choices are not actual choices. The drawback of this type of research is that the consumer may not actually make the same choice when the product is marketed.

We offered two alternative services in each choice set and since adding no choice alternative is an important issue in experimental design for the case that the

respondent does not choose any of the improved services, we add the current service with the same attributes but different levels to each choice set as the third alternative. Thus in each choice, for each alternative, each attribute comes with a single level only.

The alternatives in a choice set can be shown either as labeled or unlabeled alternatives that are we can use the names of the services or utilize some letters or numbers instead. In our case we used unlabeled alternatives such as service 1 and service 2, however, the levels of the attributes specify the type of the service. Using unlabeled alternatives we eliminate the probability of correlation between alternatives. We generate 4 versions of the questionnaire each with 8 choice sets. Only CE sections of the four questionnaires are different. Table 3.15 illustrates a sample choice set.

Table 3.15: A Sample Choice Set- Version 2- Choice Set 7

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	10 minutes	20 minutes	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	Yes	No	
24/7 accessible	No	Yes	
Highly secure	Yes	No	
Percentage change in monthly charge	15%	10%	
Your choice	[ ]	[ ]	[ ]

We will show later that by including some socio-demographic variables we tried to increase the efficiency of the model and optimize it.

Chapter 4

DESIGNING AND APPLICATIONS OF A QUESTIONNAIRE

4.1 Introduction

In the previous chapter, we explained the experimental design, discussed how to choose among the different design strategies, and how to find the most important attributes of the variable of interest along with their levels. Then using the selected attributes and attributes levels we showed how to generate choice sets. In this chapter, we describe how we constructed the different parts of our pilot and main surveys' questionnaires and report their outcomes.

4.2 Designing a Questionnaire

Since there was no study on the willingness to pay for online banking we benefited the idea behind some willingness to pay studies on public goods (Cameron and Huppert, 1989; Loureiro and Hine, 2002; Nielsen, 2011; and Ozbafli, 2012) along with other studies on questionnaire development (Oppenheim, 1966; Goodman, 1997; and Willis, 2004) and constructed the questionnaires.

We developed a five-part questionnaire for this study. In the first part, we asked the SMEs about their current banking situation. Questions in the second part were designed to determine the cost of the current services. The third part related to SMEs' willingness to pay for a modern online banking system currently offered by Bank of America to its small business customers in the USA (CVM part). In the

fourth part, we designed CE sets to find SMEs' willingness to pay for alternative improved services. The questions in the fifth part were designed to collect socio-economic information on each firm and its owners.

Bank Accounts Information and Current Banking Services: In the first part, we asked banking accounts information to extract the sample SMEs existing banking services and whether they are currently using online banking services or not. In the second part of the questionnaire we asked some attitudinal questions toward their current banking services, the frequencies of performing their banking, the time spending on banking transactions through traditional banking and online banking, the convenient time for performing their banking transactions, monthly charge of having a traditional banking account and an online banking, the charge of different types of transactions through traditional and online baking, the sample SMEs' rating of their traditional banking services, whether they perform their banking transaction by themselves or employ a specific employee to do that, the amount they pay to the particular employ if there is, and the travel cost to get to bank branches.

CVM Questions*:* We designed a hypothetical market for a new business online banking services in part three to extract the sample SMEs' willingness to pay using the contingent valuation method. To minimize information bias we first explained the features and attributes of the services and the options provided by the service. Then we asked whether they would like to participate in this contingent market. We utilized payment card then and asked the potential customer to put a tick beside the minimum amount and a cross next to the maximum amount they are willing to pay for the service. We asked the respondents who didn't accept to participate in the market about their reasons.

CE Questions: The fourth section was designed to elicit the sample SMEs willingness to pay for online banking services using choice experiment method. As we explained in the previous chapter we generated 32 choice sets and arranged it in four versions each with 8 choice sets. We included the choice sets associated with each version in the fourth part of the questionnaire and constructed four versions of the questionnaire.

Socio-Demographic Questions*:* The questions in the last section of the questionnaire collected data on the characteristics of the firm's owner and the firm itself. The questions about the owner's characteristics consist of age, gender, marriage status, and level of education. The questions on firm's characteristics include the number of employees, annual income, whether they have international transactions, sector (production, service, trade, agriculture, other), and level of imports and exports. This part is important in our analysis as the collected data on this part help us to find the reasons for different willingness to pay and whether the characteristics affect the valuation of the attributes of the service.

4.3 Pilot Study

To test the questionnaire we conducted a Pilot survey in March 2014. We interviewed 32 firms' manages.

4.3.1 Results of the First Part of the Questionnaire in the Pilot Study

All 32 firms had at least a bank account, the majority of the firms did not use online banking services. The minority of the firms how used online banking services stated that it was an additional service. The sample SMEs bank account information is shown in Table 4.1.

4.3.2 Results of the Second Part of the Questionnaire in the Pilot Study

Of 32 firms only two had online banking service which was only used to get informal balance statement (without bank's stamp for internal use with the cost of zero). The majority of firms performed almost all types of banking transactions through bank branches. More than 59% of the respondents believed that the services were available through traditional banking and both two respondents who had online banking services stated that the services were available through online banking.

The respondents answer to question 18 about online banking features indicate that 81.25% believed it was available anywhere and for 24/7, 62.5% stated that it saved time, 65.5% believed it was easy to use and had lower cost, 78% said it was reliable, 62.5% stated that it gave instant feedback and was secure, and 56.25% believed that it had a higher speed compared to traditional banking.

75% of respondents stated that traditional banking services are secured. The information for performing their banking transactions is shown in table 4.2.

4.3.3 Results of the Third Part of the Questionnaire in the Pilot Study (CVM Questions)

For the CVM question, we first asked whether they participate in our hypothetical market (question 20), 87.5% participated in the market. 12.5% where willing to stay with their current service and in a follow-up question (question 22) we asked them their reason and they stated that: the current service covered their needs for banking services, it was more convenient since for the transactions two or more persons should sign the issued cheques, they had a person in bank branch to perform their transactions, and they thought the traditional banking was more secure. 50% of

respondent were willing to pay more than $500. The frequency of the bids in the payment cards is shown in Table 4.3.

4.3.4 Results of the Fourth Part of the Questionnaire in the Pilot Study (CE Questions)

The respondents made choice among 256 choice sets, 224 (87.5%) choices were service 1 or 2 and 32 (12.5%) current service. The frequencies of the services selected are shown in Table 4.4.

4.3.5 Results of the Fifth Part of the Questionnaire in the Pilot Study

The majority of the sample SMEs owners in the pilot study were male, married, and with the age of 44 to 50. All the owners had a university level of education and above. The majority of the firms had a number of employees between 5 to 11and trade was the most frequently mentioned sector for the firms. Tables 4.5 shows the characteristics of the sample SMEs

4.4 Revised Questionnaire

From the result of the pilot study, we found out that online banking service is an additional service to other services thus we removed question four from the first part of the questionnaire. The results of the pilot survey also showed that buying and selling equity and mutual funds were not regular transactions for small and medium-sized enterprise, therefore, we removed them from question 6, 7, and 12 in the second part of the questionnaire. In the third part of the questionnaire, we changed the bids from $180 to $ 600 to increase the ranges of the willingness to pay. To find out whether the companies have international trade and their level of import and export we added three more questions in the last part of the questionnaire. We further added a 'none' choice to question 2 for those participants who did not have a bank account and two questions (question 6 and 7) to collect data on time spent on some

banking transactions through traditional banking and the frequencies of performing each banking transaction.

4.5 Main Study

4.5.1 Sample Selection

According to Orme (2010), for the choice based survey, the minimum sample size can be derived using the rule $\frac{nta}{c} > 500$, where *n* is the sample size, *t* is the number of choice sets faced by each respondent, *a* is the number of alternatives, and *c* is the largest number of attribute levels. Using this formula, the minimum sample size for our study should not be less than 83. To increase the precision, we chose a sample of 400 SMEs.

The population of interest in this study is SMEs in the UAE free trade zones. To find out the number of SMEs in the UAE Free Trade Zones, we used the UAE Free Zones Directory for 2012 (Global Resources, 2012). Once the population of interest is defined the next task is to determine sampling strategy. Since we intended to make inferences from the sample to all SMEs in the UAE free trade zones, we utilized exogenous stratified random sampling (ESRS). Based on the registered companies in the UAE Free Zones Directory for 2012, of the 9,976 registered companies in the Free Trade Zones, 16.7% operate in Dubai, 30% in Jebel Ali, 3.4% in Hamriyah, 20.3% in Sharjah, 8.2% in Ajman, and 21.4% in Ras Al Khaimah. We used these percentages to select our sample. Table 4.6 shows the number of respondents in each district. Our sampling frame is divided into six strata based on the six districts of the Free Trade Zones.

Table 4.6: Number of Participants in each District

#	District	No. of companies	% of the total	No. of interviews
1	Dubai	1,662	16.7	67
2	Jebel Ali	2998	30.0	120
3	Hamriyah	339	3.4	14
4	Sharjah	2,024	20.3	80
5	Ajman	823	8.2	33
6	Ras Al Khaimah	2,130	21.4	86
Total		9,976	100	400

Overall, the sample represents approximately 4% of the total number of enterprises registered in the Free Trade Zones. All of the selected companies can be considered to be SMEs, as all of them employed fewer than 250 employees and their annual revenues were all less than US$68 million[4].

4.5.2 Main Survey Questionnaire Results

The questionnaire in this study is roughly complex and as it has been explained above consists of five different sections. Therefore we decided to collect the data by face-to-face interview of the company's owners/financial managers. This survey administration mode minimizes the information bias. The field research for this study was conducted in October 2014.

4.5.2.1 Results of the First Part of the Questionnaire in the Main Study

All 400 firms had at least a bank account, the majority of the firms did not use online banking services (85.25%). The majority of the firms had current accounts (64.5%) and worked with only one bank (65%). The sample SMEs bank account information is illustrated in Table 4.7.

[2] A company with fewer than 250 employees and revenue of less than US$68 million is considered to be an SME (World Trade Organization, 2012).

4.5.2.2 Results of the Second Part of the Questionnaire in the Main Study

Of 400 firms only 75 companies had online banking service which was only used to get informal balance statement. Just like the results for the pilot survey, the majority of firms performed almost all types of banking transactions through bank branches and ATM with the exception of buy/sell of foreign exchange. The aforementioned transaction was performed through an exchange office by the majority of the companies (59%).

The average time spending at the bank to perform all of the banking transactions was about 30 minutes, except for money transfer which was about 6 hours. 32.5% of the firms needed to check their bank account balance at least once a day. Majority of firms had to exchange money and had the periodic payment at least once a month.

Only 17.75% of the firms preferred to do their banking during working hours, 82.25% of the SMEs preferred to perform them in other times of a day. The average travel time to get to the bank branch was 43 minutes. The mean of monthly charge of having a traditional bank account was $140 and to have online banking they did not pay any charge.

Since the firms did not do their banking online they did not have information about online banking cost of each service, but they stated that to get a balance statement online they did not need to pay. Only 33.75% of the respondents believed that all banking services are available through the bank branch and 95.25% of them stated that the services are available online.

70.75% of the firms had a specific employee who performed their banking transactions and the mean salary was $ 334.6. 61.75% of them used public transportation to get to the bank branch and the mean of transportation cost was $5.4 per travel. The majority of the respondents gave a high rate to all features of online banking services which were: 24/7 availability, anywhere accessibility, time-saving, lower cost, reliability, security, higher speed, and giving instant feedback. 58.5% of the respondents gave a high rate to the security of traditional banking services. The ways to perform banking transactions are shown in table 4.8.

4.5.2.3 Results of the Third Part of the Questionnaire in the Main Study (CVM Questions)

For the main survey, 96.5% of the sample SMEs participated in the hypothetical market. 3.5% where willing to stay with their current service. Their answer to the follow-up question about their reason to stay with their current service was similar to the one in the pilot study. The frequencies of the SMEs stated willingness to pay for the specified business online banking is shown in Table 4.9.

Table 4.9: Frequency of the Bids in the Payment Cards

Question 21	Bid ($)	Frequency	Percentage
	180 up to 240	4	1.04%
	240 up to 300	10	2.59%
	300 up to 360	17	4.40%
	360 up to 420	25	6.48%
	420 up to 480	31	8.03%
	480 up to 540	52	13.47%
	540 up to 600	247	63.99%
	Total	386	100%

4.5.2.4 Results of the Fourth Part of the Questionnaire in the Main Study (CE Questions)

The respondents made choice among 3200 choice sets, 2908 selected services were service 1 and service 2 (90.87%) only 292 (9.13%) were current service. Table 4.10 shows the frequencies of the service selected.

Table 4.10: Frequency of Services Selected

Question 23 to 30	Service	Frequency	Percentage
	Service 1	1707	53.34%
	Service 2	1201	37.53%
	Current service	292	9.13%
	Total	3200	100%

4.5.2.5 Results of the Fifth Part of the Questionnaire in the Main Study

90.25% of the sample SMEs owners in the main study were male, 82% were married, with the average age of 42, and the level of education of the majority of them was university and above. The average number of employees was 11 and the firms' average yearly income was $ 1,502,650. The majority of the sample SMEs were engaged in international trade with a level of exports more than 25% of their sale. Table 4.11 shows the characteristics of the sample SMEs.

Chapter 5

CONTINGENT VALUATION METHOD RESULTS

5.1 Introduction

In the previous chapter, we presented the outcomes of the pilot and main study and went over the questionnaire. We explained about the survey sample selection and administration and reported the descriptive statistics of the survey data. In this chapter, we estimate the SMEs' willingness to pay for business online banking using the contingent valuation method (CVM). As we explained in chapter 4 the third section of the questionnaire was dedicated to the CVM questions. In this section, we introduced a hypothetic market for a business online banking similar to one currently offered by the Bank of America, defined the features of the service and asked the respondents whether they would participate in this contingent market. If the answer was yes then using payment cards, they were asked about the amount they were a willingness to pay for the service directly. If the answer was no, there were asked about their reasons.

5.2 Data

All 400 sample SMEs answered the first question of the CVM part. Of these 400, 14 (3.5%) indicated that they would not participate in this market. We further asked these respondents about their reasons. They were just like their reasons for CE part. They thought their current service covered their needs for banking services, it was more convenient since for the transactions two or more persons should sign the

issued check, they had a person in a bank branch to perform their transactions, and they thought the traditional banking was more secure. Table 5.1 shows the frequencies of the SMEs stated willingness to pay for business online banking services.

Table 5.1: Frequency of the Bids in the Payment Cards

Bid ($)	Frequency	Percentage
180 up to 240	4	1.04%
240 up to 300	10	2.59%
300 up to 360	17	4.40%
360 up to 420	25	6.48%
420 up to 480	31	8.03%
480 up to 540	52	13.47%
540 up to 600	247	63.99%
Total	386	100%

5.3 Sample SMEs' Descriptive Statistics

Tables 5.2 to 5.9 provide an overview of sample companies by sector of activity, gender, and mean age of the owner, number of employees, engagement in international trade, and level of education of the owner.

Table 5.2: Sample SMEs' Sector of Activity

Sector	Frequency	Percentage
Production	12	3.11
Services	97	25.13
Trade	217	56.22
Production and Trade	12	3.11
Services and Trade	48	12.44
Total	386	100

From Table 5.2 we can see that over half of the firms surveyed (56.22%) were engaged in trade. A further 37.57% were engaged in either services or services and trade.

Table 5.3 shows that about 83% of the sample SMEs were engaged in international trade as importers or exporters, or both.

Table 5.3: Sample SMEs' Engagement in İnternational Trade

	Yes	No
Frequency	320	66
Percentage	82.90%	17.10%

With regard to the gender of the owner of the firms, the majority were male (91%), as reported in Table 5.4.

