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**FACTORS THAT
INFLUENCE THE USE
OF MOBILE BANKING
IN LEBANON:
INTEGRATION OF
UTAUT2 AND 3M
MODEL**

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FACTORS THAT INFLUENCE THE USE OF MOBILE BANKING IN LEBANON: INTEGRATION OF UTAUT2 AND 3M MODEL

Dña. Maria De La Concepcion Varela Neira

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Que la presente tesis, corresponde con el trabajo realizado por D. Ashraf Hilal, bajo mi dirección, y autorizo su presentación, considerando que reúne los requisitos exigidos en el Reglamento de Estudios de Doctorado de la USC, y que como director de ésta no incurre en las causas de abstención establecidas en Ley 40/2015.

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DEDICATION

I humbly dedicate this thesis to my adorable mother Nada Slim, to my beloved father Faisal Hilal, and to my special brother Nour Hilal for their endless love, inspiration and support.

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RESUMO

A banca móbil (M-banking) é un servizo remoto ofrecido polas institucións financeiras que permite aos clientes acceder a servizos bancarios mediante o uso dun dispositivo móbil (por exemplo, teléfono, tableta, etc.) en calquera momento e en calquera lugar. Por tanto, a banca móbil comercialízase como un servizo útil e innovador que os bancos ofrecen aos seus consumidores para mellorar a súa satisfacción e lealdade.

Con todo, nos países en desenvolvemento, a aceptación e o uso da tecnoloxía de banca móbil segue sendo deficiente. Por tanto, o estudo actual propón un modelo conceptual que trata de explicar os factores que inflúen no uso da banca móbil desde a perspectiva do consumidor. A base deste marco é a integración do modelo 3M de motivación e personalidade e a teoría unificada e estendida de aceptación e uso da tecnoloxía dúas (UTAUT2). Para a súa análise desenvolveuse un cuestionario autoadministrado co que se obtiveron datos dunha mostra non aleatoria de clientes bancarios libaneses. Logo empregouse un modelo de ecuacións estruturais (SEM) para analizar os datos recompilados, utilizando EQS 6.1 para Windows e Stata 14.0.

Os resultados obtidos apoian vínculos entre os trazos de personalidade, os factores motivacionais e o comportamento de uso. Especificamente, o uso da banca móbil polos individuos libaneses está significativamente influenciado pola expectativa de esforzo, as condicións facilitadoras, a motivación hedónica, a necesidade de cognición, a necesidade de estrutura, a necesidade de afiliación, a personalidade proactiva, a inestabilidade emocional e a amabilidade. Con todo, a expectativa de rendemento, a influencia social, a autoeficacia xeral, a extraversión, a responsabilidade e a apertura á experiencia non tiveron un impacto significativo no comportamento de uso.

O exame dos factores que inflúen no uso da banca móbil, especialmente no Líbano, fai importantes contribucións á literatura e a práctica. Así, o presente estudo amplía o modelo teórico de UTAUT2 incorporando variables de personalidade. Máis en concreto, destaca a importancia dos aspectos psicolóxicos na predición do comportamento de aceptación da tecnoloxía. Por último, é un intento de proporcionar pautas para estratexias de mercadotecnia efectivas que melloren as taxas de uso da banca móbil no Líbano.

PALABRAS CRAVES

Banca móbil, UTAUT2, Modelo 3M, Comportamento de Uso, Líbano

RESUMEN

La banca móvil (M-banking) es un servicio remoto ofrecido por las instituciones financieras que permite a los clientes acceder a servicios bancarios mediante el uso de un dispositivo móvil (por ejemplo, teléfono, tableta, etc.) en cualquier momento y en cualquier lugar. Por lo tanto, la banca móvil se comercializa como un servicio útil e innovador que los bancos ofrecen a sus consumidores para mejorar su satisfacción y lealtad.

Sin embargo, en los países en desarrollo, la aceptación y el uso de la tecnología de banca móvil sigue siendo deficiente. Por lo tanto, el estudio actual propone un modelo conceptual que trata de explicar los factores que influyen en el uso de la banca móvil desde la perspectiva del consumidor. La base de este marco es la integración del modelo 3M de motivación y personalidad y la teoría unificada y extendida de aceptación y uso de la tecnología dos (UTAUT2). Para su análisis se desarrolló un cuestionario auto administrado con el que se obtuvieron datos de una muestra no aleatoria de clientes bancarios libaneses. Luego se empleó un modelo de ecuaciones estructurales (SEM) para analizar los datos recopilados, utilizando EQS 6.1 para Windows y Stata 14.0.

Los resultados obtenidos apoyan vínculos entre los rasgos de personalidad, los factores motivacionales y el comportamiento de uso. Específicamente, el uso de la banca móvil por los individuos libaneses está significativamente influenciado por la expectativa de esfuerzo, las condiciones facilitadoras, la motivación hedónica, la necesidad de cognición, la necesidad de estructura, la necesidad de afiliación, la personalidad proactiva, la inestabilidad emocional y la amabilidad. Sin embargo, la expectativa de rendimiento, la influencia social, la autoeficacia general, la extraversión, la responsabilidad y la apertura a la experiencia no tuvieron un impacto significativo en el comportamiento de uso.

El examen de los factores que influyen en el uso de la banca móvil, especialmente en el Líbano, hace importantes contribuciones a la literatura y la práctica. Así, el presente estudio amplía el modelo teórico de UTAUT2 incorporando constructos de personalidad. Más en concreto, destaca la importancia de los aspectos psicológicos en la predicción del comportamiento de aceptación de la tecnología. Por último, es un intento de proporcionar pautas para estrategias de marketing efectivas que mejoren las tasas de uso de la banca móvil en el Líbano.

PALABRAS CLAVES

M-Banking, UTAUT2, 3M Modelo, Comportamiento de Uso, Líbano

ABSTRACT

Mobile banking (M-banking) is a remote service offered by financial institutions that enables customers to access banking services by the use of mobile devices (e.g. phone, tablet, etc.) at any time and in any place. Hence, mobile banking has been marketed as a useful and innovative service that banks offer to their consumers to improve their satisfaction and loyalty.

However, in developing countries, acceptance and use of mobile banking technology is still poor. Thus, the current study proposed a conceptual model that tries to explain the factors that influence the use of mobile banking from a customer perspective. The basis for this framework is the integration of the 3M model of motivation and personality and the extended unified theory of acceptance and use of technology two (UTAUT2). For its analysis, a self-administrated questionnaire was developed with which data was obtained from a non-random sample of Lebanese banking customers. Structural equation modelling (SEM) was then employed to analyse the data collected, using EQS 6.1 for windows and Stata 14.0.

The results obtained supported links among personality traits, motivational factors and use behaviour. Specifically, Lebanese individuals' mobile banking use was significantly influenced by effort expectancy, facilitating conditions, hedonic motivation, need for cognition, need for structure, need for affiliation, proactive personality, neuroticism, and agreeableness. However, performance expectancy, social influence, general self-efficacy, extraversion, conscientiousness, and openness to experience did not have a significant impact on use behaviour.

Examining factors that influence the use of mobile banking especially in Lebanon makes important contributions to literature and practice. The current study extends the theoretical model of UTAUT2 by incorporating personality constructs. More in particular, it highlights the importance of psychological aspects in predicting technology acceptance behaviour. Lastly, it is an attempt to provide guidelines for effective marketing strategies that enhance mobile banking usage rates in Lebanon.

KEYWORDS

M-Banking, UTAUT2, 3M Model, Use Behaviour, Lebanon

RESUMEN AMPLIADO

Los teléfonos móviles y la tecnología móvil han sido testigos de una gran revolución. La penetración móvil ha crecido rápidamente. En 2016, se estimaba que el 62.9 por ciento de la población mundial ya poseía un teléfono móvil (Statista, 2017). Para 2017, se pronosticó que el número de usuarios de teléfonos móviles alcanzaría los 4.770 millones y se espera que en 2019 la cantidad de usuarios de teléfonos móviles en el mundo supere la marca de los cinco mil millones (Statista, 2018).

A medida que los dispositivos móviles comenzaron a acceder a Internet en cualquier momento y en cualquier lugar, el comercio móvil comenzó a aumentar (Huang & Wang, 2007). En realidad, el término comercio móvil resume cualquier forma de interacción con los clientes a través de dispositivos móviles. Actualmente, muchos servicios financieros dependen de las tecnologías de telecomunicaciones móviles. Estos servicios financieros móviles se dividen en dos categorías principales: pagos móviles y banca móvil (Georgi & Pinkl, 2005). Esta Tesis Doctoral se centra en la segunda clase de los servicios financieros móviles, en otras palabras, en la banca móvil.

La banca móvil es diferente de los pagos móviles, que implican el uso de un dispositivo móvil para pagar bienes o servicios en el punto de venta o de forma remota, de manera similar al uso de una tarjeta de débito o crédito para realizar un pago EFTPOS (Chandran, 2014). Por su parte, la banca móvil se considera como un "producto o servicio ofrecido por un banco o instituto de micro finanzas (modelo dirigido por el banco) o MNO (modelo no bancario) para realizar transacciones financieras y no financieras utilizando un dispositivo móvil, a saber un teléfono móvil, teléfono inteligente o tableta" (Shaikh & Karjaluoto, 2015, p. 131) o como un servicio remoto (a través de teléfono móvil, PDA, tabletas, etc.) que ofrecen las entidades financieras para satisfacer las necesidades de sus clientes (Leivaa, Climentb, & Cabanillasa, 2017).

Aun así, la banca móvil ha traído varias ventajas no solo a la economía, sino también a las instituciones financieras (Cognizant, 2013)

De ahí que la banca móvil se haya comercializado como un servicio útil e innovador que los consumidores reciben de sus bancos.

Según la investigación de Juniper (2015), el número de usuarios de banca móvil global fue de 800 millones a fines de 2014, estimándose una base global de 1.800 millones de usuarios de banca móvil en 2019. Sin embargo, existen grandes diferencias en las tasas de adopción de la banca móvil en los mercados globales. En general, el uso de la banca móvil en Australia, los Países Bajos, Suecia y los EE. UU, se aproxima a la mitad de todos los adultos en línea, mientras que Canadá (30%), el Reino Unido (25%) y Alemania (19%) están rezagados (Hostis & Wannemacher, 2015).

Investigaciones recientes han demostrado una mayor tasa de crecimiento en la adopción de la banca móvil en los países en desarrollo en comparación con los desarrollados. Esto se debe a la demora en la adopción inicial en los países en desarrollo (Futur Foundation, 2010). De hecho, se han encontrado tasas récord de adopción de banca móvil del 60% al 70% en los países en desarrollo (por ejemplo, India, Líbano, Pakistán, etc.) y no en los países desarrollados (por ejemplo, Canadá, Reino Unido, EE. UU., etc.) (Juniper, 2015).

Con respecto a Líbano, se estima que en 2016 sólo el 7% de los bancos libaneses (5 de 65) en 2016 no ofrecían servicios de banca digital en el Líbano (Blominvest Bank S.A.L., 2016). Sin embargo, lo que resulta importante es cuántos clientes están dispuestos a usar esta banca. Según el informe Arabnet (2016), sobre la adopción de la banca digital en Oriente Medio, el 75% de los clientes bancarios en el Líbano afirmaron visitar sus sucursales regularmente. Además, el mismo estudio mostró que del 54% de los adoptantes de banca digital en Líbano solo el 10% considera usar de modo único canales bancarios en línea para realizar sus actividades bancarias, y solo el 6% considera usar solo el canal de banca móvil (Arabnet, 2016). También se encontró que el 31% de los clientes de bancos libaneses nunca han utilizado ningún tipo de banca digital, incluida la banca móvil. Estos datos son indicativos de las bajas tasas de adopción y uso de la banca móvil en el Líbano (Domat, 2017).

Ante la realidad indicada, el objetivo principal de esta investigación es identificar y examinar los factores clave que predicen el uso de la tecnología de banca móvil en la población de Líbano. Más concretamente, se pueden establecer los siguientes objetivos específicos:

- Identificar lagunas de investigación y formular una mejor comprensión sobre la adopción y uso de la banca móvil por libaneses en base a literatura previa.
- Formular un modelo conceptual claro y proponer hipótesis sobre el uso de la tecnología de banca móvil en el Líbano.
- Analizar empíricamente la validez y confiabilidad de los constructos utilizados en el modelo conceptual propuesto.
- Examinar empíricamente las hipótesis del modelo para identificar los factores que influyen en los individuos libaneses para usar la banca móvil en el Líbano.
- Proponer las implicaciones teórico y practicas derivadas de los resultados del estudio.

Para comprender los determinantes de la adopción y el uso de nuevas tecnologías en los últimos años se han aplicado diversas perspectivas teóricas. Esta Tesis Doctoral revisa de modo exhaustivo y críticamente la literatura relacionada con la tecnología de banca móvil, a fin de identificar los gaps de investigación y adquirir una mejor comprensión sobre el uso, o no uso, de la banca móvil en Líbano.

Los factores que pueden influir en la intención o el comportamiento de adopción de las nuevas tecnologías pueden variar desde un contexto organizacional hasta un contexto del consumidor. Esto significa que para una mejor aplicabilidad en un contexto centrado en el cliente, es esencial aplicar un marco teórico apropiado para este contexto (Venkatesh, Thong, & Xu, 2012).

En el nivel teórico, se han formulado varias teorías y modelos para comprender los factores que influyen en las intenciones y los

comportamientos de los individuos con respecto a las nuevas tecnologías (en este caso, la banca móvil),

- Teoría de la difusión de innovaciones (DIT) (Rogers, 1962)
- Teoría de la acción razonada (TRA) (Fishbein & Ajzen, 1975)
- Teoría del comportamiento planificado (TPB) (Ajzen, 1985)
- Modelo de aceptación de tecnología (TAM) (Davis, Bagozzi, & Warshaw, 1989)
- Teoría del comportamiento planificado descompuesto (DTPB) (Taylor & Todd, 1995)
- Teoría unificada de tecnología de aceptación y uso (UTAUT) (Venkatesh, Davis, Morris, & Davis, 2003)
- Teoría unificada de tecnología de aceptación y uso dos (UTAUT2) (Venkatesh, Thong, & Xu, 2012).

El modelo UTAUT2, es el marco teórico más desarrollado para explicar los factores que influyen en el uso de la banca móvil desde la perspectiva del cliente.

Hay algunos estudios que examinan la intención y el uso de los clientes individuales de la banca móvil en Líbano (Audi et al., 2016; Sujud & Hashem, 2017). Estos estudios proporcionan una comprensión inicial de los factores que influyen en las intenciones de utilizar la banca móvil, pero no se examinan los factores de personalidad de los clientes que influyen en el comportamiento real del uso de la banca móvil. Sin embargo, las investigaciones psicológicas han establecido que los comportamientos individuales están influidos por los rasgos de personalidad que dan forma a estos comportamientos (Costa & McCrae, 1992). Los rasgos de personalidad tienen un efecto importante en el comportamiento personal, de modo que las actitudes, creencias, cogniciones y comportamientos de las personas están en parte determinados por su personalidad (Aldemir & Bayraktaroğlu, 2004).

Esta Tesis Doctoral trata de cubrir este gap conectando las teorías de adopción y uso de nuevas tecnologías y el "Modelo Meta-teórico de la Motivación" o el modelo 3M de personalidad y motivación (Mowen, 2000). Este modelo asume un enfoque jerárquico de los rasgos de personalidad e ilustra su influencia sobre el comportamiento real.

El modelo 3M es el modelo más completo, preciso y parsimonioso de clasificación de los rasgos de personalidad. El modelo de 3M considera cuatro niveles principales: rasgos elementales / cardinales, rasgos centrales / compuestos, rasgos situacionales y rasgos superficiales (Mowen, 2000).

Por lo tanto, esta Tesis Doctoral argumenta que

- Los rasgos elementales, los rasgos compuestos y los antecedentes del uso de nuevas tecnologías considerados en UTAUT2 tienen el potencial de motivar directamente el uso de la banca móvil.
- Los rasgos elementales y los rasgos compuestos tienen el potencial de influir directamente en los antecedentes de adopción y uso de banca móvil considerado en UTAUT2.
- Los rasgos elementales son antecedentes directos de los rasgos compuestos.

A nivel metodológico, esta Tesis Doctoral emplea un enfoque cuantitativo para lograr las metas y los objetivos del estudio. De hecho, los datos para el estudio actual provienen de un cuestionario auto-administrado realizado en un estudio de campo.

Fowler (2002) recomienda que los investigadores deben abordar las tres partes que conforman el enfoque de investigación por encuesta: muestreo, cuestionario y mecanismo de recogida de datos.

La población considerada está formada por individuos libaneses (mayores de 18 años, con un teléfono inteligente y una cuenta bancaria) que residen en la capital de Líbano, "Beirut". La muestra utilizada está

formada por 625 individuos de los cuales 309 eran usuarios de banca móvil y 316 no usuarios de banca móvil.

Para recopilar los datos requeridos de los clientes bancarios libaneses que poseen teléfonos inteligentes y para obtener una cantidad adecuada de datos cuantitativos, el cuestionario auto-administrado se consideró como el mejor instrumento de recopilación de datos.

Utilizando el cuestionario auto-administrado, todos los constructos integrados en el modelo conceptual (variables dependientes e independientes) fueron medidos por un total de noventa y ocho (98) ítems pertenecientes a escalas académicas derivadas de la literatura. En particular, la expectativa de rendimiento (PE): 4 ítems; expectativa de esfuerzo (EE): 4 ítems; influencia social (SI): 3 ítems; condiciones facilitadoras (FC): 4 ítems; motivación hedónica (HM): 3 ítems; personalidad proactiva (PP): 10 ítems; autoeficacia general (GSE): 3 ítems; necesidad de afiliación (NFA): 5 ítems; necesidad de estructura (NFS): 12 ítems; necesidad de cognición (NFG): 5 ítems; apertura a la experiencia (OE): 10 ítems; extraversión, (EX): 8 ítems; responsabilidad (CON): 9 ítems; amabilidad (AG): 9 ítems; inestabilidad emocional (NE): 8 ítems; y comportamiento de uso (UB): 1 ítem. Por otro lado, para los usuarios de la banca móvil, el cuestionario incluía elementos para medir la intensidad del uso de la banca móvil (medida por las actividades realizadas al usar la banca móvil), el hábito, utilizado en UTAUT2, y la antigüedad empleando la banca móvil. Los ítems se tradujeron al árabe.

La identificación de cómo se cargan las variables observadas en los constructos fundamentales no observados (latentes) es la función central de los modelos de medición (Byrne, 2010). Arbuckle (2005) mencionó que para que los académicos expliquen las conexiones unificadas entre las variables observadas (variables indicadoras) y las variables no observadas (variables compuestas) se deben aplicar modelos de medición.

La medición y validación de los constructos se realizó mediante el análisis de modelado de ecuaciones estructurales SEM utilizando los programas de software estadístico EQS 6.1 y STATA 14. Para evaluar la

fiabilidad y la validez de los constructos en el estudio actual se analizaron el alfa de Cronbach, la fiabilidad compuesta, la varianza media extraída, la validez discriminante y la validez convergente

Dado que el estudio actual involucra un grupo bastante grande de constructos, cada uno con varios ítems, y muchas hipótesis, el análisis agregado de todas ellas no fue posible. Por lo tanto, el investigador dividió el modelo en dos sub-modelos separados. El primer sub-modelo incorpora los cinco rasgos elementales y los rasgos de personalidad compuestos, mientras que el segundo sub-modelo incluye los rasgos de personalidad compuestos y los constructos UTAUT2.

Por lo tanto, se analizaron por separado dos modelos de medición, lo que implica que el Alpha de Cronbach, la fiabilidad compuesta, la varianza media extraída, la validez discriminante, la validez convergente y el ajuste del modelo se examinaron por separado para cada submodelo.

Los resultados demostraron una significación insuficiente en el nivel de fiabilidad de los constructos, validez y ajuste para ambas partes del modelo de investigación (sub-modelo 1 y sub-modelo 2). Por lo tanto, y después de un análisis exhaustivo, se procedió a eliminar algunos elementos y a crear un factor de segundo orden para mejorar el ajuste del modelo.

Así, algunos ítems con cargas de factoriales insuficientes fueron descartados. Además, un constructo se transformó en un factor de segundo orden. La personalidad proactiva, en línea con la literatura previa, incorporó dos dimensiones diferentes. Después de las modificaciones, los resultados de ambos sub-modelos estuvieron por encima de los puntos de corte, lo que indica la fiabilidad y validez del modelo de investigación actual.

El análisis del modelo estructural es la siguiente etapa, donde el modelo e hipótesis de investigación sugeridos anteriormente deben ser validados. En otras palabras, esta etapa es donde se verifican las hipótesis de investigación propuestas, abordando los patrones y grado de relación entre los constructos.

Por lo tanto, para analizar las hipótesis propuestas, se probaron dos modelos en SEM. El primer sub-modelo comprobaba el efecto de todos los antecedentes sobre el uso de banca móvil. Teniendo en cuenta la naturaleza binaria del uso de banca móvil, se aplicó un Modelo de Ecuaciones Estructurales Generalizadas (GSEM) utilizando una estimación "probit" con el programa Stata 14.0 para evaluar el impacto de todas las variables sobre el uso.

El segundo sub-modelo analizaba los efectos de los rasgos elementales y los rasgos compuestos sobre los factores motivacionales recogidos en UTAUT2, así como los efectos de los rasgos elementales sobre los rasgos compuestos. Debido a la longitud de este segundo sub-modelo, para presentar sus resultados, estos se han dividido en dos tablas, una que muestra los efectos sobre las variables motivacionales (UTAUT2) y la segunda que muestra los efectos sobre los rasgos compuestos.

Los resultados indican que el uso de la banca móvil no solo está influenciado por los factores motivacionales recogidos en el modelo UTAUT2. Los rasgos de personalidad elemental y los rasgos de personalidad compuestos también son importantes en la determinación del comportamiento de uso. De hecho, los resultados revelaron que la expectativa de esfuerzo, las condiciones facilitadoras, la motivación hedónica, la necesidad de cognición, la necesidad de estructura, la personalidad proactiva, la necesidad de afiliación, la inestabilidad emocional y la amabilidad son predictores del uso de la banca móvil en el Líbano. Mientras que la expectativa de rendimiento, la influencia social, la autoeficacia general, la extraversión, la apertura a la experiencia y la responsabilidad no tuvieron un impacto significativo sobre el uso de la banca móvil en el Líbano.

A pesar de sus contribuciones, como mostrar la importancia de personalidad en la predicción del comportamiento, esta Tesis Doctoral presenta diferentes aspectos que limitan el alcance de los resultados. Tales limitaciones se asocian a la generalización del estudio, por centrarse en una región específica con características culturales

particulares y por analizar una tecnología concreta y carecer de financiación para la realización de la misma.

Por lo tanto, sería interesante llevar a cabo futuras investigaciones que superen las limitaciones mencionadas anteriormente. Por lo tanto, el mismo modelo se puede aplicar a otros mercados y con más participantes en la muestra. Además, se pueden realizar investigaciones sobre los constructos no significativos del estudio actual. Asimismo, estudios futuros pueden abordar la intensidad del uso de la banca móvil en lugar de solo si se usa o no.

EXTENDED SUMMARY

Mobile phones and mobile technology have witnessed a great revolution. Mobile penetration has grown rapidly. In 2016, it was estimated that 62.9 percent of the world's population already had a mobile phone (Statista, 2017). For 2017, it was predicted that the number of mobile phone users would reach 4,770 million and it is expected that in 2019 the number of mobile phone users in the world will exceed the five billion mark (Statista, 2018).

As mobile devices began to access the Internet anytime and anywhere, mobile commerce began to increase (Huang & Wang, 2007). In fact, the term mobile commerce summarizes any form of interaction with customers through mobile devices. Currently, many financial services depend on mobile telecommunications technologies. These mobile financial services are divided into two main categories: mobile payments and mobile banking (Georgi & Pinkl, 2005). This Doctoral Thesis focuses on the second class of mobile financial services, in other words, on mobile banking.

Mobile banking is different from mobile payments, which involve the use of a mobile device to pay for goods or services at the point of sale or remotely, similar to the use of a debit or credit card to make an EFTPOS payment (Chandran, 2014). For its part, mobile banking is considered as a "product or service offered by a bank or microfinance institute (model led by the bank) or MNO (non-bank model) to perform financial and non-financial transactions using a mobile device, namely a mobile phone, smartphone or tablet " (Shaikh & Karjaluo, 2015, p. 131) or as a remote service (via mobile phone, PDA, tablets, etc.) offered by financial institutions to meet the needs of their clients (Leivaa, Climentb, & Cabanillasa, 2017).

Even so, mobile banking has brought several advantages not only to the economy, but also to financial institutions (Cognizant, 2013). Hence, mobile banking has been marketed as a useful and innovative service that consumers receive from their banks.

According to Juniper's (2015) research, the number of users of global mobile banking was 800 million at the end of 2014, estimating a global base of 1,800 million mobile banking users in 2019. However, there are large differences in adoption rates of mobile banking in global markets. In general, the use of mobile banking in Australia, the Netherlands, Sweden and the USA, approaches half of all adults online, while Canada (30%), the United Kingdom (25%) and Germany (19%) are lagging behind (Hostis & Wannemacher, 2015).

Recent research has shown a higher growth rate in the adoption of mobile banking in developing countries compared to developed ones. This is due to the delay in initial adoption in developing countries (Futur Foundation, 2010). In fact, record rates from 60% to 70% of mobile banking adoption have been found in developing countries (e.g., India, Lebanon, Pakistan, etc.) and not in developed countries (e.g., Canada, United Kingdom, USA, etc.) (Juniper, 2015).

With respect to Lebanon, it is estimated that in 2016 only 7% of Lebanese banks (5 out of 65) in 2016 did not offer digital banking services in Lebanon (Blominvest Bank S.A.L., 2016). However, what is important is how many customers are willing to use this banking service. According to the Arabnet report (2016), on the adoption of digital banking in the Middle East, 75% of banking customers in Lebanon reported visiting their branches regularly. In addition, the same study showed that of the 54% of adopters of digital banking in Lebanon, only 10% consider using only online banking channels to carry out their banking activities, and only 6% consider using only the mobile banking channel (Arabnet, 2016). It was also found that 31% of Lebanese bank clients have never used any type of digital banking, including mobile banking. These data are indicative of the low rates of adoption and use of mobile banking in Lebanon (Domat, 2017).

In view of the indicated reality, the main objective of this research is to identify and examine the key factors that predict the use of mobile banking technology in the population of Lebanon. More precisely, the following specific objectives can be established:

- To identify research gaps and formulate a better understanding of the adoption and use of mobile banking by Lebanese individuals based on previous literature.
- To formulate a clear conceptual model and propose hypotheses about the use of mobile banking technology in Lebanon.
- To empirically analyze the validity and reliability of the constructs used in the proposed conceptual model.
- To empirically examine the model's hypotheses to identify the factors that influence Lebanese individuals to use mobile banking in Lebanon.
- To propose the theoretical and practical implications derived from the results of the study.

To understand the determinants of the adoption and use of new technologies in recent years, several theoretical perspectives have been applied. This Doctoral Thesis reviews exhaustively and critically the literature related to mobile banking technology, in order to identify research gaps and gain a better understanding of the use, or non-use, of mobile banking in Lebanon.

The factors that can influence the intention to adopt or adoption behavior of new technologies can vary from an organizational context to a consumer context. This means that for a better applicability in a client-centered context, it is essential to apply a theoretical framework appropriate for this context (Venkatesh, Thong, & Xu, 2012). At the theoretical level, several theories and models have been formulated to understand the factors that influence the intentions and behaviors of individuals with respect to new technologies (in this case, mobile banking),

- Theory of diffusion of innovations (DIT) (Rogers, 1962)
- Theory of reasoned action (TRA) (Fishbein & Ajzen, 1975)
- Theory of planned behavior (TPB) (Ajzen, 1985)

- Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989)
- Theory of Defaulted Planned Behavior (DTPB) (Taylor & Todd, 1995)
- Unified Theory of Acceptance and Use Technology (UTAUT) (Venkatesh, Davis, Morris, & Davis, 2003)
- Unified theory of acceptance and use technology two (UTAUT2) (Venkatesh, Thong, & Xu, 2012).

The UTAUT2 model is the most developed theoretical framework to explain the factors that influence the use of mobile banking from the client's perspective.

There are some studies that examine the intent and use of individual customers of mobile banking in Lebanon (Audi et al., 2016; Sujud and Hashem, 2017). These studies provide an initial understanding of the factors that influence the intention to use mobile banking, but do not examine the customers' personality factors that influence the actual usage behavior. However, psychological research has established that individual behaviors are influenced by the personality traits that shape these behaviors (Costa & McCrae, 1992). Personality traits have an important effect on personal behavior, so that people's attitudes, beliefs, cognitions and behaviors are partly determined by their personality (Aldemir & Bayraktaroğlu, 2004).

This Doctoral Thesis seeks to cover this gap by connecting theories of adoption and use of new technologies and the "Meta-theoretical Model of Motivation" or the 3M model of personality and motivation (Mowen, 2000). This model assumes a hierarchical approach to personality traits and illustrates their influence on real behavior. The 3M model is the most complete, precise and parsimonious model of classification of personality traits. The 3M model considers four main levels: elemental / cardinal traits, central / compound traits, situational traits, and surface traits (Mowen, 2000).

Therefore, this Doctoral Thesis argues that:

- Elemental traits, compound traits and the antecedents of the use of new technologies considered in UTAUT2 have the potential to directly motivate the use of mobile banking.
- Elemental traits and compound traits have the potential to directly influence the antecedents of adoption and use of mobile banking considered in UTAUT2.
- Elemental traits are direct antecedents of compound traits.

At the methodological level, this Doctoral Thesis uses a quantitative approach to achieve the goals and objectives of the study. In fact, the data for the current study comes from a self-administered questionnaire conducted in a field study.

Fowler (2002) recommends that researchers should address the three parts that make up the research-by-survey approach: sampling, questionnaire, and data collection mechanism.

The population considered is made up of Lebanese individuals (over 18 years of age, with a smartphone and a bank account) residing in the capital of Lebanon, "Beirut". The sample used consists of 625 individuals of which 309 were mobile banking users and 316 non-mobile banking users.

To collect the required data from Lebanese banking customers who own smartphones and to obtain an adequate amount of quantitative data, the self-administered questionnaire was considered as the best data collection instrument.

Using the self-administered questionnaire, all the constructs integrated in the conceptual model (dependent and independent variables) were measured by a total of ninety-eight (98) items belonging to academic scales derived from the literature. In particular, performance expectancy (PE): 4 items; effort expectancy (EE): 4 items; social influence (SI): 3 events; facilitating conditions (FC): 4 items; hedonic

motivation (HM): 3 items; proactive personality (PP): 10 items; general self-efficacy (GSE): 3 items; need for affiliation (NFA): 5 items; need for structure (NFS): 12 items; need for cognition (NFG): 5 items; Openness to experience (OE): 10 items; extraversion, (EX): 8 items; conscientiousness (CON): 9 items; agreeableness (AG): 9 items; neuroticism (NE): 8 items; and usage behavior (UB): 1 item. On the other hand, for mobile banking users, the questionnaire included elements to measure the intensity of the use of mobile banking (measured by the activities performed when using mobile banking), habit, used in UTAUT2, and seniority using mobile banking. The items were translated into Arabic.

The identification of how the observed variables are loaded into the fundamental not observed (latent) constructs is the central function of the measurement models (Byrne, 2010). Arbuckle (2005) mentioned that in order for academics to explain the unified connections between the observed variables (indicator variables) and the unobserved variables (compound variables), measurement models must be applied.

The measurement and validation of the constructs was carried out through structural equations modeling analysis (SEM) using the statistical software programs EQS 6.1 and STATA 14. To evaluate the reliability and validity of the constructs in the current study, Cronbach's alpha, composite reliability, average variance extracted, discriminant validity and convergent validity were analyzed.

Given that the current study involves a rather large group of constructs, each with several items, and many hypotheses, the aggregate analysis of all of them was not possible. Therefore, the researcher divided the model into two separate sub-models. The first sub-model incorporates the five elemental traits and the compound personality traits, while the second sub-model includes the compound personality traits and the UTAUT2 constructs.

Therefore, two measurement models were analyzed separately, which implies that the Cronbach's Alpha, the composite reliability, the average variance extracted, the discriminant validity, the convergent

validity and the fit of the model were examined separately for each sub-model.

The results showed an insufficient significance in the levels of reliability, validity and fit for both parts of the research model (sub-model 1 and sub-model 2). Therefore, and after a thorough analysis, the researcher proceeded to eliminate some elements and create a second order factor to improve the fit of the model.

Thus, some items with insufficient factorial loads were discarded. In addition, a construct was transformed into a second-order factor. Proactive personality, in line with the previous literature, incorporated two different dimensions. After the modifications, the results of both sub-models were above the cut-off points, which indicate the reliability and validity of the current research model.

The analysis of the structural model is the next stage, where the model and research hypotheses suggested above must be validated. In other words, this stage is where the proposed research hypotheses are verified, addressing the patterns and degree of relationship among the constructs.

Therefore, to analyze the hypotheses proposed, two models were tested with SEM. The first sub-model verified the effect of all antecedents on the use of mobile banking. Taking into account the binary nature of the use of mobile banking, a Generalized Structural Equation Model (GSEM) was applied using a "probit" estimate with the Stata 14.0 program to evaluate the impact of all the variables on use.

The second sub-model analyzed the effects of the elemental and compound traits on the motivational factors collected in UTAUT2, as well as the effects of the elemental traits on the compound traits. Due to the length of this second sub-model, to present its results, these were divided into two tables, one that shows the effects on the motivational variables (UTAUT2) and the second that shows the effects on the compound traits.