Table 5.4: Sample SME Owners' Gender

Gender	Frequency	Percentage
Male	350	90.67
Female	36	9.33
Total	386	100

As shown in Table 5.5, the entrepreneurs operating in the free zones are relatively young, with ages ranging from 22 to 68 years and a mean of 42.4 years.

Table 5.5: Sample SME Owners' Mean Age

Variable	Number of Observations	Mean	Std. Dev.	Min	Max
Age	386	42.4	11.22	22	68

An interesting feature of these SMEs is their size. They are small, with the number of employees ranging from 2 to 72 and an overall average of 11 employees per firm. Nevertheless, these firms are rather dynamic, as attested by the fact that more than 80% are engaged in international trading activities.

Table 5.6: Sample SMEs' Number of Employees

Variable	Number of Observations	Mean	Std. Dev.	Min	Max
Number of employees	386	11	7.13	2	72

Table 5.7 shows the education level of the owners of these firms. It is surprisingly high. About 70% of the total (268 owners) had completed a university degree, and 67 had completed a master's degree or Ph.D. Hence, these owners' time is likely to have a relatively high opportunity cost. They are also likely to be experienced in using web-based interfaces.

Table 5.7: Sample SME Owners' Education Level

Education level	Frequency	Percentage	Cumulative (%)
Secondary school	21	5.44	5.44
High school	95	24.61	30.05
University	203	52.59	82.64
Master	62	16.06	98.70
PhD	5	1.30	100
Total	386	100	

In Table 5.8 we report the attitudes of those surveyed on the quality of the existing banking services. Clearly, from the perspective of these firms, the quality of the existing banking services provided in the UAE has considerable room for improvement.

Table 5.8: Attitudes to Current Banking Services

Question: On a scale of 1 to 5 (where 1 is low), how would you rate the services currently available through your bank branch?			
Ranking Scale	Frequency	Percentage	Cumulative (%)
1	17	4.40	4.40
2	90	23.32	27.72
3	154	39.90	67.62
4	80	20.73	88.34
5	45	11.66	100
Total	386	100	

Of the 386 respondents surveyed, 67.62% believe that the current bank services are not good (4.40% very bad, 23.32% bad, 39.90% neither bad nor good), with the remainder reporting that the current bank services are good (20.73%) or very good (11.66%). Some 59% of respondents stated that banking transactions take an average of more than 30 minutes each at the bank, while 66.5% believe that traditional banking is more costly than online banking.

As previously reported, 386 companies stated that they would choose online banking services (i.e. would participate in our hypothetical market) and 14 stated that they would not. The former group is therefore assigned a positive WTP and the latter zero WTP. Table 5.9 shows the percentage breakdown by WTP and the reasons that zero-WTP companies would not choose online banking.

Table 5.9: Percentage Breakdown by WTP and Reason for not Choosing Online Banking

Measure	Percentage
Positive WTP (would participate in the market)	96.50
Zero WTP (would not participate in the market)	3.50
Total observations = 400	100
Reasons for not choosing	
The current service is adequate	57.20
The service should be free	21.40
Do not have computer knowledge	14.30
It is complicated; we do not need it	7.10

5.3 Econometric Model

We used an interval regression model to identify the effect of respondent characteristics on WTP for online banking services. Using STATA software, we regressed the lower and upper boundaries of WTP on owner age, gender, and level of education, as well as company features—number of employees (indicative of company size), transportation cost to get to the bank, sector (production, services, trade, production and trade, or services and trade), and whether the company is engaged in international trade. Cameron and Huppert (1989) stated that they preferred to use a log form for the dependent variable as the results of most previous studies showed the WTP to be positively skewed. Following their model, we first estimated a log form and then estimated a linear form of willingness to pay. The log-likelihood function attributable to the latter was higher (-660.11) than the corresponding of the former (-712.80), thus we concluded that the linear form of the interval was better than the log form.

For the variables such as sectors, gender, education level, international trade we defined dummy variables. The dummy variables for the last two, took a value of one if the owner's level of education was above university and if the company traded

internationally. For the other categorical variables, we defined a number of dummy variable equal to the number of categories minus one.

Of these characteristics, three appear statistically significant. They are the number of employees, the transportation cost to get to the bank (named travel cost), and engaging in international trade. That is, the WTP for business online banking is a function of the number of employees, travel cost[5], and international trade. This gives the estimated equation:

$$WTP_i = constant + \beta_{number\ of\ employees} \times number\ of\ employees + \beta_{cost} \times cost + \beta_{international\ trade} \times international\ trade \quad (5.1)$$

Table 5.10: Interval Regression Results (Number of observations = 386)

Variable	Coefficient (SE)
Constant	440.6641*** (11.7284)
International trade	44.9103*** (11.1925)
Number of employees	2.6039*** (0.5767)
Travel cost	0.1894** (0.084)
Number of observations	386
Log-likelihood function	-660.1144
LL-ratio	48.43

***99% level of confidence, **95% level of confidence

Table 5.10 presents the STATA estimated coefficients. All coefficients are statistically significant at a 99% or 95% confidence level, and all signs are as expected. The coefficient for the number of employees is positive, indicating that as the number of employees increases, the WTP of the SMEs for online banking services will increase. Similarly, the cost coefficient is positive, indicating that as the

[5] Value of cost have been converted into USD at an average rate of 3.67AED/USD (October 2014)

travel cost rises, the WTP for online banking will increase. A positive value for SMEs' engagement in international trade indicates that SMEs engaged in international transactions will have a higher WTP.

To determine the goodness of fit of the model we use log-likelihood ratio (LL-ratio) test which is calculated as follow:

LL ratio = -2(LL of the base model[6]- LL of the estimated model)$\sim Chi - Square$

First, we estimated the constant only model with the log likelihood of -684.33 and then using equation 8 we calculated the value of LL-ratio. Comparing the calculated value (48.43) with the chi-square critical value with 3 degrees of freedom[7] (7.815), we concluded that the model is better than the constant-only model.

Finally, the fitted value of WTP can be calculated using the estimated coefficients which should be considered as a reliable central tendency of unobserved WTP. Using STATA, we computed the fitted values and the resulting average WTP as $ 518.5 per month.

To figure out whether engaging in international trade influences the company's willingness to pay for online banking we used the resulting parameters and estimated the willingness to pay of the companies with and without international trade. Table 5.11 illustrates the calculated WTP for online banking of the firms with three different situations. The average WTP of companies with international trade is about 12 percent higher ($ 528.00) than for the firms not engaged in international trade ($472.50).

6 The constant only model is often used as the base model.
[7] The degrees of freedom is equal to the deference between numbers of parameters in two models.

Table 5.11: Calculated WTP for Online Banking of the Firms Under Three Conditions

Firms	Willingness to pay(USD)
All firms	518.5
Firms without international trade	472.5
Firms with international trade	528.0

In the next step, we estimated the willingness to pay for online banking of the three aforementioned groups of firms according to their numbers of employees and travel cost. To categorize these two variables namely number of employees and travel cost we computed some statistical measures. The calculated measures are shown in table 5.12.

Table 5.12: Statistical Measures for Variables (Number of Employees and Travel Cost)

Measure	Number of employees	Travel cost
Minimum value	2	0
First quartile(Q1)	8	21.8
Median	10	43.6
Third quartile(Q3)	13	114.5
Maximum	72	257.5
Inter quartile range(IQR)	5	92.7
Lower boundary	--	24.55
Upper boundary	21	253.55

The values presented in the second column of table 5.12 indicate that the numbers of employees more than 21 ((IQR*1.5) + Q3) should be considered as outliers. Therefore we considered three numbers of employees (5, 12, and 18) and substitute them in equation 5.1 along with the estimated parameters in table 5.11 and the

average values of the other variables and calculated the WTP of the firms with the three different categories (all firms, firms with and without international trade).

Table 5.13: Comparison of the WTP of the Sample Firms with Three Different Conditions According To The Numbers Of Employees

Firm	WTP($) of the firms with 5 employees	WTP($) of the firms with 12 employees	WTP ($) of the firms with 18employees
All firms	522.50	568.73	608.35
Firms with no international trade	480.50	526.73	566.35
Firms with international trade	531.09	577.32	616.94

The computed values of the WTP in table 5.13 show that the firms' valuation of online banking increases between 16 and 18 percent as the number of employees in the firms increases from 5 to 18 employees. It is also clear that the WTP of the firms with international trade and with all the three different numbers of employees are higher than the averages for all firms and for the firms without international trade. This specifies that the online banking service is more valuable for the SME firms engaged in international trade irrespective of their size.

As it can be seen in the third column of table 5.12 there is no outlier for travel cost variable, because all the observations lie within lower and upper boundaries. Since the middle 50% of observations lie between 21.8 and 114.5 we considered the WTP of the three groups of the firms with three types of travel costs. We defined the firms with the travel cost of $21.8, $43.6, $114.5 as the firms with low, medium, and high costs. We used the estimated parameters in table 5.11, the average values of the other variables, and these three different amounts of travel cost again and substituted them

into equation 5.1 and computed the WTP of the firms. Table 14 illustrates the estimated WTP of these three categories of the firms.

Table 5.14: The Estimated WTP for Online Banking of the Firms with Three Different Travel Costs

Firms	WTP($) of the firms with a cost of $21.8	WTP($) of the firms with a cost of $43.6	WTP($) of the firms with a cost of $114.5
All firms	555.77	559.90	573.32
With no international trade	510.83	514.96	526.39
With international trade	562.35	566.47	579.90

Just like the previous table, table 5.14 indicates that the WTP of the firms with international trade is higher than the two other categories of the firms. It also shows that as the travel cost increases the WTP increases as well. However, the increase is modest at 3 percent increase between the lower and upper bound of the range of travel costs associated with this sample of firms. Comparing the results in the two tables it is clear that the impact of the size of the firms is greater than the effect of the travel cost on the firms' WTP for online banking services.

Chapter 6

RESULTS OBTAINED FROM THE CHOICE EXPERIMENTS STUDY

6.1 Introduction

In the previous chapter, we presented the result of a CVM study. Using an interval regression model we estimated that on average an SME was willing to pay for online banking $518.5 per month. In this chapter, we will describe the estimated results of multinomial logit, mixed logit, and mixed logit with some interaction terms.

6.2 Descriptive Statistic of the CE Part of the Questionnaire

In chapter 3 we explain how we constructed choice sets as CE section which was the fourth part of the survey questions. As we explained before there were four versions of choice sets. Each respondent answered one version consist of eight choice sets. The sample size was 400 and all 400 SMEs answered this part of the questions. The choice sets were shown to the respondent one by one with a question of if they were to make a choice between the two new services and their current service which one would they select? Table 6.1 shows the descriptive results of the sample.

As the table shows there are 4 different versions of choice sets with a sample of 400 SMEs. The respondents answered a total of 3200 choice sets. There were 100 respondents for each version. 53.4% of the respondents chose service 1, and 37.5% chose service 2 (90.9% of the respondents chose new service). 9.1% of the respondents chose service 3 (current service). Among 3200 responses, 2909 respondents chose the new service and 291 of them preferred to stay with their current service.

In addition to the eight choice sets in the CE section of the survey questions, there was a supplementary question for those how preferred their existing services. The question asked about the reasons for not to choose the new services. The main reasons stated by the respondents were that the companies' bank accounts were controlled by two groups mostly a financial manager and the owners of the companies and in order to perform a banking transaction a bank check needed to be issued with at least two signatures. Other reasons specified by them were: they thought their current services were enough for their companies, their existing services were highly secure, and their computer literacies were low.

Of the five attributes, travel time and percentage change in monthly charge appeared to be continuous variables. We effects coded the rest of the attributes namely: waiting at the bank, 24/7 accessibility, and high security with the value of 1 and -1. To enter the data into an excel spread sheet, we coded the variables as table 6.2.

Table 6.2: The Codes Used to Define the Variables to the Software

Name of the variable	Explanation
Id	Number of participants. 1-400
Ver	Versions number. 1-4
Choiceset	The number of choice set
Alti	The number of alternative 1, 2, 3
Noalt	Number of alternatives
Choice	Chosen alternative. 1: selected ; 0: not selected
TT	Travel time(minutes) : 0,10,20,30
W	Waiting at bank : 1= yes, -1= no
AC 24_7	24/7 accessibility: 1= yes, -1=no
HS	High security: 1= yes, -1=no
CHMC	Change in monthly charge of the bank account: 0%, 5%, 10%, 15%
CM	Change in monthly charge of the bank account in USD
LMC	Log of Change in monthly charge of bank account

The last three rows of the table are about the cost attribute (firms' increase in monthly charge of the bank account). CHMC is the percentage increase in monthly charge of bank accounts. CM is an increase in monthly charge of the bank account in terms of US dollars. There was a question on bank account monthly charge paid by firms in part two associated with firms' current banking services. The amount of monthly charges stated by the firms were in terms of Arab Emirates Dirhams (AED)

which were converted to US Dollars.[8] Thus to calculate CM we multiplied the percentages by firms' current monthly charge of bank accounts. Calculated CMs, then, were compared with the annual revenue divided by 12 and the results showed a dramatic difference between monthly revenue and the hypothetical monthly charge. So there was no reason to exclude any observation from the data set. LMC is a log of change in the monthly charge. As the logarithm of zero is undefined, in order to correct for the zero charge cases we added $1 to all the charges and calculate it as follow:

LMC = log (CM+1).

Table 6.3 shows the frequency of alternatives and attribute levels for the new services and firms' existing banking service.

Table 6.3: Frequency Distribution Table for the Alternatives and Attribute Levels

		Frequency	Percent
Alternative			
	1	1708	53.40%
	2	1201	37.50%
	3	291	9.10%
Total		3200	100%
Service 1 and 2		2909	90.90%
Travel time			
	0	896	30.80%
	10	825	28.40%
	20	632	21.70%
	30	556	19.10%
Waiting at bank			
	Yes	687	23.60%
	No	2222	76.40%
24/7 accessibility			
	Yes	1887	65%
	No	1022	35%

[8] We used a rate of 3.67, the rate of AED in October 2014.

High security			
	Yes	1903	65.40%
	No	1006	34.60%
Percentage change in the monthly charge			
	5%	814	28%
	10%	732	25%
	15%	464	16%
	20%	899	31%
Existing service			
Travel time(TT)			
	$30 \leq TT < 45$	134	46.1%
	$45 \leq TT < 60$	142	48.8%
	$60 \leq TT < 75$	1	0.3%
	$75 \leq TT < 90$	14	4.8%
Waiting at bank			
	Yes	291	100%
	No	0	0%
24/7 accessibility			
	Yes	0	0%
	No	291	100%
High security			
	Yes	291	100%
	No	0	0%

Of 2909 respondents who chose the new services, 2222 (76.4%) preferred a service with no waiting at bank, 1887 (65%) a service with 24/7 accessibility, 1903(65.4%) a highly secure service, 895 (30.8%) travel time of zero, 825 (28.4%) travel time of 10 minutes, therefore for 59.1% travel time was less than 10 minutes.

For the cost attribute of the sample SMEs: only 9.1% of the responded stated they would not pay anything more than their current payment, and 90.9% were willing to pay an extra charge. Among 90.9 %, 28% stated that they were willing to pay 5% higher than their current monthly charges, 25% would pay 10% higher, 16% would pay 15% more, and 31% of them were willing to pay 20% extra charges.

6.3 Characteristics of the Sample SMEs

The characteristics of the owners of the SMEs and the companies themselves are illustrated in table 6.4.

Table 6.4: Characteristics of the Sample SMEs

owners' characteristics				
age	Male	married	university or above	
42	90.25%	82%	69.75%	
companies characteristics				
average employees	average annual income($)	with international trade	imports more than 15%	exports more than 25%
11	1,432,472.7	82.25%	67.75	46%

The average age of the owners is 42. That 90.25% of them are male and 82% are married. The level of education of 69.75% of the owners is university or above. The average number of employees is 11. Average annual revenue is $ 1,432,472. 82.25% of the companies have international trade, 67.75% of them have a level of imports more than 15% and 46% have a level of exports more than 25%.

6.4 Econometric Models

Consumers' choices depend on the utility that they can get from the consumption of alternative bundles of goods or services. If there are *i*= 1, … , *I*, alternatives that a decision maker *q* must choose from, then his or her utility can be denoted as *Uqi*. Since a decision maker theoretically chooses the services or goods to maximize utility, he or she selects the alternative *i* when $U_{qi} > U_{qj} \quad \forall i \neq j$.

The whole utility gained from choosing an alternative cannot be observed, while the utility gained from the specified attributes can be estimated. Thus the utility function

can be written as: $U_{qi} = V_{qi} + \varepsilon_{qi}$

where, V_{qi} is the observable part of the utility that individual q obtains from alternative i and ε_{qi} contains all the features that cannot be observed and are unknown. There is a discrete number of alternatives, i= 1, 2, …, I.

6.4.1 Multinomial Logit (MNL) Model

According to Train (2009), the probability that individual q will choose alternative i is:

$$P_{qi} = Pr\left(U_{qi} > U_{qj} \quad \forall\, i \neq j\right)$$

$$= Pr\left(V_{qi} + \varepsilon_{qi} > V_{qj} + \varepsilon_{qj} \quad \forall\, i \neq j\right)$$

$$P_{qi} = Pr\left(\varepsilon_{qj} < \varepsilon_{qi} + V_{qi} - V_{qj} \quad \forall\, i \neq j\right)$$

ε_{qi} is a random variable and assumed to be an independently identically distributed extreme value, so the density for each unobserved component of utility is:

$$f\left(\varepsilon_{qi}\right) = e^{-\varepsilon_{qj}} e^{-e^{-\varepsilon_{qj}}}$$

and its cumulative distribution is :

$$F\left(\varepsilon_{qi}\right) = e^{-e^{-\varepsilon_{qj}}}$$

thus the choice probability will be :

$$P_{qi} = \int \left(\prod_{j \neq i} e^{-e^{-\left(\varepsilon_{qi} + V_{qi} - V_{qj}\right)}} \varepsilon_{qj} \right) (e^{-\varepsilon_{qi}} e^{-e^{-\varepsilon_{qi}}}) d\varepsilon_{qi}$$

The logit choice probability can then be derived as:

$$P_{qi} = \frac{e^{V_{qi}}}{\sum_j e^{V_{qj}}} \tag{6.1}$$

The probability that individual q chooses alternative i is equal to the ratio of the exponential of the observed utility received from alternative i to the sum of exponentials of the observed utility received from all other alternatives (excluding i). As V_{qi} is a function of the attributes x provided by the alternative i,

then: $V_{qi} = \acute{\beta} x_{qi}$ (6.2)

Where $\acute{\beta}$ is a vector of coefficients for the attributes of the alternative *i.*

Substituting $\acute{\beta} x_{qi}$ for V_{qi}, in equation 6.1, yields the expression for the probability as:

$$P_{qi} = \frac{e^{\acute{\beta} x_{qi}}}{\sum_j e^{\acute{\beta} x_{qj}}} \quad (6.3)$$

Using a software (STATA and NLOGIT), one can estimate the βs (the coefficients of the attributes), the probability of an individual choosing the alternatives, and hence, be able to calculate the value of the utility gained from the choices. As the value of the dependent variable lies between zero and one, the estimation of the parameters by ordinary least squares cannot be used, so the software applies the maximum likelihood procedure to carry out the estimations.

We used Nlogit Version 3 as an econometrics software package to estimate four multinomial logit models and a constant only model. These four models were different in terms of specification of the attributes. First, we estimated constant only model as a base model. Table 6.5 shows the coefficient of the model along with the log-likelihood function and pseudo- R^2. The coefficients of the attributes are highly significant at 99% level of confidence for all models.

Table 6.5: Constant Only Model

Variable	Coefficient (S.E.)
ASC	1.60909421*** (0.06148322)
No. of observations	3200
LL function	-2991.41
Pseudo R^2	0.1490

***99% level of confidence.

For the first model we considered the linear specification for all attributes and estimated the following model:

Table 6.6: MNL Model with Linearly Specified Attributes

Attribute	Coefficient (S.E.)
Constant	-0.03105335 (0.11907732)
Travel time	-0.05564998*** (0.00302967)
Waiting at bank	-0.89971017*** (0.03255481)
24 hours a day and 7 days a week Accessibility	0.70108294*** (0.03228351)
High security	0.73301209*** (0.03326311)
Increase in the monthly charge	-0.05391464*** (0.00383318)
No. of observations	3200
LL function	-1922.256
Pseudo-R^2	0.45321

***99% level of confidence.

As the table shows only alternative specific constant is not significant. In the second model travel time, the attribute was considered in log form and the other four attributes as linear variables. The table below shows the estimated coefficient of the model:

Table 6.7: MNL Model With Log Form of Travel Time Attribute and Linear Form of Other Three Attributes

Attribute	Coefficient (S.E.)
Constant	.63106191*** (0.11147099)
log of Travel time	-0.4722951*** (0.02720108)
Waiting at bank	-0.89524463*** (0.03237644)
24 hours a day and 7 days a week Accessibility	0.70163304***

	(0.03243355)
High security	0.7418302*** (0.03380846)
Increase in the monthly charge	-0.05379703*** (0.00390818)
No. of observations	3200
LL function	-1952.98
Pseudo- R^2	0.4445

***99% level of confidence

For the third model, both travel time and cost attributes were specified as logarithmic variables and the other three attributes were defined as linear.

Table 6.8: MNL Model with Log Form Of Travel Time and Cost and Linear Form Of Other Three Attributes.

Attribute	Coefficient (S.E.)
Constant	2.62804108*** 0.2031787
log of Travel time	-0.47319521*** 0.02721153
Waiting at bank	-0.90082176*** 0.03253613
24 hours a day and 7 days a week Accessibility	0.73350483*** 0.03370773
High security	0.77441282*** 0.0346741
log of increase in the monthly charge	-1.08206769*** 0.07114681
No. of observations	3200
LL function	-1923.195
Pseudo- R^2	0.4529

***99% level of confidence.

For the fourth model only cost attribute was defined as log form and other four attributes were specified in linear form.

Table 6.9: MNL Model with Four Linear and One Logarithmic Attributes

Attribute	Coefficient (S.E.)
Constant	1.92370047*** (0.1963607)
Travel time	-.05585408*** (0.00302362)
Waiting at bank	-.91013893*** (0.03294889)
24 hours a day and 7 days a week Accessibility	.73260982*** (0.03356298)
High security	.76428424*** (0.03403838)
The logarithm of the change in the monthly charge	-1.07619894*** (0.06917064)
No. of observations	3200
LL function	-1891.204
Pseudo- R^2	0.4620

***99% level of confidence.

To decide on the goodness of fit of the estimated model, we use the log likelihood (LL) ratio test and compare the results of the model with the attributes with the constant-only model (the model without any attributes as the base model). (Hensher *et al*., 2015). The LL-ratio test can be calculated as follows:

LL ratio= −2 (LL of the base model – LL of the estimated model) ~chi-square[9] (6.4). Below we calculate LL-ratio for the fourth model: The LL-ratio= -2((-1891.2-(-2991.4))= 2200.4.

Since the difference between the numbers of parameters of the two model is five we compare the calculated value with chi-square critical value for the degrees of freedom of five which is 11.07. The computed valued is well above the critical value, thus we conclude that the estimated model is better than the constant-only model.

[9] The degrees of freedom is equal to the difference between the numbers of parameters in two models

Another alternative test for the models is Pseudo R^2 statistic which can be calculated as below:

$$\text{Pseudo } R^2 = \frac{\text{LL of the base model} - \text{LL of the estimated model}}{\text{LL of the base model}} \quad (6.5)$$

To decide on the best model LL- ratios and Pseudo R^2 statistic were computed for all the estimated multinomial logit models as the table below.

Table 6.10: Estimated Multinomial Logit Models Specification

#	Model specification	LL	LL ratio	Pseudo R^2 statistic
1	ASC (constant only model)	-2991.41	-	-
2	U(1,2)=asc+Btt×tt+Bw×w+Bac24_7×ac24_7+ Bhs×hs+Bchmc×chmc	-1922.26	2138.3	35.74 %
3	U(1,2)=asc+Bltt×ltt+Bw×w+Bac24_7×ac24_7 +Bhs×hs+Blmc×lmc	-1952.98	2206.2	34.71 %
4	U(1,2)=asc+Bltt×ltt+Bw×w+Bac24_7×ac24_7 +Bhs×hs+Blmc×lmc	-1923.19	2136.4	35.71 %
5	U(1,2)=asc+Btt×tt+Bw×w+Bac24_7×ac24_7+ Bhs×hs+Blmc×lmc	-1891.2	2200.4	36.78 %

Table 6.10 indicates that the last model has the closest log-likelihood function to zero, the highest LL-ratio, and the highest value of Pseudo R^2 statistic. Therefore we select it as the best MNL model. Thus our MNL model can be specified as:

$$V(1,2) = ASC + \beta_{TT} \times TT + \beta_W \times W + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS + \beta_{LMC} \times LMC \quad (6.6)$$

6.4.2 Willingness to Pay

The willingness to pay by consumers for an attribute can be found by taking the ratio of their coefficient of an attribute to the coefficient of the related cost Gronberg & Reed (1994).

Therefore marginal willingness can be computed as:

$$MWTP_i(x) = \frac{\frac{\partial V(x)}{\partial x_i}}{-\frac{\partial V(x)}{\partial C}}, \quad i = 1, 2, 3, \ldots, I \tag{6.7}$$

thus,

$$MWTP_i(x) = \frac{\beta_i}{-\beta_C} \tag{6.8}$$

where i refers to an attribute and $MWTP_i(x)$ is the willingness to pay for a change in the levels of the attributes. According to Hu et al.,(2004) for the attribute with two levels, marginal willingness to pay is calculated as[10]:

$$MWTP_i(x) = 2 \times \frac{\beta_i}{-\beta_C} \tag{6.9}$$

For our model, the marginal willingness to pay for travel time attribute can be calculated as follow since the cost attribute is in log form:

$$MWTP_{TT}(banking\ services) = \frac{\beta_{TT}}{-\beta_{LMC}(\frac{1}{MC+1})} = \frac{\beta_{TT}}{-\beta_{LMC}}(MC + 1) \tag{6.10}$$

Marginal willingness to pay for other three attributes which are effects coded are computed as follow:

$$MWTP_i(banking\ services) = 2\frac{\beta_i}{-\beta_{LMC}\frac{1}{MC+1}} = 2\frac{\beta_i}{-\beta_{LMC}}(MC + 1) \tag{6.11}$$

where i refers to the three attributes: waiting at bank, 24/7 accessibility, and high scurity.

6.4.3 Compensating Variation

Individuals' choices depend on how they value their chosen product's attributes. Calculating the compensating variation (CV) is a way to measure this valuation (Meijer and Rouwendal, 2006). The CV is the change in consumer surplus (expressed in monetary terms), that is calculated by taking the difference between two estimates of utility created by different levels of attributes (Morey *et al.*, 1993).

[10] Unlike a dummy variable which takes the value of 0 and 1, these attributes take the value of 1 and -1 with a difference of 2, so the ratio should be multiply by 2

It measures the willingness to pay for the improvement in utility expressed by the choice makers (Venkatachalam, 2004), Thus:

$$V(x^0, y - Cost + CV) = V(x^1, y - Cost) \quad (6.12)$$

where x^0 is a product with the old attributes (V^0), and changes to x^1 with the new levels of the attributes (V^1), y is the consumer's level of income. The value of the CV is the amount that equals the left and right hand side of the equation above.

Thus:

$$V^1 - V^0 = 0 \quad (6.13)$$

In this case:

$$V^0 = (\beta_{TT} + SD \times N) \times TT + \beta_W \times w + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS \quad (6.14)$$

and

$$V^1 = ASC + (\beta_{TT} + SD \times N) \times TT + \beta_W \times w + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS + \beta_{LMC} \times LMC \quad (6.15)$$

Therefore, V^1, when the change in monthly charge is zero, shows the change in the quality of the improved services with zero payment:

$$V^1 \mid_{MC=0} = ASC + (\beta_{TT} + SD \times N) \times TT + \beta_W \times W + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS \quad (6.16)$$

So:

$$V^1 = V^1 \mid_{MC=0} + \beta_{LMC} \times LMC \quad (6.17)$$

The compensating variation (CV) here is the amount of additional monthly charge (MC) that keeps a consumer at its initial level of utility, Hence MC = CV.

As we mentioned earlier, we used the logarithm of monthly charge and as the logarithm of zero is undefined, to correct for the zero charge cases we added $1 to all the charges, hence:

$$LMC = ln\,(MC + 1) \tag{6.18}$$

$$LMC = ln\,(CV + 1) \tag{6.19}$$

$$V^1 = V^1 \mid_{MC=0} + \beta_{LMC} \times \ln(1 + CV) \tag{6.20}$$

Therefore:

$$V^1 - V^0 = [V^1 \mid_{MC=0} + \beta_{LMC} \times \ln(1 + CV)] - V^0 \tag{6.21}$$

$$\ln(1 + CV) = \frac{1}{\beta_{LMC}}[V^0 - V^1 \mid_{MC=0}] \tag{6.22}$$

$$CV = EXP(\frac{1}{\beta_{LMC}} \times [V^0 - V^1 \mid_{MC=0}]) - 1 \tag{6.23}$$

6.4.4 Mixed Logit Model

The multinomial logit (MNL) model has been utilized in many studies, but researchers have gradually discovered that the assumption of IIA (independence of irrelevant alternatives) might not always hold. In other words, certain attributes may affect the utility of some individuals differently than it affects others. Hence the IIA assumption that an attribute affects each individual utility, in the same way, might reduce the accuracy of the research results. Therefore, the mixed logit model, which relaxes this restriction, has also been used (Chang and Jayson, 2011).

The assumption in the mixed logit model is that choice makers identify the features of the alternatives, evaluate the attributes of each alternative compare it to the others, and select the alternative that maximizes their utility (Shaw and Ozog, 1999). Since consumers have different tastes and preferences, one should utilize random coefficient attributes for each individual. Thus, the utility function is:

$$U_{qi} = V_{qi} + \varepsilon_{qi} = \acute{\beta}_q x_{qi} + \varepsilon_{qi} \tag{6.24}$$

where $\acute{\beta}_q$ is the vector of the coefficients for the attributes that vary over individuals. To find the probabilities in mixed logit, one must integrate the probabilities of logit over the coefficients of the density function (Train, 2009). As has been shown above, the probability of individual *q* choosing alternative *i* is:

$$P_{qi}^{L}(\beta_q) = \frac{e^{\acute{\beta}_q x_{qi}}}{\sum_j e^{\acute{\beta}_q x_{qj}}} \tag{6.25}$$

Therefore, the probability (P_{qi}^{ML}) that an individual q chooses alternative i is calculated from the mixed logit as:

$$P_{qi}^{ML} = \int P_{qi}^{L}(\beta_q) f(\beta) d\beta \tag{6.2}$$

$$P_{qi}^{ML} = \int \left(\frac{e^{\acute{\beta} x_{qi}}}{\sum_j e^{\acute{\beta} x_{qj}}} \right) f(\beta) d\beta \tag{6.27}$$

As we mentioned above the MLN model is restricted by the assumption of IIA; to test this limitation for the model, we used the Hausman test for IIA. Since the P-value of the results is less than 5% the null hypothesis (homogenous coefficients, IIA assumption) can be rejected (Hensher *el. al*., 2015). We, therefore, use a less limiting model, the mixed logit model.