The results indicate that the use of mobile banking is not only influenced by the motivational factors collected in the UTAUT2 model. Elemental personality traits and compound personality traits are also important in determining usage behavior. In fact, the results revealed that effort expectancy, facilitating conditions, hedonic motivation, need for cognition, need for structure, proactive personality, need for affiliation, neuroticism and agreeableness are predictors of the use of mobile banking in Lebanon. While performance expectancy, social influence, general self-efficacy, extraversion, openness to experience and conscientiousness did not have a significant impact on the use of mobile banking in Lebanon.

Despite his contributions, such as showing the importance of personality in the prediction of behavior, this Doctoral Thesis presents different aspects that limit the scope of the results. Such limitations are associated with the generalization of the study, for focusing on a specific region with particular cultural characteristics and for analyzing a specific technology and lacking funding for the realization of it.

Therefore, it would be interesting to carry out future investigations that overcome the limitations mentioned above. Therefore, the same model can be applied to other markets and with more participants in the sample. In addition, research can be done on the non-significant constructs of the current study. Also, future studies can address the intensity of mobile banking use instead of only if it is used or not.

ACRONYMS AND ABBREVIATIONS

AG	Agreeableness
ANOVA	Analysis of Variance
ATM	Automated Teller Machine
AVE	Average Variance Extracted
BDL	Banque Du Liban
BI	Behaviour Intention
CFI	Comparative Fit Index
CON	Conscientiousness
DF	Degrees of Freedom
DTPB	Decomposed Theory of Planned Behaviour
D²	Mahalanobis Distance
E	Error of Variance
E-Commerce	Electronic Commerce
EE	Effort Expectancy
EQS	Multivariate Statistical Software
EX	Extraversion
FC	Facilitating Conditions
FL	Factor Loading
GSE	General Self-efficacy

HM	Hedonic Motivation
H1	Theoretical Hypothesis Proposed
IDT	Innovation Diffusion Theory
IFI	Incremental Fit Index
IS	Information Systems
IT	Information Technology
M-Banking	Mobile Banking
MCAR	Missing Completely at Random
M-Commerce	Mobile Commerce
MPCU	Model of PC Utilization
N	Number of Cases
NE	Neuroticism
NFA	Need for Affiliation
NFC	Need for Cognition
NFS	Need for Structure
NI	Number of Items Composing a Construct
OE	Openness to Experience
PBC	Perceived Behavioural Control
PE	Performance Expectancy
PEU	Perceived Ease of Use

PP	Proactive Personality
PU	Perceived Usefulness
RFC	Resource Facilitating Conditions
RMSEA	Root Mean Square Error of Approximation
SCT	Social Cognitive Theory
SEM	Structural Equational Model
SF	Self-efficacy
SI	Social Influence
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
SRMR	Standardized Root Mean Square Residual
STATA	Statistical Software Package for Statistics and Data
TAM	Technology Acceptance Model
TAM2	Extended Technology Acceptance Model
TFC	Technology Facilitating Conditions
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTF	Theory of Technology Fit
UB	Use Behaviour
USSD	Unstructured Supplementary Service Data

UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Extended Unified Theory of Acceptance and Use of Technology
WAP	Wireless Application Protocol
X²	Chi-Square
α	Cronbach's Alpha

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INTRODUCTION

INTRODUCTION

The phenomenal growth of the Internet since the mid of 1990s is fundamentally changing the economy. The Internet has become more than a simple and effective way to exchange e-mails and documents; it is emerging as a critical support of commerce. Since the debut of the Internet concept in 1994, Internet users have augmented exponentially. Meanwhile, the number of computer hosts, registered domains, and web sites has also been drastically growing with parallel extraordinary rates.

The worldwide growth of the Internet has been followed by the change of trade transactions and the proliferation of electronic commerce or E-commerce, which mostly means buying and/or selling products through the internet and is commonly associated with online shopping.

The potential benefits of E-commerce in expanding markets, and improving market information, transparency of pricing and distribution of goods and services, have been acknowledged. E-commerce has become an economic phenomenon that broadly affects the production, exchange, distribution, and consumption of products and services.

Parallel with the rapid development of Internet infrastructure, mobile phones and mobile technology have witnessed a tremendous revolution.

As mobile devices started to access Internet at anytime and anywhere to deal with anything, mobile applications and mobile Internet platforms began to prevail. Thus mobile commerce started rising.

Mobile commerce, abbreviated as M-Commerce, is a sub category of E-Commerce. The term mobile commerce refers to the process of purchasing products or services via online or wireless connections by the use of mobile or hand devices.

This Doctoral Thesis is focused on M-Commerce in the banking sector, more specifically, mobile banking, as a sub part of M-Commerce.

Mobile banking or what is known as M-banking is an M-Commerce application that enables customers to bank virtually at any place and any time. M-banking allows individuals or customers to perform any kind of banking services with the use of a mobile phone.

Mobile banking provides a big set of benefits not only to service providers but to its users as well. Surprisingly, given the widespread adoption and large usage of mobile telephones, until the moment, adoption and usage rates of mobile banking technology by customers are not satisfactory to service providers. Nevertheless, financial firms and service providers are forced to provide mobile banking services based on the tendency of customers to adopt and integrate in such new technology.

In Lebanon in particular, banks expected mobile banking technology to record high acceptance rates similar to other mobile technology acceptance rates. Huge amounts of financial investments as well as other resources were spent by Lebanese banks. But, in fact, mobile banking technology adoption rates in Lebanon are still not satisfactory.

The lack of studies examining the factors that influence mobile banking use in Lebanon and the deficiency of a theoretical framework that addresses the issue of mobile banking behaviour from an appropriate customer perspective are all vital in verbalizing the aim of the current study. Therefore, the main aim of this research is to identify and examine the key factors that predict the use of mobile banking technology in Lebanon.

As adoption and usage of mobile banking technology does not only depend on receiving the service from service providers but it is mainly influenced by customers' considerations, values and evaluations, this Doctoral Thesis examines personal factors which impact customer's usage of mobile banking.

Therefore, based on this research aim, the objectives of the current study can be summarized by the following:

- To review and build a clear image regarding the mobile banking technology in Lebanon
- To identify research gaps and formulate a better understanding about the use of mobile banking by Lebanese individuals in Lebanon based on previous literature.
- To formulate a clear conceptual model and propose corresponding hypotheses regarding the use of mobile banking technology in Lebanon.
- To explain how data was collected to test the proposed framework.
- To empirically analyse the validity and reliability of the constructs used in the proposed conceptual model.
- To empirically examine the hypothesized paths to be able to understand the factors that influence Lebanese individuals to use mobile banking in Lebanon.
- To propose the final contributions of the current study at the level of practitioners and scholars.

Applying and choosing a suitable research approach is determined by several research characteristics. First a suitable research approach depends on the kind of theories and models that are implanted in the research. In other words, the research approach depends on the research objectives, whether it is oriented toward theory testing or theory building. The current research does not focus on constructing and defining a new theory, instead it is more oriented toward theory testing. Second, the current investigation addresses the community of bank customers. Therefore, the current study is oriented toward testing a theory, not developing a new one, on a specific set of individuals (bank customers).

For a better understanding of the current investigation, a detailed structure of the dissertation is necessary. This Doctoral Thesis is

composed of five chapters. A brief summary reflecting each of the chapters is expressed below.

Chapter one presents a detailed overview about mobile banking technology and how it is attractive for both customers and organizations (advantages of mobile banking). Further, this chapter portrays a detailed description regarding mobile banking in Lebanon and provides a realistic statistical view about its penetration and adoption rates.

Chapter two discusses prior literature at the theoretical level. Referring to the aim of the study, this chapter provides a detailed dialogue concerning the evolution of the main technology adoption theories and models. Furthermore, this chapter identifies personality theories and constructs that match technology adoption theories, in order to pose new construct paths. To give a suitable guiding conceptual model, this chapter presents a detailed review and evaluation of the main models and theories that best address personality, motivation and behaviour. Accordingly, as a final point, this chapter exposes a conceptual model with several research hypotheses, based on logical and theoretical justifications.

Chapter three is the methodology chapter. It starts with a brief introduction and then discusses the possible suitability of several research approaches. In fact this chapter identifies different research approaches and explains what best suits the current study. It concludes that the field survey approach is the best approach for the current study. Not only but also this chapter provides a clear view with sufficient justifications regarding the sample frame, the sample size, and the sampling instrument (self-administrated questionnaire). In addition, this chapter clarifies the main aspects related to the questionnaire used, highlighting its construction, validation, and administration. As well, chapter three also exposes an appropriate detailed justification for the use of SEM as the most appropriate statistical analysis technique.

On the other side, the results retrieved from the different analyses performed are presented as well in chapter three. Indeed, this chapter included all the results of data screening, missing data, outliers, and also

descriptive statistics (frequencies and percentages) regarding several constructs measured in the questionnaire. By the same token, chapter three provides a separate section that describes and discusses the results obtained of SEM analyses at both levels (validation and path analysis).

Chapter four is the chapter devoted to the discussion of the obtained results and conclusions. In fact, this chapter is dedicated to providing a deep analysis and discussion of the results presented in the previous chapter. It discusses and explains each construct used in the conceptual model and addresses all its results concerning the path analysis. Finally, chapter four provides a concrete exposition of the research contributions, from both a theoretical and practical perspective, based on the highlights of the discussion of results.

Chapter five is the conclusion chapter and is the final chapter that composes the body of the current dissertation. This chapter provides a short summary of all the chapters and a brief precise description of their contents. Moreover, the conclusion chapter highlights the main findings retrieved from the current study and their linkage with the research objectives. As well this chapter ends by describing the current research limitations and proposing possible future researches that best consider and overcome the presented limitations.

CHAPTER ONE
MOBILE BAKING

1 MOBILE BANKING

Since the debut of the Internet concept in 1994, Internet users have augmented exponentially from 6 million in 1997 to 45.8 million by 2002. By the end of 2003, this number was almost doubled marking around 80 million users and a total of bandwidth of leased international connections reaching 27.216 million in 2004 (Lu, 2005). Around 40% of the world population has an Internet connection today. The first billion was reached in 2005, the second billion in 2010 and the third billion in 2014. Evolution of number and penetration of Internet users is shown in Table 1.1.

Table 1.1: Internet Use and Penetration Rates

	Internet Users	% of Population	World Population	Non-Users (Internetless)	1Y User Change %	1Y User Change	World %
2016	3,424,971,237	46.1 %	7,432,663,275	4,007,692,038	7.5 %	238,975,082	1.13 %
2015	3,185,996,155	43.4 %	7,349,472,099	4,163,475,944	7.8 %	229,610,586	1.15 %
2014	2,956,385,569	40.7 %	7,265,785,946	4,309,400,377	8.4 %	227,957,462	1.17 %
2013	2,728,428,107	38 %	7,181,715,139	4,453,287,032	9.4 %	233,691,859	1.19 %
2012	2,494,736,248	35.1 %	7,097,500,453	4,602,764,205	11.8 %	262,778,889	1.2 %

	Internet Users	% of Population	World Population	Non-Users (Internetless)	1Y User Change %	1Y User Change	World %
2011	2,231,957,359	31.8 %	7,013,427,052	4,781,469,693	10.3 %	208,754,385	1.21 %
2010	2,023,202,974	29.2 %	6,929,725,043	4,906,522,069	14.5 %	256,799,160	1.22 %
2009	1,766,403,814	25.8 %	6,846,479,521	5,080,075,707	12.1 %	191,336,294	1.22 %
2008	1,575,067,520	23.3 %	6,763,732,879	5,188,665,359	14.7 %	201,840,532	1.23 %
2007	1,373,226,988	20.6 %	6,681,607,320	5,308,380,332	18.1 %	210,310,170	1.23 %
2006	1,162,916,818	17.6 %	6,600,220,247	5,437,303,429	12.9 %	132,815,529	1.24 %
2005	1,030,101,289	15.8 %	6,519,635,850	5,489,534,561	12.8 %	116,773,518	1.24 %
2004	913,327,771	14.2 %	6,439,842,408	5,526,514,637	16.9 %	131,891,788	1.24 %
2003	781,435,983	12.3 %	6,360,764,684	5,579,328,701	17.5 %	116,370,969	1.25 %
2002	665,065,014	10.6 %	6,282,301,767	5,617,236,753	32.4 %	162,772,769	1.26 %

	Internet Users	% of Population	World Population	Non-Users (Internetless)	1Y User Change %	1Y User Change	World %
2001	502,292,245	8.1 %	6,204,310,739	5,702,018,494	21.1 %	87,497,288	1.27 %
2000	414,794,957	6.8 %	6,126,622,121	5,711,827,164	47.3 %	133,257,305	1.28 %

Source: Internet Live Stats 2018

According to Internet Live Stats (data elaborated by International Telecommunication Union (ITU) and United Nations Population Division) in 2014, nearly 75% (2.1 billion) of all Internet users in the world (2.8 billion) live in the top 20 countries. The remaining 25% (0.7 billion) is distributed among the other 178 countries, each representing less than 1% of total users. China, the country with most users (642 million in 2014), represents nearly 22% of total, and has more users than the next three countries combined (United States, India, and Japan). Among the top 20 countries, India is the one with the lowest penetration: 19% and the highest yearly growth rate. At the opposite end of the range, United States, Germany, France, U.K., and Canada have the highest penetration: over 80% of population in these countries has an Internet connection.

Meanwhile, the number of computer hosts, registered domains, and web sites has also been drastically growing with parallel extraordinary rates. For example, the report by Verisign (2018) showed that the Internet grew by approximately 1.3 million domain names in the first quarter of 2017, and closed with a base of 330.6 million domain names across all top-level domains (TLDs). This is a 3.7 percent increase, year over year. The .com and .net TLDs had a combined total of approximately 143.6 million domain name registrations in the domain name base in the first quarter of 2017 (Verisign, 2018). New .com and .net domain name registrations totalled 9.5 million during the first

quarter of 2017. In the first quarter of 2016, new .com and .net domain name registrations totalled 10 million (Verisign, 2017). The worldwide growth of the Internet has been followed by the change of trade transactions and the proliferation of electronic commerce or E-commerce.

E-commerce, or electronic commerce, mostly means buying and/or selling products through the Internet and is commonly associated with online shopping. E-commerce statistics corroborate “the explosive pace at which this industry has developed as worldwide B2C e-commerce sales amounted to more than 1.2 trillion US dollars in 2013” (Statista, 2018, p. 3).

Currently 40 percent of worldwide Internet users have bought products or goods online via desktop, mobile, tablet or other online devices. This percentage means more than 1 billion online buyers and it is estimated that it will continue to grow (Statista, 2018).

Not only but also E-commerce platforms as well as the process itself have become an economic phenomenon that broadly affects the production, exchange, distribution, and consumption of products and services (Lu, 2005).

Mobile phones and mobile technology have been witnessing a tremendous revolution. Mobile penetration has been growing rapidly. For 2017 the number of mobile phone users was forecast to reach 4.77 billion and the number of mobile phone users in the world is expected to pass the five billion mark by 2019. In 2016, an estimated 62.9 percent of the population worldwide already owned a mobile phone (Statista, 2017).

The number of smart phone users is forecasted to grow from 2.1 billion users in 2016 to around 2.5 billion users by the end of 2019, with smart phone penetration rates increasing as well. Just over 36 percent of the world's population is projected to use smart phones by 2018, up from about 10 percent in 2011 (Statista, 2016)

As mobile devices have started accessing Internet at anytime and anywhere, to deal with anything, mobile commerce started rising (Huang & Wang, 2007). Mehmood (2015) identified four types of mobile banking conceptualizations. Figure 1.1 shows the four classes with their corresponding definitions and the literature that supports them.

The evolution of the M-Commerce concept has been fast. M-Commerce is known for its generality; actually this term summarizes any form of interaction between customers throughout mobile devices. These interactions may be at the level of issuing electronic coupons, providing loyalty services, and creating dedicated websites that are specifically designed to facilitate mobile browsing (Alex, 2010). Mobile commerce shows a clear trend of growth considering the popularity and widespread use of smart phones and growing usage of tablets (Statista, 2016).

Source: Mehmood (2015)

Classification	Definition	Literature
1. Subset/Revolutionized form of E-Commerce	M-Commerce is a subset or a new form of e-commerce and all the aspects involved can be extended and applied to m-commerce.	O.B. Kwon & Sadeh (2004), Coursaris & Hassanein(2002), Scharl et al. (2005)
2. Transactions	A transaction having a definite value or utility, administered through any mobile terminal equipment on the mobile telecommunication network, can be considered a part of mobile commerce.	Li Yan (2005), Barnes (2002), Tsalgatidou & Pitoura (2001)
3. Business Ecosystem	M-commerce is an interactive ecology system of people and organizations based on social and technological effects.	Mylonopoulos & Doukidis (2003)
4. Combination of 1, 2, 3	M-commerce is an extension of e-commerce in which products or goods are managed through wireless mobile equipment without time or place constraints in order to increase the profitability / efficiency of business processes.	Y.F.Kuo & C.W.Yu (2006), X Y Ming (2008)

Figure 1.1: M-Commerce Definition Based on Classification

Banking provides several financial services. Currently many financial services depend on mobile telecommunication technologies to achieve them. These mobile financial services in turn are divided into two main categories: Mobile Payments and Mobile Banking (Georgi & Pinkl, 2005).

Mobile payments refer to transactions conducted using a mobile phone and payment instruments. Mobile payments includes: Banking instruments such as cash, bank account or debit/credit card, and Stored value accounts (SVAs) such as transport card, gift card, PayPal or mobile wallet. Mobile payments exclude transactions that use: Carrier billing using the telecom's billing system with no integration of the bank's payment infrastructure, or telebanking by using the mobile phone to call the service center via an interactive voice response (IVR) system. However, IVR used in combination with other mobile channels such as Short Message Service (SMS) or Unstructured Structured Service Data (USSD) is included Gartner, (2018).

With understanding the interest of analysing mobile payments, this Doctoral Thesis focuses on the second part of mobile financial services, in other words, on mobile banking.

1.1 MOBILE BANKING

The digital revolution is troubling the link between banks and their clients as new features continuously appear to enhance customer experience (Deloitte Digital, 2017). In particular, a new disruption has appeared with the high level of smart phone usage and M-Commerce adoption over such phones (Munongo, Chitungo, & Simon, 2013). Smart phone recent revolution has changed the way people used to do things.

1.1.1 Concept

Luarn and Lin (2005) referred to mobile banking as cell phone banking that allows access to banking networks by the wireless application protocol (WAP) to perform banking services such as account management, information inquiry, money transfer, and bill payment. Years after, mobile banking was referred as a banking facility, viewed as a part of Internet banking, which helps people perform account balances

and transaction history inquiries, funds transfers, and bill payments via smart phones or PDA instead of visiting banks (Gu, Lee, & Suh, 2009; Kim, Shin, & Lee, 2009; Laukkanen, 2007; Luo, Li, Zhang, & Shim, 2010; Stair & Reynolds, 2008).

Mobile banking has also been considered as a “product or service offered by a bank or a microfinance institute (bank-led model) or MNO (non-bank-led model) for conducting financial and non-financial transactions using a mobile device, namely a mobile phone, smartphone, or tablet” (Shaikh & Karjaluo, 2015, p. 131) or as a remote service (via mobile phone, PDAs, tablets, etc.) offered by financial entities to meet the needs of their customers (Leivaa, Climentb, & Cabanillasa, 2017). Table 1.2 shows a list of mobile banking services.

Table 1.2: List of Mobile Banking Services

List of Services Available With Mobile Banking	
Consult Account Activities	Recharge Mobile
Transfers	Block Card
Transmissions	Extend The Limit Of The Credit Card
Consult Domiciliation's	Consult Loans And Mortgages
Consult Non-Domiciled Receipts	Consult/Management Of Deposits
Payment Of Municipal Taxes	Consult/Management Of Securities
Consult Municipal Taxes	Consult/Management Of Investment Funds
Payment Of Social Security	Consult/Management Of Retirement Plans/Pensions
Consult Insurances	Consult/Management Of Insured Pension Plans

List of Services Available With Mobile Banking	
Amortization Of Loans	Recharge Mobile
Payments Of Educational Services	Financial Donations
Payments Of Gaming And Entertainment	Retail Payments
Transportation Bills	Parking Payments Bills
ATM Locator	Branch Locator
Access To Brokerage Services	Exchange Of Data Messages, Notifications And Mails

Source: Federal Reserve Bank (2016)

Mobile banking is different from mobile payments, which implies the use of a mobile device to pay for goods or services either at the point of sale or remotely, similarly to the use of a debit or credit card to realize an EFTPOS payment (Chandran, 2014).

Mobile banking consists of three inter-related concepts: Mobile accounting, Mobile brokerage, and Mobile financial information services. Most services in the categories designated “accounting” and “brokerage” are transaction-based. The non-transaction-based services of an informational nature are however essential for conducting transactions - for instance, balance inquiries might be needed before committing a money remittance. The accounting and brokerage services are therefore offered invariably in combination with information services, whereas information services may be offered as an independent module.

Mobile banking transactions can be broadly classified into two types: push and pull. Push type is a one-way transaction where our bank sends us information pertaining to our account via SMS. Pull type is a

two-way transaction, where we send a request and the bank replies. This can be further classified into five types.

- Inter-bank mobile payment service (IMPS) - It is a fund transfer service through National Payment Council of India (NPCI). This service lets you transfer funds from one account to another across banks within the country using your mobile phone. You can use the IMPS via your banks' app, USSD'S dial-in number, encrypted SMS banking or net banking.
- Bank apps - Here you need to download your bank's application or software on your mobile phone via Internet. This works on both GSM and CDMA handsets for Android and iPhone platforms.
- USSD-based - For this type, all you have to do is dial the bank's service code and you can ask for information on your bank account. You don't need a Smartphone or high end phone to use the USSD platform.
- SMS-Based -It is the most popular method of mobile banking. You can get your account information via SMS.
- Internet-based mobile banking - This way of banking is where you use your mobile screen like a computer monitor. Apart from these there are more options like the mobile wallets, offered by telecom service provider platforms, for instance Vodafone's m-pesa, Bharti Airtel's Airtel Money and Aircel's Mobile Money. Even an un-banked customer can use this service. A smart phone and an Internet connection are not essential.

Mobile banking users are especially concerned with security issues like financial frauds, account misuse and user friendliness issues - difficulty in remembering the different codes for different types of transactions or application software installation and updating due to lack of standardization.

1.1.2 Technologies

Mobile banking is still developing with the aid of technology and mobile devices. Three different technology solutions summarize the technological background being used in the mobile banking sector to perform mobile financial services: messaging based applications, browser based applications, and client based applications (Binam, 2012).

Starting by messaging based application technology. This is considered as a major old way of interacting between banks and their customers. Clients send up commands and queries that are predefined by the bank via a text message in order to inform or perform, and banks send back a reply within a text message (Sunil, 2013). This kind of communication occurs throughout several complex and sophisticated procedures (Krugel, 2007). This mobile banking technology allows customers to receive short messages (SMS) in their phones for any new notifications, and any other banking activities, such as fund transfers, confirmations and direct payments using GPRS (General Packet Radio Service), that are being supported throughout java development and wireless application protocol (WAP) (Gavin, 2007).

The SMS technology feature was the first mobile financial technology approach allowing banking transactions through mobile phones (Taleghani, Gilaninia, Rouhi, & Mousavian, 2011). Another form of messaging-based applications is the Unstructured Supplementary Service Data (USSD), which has compatibility with most mobile phones. On the other side, a simple application or set of APIs can be used by banks to generate short messages to be sent to customers mobile devices, or to respond to customer requests and notify them with any news. Consequently, security is needed in this domain, hence banks license up a short code of five to six digits, which would use to communicate with their customers for a SMS mobile banking services (Bog & Person, 2009)

The second technology solution that is being used is a browser based application. It mainly requires a compatible supported mobile phone to perform the actions over. A browser based application is set to be a Wireless Access Protocol or what is known as WAP based on Internet

access (Gavin, 2007). In other words, Internet must be found in the mobile device, acting according to a wireless access protocol. This kind of technology solution enables the client to access banking portals and to achieve transactions throughout the mobile internet (Kiran, 2009).

Source: Binam, 2012

Mobile Banking Comparison Chart	Mobile App	Mobile Web	Text Banking
How can this solution help me?	App for iPhone, BlackBerry and Android	Banking optimized for mobile browsers	Banking for text users (no smartphone required)
What can it do for me?	<ul style="list-style-type: none"> - Check balances - View history - Transfer funds - Pay bills - Deposit checks - Locate nearest ATM/Branch 	<ul style="list-style-type: none"> - Check balances - View history - Transfer funds - Pay bills - Locate nearest ATM/Branch 	<ul style="list-style-type: none"> - Check balances - View history - Locate nearest ATM/Branch
For what type of accounts?	<ul style="list-style-type: none"> - Checking - Savings - Credit Card 	<ul style="list-style-type: none"> - Checking - Savings - Credit Card 	<ul style="list-style-type: none"> - Checking - Savings - Credit Card
How do I get started?	Visit your App Store to download	Enter into your mobile browser	Sign on to Online Banking, go to Mobile Banking Center, add mobile number to enable text

Figure 1.2: Comparative Overview about Basic Technology Solutions of Mobile Banking

Finally, the most commonly used technology is a client based application. This technology is based on special software and applications that are installed or downloaded over the phone platform. Client based applications are rapidly evolving to help users access banking services that require faster, richer, and non-user experience to use (Zainol, 2011). Client based applications have plenty of benefits, including access to all banking functionalities, strong authentication and encryption of sensitive data, and secure procedures of payments and transactions (Vermaas & Raymond, 2013). As a result, client based

applications are the most common used solutions for mobile banking, since they offer a powerful and secure application functionality by protecting user and banking data over the mobile hand set device (Monitisi, 2012). In this sense, and based on the rapid innovation of technology solutions in the field of mobile financial services, a fast development of mobile banking is expected (Barry & Albertazzi, 2011). Figure 1.2 shows a comparative overview about basic technology solutions of mobile banking.

1.1.3 Advantages and Disadvantages

Every aspect nowadays clarifies certain advantages and benefits behind its success, as well as certain disadvantages and weakness behind its failure. The use of mobile phones has a positive and significant impact on a country's economic growth, and its impact may be twice as large in developing countries as in developed countries (Salzman, Thompson, & Daily, 2001). Still, mobile banking has brought several advantages not only to the economy but also to financial institutions (Cognizant, 2013).

1.1.3.1 Advantages and Disadvantages to Customers

Mobile banking has several advantages to customers. Among the main ones are the following: (i) availability, (ii) security, (iii) does not require an Internet connection, and (iv) time saving.

The first essential gain for customers of using mobile banking is its availability. Mobile banking is available all the time, twenty four hours a day seven days a week (Zainol, 2011). Thus, its main advantage is its ubiquity and immediacy, which provides a convenient, expedient and ideal choice for accessing financial services for most mobile phone users in rural areas (Tiwari, Buse, & Herstatt, 2006).

By using mobile banking, subscribers can pay their bills, transfer funds, check account balances, review their recent transactions, block their ATM cards and perform many other services which are offered (Mohd, 2011). Mobile banking, in addition, has been using a deeply secured technology for banking in the recent era; users of mobile phones can perform several financial functions and transactions conveniently

and securely with their mobile devices (Cope, 2011). Usually, good mobile banking apps have a security guarantee.

On the other hand, and due to the revolution of technology, mobile banking may be run over mobile devices without the need for a broad band, or cable Internet connection to operate, in such a way that it only uses the service provided or utilizes the mobile connectivity of telecom operators and therefore it does not require a broadband Internet connection (Dass & Pal, 2010). Based on a survey carried in UK by Strong & Old (2000), convenience and easiness to use were found as the motivational factors for consumers to use mobile banking activities.

Mobile banking allows customers to save time. Instead of allocating time to walk into a bank, customers can check their account balances, review recent transactions, schedule and receive payments, transfer funds, locate ATMs, and organize their accounts from where they are.

Few disadvantages are observed at the level of mobile banking. Receiving fake SMS or what is known as “Smishing” may be one for users of mobile banking services (Kadušić, Bojović, & Žgalj, 2011). This threat usually affects new mobile banking application subscribers. They receive a fake SMS asking about certain bank account details and many users fall into this trap.

Despite the fact that mobile banking is more secure than Internet banking, additional security issues must be taken into account (Jeong & Tom, 2013). Bank customers in developing countries need to consider the issues of hacking, the integrity of the password been used, data encryption and personal protection of information when it comes to adopting electronic or mobile banking (Benamati & Serva, 2007). It was discovered that security and privacy are crucial matters as asserted by consumers, and they may have an impact on consumer decision making regarding the usage of mobile banking; thus, security and privacy issues remain priority challenges to bankers in the mobile banking sector (Alkhaldi, 2016).

Mobile banking is still in its rise and full support to this kind of technology is not yet fully recognized. Some phones don't support mobile banking features and services yet due to technical issues. It requires you to install apps on your phone to use the mobile banking features, which are available on high end Smartphones (Jarunee, 2014). If you do not have a Smartphone, the use of mobile banking becomes limited. Transactions like transfer of funds are only available on high end phones (Jarunee, 2014). In consequence, contemporary mobile devices like Smartphones and tablets are better adapted for mobile banking than the old mobile devices (Brown, Cajee, Davies, & Stroebel, 2003).

Barriers of mobile banking are associated with mobile barriers. The main platform to operate in mobile banking is the phone, therefore the limit of speed in processing, the screen size and the battery life all act as mobile barriers and hence as barriers for banking over the phone (Kazi & Mannan, 2013).

Many phones are not yet compatible with anti-virus software. Although "identity thieves are still a few steps behind when it comes to learning to implement some of their most successful computer tricks (phishing, spamming, spreading viruses, account hacking, etc.) on a cell phone level, experts agree that it is only a matter of time and people shouldn't assume that anti-virus software isn't necessary for cell phones" (Chandran, 2014, p. 3).

Besides, the chance of losing a person's mobile device often means that phones are still in an unsafe position, which also means that criminals can gain access to your mobile banking PIN and other sensitive information. All of these are mobile related concerns generating up what is known as mobile banking disadvantages and challenges (Masinge, 2010; Vermaas & Raymond, 2013).

1.1.3.2 Advantages and Disadvantages to Financial Institutions

A huge variety of services is supported by mobile banking. The person to person financial transfers offered by mobile banking is very important to emerging economics, since it provides a financial service

for unbanked people (Cognizant, 2013). This means that mobile banking is considered as a driver of socio-economic development in emerging markets as well as a new distribution channel for financial institutions.

Moreover, mobile banking has been the main recovery and response channel for financial institutions from emergency situations and disasters (Nir & Sharad, 2012). All data are stored, backed up and archived online, ready to restore in case of emergencies and disasters. This helps financial institutions that had problems and difficulties in delivering services through traditional channels, considering mobile banking as a branchless financial service provider (Ivatury & Mas, 2008; Donner & Tellez, 2008).

Applying mobile banking is a Banks' response for to needs of core customers as well as a main source of revenue. This explains that mobile banking does not only generate additional revenues from the existing customer-base but may even attract new customers that are the main revenue (Karsch, 2004).

Finally, reducing the cost is considered another advantage. Mobile banking has helped financial institutions to reduce their costs of implementing new branches, and of carriers, paperwork etc. (Sunil & Durga, 2013). Banks have reduced their operating cost and offer banking services throughout mobile banking with a very low cost (Souranta, 2003). Mobile banking increases efficiency, helping to decongest the banking halls and reducing the amount of paperwork for the bank (Chandran, 2014). By using technology, costs have being reduced for both clients and banks themselves.

1.1.4 Adoption Rates

Banks in recent times have extensively and actively innovated and promoted the services that they offer, thus mobile banking has been marketed as a useful and innovative service that consumers receive from their banks. In 2008, 4.3% of mobile Internet global subscribers claimed that they were using their phones to perform banking activities. By the beginning of 2010 the number had doubled to reach 9% recording also a

marked acceleration by the end of the year reaching 42.9% (Futur Foundation, 2010).

According to MEF Global Mobile Money Report (2016) revealed at the end of 2015, 69% of global mobile subscribers had performed at least one banking activity throughout the use of their phones. This clearly indicates that positive penetration rates are being recorded year after year in the mobile banking sector. This is an evident sign of the rapid rise of mobile banking adoption and usage globally. According to Juniper research (2015) the number of global mobile banking users was 0.8 billion by the end of 2014 and a rapid growth over the coming years was forecasted, expecting a global mobile banking users' base of 1.8 billion people by 2019 as demonstrated in Figure 1.3.

Source: Juniper Research KMPG Analysis 2015

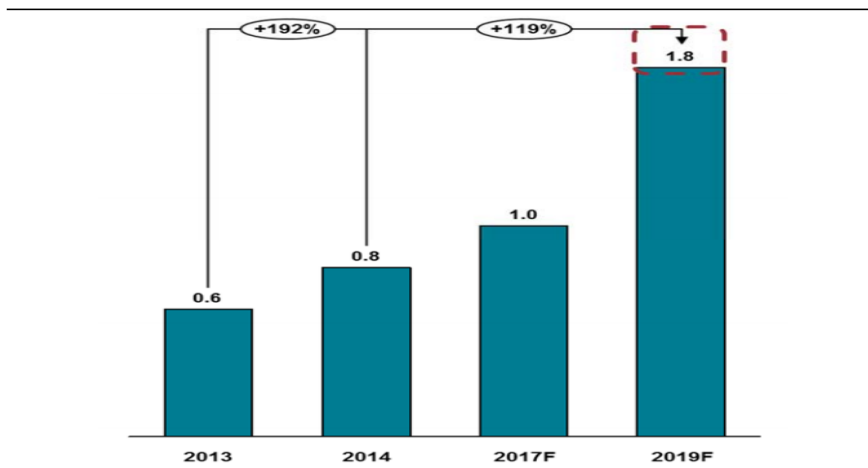


Figure 1.3: Global Mobile Banking Users

Mobile banking is growing drastically, users are mounting exponentially, and the incidence of its use is also rising hastily. By the end of 2015 mobile technology was already the largest banking channel for the majority of banks worldwide by volume of transactions (Juniper, 2015).