We use the estimated MNL model as a base for mixed logit model and then by changing the distribution for the coefficient of each attribute except price we estimated a variety of mixed logit models. Once the standard deviation of the distribution is no longer significant, we consider the coefficient to be homogeneous, and at the end of the process, the best model is chosen. Table 6.11 illustrates the best model. In this model, the only coefficient that can be considered as a random coefficient is the travel time coefficient which is normally distributed[11]. The mean of

[11] We chose the model with normal distribution for coefficient of travel time attribute rather than other distribution as its log likelihood was the highest one.

the coefficient is: -0.1121 and its standard deviation is 0.1031. Therefore the coefficient of travel time attribute is$-0.1121 + 0.1031 \times N$: Where N is a vector of q with a mean of zero and a standard deviation of one.

Table 6.11: Estimated Parameters of the Mixed Logit

Attribute	Coefficient (SE)
Random parameters in utility functions	
Travel time	-.11210927*** (0.00894839)
Constant	2.59441545*** (0.26416853)
Waiting at bank	-1.28332338*** (.06721094)
24 hours a day and 7 days a week accessibility	1.01377559*** (0.05727650)
High security	1.08220609*** (0.06097055)
Log of change in the monthly charge	-1.49911206*** (0.10481858)
Derived standard deviations of parameter distributions	
NsTT (standard deviation of the coefficient of travel time attribute)	.10311506*** (0.01061114)
Number of observations	3200
Log-likelihood function	-1840.452
Pseudo R^2	0.4765

***99% level of confidence.

The log likelihood function and Pseudo R^2 of ML model improve compare to the MNL model. The log likelihood function and Pseudo R^2 change from -1891.2 and 0.462 to -1840.45 and 0.477, respectively. Therefore the ML model is preferred over MNL.

Using the parameters and attributes specified in the table, the estimated model becomes:

$$V(1,2) = ASC + (\beta_{TT} + SD \times N) \times TT + \beta_W \times W + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS + \beta_{LMC} \times LMC \quad (6.28)$$

Where, SD is the standard deviation of travel time and N has a standard normal distribution with mean of zero and standard deviation of 1. Thus the coefficient of travel time attribute can take either a positive or a negative value which means travel time can affect the utility of the firms' owners either positively or negatively. In equation 6.28 the coefficient of travel time is a normally distributed random variable with a mean of β_{TT}, thus the marginal effect of travel time can be computed by adding the product of the standard deviation and N to the mean(β_{TT}).

6.4.5 Welfare Impact of the Improved Services

To find the average welfare impact of the improved services we computed the average CV for four different scenarios by using the estimated parameters and the aforementioned formula for compensating variation.

For all four cases, we are considering online banking with the travel time and the waiting time of zero, but the other two attributes vary for each scenario as follow:

1. The service is available 24 hours a day and 7 days a week and is highly secure.
2. The service is not available 24 hours a day and 7 days a week but is highly secure.
3. The service is available 24 hours a day and 7 days a week but is not highly secure.
4. The service is not available 24 hours a day and 7 days a week and is not highly secure.

The baseline utility, V_0, is computed using the estimated parameters from Table 6.11 along with the average attribute levels of the current service obtained from the survey and reported in Table 6.12

Table 6.12: The Average for Attribute Levels of the Current Service

Travel time (TT) (minutes)	Waiting at the bank (W) (yes-no)	Accessibility (AC24/7) (yes-no)	High security (HS) (yes-no)
43	1	-1	1

The resulting CV is shown in Table 6.13.

Table 6.23: Willingness-to-Pay For Four Alternative Scenarios

Scenario	Estimated CV($)
1	532.96
2	137.08
3	125.03
4	31.59

Table 6.13 shows that the impact of online banking with 24/7 accessibility and high security does have the highest impact. As the level of one of these two attributes decreases the willingness to pay decreases substantially.

6.4.6 The Result of the Mixed Logit with Some Interaction Terms

As mentioned above, the mixed logit or random parameter model allows the parameters to change over the observations. To identify the cause of this heterogeneity we estimated different models with different interactions. To determine whether the individuals' characteristics affected their preferences in choosing different attribute levels, we estimated a further model that allows

interactions between the random parameter, travel time, and all available socio-demographic characteristics.

We included three dummy variables to the data: the first dummy was defined for the owners' level of education. We considered a value of one for the variable if the owner had a level of education above high school and zero otherwise. The second dummy was assigned to the level of imports. A value of one was considered for a level of imports higher than 15% and zero otherwise. The third dummy was allocated to the level of exports. The value of this variable was one for a level of export more than 25% and zero otherwise.

Among the characteristics, that affect a respondent's utility as a result of increased travel time are the person's age and level of education. The firm's characteristics that are important in affecting the respondent's valuation of travel time are the intensity of the importation and exportation conducted by the firm. Where the intensity of the firm's importing activity is captured by the question, what is the proportion of inputs (in terms of value) do you buy from other countries? The variable took a value of zero if the answer was 15% or less, and one otherwise.

Likewise, the impact of the intensity of exporting activities of the firm is measured by the respondent's answer to the question, what proportion of your sales do you make to customers in other countries? If the answer was more than 25% it took a value of one, and zero otherwise.

Table 6.14: Estimated Coefficients of the Mixed Logit Model with İnteractions

Attribute	Coefficient (S E)

Random parameters in utility functions	
Travel time	-.10851179*** (0.01600849)
Nonrandom parameters in utility functions	
Alternative specific constant	2.66703969*** (0.26217214)
Waiting at bank	1.28014417*** (0.06609169)
24 hours a day and 7 days a week accessibility	1.02095999*** (0.0564763)
High security	1.07918501*** (0.06010703)
Log of change in the monthly charge	1.54250476*** (0.10418844)
travel time *age	.00093054*** (0.00030417)
travel time * education	-.01710150** (0.00731373)
travel time * import	-03190274*** (0.00887775)
travel time * export	-.02048581** (0.00827702)
Derived standard deviations of parameter distributions	
The standard deviation of the coefficient of travel time	.09921994*** (0.0101593)
Number of observations	3200
Log likelihood function	-1811.97
	0.4846

***99% level of confidence
**95% level of confidence.

Table 6.14 shows that all the coefficients on all the variables are highly significant at the 99% or 95% level. The coefficients of all the attributes have the expected signs and the relative magnitudes of the coefficients have remained quite stable across models. The parameter for the interaction between age and travel time is positive: when age increases, travel time becomes less important. Contrariwise, the coefficient on the interaction parameter between the level of education and travel time is

positive: for higher-educated people, travel time is more important. This is as expected given their higher opportunity cost of time.

The value of the parameter is negative for the interaction between a level of imports more than 15% by the company and travel time. Thus, when the level of imports is higher than 15%, travel time becomes more important in reducing utility. The value for the interaction parameter between a percentage of exports higher than 25% and travel time is negative. Hence, when the percentage of exports activities undertaken by a company is more than 25%, the travel time needed to carry out banking activities becomes a more important variable in reducing utility. These two coefficients indicate that for SMEs engaged in international trade time savings is relatively more valuable than it is for other types of SMEs.

Therefore, the observed utility function with significant interactions can be expressed as:

$$V(services) = ASC + (\beta_{TT} + SD \times N) \times TT + \beta_W \times W + \beta_{AC\ 24/7} \times AC\ 24/7 + \beta_{HS} \times HS + \beta_{LMC} \times LMC + \beta_{(TT \times age)} \times (TT \times age) + \beta_{(TT \times edu)} \times (TT \times edu) + \beta_{TT \times imports} \times (TT \times imports) + \beta_{TT \times exports} \times (TT \times exports) \quad (6.29)$$

where, TT×age denotes the interaction variable between travel time and the age of the respondent, TT×edu denotes the interaction variable between travel time and the respondent level of education, TT×imports denotes the interaction variable between travel time and the level of imports, and TT×exports denotes the interaction terms between travel time and the level of exports of the firm.

To decide on the goodness of fit of the model over the model without interaction terms we applied log-likelihood ratio test and Pseudo R^2. The log-likelihood function of this model and the previous model are -1811.97 and -1837.88, respectively. The log likelihood ratio is computed as: The LL-ratio= -2((-1840.45-(-1811.97)) = 56.96

Chi-square critical value with 4 degrees of freedom[12] is equal to 9.488 at 95% level of confidence which is less than the calculated LL-ratio. Thus we conclude that the ML model with these four interaction terms is a better model. Utilizing Nlogit software we estimated marginal willingness to pay for the constant and four attributes. They are shown in Table 6.15.

Table 6.15: Estimated Marginal Willingness to Pay for the Attributes of Online Banking

Attribute	MWTP function	MWTP (SE)
Alternative specific constant	$\frac{ASC}{-BLMC}(MC+1)$	32.8516031*** (1.89276473)
Travel time	$\frac{\beta_{TT}}{-BLMC}(MC+1)$	-1.33660785*** (0.19575844)
Waiting at bank	$2\times\frac{\beta_{W}}{-BLMC}(MC+1)$	-31.5366796*** (1.85649779)
Accessibility for 24/7	$2\times\frac{\beta_{24/7\ AC}}{-BLMC}(MC+1)$	25.1516109*** (1.35491016)
High security	$2\times\frac{\beta_{HS}}{-BLMC}(MC+1)$	26.5859993*** (1.45148831)

[12] Degrees of freedom is equal to the difference between the two models in terms of the number of parameters

Since the selected model is the ML model with the interaction terms, we calculate compensating variation once again for the four aforementioned scenarios using the estimated parameters. The average attribute levels for firms' current banking services utilized to calculate V_0 are as table 6.16.

Table 6.16: The Average for Attribute Levels and Four Interaction Variables of the Current Service

Travel time (TT) (minutes)	Waiting at the bank (W) (yes-no)	Accessibility (AC24/7) (yes-no)	High security (HS) (yes-no)	TT*age	TT* education	TT* imports	TT* exports
43	1	-1	1	1839.04	29.75	30	19.95

We calculated the average welfare impact of the scenarios for the selected ML model with interactions as table 6.17

Table 6.17: Estimated Willingness To Pay For Four Alternative Online Banking Using The ML Model With İnteractions

Scenario	Estimated CV($)
1	451.07
2	119.31
3	110.56
4	28.69

The probability of choosing the first scenario, which reflects the characteristics of online banking, over the current service is 96.5%. The computed willingness to pay for the scenarios using the two models namely mixed logit and mixed logit with interactions are noticeably different. Table 6.18 shows the two estimations.

Table 6.18: Comparison of Estimated WTPs for the Four Scenarios

Scenario	Estimated CV for ML without interactions($)	Estimated CV for ML with interactions($)
1	532.96	451.07
2	137.08	119.31
3	125.03	110.56
4	31.59	28.69

The estimated WTPs of the ML model for all four scenarios are higher than their corresponding ML model with interactions. Since the value of the LL- ratio and Pseudo R^2 recommend that the latter model is a better model we accept estimated WTP for the scenarios of the ML model with interactions.

The computed CV shows that the highest average welfare effect (willingness to pay) of $451.07 per month is related to the first scenario, which is full-service online banking services with 24/7 accessibility and high security. For the second scenario, in which 24/7 accessibility is removed, CV decreases to $119.31. The CV calculated for the third scenario, which does not include a high level of security, is $110.56. Finally, the CV calculated for the final scenario, which includes only the first two attributes (zero travel time and zero waiting time) is only $28.69 per month. The results show that the two attributes of 24/7 accessibility and high security are very important, in combination with zero travel time and zero waiting time.

To figure out whether engaging in international trade affects the firms' willingness to pay for aforementioned four scenarios, we sorted the data for firms with four different conditions: firms with no foreign trade, firms with international trade, firms with a level of export more than 25%, and firms with a level of imports more than 15%.

First, we calculated willingness to pay for the four scenarios of the firms without international trade. To compute V_0 we substituted the averages illustrated in table 6.19 along with the estimated parameters in table 6.14, into equation 6.29 and $V_1$is calculated using the same parameters and new attribute levels substituting into equation 6.29. The value of waiting at bank, accessibility, and high security attributes are 1, -1, and 1, respectively for all four conditions.

Table 6.19: The Average for Attribute Levels and Four Interaction Variables of the Current Service.

`	Number of firms	Travel time (TT) (minutes)	TT*age	TT* education	TT* imports	TT* exports
Without international trade	71	39.	1528.13	26.74	0	0
With international trade	329	44	1898.20	30.28	35.73	23.75
With export more than 25%	184	43	1945.00	30.45	41.8	42.59
With imports more than 15%	279	43	1895.00	31.05	43.06	28.09

Utilizing above-mentioned method and averages from table 6.19, then the willingness to pay for the four scenarios of firms with international trade, a level of exports more than 25%, and a level of imports more than 15%, were calculated. Table 6.20 illustrates their willingness to pay for the four scenarios.

Table 6.20: Willingness-To-Pay for Four Alternative Scenarios of Firms with 4 Different Conditions

Scenario	without international trade	With international trade	Exports>25%	Imports>15%
1	163.31	580.29	736.26	645.87
2	42.73	153.70	195.21	171.15

3	39.55	142.45	180.94	158.63
4	9.79	37.18	47.41	41.48

As table 6.20 shows engaging in international trade does affect the willingness to pay for the four alternatives banking services. There is a substantial difference between these two situations. We calculated the expected range of the willingness to pay for the four scenarios. First, the WTP to pay for the alternative scenarios, and their corresponding standard errors were estimated applying the Wald command of Nlogit. Then utilizing the delta method we calculated the confidence interval at a 95% level of confidence as the Table below.

Table 6.21: Computed Confidence İnterval for the Estimated CV of Four Scenarios

Scenario	CV (SE)	Lower bound $/month	Upper bound $/month
1	451.07 (151.32)	154.48	747.66
2	119.31 (34.25)	52.20	186.44
3	110.56 (31.65)	48.53	172.59
4	28.69 (7.06)	14.85	42.53

As the intervals illustrated above show the WTP for all scenarios takes positive values over these ranges. We further calculated the intervals for the four scenarios of firms with four different conditions illustrated in Table 6.22.

Table 6.22: Confidence İnterval For Estimated WTP For Four Scenarios Of Firms with Different Conditions

Scenario		WTP($) (SE)	Lower bound $/month	Upper bound $/month
1	firms:			
	without international trade	163.31 (50.97)	63.41	263.21

	With international trade	580.49 (202.97)	182.67	978.31
	with Exports>25%	736.26 (270.81)	205.47	1,267.05
	with imports>15%	645.87 (230.19)	194.70	1,097.04
2	firms:			
	without international trade	42.73 (11.56)	20.07	65.39
	With international trade	153.75 (46.35)	62.90	244.60
	with Exports>25%	195.21 (62.63)	72.45	317.96
	with imports>15%	171.15 (52.81)	67.64	274.66
3	firms:			
	without international trade	39.55 (10.69)	18.60	60.50
	With international trade	142.50 (42.83)	58.55	226.45
	with Exports>25%	180.94 (57.93)	67.40	294.48
	with imports>15%	158.63 (48.83)	62.92	254.34
4	firms:			
	without international trade	9.79 (2.42)	5.05	14.53
	With international trade	37.19 (9.66)	18.26	56.12
	with Exports>25%	47.42 (13.30)	21.35	73.49
	with imports>15%	41.48 (11.09)	19.74	63.22

The estimated intervals shown in table 6.22 indicate that the WTP for all scenarios lies within positive ranges.

Chapter 7

CONCLUSION

7.1 Introduction

As international trade becomes more important as a means of economic growth for most developing countries, an issue is raised about which facilities should be prepared for the exporter firms, and how the firms value these facilities. Improved banking services can be considered as the main pillar of this infrastructure.

Many studies found the importance of banking services as a facilitator in business. To find the value of these services to SME exporters, the present study developed a model for the utility received by the firms as a function of the attributes of the services. Utilizing the function, the study calculated the economic impact of online banking services. The key attributes of the banking services have been identified and the value of each of these attributes along with the average overall value of online banking to the sample SMEs as having been computed.

We further regressed the SMEs willingness to pay for business online banking services on the socio-demographic variables of the sample and estimated the average WTP in this way. To estimate the value of online banking to the sample SMEs we utilized two methods: contingent valuation and choice experiment methods.

This study contributes to how the quality changes in banking services will change the consumer surplus in developing countries and what actions need to be applied to improve economic surplus in this part of the world. In this research we attempted to model the factors that affect online banking services as well as the value of the services to the SMEs that engaged in international trade, the concept which is getting a high value over time given that the nature of the world economy is changing and banks can be considered as an important accelerator for these changes.

7.2 Comparison of CE and CV Methods

In chapter 5 and 6 we estimated the average WTP for online banking services utilizing CE and CV methods. In the CVM part of our questionnaire, we explained a contingent market for specific business online banking services. We first explained the features and options of the services and then asked them whether they participate in this market. If the answer was yes then using payment ladder setup the respondents were asked their willingness to pay for the service directly.

Utilizing an interval regression model we estimated the average willingness to pay of $ 518.5 per month. In other words, the results show on average an SME is willing to pay $518.5 in addition to its monthly charge of a bank account in order to have improved banking services.

The CE part of the questionnaire consisted of eight choice sets each with two improved services and the current service as the alternative services. The alternatives had five attributes each with some attributes level. The attributes of banking services were specified as travel time, waiting at a bank branch, 24/7 accessibility, high

security, and change in monthly charge of the bank account. About 91% of the time the respondents chose the improved services.

Using a mixed logit model with interactions we modeled the utility as a function of the attributes and estimated their associated parameters. We then defined four service packages for online banking services and substituting the estimated parameters and average of the attributes for each package and calculated their related compensating variation. The waiting and travel time for all four packages were zero. The first package was defined as a package with 24/7 accessibility and high security and the WTP for that was $ 451.07 per month.

The estimated WTP for the second package, which was not available 24 hours a day and 7 days a week but was highly secure, was $119 per month. The third package was available 24 hours a day and 7 days a week but was not highly secure and its estimated WTP was $ 110.56 per month. Finally, the last package was neither available 24 hours a day and 7 days a week nor high secure and its calculated WTP was $ 28.69 per month. We further estimated the WTP for the four packages of the firms with and without international trade and found a considerable difference between the two amounts.

The estimated WTP result from both methods shows that firms with international trade are willing to pay a higher amount per month to use online banking services. The average WTP estimate derived from CVM is higher for all firms and the firms with no international trade compared to the CE model but it is lower for the firms with international trade. Table 7.1 presents the three different estimates of WTP for online banking services using the two methods.

Table 7.1: Comparison of the Estimated WTP Result from CV and CE Methods

Method	Average WTP (all firms) ($)	Firms with international trade($)	Firms without international trade ($)
CVM	518.5	528	472.5
CE	451.07	580.29	163.31

7.3 Policy Implications

Modern banking services are critical inputs to the efficient functioning of a business and play a particularly important role in SMEs involved in international trade. Traditional banking consumes time and effort, and, hence, it is more costly than online banking. For business owners and CEOs, the opportunity cost of time is high. One of the most important attributes of online banking is that it saves time. A good-quality online banking system provides a service that requires zero travel time and waiting time and is available 24 hours a day, 7 days a week.

The results of the CE method of this study also show that security and 24/7 accessibility are key attributes. Where the scenario is changed to a situation without 24/7 accessibility or one in which the services are not highly secure, the value of compensating variation falls dramatically.

The results of this study indicate that the benefits that trading SMEs receive from internet banking are quite substantial. For a secure and 24/7-accessible service, the average value is approximately US$646.00 per month or US$7,750 per year. For export-intensive SMEs, the WTP per month increases a further 14% to an average of

$736.00 per month, or $8,832.00 per year. For some firms, particularly those that are heavily engaged in international trade, the value of this service will be greater.

On the other hand, the cost to banks of providing this service is very modest and may even be negative, in that once the system is installed and tested, it is a cost saving for the bank (Simpson, 2002). Hence, the potential net financial and economic welfare gains are substantial. Certainly, over time, the financial cost of supplying such a service has fallen and will continue to fall.

For developing countries wishing to expand their SME sector into areas of international trade, the key policy initiative for realizing this net benefit is to provide the appropriate regulatory environment. Banks need to be able to offer online banking services easily, and security must be assured. The results of this study provide a quantified estimate of how policies to facilitate this improvement in banking services can significantly reduce the cost of doing business by SMEs in general, particularly for those wishing to engage in international trade.

The provision of improved banking services for SMEs will help to meet the policy goal of improving international trade in the UAE. This is a policy conclusion that is likely to hold for any transitional economy that has obsolete banking regulations with respect to the operation on online banking systems. A reliable online banking facility could play a key role in enhancing international trade, providing SMEs with specialized, convenient, and low-cost services.

The results of CV method of this study demonstrate that the average SMEs' WTP for business online banking services is USD 518.5 per month, reflecting the value of the

increased convenience, including the savings in transportation and employee (salary), costs associated with traditional branch banking.

If most of the UAE free zone companies (9,976 companies) were to utilize online banking services, the cumulative time and cost savings would be very substantial. A rough estimate would be USD 62.1million per year (USD $518.5 \times 12 \times 9{,}976$). In addition, online banking is associated with a reduction in demand for in-branch transactions, resulting in a decrease in bank operating costs (Aladwani, 2001) and a lowering of the incidence of internal fraud.

A policy implication of this study is that the government should provide appropriate legislative and regulatory frameworks to allow banks to provide round-the-clock, secure online banking services. Such an advancement in service provision not only yields a very substantial benefit to SMEs but also is likely to reduce the operating costs of the banks.

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APPENDICES

Appendix 1: Tables

Table 3.2: The Factorial Design Codes

Attribute	Levels	Orthogonal code
Travel time	0 minute	0
	10minutes	1
	20 minutes	2
	30minutes	3
Waiting	No	0
	Yes	1
24/7 Accessibility	Yes	0
	No	1
High security	Yes	0
	No	1
Cost (percent higher than monthly charge)	5% more than current charge	0
	10% more than current charge 15% more than current charge	1
		2
	20% more than current charge	3

Table 3.3: The Orthogonal Fractional Factorial Design for Banking Services

Profiles	A	B	C	D	E
1	3	0	0	1	0
2	2	1	0	0	1
3	1	0	0	0	3
4	0	1	1	0	3
5	3	1	0	0	3
6	3	0	0	1	3
7	0	1	1	0	0
8	3	1	0	0	0
9	0	0	1	1	0
10	2	1	0	0	2
11	2	1	1	1	0
12	0	1	0	1	1
13	3	1	1	1	1
14	3	0	1	0	2
15	0	0	0	0	2
16	1	1	1	0	1
17	0	0	0	0	1
18	1	0	0	0	0
19	0	1	0	1	2
20	3	1	1	1	2
21	1	0	1	1	2
22	2	1	1	1	3
23	2	0	0	1	1
24	1	1	0	1	0
25	0	0	1	1	3
26	2	0	1	0	0
27	3	0	1	0	1
28	2	0	1	0	3
29	1	1	1	0	2
30	2	0	0	1	2
31	1	1	0	1	3
32	1	0	1	1	1

Table 3.4: Orthogonal Coding for the Attribute Levels

Attribute	Levels	Orthogonal code
Travel time	0 minute	-3
	10minutes	-1
	20 minutes	1
	30minutes	3
Waiting at bank	No	-1
	Yes	1
24/7 Accessibility	Yes	-1
	No	1
High security	Yes	-1
	No	1
Cost	5% more than current charge	-3
(percent higher	10% more than current charge 15%	-1
than monthly	more than current charge	1
charge)	20% more than current charge	3

Table 3.5: The Treatment Combinations With Orthogonal Codes

Profile	A	B	C	D	E
1	3	-1	-1	1	-3
2	1	1	-1	-1	-1
3	-1	-1	-1	-1	3
4	-3	1	1	-1	3
5	3	1	-1	-1	3
6	3	-1	-1	1	3
7	-3	1	1	-1	-3
8	3	1	-1	-1	-3
9	-3	-1	1	1	-3
10	1	1	-1	-1	1
11	1	1	1	1	-3
12	-3	1	-1	1	-1
13	3	1	1	1	-1
14	3	-1	1	-1	1
15	-3	-1	-1	-1	1
16	-1	1	1	-1	-1
17	-3	-1	-1	-1	-1
18	-1	-1	-1	-1	-3
19	-3	1	-1	1	1
20	3	1	1	1	1
21	-1	-1	1	1	1
22	1	1	1	1	3
23	1	-1	-1	1	-1
24	-1	1	-1	1	-3
25	-3	-1	1	1	3
26	1	-1	1	-1	-3
27	3	-1	1	-1	-1
28	1	-1	1	-1	3
29	-1	1	1	-1	1
30	1	-1	-1	1	1
31	-1	1	-1	1	3
32	-1	-1	1	1	-1

Table 3.6: The Treatment Combinations with Factorial Codes for Banking Services

Profiles	Travel time	Waiting at bank	24/7 accessibility	High security	Change in monthly charge
1	3	0	0	1	0
2	2	1	0	0	1
3	1	0	0	0	3
4	0	1	1	0	3
5	3	1	0	0	3
6	3	0	0	1	3
7	0	1	1	0	0
8	3	1	0	0	0
9	0	0	1	1	0
10	2	1	0	0	2
11	2	1	1	1	0
12	0	1	0	1	1
13	3	1	1	1	1
14	3	0	1	0	2
15	0	0	0	0	2
16	1	1	1	0	1
17	0	0	0	0	1
18	1	0	0	0	0
19	0	1	0	1	2
20	3	1	1	1	2
21	1	0	1	1	2
22	2	1	1	1	3
23	2	0	0	1	1
24	1	1	0	1	0
25	0	0	1	1	3
26	2	0	1	0	0
27	3	0	1	0	1
28	2	0	1	0	3
29	1	1	1	0	2
30	2	0	0	1	2
31	1	1	0	1	3
32	1	0	1	1	1

Table 3.7: The Treatment Combinations with Orthogonal Codes for Banking Services

Profile	Travel time	Waiting at bank	24/7 accessibility	High security	Change in monthly charge
1	3	-1	-1	1	-3
2	1	1	-1	-1	-1
3	-1	-1	-1	-1	3
4	-3	1	1	-1	3
5	3	1	-1	-1	3
6	3	-1	-1	1	3
7	-3	1	1	-1	-3
8	3	1	-1	-1	-3
9	-3	-1	1	1	-3
10	1	1	-1	-1	1
11	1	1	1	1	-3
12	-3	1	-1	1	-1
13	3	1	1	1	-1
14	3	-1	1	-1	1
15	-3	-1	-1	-1	1
16	-1	1	1	-1	-1
17	-3	-1	-1	-1	-1
18	-1	-1	-1	-1	-3
19	-3	1	-1	1	1
20	3	1	1	1	1
21	-1	-1	1	1	1
22	1	1	1	1	3
23	1	-1	-1	1	-1
24	-1	1	-1	1	-3
25	-3	-1	1	1	3
26	1	-1	1	-1	-3
27	3	-1	1	-1	-1
28	1	-1	1	-1	3
29	-1	1	1	-1	1
30	1	-1	-1	1	1
31	-1	1	-1	1	3
32	-1	-1	1	1	-1

Table 3.8: The Treatment Combinations for Banking Services with Blocking Column

Profiles	Travel time	Waiting at bank	24/7 accessibility	High security	Change in monthly charge	Blocking
1	3	0	0	1	0	3
2	2	1	0	0	1	0
3	1	0	0	0	3	2
4	0	1	1	0	3	0
5	3	1	0	0	3	3
6	3	0	0	1	3	1
7	0	1	1	0	0	2
8	3	1	0	0	0	1
9	0	0	1	1	0	0
10	2	1	0	0	2	2
11	2	1	1	1	0	1
12	0	1	0	1	1	3
13	3	1	1	1	1	0
14	3	0	1	0	2	0
15	0	0	0	0	2	3
16	1	1	1	0	1	3
17	0	0	0	0	1	1
18	1	0	0	0	0	0
19	0	1	0	1	2	1
20	3	1	1	1	2	2
21	1	0	1	1	2	3
22	2	1	1	1	3	3
23	2	0	0	1	1	2
24	1	1	0	1	0	2
25	0	0	1	1	3	2
26	2	0	1	0	0	3
27	3	0	1	0	1	2
28	2	0	1	0	3	1
29	1	1	1	0	2	1
30	2	0	0	1	2	0
31	1	1	0	1	3	0
32	1	0	1	1	1	1

Table 3.9: The Treatment Combinations For Banking Services Sorted Based On Blocking Column

Profile	Travel Time	Waiting at bank	Accessibility	High Security	Monthly Charge	Blocking
2	2	1	0	0	1	0
4	0	1	1	0	3	0
9	0	0	1	1	0	0
13	3	1	1	1	1	0
14	3	0	1	0	2	0
18	1	0	0	0	0	0
30	2	0	0	1	2	0
31	1	1	0	1	3	0
6	3	0	0	1	3	1
8	3	1	0	0	0	1
11	2	1	1	1	0	1
17	0	0	0	0	1	1
19	0	1	0	1	2	1
28	2	0	1	0	3	1
29	1	1	1	0	2	1
32	1	0	1	1	1	1
3	1	0	0	0	3	2
7	0	1	1	0	0	2
10	2	1	0	0	2	2
20	3	1	1	1	2	2
23	2	0	0	1	1	2
24	1	1	0	1	0	2
25	0	0	1	1	3	2
27	3	0	1	0	1	2
1	3	0	0	1	0	3
5	3	1	0	0	3	3
12	0	1	0	1	1	3
15	0	0	0	0	2	3
16	1	1	1	0	1	3
21	1	0	1	1	2	3
22	2	1	1	1	3	3
26	2	0	1	0	0	3

Table 3.10: The Treatment Combinations for the Four Versions

Card ID	Travel Time	Waiting at bank	Accessibility	High Security	Monthly Charge	Blocking
2	20 min	No	No	No	10% more	Version 1
4	0 min	No	Yes	No	20% more	Version 1
9	0 min	Yes	Yes	Yes	5% more	Version 1
13	30 min	No	Yes	Yes	10% more	Version 1
14	30 min	Yes	Yes	No	15% more	Version 1
18	10 min	Yes	No	No	5% more	Version 1
30	20 min	Yes	No	Yes	15% more	Version 1
31	10 min	No	No	Yes	20% more	Version 1
6	30 min	Yes	No	Yes	20% more	Version 2
8	30 min	No	No	No	5% more	Version 2
11	20 min	No	Yes	Yes	5% more	Version 2
17	0 min	Yes	No	No	10% more	Version 2
19	0 min	No	No	Yes	15% more	Version 2
28	20 min	Yes	Yes	No	20% more	Version 2
29	10 min	No	Yes	No	15% more	Version 2
32	10 min	Yes	Yes	Yes	10% more	Version 2
3	10 min	Yes	No	No	20% more	Version 3
7	0 min	No	Yes	No	5% more	Version 3
10	20 min	No	No	No	15% more	Version 3
20	30 min	No	Yes	Yes	15% more	Version 3
23	20 min	Yes	No	Yes	10% more	Version 3
24	10 min	No	No	Yes	5% more	Version 3
25	0 min	Yes	Yes	Yes	20% more	Version 3