The year 2016 demonstrated a drastic change in the sector of mobile banking globally. The latest study conducted by First Annapolis Consulting (2016) indicated the highest average rates of adoption of mobile banking services among banking subscribers by the year 2016. According to a study lunched in 2016 in different countries and graphically represented by the Figure 1.4, more than 70% reported using mobile banking as a primary banking channel for performing their banking activities (Fox, Causey, & Cencula, 2016).

Source: Fox, Causey, and Cencula, 2016

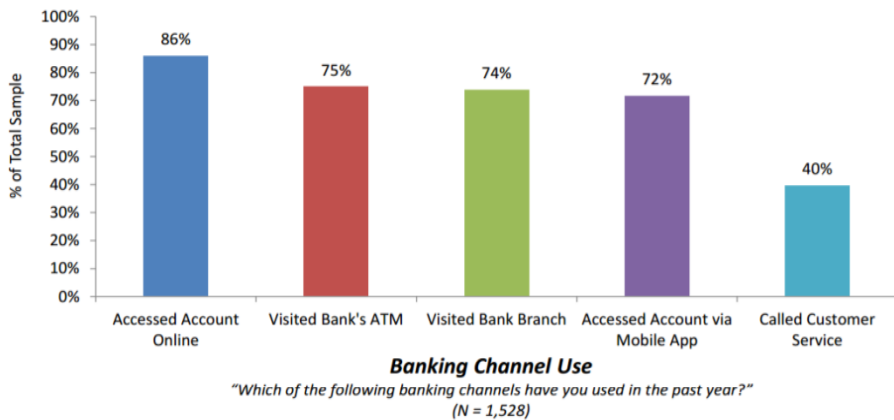


Figure 1.4: Percentage of Banking Channels Used

From another perspective, penetration rates can be seen at the level of activities performed by mobile banking. A global study recorded that 28% out of all other performed activities refer to checking account balances, 18% to transferring funds between accounts, 16% to sending money to someone else and 9% to applying for a loan (MEF, 2015). This explains that people are performing more activities through mobile banking day after day even though they are more complicated.

The new high adoption rates of mobile banking technology can also be commented due to the high levels of frequency of use of such service

by users. High percentages of daily and weekly usage of mobile banking were recorded, stating an average of 31% for daily use and 47% for weekly use of mobile banking services respectively, as demonstrated in Figure 1.5 (Fox, Causey, & Cencula, 2016).

Source: Fox, Causey, and Cencula, 2016

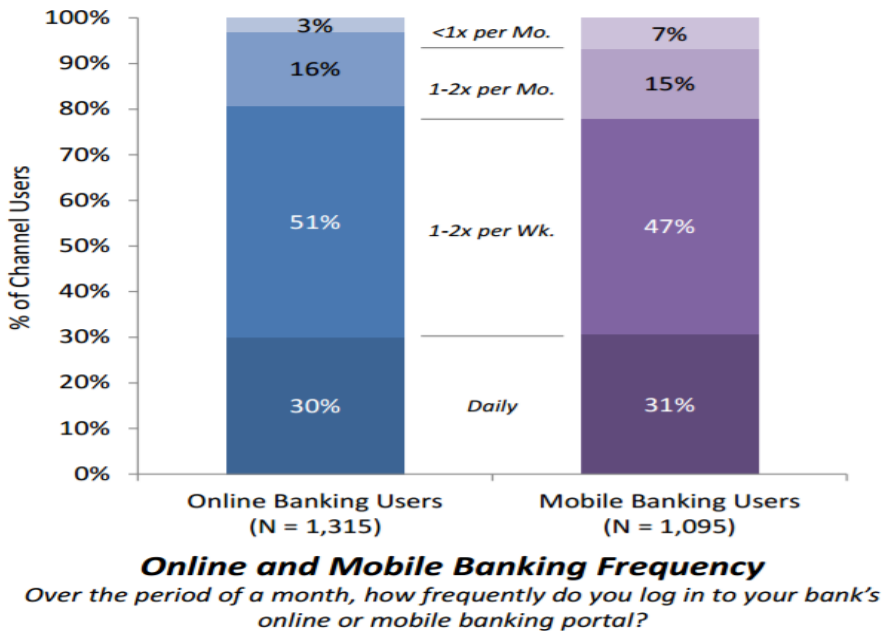


Figure 1.5: Frequency of Use of Mobile Banking

According to Kazi and Mannan (2013), the number of visits by customers to their bank branches has been decreasing as mobile banking was introduced to the market. They also stated that 27% of the sample branch bank clients visit the branch less often to administer their money; and 24% of the same sample branch clients use less often ATMs and banking call-center to get informed and to perform banking activities. The reasons given to why people have increased their use of mobile banking were: 55% of these users used mobile banking to avoid going to

their bank branch, while 43% of the users indicated that they used mobile banking to avoid using the call center (Jeong & Tom, 2013).

Obvious benefits are being generated from the use of mobile banking. In fact, Gebba, Aboelmaged, and Raafie (2013) stated that people who are using it have figured out its proficiency and certify the feeling of liking mobile banking. In another investigation more than half of the collected sample of mobile banking subscribers (57%) uttered that they had been using mobile banking more often, and only 7% of this sample mentioned that they were not interested in using this channel any more (Beatriz & Pierre, 2010). This demonstrates the real benefits consumers obtain from using their mobile phone for banking services (Rogers & Mwesigwa, 2010).

Mobile banking adoption has been related to an increase in smartphone usage (Juniper, 2015). Smartphone users are more likely to engage in mobile banking than non-smartphone users. A study conducted between 2011 and 2014 showed that, in 2014, 39% of normal mobile phone users had adopted mobile banking services, whereas 52% of smartphone users had reported their adoption of mobile banking, and this proportion had been steadily increasing as shown in Figure 1.6 (Federal Reserve Board, 2015). This suggests that as smartphone adoption continues to increase, mobile banking usage may also increase (Federal Reserve Board, 2015).

Similarly, mobile banking usage and adoption have been associated with age (Federal Reserve Board, 2015). Studies and surveys between 2013 and 2015 have stated that young consumers are more likely to use and adopt mobile banking services than old consumers. On top of that, the studies have demonstrated that 60% of mobile banking users are aged between 18 and 29, whereas only 13% of mobile banking users are aged more than 60 years (Federal Reserve Board, 2015).

The increased adoption of mobile banking services has been regardless of place. However, there are big differences in adoption rates across global markets. Overall, mobile banking use in Australia, the Netherlands, Sweden, and the USA is approaching half of all online

adults, whereas Canada (30%), the UK (25%), and Germany (19%) are lagging behind (Hostis & Wannemacher, 2015).

Source: Federal Reserve Board, 2015

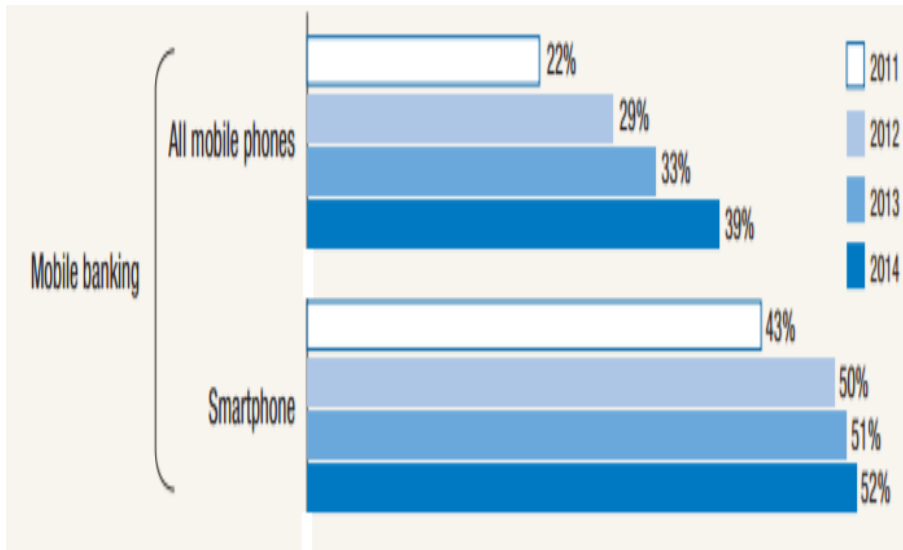


Figure 1.6: Mobile Banking Adoption Increase as Smartphone Adoption Increase, 2011-14

Recent researches have demonstrated a higher rate of growth in the adoption of mobile banking in developing countries compared to the developed ones. This is due to the delay in adoption, which is taking place now in developing countries (Futur Foundation, 2010). In fact, record rates of adoption of mobile banking of 60% to 70% have been found in developing countries (example India, Lebanon, Pakistan etc.) and not in developed countries (example Canada, UK, USA etc.) (Juniper, 2015).

Additionally, mobile banking in 2016 has recorded the highest popularity rates in developing countries, such as India (46%), Indonesia (37%), Mexico (34%) and Turkey (34%) (Nielsen, 2016). This does not mean that developing countries adopt mobile banking more rapidly and with higher rates than developed countries; on the contrary, it means that developed countries have already adopted mobile banking, whereas developing countries are the late adopters of mobile banking services (Juniper, 2015).

Asia in 2016 has recorded the highest usage rates of mobile banking globally (Nielsen, 2016). According to Sumedh and Le (2015), both developed and developing Asia have seen a sharp increase in digital banking. Still, during the year 2014, it was recorded that 61% of smartphone usage activities were related to the access of banking services in developed Asia, while only 26% in developing Asia (Sumedh & Le, 2015). Bank customers in developing countries need to consider the issue of hacking, the integrity of the passwords used, data encryption, and protection of personal information when it comes to adopting electronic or mobile banking (Benamati & Serva, 2007). Nevertheless, it should be noted that mobile phones remain the most popular form of communication between individuals and businesses in Middle East and Arab countries, which are considered developing countries (Sumedh & Le, 2015).

1.1.5 Mobile Banking in Lebanon

The Lebanese banking sector is the most active industry in the Lebanese market. Researches and reports have found that the Lebanese banking sector is the most profitable industry at the level of the Lebanese economy (Peters, Raad, & Sinkey, 2004). Banks in Lebanon are some of the more vital and solid flourishing private companies influencing the Lebanese economy. They are all focused on competing and conquering great levels of competitiveness and competitive advantage. Consequently, from time to time, Lebanese banks launch a series of programs, services and features to improve banking experiences, maintain consumer loyalty, and gain positive consumer feedbacks.

Concerning the Lebanese market, all banking services are controlled by the Lebanese Central Bank. The Lebanese Central Bank or what is known by “Bank De Liban” (BDL), is the official governmental banking institution that regulates controls and examines the whole banking sector in Lebanon. After the Lebanese civil war in 1990, the banking sector started to improve and lift-up progressively, and Lebanese banks started functioning healthier. Adoption of banking services in the Lebanese market started to grow. Banks became more trustworthy, and the banking sector developed.

According to BDL, the Lebanese market is highly saturated with financial institutions. By the year 2017, 65 Lebanese banks (see Appendix 1) were legally functioning under the regulations of the Lebanese Central Bank (Banque Du Liban, 2017). Moreover, it was estimated by the year 2016 that only 7% of these banks (5 out of 65) were not offering the services of digital banking in Lebanon (Blominvest Bank S.A.L., 2016).

1.1.5.1 Mobile Banking Rates

Mobile and telecommunication technologies in Lebanon are growing fast by the means of two mobile service providers available in the Lebanese market: MTC touch and Alfa (IDAL , 2016). It was recently recognized that Lebanon is witnessing high levels of mobile penetrations rates, reaching 87.07% by the end of 2015 (Byblos Bank SAL, 2016); whereas in terms of Internet penetration rates, only 52% of the Lebanese population are Internet subscribers and users (Blominvest Bank S.A.L., 2016).

New “Mobile Banking” innovations have been introduced in the Lebanese banking sector. Thus, banks have started to battle to attain and make mobile banking services available, with about 14 banks (not all banks have mobile banking) making their mobile banking applications available on virtual markets (Audi, 2016). Hence, unique applications to access mobile banking services with unique names for each bank were recently developed. These 14 banks (see Appendix 2) have rushed to introduce mobile banking services to Lebanese citizens and into the Lebanese market but with different forms and at different time scales.

Lebanese banks have launched such services to maintain a competitive advantage in the market, to scope over wider geographical regions, to minimize daily expenses and costs, to subsidize to their service value and quality, and to boost customer gratification and loyalty (Audi, 2016).

Despite all the investments and efforts exerted regarding new technologies in the banking sector in Lebanon, the actual adoption of such technologies including mobile banking is still low and it has not live up to expectations (Blominvest Bank S.A.L., 2015). According to a study conducted in 2017 over the MENA countries regarding the adoption of digital banking, Lebanon and Jordan have the lowest rates of digital banking adoption, with 54% and 42% respectively (IDAL, 2017). Although this percentage has increased by 38% from the year 2016 to the year 2017, it was still considered that Lebanon has one of the lowest adoption rates regarding digital banking in 2017 (IDAL, 2017).

Source: Arabnet 2017

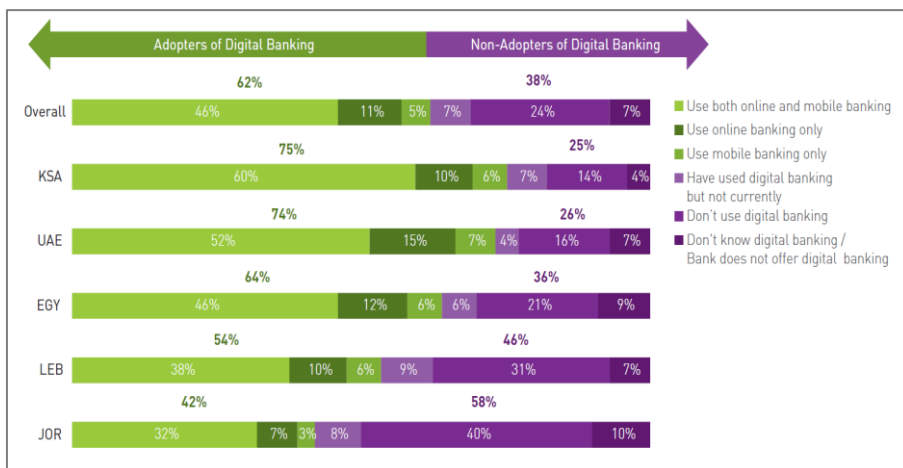


Figure 1.7: Rates of Adopters and Non-Adopters by Countries

According to the Arabnet report (2016) on digital banking adoption in the Middle East, 75% of bank customers in Lebanon claimed to visit

their branches regularly. Furthermore, this study shows (see Figure 1.5) that of those 54% of digital banking adopters in Lebanon only 10% consider using only online banking channels to perform their banking activities, and only 6% consider using only the mobile banking channel (Arabnet, 2016). The remaining 38% represent the Lebanese population who owns a bank account and use both mobile banking and online banking services to perform banking activities (Arabnet, 2016). Figure 1.7 also shows that 31% of Lebanese bank owners have never used any kind of digital banking, including mobile banking and 9% have used digital banking but do not do it anymore. This is sufficient to indicate the low adoption and use rates of mobile banking in Lebanon (Domat, 2017).

CHAPTER TWO

LITERATURE REVIEW

2 LITERATURE REVIEW

Researchers have pointed out the importance of technology in our present era where the level of technology adoption has been distinct among people, countries, and technologies themselves. In recent years, a variety of theoretical perspectives have been applied to provide an understanding of the determinants of new technologies adoption and use.

Mobile banking technology has been addressed in different markets (developing and developed countries) from different perspectives (customer versus organizational) analysing different outcomes (intentions, use, acceptance etc.) (Muñoz-Leiva, Climent-Climent, & Liébana-Cabanillas, 2017). Thus mobile banking became an attractive subject for both practitioners and academics (Sujud & Hashem, 2017).

This PHD thesis is devoted to comprehensively and critically reviewing literature regarding mobile banking technology, so as to identify research gaps and to acquire a better understanding about the customers' use or non-use of mobile banking.

Several researchers such as Meuter, Ostrom, Roundtree, and Bitner, (2000), Meuter, Ostrom, Bitner, and Roundtree (2003) and Meuter, Bitner, Ostrom, and Brown (2005) and Püschel, Mazzon, and Hernandez (2010) all indicated that adopting mobile banking is not practicable except if customers widely consider it as a full alternative for human encounters. Indeed mobile banking success does not only depend on service providers making the innovative technology available but rather it depends on customers perceptions to accept this innovation as a full alternative to previous human banking services. More precisely it was stated by Meuter, Bitner, Ostrom, and Brown (2005, p. 78) that “for many firms, often the challenge is not managing the technology but rather getting consumers to try the technology” and by Püschel, Mazzon, and Hernandez (2010), who insisted that the usage of mobile banking

technology is mainly influenced by customers' perceptions and not by service providers. Curran and Meuter (2007) argued that changing traditional behaviours to adapt to new technological phenomena, such as mobile banking use is complicated, especially when such new phenomena are still poorly understood. Similarly other scholars indicated that customers have control over new services and are able to access them based on their wants and standards (Chen, Chen, & Chen, 2009; Meuter & Bitner, 1998; Pantano & Viassone, 2014; Weijters, Rangarajan, Falk, & Schillewaert, 2007; Zeithaml, Parasuraman, & Malhotra, 2002). Therefore, the most challenging step in technology innovation is to attract customers to accept and use technology innovations.

With reference to technology adoption and use, several theories have been formulated and many factors have been examined to address new technology adoption. These theories may be applied to mobile banking.

At the theoretical level, several theories and models have been formulated to understand the factors that influence customer intentions and behaviours regarding new technologies (in this case, mobile banking). Out of these models and theories, some have been considered crucial in the understanding of human behaviour regarding new technology, such as:

- Diffusion of innovation theory (DIT) (Rogers, 2003) 1962
- Theory of reasoned action (TRA) (Fishbein & Ajzen, 1975)
- Theory of planned behaviour (TPB) (Ajzen, 1985)
- Technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989)
- Decomposed theory of planned behaviour (DTPB) (Taylor & Todd, 1995)
- Unified theory of acceptance and use technology (UTAUT) (Venkatesh, Davis, Morris, & Davis, 2003)

- Unified theory of acceptance and use technology two (UTAUT2) (Venkatesh, Thong, & Xu, Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology, 2012).

Until the past few years, the technology acceptance model (TAM) was the most frequently adopted model by researchers in the field of mobile banking (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnla, 2004). Some studies tried to combine more than one theory to better explain the factors that influence mobile banking adoption. For example Koenig-Lewis, Palmer, and Moll (2010) integrated TAM with IDT to better predict mobile banking adoption. This was until the development of the unified theory of acceptance and use technology two (UTAUT2), which was recently addressed as the most important theoretical base to help explain acceptance of mobile banking or any new technology innovation from a customer perspective (Arenas-Gaitán, Peral-Peral, & Ramón-Jerónimo, 2015).

According to Venkatesh et al. (2012), before the development of UTAUT2, few technology adoption theories were oriented to examine the factors that influence usage patterns (i.e. behavioural intention, usage behaviour, acceptance, adoption, and continued intention to use) of new technologies from the customer point of view, instead the majority of technology adoption theories were oriented to the organizational context. For instance, Venkatesh, Thonh, and Xu (2012), in their study, mentioned that TAM, technology readiness, and UTAUT are models used to explain individuals' intentions to use new innovations in an organizational context. Factors that may influence the intention or adoption behaviour toward new technologies may vary from an organizational context to a consumer context. This means that for a better applicability in a customer focused context, it is essential to apply a theoretical framework that is appropriate for this context (Venkatesh, Thong, & Xu, Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology, 2012). UTAUT2 model, developed by Venkatesh, Thonh, and Xu (2012), is the best theoretical framework to explain the factors that influence the usage of mobile banking from a customer perspective.

There are some studies that examine individual customers' intention and use of mobile banking in Lebanon (Sujud & Hashem, 2017; Audi, et al., 2016). These studies provide an initial understanding of factors that influence intentions to use mobile banking, but they did not focus on the customers' personality factors that influence actual mobile banking use behaviour. In other words, previous literature in mobile banking has been oriented to study the factors that impact the intention of behaviour but not the actual behaviour.

Moreover, previous studies regarding mobile banking in Lebanon have not considered the importance of other individual personal factors (personality factors) in adopting mobile banking. Indeed, personality traits have been seldom used and integrated in previous investigations on technology adoption and acceptance (Wixom & Todd, 2005). Hence this reveals the deficiency of understanding the personal and motivational factors that may influence the actual use of mobile banking in Lebanon.

Many researchers such as Costa and McCrae (1992) have indicated that individual behaviours are influenced by personality traits. Therefore, it is important to integrate them into a well-defined theoretical framework. This Doctoral Thesis tries to cover this gap linking theories of new technologies adoption and use and the "Meta-theoretic Model of Motivation" or 3M model of personality and motivation (Mowen, 2000). This model assumes a hierarchical approach of personality traits and illustrates their influence over actual behaviour. This Doctoral Thesis takes in some aspects of this model to integrate them with the UTAUT2 model.

The 3M model is the most comprehensive, accurate and parsimonious model that classifies personality traits. The 3M model was grounded over principles and assumptions from several theoretical approaches (e.g., control theory, evolutionary psychology, and hierarchical model of personality traits).

A trait can be viewed as a temporally stable individual characteristic (Ajzen 2005) that exerts influence and helps determine individual's behaviour and cognitive style (Mount, Murray, & Steve, 2005).

A relevant aspect of the 3M model is its hierarchical approach to personality. According to many scholars (Allport, 1961; Lastovicka, 1982; Costa & McCare, 1995; Mowen & Spears, 1999) personality traits are classified into levels based on their degree of abstractness. The 3M model considers four main levels of personality traits (Elemental/Cardinal Traits, Central/Compound traits, Situational Traits, and Surface Traits) (Mowen, 2000).

Cardinal traits were defined by Allport (1961, p. 5) as “the basic underlying predispositions of individuals that arise from genetics and the early learning history of people”. The big five factor model of personality represents a main subset of this level of personality traits

The second level of the hierarchical approach of personality traits was named compound traits in the 3M Model (Mowen & Spears, 1999). These traits are considered less abstract and more concrete than the elemental traits and they are defined as one-dimensional dispositions resulting from the culture and previous history of individuals and from the combination of some elemental traits of these individuals (Hough & Schneider, 1996). These compound traits are expected to have a better predictive power of behaviour than elementary traits, due to the distinct properties that they have over elemental traits (Mowen, Park, & Zablah, 2007).

Situational traits are the third level in the hierarchical approach to personality traits. These traits were defined as “one-dimensional predispositions to behave within a general situational context” (Mowen, 2000, p. 21). Some studies have declared that situational traits are the result of interaction of elemental and compound traits (known as basic personality traits) with situational contexts that in turn help predict concrete surface traits (Schneider & Christine, 2011). According to Mowen and Sujjan (2005) situational traits may serve as motives, for engaging in behaviour, because they can be expected to account for more variance in such behaviour.

Surface traits are the final level of the hierarchical approach of personality traits. Surface traits are defined as “traits that delineate the

programs of behaviour that individuals run in order to complete tasks” (Mowen, 2000, p. 21).

For the past decades, researchers have noted the importance of personal factors in predicting the acceptance and use of new technologies (Lucas, 1981). Also since the existence of models of adoption and use of new technologies, a spot of light has been shed on personal factors and traits that may have an influence on personal behaviour towards new technologies (Ajzen, 1988). However it was not until 1990 when a subset of personal factors, or what is known as dispositional factors, were integrated in the predictive models of technology adoption.

Personality has been defined as the set of pattern characteristics, thoughts, feelings and behaviours that discriminate a person from another and persevere over time and situations, as well as the individual response to certain and particular situations (Phares & Chaplin, 1997). From another perspective personality has been conceived as a consistent and stable factor that regulates the interaction of individuals with their internal and external environments (Synder & Ickes, 1985). In other words, people differ by a set of stable characteristics and tendencies (Maddi, 1989).

Psychological researches have stated that individual behaviours are influenced by personality traits that shape these behaviours (Costa & McCrae, 1992). Personality traits have an important effect on personal behaviour, such that people attitudes, beliefs, cognitions and behaviours are in part determined by their personality (Aldemir & Bayraktaroglu, 2004).

This Doctoral Thesis takes two main thoughts of the 3M model: (i) personality traits influence individual beliefs and behaviours and (ii) there are distinct levels of personality traits. Given the complexity of model and the high number of variables that form it, three sub-models were elaborated. In sub-model 1, elemental traits, compound traits and UTAUT2 variables relate to mobile banking use. In sub-model 2, elemental and compound traits relate to UTAUT2 variables, and in sub-

model 3 elemental traits relate to compound traits. Therefore, this Doctoral Thesis argues that:

- Elemental traits, compound traits, and the antecedents of new technology use considered in UTAUT2, have the potential to directly motivate mobile banking use.
- Elemental traits and compound traits have the potential to directly influence the antecedents of mobile banking adoption and use considered in UTAUT2.
- Elemental traits are direct antecedents of compound traits.
- All relationships are showed in Figure 2.1, which illustrates the proposed model.

Source: Personal Elaboration

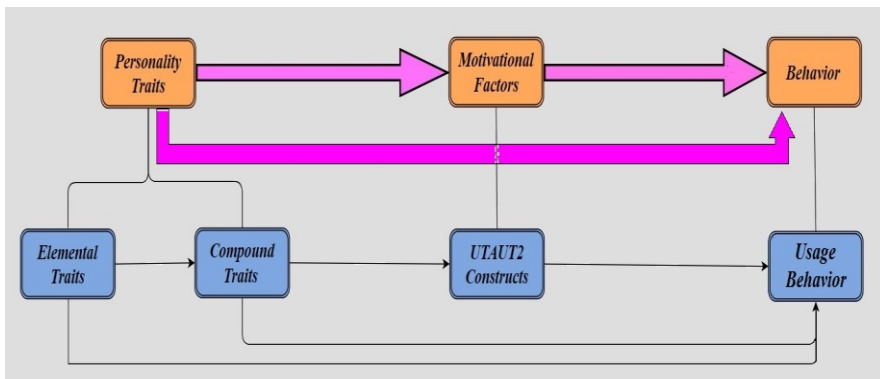


Figure 2.1: Logical Basement for Hypothesis Implementation

Applying the UTAUT2 model over the bases of the 3M model of motivation and personality, this Doctoral Thesis posits a new research model that considers the importance of personality traits (with the same hierarchy as the 3M model) in predicting mobile banking technology use, as well the importance of the motivational constructs of UTAUT2 to predict the use of mobile banking. This work may deliver an added value to the literature of technology adoption in general, focus on technology

use in new contexts (Lebanon), and highlight the main factors that influence the use of mobile banking in Lebanon.

In this chapter, Section 1 summarizes the literature regarding the previously used theories in the domain of technology adoption, selecting the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) as basis for establishing hypotheses. Section 2 reviews literature discussing personality theories and constructs. Finally, section 3 presents my research model and the proposed hypotheses.

2.1 THEORIES OF TECHNOLOGY ADOPTION AND USE

The following sections describe the more accepted theories and models on technology adoption and use. These theories and models have evolved over the years.

2.1.1 Diffusion of Innovation Theory

The aim of researches and studies that adopt the diffusion of innovation theory is to focus on how and why innovative technologies are being adopted and their different adoption rates (Rogers, 1962, 1983, 1995; Rogers & Schoemaker, 1971). The diffusion of innovation theory has been used in many fields starting from agricultural studies reaching to information system studies (Moore & Benbasat, 1991; Rogers, 2003).

Source: Rogers 1995

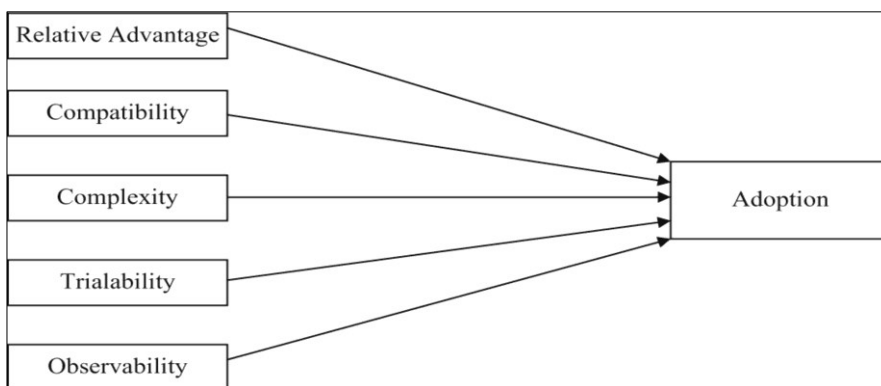


Figure 2.2: Diffusion of Innovation Theory (DIT)

According to DIT, the probability of adoption of any innovation varies as a result of five characteristics (Figure 2.2): relative advantage, complexity, compatibility, trialability, and observability (Rogers, 1995).

Relative advantage refers to the advantage and benefits assumed to be obtained after the innovation process took place, whereas, on the other hand, complexity refers to the degree of difficulty of technology usage (Moore & Benbasat, 1991). Compatibility is the degree in which an innovation is consistent and harmonious with the adopter's needs, values, experiences and wishes. Trialability is the degree in which an innovation can be tried or experienced before the usage and adoption stage. Finally observability, the final construct, is the extent to which the benefits and welfares of an innovation can be noticed, viewed and easily recognized (Rogers, 1995; 2003).

2.1.2 Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) was firstly developed by Fishbein and Ajzen (1975); however many studies consider to apply the more recent version of TRA from 1980 (Ajzen & Fishbein, 1980). According to Fishbein and Ajzen (1975) TRA hypothesizes that intentions are the pivotal antecedents of human behaviour as they mediate the effect of attitudes and subjective norms on this behaviour.

TRA has been considered as one of the most influential theories in the field of human behaviour, being used to investigate the attitude-behaviour relationship in many fields of study, not only in information systems technology (Magee, 2002).

TRA is based on four main assumptions (Fishbein & Ajzen, 1975): (i) individual behaviours are mostly determined and controlled by intentions; (ii) individuals are rational and before engaging in any action, they systematically consider their actions; (iii) humans are rational animals that use all kinds of available information regarding the situation before considering any behaviour, and (iv) human social behaviour is based and controlled through individual beliefs

Although the basic purpose of TRA is to study consumer behaviour, it has also been applied to many fields, such as breastfeeding, condom use, consumer behaviour, business, voting, exercising, agriculture and food (Manstead, Proffitt, & Smart, 1983; Kloebe, Thompson, & Miner, 1999; Magee, 2002; Holden & Karsh, 2009; Sparks, Shepherd, & Frewer, 1995; Sheppard, Hartwick, & Warshaw, 1988). Studies revealed a good support and validity of TRA (Sheppard, Hartwick, & Warshaw, 1988).

2.1.2.1 Variables and Relations

TRA defined intentions as “probability, as stated by the respondent, that he/she will perform the stated action” (Ajzen & Fishbein, 1980, p. 180). Those intentions immediately influence the behaviour and are based on attitudes and subjective norms. Attitudes are mainly based on positive and negative self-evaluations of certain behaviour and reflect the amount of “affect”, in other words, they stand for the person’s general feelings of favourableness or un-favourableness toward a certain concept (Fishbein & Ajzen, 1975). Subjective norms refer to an individual perception about what others will think about his/her behaviour, i.e., “the person’s own estimation of the social pressures whether to perform or not to perform the intended behaviour” (Ajzen & Fishbein, 1980, p. 6). Therefore, subjective norms focus on the influence of other people in the surrounding environment on the individual’s intention to perform behaviour.

As shown in Figure 2.3, attitudes, which are the first determinants of intentions, are influenced by behavioural beliefs and outcome evaluations (Fishbein & Ajzen, 1975). Behavioural beliefs are defined as the beliefs about the likelihood of various consequences, whereas outcome evaluations refer to how good or bad it would be if those consequences happened (Fishbein & Ajzen, 1975). Consequently attitudes are a set of behavioural beliefs of an individual regarding the positive or negative outcome of his/her behaviour (Fishbein & Ajzen, 1975).

Source: Fishbein and Ajzen 1975

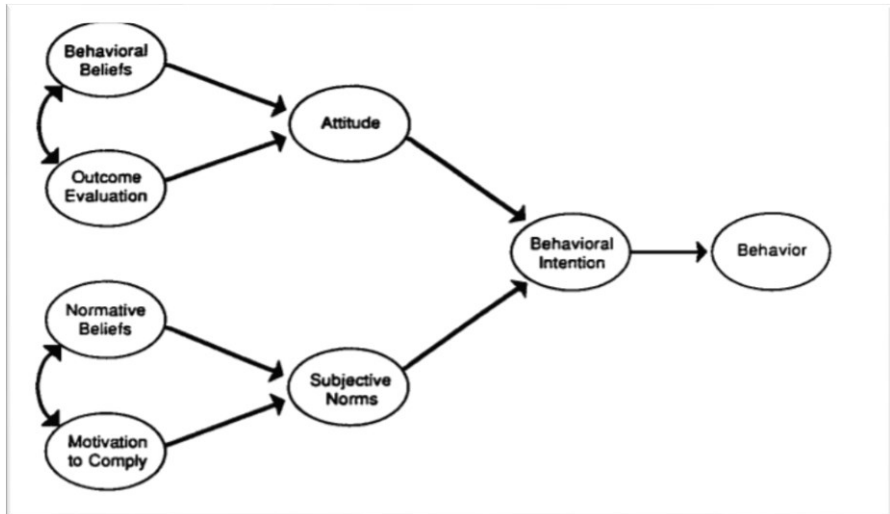


Figure 2.3: Theory of Reasoned Action (TRA)

Subjective norms are the second predictor of intentions, and they are influenced by normative beliefs and motivation to comply (Fishbein & Ajzen, 1975). Normative beliefs are viewed by TRA as the perception of family, friends, and close people about the results and outcomes of behaviour, whereas motivation to comply is viewed as the degree to which such normative beliefs influence human behaviour (Fishbein & Ajzen, 1975). Therefore, subjective norms are determined by the “perceived expectations of specific referent individuals or groups and by the person’s motivation to comply with those expectations” (Fishbein & Ajzen, 1975, p. 302).