27	30 min	Yes	Yes	No	10% more	Version 3
1	30 min	Yes	No	Yes	5% more	Version 4
5	30 min	No	No	No	20% more	Version 4
12	0 min	No	No	Yes	10% more	Version 4
15	0 min	Yes	No	No	15% more	Version 4
16	10 min	No	Yes	No	10% more	Version 4
21	10 min	Yes	Yes	Yes	15% more	Version 4
22	20 min	No	Yes	Yes	20% more	Version 4
26	20 min	Yes	Yes	No	5% more	Version 4

Table 3.11: The Four Versions of Service 1 and 2 in Factorial Codes

		Service 1					Service 2				
Blocking	Profile	Travel Time	Waiting at bank	Accessibility	High Security	Change in Monthly Charge	Travel time	Waiting at bank	Accessibility	High security	Change in Monthly charge
0	2	2	1	0	0	1	1	0	1	1	2
0	4	0	1	1	0	3	3	0	0	1	0
0	9	0	0	1	1	0	3	1	0	0	3
0	13	3	1	1	1	1	0	0	0	0	2
0	14	3	0	1	0	2	0	1	0	1	1
0	18	1	0	0	0	0	2	1	1	1	3
0	30	2	0	0	1	2	1	1	1	0	1
0	31	1	1	0	1	3	2	0	1	0	0
1	6	3	0	0	1	3	0	1	1	0	0
1	8	3	1	0	0	0	0	0	1	1	3
1	11	2	1	1	1	0	1	0	0	0	3
1	17	0	0	0	0	1	3	1	1	1	2
1	19	0	1	0	1	2	3	0	1	0	1
1	28	2	0	1	0	3	1	1	0	1	0
1	29	1	1	1	0	2	2	0	0	1	1
1	32	1	0	1	1	1	2	1	0	0	2
2	3	1	0	0	0	3	2	1	1	1	0

2	7	0	1	1	0	0	3	0	0	1	3
2	10	2	1	0	0	2	1	0	1	1	1
2	20	3	1	1	1	2	0	0	0	0	1
2	23	2	0	0	1	1	1	1	1	0	2
2	24	1	1	0	1	0	2	0	1	0	3
2	25	0	0	1	1	3	3	1	0	0	0
2	27	3	0	1	0	1	0	1	0	1	2
3	1	3	0	0	1	0	0	1	1	0	3
3	5	3	1	0	0	3	0	0	1	1	0
3	12	0	1	0	1	1	3	0	1	0	2
3	15	0	0	0	0	2	3	1	1	1	1
3	16	1	1	1	0	1	2	0	0	1	2
3	21	1	0	1	1	2	2	1	0	0	1
3	22	2	1	1	1	3	1	0	0	0	0
3	26	2	0	1	0	0	1	1	0	1	3

Table 3.12: The Four Versions of Service 1 and 2 with the Attributes

		Service 1					Service 2				
Blocking	Profile	Travel Time	Waiting at bank	Accessibility	High Security	Change in Monthly Charge	Travel time	Waiting at bank	Accessibility	High security	Change in Monthly charge
0	2	20 min	Yes	Yes	Yes	10% more	10 min	No	No	No	15% more
0	4	0 min	Yes	No	Yes	20% more	30 min	No	Yes	No	5% more
0	9	0 min	No	No	No	5% more	30 min	Yes	Yes	Yes	20% more
0	13	30 min	Yes	No	No	10% more	0 min	No	Yes	Yes	15% more
0	14	30 min	No	No	Yes	15% more	0 min	Yes	Yes	No	10% more
0	18	10 min	No	Yes	Yes	5% more	20 min	Yes	No	No	20% more
0	30	20 min	No	Yes	No	15% more	10 min	Yes	No	Yes	10% more
0	31	10 min	Yes	Yes	No	20% more	20 min	No	No	Yes	5% more
1	6	30 min	No	Yes	No	20% more	0 min	Yes	No	Yes	5% more
1	8	30 min	Yes	Yes	Yes	5% more	0 min	No	No	No	20% more
1	11	20 min	Yes	No	No	5% more	10 min	No	Yes	Yes	20% more
1	17	0 min	No	Yes	Yes	10% more	30 min	Yes	No	No	15% more

1	28	20 min	No	No	Yes	20% more	10 min	Yes	Yes	No	5% more
1	29	10 min	Yes	No	Yes	15% more	20 min	No	Yes	No	10% more
1	32	10 min	No	No	No	10% more	20 min	Yes	Yes	Yes	15% more
2	3	10 min	No	Yes	Yes	20% more	20 min	Yes	No	No	5% more
2	7	0 min	Yes	No	Yes	5% more	30 min	No	Yes	No	20% more
2	10	20 min	Yes	Yes	Yes	15% more	10 min	No	No	No	10% more
2	20	30 min	Yes	No	No	15% more	0 min	No	Yes	Yes	10% more
2	23	20 min	No	Yes	No	10% more	10 min	Yes	No	Yes	15% more
2	24	10 min	Yes	Yes	No	5% more	20 min	No	No	Yes	20% more
2	25	0 min	No	No	No	20% more	30 min	Yes	Yes	Yes	5% more
2	27	30 min	No	No	Yes	10% more	0 min	Yes	Yes	No	15% more
3	1	30 min	No	Yes	No	5% more	0 min	Yes	No	Yes	20% more
3	5	30 min	Yes	Yes	Yes	20% more	0 min	No	No	No	5% more
3	12	0 min	Yes	Yes	No	10% more	30 min	No	No	Yes	15% more
3	15	0 min	No	Yes	Yes	15% more	30 min	Yes	No	No	10% more
3	16	10 min	Yes	No	Yes	10% more	20 min	No	Yes	No	15% more
3	21	10 min	No	No	No	15% more	20 min	Yes	Yes	Yes	10% more
3	22	20 min	Yes	No	No	20% more	10 min	No	Yes	Yes	5% more
3	26	20 min	No	No	Yes	5% more	10 min	Yes	Yes	No	20% more

Table 3.13*:* Code-Sum Differences for all 32 Profiles

Blocking	Profile	Code-sum service 1	code-sum service 2	Code-sum difference
0	2	4	5	-1
0	4	5	4	1
0	9	2	7	-5
0	13	7	2	5
0	14	6	3	3
0	18	1	8	-7
0	30	5	4	1
0	31	6	3	3
1	6	7	2	5
1	8	4	5	-1
1	11	5	4	1
1	17	1	8	-7
1	19	4	5	-1
1	28	6	3	3
1	29	5	4	1
1	32	4	5	-1
2	3	4	5	-1
2	7	2	7	-5
2	10	5	4	1
2	20	8	1	7
2	23	4	5	-1
2	24	3	6	-3
2	25	5	4	1
2	27	5	4	1
3	1	4	5	-1
3	5	7	2	5
3	12	3	6	-3
3	15	2	7	-5
3	16	4	5	-1
3	21	5	4	1
3	22	8	1	7
3	26	3	6	-3

Table 3.14: The Revised Versions of Service 1 and 2 with the Attributes

		Service 1					Service 2				
Blocking	Profile	Travel Time	Waiting at bank	Accessibility	High Security	Change in Monthly Charge	Travel time	Waiting at bank	Accessibility	High security	Change in Monthly charge
0	2	20 min	Yes	Yes	Yes	10% more	10 min	No	No	No	15% more
0	4	0 min	Yes	No	Yes	20% more	30 min	No	Yes	No	5% more
0	9	0 min	No	No	No	5% more	30 min	Yes	Yes	Yes	20% more
0	13	30 min	Yes	No	No	5% more	0 min	No	Yes	Yes	20% more
0	14	30 min	No	No	Yes	15% more	0 min	Yes	Yes	No	10% more
0	18	10 min	No	Yes	Yes	20% more	20 min	Yes	No	No	5% more
0	30	20 min	No	Yes	No	15% more	10 min	Yes	No	Yes	10% more
0	31	10 min	Yes	Yes	No	20% more	20 min	No	No	Yes	5% more
1	6	30 min	No	Yes	No	20% more	0 min	Yes	No	Yes	5% more
1	8	30 min	Yes	Yes	Yes	5% more	0 min	No	No	No	20% more
1	11	20 min	Yes	No	No	5% more	10 min	No	Yes	Yes	20% more
1	17	0 min	No	Yes	Yes	20% more	30 min	Yes	No	No	5% more

1	19	0 min	Yes	Yes	No	15% more	30 min	No	No	Yes	10% more
1	28	20 min	No	No	Yes	20% more	10 min	Yes	Yes	No	5% more
1	29	10 min	Yes	No	Yes	15% more	20 min	No	Yes	No	10% more
1	32	10 min	No	No	No	10% more	20 min	Yes	Yes	Yes	15% more
2	3	10 min	No	Yes	Yes	20% more	20 min	Yes	No	No	5% more
2	7	0 min	Yes	No	Yes	5% more	30 min	No	Yes	No	20% more
2	10	20 min	Yes	Yes	Yes	15% more	10 min	No	No	No	10% more
2	20	30 min	Yes	No	No	5% more	0 min	No	Yes	Yes	20% more
2	23	20 min	No	Yes	No	10% more	10 min	Yes	No	Yes	15% more
2	24	10 min	Yes	Yes	No	5% more	20 min	No	No	Yes	20% more
2	25	0 min	No	No	No	20% more	30 min	Yes	Yes	Yes	5% more
2	27	30 min	No	No	Yes	10% more	0 min	Yes	Yes	No	15% more
3	1	30 min	No	Yes	No	5% more	0 min	Yes	No	Yes	20% more
3	5	30 min	Yes	Yes	Yes	20% more	0 min	No	No	No	5% more
3	12	0 min	Yes	Yes	No	10% more	30 min	No	No	Yes	15% more
3	15	0 min	No	Yes	Yes	20% more	30 min	Yes	No	No	5% more

Table 4.1: Sample SMEs Bank Account Information

Question 1	Having a bank account	Frequency	Percentage
	Yes	32	100%
	No	0	0%
	Total	32	100%

Question 2	Type of bank account	Frequency	Percentage
	saving	10	31.250%
	current	17	53.125%
	Both	5	15.625%
	Total	32	100%

Question 3	Number of banks to work with	Frequency	Percentage
	1	19	59.375%
	2	10	31.250%
	3	2	6.250%
	4	1	3.125%
	Total	32	100%

Question 4	Online Banking	Frequency	Percentage
	yes	2	6.250%
	No	30	93.750%
	Total	32	100%

Question 5	Type of online banking service		
	additional	2	6.250%
	separate	0	0.000%
	do not have	30	93.750%
	Total	32	100%

Table 4.2: Ways to Perform Banking Transactions

Question 6.1	Way to get balance statement	Frequency	Percentage
	Bank branch	23	71.875%
	ATM	7	21.875%
	Online	1	3.125%
	Exchange office	0	0.000%
	Bank branch & online	1	3.125%
	Do not have	0	0.000%
	Total	32	100%

Question 6.2	Way to transfer money	Frequency	Percentage
	Bank branch	18	56.250%
	ATM	8	25.000%
	Online	0	0.000%
	Exchange office	4	12.500%
	Bank branch & ATM	1	3.125%
	Do not have	1	3.125%
	Total	32	100%

Question 6.3	Foreign Exchange buy/sell	Frequency	Percentage
	Bank branch	6	18.75%
	ATM	2	6.25%
	Online	0	0.00%
	Exchange office	22	68.75%
	Do not have	2	6.25%
	Total	32	100%

Question 6.4	Mutual Fund buy/sell	Frequency	Percentage
	Bank branch	0	0.00%
	ATM	0	0.00%
	Online	0	0.00%
	Exchange office	0	0.00%
	Do not have	32	100%
	Total	32	100%

Question 6.5	Periodic Payments	Frequency	Percentage
	Bank Branch	23	71.875%
	ATM	5	15.625%
	Online	0	0.000%
	Exchange office	3	9.375%
	Bank Branch & ATM	1	3.125%
	Total	32	100%

Question 6.6	Equity Shares buy/sell	Frequency	Percentage
	Bank Branch	0	0.00%
	ATM	0	0.00%
	Online	0	0.00%
	Exchange office	0	0.00%
	Bank Branch & ATM	0	0.00%
	Do not have	32	100%
	Total	32	100%

Question 7.1	Frequency of statement	Frequency	Percentage
	Daily once	4	12.500%
	Daily several	2	6.250%
	Weekly once	5	15.625%
	Weekly several	5	15.625%
	Monthly once	13	40.625%
	Monthly several	3	9.375%
	Total	32	100%

Question 7.2	Frequency Of Money transfer	Frequency	Percentage
	Daily several	2	6.250%
	Weekly once	2	6.250%
	Weekly several	6	18.75%
	Monthly once	13	40.625%
	Monthly several	4	12.500%
	Occasionally	2	6.250%
	Do not have	3	9.375%
	Total	32	100%

Question 7.3	Frequency Of Foreign Exchange buy/sell	Frequency	Percentage
	Daily once	2	6.250%
	Weekly once	2	6.250%
	Weekly several	9	28.125%
	Monthly once	9	28.125%
	Monthly several	7	21.875%
	Occasionally	3	9.375%
	Total	32	100%

Question 7.4	Frequency Of Mutual Fund buy/sell	Frequency	Percentage
	Daily once	0	0.00%
	Daily several	0	0.00%
	Weekly once	0	0.00%
	Weekly several	0	0.00%
	Monthly once	0	0.00%
	Monthly several	0	0.00%
	Occasionally	0	0.00%
	Do not have	32	100%
	Total	32	100%

Question 7.5	Frequency Of Payments	Frequency	Percentage
	Daily several	3	9.375%
	Weekly once	6	18.750%
	Weekly several	5	15.625%
	Monthly once	10	31.250%
	Monthly several	5	15.625%
	Occasionally	1	3.125%
	Do not have	2	6.250%
	Total	32	100%

Question 7.6	Frequency Of Equity Share buy/sell	Frequency	Percentage
	Daily once	0	0.00%
	Daily several	0	0.00%
	Weekly once	0	0.00%
	Weekly several	0	0.00%
	Monthly once	0	0.00%
	Monthly several	0	0.00%
	Do not have	32	100%
	Total	32	100%

Question 8	Convenient time to perform banking transactions	Frequency	Percentage
	6 am to 9 am	6	18.75%
	8 am to 5 pm	6	18.75%
	9 pm to 6 am	2	6.25%
	Any time	18	56.25%
	Total	32	100%

Question 9	Distance from the bank/s	Frequency	Percentage
	less than 1km	5	15.625%
	1 to 2 km	5	15.625%
	2 to 5 km	8	25.000%
	5 to 10 km	4	12.500%
	more than 10 km	10	31.250%
	Total	32	100%

Question 10	Monthly charge of traditional banking($)	Frequency	Percentage
	0 up to 22	3	9.375%
	22 up to 44	2	6.250%
	44 up to 66	5	15.625%
	66 up to 88	13	40.625%
	88 up to 110	3	9.375%
	110 up to 132	1	3.125%
	154 up to 176	5	15.625%
	Total	32	100%

Question 11	Monthly charge of online banking($)	Frequency	Percentage
	Do not have	30	93.75%
	55	2	6.25%
	Total	32	100%

Question 12	Statement	Money transfer	Foreign exchange (buy/sell)	Mutual funds (buy/sell)	Equity share (buy/sell)	Periodic payments	Other payments
Mean cost of traditional banking	100	150	30	Do not have	Do not have	30	30
Mean cost of online banking	0	Do not have	Do not have	Do not have	Do not have	Do not have	Do not have

Question 13.1	Customer rate of service availability through traditional banking from 1 to 5 (low to high)	Frequency	Percentage
	1	1	3.125%
	2	3	9.375%
	3	9	28.125%
	4	16	50.000%
	5	3	9.375%
	Total	32	100%

Question 13.2	Customer rate of service availability through online banking from 1 to 5 (low to high)	Frequency	Percentage
	1	-	-
	2	-	-
	3	-	-
	4	-	-
	5	2	100%
	Total	2	100%

Question 14	The person who makes the transactions through a bank branch	Frequency	Percentage
	Owner	7	21.875%
	A specific employee	24	75.000%
	A person at the bank	1	3.125%
	Others	-	-
	Total	32	100%

Question 15	Employee's salary who makes the transactions through a bank branch	Frequency	Percentage
	0	8	25.000%
	1000	6	18.750%
	1200	4	12.500%
	1500	6	18.750%
	2000	3	9.375%
	2500	3	9.375%
	3000	2	6.250%
	Total	32	100%

Question 16	How to get to a bank branch	Frequency	Percentage
	Public transportation	24	21.875%
	Company's vehicle	8	75.000%
	Others	0	3.125%
	Total	32	100%

Question 17	Cost to get to the bank branch ($)	Frequency	Percentage
	0	2	6.250%
	3	4	12.500%
	4	6	18.750%
	5	11	34.375%
	9	5	15.625%
	9.5	1	3.125%
	15	3	9.375%
	Total	32	100%

Question 18.1	Rating the feature of online banking from 1 to 5 (lowest to highest)- 24/7 availability	Frequency	Percentage
	1	0	0.000%
	2	1	3.125%
	3	5	15.625%
	4	10	31.250%
	5	16	50.000%
	Total	32	100%

Question 18.2	Rating the feature of online banking from 1 to 5 (lowest to highest)- anywhere accessibility	Frequency	Percentage
	1	0	0.00%
	2	2	6.25%
	3	4	12.50%
	4	18	56.25%
	5	8	25.00%
	Total	32	100%

Question 18.3	Rating the feature of online banking from 1 to 5 (lowest to highest)- time-saving	Frequency	Percentage
	1	0	0.000%
	2	1	3.125%
	3	11	34.375%
	4	13	40.625%
	5	7	21.875%
	Total	32	100%

Question 18.4	Rating the feature of online banking from 1 to 5 (lowest to highest)- lower cost	Frequency	Percentage
	1	0	0.000%
	2	1	3.125%
	3	10	31.250%
	4	10	31.250%
	5	11	34.375%
	Total	32	100%

Question 18.5	Rating the feature of online banking from 1 to 5 (lowest to highest)- easy to use	Frequency	Percentage
	1	0	0.000%
	2	1	3.125%
	3	10	31.250%
	4	14	43.750%
	5	7	21.875%
	Total	32	100%

Question	Rating the feature of online banking from 1	Frequency	Percentage

18.6	to 5 (lowest to highest)- reliability		
	1	0	0.000%
	2	1	3.125%
	3	6	18.750%
	4	15	46.875%
	5	10	31.250%
	Total	32	100%

Question 18.7	Rating the feature of online banking from 1 to 5 (lowest to highest)- security	Frequency	Percentage
	1	0	0.000%
	2	1	3.125%
	3	11	34.375%
	4	11	34.375%
	5	9	28.125%
	Total	32	100%

Question 18.8	Rating the feature of online banking from 1 to 5 (lowest to highest)- higher speed	Frequency	Percentage
	1	1	3.125%
	2	3	9.375%
	3	10	31.250%
	4	10	31.250%
	5	8	25.000%
	Total	32	100%

Question 18.9	Rating the feature of online banking from 1 to 5 (lowest to highest)- instant feedback	Frequency	Percentage
	1	1	3.125%
	2	2	6.250%
	3	9	28.125%
	4	12	37.500%
	5	8	25.000%
	Total	32	100%

Question 19	Rating the security of traditional banking from 1 to 5 (lowest to highest)	Frequency	Percentage
	1	0	0.000%
	2	0	0.000%
	3	8	25.000%
	4	13	40.625%
	5	11	34.375%
	Total	32	100%

Table 4.3: Frequency Of The Bids In The Payment Cards

Question 21	Bid ($)	Frequency	Percentage
	200 up to 250	4	14.29%
	250 up to 300	5	17.86%
	300 up to 350	1	3.57%
	350 up to 400	2	7.14%
	400 up to 450	2	7.14%
	450 up to 500	13	46.43%
	500 up to 550	1	3.57%
	Total	28	

Table 4.4: Frequency of Services Selected

Question 23 to 30	Service	Frequency	Percentage
	Service 1	104	40.625%
	Service 2	120	46.875%
	Current service	32	12.500%
	Total	256	100%

Table 4.5: Characteristics of the Sample SMES

Question 31	Gender of the firm's owner	Frequency	Percentage
	Male	30	93.75%
	Female	2	6.25%
	Total	32	100%

Question 32	Age of the firm's owner	Frequency	Percentage
	26 up to 32	2	6.250%
	32 up to 38	5	15.625%
	38 up to 44	4	12.500%
	44 up to 50	12	37.500%
	50 up to 56	8	25.000%
	56 up to 62	1	3.125%
	Total	32	100%

Question 33	Marital status	Frequency	Percentage
	Single	4	12.5%
	Married	28	87.5%
	Total	32	100%

Question 34	Highest formal education	Frequency	Percentage
	University	23	71.875%
	Master	8	25.000%
	Ph.D	1	3.125%
	total	32	100%

Question 35	Number of employees	Frequency	Percentage
	2 up to 5	5	15.625%
	5 up to 8	10	31.250%
	8 up to 11	9	28.125%
	11 up to 14	5	15.625%
	14 up to 17	2	6.250%
	17 up to 20	0	0.000
	20 up to 23	1	3.125%
	Total	32	100%

Question 36	Yearly income ($)	Frequency	Percentage
	98000 up to 201000	3	9.375%
	201000 up to 304000	7	21.875%
	304000 up to 407000	3	9.375%
	407000 up to 510000	8	25.000%
	510000 up to 613000	1	3.125%
	613000 up to 716000	3	9.375%
	716000 up to 819000	7	21.875%
	Total	32	100%

Question 37	Firm's sector	Frequency	Percentage
	Production	1	3.125%
	Service	10	31.250%
	Trade	12	37.500%
	Service and trade	7	21.875%
	Production and trade	1	3.125%
	Other	1	3.125%
	Total	32	100%

Table 4.7: Sample Smes Bank Account Information

Question 1	Having a bank account	Frequency	Percentage
	Yes	400	100%
	No	0	0%
	Total	400	100%

Question 2	Type of bank account	Frequency	Percentage
	Saving	97	24.25%
	Current	258	64.50%
	Both	45	11.25%
	None	0	0.00%
	Total	400	100%

Question 3	Number of banks to work with	Frequency	Percentage
	1	260	65.00%
	2	121	30.25%
	3	19	4.75%
	Total	400	100%

Question 4	Online Banking	Frequency	Percentage
	Yes	57	14.25%
	No	343	85.75%
	Total	400	100%

Table 4.8: Ways To Perform Banking Transactions

Question 5.1	Way to get balance statement	Frequency	Percentage
	Bank branch	182	45.50%
	ATM	71	17.75%
	Online	23	5.75%
	Exchange office	0	0.00%
	Do not have	0	0.00%
	Bank branch & ATM	93	23.25%
	Online & bank branch	24	6.00%
	Online, bank branch & ATM	7	1.75%
	Total	400	100%

Question 5.2	Way to transfer money	Frequency	Percentage
	Bank branch	114	28.50%
	ATM	142	35.50%
	Online	0	0.00%
	Exchange office	75	18.75%
	Do not have	13	3.25%
	Bank branch & ATM	37	9.25%
	Bank branch and exchange office	9	2.25%
	ATM & exchange office	6	1.50%
	Bank branch, ATM, & exchange office	4	1.00%
	Total	400	100%

Question 5.3	Foreign Exchange buy/sell	Frequency	Percentage
	Bank branch	15	3.75%
	ATM	47	11.75%
	Online	0	0.00%
	Exchange office	236	59.00%
	Do not have	23	5.75%
	Bank branch & ATM	2	0.50%
	Bank branch and exchange office	42	10.50%
	ATM & exchange office	30	7.50%
	Bank branch, ATM, & exchange office	5	1.25%
	Total	400	100%

Question 5.4	Periodic Payments	Frequency	Percentage
	Bank branch	269	67.25%
	ATM	65	16.25%
	Online	0	0.00%
	Exchange office	0	0.00%
	Do not have	4	1.00%
	Bank branch & ATM	60	15.00%
	Bank branch, ATM, & exchange office	2	0.50%
	Total	400	100%

Question 5.5	Other payments	Frequency	Percentage
	Bank branch	189	47.25%
	ATM	82	20.50%
	Online	0	0.00%
	Exchange office	0	0.00%
	Do not have	96	24.00%
	Bank branch & ATM	33	8.25%
	Total	400	100%

Question 6	Banking services	Mean of time spent at the bank(Minute)
	Balance statement	27
	Money transfer	379
	Foreign exchange buy/sell	26
	Periodic payments	26
	Other payments	30

Question 7.1	Frequency of getting balance statement	Frequency	Percentage
	Daily once	100	25.00%
	Daily several	30	7.50%
	Weekly once	155	38.75%
	Weekly several	49	12.25%
	Monthly once	44	11.00%
	Monthly several	21	5.25%
	Occasionally	1	0.25%
	Total	400	100%

Question 7.2	Frequency Of Money transfer	Frequency	Percentage
	Daily once	11	2.75%
	Daily several	10	2.50%
	Weekly once	69	17.25%
	Weekly several	99	24.75%
	Monthly once	136	34.00%
	Monthly several	56	14.00%
	Occasionally	6	1.50%
	Do not have	13	3.25%
	Total	400	100%

Question 7.3	Frequency of foreign exchange buy/sell	Frequency	Percentage
	Daily once	0	0.00%
	Daily several	6	1.50%
	Weekly once	21	5.25%
	Weekly several	101	25.25%
	Monthly once	180	45.00%
	Monthly several	19	4.75%
	Occasionally	50	12.50%
	Do not have	23	5.75%
	Total	400	100%

Question 7.4	Frequency of periodic payments	Frequency	Percentage
	Daily once	15	3.75%
	Daily several	0	0.00%
	Weekly once	26	6.50%
	Weekly several	93	23.25%
	Monthly once	242	60.50%
	Monthly several	20	5.00%
	Occasionally	0	0.00%
	Do not have	4	1.00%
	Total	400	100%

Question 7.5	Frequency of other payments	Frequency	Percentage
	Daily once	0	0.00%
	Daily several	0	0.00%
	Weekly once	10	2.50%
	Weekly several	69	17.25%
	Monthly once	197	49.25%
	Monthly several	10	2.50%
	Occasionally	18	4.50%
	Do not have	96	24.00%
	Total	400	100%

Question 8	Convenient time to perform banking transactions	Frequency	Percentage
	6 am to 9 am	134	33.50%
	8 am to 5 pm	71	17.75%
	6 pm to 9 pm	16	4.00%
	9 pm to 6 am	12	3.00%
	Any time	167	41.75%
	Total	400	100%

Question 9	Travel time to get to the bank branch (minute)	Frequency	Percentage
	15 up to 31	165	41.25%
	31 up to 46	186	46.50%
	46 up to 61	3	0.75%
	61 up to 76	31	7.75%
	76 up to 91	15	3.75%
	Total	400	100%

Question 9	Mean travel time to get to bank branch (minute)	Minimum (minute)	Maximum (minute)
	43	15	90

Question 10	Monthly charge of traditional banking($)	Frequency	Percentage
	0 up to 35	11	2.75%
	35 up to 70	80	20.00%
	70 up to 105	38	9.50%
	105 up to 140	50	12.50%
	140 up to 175	33	8.25%

	175 up to 210	179	44.75%
	210 up to 245	7	1.75%
	More than 245	2	0.50%
	Total	400	100%

Question 10	Mean of monthly charge of traditional banking ($)	Minimum ($)	Maximum ($)
	140	0	313

Question 11	Monthly charge of online banking($)	Frequency	Percentage
	0	57	14.25%
	Do not have	343	85.75%
	Total	400	100%

Question 12.1	Banking services through a bank branch	Mean of cost of service ($)
	Balance statement	8.3
	Money transfer	9.2
	Foreign exchange buy/sell	10.3
	Periodic payments	7.9
	Other payments	7.9

Question 12.2	Online banking service	Mean of cost of service ($)
	Balance statement	0
	Money transfer	Do not know
	Foreign exchange buy/sell	Do not know
	Periodic payments	Do not know
	Other payments	Do not know

Question 13.1	Customer rate of service availability through traditional banking from 1 to 5 (low to high)	Frequency	Percentage
	1	18	4.50%
	2	90	22.50%
	3	157	39.25%
	4	85	21.25%
	5	50	12.50%
	Total	400	100%

Question 13.2	Customer rate of service availability through online banking from 1 to 5 (low to high)	Frequency	Percentage
	1	0	0.00%
	2	0	0.00%
	3	3	0.75%
	4	16	4.00%
	5	38	9.50%
	Do not have	343	85.75%
	Total	400	100%

Question 14	The person who makes the transactions through a bank branch	Frequency	Percentage
	Owner	93	23.25%
	A specific employee	283	70.75%
	A person at the bank	15	3.75%
	Others	9	2.25%
	Total	400	100%

Question 15	Employee's mean salary who makes the transactions through bank branch ($)	Minimum ($)	Maximum ($)
	334.6	163.5	953.7

Question 16	How to get to a bank branch	Frequency	Percentage
	Public transportation	110	27.50%
	Company's vehicle	247	61.75%
	Others	43	10.75%
	Total	400	100%

Question 17	Mean cost to get to bank branch ($)	Minimum ($)	Maximum ($)
	5.4	0	13.7

Question 18.1	Rating the feature of online banking from 1 to 5 (lowest to highest)- 24/7 availability	Frequency	Percentage
	1	0	0.00%
	2	2	0.50%
	3	30	7.50%
	4	221	55.25%
	5	147	36.75%
	Total	400	100%

Question 18.2	Rating the feature of online banking from 1 to 5 (lowest to highest)- anywhere accessibility	Frequency	Percentage
	1	0	0.00%
	2	0	0.00%
	3	25	6.25%
	4	250	62.50%
	5	125	31.25%
	Total	400	100%

Question 18.3	Rating the feature of online banking from 1 to 5 (lowest to highest)- time-saving	Frequency	Percentage
	1	2	0.50%
	2	1	0.25%
	3	36	9.00%
	4	204	51.00%
	5	157	39.25%
	Total	400	100%

Question 18.4	Rating the feature of online banking from 1 to 5 (lowest to highest)- lower cost	Frequency	Percentage
	1	0	0.00%
	2	0	0.00%
	3	39	9.75%
	4	164	41.00%
	5	197	49.25%
	Total	400	100%

Question 18.5	Rating the feature of online banking from 1 to 5 (lowest to highest)- easy to use	Frequency	Percentage
	1	0	0.00%
	2	2	0.50%
	3	22	5.50%
	4	217	54.25%
	5	159	39.75%
	Total	400	100%

Question 18.6	Rating the feature of online banking from 1 to 5 (lowest to highest)- reliability	Frequency	Percentage
	1	0	0.00%
	2	4	1.00%
	3	40	10.00%
	4	203	50.75%
	5	153	38.25%
	Total	400	100%

Question 18.7	Rating the feature of online banking from 1 to 5 (lowest to highest)- security	Frequency	Percentage
	1	2	0.50%
	2	1	0.25%
	3	29	7.25%
	4	186	46.50%
	5	182	45.50%
	Total	400	100%