2.1.2.2 Limitations

Scholars and researchers have identified gaps in TRA. They have stated that the model is too general, and it lacks to identify beliefs constructs that are determinants of attitudes (Davis, Bagozzi, & Warshaw, 1989). Some scholars have, as well, stated that TRA lacks situational analysis; it deals more with prediction rather than exact

situations and cases (i.e. attitudes and behaviour depend on evaluation and approximation) (Foxall, 1997).

According to Davies, Foxall and Pallister (2002) TRA seems to be incapable of comprehending the adoption of new technologies at the level of consumer behaviour, since actual behaviour is not measured accurately. Other researchers have identified a gap at the level of behavioural intentions, stating that attitudes may be predictors of usage or actual behaviour in some cases instead of predicting only intentions to use (Davies, Foxall, & Pallister, 2002).

2.1.3 Theory of Planned Behaviour (TPB)

The theory of Reasoned Action was enhanced and extended, resulting in a new theory known as Theory of Planned Behaviour (TPB). TPB includes one additional construct, known as perceived behaviour control, in order to measure the extent to which individuals do not have a complete control over their behaviour (Ajzen, 1985) (see Figure 2.3). TPB is considered to be more wide and general than TRA since it predicts all kinds of voluntary, planned and mandatory human behaviours (Chau & Hu 2002).

According to Li (2011) TPB helps study situations where individuals lack of sufficient resources and information to perform certain behaviour and, hence, they consider it mandatory.

TPB has been widely applied in many fields of study (Taylor & Todd, 1995) and empirical research has revealed significant results, all highlighting the importance of perceived behavioural control in determining both behavioural intentions and actual usage (e.g., Chau & Hu, 2001; Foxall, 1997; Madden, Thomas, Ellen, & Ajzen, 1992; Mathieson, 1991; Nguyen, Liu, Litsky, & Reinke, 1997; Taylor and Todd, 1995).

2.1.3.1 Variables and Relations

Based on what was proposed by Ajzen (1991) behaviour is now influenced by two main factors, intention and perceived behavioural control. In turn, intention is influenced by attitudes toward behaviour,

subjective norms, and perceived behavioural control (Figure 2.4). Intention remains to be the main motivational antecedent of behaviour; thus, the greater the strength of an intention to conduct an action, the greater the likelihood that such an action will be implemented.

Source: Ajzen 1985

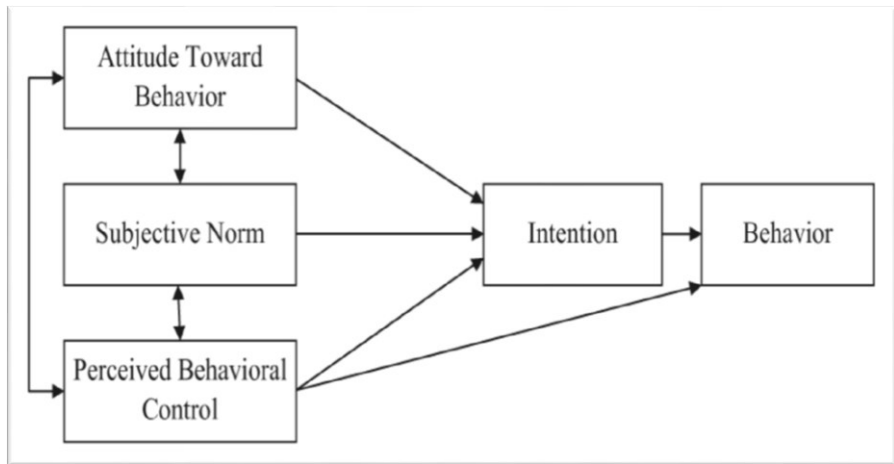


Figure 2.4: Theory of Planned Behaviour (TPB)

Attitude toward behaviour is defined as “the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question” (Ajzen, 1988, p. 188).

Another predictor of intentions is subjective norm defined as the societal pressure exerted on individuals in order to affect their behaviour; these norms may include a set of feelings, moral obligations, and responsibilities assisting in specifying and engaging in certain behaviour (Spil, 2006).

The last construct that predicts intention and distinguishes TRA from TPB is perceived behavioural control. The definition of perceived

behavioural control took many directions; it was firstly defined as the set of perceptions held by individuals regarding his/her ability to carry out certain behaviour (Ajzen & Fishbein, 1980). Later, perceived behavioural control was redefined as an individual's consideration regarding the ease or difficulty associated with conducting an action (Ajzen, (1991). This definition was also based on the linkage between perceived behavioural control and the self-efficacy concept, which refers to our own opinions and views on the way in which we carry out behaviours in potential circumstances (Ajzen, 1991).

Accordingly, three main perceptions were behind the creation of TPB: (i) behavioural beliefs regarding a behaviour produce favourable or unfavourable attitude concerning this behaviour; (ii) the normative beliefs about others' expectation generate social pressure or what is known as subjective norms; and (iii) control beliefs make individuals feel in control of their actions, which in turn rises their perceived behavioural control (Ajzen, 1991).

TPB hence predicts that are controlled by three main constructs in such a way that the more favourable the subjective norms and the attitudes and the greater the perceived behavioural control of an individual, the greater the intention to perform a behaviour, leading in turn to the likelihood of actual behaviour (Ajzen, 2002). The construct perceived behavioural control is considered also a direct predictor of behaviour. Ajzen (1991) argued that in situations where intentions could not act as the major predictor of behaviour, perceived behavioural control would be the major predictor of intentions as well as behaviour.

A new theory called Decomposed Theory of Planned Behaviour (DTPB) was born based on TPB (Taylor & Todd, 1995). DTPB is an integration of TRA, TPB and other key constructs (Taylor & Todd, 1995). The three main constructs that formed TPB were all decomposed into many other constructs (see Figure 2.5). Attitude was therefore predicted by perceived ease of use, perceived usefulness, and compatibility. Subjective norms were predicted by two normative beliefs known as peer influence and superior influence. Finally, perceived behavioural control was predicted by three control beliefs: self-efficacy,

technology facilitating conditions, and resource facilitating conditions (Taylor & Todd, 1995).

Source: Taylor and Todd 1995

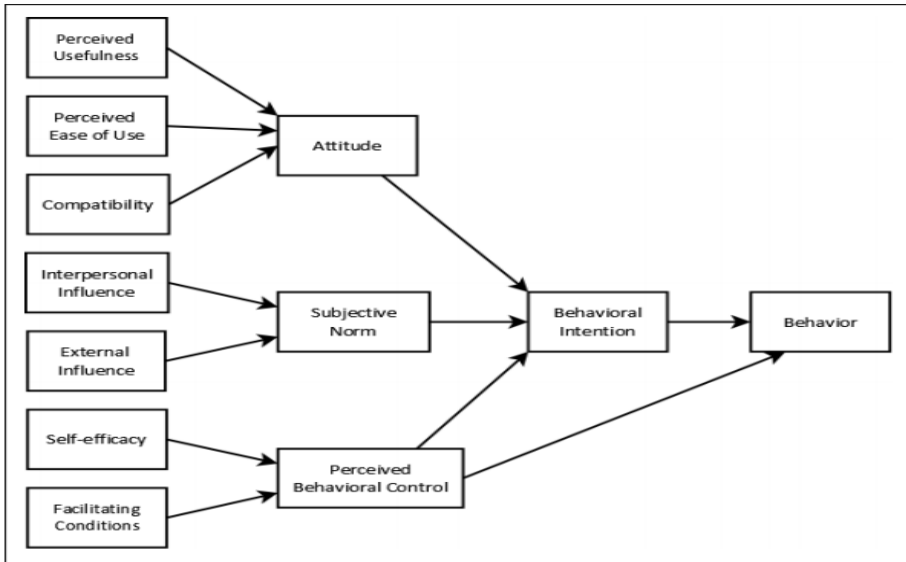


Figure 2.5: Decomposed Theory of Planned Behaviour (DTPB)

Perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort” while perceived usefulness refers to “the degree to which a person believes that using a particular technology will enhance his performance” (Davis, 1989, p. 320). Compatibility refers to “the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters” (Moore & Benbasat, 1991, p. 195).

Peer influence or what is known as internal influence, is viewed as the influence exerted by close people such as family, friends, or colleagues. Superior influence or external influence is defined as the

influence of mass media reports, experts, opinions, or other non-personal information (Hsu & Chiu, 2004; Lin, 2007).

Finally the term self-efficacy refers to the self-confidence of individuals in performing behaviour (Compeau & Higgins, 1995), whereas facilitating conditions refers to the external resources that facilitate the engagement in certain behaviour (Ajzen, 1999, 2002; Lin, 2007).

The research model of DTPB has been applied to a huge variety of successful researches (e.g., Pavlou & Fygenson, 2006; Hsu & Chiu, 2004; Lin, 2007).

2.1.3.2 Limitations

According to many scholars TPB did not solve all gaps found with the previous TRA. Foxall (1997) argued that the constructs used to predict intentions and behaviours are not sufficient (i.e. other constructs may as well predict behaviours and intentions). The constructs all depend on expectations and particular situations. It was seen that the concepts of behaviour and intention were predicted based on assumptions, expectations and approximations (Foxall, 1997), whereas concrete and precise factors to predict behaviour and intentions were missed.

Furthermore, Manstead and Parker (1995) argued that the variance in behavioural intentions may result in personal norms and not only in behaviour towards technology adoption. They stated that behavioural intentions do not always predict behaviours, but they may be a direct predictor of personal norms instead.

Finally Ajzen (1991) noted that TPB is a model open for further expansion, expressing that some other future developments may fulfil TPB gaps.

2.1.4 Technology Acceptance Model (TAM)

With the growing technology needs in 1970's and with the failure of researches to come up and carry out a reliable model that could explain system acceptance or rejection, Davis (1985) proposed a new theory

based on the previous work of TRA. This theory was called Technology Acceptance Model (TAM). TAM was proposed to explain the potential user's behavioural intention to use a technological innovation (Chismar & Wiley-Patton, 2002; Roneteltap, Van Trijp, Renes, & Frewer, 2007; Venkatesh, 2000).

The first TAM version was mainly focused on user motivation (see Figure 2.6). External variables or what is known as the system features, were the predictors of user motivation, which in turn predicts response or what is noted as the actual usage of new technology (Chuttur, 2009).

Source: Davis 1989

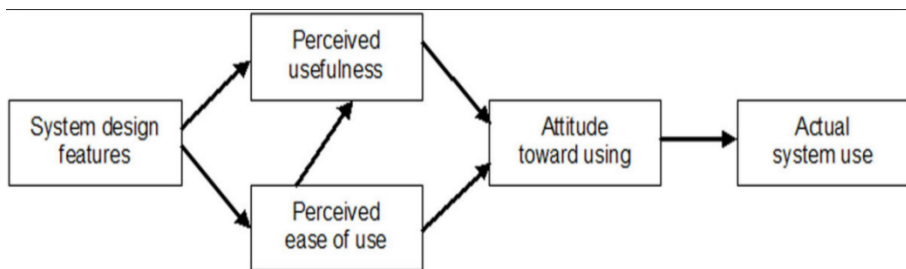


Figure 2.6: Theory of Technology Acceptance Model First Version (TAM)

This first version was edited several times. Davis, Bagozzi, and Warshaw (1989) modified TAM by integrating behavioural intention to the previous model developed by Davis (1989). The model explained that people may directly form a positive intention to use a system because they perceived the system to be useful. Further, the next empirical modification was held by Davis & Venkatech (1996), who proposed that attitude was not found to fully mediate the relation between perceived usefulness and behavioural intention (see Figure 2.7).

Source: Davis, Bagozzi, and Warshaw 1989

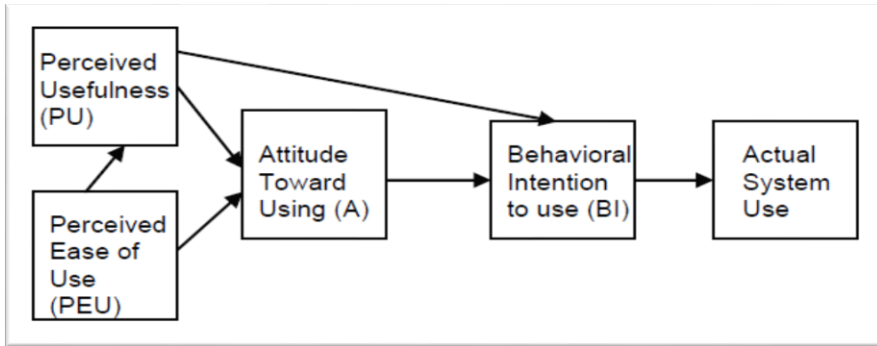


Figure 2.7: Theory of Technology Acceptance Model Second Version (TAM)

Finally, the last version of TAM considered three main constructs: perceived usefulness, perceived ease of use, and behavioural intentions. Perceived ease of use predicts both, perceived usefulness and behavioural intentions. In turn, perceived usefulness also predicts behavioural intentions. Finally, behavioural intentions are the direct predictors of actual technology usage (Davis & Venkatech, 1996) (see Figure 2.8).

Source: Venkatesh 1996

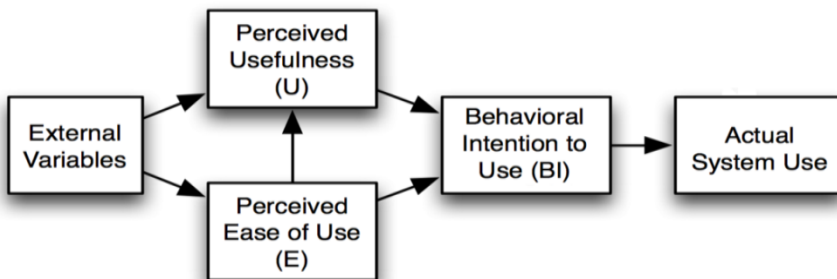


Figure 2.8: Theory of Technology Acceptance Model Third version (TAM)

TAM was originally developed to ease the management of new technologies in organizational settings, before it was declared by Phan and Daim (2011) to be a universal theory applicable to different contexts, including individual ones.

Without any doubts, TAM remains the most dominant and widespread applied theory for explaining acceptance and use of technology, which can be supported by the number of journal citations, since it has reached over 15,000 citations by the year 2016 (Google Scholar 2016). Furthermore, it has been employed to explain mobile banking (Pikkarainen, Pikkarainen, Karjaluoto, & Pahlila, 2004), online shopping (Vijayasarathy, 2004), social media (Rauniar, Rawski, Yang, & Johnson, 2014), and e-commerce (Crespo, De Los Salmones, & Del Bosque, 2013), among others.

Many factors have contributed to the prominent, popular and widely usage of TAM in studies concerning user acceptance of technology. The first chief reason why TAM has been used widely is the simple, easy, and parsimonious structure of the model, which could adequately explain and predict the intention and usage of technology (Agarwal & Prasad, 1999). Moreover, TAM has well validated measurement scales for its constructs, with a high explanatory power (Lee, Kozar, & Larsen, 2003; Srite, 2006; Meister & Compeau, 2002). These have been a brilliant advantage of TAM, as they have enabled researchers to attach and expand additional factors relevant to technology adoption behaviour (Venkatesh, Davis, Morris, & Davis, 2003).

2.1.4.1 Variables and Relations

The first version of TAM focuses on user motivation, which was integrated by three main concepts: perceived ease of use, perceived usefulness, and attitude (Davis, 1989). Perceived ease of use and perceived usefulness affects attitude that in turn influences a fourth variable called “actual usage” (Davis, 1989).

The construct definition of attitude was mainly adopted from the previous TRA. On the other side, perceived ease of use was defined as the perception of an user on the level of difficulty faced when using a new technology (i.e. the easiness of function of any technology used), while perceived usefulness was defined as the perception of benefits to be attained from any usage of the new technology (Venkatesh, 2000). These two constructs are related, so that perceived ease of use influences perceived usefulness, in such a way that the easier the use of technology is the more useful it will be (Venkatesh, 2000).

The next version of TAM was differentiated from the first one by the addition of a new construct called behavioural intention (Davis, Bagozzi, & Warshaw, 1989). The same relations were kept from the previous model of TAM. The definition of behavioural intention was adopted from the previous TRA. According to Davis, Bagozzi, and Warshaw (1989), behavioural intentions was mainly predicted by attitudes and perceived usefulness, thus enabling behavioural intentions to be the direct predictor of actual usage. The direct relationship between perceived usefulness and behavioural intentions implies that the more welfare received from the usage of a new technology the greater the intention to use the new technology (Venkatesh, 2000).

The final version of TAM was edited by Davis and Venkatech (1996). The argument between scholars was concerning attitudes, with studies confirming the useless role that attitudes play in mediating the impact of perceived usefulness and perceived ease of use on behavioural intentions (Venkatesh, 1999).

Previous studies employing TAM have confirmed the direct influence of perceived ease of use and perceived usefulness on behavioural intention and the elimination of attitudes (Chuttur, 2009; Schepers & Wetzels, 2007; Srite & Karahanna, 2006; Sun & Zhang, 2006).

2.1.4.2 Limitations

TAM has been widely used and it has been a base tool to predict end user acceptance of technology in its early stages, due to its simplicity and

straightforwardness (Venkatesh, Davis, Morris, & Davis, 2003). However, this wide spread of TAM has also provided a wide base for criticism (Horton, Buck, Waterson, & Clegg, 2001). TAM has been also considered as TPB: a supplier of general information concerning user opinions on new technologies, where, for example, perceived usefulness for a customer can be decided based on a wide range of technology aspects (Taylor & Todd, 1995). Thus, by merely measuring perceived usefulness, a lot of information is lost in particular, such as reasons why the technology is perceived to be useful (Taylor & Todd, 1995; Mathieson, 1991).

Furthermore, TAM lacks demographical constructs, so that it remains deprived of the measure of any personal profile constructs such as age, gender etc. (Davis, Bagozzi, & Warshaw, 1989). Some researchers have also suggested that excluding constructs such as subjective norms, technology type, culture, and type of users indicates a weakness of TAM (King & He, 2006; Schepers & Wetzels, 2007).

Additionally, TAM misses to address the perception of barriers of usage in the context of technology (Porter & Donthu, 2006). TAM was developed at the level of individual context, but unfortunately it has been inappropriately over used at group or organizational level by many researchers (Lee, Kozar, & Larsen, 2003; Lucas, Swanson, & Zmud, 2007). Finally, many researchers have argued that TAM is difficult to put into practice, preventing management from using it to implement new technology usage (Lucas, Swanson, & Zmud, 2007; Lee, Kozar, & Larsen, 2003).

2.1.5 Theory of Technology Acceptance Model 2 (TAM2)

To overcome the limitations of the previous TAM a new model was developed by Venkatesh and Davis (2000) called Technology Acceptance Model 2 (TAM2). Based on the same principals and ideology of TAM, the new model aimed to increase the explanatory power of TAM by adding new constructs that affect perceived usefulness and behavioural intention (Venkatesh & Davis, 2000).

According to Chuttur (2009) TAM2 is a more comprehensive model, as new variables were incorporated in order to explain the preferences for any new system or technology, in addition to exploring the impact of social constructs (subjective norms) on usefulness and intention to use a technology (see Figure 2.9).

Source: Venkatesh and Davis 2000

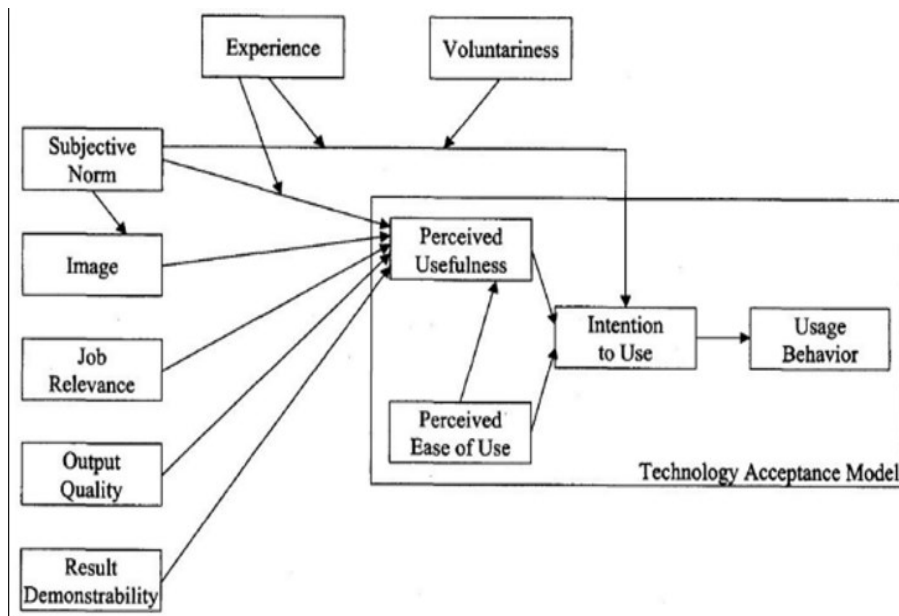


Figure 2.9: Theory of Technology Acceptance Model 2 (TAM2)

Legris, Ingham, and Collette (2003) stated that the new added constructs can be integrated in two main categories: social influence and cognitive instrumental processes. These two main categories were considered essential to the study of user acceptance of new technologies (Wu, Chou, Weng, & Huang, 2011).

Researchers have approved the validity and reliability of TAM2 through four longitudinal studies applied to organizational contexts.

TAM2 has explained 60% of variance of behavioural intentions, as well as 60% of variance of overall user acceptance and usage of new information technologies (Venkatesh & Davis, 2000).

2.1.5.1 Variables and Relations

Seven new constructs were added that distinguish TAM2 from TAM. These new constructs were integrated into two categories: social influence and cognitive instrumental process. Social influence includes subjective norms, voluntariness and image, whereas cognitive instrumental process incorporates the four remaining constructs, job relevance, output quality, result demonstrability, and experience (Porter & Donthu, 2006; Venkatesh & Davis, 2000).

Starting by the first construct, subjective norms, its definition was mainly adopted from previous studies and it is “the person’s perception that most people who are important to him think he should or should not perform the behaviour in question” (Fishbein & Ajzen, 1975, p. 302). Subjective norms are considered to have a positive relation with perceived usefulness. The relationship between these two constructs is explained based on the concept of internalization developed by Kelman (1958). Thus, if an employee notices that his/her supervisor considers that using a new system is useful in their work; he/she (employee) may as well start thinking that the new system is useful.

Subjective norms have been found to have a relationship with behavioural intention. According to Venkatesh and Davis (2000), people may intent to perform a behaviour based on the beliefs of important referent people. So, they may perform the behaviour even though they may not have positive feelings towards performing it.

Image is the second new construct in TAM2. Image is defined as the degree to which using a new system of technology will enhance an individual’s social level among peers (Venkatesh & Davis, 2000). Image is related to subjective norms based on the term “identification” (Kelman, 1958). Therefore, if important organizational employees have faith in a system, then the use by an employee of such system will develop his/her status among colleagues.

Moreover, image has a direct effect on perceived usefulness. If a person believes that using the system will improve his/her status in a certain organization, this will directly increase the productivity and effectiveness of the system, which means increasing perceived usefulness (Venkatesh & Davis, 2000).

The relation proposed in TAM2 of subjective norms with both perceived usefulness and behavioural intentions is moderated by two new constructs: voluntariness and experience (Venkatesh & Davis, 2000).

Voluntariness is considered the opposite of mandatory and is defined as a decision in non-mandatory situations (Venkatesh & Davis, 2000). Hartwick and Barki (1994) found a significant relation between subjective norms and behavioural intentions in cases where the system usage is considered to be mandatory.

TAM2 also posits that experience moderates the relation between subjective norms, perceived usefulness and behavioural intentions. Venkatesh & Davis (2000) maintained in their studies that initial decision making and initial behaviour relies on other people's opinions (i.e. subjective norms), but as time goes by (i.e. increased experience), behaviours and intentions to behave will be based on experience and not on others' opinions.

The remaining cognitive instrumental processes in TAM2: job relevance, output quality, result demonstrability, are predictors of perceived usefulness (Venkatesh & Davis, 2000). Job relevance refers to the extent to which an individual considers using a system to be applicable in his/her job. Output quality is defined as the extent to which a used system or technology is evaluated in performing tasks. Finally, result demonstrability refers to the extent to which a system user can attribute his/her performance increase to the system or technology usage (Moore and Benbasat 1991).

2.1.5.2 Limitations

Even if TAM2 was extended from the previous TAM, it cannot overcome previous inherited limitations presented by TAM (Wilkins, Swatman, & Holt, 2009). Furthermore, all the new constructs were directed only towards the prediction of perceived usefulness, whereas no other constructs were added to predict perceived ease of uses or even intention and behaviour (Abbasi, 2011). Thus, TAM2 was considered to have the same limitations as TAM.

2.1.6 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was created based on the integration of eight theories (TRA – TPB – TAM – TAM2 – IDT – SCT – MM – MPCU), that has been used in a large number of previous studies. This merge created a unified theoretical basis for a new technology adoption behaviours framework, known as the unified theory of acceptance and use of technology (Venkatesh, Davis, Morris, & Davis, 2003) (see Figure 2.10).

UTAUT has been considered as a base line model that has been applied to a variety of technological studies in organizational and non-organizational settings. For example, UTAUT has been employed to explain technology intention to use location-based services (Xu & Gupta, 2009), mobile technologies (Park, Yang, & Lehto, 2007), mobile banking (Zhou, Lu, & Wang, 2010), Internet banking (Im & Hong, 2011), and health information technologies (Kijisanayotin, Pannarunothai, & Speedie, 2009).

UTAUT has explained around 70% of variance of intention to use technological services, as well as around 50% of variance of technology usage (Venkatesh, Thong, & Xu, 2012).

Source: Venkatesh, Davis, Morris, and Davis, 2003

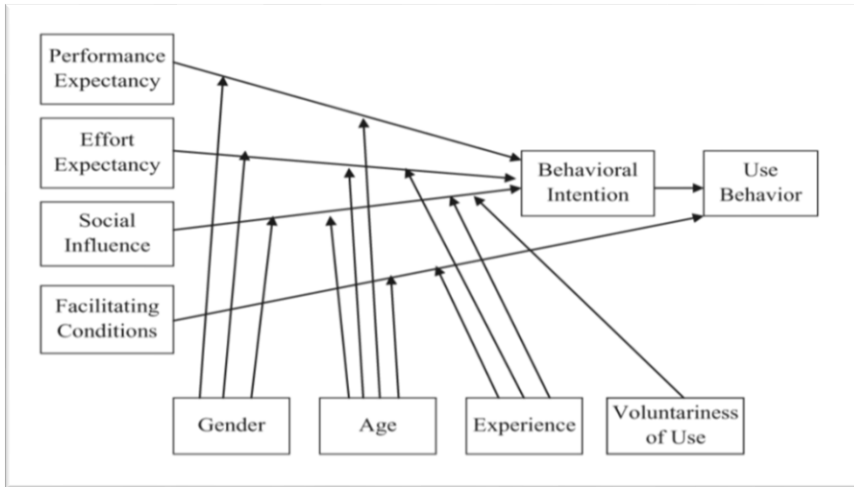


Figure 2.10: Unified Theory of Acceptance and Use of Technology (UTAUT)

2.1.6.1 Variables and Relations

This theory postulates four main determinants of intention and usage of new technology and four moderators on the effects of the core constructs in the model. As Figure 2.19 shows, performance expectancy, effort expectancy, and social influence are the main antecedents of intention. Next, intentions and facilitating conditions are the direct antecedents of use behaviour.

Venkatesh Davis, Morris, and Davis, (2003, p. 12), defined: performance expectancy as “the degree to which an individual believes that the use of the system will help him or her to attain gains in job performance”; effort expectancy as the “degree of ease associated with the use of the system”; social influence as “the degree to which an individual perceives that others believe he or she should use the new system”; and, finally, facilitating conditions as “the degree to which an

individual believes that an organizational and technical infrastructure exists to support use of the system”.

UTAUT also considers four moderators. Age, gender, experience, and voluntariness moderate some of the relationships proposed (Venkatesh, Davis, Morris, & Davis, 2003).

Thus, according to Venkatesh Davis, Morris, and Davis, (2003), performance expectancy is a positive antecedent of intention to use, and this relationship is moderated by age and gender. Effort expectancy also has a positive effect on intention to use the new technology, and this effect is moderated by three variables (age, gender and experience). In the same sense, the third main construct, social influence, also has a positive effect on intention to use new technology, and this effect is moderated by the four variables: age, gender, experience and voluntariness.

The construct facilitating conditions also has a positive effect on the use of the new technology, and this relationship is moderated by two variables (age and gender). The final relationship posed by UTAUT is between intention to use the new technology and actual usage of the new technology, which is also considered a positive relationship (Venkatesh, Davis, Morris, & Davis, 2003).

2.1.6.2 Limitations

UTAUT appears to be a recreation of the theory of planned behaviour and the theory of reasoned action (Benbasat & Barki, 2007). UTAUT was developed using the same constructs but with different names (for example: perceived usefulness and performance expectancy; perceived ease of use and effort expectancy) or even with some other identical constructs (for example: facilitating conditions) that existed in the decomposed theory of planned behaviour (Benbasat & Barki, 2007).

UTAUT has been hardly criticized because it was developed to address technology adoption and acceptance of non-users in an organizational context only, i.e., UTAUT was proposed to explain the adoption of technology from an employees' perspective (Bouwman,

Carlsson, Molina-Castillo, & Walden, 2007). In addition, critics have argued that UTAUT still neglects important independent variables such as cost and individual differences (Bagozzi, 2007). Researches needed to identify adoption causes, as well as to address in a broader, accurate, and efficient manner the customer perspective.

Furthermore, in spite of the good performance of UTAUT in the original study by Venkatesh, Davis, Morris, & Davis (2003), a number of studies have recognized poor predictive power of UTAUT (Chiu, Fang, & Tseng, 2010). In their meta-analysis, Dwivedi, Rana, Chen, and Williams (2011) found that UTAUT only predicted 39% of variance in behavioural intention and 40% of variance in usage, very different from the approximately 70% of variance in behavioural intention of the original study by Venkatesh, Davis, Morris, and Davis (2003).

2.1.7 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)

UTAUT was therefore extended to UTAUT2, which focuses on the consumer perspectives regarding technology adoption (Venkatesh, Thong, & Xu, 2012). Mainly, what distinguishes UTAUT2 from UTAUT is the integration of new user constructs.

2.1.7.1 Variables and Relations

Venkatesh, Thonh, and Xu (2012) proposed three new constructs and relationships to move from an employee perspective to a customer point of view regarding new technology intention and usage (see Figure 2.11).

Hedonic motivation, price value, and habit were incorporated to UTAUT2, forming a new set of relationships among the constructs. The new constructs were defined as follows (Venkatesh, Thong, & Xu, 2012, p. 163): hedonic motivation is “an enjoyment or happiness resultant from using a technology and play significant part in determining new technology adoption”; habit is “the extents to which people tend to perform behaviours automatically because of learning equate habit with automaticity”; and, finally, price value is a “consumer’s cognitive trade-

off between the perceived benefits of the applications and the monetary cost for using them”.

Source: Venkatesh, Thonh, and Xu, 2012

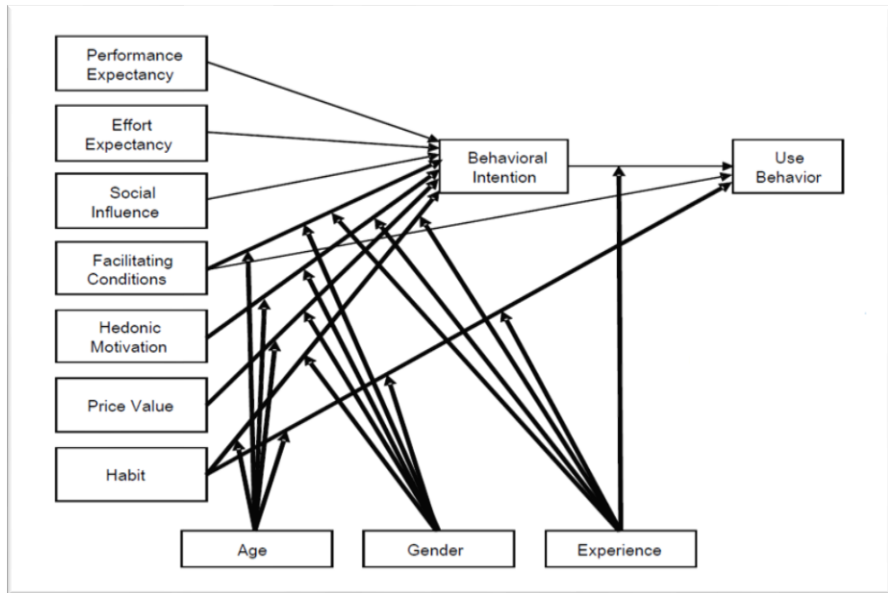


Figure 2.11: Unified Theory of Acceptance and Use of Technology Two (UTAUT2)

Before the development of UTAUT2, hedonic motivation had been found to have a strong relationship with technology usage at the level of consumer behaviour in the hedonic-motivation system adoption model that was developed as an alternative to TAM (Brown & Venkatesh, 2005; Van, 2004; Nysveen, Pedersen, & Thorbjorsen, 2005). Investigations regarding hedonic motivation have proved that the level of enjoyment while using a new technology is a consistent and strong predictor of user acceptance behaviour toward such technology (Children, Carr, Peck, & Carson, 2001). Accordingly, UTAUT2

integrates the positive effect of hedonic motivation on intention to use the new technology (Venkatesh, Thong, & Xu, 2012).

Price value was incorporated into UTAUT2, due to the important impact of price in decision making processes. Price value is a more important indicator for users than for employees, since users evaluate cost compared to the quality and benefits obtained from using the technology more than employees do (Zeithaml, 1988). The construct “price value” is considered a positive antecedent of intention to use the new technology, in other words, when the benefits obtained from using a technology are greater than the monetary cost of using this technology, consumers will be more likely to use this technology (Venkatesh, Davis, Morris, & Davis, 2003). Age and gender are moderators of the relation between price value and intention to use the new technology.

The last inclusion was habit. It was identified as a new theoretical concept and predictor of technology use from a customer perspective (Davis & Venkatesh, 2004; Limayem & Hirt, 2003; Malhotra, Kim, & Patil, 2006).

Prior researches had discussed whether habit influences intention to adopt the new technology or actual use of the technology (Aarts & Dijkstrehuis, 2000; Kim & Malhotra, 2005). On the one hand, the habit influence on intention is explained by the fact that attitudes, which can trigger intentions, result from repeated actions of behaviour (Venkatesh, Thong, & Xu, 2012). On the other hand, habit can directly influence behaviour, as habituation is generated from repeated actions and performances, which are sufficient to stimulate a specific behaviour on an individual (Ronis, Yates, & Kirscht, 1989; Verplanken, Aarts, Van, & Moonen, 1998).

2.1.7.2 Limitations

Although UTAUT2 has explained 70% of variance of behavioural intentions, it is still debated (Venkatesh, Thong, & Xu, 2012). One of the limitations of UTAUT was that due to the number of independent variables the model remained to be too debatable (Bagozzi, 2007). The

same can be said regarding UTAUT2, which integrates a bunch of independent variables.

Moreover, thorough the review of 56 quantitative m-commerce, m-banking, and m-payment studies, Emma, Michael, and Yogesh (2013) revealed that a total of 269 relationships had been examined, of which 63 relationships had been analysed by two or more different studies. Of these 63 relationships, several constructs are not represented in UTAUT2 (for example, self-efficacy, innovativeness, trialability, trustworthiness, perceived risks, etc.). This supports the argument that many other factors influencing the adoption of technology can be added to UTAUT2. In this line, Venkatesh, Thonh, & Xu (2012) stated that future research should attempt to identify other key constructs to different research contexts in order to extend UTAUT2.

2.1.8 Revision of Studies

The previously mentioned theories have been used intensively in the field of mobile banking adoption. Table 2.1 summarizes the most important studies conducted in the field starting from the year 2003.

Table 2.1: Summary of Empirical Researches Using Different Technology Adoption Theories

Authors	Research Models	Sampling & Countries	Main Findings
Brown et al. [2003]	IDT and DTPB	162 questionnaires collected from convenience and online sampling in South Africa	Relative advantage, trialability, number of banking services, and risk significantly influence mobile banking adoption

<p>Suoranta and Mattila [2003]</p>	<p>Bass diffusion model and IDT</p>	<p>1253 samples drawn from one major Finnish bank by the postal survey in Finland</p>	<p>Information sources (i.e., interpersonal word-of-mouth), age, and household income significantly influence mobile banking adoption.</p>
<p>Siu, Chan, Lu, and Ming [2004]</p>	<p>TAM and Social cognitive theory</p>	<p>634 questionnaires are collected from undergraduates and graduates universities in Hong Kong</p>	<p>Perceived usefulness, perceived ease of use, subject norm, and self-efficacy are the main factors influencing an adoption and continuous usage of new technology.</p>
<p>Luarn and Lin [2005]</p>	<p>TAM and TPB (Extended TAM)</p>	<p>180 respondents are surveyed at an e-commerce exposition and symposium in Taiwan</p>	<p>Perceived self-efficacy, financial cost, creditability, perceived ease-of-use, and perceived usefulness had remarkable impact on</p>
<p>Laforet and Li [2005]</p>	<p>Attitude Motivation, and behaviour</p>	<p>300 respondents randomly interviewed in the streets of six major cities in China</p>	<p>Awareness, confidential and security, past experience with computer and new technology are salient factors influencing mobile banking adoption</p>

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<p>Laukkanen [2007]</p>	<p>Mean-end Theory</p>	<p>20 qualitative in-depth interviews conducted with a large Scandinavian bank customers in Finland</p>	<p>Perceived benefits (i.e., location free and efficiency) are main factors encouraging people to adopt mobile banking</p>
<p>Ratten [2007]</p>	<p>Social cognitive theory</p>	<p>203 Australian youths respondents a surveyed via mail and telephone techniques in Australia</p>	<p>Media exposure, modelling of other, outcome expectancy, self-efficacy and outcome values were proposed to influence the behavioural intention to use mobile banking</p>
<p>Amin et al. [2008]</p>	<p>TAM</p>	<p>156 respondents obtained via convenience samp</p>	<p>Perceived usefulness, easy-of-use, credibility, amount of information, and normative pressure significantly influence the adoption of mobile banking</p>
<p>Laukkanen and Pasanen [2008]</p>	<p>Diffusion of Innovation Theory (DIT)</p>	<p>2675 questionnaires completed via the log-out page of a bank in Finland</p>	<p>Demographics such as education, occupation, household income, and size of the household do not influence mobile banking adoption, while age and gender are main differentiating variables.</p>

<p>Yang [2009]</p>	<p>Item Response Theory (IRT)</p>	<p>178 students selected from a university in South Taiwan</p>	<p>Adoption factors are location-free conveniences, cost effective, and fulfil personal banking needs, while resist factors are concerns on security and basic fees for connecting to mobile banking</p>
<p>Gimun Kim, BongSik Shin and Ho Geun Lee [2009]</p>	<p>IDT and Trust</p>	<p>192 samples of cellular-phone users in Korea</p>	<p>Relative benefits, propensity to trust and structural assurances had a significant effect on initial trust in mobile banking. As well initial trust and relative benefits was vital in promoting personal intention to make use of mobile banking</p>
<p>Ja-Chul Gu, Sang-Chul Lee and Yung-Ho Suh [2009]</p>	<p>Extended TAM</p>	<p>910 usable responses from customers who used mobile banking service within WooriBank in Korea.</p>	<p>Self-efficacy, perceived usefulness, trust and perceived ease-of-use have significant effect on behavioural intention in mobile banking</p>
<p>Lee and Chung [2009]</p>	<p>DeLone's and McLean's Information System Success Model: IS Theory</p>	<p>276 questionnaires are collected from online sampling in South Korea</p>	<p>System quality and the information quality significantly influenced customer's trust and satisfaction</p>

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<p>Ja, Sang, and Yung [2009]</p>	<p>TAM and TRA</p>	<p>910 respondents from web based surveyed and randomly interviewed managers of banking company in South Korea.</p>	<p>Perceived self-efficacy, perceived ease-of-use, perceived usefulness and trust are the main factors that influence behavioural intention to adopt mobile banking</p>
<p>Koenig-Lewis, Palmer, and Moll [2010]</p>	<p>TAM and IDT</p>	<p>155 questionnaires are collected from participants in Germany, aged between 18 and 35 years old</p>	<p>Compatibility, perceived usefulness, and risk are influential factors for customer to adopt mobile banking services</p>
<p>Zhou, Lu, and Wang [2010]</p>	<p>UTAUT and TTF</p>	<p>250 questionnaires are collected from two universities and three service halls in eastern China</p>	<p>Performance expectancy, task technology fit, social influence, and facilitating conditions had significant effects on user adoption and task technology.</p>
<p>Masinge [2010]</p>	<p>TAM and TPB</p>	<p>450 questionnaires are collected from participants in Gauteng Province, South Africa.</p>	<p>Perceived usefulness has a significant impact on the adoption of mobile banking by the BOP</p>

<p>Cruz et al. [2010]</p>	<p>TAM and theory of resistance to innovation</p>	<p>3585 respondents collected through an online survey in Brazil</p>	<p>The cost barrier and perceived risk are highest rejection motives, following are unsuitable device, complexity, and lack of information.</p>
<p>Riquelme and Rios [2010]</p>	<p>TAM, TPB, and IDT</p>	<p>681 samples drawn from the population of Singapore</p>	<p>Usefulness, social norms, risk influences the intention to adopt mobile banking</p>
<p>Xin Luo, Han Li, Jie Zhang and J.P. Shim [2010]</p>	<p>Multidimensional Trust, multi-faceted risk perception, self-efficacy.</p>	<p>180 undergraduate students enrolled in general business core courses in US</p>	<p>Risk perception, derived from eight different facets, is a salient antecedent to innovative technology acceptance</p>
<p>Puschel et al. [2010]</p>	<p>IDT and DTPB</p>	<p>666 respondents surveyed on an online questionnaire in Brazil</p>	<p>Relative advantages, visibility, compatibility, and perceived easy-of-use significantly affects attitude, and attitudes, subjective norm, and perceived behavioural control significantly affects intention.</p>

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<p>Yung-Cheng Shena, Chun-Yao Huangb, Chia-Hsien Chua and Chih-Ting Hsu [2010]</p>	<p>Benefit-Cost framework</p>	<p>400 respondents of working class people were used in the study</p>	<p>It was found that the convenience benefit and the security cost both influence the adoption intention of the mobile banking systems</p>
<p>Natarjan et al. [2010]</p>	<p>Analytical Hierarchy Process Model (AHP)</p>	<p>40 data obtained from a bank in India</p>	<p>Purpose, perceived risk, benefits, and requirements are main criteria to influence people to choose banking channels.</p>
<p>Tao Zhou, Yaobin Lu and Bin Wang [2010]</p>	<p>Integrating (TTF) and (UTAUT)</p>	<p>250 surveys collected from universities and service halls of China Mobile and China Unicom branches.</p>	<p>Performance expectancy, task technology fit, social influence, and facilitating conditions have significant effects on user adoption. In addition, significant effect of task technology fit on performance expectancy was found</p>
<p>Koenig-Lewis et al. [2010]</p>	<p>TAM and IDT</p>	<p>155 consumers aged 18-35 collected via online survey in Germany</p>	<p>perceived usefulness, compatibility, and risk are significant factors, while perceived costs, easy-of-use, credibility, and trust are not salient factors</p>

<p>Sripalawat et al. [2011]</p>	<p>TAM and TPB</p>	<p>195 questionnaires collected via online survey in Thailand</p>	<p>Subjective norm is the most influential factor, the following is perceived usefulness and self-efficacy</p>
<p>Dasgupta et al. [2011]</p>	<p>TAM</p>	<p>325 usable questionnaires gathered from MBA students in India</p>	<p>Perceived usefulness, easy-of-use, image, value, self-efficacy, and credibility significantly affect intentions toward mobile banking.</p>
<p>Hsiu-Fen Lin [2011]</p>	<p>IDT and Knowledge based Trust theory</p>	<p>368 surveys of students and mobile banking customers provided by one public and three private banks in Taiwan</p>	<p>Perceived relative advantage, ease of use, compatibility, competence and integrity significantly influence attitude, that lead to behavioural intention to adopt (or continue-to-use) mobile banking</p>
<p>Sripalawat, Thongmak, and Ngramyard [2011]</p>	<p>TAM and TPB</p>	<p>200 questionnaires were distributed to banking customer and mobile users in Bangkok metropolitan areas</p>	<p>Subjective norm is the most influential factors affecting mobile banking acceptance.</p>

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<p>Daud, Kassim, Said, and Noor [2011]</p>	<p>TAM</p>	<p>330 questionnaires are collected from the customers of 11 banks in Malaysia</p>	<p>Perceived usefulness, perceived credibility and awareness are significantly influence on customer intention to adopt.</p>
<p>Philip O'Reilly, Aidan Duane and Pavel Andreev [2012]</p>	<p>Trust Theory Model</p>	<p>141 survey of Irish Smart Phone users</p>	<p>Pull-based model (Where consumers have high levels of control over the transaction process) is the model consumers are most likely to adopt, and most likely to use to make M-Payments.</p>
<p>Tao Zhou, Hangzhou Dianzi [2012]</p>	<p>IDT, UTAUT, and TAM</p>	<p>240 questionnaires are collected from a survey at a university located in Eastern China</p>	<p>Central cues, peripheral cues, and self-efficacy are significant effects on initial trust in mobile banking</p>
<p>Tao Zhou [2012]</p>	<p>UTAUT and Privacy risk</p>	<p>191 surveys obtained from outlets of China Mobile and China Unicom</p>	<p>Usage is affected by performance expectancy, effort expectancy and perceived risk</p>

<p>Yu [2012]</p>	<p>UTAUT</p>	<p>441 respondents are randomly surveyed in major Taipei downtown areas</p>	<p>Social influence, perceived financial cost, performance expectancy and perceived credibility are the most significant factors that influenced individual intention to adopt mobile banking service.</p>
<p>Yong-Ki Lee, Jong-Hyun Park, Namho Chung and Alisha Blakeney [2012]</p>	<p>TAM and TTF theory combining personal characteristics to them</p>	<p>240 surveys of customers using Internet banking services of local banks in Korea</p>	<p>Personal innovativeness significantly influences perceived ease-of-use. Absorptive capacity affects usage intention. Perceived task technology, versus a task characteristic view, significantly influences perceived usefulness.</p>
<p>Tao Zhou [2013]</p>	<p>Information systems success model and flow theory</p>	<p>195 surveys collected from service outlets of China Mobile and China Unicom</p>	<p>System quality, information quality and service quality affect continuance intention through trust, flow and satisfaction. As well trust affects flow, which in turn affects satisfaction</p>

2 LITERATURE REVIEW

<p>Arunagiri , Michael, Teoh [2014]</p>	<p>TAM</p>	<p>North Malaysia</p>	<p>Perceived usefulness, perceived benefit and perceived credibility were the factors affecting users having intention to adopt mobile banking. Meanwhile, the perceived ease of use and perceived financial cost were found to be insignificant in this study</p>
<p>Tiago, Miguel, Manoj, and Ales [2014]</p>	<p>UTAUT, TTF and ITM</p>	<p>sample of 194 individuals in Portugal</p>	<p>Facilitating conditions and behavioural intentions directly influence m-Banking adoption. Initial trust, performance expectancy, technology characteristics, and task technology fit have total effect on behavioural intention.</p>

<p>John [2015]</p>	<p>IDT</p>	<p>Faculty members of leading universities in Asian region. Sample of 261 full time lecturers</p>	<p>computer self-efficacy, relative advantage, compatibility and prior computer experience are significantly influencing their perceived ease of use and attitude towards using educational technologies</p>
<p>Rajan and Baral [2015]</p>	<p>TAM with the combination of other constructs</p>	<p>End users of ERP systems in Indian organizations</p>	<p>computer self-efficacy, organizational support, training, and compatibility have a positive influence on ERP usage</p>
<p>Ayensa, Mosquera, and Murillo [2016]</p>	<p>UTAUT2</p>	<p>628 Spanish customers of the Zara store</p>	<p>personal innovativeness, effort expectancy, and performance expectancy are the key determinants to purchase intention</p>
<p>Tan and Lua [2006]</p>	<p>Extended UTAUT</p>	<p>Sub-group of Generation Y consumers that are college or university students. The final sample collected was 347 cases</p>	<p>Performance expectancy, Effort expectancy, perceived risk and social influence are predictors of intention to adopt mobile banking.</p>

Luna, Rios, Cabanillas and Luna [2017]	Extended TAM	Sample consisted of 423 mobile phone users in Brazil	Personal innovation in IT and perceived usefulness are determinants of future intention to use the NFC technology for payments in Brazil
Noor, Kamil, Mohammad [2017]	UTAUT	Questionnaire sent to 181 external auditors	Performance expectancy, effort expectancy and social influence, all have a significant impact on intention to adopt CAATs by external auditors
Dube and Gumbo [2017]	Extended TAM	Sample dataset comprising of 268 bank and supermarket customers	Ease of use, usefulness and reliability are the important factors influencing intention and use of online transaction platform. As well ease of use influence usefulness. Enjoyment, availability and income influence usefulness.

Source: Personal Elaboration

Based on the empirical studies presented in Table 2.1 regarding mobile banking technology, it can be stated that the most recently used theories in this domain are TAM and UTAUT. On the other side, we can also see that the extended version of the unified theory of acceptance and

use of technology (UTAUT2) has only been employed once in the field of mobile banking.

2.1.9 Hypotheses: Relations of UTAUT2 Motivational Constructs with Use

UTAUT2 poses several antecedents (motivators) to explain intention to adoption and use new technologies. In this Doctoral Thesis we consider performance expectancy, effort expectancy, social influence, hedonic motivation and facilitating conditions (constructs of UTAUT2) to predict mobile banking use. We do not consider habit and price value (also constructs of UTAUT2) for the following reasons.

Habit in UTAUT2 is referred to as the extent to which an individual believes that the behaviour is set to be automatic (Venkatesh, Thong, & Xu, 2012). Therefore, habit in the use of mobile banking cannot be measured and cannot exist among respondents that are still non-users of mobile banking. Habit only exist and can be measured with users of mobile banking. Since we are studying the antecedents of use or non-use of mobile banking and the sample size is a set of users and non-users as well, the construct habit was dropped.

Price value in UTAUT2 is referred to as the cost of the technology versus the value it supplies (Venkatesh, Thong, & Xu, 2012). Mobile banking is a technology done throughout mobile devices; this almost means throughout applications or mobile web browsers with a smartphone. Based on the fact that mobile banking apps are accessed free of charge for smartphone users in Lebanon and that our sample only covers Lebanese smartphones holders, mobile banking has no additional price (i.e. initial cost) to be paid. Since mobile banking applications and banks web-pages are free, price value is not considered an influential factor to explain Lebanese people's use or non-use of mobile banking. Therefore, price value was dropped based on the argument that price value is not a crucial determinant of the use or non-use of mobile banking technology in Lebanon.

Behavioural intention or intention to adopt considers the future willingness to adopt the technology by non-users (Venkatesh, Morris,

Davis, & Davis, 2003). According to the UTAUT and to UTAUT2, this intention influences actual behaviour of adoption (i.e. intention influences use) in contexts of technology non-users (Venkatesh, Thong, & Xu, 2012).

The construct intention to adoption cannot be measured by users of mobile banking as they have already adopted it. Therefore, since our research is oriented towards studying factors influencing the actual use or non-use of technology and, consequently, samples both users and non-users of mobile banking, the construct behavioural intention was dropped in our study.

Performance expectancy as explained before represents personal beliefs that using mobile banking will deliver a set of benefits (Venkatesh, Davis, Morris, & Davis, 2003). It was proposed that people will intent to use the technology if they expect that it will generate positive consequences (Compeau & Higgins, 1995); that is, whether they consider mobile banking useful. Therefore:

H1a: Performance expectancy is positively related to use of mobile banking.

The same can be applied to effort expectancy, which represents the ease of use of mobile banking service (Venkatesh, Davis, Morris, & Davis, 2003). As individuals realize the simplicity of using mobile banking service, they are more willing to use it (Lin, 2010). This as well can allow us to deduct that individuals with high levels of effort expectancy, that is people to considering mobile banking easy to use, tend to be users of mobile banking. Therefore:

H1b: Effort expectancy is positively related to use of mobile banking.

Social influence has also been related to intention to adopt new technologies (Venkatesh, Thong, & Xu, 2012). The social pressure exerted by the surrounding environment will influence behaviour. In other words, if the majority of the social context of the individual is

comprised by mobile banking users, this will encourage him/her to be user of mobile banking as well. Hence, we can fetch that people with high levels of social influence tend to be users of mobile banking. Therefore:

H1c: Social influence is positively related to use of mobile banking.

Likewise, facilitating conditions have been seen to have a direct impact on technology use (i.e. behaviour) (Venkatesh, Thong, & Xu, 2012). The more help, support and resources available for people the more likely that their behaviours will be oriented towards using new technologies. This helps me explain that people who encounter high levels of facilitating conditions are more likely to be users of mobile banking.

H1d: Facilitating conditions is positively related to use of mobile banking.

Hedonic motivation refers to the level of fun and pleasure derived from using the new technology (Venkatesh, Thong, & Xu, 2012). But since mobile banking is not an entertaining service but, as explained before, a serious business service, people with high levels of hedonic motivation will search for other types of services to fulfil their desires and motivations. In fact hedonic motivation applies more to entertaining and social apps, while mobile banking does not match with such description. Hence, I predict that people who find less hedonic motivation in mobile banking services tend to be users of mobile banking. Therefore:

H1e: Hedonic motivation is negatively related to use of mobile banking.

2.2 COMPOUND PERSONALITY TRAITS

There are various compound personality traits that can be related to the constructs of UTAUT2. In this Doctoral Thesis we consider the five following traits: need for cognition, need for structure, need for affiliation, general self-efficacy, and proactive personality.

2.2.1 Need for Cognition

Cohen, Scotland, and Wolfe (1955) were the first to introduce the new intrinsic psychological need known as need for cognition. Need for cognition refers to the tendency to engage in and enjoy effortful cognitive activities (Cacioppo & Petty, 1982). People with high levels of need for cognition have been referred as “cognisors” while those with low levels of need for cognition have been considered “misers” (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Other researchers have indicated that need for cognition is an intrinsic trait representing a special manner of how individuals approach tasks where thinking is required (Fleischhauer, Enge, Brocke, Ullrich, & Strobel, 2010).

Based on Cacioppo and Petty’s (1982) definition, people who enjoy cognitive efforts are considered as individuals with need for cognition while others who do not enjoy cognitive efforts are considered as individuals with low levels of need for cognition.

Cacioppo and Petty (1982) stated that people with low need for cognition are more likely to escape from situations where they need to think and, consequently, always try to seek new ways to avoid situations that require certain level of thinking. Likewise, it has been noticed that individuals with high need for cognition tend to integrate in all details and consider all relevant information, meanwhile individuals with low need for cognition rely more on status cues to make decisions and judgments (Haugtvedt, Petty, & Cacioppo, 1992). As well it has been previously demonstrated that individuals who tend towards elaborating, organizing and inspecting personal information are those with high levels of need for cognition, while in contrast, individuals with low need for cognition are those described as chronic cognitive followers (Cacioppo, Petty, Feinstein, & Jarvis, 1996).

Curşeu (2011) argued that need for cognition characteristics also reach to the level of decision making. He stated that individuals with high levels of need for cognition are more able to make informed decisions since they search information more closely while deciding. Moreover the process of efficient informative decision making is easier among individuals with high levels of need for cognition since they use more evidence effectively and logically (Mendelberg, 2002). In fact this characteristic of individuals with high need for cognition helps to provide them with more opportunities to engage and integrate in the surrounding environment and society.

Nair and Ramnarayan (2000) in their study found that need for cognition is related to problem solving as individuals with high levels of need for cognition are more successful at problem solving based on their characteristics. Other scholars have agreed as well that need for cognition is attached directly with personality motivation (Steinhart & Wyr, 2009, Preckel, Holling, & Vock, 2006) and types of processing (Sadowski & Gülgöz, 1996).

2.2.1.1 Hypotheses on the relationships among Need for Cognition, motivators of mobile banking use, and mobile banking use

Many studies have agreed that decisions regarding accepting new technologies are based on cognitive causes. Slovic, Flynn, & Layman (1991) and Chaiken, (1987) suggested that behaviours, such as technology adoption, are mostly guided by effortful processes, such as cognitive shortcuts; however, little attention has been paid on the role of need for cognition in the adoption of new technology and up to date no studies have been published in the field of mobile banking that consider this personality trait (Choa & Parkb, 2014).

Need for cognition has been attached to technology adoption through the field of new learning systems (Evans, Kirby, & Fabrigar, 2003; Chen & Wu, 2012; Kai-Wen, 2011; Turner & Croucher, 2013). Petty and Cacioppo (1986) stated that cognitive “misers” who have low levels of need for cognition tend to avoid complicated systems that require a great amount of cognitive effort, meanwhile cognitive “cognisors” who have high levels of need for cognition tend to have positive expectations and

perceptions regarding the easy use of the new system; in other words, individuals with a high need for cognition have more motivation towards cognitive efforts, resulting in expectations that the new system will be easy to use.

Reinhard and Dickhauser (2009) proposed a relation between expectancies, task difficulties, and need for cognition. They tried to explain that effort expectations formed based on task difficulties are lower among individuals with a high need for cognition. In other words, they stated that individuals with a high need for cognition control their expectancies regarding the task difficulties. They argued that people with a high need for cognition expect tasks to be easier (Reinhard & Dickhauser, 2009).

Other studies linked need for cognition with motivation. Steinhart and Wyer (2009) stated that the approach motivation (the motivation to engage or accept activities) is high among individuals with high need for cognition once they consider the activity as non-difficult. As individuals with a high need for cognition look forward to seek, organize, elaborate and scrutinize information that increases their knowledge, they are prone to expectancies of ease of use.

Moreover, early adopters in all innovation diffusion studies are described as curios, stimulation seekers and cognitive individuals (Hirschman, 1980; Dupagne, 1999), which are the same characteristics as those of individuals with high need for cognition (Olson, Cameron, & Fuller, 1984). Recently it was suggested that need for cognition can be a direct determinant of innovation adoption and that innovators are prone to cognition (Wood & Swait, 2002). In the same line, Cho and Park (2014) proposed and found support to the notion that technology users have high levels of need for cognition. Adopting new technologies requires the cognitive efforts to value benefits, assess vulnerabilities, and learn new processes of functioning. Correspondingly this can be applied to mobile banking. People with high need for cognition will be users of mobile banking since they are more curios to learn and excited to assess new knowledge. Therefore:

H2a: Need for cognition is positively related to the effort expectancy.

H2b: Need for cognition is positively related to use of mobile banking.

2.2.2 The Need for Structure

Several psychologists have considered personal need for structure a cognitive structural personal variable (Abelson, 1981; Markus & Zajonc, 1985; Fiske & Taylor, 1991; Neuberg & Newsom, 1993). The term “cognitive structuring” refers to the mental activities of decomposing complex environments into simpler ones using various types of representations (Kim, Hahn, & Yoon, 2015).

Need for structure is considered an individual difference construct that refers to the simplified degree of structure in life, expressing a dislike of uncertainty, a requirement of predictability and a confirmatory of routine (Neuberg & Newsom, 1993). Other authors have defined personal need for structure as a chronic desire for clarity and certainty aside with an escape from ambiguity (Elovainio & Kivimäki, 2001; Thompson, Naccarato, Parker, & Moskowitz, 2001). Moskowitz (1993) indicated that the level of personal need for structure is the regulator of the variation of people’s dispositional motivation to cognitively structure their own world more simply and unambiguously.

A similar construct known as “need for closure” emerged aside from personal need for structure and two different measures appeared (Webster & Kruglanski, 1994). Some researchers started to consider the personal need for structure construct to be subsumed under the need for closure construct, while others argued that the scores of the two scales are different and not substantially correlated (Kruglanski, Webster, & Klem, 1993). For example, Neuberg, Judice, and West (1997) stated that the scales are in some ways redundant. Researches did not provide a clear image regarding this issue until a concrete reliable scale of independent personal need for structure emerged (Thompson, Naccarato, Parker, & Moskowitz, 2001; Rietzschel, De Dreu, & Nijstad, 2007).

Need for structure has also been conceptually compared to other constructs such as authoritarianism (Adomo, Frenkel-Brunswick, Levinson, & Sanford, 1950), dogmatism (Rokeach, 1960), intolerance of ambiguity (Eysenck, 1954) and uncertainty orientation (Sorrentino & Short, 1986). Individuals with high need for structure are characterized by the avoidance of uncertainty (Fumham, 1994). This can be explained by the fact that both uncertainty avoidance and need for structure prefer clear structures, rules and orders (Pundt & Venz, 2017). Also individuals with high need for structure are described as individuals who feel uncomfortable in situations that lack clarity and structure (Thompson, Naccarato, Parker, & Moskowitz, 2001).

According to Svecova and Pavlovicova (2016), personal need for structure represents the generalization of previous experiences and the simplification of information into fewer complex categories to use in ambiguous situations in order to maintain security. Personal need for structure affects both information acquisition and processing strategies. Need for structure is characterized by the organization of information in a simpler way.

Individuals with high need for structure use simple information processing strategies, such as stereotyping, categorization of information in simpler categories and impression formation. These individuals are less likely to expose complex demonstrations (Moskowitz, 1993; Neuberg & Newsom, 1993; Schaller, Boyd, Yohannes, & Brien, 1995). Other researchers have argued that individuals with high personal need for structure are likely to use heuristic approaches to make sense of their social surrounding (Thompson, Naccarato, Parker, & Moskowitz, 2001) and use more emergent and scarcer essential attributes in their impressions (Hutter, Crisp, Humphreys, Waters, & Moffitt, 2009)

In addition Thompson, Roman, Moskowitz, Chaiken, and Bargh (1994) found that a high personal need for structure represents individuals who are confident in their decisions, do not prefer to seek alternatives and are likely to freeze among the first enlightenment. Therefore, personal need for structure is characterized by less creativity, the need for fast, easy and accurate responses, and keeping a step away

from uncertainty and ambiguous situations in which they feel insecure and uncomfortable (Svecova & Pavlovicova, 2016).

2.2.2.1 Hypotheses on the relationships among Need for Structure, motivators of mobile banking use, and mobile banking use

Personal need for structure has never been studied directly with innovation adoption. I expect that need for structure will be related to mobile banking use through its link with authoritarianism and dogmatism, which have a negative impact on innovation adoption, and with innovation and creativity, which have a positive impact on innovation adoption.

Personal need for structure has been positively related to dogmatism, and dogmatism is reversely correlated with innovation adoption (Coney & Harmon, 1979). Schultz and Searleman (1998) demonstrated that high personal need for structure was positively associated with less flexibility in a mental set of thoughts. This means that people with high need for structure prefer to orient towards traditional, old, clear and guaranteed ways of performing things. Moreover, need for structure has been negatively linked to creativity (Wood & Swait, 2002), meaning that individuals with high personal need for structure are traditional with their ideas and care less for changes.

A high personal need for structure has also been related to authoritarianism and freezing over decision making, which impedes flexibility of thought and therefore might be negatively related to creativity (Thompson, Naccarato, Parker, & Moskowitz 2001; Rubinstein, 2003).

Rietzschel, Nijstad, and Stroebe (2006) found that those people with high personal need for structure are less flexible in their thinking, which may result in less flexibility toward change and innovation. Individuals with high personal need for structure prefer close monitoring and are less innovative and creative (Rietzschel, Slijkhuis, & Van Yperen, 2014)

The negative relationship between need for structure and authoritarianism and dogmatism, and the positive relationship between

need for structure and innovation and creativity, indicate that need for structure may be related to consumers' use of new technologies.

Hence, since technology adoption and especially mobile banking adoption is considered a changing process, a negative relation between individuals with need for structure and use of mobile banking can be expected. Adopting mobile banking is a process of change and people with high need for structure can see it as a new modern ambiguous technology.

In addition, if individuals with high personal need for structure are more confident in their decisions (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994), it can be expected that they will give less relevance to others opinions regarding the use of mobile banking and, hence, their influence will be lower. On the other hand, individuals with low personal need for structure will be less confident in their decisions and give more value to what friends and relatives say. Therefore:

H3a: Need for structure is negatively related to social influence.

H3b: Need for structure is negatively related to use of mobile banking.

2.2.3 The Need for Affiliation

The term “need for affiliation” represents a personality trait that was first introduced by Murray (1938) in his theory of personality. This theory identified 17 personal needs and classified them into five major categories, with need for affiliation being categorized under affection. Need for affiliation describes the individuals' aspiration to pursue and sustain interpersonal relationships with others (Murray (1938).

According to Murray (1938), affection needs are needs focused on our longing to love and be loved, that is signified by need for affiliation. Years later, the “need for affiliation” term disappeared with the rise of Maslow's hierarchy of needs theory, which addressed “need of belonging” instead of “need of affection” (Maslow, 1943).

Need for affiliation was again popularized by McClelland (1961), who proposed a motivational model on how the need for power, the need for achievement and the need for affiliation affect people actions. This scholar identified affiliation as a personal need that reflects the aim of building close and friendly relationships with others. Later, McClelland (1978) defined need for affiliation as a requirement to belong to a certain social group. Some other researchers, although agreeing with McClelland, stated that need for affiliation is more oriented toward building emotional relationships with people (Veroff, Reuman, & Feld, 1984).

Need for affiliation has been placed under the category of psychogenic needs (Murray, 1938). It summarizes people's wish to belong to groups, wanting to be liked, preferring collaboration over competition, dislike of risks and uncertainty and willingness to agree with others' point of view in the group. Therefore, according to McClelland (1988), need for affiliation goes under the need of affection.

Need for affiliation represents the sense of involvement in a certain social group. Individuals demonstrating high levels of need for affiliation are described as sociable, corporative, agreeable and relationship builders (McClelland, 1987). Consequently, individuals with high need for affiliation are eager to dedicate substantial time to pursue interactions with others (McClelland & Koestner, 1992).