Question 18.8	Rating the feature of online banking from 1 to 5 (lowest to highest)- higher speed	Frequency	Percentage
	1	0	0.00%
	2	0	0.00%
	3	17	4.25%
	4	209	52.25%
	5	174	43.50%
	Total	400	100%

Question 18.9	Rating the feature of online banking from 1 to 5 (lowest to highest)- instant feedback	Frequency	Percentage
	1	0	0.00%
	2	0	0.00%
	3	23	5.75%
	4	186	46.50%
	5	191	47.75%
	Total	400	100%

Question 19	Rating the security of traditional banking from 1 to 5 (lowest to highest)	Frequency	Percentage
	1	31	7.75%
	2	65	16.25%
	3	70	17.50%
	4	124	31.00%
	5	110	27.50%
	Total	400	100%

Table 4.11: Characteristics of the Sample SMEs

Question 31	Gender of the firm's owner	Frequency	Percentage
	Male	361	90.25%
	Female	39	9.75%
	Total	400	100%

Question 32	Age of the firm's owner	Frequency	Percentage
	20 up to 25	7	1.75%
	25 up to 30	53	13.25%
	30 up to 35	47	11.75%
	35 up to 40	77	19.25%
	40 up to 45	59	14.75%
	45 up to 50	54	13.50%
	50 up to 55	32	8.00%
	55 up to 60	36	9.00%
	60 up to 65	20	5.00%
	65 up to 70	15	3.75%
	total	400	100%

Question 32	Mean age of the firm's owner	Minimum	Maximum
	42	22	68

Question 33	Marital status	Frequency	Percentage
	Single	62	15.50%
	Married	328	82.00%
	Divorced	7	1.75%
	Widow/er	3	0.75%
	Total	400	100%

Question 34	Highest formal education	Frequency	Percentage
	Secondary school	22	5.50%
	High school	99	24.75%
	University	209	52.25%
	Master	65	16.25%
	Ph.D	5	1.25%
	Total	400	100%

Question 35	Number of employees	Frequency	Percentage
	2 up to 10	175	43.75%
	10 up to 18	182	45.50%
	18 up to 26	84	8.50%
	26 up to 34	4	1.00%
	34 up to 42	1	0.25%
	42 up to 50	1	0.25%
	50 up to 58	1	0.25%
	58 up to 66	1	0.25%
	66 up to 74	1	0.25%
	Total	400	100%

Question 35	Mean number of employees	Minimum	Maximum
	11	2	72

Question 36	Yearly income ($)	Frequency	Percentage
	80,000 up to 420,000	41	10.25%
	420,000 up to 760,000	64	16.00%
	760,000 up to 1,100,000	59	14.75%
	1,100,000 up to 1,440,000	62	15.50%
	1,440,000 up to 1,780,000	71	17.75%

	1,780,000 up to 2,120,000	56	14.00%
	2,120,000 up to 2,460,000	27	6.75%
	2,460,000 up to 2,800,000	2	0.50%
	2,800,000 up to 3,140,000	4	1.00%
	More than 3,140,000	14	3.50%
	Total	400	100%

Question 36	Mean of yearly income ($)	Minimum ($)	Maximum ($)
	1,502,650	80,000	21,428,571

Question 37	Firm's sector	Frequency	Percentage
	Production	14	3.50%
	Service	105	26.25%
	Trade	221	55.25%
	Service and trade	48	12.00%
	Production ad trade	12	3.00%
	Total	400	100%

Question 38	Having international trade	Frequency	Percentage
	Yes	329	82.25%
	No	71	17.75%
	Total	400	100%

Question 39	Firm's level of imports (percent of input)	Frequency	Percentage
	Less than 15%	52	15.81%
	15% up to 25%	134	40.73%
	25% up to 35%	102	31.00%
	35% up to 45%	29	8.81%
	45% up to 55%	5	1.52%
	More than 55%	7	2.13%
	Total	329	100%

Question 40	Firm's level of exports (percent of sale)	Frequency	Percentage
	Less than 15%	59	17.93%
	15% up to 25%	86	26.14%
	25% up to 35%	113	34.35%
	35% up to 45%	36	10.94%
	45% up to 55%	28	8.51%
	More than 55%	7	2.13%
	Total	329	100%

Table 6.1: Descriptive Results of the Sample

ver	Number of respondents	Service	CSet1	CSet2	CSet3	CSet4	CSet5	CSet6	CSet7	CSet8	Total	Total CSet
1	100	1	90	0	88	88	0	3	1	86	356	800
		2	0	90	2	2	90	87	89	5	365	
		3	10	10	10	10	10	10	10	9	79	
2	100	1	83	84	3	3	85	87	6	85	436	800
		2	8	6	87	86	4	2	83	4	280	
		3	9	10	10	11	11	11	11	11	84	
3	100	1	89	2	90	89	90	1	2	1	364	800
		2	2	89	1	2	1	90	89	90	364	
		3	9	9	9	9	9	9	9	9	72	
4	100	1	1	3	92	92	90	90	92	92	552	800
		2	92	90	1	1	3	3	1	1	192	
		3	7	7	7	7	7	7	7	7	56	
TOTAL	400		400	400	400	400	400	400	400	400	3200	3200

SERVICE	CSet1	CSet2	CSet3	CSet4	CSet5	CSet6	CSet7	CSet8	Total	%
1	263	89	273	272	265	181	101	264	1708	53.4%
2	102	275	91	91	98	182	262	100	1201	37.5%
3	35	36	36	37	37	37	37	36	291	9.1%
TOTAL	400	400	400	400	400	400	400	400	3200	100%

Survey Questionnaire

Estimating willingness to pay for online banking services using by Small and Medium-sized Enterprises in UAE Free Zones

This confidential survey is designed to determine your perception of traditional versus online banking services that your company is receiving from its banks. Only summary measures and conclusions from this survey will be reported. No response from a single company will be reported. Your participation in this survey is greatly appreciated.

Part I) Account information

1. Do you have a bank account opened in the name of your company?

   1) Yes ☐ 2) No ☐

2. What type of a bank account does your company have?
   1) Saving account ☐ 2) Current account ☐ 3)Both ☐ 4) None ☐

3. How many banks do you work with currently? ----------

4. Do you use online banking service for any financial/ banking transactions of your company?

   1) Yes ☐ 2) No ☐

Part II) Current banking services

5. Where do you typically (most often) make the following transactions and how long do they take?

	Type of Transactions	At The Bank Branch	Automatic Teller Machine	Through Internet Banking	At the exchange office	Do not make the transaction
1	Information inquiries(balance					
2	Money transfers					
3	Foreign exchange					
4	Payments					
5	Any other periodic					

6. How long do they take if you perform the following transactions inside the bank?

Type of Transactions		Time spending	Do not know
1	Information inquiries(balance statement)		
2	Money transfers (EFT)		
3	Foreign exchange buy/sell		
4	Payments		
5	Any other periodic payment		

7. How often do you make the following transactions?

Type of Financial Transactions		Daily once	Daily Several times	Weekly once	Weekly Several times	Monthly once	Monthly Several times	Occasionally less than once a month	Do not have
1	Information inquires (balance								
2	Money transfers (EFT)								
3	Foreign exchange buy/sell								
4	Payments								
5	Any other periodical								

8. At what time of day is it most convenient to perform your transactions?

   1) Between 6am and 9am ☐ 2) During working hours (8am to 5 pm) ☐

   3) Between 6pm and 9pm ☐ 4) Between 9pm and 6am next morning ☐

   5) Anytime ☐

9. How long does it take (on average) to get to the company's bank branch? …….

10. To have a traditional bank account (not online banking) for your company, how much should you pay monthly in terms of Arab Emirates Dirham?

11. To have an online banking account for your company, how much should you pay monthly in terms of Arab Emirates Dirham? _____

12. How much do the following transactions cost if you make them through online banking or traditional bank branch? _____

Type of Transactions		Charges If Completed At The Bank Branch	Charges If Completed Through Internet Banking
1	Information inquiries(balance statement)		
2	Money transfers (EFT)		
3	Foreign exchange buy/sell		
4	Payments		
5	Any other periodical payment		

13. On the scale of 1 t 5 (low to high), how would you rate the banking services available through:

Type of banking	**Rating Scale**				
	1	**2**	**3**	**4**	**5**
Your company's bank branch					
Your company's online banking					

14. Who makes the transactions through a bank branch?
    1)I make them by myself ☐ 2)We have a specific employee to do them ☐
    3) we call a specific person at the bank branch to do them ☐
    4) Others ☐

15. If there is a specific employee to go to Bank branch, how much does it cost per month to hire this person to complete the banking activity?

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16. How do you get to the bank branch?
    1) By public transportation ☐ 2) By company's vehicle ☐ 3) Others ☐

17. How much does it cost to get to the bank branch (e.g. for public transportation the fare which you pay)?

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18. On the scale of 1to 5, 1 being the lowest and 5 being the highest, how would you rate the following benefits of internet banking?

Benefits	**Rating Scale**				
	1	**2**	**3**	**4**	**5**
Available 7 days and 24 hours					
I can access from anywhere					
It provides time savings					
The transactions have low or no					
Easy to use					
The services are reliable					
The services are secure					
The transactions are done quickly					
I can get instant feedback for my					

19. On the scale of 1to 5, 1 being the lowest and 5 being the highest, how would you rate the security of traditional banki

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Part III) Willingness to pay for CashPro Online Quick Reference Card

CashPro Online is a worldwide client access channel designed to deliver the global power of the Bank through one portal and one password. The portal allows you to monitor your treasury management services, manage payments, receipts, and treasury

and trade activities. CashPro online's benefits and features: CashPro provides alert notifications (for example when credit card balances need to be paid when bank statements can be downloaded) for your accounts anytime, anywhere and virtually any way (including e-mail, fax, text or voice). It offers multiple layers of security at entry. Single login page and URL, More payments power, Beneficiary advising will notify recipients when a payment you are sending via a wire transfer is coming, Enhanced analytics: The global Information Reporting module provides analytical tools that help clients demystify the data, Commercial Credit enables many clients (depending on the details of their lending arrangement) to obtain loan balances, process payments and principal advances, view billing and bill-not-paid statements and transaction histories. CashPro Accelerate enables clients to calculate and analyze their daily cash positions faster and more accurately by transferring account information directly into their custom Excel spreadsheets with automatic data feeds.

20. Would you choose CashPro Online Quick Reference Card? .....

21. Yes, if its monthly charge were…..... (please choose **two amounts** which show your minimum and maximum willingness to pay for that)

put a tick next to the highest amount you are sure that you would pay and a cross next to the first amount that you are sure that you would not pay	**Monthly charge**		
	1	Less 660 AED	
	2	660 AED	
	3	880 AED	
	4	1100 AED	
	5	1320 AED	
	6	1540 AED	

Security key device. Each transaction has a unique pin code given by the personal security key device. 	7	1760 AED	
	8	1980 AED	
	9	2200 AED	
	10	More than 2200 AED	

If you chose not to go for the CashPro Online Quick Card please go to the next question of this part, otherwise, go to part IV.

22. What are the reasons for not going for this Card? Please elaborate.

Part IV) willingness to pay for improved banking services

We will now ask some questions regarding your company's willingness to have improved banking services. Your banking services will be defined by the following characteristics and the levels each characteristic may take:

1- ***Travel time***: This refers to the time which it takes you to get to your bank.

2- ***Waiting at the bank***: This shows if you need to wait in line to make your transactions

3- ***24/7 accessible***: This shows if you have access to the bank anytime.

4- ***Highly secure***: This shows whether your transactions are made in the high secure area.

5- ***Change in monthly charge***: This refers to the percent change in your bank account monthly charge.

In order to provide improved banking services, the bank has tomakea major capital investment and cover the maintenance cost of the new project. The level of investment and maintenance costs required to provide a service depends on the levels chosen for each of the attributes defined above. The bank will pay for this investment and maintenance costs by collecting money from the banking services users.

There are 8 choice sets. In each choice set, you will be presented with two banking services alternatives, Service 1 and Service 2. For each alternative, the travel time, waiting at the bank, 24/7 accessibility, high security, and percentage change in monthly charge are stated. These characteristics are identical throughout the choice sets however their levels will change. Please for each choice set, state which alternative you think is the best for your company (Service 1 or Service 1) by check the bracket under the column of the service.

23. Choice set number 1

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	20 min	10 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	Yes	No	
24/7 accessible	Yes	No	
Highly secure	Yes	No	
Percentage change in the monthly charge	10% more	15% more	
Your choice	[ ]	[ ]	[ ]

24. Choice set number 2

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	0 min	30 min	Neither Service 1

Waiting at bank	Yes	No	nor Service 2: I prefer to stay with my current service
24/7 accessible	No	Yes	
Highly secure	Yes	No	
Percentage change in monthly charge	20% more	5% more	
Your choice	[ ]	[ ]	[ ]

25. Choice set number 3

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	0 min	30 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	No	Yes	
24/7 accessible	No	Yes	
Highly secure	No	Yes	
Percentage change in the monthly charge	5% more	20% more	
Your choice	[ ]	[ ]	[ ]

26. Choice set number 4

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	30 min	0 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	Yes	No	
24/7 accessible	No	Yes	
Highly secure	No	Yes	
Percentage change in monthly charge	5% more	20% more	
Your choice	[ ]	[ ]	[ ]

27. Choice set Number 5

Attributes	*Service 1*	*Service 2*	*Current Service*

Travel time	30 min	0 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	No	Yes	
24/7 accessible	No	Yes	
Highly secure	Yes	No	
Percentage change in the monthly charge	15% more	10% more	
Your choice	[ ]	[ ]	[ ]

28. Choice set Number 6

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	10 min	20 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	No	Yes	
24/7 accessible	Yes	No	
Highly secure	Yes	No	
Percentage change in the monthly charge	20% more	5% more	
Your choice	[ ]	[ ]	[ ]

29. Choice set Number 7

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	20 min	10 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	No	Yes	
24/7 accessible	Yes	No	
Highly secure	No	Yes	
Percentage change in monthly charge	15% more	10% more	
Your choice	[ ]	[ ]	[ ]

30. Choice set Number 8

Attributes	*Service 1*	*Service 2*	*Current Service*
Travel time	10 min	20 min	Neither Service 1 nor Service 2: I prefer to stay with my current service
Waiting at bank	Yes	No	
24/7 accessible	Yes	No	
Highly secure	No	Yes	
Percentage change in monthly charge	20% more	5% more	
Your choice	[ ]	[ ]	[ ]

31. What are the reasons for preferring to stay with your current service? Please specify. ----------
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Part V) Demographic Information

32. Sex(gender) of owner : 1) Male ☐ 2) Female ☐

33. Age of the owner: ----------

34. Marital status of the owner :

    1) Single ☐ 2) Married ☐ 3) Divorced ☐ 4) Widow/er ☐

35. The highest education level of the owner of the enterprise:

    1) Primary☐ 2) Secondary ☐ 3) High school ☐

    4) University☐ 5) Master degree ☐ 6) PhD ☐

36. The number of employees in the company: ----------

37. Your Company's annual revenue (AED): ----------

38. The sector in which the enterprise operates:

    1) Production ☐ 2) Service ☐ 3) Trade ☐ 4) Agriculture ☐ 5) Other ☐

39. Do you have business transactions abroad (buying/selling from/to other countries)?

    1)Yes ☐ 2) No ☐

40. What proportions of your inputs do you buy(in terms of value)from other countries?

    1)Less than15% ☐ 2) 15-25% ☐ 3)25-35% ☐ 4)35-45% ☐

    5)45-55% ☐ 6) More than 55% ☐

41. What proportions of your sales do make to customers in other countries?

1)Less than15% ☐ 2) 15-25% ☐ 3)25-35% ☐ 4)35-45% ☐

5)45-55% ☐ 6) More than 55% ☐