It has been noticed that the primary concern of individuals with a high need for affiliation is the interaction with others (Klein & Pridemore, 1992). Hence, the desire to achieve close and friendly social relationships with others is the base of high levels of need for affiliation (McClelland, 1961, 1985; Robbins, 2003).

According to Baron and Byrne (2003), people with high levels of need for affiliation expose high emotional involvement in relationships. These people are also worried about accomplishing warm and sensitive contacts with others (McClelland, 1976).

Some researchers have stated that affiliation results in social closeness to others, based on sensitivity, warmth relationships and sociability to others (Minbashian, Bright, & Bird, 2009). Hill (2009) confirmed that affiliation is the hidden motive that forecasts long term behavioural tendencies and engages individuals in more social behaviours, being positive stimulation, emotional support, social comparison and attention. Hill (2009) therefore concluded that individuals with high levels of need for affiliation lean towards being unpopular since they express high social anxiety and demonstrate low leadership characters.

Scholars have agreed that human interactions are based on affiliation, which is the reason behind inspiring and exchanging social relationships and interactions (Gable, 2006). Leary (2010) showed that people with a desire to be near and interact with others demonstrate high need to affiliate. A high level of need for affiliation among individuals has also been related to the cooperative and non-competitive nature of individuals.

2.2.3.1 Hypotheses on the relationships among Need for Affiliation, motivators of mobile banking use, and mobile banking use

Previous research seems to indicate that the relationship between need for affiliation and technology adoption and use is positive. For example, McKenna, Green and Gleason (2002) found that people with social anxiety and shyness look forward to fulfil their need for affiliation throughout Internet online communication. The need for affiliation among people who practice interpersonal online communication and interaction leads them to be more involved in social online actions, such as online chatting, online dating and self-presentation (Gibbs, Ellison, & Heino, 2006). In addition, Peter and Valkenburg (2006) found that, the higher the level of need for affiliation among adolescents, the higher their integration in Internet communication.

Chung and Nam (2007) showed that need for affiliation is a key element in predicting the usage of instant messenger technology. In particular, they argued that users of social media have a stronger need for affiliation than non-users. Another study declared that need for affiliation

is a direct predictor of the intensity of SMS technology usage (Zhou, 2009). Moreover, another investigation found that individuals satisfied their need for affiliation by integrating in social media (Huang, 2014). However, regarding mobile banking, I do not expect this positive relationship, as people who look forward to fulfil their affiliation motivation care about maintaining quality relationships and face to face contacts. This preference for face to face contact and for maintaining relationships with other people is less available with mobile banking technology. Thus, the use of mobile banking limits all these desires and aims.

Conceptually, need for affiliation focuses on personal relationships and individual perceptions regarding certain actions and ideas are based on these personal relationships (McClelland, 1985). This explains why individuals with a high need for affiliation consider new work technologies such as mobile banking as less useful and do not prefer to use mobile banking technology. Using mobile banking will limit their personal interaction with other banking officers and decrease their chances of building personal relationships. Personal interactions with bank employees help fulfil their affiliation needs better than new electronic technologies. Therefore, individuals with high levels of need for affiliation will expect mobile banking to be a non-useful technology and will have less interest in using it.

Moreover, if individuals with high need for affiliation are more willing to agree with others' points of view (Murray, 1938; McClelland, 1987), it can be expected that they will have more people that influence their decisions and their impact will also be greater; on the other hand, individuals with low need for affiliation are less agreeable and, therefore, will have less people that influence them and will also give less importance to others' opinions. Therefore:

H4a: Need for affiliation is negatively related to performance expectancy.

H4b: Need for affiliation is positively related to social influence.

H4c: Need for affiliation is negatively related to use of mobile banking.

2.2.4 General Self-Efficacy

Social Cognitive Theory (Bandura, 1986), mainly focuses on the role of self-referent beliefs, considering self-efficacy a key construct. Self-efficacy refers to “someone’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (Bandura, 1994, p. 71). Later, the same scholar defined it as “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3).

Bandura (1986) stated that the feelings, thoughts and behaviours of individuals are controlled and managed by their beliefs. Thus, an individual’s belief in his/her own capabilities, known as self-efficacy, is a better predictor of individual behaviour than actual capabilities.

A notable distinction has been made between self-efficacy as a stable trait with constant levels that individuals carry with them from a situation to another, and between self-efficacy as a specific situational trait that varies within the same individual depending on situations (Agarwal, Sambamurthy & Stair, 2000; Chen, Gully & Eden, 2004; Downey, 2006; Hasan, 2006; Hsu & Chiu, 2004; Hasan & Ali, 2006; Tzeng, 2009). The stable trait with constant levels among different situations was termed global chronic self-esteem or general self-efficacy, whereas the specific situational trait was named specific self-efficacy. Several studies have presented specific self-efficacy as a motivational state, a variable varying in magnitude from a situation to another, whereas general self-efficacy has been considered a motivational stable trait that is carried from one situation to another (Judge, Erez & Bono, 1998; Luszczynska, Gutiérrez-Doña & Schwarzer, 2005; Sherer & Adams, 1983; Sherer, et al., 1982). General self-efficacy refers to an individual trait regarding his/her abilities to perform in different and varied stressful situations by the mean of a wide and stable sense of personal skills (Chen, Gully & Eden, 2001; Scherbaum, Cohen-Charash & Kern, 2006). Chen, Gully, and Eden (2001) conceptualized general

self-efficacy as the tendency of individuals to consider themselves capable of managing situations, handling and meeting tasks requirements in diversified circumstances; that is, individuals' general beliefs concerning their abilities to meet desired outcomes (Azizli, Atkinson, Baughman, & Giammarco, 2015)

Shelton (1990) argued that accumulated success and failure in several domains and different tasks are the causes behind general self-efficacy. Previous experience is the most powerful and key antecedent of general self-efficacy (Sherer, et al., 1982). General self-efficacy has been used in many studies and domains, and has been considered a key predictor of general outcomes (Van Der Slot, et al., 2010; Barlow, Williams, & Wright, 1996 great for explaining behaviour in a wide range of contexts or situations (Luszczynska, Gutierrez-Dona, & Schwarzer, 2005; Scholz, Doña, Sud, & Schwarzer, 2002).

Schwarzer and Jerusalem (1995) developed the most popular and easy scale of general self-efficacy. In numerous studies, this scale has shown internal consistency; however, its reliability tests and scores have not been reasonable (Zhou, 2015).

Individual self-efficacy normally develops over time. Four main elements may be considered for this development of self-efficacy (Bandura, 1986, 1997): (i) actual experience, (ii) vicarious experience, (iii) verbal persuasion and (iv) psychological states.

According to Bandura (2010) the most influential antecedent of self-efficacy is performance accomplishments (also called inactive mastery experience) that is an interpreted result of one's purposive performance. This importance was also explained more deeply stating that reducing the effect of failure among individuals depends on strong self-efficacy, which is mainly developed throughout repeated success. Failure destroys self-efficacy especially if it was not solidly established, whereas success carries out sharp beliefs in personal self-efficacy (Bandura, 1997).

Vicarious experience is the next source of self-efficacy, which is provided by observing social models and is the opposite of inactive

mastery experience (Bandura, 1997). Vicarious experience is obtained by observing successful experiences in performing a certain task (Alqurashi, 2016). People with limited prior experience that are not sure about their capabilities and abilities regarding a specific task depend on others models (i.e. experiences and information). Bandura (1997, p. 197) mentioned, “Individuals persuade themselves that if others can do it, they should be able to achieve at least some improvement in performance”. So, it does not always depend on someone’s capability to complete a task but on social comparison as well, meaning that self-efficacy would be higher if individuals are capable of fulfilling a task that others have already done (Alqurashi, 2016).

Verbal persuasion is the third antecedent of self-efficacy. It is the most simple and used element to develop self-efficacy. Verbal persuasion refers to the action of people trying to persuade others verbally to master or perform an action (Bandura, 1997). This can lead to boosting self-efficacy by encouragement or lowering self-efficacy through unrealistic feedbacks (Bandura, 1997).

The final source of self-efficacy is the individual’s psychological and emotional state. Self-efficacy in coping with situations can be affected by emotional arousal (Bandura, Adams, & Beyer, 1977). The development of an individual’s confidence is related to his/her feelings when achieving a task (Bandura, 2010).

Self-efficacy can be destructively impacted by stress, anxiety, worry and fear (Pajares, Johnson, & Usher, 2007). It has been stated that individuals that are not in a state of aversive arousal are more likely to succeed in their tasks (Bandura, 1997). Hence, according to Bandura (1997, p. 106) the best way to alter self-efficacy is “To enhance physical status, reduce stress levels and negative emotional proclivities, and correct misinterpretations of bodily states”.

2.2.4.1 Hypotheses on the relationships among General Self-Efficacy, motivators of mobile banking use, and mobile banking use

There are several reasons that can explain the effect of self-efficacy on individual’s adaptation, change and behaviour (Bandura, 1986, 1997,

2001). First, in several studies, self-efficacy has been found to play the role of major predictor of goal choice (Locke, Fredrick, Lee, & Bobko, 1984). Choices of behaviour and courses of action taken by people are all influenced by self-efficacy, in the sense that people tend to engage in tasks they feel proficient (Thoungnoum, 2002).

Second, self-efficacy influences the levels of persistence and effort individuals exert performing a task, due to its impact on expectations of final success. High persistence among tasks is related to high self-efficacy among individual (Bandura, 2001). Consequently, by increasing persistence and effort, self-efficacy helps impact the levels of performance (Bandura, 1982).

Third, emotional reactions and thought patterns are as well affected by self-efficacy. Individual with high self-efficacy view tough tasks as challenges not as threats, to be overwhelmed and not avoided (Thoungnoum, 2002). According to Pajares and Schunk (1981), individuals with high self-efficacy lean towards maintaining solid obligation even when opposing failure. Conversely, anger, stress and anxiety may be experienced by low self-efficacy individuals while performing a task, since they rate tasks as more difficult than they actually are (Thoungnoum, 2002). Moreover, low self-efficacy individuals avoid potential threats and show anxiousness based on their insight that they are incapable of managing such kind of potential tasks.

Therefore, self-efficacy is a key factor influencing choice of behaviour, persistence and levels of effort exerted while facing a tough task (Bandura, 1977). Hamari and Koivisto (2015) related general self-efficacy to higher levels of effort and increased persistence on difficult tasks.

Individuals attaining to achieve extraordinary goals and expressing high resistance to failure are noticed to be of high levels of self-efficacy (Ellen, Bearden & Sharma, 1991; Claggett & Goodhue, 2011). These high levels of self-efficacy provide the will to utilize new technology and deliver the feel of success while using it, whereas low levels of self-efficacy provide less confidence in employing new technology and help

individuals think that this technology is complicated to use (Cazares, 2010).

High general beliefs in one's abilities regarding the use of a technology will automatically generate positive expectations regarding its use; i.e., and individual's high beliefs in his/her abilities will help him/her expect that the technology will be simple and he/she will be an expert using it. In the management information system literature, it has been reported that self-efficacy has a positive direct effect on perceived ease of use; i.e., effort expectancy (Igarria & Iivari, 1995; Venkatesh, 2000; Venkatesh & Davis, 1996). Self-efficacy has been found to be a determinant of perceived ease of use (effort expectancy) before and after the use of technology (Garrido-Moreno & Aguila-Obra, 2008; Hsu, Wang & Chiu, 2009; Macharia & Pelsler, 2014; Venkatesh & Davis, 2000). Individuals with high levels of self-efficacy will expect that using a new technology will be easy; hence, general self-efficacy will have a positive effect on effort expectancy (Sung, Jeong, Jeong, & Shin, 2015). In the field of Internet banking, Internet self-efficacy has been shown to influence behaviour intentions through perceived ease of use, usefulness and credibility (Chan & Lu, 2004). Thus, people become actual adopters of mobile banking in the moment they realize their ability to use mobile banking (Amin, Supinah, Aris, & Baba, 2012).

On the other side, regarding self-efficacy's relationship with intrinsic motivation, Bandura (1982) stated that self-efficacy regulates human behaviour throughout motivation. People with high levels of general self-efficacy are more motivated to complete tasks than those who have low levels of self-efficacy (Schunk & Dale, 1990). The higher the general self-efficacy is the more hedonic incentives exist to achieve a task. This explains why people who are more confident regarding certain tasks (high in self-efficacy) consider these tasks to be entertaining and funny. Thus, people with high self-efficacy are more hedonically motivated.

Moreover, mobile banking, as a new service, requires users to have certain skills, such as configuring the mobile phone to use the application or to connect to the wireless Internet, so that they can operate their phones to use the service. As facilitating conditions reflect the effect of a

user's knowledge, ability and resources on their use (Venkatesh et al., 2003), it can be expected that individuals with high self-efficacy will perceive more facilitating conditions towards mobile banking than individuals with low self-efficacy.

Self-efficacy has been declared a predictor of behaviour long ago. In fact, it was included as a determinant of behaviour intention in the extended TAM model (Luarn & Lin, 2005). Others investigators have argued that self-efficacy plays an important role in indicating the use or not of internet banking among individuals (Chau & Ngai, 2010). Regarding mobile banking, some studies have doubted that general self-efficacy can directly influence mobile banking intention to use. Meanwhile other studies have supported and confirmed the direct impact of general self-efficacy over mobile banking adoption behaviour (Dasgupta, Gupta & Sahay, 2011; Luarn & Lin, 2005; Sripalawat, Thongmak & Ngramyarn, 2011). They have argued that people with high self-efficacy are more likely to adopt mobile banking. This was explained by them in the sense that the high the levels of self-efficacy an individual has, the more motivational tendencies he/she shows for exploring new experiences and ideas. Moreover, Wang et al. (2006) stated that self-efficacy has a significant effect on behavioural intentions to adopt mobile financial services. Similarly Slylianoa and Jackson (2007) stated that general self-efficacy impacts future technology usage. Self-efficacy generates the feeling of confidence leading to the adoption of new behaviours. Consequently it can be posed that individuals with high levels of general self-efficacy tend to be users of mobile banking. In this line, many scholars have shown that self-efficacy has a direct and indirect influence on technology acceptance (Agarwal, Sambamurthy & Stair, 2000; Hill, Smith & Mann, 1987; Hong, Thong, Wong & Tam, 2001; Liaw, 2002; Luarn & Lin, 2005; Venkatesh & Davis, 1996; Yi & Hwang, 2003). Therefore:

H5a: General self-efficacy is positively related to effort expectancy.

H5b: General self-efficacy is positively related to hedonic motivation.

H5c: General self-efficacy is positively related to facilitating conditions.

H5d: General self-efficacy is positively related to use of mobile banking.

2.2.5 Proactive Personality

Behavioural literature especially in the psychological fields has considered plenty of dynamic relations and process interaction between people and the environment. People influence the environment; i.e., individuals influence their situations, and are not only passive recipients of environmental presses (Buss & Finn, 1987).

Changing a situation, taking actions, altering circumstances or even affecting an environment are based on individual differences of people (Buss, 1987). Empirical studies have revealed many processes through which individuals can influence their environment; including, selection (choosing situations in which to participate) (Schneider, 1983), cognitive restructuring (people perceive and appraise environments) (Lazarus, 1984), evocation (people evoke reactions from others) (Scarr & McCartney, 1983), and manipulation (people's effort to shape, alter, and change their interpersonal environment) (Buss, 1987; Buss, Gomes, Higgins & Lauterbach, 1987). Individuals who take an active role in creating their own environment tend to have a proactive personality. Proactive personality is a variable that has proved its effect on many outcomes regarding human behaviour (Hough & Schneider, 1996).

The first description of proactive personality was simply a "disposition towards taking action to influence one's environment", which was primarily based on the person-situation relationship (Bateman & Crant, 1993). In particular, it was conceived as a stable tendency trait to alter and influence environmental changes that in turn differentiates them based on the actions taken to impact such environment (Bateman & Crant, 1993). Another definition was later established by Crant (2000), who described it as a narrow personality trait derived from the big five that describes the tendency to identify opportunities and work on such impulses to help change situations and affect the environment. Many

other definitions have been released addressing the term proactive personality but they all reveal the same sense of definition.

Proactive personality addresses cognitions and behaviours that motivate a desire for information searching and opportunities identification, improving situations, updating skills, and widening the understandings of things (Crant, 2000). Conversely, people without a proactive personality flow with environmental conditions, tend to adapt to situations and express fears of change. Hence, they are considered to be passive rather than active (Bateman & Crant, 1993).

Proactive people are future oriented. Forward thinking is the first characteristic that describes proactive individuals (Bateman & Crant, 1993). Thus, proactive individuals tend to seek opportunities rather than waiting for chances to come (Crant, 2000; Major, Turner & Fletcher, 2006).

According to Seibert, Kraimer & Crant (2001) proactive individuals seek cognition, such as identifying new ideas to enhance their skills and attain the company's future missions and visions.

Setting up proactive goals is another characteristic of proactive individuals (Parker, Bindl, & Strauss, 2010). Envisioning and planning for the aim of changing and having a different future throughout self or environmental change is known as proactive goal generation. Visualization and signification for a forthcoming and forward era of time relating to a person situation, in addition to forestalling upcoming consequences defines the term of envisioning according to Grant and Ashford (2008). On the other side, planning refers to the actions to be taken to achieve and attain such future (Bindl & Parker, 2009).

Bateman & Crant (1993), in their first definition and throughout their entire research, have insisted on, and attached "take actions" as a characteristic of proactive personality individuals. Changing the entire environment or a situation to more comfortable future circumstances that fit their perceptions requires taking actions and making decisions to achieve these goals (Crant, 2000).

Proactive individuals may not only take actions to alter situations and enhance their current performance but they also carry out anticipatory actions to obtain additional information, seek new ideas, be aware of policies and increase their knowledge and knowhow of processes and the environment (Major, Turner & Fletcher, 2006 and Seibert, Kraimer & Crant, 2001). Furthermore, proactive individuals are forward thinkers, thus they do not wait for things and opportunities to come to them, instead they develop and take actions to acquire chances and capture opportunities faster and more efficiently than others do (Crant, 2000).

Another characteristic that stands for proactive personality is problem solving. Proactive individuals tend to be problem anticipators and fixers in their entire environment (Bateman & Crant, 1993). As it has been already commented, envisioning involves perceiving a current or future problem opportunity; thus, proactive individuals tend to identify current and future problems (Parker, Bindl, & Strauss, 2010). Moreover Frohman (1997) presented proactive individuals as self-initiators who see a problem and attack it without any previous recommendations on what to do.

A reason that may help proactive individuals identify problems is their desire to acquire new ideas and knowledge about their environment more rapidly than others do (Bateman & Crant, 1993). They feel responsible of providing added value to the environment and organizations; thus, they are able to gather social and political knowledge that helps them identify future risks and problems and tackle them immediately (Parker, Bindl, & Strauss, 2010)

Seeking new opportunities is another characteristic identified for proactive personality individuals from the beginning (Bateman & Crant, 1993). In order to change situations, environments and circumstances, proactive individuals need to search for new challenges and opportunities, contrary to passive individuals who aim to adapt to situations and forget about new opportunities (Crant, 2000). Identifying new opportunities is considered to be complementary to the future orientation characteristic and seeking new information aspect of

proactive individuals. Moreover, the self-initiative attribute that distinguishes proactive individuals from passive ones stimulates and arouses the sense of being opportunity seekers and opportunity capturers (Crant, Li, & Liang, 2010).

The ultimate characteristic attached to proactive personality individuals is that they are action oriented. Since they look forward to changing the status quo and avoid adapting to situations and circumstances the way they are, they are oriented towards taking actions that satisfy their aims (Bateman & Crant, 1993).

Proactive individuals are therefore oriented towards personal initiative behaviour (Bateman & Crant, 1993). To sum up, proactive individuals take a self-starting and active approach; going beyond what is required, concerning their actions (Frese, Kring, Soose, & Zempel, 1996).

2.2.5.1 Hypotheses on the relationships among Proactive Personality, motivators of mobile banking adoption and use, and mobile banking use

Proactive personality is the stable disposition towards proactive behaviour (Bateman & Crant, 1993). Proactivity is behaviour referring to actions taken by people to impact themselves or the environment.

Behind proactive personality there are a set of common motivational processes (Crant, 2000; Frese & Fay, 2001; Grant & Ashford, 2008). This explains that proactive individuals are highly motivated to achieve goals, seek new opportunities and modify the environment. According to Parker and Collins (2010) and Lin, Lu, Chen and Chen (2014) proactive personality influences motivational aspects.

The impact of proactive personality has been studied in plenty of fields, such as career success, job performance, team work and leadership (Claes, Beheydt, & Lemmens, 2005; Ashford & Northcraft, 1992; Kirkman & Rosen, 1999; Crant & Bateman, 2000); however there is no literature explaining the relationship between proactive personality and the UTAUT2 factors.

Linking the forward thinking characteristic of proactive personality with technology adoption behaviour helps identify a positive relation between proactive personality individuals and new technology acceptance.

According to Bateman and Crant (1993) proactive personality individuals tend to be: (i) decision takers, (ii) problem solvers, (iii) forward thinkers, (iv) action oriented individuals, (v) proactive goal setters, and (vi) new opportunity seekers. This can explain that individuals who tend to seek new opportunities, set new proactive goals, be forward thinkers and orient towards new actions are more likely to view new technologies (mobile banking) as useful and as well as easy to use.

The linkage of the characteristic “decision takers” of proactive personality individuals with technology adoption can be viewed spontaneously. Technology rapid development in all fields brings up new opportunities for businesses and individuals. Mobile banking technology may be one of them. Proactive personality individuals may consider adopting mobile banking technology as an opportunity to increase business or individual performance. Furthermore, for people who are action oriented, adopting mobile banking services will be a normal action to be involved in, since they like changing the status quo and impacting the circumstances of the whole environment.

In addition, being forward thinker increases the sense of future expectations (Bateman & Crant, 1993). Throughout the technology adoption life cycle, early adopters of technology seem to have the same forward thinking orientation as proactive individuals (Rogers, 1995). Early adopters are seen as visionary people, who find it easy to imagine, think forward, understand and appreciate future benefits when it comes to adopting such new technologies in a hurry before opportunities are closed in order to reach their business goals (Rogers, 1995). It can be noted that proactive individuals have the same characteristics as new technology early adopters at the level of forward thinking, which means that highly proactive individuals can be considered early adopters of mobile banking services. In other words, proactive personality through

its characteristic “forward thinking” has a positive relation with adoption of mobile banking technologies.

On the other hand, Venkatesh, (2000, p. 351) mentioned that “proactive individuals may adopt a new technology after considering its facilitating conditions”. Thus, proactive individuals may consider the availability of resources and facilities while considering a new technology. The fact of being a forward thinker favours a positive consideration regarding the availability of external resources, which may influence the adoption of certain behaviours. In other words, proactive individuals with their additional thinking abilities and positive future orientations reflect positively and optimistically regarding available conditions. Put simply, proactive individuals view the available resources (facilitating conditions) as an advantage to start and conduct changes.

Accepting the new mobile banking technology and changing the old ways of doing bank transactions may be a proactive goal by itself. Adapting mobile banking technologies may also serve proactive personality individuals’ intentions to change situations and circumstances. Adopting mobile banking technologies may serve both aspects of proactive goal setting “visioning and planning”, supporting a positive relation between proactive personality and technology adoption behaviour. Moreover, proactive individuals are self-initiated individuals; i.e., “they seek change based on what they personally consider motivating” (Parker, Bindl, & Strauss, 2010, p. 828). This implies that proactive individuals perform some actions since they consider them to be entertaining or enjoyable. Mobile banking technologies may serve the goals and visions of proactive individuals. Thus, the more proactive individuals are, the more hedonically motivated towards mobile banking they are going to be, based on the assumption that they prefer to resolve threats, achieve goals and alter situations.

Flopping back to past theories in technology adoption, usefulness has been a major predictor of why people adopt mobile banking. Reasonably and sensibly, people who seek out new opportunities adopt any new technology that may be distinct and more developed than previous ones. Adopting mobile banking technologies may open new

prospects and chances for adopters in their careers, environment or situations. Mobile banking technologies in this sense can be identified as a new opportunity that may be identified by proactive individuals who are future oriented and “opportunity seekers”. Seeking opportunities by proactive individuals will lead them to perceive mobile banking technology services as useful. Seeking new opportunities by proactive individuals can be a chief reason for proactive people to adopt mobile banking based on the vision that adopting new technologies may open the opportunity towards new prospects and chances that help alter the status quo and change the situation (Crant, 2000).

Probably the same applies with the construct “ease of use”, which has also been considered as a cause of adopting mobile banking in recent technology theories. A proactive personality individual is used to taking action to change situations and affect the environment. Moreover, he/she has no fear of change and is a problem solver. These characteristics will likely make him/her less worried about the complexity of the new technology as he/she has probably overcome complex situations before. Thus, I expect proactive personality individuals to perceive adopting mobile banking as easier than non-proactive individuals who express fear of change and are not familiar with taking action. Therefore:

H6a: Proactive personality is positively related to performance expectancy.

H6b: Proactive personality is positively related to effort expectancy.

H6c: Proactive personality is positively related to hedonic motivation.

H6d: Proactive personality is positively related to facilitating conditions.

H6e: Proactive personality is positively related to use of mobile banking.

2.3 ELEMENTAL TRAITS

Personality measurement has been addressed by many psychological researches proposing various underlying dimensions. A conclusion was finally drawn indicating that the basic personality traits can be reduced and categorized under five main types known as the big five dimensions (Barrick & Mount, 1991). It has taken a lot of time to identify and differentiate the big five factors from each other's and assign to each type of personality its own exclusive physiognomies, descriptions and traits. Nevertheless, recently those big five dimensions have been considered as the standard personality trait model (Wehrli, 2008). In this line, McElroy, Hendrickson, Townsend and DeMarie (2007) have quantified that these big five dimensions have been a better forecaster of basic personality indicators for technology related concerns than the Myers-Briggs Type Indicator.

The Five Factor Model (FFM) is the most comprehensive model that represents abstract personality traits (Costa & McCrae, 1992) and is considered the most useful taxonomy in personality research, (Barrick, Mount, & Judge, 2001). According to Barrick and Mount (1991) the big five factors are: agreeableness, conscientiousness, extraversion, neuroticism and openness to experience.

2.3.1 Agreeableness

Agreeableness was defined by Graziano and Eisenberg (1997, p. 797) as "a compassionate interpersonal orientation described as being kind, considerate, likable, helpful and cooperative". Therefore, individuals scoring high on agreeableness are more helpful, less selfish, friendly and more caring about others (Howard & Howard, 1995).

Some scholars such as Goldberg (1992) insist that agreeableness best describes people who aim to achieve collaboration and social coherence. Agreeableness also identifies people that are highly social (Mount, Murray, & Steve, 2005), friendly and generous in negotiations in a friendly environment (Ostendorf & Angleitner, 1992).

McElroy, Hendrickson, Townsend and DeMarie (2007) have indicated that the more agreeable a person is the more he/she seems to be

good natured, compassionate, sympathetic and forgiving. Accommodating, helping people and being capable of resolving issues by the creation of a win-win situation and with the help of flexible attitudes are also characteristics of an agreeable personality (Cattell & Mead, 2008).

2.3.2 Conscientiousness

The second trait that was considered is conscientiousness. What best describes conscientiousness is the propensity to be a thorough, responsible, organized, hardworking, achievement oriented and persevering individual (Costa, McCrae, & Dye, 1991).

An extensive volume of investigations has indicated that employees with a conscientious personality tend to be extremely motivated, hardworking and very consistent (Salgado, 1997). Conscientious individuals have a high intrinsic motivation to achieve outstandingly, persistence and are always willing to improve their level of performance throughout self – control (Costa, McCrae, & Dye, 1991). In other words conscientious people are seekers of success and advantages, with behaviours intended to be performed in a way to achieve super usefulness (Moon, 2001). Conscientious individuals are intrinsically motivated to perform and achieve positive behaviours of high work performance that can be obtained by adopting new technology services (Barrick & Mount, 2000).

Some researchers have defined this trait as being reliable, deliberate and strong willing, proposing that people with a conscientious personality tend to organize, plan, measure, analyse and then handle or adopt tasks or actions (McElroy, Hendrickson, Townsend, & DeMarie, 2007). Burch and Anderson (2008) found that well-structured future planning is what characterizes conscientiousness personalities. In the same sense, other studies have deducted that this kind of personality demonstrates high correspondence to organized schedules, solidness and extraordinary attentiveness regarding surrounding atmospheres (Cattell & Mead, 2008).

2.3.3 Extraversion

The third trait is extraversion, which is known for its amazement, cheerfulness and excitement. Extraversion is the act, state or habit of being verbose, arguer of others opinions, interactive with every one frankly and a seeker of excitement (Burch & Anderson, 2008; Howard & Howard, 1995).

Such personality is characterized by liking people, preferring groups, enjoying excitement and stimulation and experiencing positive effects summarized by vigour, ardour and enthusiasm (Costa & McCrae, 1992; John & Srivastava, 1999). Extraversion fluctuates also towards being social attractive individuals, optimistic, ambitious, gregarious and risk takers (McElroy, Hendrickson, Townsend, & DeMarie, 2007).

Interactions and interpersonal relationships play a major part in an extravert personality, considering it as a very relevant characteristic (Watson & Clark, 1997). Since extraversion has a social aspect in its component, it has been proposed that this kind of personality acts, behaves and performs better under social conditions and factors (Barrick & Mount, 1991).

Devaraja, Easley, and Crant (2008) argued that social consequences of behaviour and social imaging are core outcomes that highly extravert individuals aim to achieve and care about.

2.3.4 Neuroticism

Neuroticism is the fourth trait of personality. Neuroticism comprises the traits and characteristics of individuals who are fearful, sad, embarrassed, distrustful and stressful; thus, leading them to be anxious, self-conscious and paranoid (Devaraja, Easley & Crant, 2008; McElroy, Hendrickson, Townsend & DeMarie, 2007). Individuals with high levels of neuroticism are stressful, emotional and anxious (Saucier & Goldberg, 1998).

Neurotic people reveal high levels of frustration and hopelessness when expressing feelings and exhibiting behaviours (Ostendorf & Angleitner, 1992). To the contrary, individuals with more interior

strength to face stressful situations, more optimistic and more emotionally stable scored low levels of neuroticism (Roberts & Robins, 2000), demonstrating by that more maturity, coolness and less over reactivity in stressful environments (Cattell & Mead, 2008).

2.3.5 Openness to Experience

The final personality trait would be openness to experience. This trait is associated with the desire to explore new ideas and is called sometimes intellect or intellect-imagination. This dimension includes traits like having wide interests and intellectual curiosity, being imaginative, insightful, and attentive to inner feelings, and preferring variety (Costa & McCrae, 1992).

Studies have revealed that open to experience individuals tend to be more imaginative, independent and curious towards new ideas, experience and change, insuring their flexibility in thoughts and behaviours (Goldberg, 1993; McCrae & John, 1992). Costa and McCrae (1992) stated that “Open individuals tend to devise novel ideas, hold unconventional values and willingly question authority”. Conversely, individuals with low levels of openness to experience indicate low levels of change, due to sticking to the old ways and routine in performing activities (Goldberg, 1992), and high levels of conventionality in problem solving approaches (Burch & Anderson, 2008).

Openness to experience enables individuals to be more curious about mysterious situations permitting them to be more deductive (Mount et al., 2005). Being able to evaluate situations differently and being sensitive to your inner thoughts are the two attributes that best fit such personality (Cattell & Mead, 2008).

2.3.6 Big Five Factors and Compound Traits

The 3M model posits that elementary traits (i.e., big five factors) are related to compound traits. In this section we argue these relationships.

2.3.6.1 Big Five Factors and Need for Cognition

Based on previous literature, we expect that some elementary traits are going to be related to need for cognition. Verplanken, Hazenberg and

Palenewen (1992) mentioned that openness to experience influences need for cognition, throughout curiosity and tolerance of individuals to novel ideas, whereas conscientiousness impacts need for cognition based on the assumption that conscientious individuals are willing to engage in effortful thoughts.

Cacioppo, Petty, Feinstein, and Jarvis (1996) were one of the first researchers to confirm the positive link between need for cognition and openness to experience and conscientiousness. They argued that individuals with high need for cognition are to be of high degrees of openness and self-confidence, as well as high levels of work orientation and creativity.

The positive relationship between openness to experience and conscientiousness, and need for cognition was also verified by Sadowski and Cogburn (1997) and Brown (2006). It was clear that conscientious and open individuals are more likely to express and demonstrate high levels of curiosity regarding new themes and ideas, which represents a pre-request of scoring high levels on need for cognition.

Conversely, extraversion may have a negative effect on to the intention to engage in new effortful activities. Some studies have highlighted a negative relation between individuals demonstrating high levels of extraversion and constructive debates. Nussbaum and Bendixen (2003) proved that extraversion was positively associated with avoiding and not approaching arguments. They considered that being sociable, warm and assertive reflects low tendencies to participate and engage in debates, interactions and arguments. Taking into account that effortful activities include argumentative and doubtful thoughts, assertive sociable individuals may express fewer tendencies to partake in them. The action of being sociable, favours the fear of losing connections throughout debating, arguing or facing opposite opinions and thoughts. Hence, with extravert individuals being assertive and warm, the desire for learning and integrating in new effortful activities may be less. Therefore:

H7a: Openness to experience is positively related to need for cognition.

H7b: Conscientiousness is positively related to need for cognition.

H7c: Extraversion is negatively related to need for cognition.

2.3.6.2 Big Five Factors and Need for Structure

A long time ago, many scholars insisted on the existence of a direct relation between some constructs of the big five model and need for structure (Goldberg, 1981, 1990; McCrae & Costa, 1985, 1987; John, 1990), but so far few studies have empirically examined this assumption.

High personal need for structure is characterized by the need for fast, easy and accurate answers, as well as avoiding uncertain or ambiguous information. This characterization is an opposite description of openness to experience, which is oriented toward new novel imaginary situations, ideas and solutions (Kashihara, 2016). Likewise Sarmány-Schuller (1999) argued that people with high levels of need for structure tend to have problems with “active experimentations”. In other words, they tend to lack a willingness to change their established ways of behaviour, thinking, attitudes and simple structure. This can explain a negative relation between individuals that are open to new experiences and need for structure. Neuberg and Newsom (1993) in their study found the same negative relation between openness to experience and personal need for structure.

On the other side, conscientiousness has a positive influence on need for structure. Kashihara (2016) found a positive significant relation between conscientiousness and need for structure. This finding seems to be logical and unsurprising. Individuals described as conscientious tend to be organized, orderly and efficient in carrying out tasks, which in turn matches the description of need for structure.

Likewise, neuroticism may have a positive relationship with need for structure. Individuals who demonstrate high levels of fear, distrust and sadness are more likely to escape from ambiguous situations. In addition, individuals with high levels of neuroticism tend to be stressful, emotional and anxious, thus they will probably prefer clear and certain situations. Cattell and Mead (2008) stated that neurotic personalities demonstrate a

desire for routine. Thus, being a neurotic individual raises the probability of being structured. Therefore:

H8a: Conscientiousness is positively related to need for structure.

H8b: Openness to experience is negatively related to need for structure.

H8c: Neuroticism is positively related to need for structure.

2.3.6.3 Big Five Factors and Need for Affiliation

Individuals high in need for affiliation have a desire to interact with others (Leary, 2010), to have close friendly relationships with others (Klein & Pridemore, 1992) and are sensitive to the needs of others (Minbashian, Bright, & Bird, 2009). Thus these individuals are characterized by being social and willing to engage in interpersonal activities (Pervin, 1993). Judge and Cable (1997) linked agreeableness and extraversion to interpersonal relationships that describe preferred social interactions.

Agreeable individuals are courteous, friendly, likeable, trustworthy, altruistic and soft-hearted; thus, they are likely to be the most adored members in groups (McCrae & Costa, 1985). In addition, high agreeable individuals present high levels of tender mindedness and altruism that other people in groups appreciate (McCrae & Costa, 2008; Scott & Colquitt, 2007). On the other, need for affiliation reflects positive affect in relationships, help winning the approachability of others, and correspondence and cooperativeness among the group; all of which are aspects that help establish and maintain social harmony, which is an integral part of being agreeable (Teng, 2009).

Costa and McCrae (1988), and Emmerik, Gardner, Wendt & Fischer (2010) identified a significant positive relation between need for affiliation and the personality constructs extraversion and agreeableness.

On the other hand, high levels of neuroticism have been negatively related to need for affiliation (Barrick & Mount, 1991). It has been

argued that neurotic individuals get anxious, angry and change their moods very fast, which may impulse other group members not to like such individuals. This behaviour seems against high need for affiliation individuals' interest to accomplish warm and sensitive contact with others and to be liked. A study conducted by Emmerik, Gardner, Wendt, and Fischer (2010) showed that neuroticism has a negative relationship with need for affiliation based on the idea that neuroticism refers to irritability emotionality and moodiness of individuals. Therefore:

H9a: Extraversion is positively related to need for affiliation.

H9b: Agreeableness is positively related to need for affiliation.

H9c: Neuroticism is negatively related to need for affiliation.

2.3.6.4 Big Five Factors and General Self-Efficacy

The direct relation between all the big five personality traits and general self-efficacy has only been posed by a few researchers; however there are some studies that analyse the effect of some of the big five traits on general self-efficacy (e.g., Judge & Ilies, 2002; Thomas, Moore & Scott, 1996). The effect of three of these traits (conscientiousness, extraversion, and neuroticism) on general self-efficacy seems to be more empirically tested than the impact of agreeableness and openness to experience (Hartman & Betz, 2007; Rogers & Creed, 2010).

Bandura (1986) and Bandura and Jouden (1991) argued that the stronger the people's sense of self-efficacy, the higher their goals setting and commitments. In previous studies constructs, such as achievement motivation (goal setting mechanism) and self-regulation (commitment mechanism), have been used to argue the relationship between conscientiousness and self-efficacy (Richardson & Abraham, 2009). Conscientiousness encompasses a number of attributes that are part and parcel of the general domain of achievement motivation and self-regulation; for example, being decisive, punctual, organized, hardworking and goal oriented (Koestner, Bernieri, & Zuckerman, 1992; Zimmerman, 2002). In addition, it has been proposed that the basic characteristics of conscientiousness, such as competence, organization,

dutifulness and achievement, lead to stronger self-efficacy throughout task completion and exploration (Judge & Ilies, 2002).

An explanation for why self-efficacy is correlated with extraversion is that individuals high in extraversion possibly perceive themselves as able to cope effectively with situations because of their tendencies toward an assertive, action-oriented and positive emotional perspective (Romano, 2008). Extraversion may lead people to believe in themselves and adopt a "can do" orientation, similar to the one generated by self-efficacy in certain situations (Watson & Clark, 1997). Moreover, extrovert individuals with positive feelings and high social composure facilitate successful task completion and demonstrate certainty, which are, as well, major characteristics of general self-efficacy (Page, Bruch, & Haase, 2008).

On the other side, neuroticism has been negatively related to general self-efficacy, meaning that individuals scoring high levels of neuroticism present low levels of general self-efficacy (Page, Bruch, & Haase, 2008). Neurotic individuals are known to show tense emotions, be discouraged by nature and have difficulty to adapt to new and challenging situations and events (Abood & Ashouari-Idri, 2016). Thus, since neuroticism is oriented toward vulnerability, low feelings and negative emotions, this will normally generate the belief of being less capable of achieving certain tasks (i.e. low general self-efficacy) (Page, Bruch, & Haase, 2008)

The literature on the relationship of openness to experience with self-efficacy is scarce. However, I expect that openness to experience relates positively to general self-efficacy. This is based on the fact that general self-efficacy and openness to experience have common set of characteristics, such as exploration and embracement of challenges and new goal identifications (Komarraju & Nadler, 2013; Rofhus & Ackerman, 1999).

Finally, friendliness, cooperativeness, flexibility, courteousness, tolerance and trusting are characteristics describing agreeable individuals. It has been argued that the level of perceived compassion

and friendliness among individuals may affect the perception of successfully performing in various careers and activities (Larson, Rottinghuas, & Borgen, 2002; Barrick, Mount, & Gupta, 2003). From another perspective, being agreeable generates a sense of trust even in one's personal abilities; thus, this trust in one's own capabilities and skills can be transformed into self-efficacy perceptions. Therefore:

H10a: Extraversion is positively related to general self-efficacy.

H10b: Agreeableness is positively related to general self-efficacy.

H10c: Conscientiousness is positively related to general self-efficacy.

H10d: Openness to experience is positively related to general self-efficacy.

H10e: Neuroticism is negatively related to general self-efficacy.

2.3.6.5 Big Five Factors and Proactive Personality

The characteristics of extraversion, such as sociability, activeness and assertiveness, have been linked to the proactive tendency of changing and shaping the environment through social avenues (Major, Turner, & Fletcher, 2006). Moreover, the activeness and assertiveness of extravert individuals may relate to the tendency of gathering and uniting support for change, which is a crucial characteristic of proactive individuals (LePine & Van-Dyne, 1998; Wu, Turban & Cheung, 2007).

Openness to experience has been positively related to proactive personality based on the assumption that proactive individuals tend to capture and search for new future opportunities similarly to open to experience individuals who tend to be oriented toward imaginative intellectual opportunities (Digman, 1990). Crant and Bateman (2000) argued that the imaginary characteristic of open to experience individuals may relate to the capacity of proactive individuals to vision beyond current circumstances to implement change. In addition, they stated that

the intellectual component of openness helps proactive individuals detect complex situations and organize themselves for change.

Finally, the positive relationship of conscientiousness with proactive personality was addressed by Major, Turner and Fletcher (2006), who stated that conscientious individuals tend to eliminate inefficient procedures and plan for new methods, since they are highly organized, orderly and efficient task performers. Conscientious individuals are known as well for their competence and challenging spirit, which relates to proactive personality, since proactive individuals look forward implementing new proactive plans that help change the environment (Grant & Ashford, 2008).

Fuller and Marler (2009) insisted on the positive correlation of proactive personality with extraversion, openness to experience and conscientiousness. Support for the positive association of extraversion, openness to experience and conscientiousness with proactive personality was found in the meta-analytic study of Thomas, Whitman, and Viswesvaran (2010).

Therefore:

H11a: Extraversion is positively related to proactive personality.

H11b: Openness to experience is positively related to proactive personality.

H11c: Conscientiousness is positively related to proactive personality.

2.3.7 Big Five Factors and Antecedents in UTAUT2

In line with Mowen (2000), Mowen, Park and Zablah (2007) and Mowen, Fang and Scott (2009), this Doctoral Thesis also proposes that the big five constructs not only affect the compound traits but also the motivational variables considered by UTAUT2 and mobile banking use. In order not to repeat some of the arguments previously considered in

this section we assume that the direction of the relationship is the same in the direct relationship and indirect one.

2.3.7.1 Conscientiousness

Conscientiousness refers to the propensity to be a thorough, responsible, organized, hardworking, achievement oriented and persevering individual (Costa, McCrae, & Dye, 1991). I argue that this propensity is directly and positively related to the functional antecedents of mobile banking use and negatively associated with social influence. Moreover, previously I have proposed that conscientiousness is (i) positively related to need for cognition and general self-efficacy, and that these compound traits are positively linked to effort expectancy, (ii) negatively related to need for structure and that this compound trait is negatively linked to social influence, (iii) positively related to general self-efficacy and that this compound trait is positively linked to hedonic motivation; (iv) positively related to general self-efficacy and that this compound trait is positively linked to facilitating conditions; and (v) positively related to proactive personality and this compound trait is positively associated with performance expectancy. Consequently, we hypothesize:

H12: Conscientiousness is (a) positively related to effort expectancy, (b) negatively related to social influence, (c) positively related to hedonic motivation, (d) positively related to facilitating conditions; and (e) positively related to performance expectancy.

2.3.7.2 Extraversion

Extraversion is characterized by liking people, preferring groups, enjoying excitement and stimulation, and experiencing positive effects summarized by vigour, ardour and enthusiasm (Costa & McCrae, 1992; John & Srivastava, 1999). I argue that this disposition is directly and positively related to all antecedent of mobile banking use. Moreover, previously we have proposed that extraversion is (i) positively related to general self-efficacy, and proactive personality, and that these compound traits are positively linked to effort expectancy –however, extraversion is

negatively related to effort expectancy via need for cognition, (ii) positively related to need for affiliation and that this compound trait is positively linked to social influence, (iii) positively related need for affiliation and that this compound trait is negatively linked to performance expectancy –however, extraversion is positively related to performance expectancy through proactive personality (iv) positively related to general self-efficacy and that this compound trait is positively linked to hedonic motivation; and (v) positively related to general self-efficacy and proactive personality, and that these compound traits are positively linked to facilitating conditions. Consequently, we hypothesize:

H13: Extraversion is (a) positively related to effort expectancy, (b) positively related to performance expectancy, (c) positively related to social influence, (d) positively related to hedonic motivation, and (e) positively related to facilitating conditions.

2.3.7.3 Agreeableness

Agreeableness was defined by Graziano and Eisenberg (1997, p. 797) as "a compassionate interpersonal orientation described as being kind, considerate, likable, helpful and cooperative". Agreeableness also identifies people that are highly social (Mount, Murray, & Steve, 2005), friendly and generous in negotiations in a friendly environment (Ostendorf & Angleitner, 1992).

I argue that agreeableness is directly and positively related to all antecedent of mobile banking use but performance expectancy. Moreover, previously we have proposed that agreeableness is (i) positively related to need for affiliation, and that this compound trait is negatively linked to performance expectancy and positively linked to social influence, (ii) positively related to general self-efficacy and that this compound traits is positively linked to effort expectancy, hedonic motivation, and facilitating conditions. Consequently, we hypothesize:

H14: Agreeableness is (a) positively related to effort expectancy, (b) negatively related to performance expectancy, (c) positively related to

social influence, (d) positively related to hedonic motivation, and (e) positively related to facilitating conditions.

2.3.7.4 Neuroticism

Neuroticism is the fourth trait of personality. Neuroticism comprises the traits and characteristics of individuals who are fearful, sad, embarrassed, distrustful and stressful; thus, leading them to be anxious, self-conscious and paranoid (Devaraja, Easley & Crant, 2008; McElroy, Hendrickson, Townsend & DeMarie, 2007). Individuals with high levels of neuroticism are characterized by being stressful, emotional and anxious (Saucier & Goldberg, 1998).

I argue that neuroticism is directly and negatively related to all antecedent of mobile banking use, except to performance expectancy. Moreover, previously we have proposed that neuroticism is (i) negatively related to general self-efficacy and that this compound trait is positively to effort expectancy, (ii) negatively related need for affiliation and that this compound trait is negatively linked to performance expectancy, (iii) positively related to need for structure, and that this compound trait is negatively linked to social influence, (iv) negatively related to general self-efficacy and that this compound trait is positively linked to hedonic motivation; and (v) negatively related to general self-efficacy and that this compound trait is positively linked to facilitating conditions. Consequently, we hypothesize:

H15: Neuroticism is (a) negatively related to effort expectancy, (b) positively related to performance expectancy, (c) negatively related to social influence, (d) negatively related to hedonic motivation, and (e) negatively related to facilitating conditions.

2.3.7.5 Openness to Experience

Openness to experience is associated with the desire to explore new ideas and is called sometimes intellect or intellect-imagination. This factor includes traits like having wide interests and intellectual curiosity, being imaginative, insightful and attentive to inner feelings, and preferring variety (Costa & McCrae, 1992).

I argue that openness to experience is directly and positively related to all antecedent of mobile banking use. Moreover, previously we have proposed that openness to experience is (i) positively related to need for cognition, general self-efficacy and proactive personality, and that these compound traits are positively linked to effort expectancy, (ii) positively related to proactive personality and that this compound trait is positively linked to performance expectancy, (iii) positively related need for structure and that this compound trait is positively linked to social influence, (iv) positively related to general self-efficacy and proactive personality, and that these compound traits are positively related to hedonic motivation; and (v) positively related to general self-efficacy and proactive personality, and that these compound traits are positively related to facilitating conditions. Consequently, we hypothesize:

H16: Openness to experience is (a) positively related to effort expectancy, (b) positively related to performance expectancy, (c) positively related to social influence, (d) positively related to hedonic motivation, and (e) positively related to facilitating conditions.

2.3.8 Big Five Factors and Mobile Banking Use

In a similar way to the argument made in the previous section, we state that the elementary traits are directly related to use of mobile banking and indirectly through the elementary traits – compound traits – antecedents in UTAUT2 – mobile banking use pathway.

In a way consistent with the previously presented characteristics of the elementary features, and not to repeat what has already been argued about the indirect relationships between the variables of the model, we hypothesize:

H17b: Conscientiousness is positively related to use of mobile banking.

H17b: Extraversion is positively related to use of mobile banking.

H17c: Agreeableness is positively related to use of mobile banking.

H17d: Neuroticism is positively related to use of mobile banking.

H17e: Openness to experience is positively related to use of mobile banking.

CHAPTER THREE

METHODOLOGY

3 METHODOLOGY

3.1 INTRODUCTION

A conceptual model devoted to testing factors influencing Lebanese consumers' use of mobile banking was discussed in the previous chapter. As for the current chapter, research paradigms and approaches that have been commonly used in technology adoption studies and researches are critically reviewed. This, in turn, enables me to identify and rationalize the quantitative approach, as the most suitable research paradigm that can be applied to investigate my research hypotheses and validate my conceptual research model.

My selection of field survey as a best research model for this research is justified in this chapter, based on several arguments. This research type includes several aspects, such as sampling, sampling size, and data collection, that are also explained in the chapter. As well, this chapter demonstrates a critical justification for choosing a questionnaire technique as an appropriate data collection method in this research. Further the current chapter comments over instrument development and validations, by referring to measurement of items, translation process, pre-testing and pilot studies. In addition, preliminary data analyses and its main procedures, including data editing, coding and screening, are as well are presented. Parts of the chapter were also developed to exposing the usage of structural equation modelling (SEM) to test relations and hypotheses and validate the conceptual model. Finally, the ethical standards considered while collecting the required data are also explained. Thus, in the upcoming chapter, the previously mentioned ideas will be discussed based on the following chapter structure:

Section 2 highlights the main research epistemologies and justifies its selection for the current study. Section 3 states and reviews the research methods applied in the area of technology adoption and explain

the suitability of field survey for this investigation. Next, all aspects related to the field survey are addressed in section 4, where section 5 of this chapter provides a detailed observation of the main procedures required for developing and validating the data instrument used. All the preceding is followed by section 6, which discusses the main phases of data analysis using SEM and presents the results obtained from both preliminary data analyses and path analysis. Finally, the ethical considerations are addressed in section 7.

3.2 RESEARCH APPROACH

Research approaches are categorized into two main types: quantitative and qualitative (Bhattacharjee, 2012; Straub, Gefen, & Boudreau, 2005). The differences among the two approaches have to do with how they collect and analyse the required data, as well as the extent of using numerical and computable data to elucidate the problems under testment (Bryman & Bell, 2007).

Qualitative research is oriented towards full in-depth observation, view and analysis of phenomena's to understand the exact significance of natural settings and situations formulated by individuals (Bryman & Bell, 2007; Myers, 1997). Bhattacharjee (2012), Denzin and Lincoln (1998) and Myers (1997) referred to qualitative analysis approach as the process of comprehending a phenomenon based on examinations rather than forecasting and explaining. Thus, qualitative studies refer to personal examination of a phenomenon by the researcher, who is required to have in depth experience of the context as well with high creativity and mental analytic abilities to permit data collection (Bhattacharjee, 2012). This implies that qualitative researches generate theories based on the researcher' own understandings, since these studies are of inductive and interpretative nature (Collis & Hussey, 2003). In addition it was argued that qualitative approaches frequently use informal language (Collis & Hussey, 2003; Creswell, 2003). According to Bhattacharjee (2012) and Saunders, Lewis, and Thornhill (2003) the qualitative approach of interpretative nature represents ethnography, a case study, and action research, where action research is referred as particular instruments, such as interviews and documents for data collection.

On the other side, the quantitative approach is defined as “an organized method for combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity” (Neuman, 1997, p. 63). Researches have described quantitative data as more standardized and objective, as well as more numerical and statistical, where the formal language is more commonly utilized with this approach to collect data (Bhattacharjee, 2012; Collis & Hussey, 2003; Creswell, 2003; Guba & Lincoln, 1988; Saunders, Lewis, & Thornhill, 2003). According to Orlikowski and Baroudi (1991), quantitative research tends to seek, examine and approve causal relationships between variables and, thus, this approach is considered with high deductive power. From another perspective, quantitative approaches are described by their generalizability in results, depending on large amount of numerical data to be obtained from a sample of reasonable size (Collis & Hussey, 2003; Orlikowski & Baroudi, 1991). To obtain best quantitative data laboratory experiments, formal methods (e.g. econometrics), field surveys, and numerical methods (e.g. mathematical modelling) are the most widely identified instances (Bhattacharjee, 2012; Myers, 1997; Straub, Gefen, & Boudreau, 2005).

Referring to the nature of my study, it seems to be more oriented towards being deductive; therefore, looking for theory testing rather than theory development. Testing the hypotheses and validating the research model require quantitative measures so that results can be generalized to the whole population of mobile banking customers in Lebanon. The underlined constructs in my conceptual model such as performance expectancy, effort expectancy, social influence, facilitating conditions, personality constructs, use behaviour etc. are all characterized by using values and levels.

As the goal of my study is to attain higher generalizability and reliability in the yielded results it requires sophisticated statistical analysis such as SEM, after obtaining accurate, sufficient and valid quantitative data from a substantial sample (Orlikowski & Baroudi, 1991) from Lebanese people. Further, in the same sense, Bhattacharjee

(2012), Collis and Hussey (2003), Easterby-Smith, Thorpe, and Lowe (2002), and Remenyi, Williams, Money, and Swartz (1998) all indicated in their studies that quantitative instances, such as field survey, that obtain quantitative data throughout convenient instruments, such as self-administrated questionnaires, are more applicable and feasible in the kind of studies that are identical to mine.

Bhattacharjee (2012) and Sekaran (2003) confirmed that the best manner to separate respondents' answers from the researcher's influence is through applying a self-administrated questionnaire.

Consequently based on the above argumentations, I employed a quantitative approach to achieve my study's aims and objectives. Indeed a field survey was applied to obtain data for my current study throughout a self-administrated questionnaire. Therefore, data obtained in the current study are to be listed under the quantitative type rather than the qualitative one.

3.3 RESEARCH METHODS

Among several well-known research methods, researchers in each research must identify their own appropriate research method in order to conduct the empirical study (Bhattacharjee, 2012; Remenyi, Williams, Money & Swartz, 1998). Well-known research methods are various and they include the following: field surveys, laboratory experiments, field experiments, case studies, focus groups, ethnography and action research (Bhattacharjee, 2012; Orlikowski & Baroudi, 1991; Sekaran, 2003; Zikmund, 2003). But since Orlikowski and Baroudi (1991) stated that field survey is the research method most adopted by information system scholars, and since our study best fits the field survey (as it is demonstrated in section 3.3.1 below) the researcher main focus will only be oriented towards field survey method.

3.3.1 Field Survey

More than one scholar has defined the research method "field survey". They have referred to it as a non-experimental method that applies specific statistical techniques in order to examine the causal relations between independent and dependent variables in proposed

models or theories (Bhattacharjee, 2012; Saunders, Lewis, & Thornhill, 2003). Scholars have argued that survey research can be conducted to obtain raw data for certain statistical analyses from a sample of respondents regarding their beliefs, behaviours, profiles, opinions, attitudes, or actions, throughout well-structured questionnaires or, in a few cases, throughout interviews (Bhattacharjee, 2012; Dwivedi, Choudrie, & Brinkman, 2006; Remenyi, Williams, Money, & Swartz, 1998; Saunders, Lewis, & Thornhill, 2003).

Accordingly field survey can be categorized into two kinds based on the instrument used for obtaining the required data. These two kinds of field survey are interviews and questionnaires (Bhattacharjee, 2012). The interview method is used as an instrument for data collection in which the interviewer communicates verbally with the respondents (interviewees) through direct face-to-face contact or by the means of other channels (e.g. telephones, focus groups) (Bhattacharjee, 2012). Hence, in this case, the interviewer carries the whole responsibility of successfully conducting the interview. On the other side, questionnaires involve filling and writing down answers to structured questions in a structured format by the respondents themselves (Bhattacharjee, 2012). Therefore, it can be deduced that each of the survey method (questionnaire or interview) serves different research purposes and fulfil different research objectives (Bhattacharjee, 2012).

Aside from these two kinds, field surveys can be categorized also based on time horizons. Questionnaires or interviews that consider examining dependent and independent variables all at the same time are cross sectional surveys, whereas questionnaires and interviews that first measure independent variables and then the dependent variables at a subsequent time are longitudinal surveys (Bhattacharjee, 2012).

It has been agreed that field survey has been the most used research method in social science. Bhattacharjee (2012) and Irani, Dwivedi, and Williams (2009) particularly argued that the field survey is the most suitable method, especially in researches where the research objective or the research unit is an individual (e.g. customers, students, employees etc.).

Survey method has been characterized by its high degree of external validity since it allows researchers to obtain the required data from the required samples through direct contact (Bhattacharjee, 2012). Moreover, survey method provides the opportunity of capturing and addressing all kind of variables, including dependent and independent one. Bhattacharjee (2012) stated that survey method permits researchers to examine their points of interest from different perspectives through the possibility of applying several different theories all at the same time. Similarly, survey method permits the possibility of examining a wider set of variables, constructs and factors (such as intrinsic factors, emotion, belief, age, income etc.) that cannot be clearly observed by other research methods (i.e. through examination, case studies etc.). Bhattacharjee (2012) and Zikmund (2003) in their studies insisted that field survey is able to collect more amounts of data regarding the nature of an individual's beliefs, attitudes and emotions.

From another perspective, other scholars have stated that the data and results obtained from field surveys are more generalized (Bhattacharjee, 2012; Hair, Anderson, Tatham, & Black, 1998). This can be explained by the fact that field survey is a cost-effective method. Compared to other research methods, survey method enables researchers to cover a large sample size of respondents in a wide geographical area within reasonable time boundaries (Saunders, Lewis, & Thornhill, 2003; Sekaran, 2003; Zikmund, 2003).

3.4 SURVEY RESEARCH APPROACH

In the previous sections the survey research approach was addressed in detail. But Fowler (2002) recommended that for researchers to undertake a survey research approach with a high quality level, they should address three parts that comprise the survey research approach. These three parts to be considered are: sampling, data collection method and instrument development.

Sampling refers to the population set considered by the study. This set of the population under study (sample) must be carefully chosen by the researcher in order for the statistical results and deductions to be generalized to the whole population (Bhattacharjee, 2012; Fowler, 2002).

As for the next part “data collection method”, it refers to the way the data collection process will be achieved. The extraction of the required data could be based on one or more of these data collection methods: self-administered questionnaire, face-to-face contact, group-administered questionnaire, and online or electronic methods. Accordingly researchers must evaluate each method based on the nature of their studies to accurately decide the application of a particular method rather than others (Fowler, 2002). The final part, instrument development, is mainly related to identifying the measurement items used to assess the constructs under study, as well as response format and content, translation, and validation of the data instrument.

3.4.1 Sampling

In research in social science, it has been agreed that examining the whole population for a study is not workable and pertinent since this obliges a lot of costs, time and human resources efforts (Bhattacharjee, 2012; Gay & Airasian, 2002). The term sampling has been defined as “the statistical process of selecting a subset (called a “sample”) of a population of interest for the purposes of making observations and statistical inferences about that population” (Bhattacharjee, 2012, p. 65).

Social science researchers, who examine in their studies quite large populations, extensively claim sampling processes that must be characterized by their feasibility and reasonability (Bhattacharjee, 2012; Gay & Airasian, 2002; Zikmund, 2003). Gay and Airasian (2002) argued that in such systematic process of sampling, the research units selected (e.g. customers, citizens, students etc.) must fully represent the whole targeted population of the study. Thus, a successful sampling must represent and capture the whole population characteristics and size. This successful sample selection generates less sampling errors and bias, which, in turn, leads to more generalized results and deductions (Bhattacharjee, 2012; Sekaran, 2003; Zikmund, 2003).

Accordingly Bhattacharjee (2012) considers the process of sampling to be achieved based on three main sequential phases. The first phase includes identifying the target population, the next phase comprises

selecting the sample frame desired and the final phase is concerned with defining the most fitting sample technique to be used.

3.4.1.1 Population

The term population in statistics refers to a group of units or objects (usually individuals) under analysis based on some particular features that the researcher is interested in (Bhattacharjee, 2012; Sekaran, 2003; Zikmund, 2003). Referring to this study, and based on the aim of exploring factors influencing mobile banking use among Lebanese customers, each Lebanese individual above 18 years old, user or non-user of mobile banking, that owns a smart-phone and has a bank account is a unit of analysis (member of the population) to be targeted. As a result, this shows that, in this study, a huge set of the Lebanese population that is scattered over the whole Lebanon is to be considered. Targeting and treating all of this huge population would be inapplicable. Hence, as a conclusion, a reasonable sample size representing the whole Lebanese population of individuals above 18 years old, with a smart-phone and a bank account must be assigned to be approached for data extraction.

3.4.1.2 Sampling Frame

A sample frame represents a part of the whole population that is considered by the researcher as the easiest part to access from the population to originate the ideal sample (Bhattacharjee, 2012). Nonetheless, the most important aspect is that the sample frame must represent the whole population to end up with feasible, generalized and valid results representing the whole population (Bhattacharjee, 2012).

In this study, the “sampling frame”, representing the reachable population under study, encompassed Lebanese individuals (above 18 years old, with a smart-phone and a bank account) residing in the capital of Lebanon “Beirut”.

3.4.1.3 Sampling Technique

Sampling technique is the final phase of the sampling process. This phase is based on identifying a specific technique for reaching the required data from the selected sample frame (Bhattacharjee, 2012;

Sekaran, 2003). Researchers are supposed to select one sampling techniques out of two types: non-probability sampling and probability sampling (Bhattacharjee, 2012; Sekaran, 2003). The decision to select a particular technique rather than the other must be based on the characteristics of each kind of sampling technique (Bhattacharjee, 2012; Fowler, 2002). In addition, selecting the appropriate sampling technique has to depend on the conditions of the selected sample frame. Bhattacharjee (2012), Fowler (2002) and Sekaran (2003) all agreed that the selection of the sampling technique must consider whether this selected technique fits the nature and size of the sample frame, whether it is possible to access all research units in the sample frame and vitally whether the sample frame has an updated list of the whole eligible population for the study. Therefore, a brief discussion is provided below to explain the nature of the two sampling techniques, and a rationalized justification of the selection of non-random sampling technique as the most appropriate technique for this study.

Probability sampling, also known as random sampling, aims to target an unknown set of units of the population based on a random selection process in which each unit of the population has a probability greater than zero (non-zero probability) of being selected (the probability depends on the required quantity of data divided by the whole population size) (Bhattacharjee, 2012). As stated before, this type of sampling techniques preserves its own fundamental characteristics compared to the non-probability technique. Probability sampling is characterized by its random assortment of the research units among the whole population in the selected sample frame within a defined time interval.

Probability sampling is usually considered of high degree of generalizability, and, for many researchers, a sampling method free of error or with less sampling bias (Bhattacharjee, 2012). However, conducting such sampling technique in the present study is difficult and unpractical. Several conditions that are compulsory for a successful application of probability sampling are not available within the sampling frame of this study. For example, there is no updated list of the whole eligible population of the sample frame. Further, the researcher was unable to guarantee an accurate probability in such a way that all

Lebanese individuals can have a fixed probability to form part of the final sample list. According to Castillo (2009) and Dwivedi, Choudrie, and Brinkman (2006) these two situations are the most common complications for conducting probability sampling. Moreover, Bhattacharjee (2012) and Castillo (2009) stated that another major obstacle for applying a probability technique is a wide spread population and large sample size. This was also the case in the current study. Finally, due to privacy and security issues, no detailed information regarding the Lebanese population was given to the researcher by banks, local governments, organization, etc., which, in turn, created further difficulties in applying probability sampling (Castillo, 2009; Dwivedi, Choudrie, & Brinkman, 2006). Hence, probability sampling was found to be less suitable to the current study in order to select a sample of Lebanese individuals above 18 years old with a smart-phone and a bank account.

The other sampling technique is non-probability sampling. Through this technique, research units in the sample frame may have a zero probability of being part of the final sample, which means that the opportunity of choosing a research unity may be imprecise (Bhattacharjee, 2012; Sekaran, 2003). Thus, for some researchers, measuring the sample selection error is not possible within this kind of selection (Bhattacharjee, 2012).

Non-probability sampling technique is categorized into four main types: convenience sampling, quota sampling, expert sampling, and snowball sampling. Convenience sampling or accidental sampling is a kind of sampling process that depends on the easy access, convenience and ease of reach to select the sample from the entire population (Bhattacharjee, 2012; Champion, 2002; Dwivedi, Choudrie, & Brinkman, 2006; McDaniel & Gates, 2006; Stone, 1978). Such selection process depends of sudden occasions and situations. For example, convenience sampling happens when questionnaires are distributed to a number of individuals who are by “accident” at the place where the process of questionnaire allocation is taking place (Bhattacharjee, 2012).

Quota sampling is a non-random selection process based on the technique of fragmenting the entire population of the sample frame into mutually exclusive subcategories (Bhattacharjee, 2012). Expert sampling, on the other hand, consists in targeting research units from the sample frame based on their knowledge and experience in the addressed topic (Bhattacharjee, 2012); in other words, the selection process considers the level of experience and knowledge while non-randomly choosing the final sample list. Finally, snowball sampling is the method used by researchers when they face populations that cannot be easily addressed (Bhattacharjee, 2012 and Bryman, 2004). This selection technique consists in selecting a non-random small sample that fits the research targeted group's standards; this small group of units will then be asked to nominate another group of participants that they think fit the research assigned standards (Bhattacharjee, 2012). However; the results obtained through this selection process will be considered less generalized compared to other sampling techniques (Bryman, 2004).

In studies with customers as research units, convenience sampling has been marked as the most popular and frequently applied research sampling technique (Bryman & Bell, 2007). Furthermore, convenience sampling has been intensively used while conducting the technology acceptance theory (Taylor & Todd, 1995). In particular, studies related to the technology banking context, such as mobile banking, internet banking etc., have also effectively applied convenience sampling (Abdinoor & Mbamba, 2017; Ahmed & Sathish, 2017; Al-Ashban & Burney, 2001; Amin, 2007; Amin, Hamid, Lada, & Anis, 2008; Bhatt, 2016; Brown, Pope, & Voges, 2003; Curran & Meuter, 2005; Curran & Meuter, 2007; Dean, 2008; Foon & Fah, 2011; Gounaris & Koritos, 2008; Hosseini, Fatemifar, & Rahimzadeh, 2015; Howcroft, Hamilton, & Hewer, 2002; Khraim, Shoubaki, & Khraim, 2011; Koenig-Lewis, Palmer, & Moll, 2010; Lee, 2009; Lee, Fairhurst, & Lee, 2009; Liao, Shao, Wang, & Chen, 1999; Littler & Melanthiou, 2006; Oyedele & Simpson, 2007; Poon, 2008; Purwanegara, Apriningsih, & Andika, 2014; Rexha, John, & Shang, 2003; Shamdassani, Mukherjee, & Malhotra, 2008; Simon & Usunier, 2007; Wan, Luk, & Chow, 2005; Wang & Shih, 2009; Zhou, Lu, & Wang, 2010).

With regards to this study, it was already justified that non-random sampling is the most appropriate sampling approach. To be more precise, under the form of non-random sampling, the current study applied quota sampling. For this study to be appropriate and representative, the researcher defined a specific quota. This quota was established to guarantee enough responses from both mobile banking users and mobile banking non-users. This boundary to the targeted sample allowed the research to identify antecedents of the use variable. Nevertheless, in order to reduce the sampling bias that may be generated by the quota sampling technique and to secure generalizability of the results, the researcher addressed a large sample size, with a wide diversity in line with profile and characteristics of the Lebanese banking customers who own a smart-phone device (Miller, Acton, Fullerton, & Maltby, 2002).

Finally, in particular, the non-random sample of Lebanese individuals with bank accounts was reached in the following ways:

- Throughout a direct interaction with the targeted respondents that were obtained from researcher personal contacts
- Throughout a direct contact with the targeted respondents found at bank branches
- Throughout a direct contact with the targeted respondents that were facilitated by the help of the banks' staff
- Throughout a direct contact with the targeted respondents represented by bank customers, University students, teachers and other Lebanese public and private employees that were approached in their work places.

3.4.2 Sampling Size

The term sample size refers to the size of the sample population that the study covers. In quantitative researches, the identification of the sample size is one of the most critical issues that a researcher must take into account (Lenth, 2001). A suitable sample size is the chief factor behind reaching generalizable conclusions. In addition, if the researcher is able to choose a suitable sample size, the statistical analysis can be

more properly and easily conducted, reaching more valid and reliable results (Hair, Black, Babin, Anderson, & Tatham, 2006; Luck & Rubin, 1987; Malhotra & Birks, 2003). The sample size is limited by the statistical analysis method to be adopted (Kline, 2005; Luck and Rubin, 1987; Malhotra, 1999). According to Luck and Rubin, (1987) and Malhotra and Birks (2003), the more complex the statistical analysis method, the more compulsory it is to have a bigger sample size.

Other scholars have identified more aspects to consider when determining the sample size. Kline (2005), Muthén and Muthén (2002), and Tabachnick and Fidell (2007), all argued that a sample size must be defined not only based on the complexity of the conceptual model proposed but also on the accessibility of the targeted population, the extent of how much the variables are normally distributed, and the effect size of some variables on others. Thus, there still exists no agreement on how a sample size must be defined (Muthén & Muthén, 2002).

To validate of the research model and test the proposed research hypotheses, Structural Equation Modeling (SEM) was considered the most appropriate statistical analysis technique. To such a complex statistical analysis method, sampling size is an important aspect, to reach generalizability of results, to test for validity and reliability of the used constructs, and, as well, for the accuracy of model fitness (Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2007). Thus, to conduct a successful SEM analysis, it is important to obtain a sufficient and adequate sample size. In fact, some scholars have stated that a small sample size while conducting SEM analysis results in unsteady correlations and variance estimations (Tabachnick & Fidell, 2007).

When using a complex statistical analysis method, especially if it integrates a big set of constructs and causal paths; it has been vastly recommended to use a sample size of at least 200 respondents (Kline, 2005). Other researchers have been more specific; they have stated that when using SEM analysis, the researcher must ensure at least a pool of 200 respondents (Harris & Schaubroeck, 1990; Gerbing & Anderson, 1993). In the same sense, Hair, Anderson, Tatham, and Black (1998)

argued that a perfect sample size for performing a strong and accurate SEM analysis must have a minimum of 200 respondents.

Therefore, in the line with all of the above, the valid sample size in the current study, which should be enough for a proper SEM analysis, is a total of 625 cases.

3.4.3 Questionnaire Survey

In a survey study, and in order to collect the requested data, the questionnaire is considered as the most common and appropriate data collection instrument (Bhattacharjee, 2012; Dwivedi, Choudrie, & Brinkman, 2006; Sekaran, 2003; Zikmund, 2003). The term questionnaire survey at first referred to the data collection method used to obtain data from respondents based on a set of asked questions and responded answers, without any kind of interaction between researcher and respondents. Later the term questionnaire survey was newly defined as “a research instrument consisting of a set of questions (items) intended to capture responses from respondents in a standardized manner” (Bhattacharjee, 2012, p. 74).

Throughout a questionnaire survey, questions addressed to respondents can be of different types, known as structured, unstructured or a mix of both. According to Bhattacharjee (2012), unstructured questions allow a respondent to use his/her own language to express the answer to the question, whereas in a structured question respondents are obliged to choose among a set of pre-prepared answers.

The success of questionnaire survey as a data collection instrument mainly depends on its language and method to be conducted. Bhattacharjee, (2012) stated that from a respondent’s point of view, a successful questionnaire integrates an understandable context, reliable scale items, and a well-designed structure.

Questionnaire surveys are classified into three main kinds based on the way they are delivered to respondents and the way these respondents answer them back. These kinds are: online or web survey, self-administered questionnaire, and group-administered questionnaire

(Bhattacharjee, 2012). Starting by the online-web survey, it is a format of questionnaire developed throughout the Internet. This type of questionnaire allows researchers to send the developed electronic questionnaire to the selected sample via any kind of electronic channel (i.e. e-mail, google drive, social messenger, etc.) (Bhattacharjee, 2012). Hence, this kind of questionnaire may be conducted in two different ways. A researcher using the online-web questionnaire type may send the questionnaire to the targeted sample via e-mail, and these e-mail receivers must fill the questionnaire and send it back again (Bhattacharjee, 2012). Otherwise, the researcher may create a link that stores the previously developed online-web questionnaire, and then provide this link to his targeted sample so that they can have access and fill the provided form (Bhattacharjee, 2012). This kind of questionnaire seems to be very efficient. Online-web questionnaire is described as flexible since the data collected can be easily adjusted in case of any errors (Bhattacharjee, 2012). Moreover, it allows fast data entry to electronic databases, which are then used for statistical analysis. In addition, this method reduces costs and minimizes data collection expenses (Bhattacharjee, 2012). However, the online-web questionnaire type has also several vulnerabilities. Applying such type may automatically discard some parts of the population, since many Internet users do not trust unknown links and web addresses (Bhattacharjee, 2012). In addition, old individuals that may be an important part of the population do not feel comfortable filling up an electronic survey. Thus, this non-comfortability among part of the population may lead to an obvious sample error or bias, as stated by Bhattacharjee (2012). Finally, this kind of questionnaire may face privacy and security vulnerabilities. An unsecured channel or data storage may lead to data modification or loss (Bhattacharjee, 2012).

The next type is self-administrated questionnaire. This kind of questionnaire is very simple. The researcher is supposed to send his/her pre-developed questionnaire to his/her selected targeted sample, and, in turn, these respondents are supposed to fill and answer the assigned questionnaire and send it back to the researcher (Bhattacharjee, 2012). Self-administrated questionnaires allow respondents to fill and write their own responses without any personal interactions with the researcher nor

time or place restrictions (Hair, Bush, & Ortinau, 2003). For customer research, self-administrated questionnaire is one of the most popular and frequently used types of survey (Zikmund, 2003). However, low response rates of this survey type seem to be one of its weaknesses. Bhattacharjee (2012) explained that response rates of self-administrated questionnaires hang on the willingness of respondents to fill and complete the questionnaire. This willingness is mainly influenced by how time consuming is filling the questionnaire and returning it back to the researcher. Therefore, response rates from self-administrated questionnaires are expected to be low.

Group-administrated questionnaire is the third type of questionnaire survey. Within this type of questionnaire, a common place or meeting point is assigned by the researcher, where a group of respondents are gathered and asked to read and fill out the entire questionnaire (Bhattacharjee, 2012). This way, the researcher has a direct interaction with the respondent group (e.g. may clarify any ambiguous point related to the questionnaire), and may secure a high response rate (Bhattacharjee, 2012). Nevertheless the group-questionnaire has some drawbacks as well. Some scholars have argued that group-questionnaire cannot be properly applied in cases of large sample size where the researcher aims to target a vast population (Bhattacharjee, 2012). When targeting a large sample size that is widely spread over a wide geographical area (e.g. Lebanese banking customers), researchers may face a critical barrier of finding a suitable time and place that fits all targeted population (Bhattacharjee, 2012). Thus, group-questionnaire has been occasionally used.

3.4.3.1 Justification of Self-Administrated Questionnaire

Obtaining the required data for statistical analysis can be done using different research methods. Each study proposes different data collection approaches such as self-administered questionnaires, group-administered questionnaires or online-web questionnaires (Bhattacharjee, 2012; Fowler, 2002; Straub, Gefen, & Boudreau, 2005; Comford & Smithson, 1996). Thus each researcher in his/her study must build on a set of considerations and rational justifications for choosing the most applicable data collection method. According to Fowler, (2002) and

Straub, Gefen, and Boudreau, (2005), each researcher must take into account the research approach adopted (quantitative or qualitative), resources available (time, human etc.), research cost and finance, population characteristics and nature, sampling (sample frame, size and technique), and finally question format and context.

To gather the required data from the Lebanese banking customers who own smart-phones, and to obtain an adequate amount of quantitative data, the self-administrated questionnaire was considered the best data collection instrument for the following reasons:

It was mentioned previously that this study is an individual research project that is personally financed and funded. Hence the current study faces a set of barriers at the levels of money, human resources and time deadlines. The self-administrated questionnaire instrument is one of the most efficient data collection methods to access a large population size, spread over a wide geographical area, within evenhanded costs and practical time (Bhattacharjee, 2012; Bryman & Bell, 2003; Fowler, 2002).

In addition, to carry out statistical analyses in any quantitative study, it is required to obtain high trustworthy, precise and binding data (Creswell, 2003; Saunders, Lewis, & Thornhill, 2003). According to Bhattacharjee (2012), a self-administrated questionnaire allows researchers to retrieve exact answers to the asked questions. These standardized and accurate answers obtained throughout the self-administrated questionnaire ensure data reliability and consistency, required for the quantitative data analysis procedures.

Thus, based on several studies (such as Bryman & Bell, 2003; Bhattacharjee, 2012; Fowler, 2002; Sekaran, 2003; Zikmund, 2003) and the previous argumentations, questionnaire survey, especially self-administrated questionnaire, was found to be the most appropriate data collection method, since it is free of place, time and cost restrictions.

One of the most import aspects that motivate researchers to apply the self-administrated questionnaire is respondent independency.

Researchers like to study certain topics from other individual's perspectives (i.e. not the researcher perspective and beliefs). According to Sekaran (2003), answers and data collected from self-administrated questionnaires are less likely to be influenced by the researcher's thoughts. This, in turn, will result in more representative conclusions and truthful outcomes regarding the topic being surveyed.

Finally, among research addressing technology adoption factors and causes, the self-administrated questionnaire has been the most frequently used data collection instrument (Bhattacharjee, 2012; Orlikowski & Baroudi, 1991; Sekaran, 2003; Zikmund, 2003). In particular, for the validation of the theory of acceptance model (TAM) by Davis, Bagozzi, and Warshaw (1989) the questionnaire survey was applied. Moreover, the questionnaire survey approach was used to collect data to support the unified theory of acceptance and use of technology (UTAUT) and the unified theory of acceptance and use of technology two (UTAUT2) (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh, Thonh, & Xu, 2012). In addition, earlier studies addressing new technologies adoption in the banking sector (e.g. internet banking, mobile banking etc.) have found questionnaire survey to be a satisfactory method for data collection. For example, the studies conducted by Curran and Meuter (2005) in the USA concerning new banking channels adoption, Koenig-Lewis, Palmer, and Moll (2010) studying mobile banking adoption in Germany, Celik (2008) studying intention to adopt internet banking by Turkish banking customers, Laukkanen, Sinkkonen, and Laukkanen (2008) studying resistance to internet banking in Finland, Martins, Oliveira, and Popovic (2014) studying adoption of internet banking in Portugal, Zhou, Lu, and Wang (2010) studying mobile banking adoption in China, Riffai, Grant, and Edgar (2012) studying the online banking adoption in Oman, have all used the questionnaire survey as a data collection method.

Consequently, this study applies the self-administrated questionnaire as the data collection instrument.

3.5 INSTRUMENT DEVELOPMENT AND VALIDATION

3.5.1 Measurements

Given that the current study addresses the factors that influence mobile banking use among Lebanese customers, a structured self-administrated questionnaire was developed to collect the required data. This questionnaire addresses all the constructs presented in the conceptual model (dependent and independent variables) by means of a total of ninety eight (98) scale items adopted from previous technology adoption, and psychological literatures. In particular, performance expectancy (PE): 4 items; effort expectancy (EE): 4 items; social influence (SI): 3 items; facilitating conditions (FC): 4 items; hedonic motivation (HM): 3 items; proactive personality (PP): 10 items; general self-efficacy (GSE): 3 items; need for affiliation (NFA): 5 items; need for structure (NFS): 12 items; need for cognition (NFG): 5 items; openness to experience (OE): 10 items; extraversion, EX: 8 items; conscientiousness (CON): 9 items; agreeableness (AG): 9 items; neuroticism (NE): 8 items; use behaviour (UB): 1 item. In addition, other items and scales were also included in the questionnaire. These other scales involve the control variables of the study (age, gender, branch proximity) and, for users, the intensity of mobile banking use (measured by activities performed while using mobile banking), the habit construct used in UTAUT2, and the seniority using mobile banking. Table 3.1 presents the constructs PE, EE, SI, FC, HM, PP, GSE, NFA, NFS, NFG, OE, EX, CON, AG and NE, as well as use behaviour (UB), and their corresponding items and the reference from which each construct scale was obtained.

Table 3.1: Construct Items Adopted For Examining Mobile Banking Use

Constructs	Items		Sources
Performance Expectancy	PE1	I would find mobile banking useful in my daily life	Venkatesh, Thonh, & Xu, 2012
	PE2	Using mobile banking would increase my chances of achieving things that are important to me	
	PE3	Using mobile banking would help me accomplish things more quickly	

Constructs	Items		Sources
	PE4	Using mobile banking would increase my productivity	
Effort Expectancy	EE1	Learning how to use mobile banking would be easy for me	Venkatesh, Thonh, & Xu, 2012
	EE2	My interaction with mobile banking would be clear and understandable	
	EE3	I find mobile banking would be easy to use	
	EE4	It would be easy for me to become skilful at using mobile banking	
Social Influence	SI1	People who are important to me think that I should use mobile banking	Venkatesh, Thonh, & Xu, 2012
	SI2	People who influence my behaviour think that I should use mobile banking	
	SI3	People whose opinions that I value prefer that I use mobile banking	
Facilitating Conditions	FC1	I have the resources necessary to use mobile banking	Venkatesh, Thonh, & Xu, 2012
	FC2	I have the knowledge necessary to use mobile banking	
	FC3	Mobile banking is compatible with other technologies I use	
	FC4	I can get help from others when I have difficulties using mobile banking	
Hedonic Motivation	HM1	Using mobile banking would be fun	Venkatesh, Thonh, & Xu, 2012
	HM2	Using mobile baking would be enjoyable	
	HM3	Using mobile banking would be very entertaining	
Proactive Personality	PP1	I am constantly on the lookout for new ways to improve my life	Bateman & Crant, 1993
	PP2	Wherever I have been, I have been a powerful force for constructive change	
	PP3	Nothing is more exciting than seeing my ideas turn into reality	
	PP4	If I see something I don't like, I fix it	
	PP5	No matter what the odds, if I believe in something I will make it happen	

Constructs	Items		Sources
	PP6	I love being a champion for my ideas, even against others' opposition	
	PP7	I excel at identifying opportunities	
	PP8	I am always looking for better ways to do things	
	PP9	If I believe in an idea, no obstacle will prevent me from making it happen	
	PP10	I can spot a good opportunity long before others can	
General Self Efficacy	GSE1	I feel in control of what is happening to me	Mowen, 2000
	GSE2	I find that once I make up my mind, I can accomplish my goals	
	GSE3	I have a great deal of will power	
Need For Affiliation	NFA1	One of the most enjoyable things I can think of that I like to do is just watching people and seeing what they are like	Hill, 1987
	NFA2	I think being close to others, listening to them, and relating to them on a one-to-one level is one of my favourite and most satisfying pastimes	
	NFA3	Just being around others and finding out about them is one of the most interesting things I can think of doing	
	NFA4	I feel like I have really accomplished something valuable when I am able to get close to someone	
	NFA5	I would find it very satisfying to be able to form new friendships with whomever I liked	
Need For Structure	NFS1	It upsets me to go into a situation without knowing what I can expect from it	Thompson, Naccarato, Parker, & Moskowitz, 2001
	NFS2	I'm not bothered by things that upset my daily routine	
	NFS3	I enjoy having a clear and structured mode of life	

Constructs	Items		Sources
	NFS4	I like a place for everything and everything in its place	
	NFS5	I like being spontaneous	
	NFS6	I find that a well ordered life with regular hours makes my life tedious	
	NFS7	I don't like situations that are uncertain	
	NFS8	I hate to change my plans at the last minute	
	NFS9	I hate to be with people that are unpredictable	
	NFS10	I find that a consistent routine enables me to enjoy life more	
	NFS11	I enjoy the exhilaration of being put in unpredictable situations	
	NFS12	I become uncomfortable when the rules in a situation are not clear	
Need For Cognition	NFC1	I would rather do something that requires little thought than something that is sure to challenge my thinking abilities	Wood & Swait, 2002
	NFC2	I try to anticipate and avoid situations where there is a likely change I'll have to think in depth about something	
	NFC3	I only think as hard as I have to	
	NFC4	The idea of relying on thought to get my way to the top does not appeal to me	
	NFC5	The notion of thinking abstractly is not appealing to me	
Openness To Experience	OE1	I see myself as someone who is original, comes up with new ideas	John & Srivastava, 1999
	OE2	I see myself as someone who is curious about many different things	
	OE3	I see myself as someone who is ingenious, a deep thinker	
	OE4	I see myself as someone who has an active imagination	
	OE5	I see myself as someone who is inventive	

Constructs	Items		Sources
	OE6	I see myself as someone who Values artistic, aesthetic experiences	
	OE7	I see myself as someone who prefers work that is routine	
	OE8	I see myself as someone who Likes to reflect, play with ideas	
	OE9	I see myself as someone who has few artistic interests	
	OE10	I see myself as someone who Is sophisticated in art, music, or literature	
Extraversion	EX1	I see myself as someone who is talkative	John & Srivastava, 1999
	EX2	I see myself as someone who is reserved	
	EX3	I see myself as someone who is full of energy	
	EX4	I see myself as someone who Generates a lot of enthusiasm	
	EX5	I see myself as someone who tends to be quiet	
	EX6	I see myself as someone who has an assertive personality	
	EX7	I see myself as someone who is sometimes shy, inhibited	
	EX8	I see myself as someone who is outgoing, sociable	
Conscientiousness	CON1	I see myself as someone who does a thorough job	John & Srivastava, 1999
	CON2	I see myself as someone who can be somewhat careless	
	CON3	I see myself as someone who Is a reliable worker	
	CON4	I see myself as someone who tends to be disorganized	
	CON5	I see myself as someone who tends to be lazy	
	CON6	I see myself as someone who perseveres until the task is finished	
	CON7	I see myself as someone who Does things efficiently	

Constructs	Items		Sources
	CON8	I see myself as someone who Makes plans and follows through with them	
	CON9	I see myself as someone who is easily distracted	
Agreeableness	AG1	I see myself as someone who tends to find fault with others	John & Srivastava, 1999
	AG2	I see myself as someone who is helpful and unselfish with others	
	AG3	I see myself as someone who Starts quarrels with others	
	AG4	I see myself as someone who has a forgiving nature	
	AG5	I see myself as someone who Is generally trusting	
	AG6	I see myself as someone who Can be cold and aloof	
	AG7	I see myself as someone who is considerate and kind to almost everyone	
	AG8	I see myself as someone who is sometimes rude to others	
	AG9	I see myself as someone who likes to cooperate with others	
Neuroticism	NE1	I see myself as someone who is depressed	John & Srivastava, 1999
	NE2	I see myself as someone who is relaxed, handles stress well	
	NE3	I see myself as someone who can be tense	
	NE4	I see myself as someone who worries a lot	
	NE5	I see myself as someone who is emotionally stable, not easily upset	
	NE6	I see myself as someone who can be moody	
	NE7	I see myself as someone who remains calm in tense situations	
	NE8	I see myself as someone who gets nervous easily	

Constructs	Items		Sources
Use Behaviour	UB	Do you use mobile banking (access banking and allied financial services such as savings, funds transfer, or stock market transactions via a mobile device)?	(Harrison, Onyia, & Tagg, 2014)

3.5.2 Questionnaire Development

For studying the factors that influence mobile banking use among Lebanese individuals, a self-administrated questionnaire as discussed before has been developed based on the up-coming perceptions. The principle items PE, EE, SI, FC, and HM were exactly adopted from the UTAUT2 theory by Venkatesh, Thonh and Xu (2012). These constructs were all previously validated while conducting the model of UTAUT2, whereas the main four concepts PR, EE, SI and FC were as well validated for the original UTAUT theory generation (Venkatesh et al. 2003 and Venkatesh, Thonh, & Xu, 2012). In line with the UTAUT2 and UTAUT, the current study adopts the motivational construct (PE, EE, SI, FC and HM) and their measurement items from the proposed UTAUT2 theory by Venkatesh, Thonh and Xu (2012). Not only but also several studies that used such theories as a base for their conceptual models have already validated and adopted these items as a measurement scale for these constructs (Abu Shanab & Pearson, 2009; Al-Qeisi & Abdallah, 2013; Chiu, Fang & Tseng, 2010; Martins, Oliveira & Popovic, 2014; Riffai, Grant & Edgar, 2012; Wang & Shih, 2009; YenYuen & Yeow, 2009; Yeow, Yuen, Tong & Lim, 2008 and Zhou, Lu & Wang, 2010). Aside from that, the scale of the use behaviour UB construct was validated and adopted from the study of Harrison, Onyia, and Tagg (2014).

For the psychological aspects, each personality items scale was adopted from a distinct literature. Starting by the proactive personality construct, the ten items scale was retrieved from Seibert, Crant, and Kraimer (1999). This scale represents a shortened scale of Bateman and Crant's (1993) original scale. The 10 items scale of PP has been validated in several researches and has been recently considered as the

official scale to measure the PP construct (Crant & Beteman, 2000; Grant and Ashford, 2008; Major, Turner, and Fletcher, 2006; Parker, Bindl, and Strauss, 2010; Seibert, Crant, and Kraimer, 1999; Seibert, Kraimer, and Crant, 2001).

Regarding general self-efficacy, this construct is a crucial part of the compound personality traits presented in the 3M model (Mowen, 2000). Thus, the current study employs the GSE three items scale that was applied as well by Mowen (2000) in his validation of the 3M personality and motivation model. Moreover, this GSE scale has been used in plenty of prior studies (Chen, Gully, and Eden, 2001; Cramm, Strating, Roebroek, and Nieboer, 2013; Ebstrup, Eplov, Pisinger, and Jørgensen, 2011; Luszczynska, Gutierrez-Dona, and Schwarzer, 2005; Scholz, Doña, Sud, and Schwarzer, 2002).

Need for affiliation was measured in this study by means of a five items scale. These five scale items were drawn from Hill (1987), who was first to validate it. Several investigations have used the current NFA scale to measure the levels of need for affiliation among individuals, such as Chung and Nam (2007), Hill (2009), Huang (2014), Gibbs, Ellison, and Heino (2006), McNeese-Smith (1999), Peter and Valkenburg (2006), and Wiesenfeld, Raghuram, and Garud (2001).

The personality trait need for structure was measured by twelve items. These twelve items were drawn from Thompson, Naccarato, Parker, and Moskowitz (2001) study. As mentioned in the literature review section PNS was confounded with another construct known as need for closure. Scholars were subsuming the measurement items of both constructs until a final valid scale representing PNS was found by Thompson, Naccarato, Parker, and Moskowitz (2001). Like other constructs, this scale has been validated and is being used in many studies employing PNS (Jugert, Cohrs, and Duckit, 2009; Rietzschel, De Dreu, and Nijstad, 2007; Rubinstein, 2003; Rietzschel, Slijkhuis, and Van-Yperen, 2014).

The final compound personality trait integrated in the current study is need for cognition, which was measured by a set of five items. This

scale was retrieved from Wood and Swait (2002). The original NFC scale consisted of 34 items (Cacioppo, Petty, & Kao, 1984), which was later reduced to 18 items (Cacioppo, Petty, Feinstein, & Jarvis, 1996) but it was still considered to be “unidimensional” (Lord & Putrevu, 2005). This was until finally a five items scale with high reliability and validity scores was developed to measure NFC (Wood & Swait, 2002). This 5-items scale representing NFC has been used in a set of prior studies, such as in Choa and Parkb (2014), Dickhäuser and Reinhard (2009) and Steinhart and Wyer (2009).

The elementary personality traits known as the big five traits are also part of the conceptual model of this study. Each construct of these big five personality traits was measured by a set of items summing up a total of 44 items (i.e. the big five personality traits are measured by 44 items spread among OE: 10 items, EX: 8 items, CON: 9 items, AG: 9 items, and NE: 8 items). These scale items were obtained from John and Srivastava (1999). Many studies have used this scale to measure the five factor model constructs (Barrick, Mount, & Judge, 2001).

On the other side, in self-administrated questionnaires, the Likert scale has been widely acclaimed by scholars to be the most suited response format to stem exact retorts (Hair et al., 2006). Scholars, such as Churchill, (1995) Frazer & Lawley (2000) and McClland (1994), have all argued that a Likert scale response style is mostly preferred by respondents, as time and effort are both minimized in a process of completing a questionnaire. In the same sense, Oppenheim (1992) and Preston and Colman (2000) stated that for researchers to achieve high reliability outcomes a Likert scale is intensively recommended. Not surprisingly the Likert scale format has been intensively used in prior technology adoption studies, such as Al-Hawari & Ward (2006); Cunningham, Gerlach, Harper, & Young (2005); Curran & Meuter (2005); Dabholkar & Bagozzi (2002); Dabholkar, Bobbitt, & Lee, (2003); Davis, Bagozzi, & Warshaw, (1989); Laukkanen, Sinkkonen, & Laukkanen, (2008); Lee, Fairhurst, & Lee, (2009); Lin & Hsieh, (2006); Meuter, Ostrom, Bitner, & Roundtree, (2003); Shamdasani, Mukherjee, & Malhotra, (2008); Venkatesh, Morris, Davis, & Davis, (2003); Zhao, Mattila, & L., (2008) and Zhu, Wymer Jr, & Chen, (2002). Therefore in

the current study a five point Likert scale response format that ranges from (1) total disagreement to (5) total agreement was implemented to attain precise responses.

For respondents who indicated that they had already been using mobile banking technology (users), the self-administrated questionnaire included a small section to collect additional data. This section in the questionnaire (i.e. section only for users) comprises three sets of items to address three more constructs. The first construct was the seniority using mobile banking, i.e., how long since the respondent had started using mobile banking, and it was measured with time intervals. The time intervals were divided into five different segments: 0 to 6 months, 6 to 12 months, 12 to 18 months, 18 to 24 months and more than 24 months. The second construct was habit has proposed and measured by UTAUT2 (Venkatesh et al., 2012). The third and final construct was the intensity of mobile banking use, which was measured asking which banking activities the respondent carries out through the mobile phone.

Aside from all the above mentioned sections, the questionnaire included also three yes or no questions: use or non-use behaviour of mobile banking (UB), availability of bank branches near to the respondent allocation, and availability of daily free time. It also comprises two close-ended questions to measure gender and employment and one open-ended question to tackle age.

Adding to this, a cover page was designed by the researcher expressing the following:

- ❖ Researcher certification that this survey forms a part of a PHD study
- ❖ Researcher aim of the study
- ❖ Researcher insists on the confidentiality of data obtained being used only for the current study and scientifically research purposes

- ❖ Ensuring that survey completion is totally a voluntary action where respondents feel free to leave the survey incomplete if they wish to
- ❖ Providing detailed info about the role of the researcher and his academic institution that he refers too (University of Santiago de Compostela)
- ❖ Greeting as well gives hopes that respondents can dedicate the time to finish the survey

Thus the final questionnaire was developed by the combination of the above stated and explained parts, sections and items to form a coherent structured self-administrated questionnaire that aims to study factors influencing mobile banking adoption among Lebanese individuals.

3.5.3 Questionnaire Design

A researcher is required to be skilful and cautious while designing of his/her questionnaire (Bhattacharjee, 2012; Malhotra, 1999). Helping and motivating respondents to answer the entire survey is not the only cause behind a proper organization of a questionnaire. For the researcher, a well-organized questionnaire facilitates the process of data entry and data editing (Bhattacharjee, 2012). Actually formatting a well-designed questionnaire forces the researcher to take into consideration a bunch of aspects such as questions content and wording, response formats, and questionnaire language and translations (Bhattacharjee, 2012).

3.5.3.1 Questions Content and Wording

Most questions and items have been adopted using the exact wording from prior literatures as discussed in previous sections. Moreover, the researcher inspected each question and applied a set of rubrics suggested by Bhattacharjee (2012) and presented below to achieve a questionnaire of good quality.

1. Questions should be formulated in a clear and understandable manner

2. Questions should not contain any expression that can be understood or perceived differently from one respondent to other
3. Questions should not include any biased words
4. Questions should not be general even very detailed
5. Questions should not be imaginary and arrogant
6. Each question should hold one single response

Finally, the researcher was as well cautious to distribute the survey to respondents that demonstrated sufficient knowledge and capacity to respond accurately the assigned questions.

3.5.3.2 Questionnaire Translation

The official native language of Lebanon is Arabic and, as the current study's target are Lebanese banking customers, Arabic was the proper language for the questionnaire. Even though almost all Lebanese citizens speak English, translation to Arabic was seen to fit better the current research. According to Brislin (1976) and Brislin, Lonner, and Thorndike (1973), back translation is a perfect and common way to conduct scientific translations. In addition many other scholars have stated that to maintain good quality levels and evade cultural and linguistic variances back translation is the more effectual method for translating scientific researches (Brislin, 1976; Douglas & Craig, 2007; Malhotra, Agarwal, & Peterson, 1996; Mallinckrodt & Wang, 2004). Several technology adoption studies have used back translation (AbuShanab & Pearson, 2009; AbuShanab, Pearson, & Setterstrom, 2010; Berger, 2009; Gefen, 2000; Hanafizadeh, Behboudi, Koshksaray, & Tabar, 2014; Kim, Chung, & Lee, 2011; Koenig-Lewis, Palmer, & Moll, 2010; Lee & Chung, 2009; Zhou, 2012).

Two main phases are involved in back translation (Brislin, 1976). The first stage is as well divided into two parts. The first part of the first phase implied translating the English version of the questionnaire to Arabic by the means of a governmental certified licensed Lebanese translator in Lebanon, and the second part implied re-translating the

translated Arabic version of the questionnaire to English again by the means of another governmental certified licensed Lebanese translator in Lebanon. The second phase of back translation is about testing the consistency between the back translated English version and the original English one, where this consistency is recommended to be of high levels (Brislin, 1976; Malhotra, Agarwal, & Peterson, 1996; Mallinckrodt & Wang, 2004). In this research the back translated version mirrored the original measurement items from the original English questionnaire.

3.5.4 Pre-Testing

To guarantee and ensure an adequate level of validity and reliability, pre-testing is a prerequisite stage that should largely be considered (Bhattacharjee, 2012; Churchill, 1995; Saunders, Lewis, & Thornhill, 2003; Sekaran, 2003; Zikmund, 2003). The validation process helps the researcher revise, avoid and correct all confusions and errors that could be found in the initial data collection instrument before launching the main survey. According to Reynolds and Diamantopoulos (1998), Sekaran (2003) and Zikmund (2003) a pre-validation process pre-reflects data quality and helps predict the type of results to be extracted.

Both the original English version and the Arabic version of the questionnaire were used for pre-testing in the current study. Questionnaire drafts were sent to a set of experts to examine and evaluate aspects related to: (1) redundancy of questions; (2) content adequacy in expressing and reflecting the aimed constructs; (3) language simplicity and accuracy in expressing constructs, and mobile banking contexts and settings; (4) comments and suggestions regarding weak points to be considered.

The first examination was done on the English version of the questionnaire. The English version was revised by two different professors. The first professor is at the Faculty of Economics in the Marketing department at the University of Santiago de Compostela, Spain. While the other, is a professor of English language in the Linguistics department at the Modern University of Business and Science in Damour, Lebanon. Few comments were generated regarding the whole questionnaire. Suggestions were focused on word ordering and

language expressions. Hence few modifications were made at this level. On the other hand, a comment was made regarding the cover page; thus, a brief modification about the study description and aim was added.

Evaluating and validating the Arabic version of the questionnaire aside from the back translation method remained a crucial step to ensure the applicability of the translated questionnaire to the Lebanese context. Thus the Arabic version of the questionnaire was examined by three different native Arabic professors in the relative domain of this current research. The initial two professors were of the same specialty in the marketing sector but from different universities. The first reviewer from the Marketing department was located at the Modern University of Business and Science, and the second reviewer was located at the American University of Beirut. On the other hand, the third and final professor was specialized in the Information Systems Management domain at the Modern University of Business and Science. All the mentioned professors were mobile banking experts, as well as native Arabic speakers with fluent English language abilities. These reviewers suggested some small modifications at the level of rephrasing to express more clarity of the context. For example the word “Spontaneous” was added between brackets aside from the Arabic formal translation in question number five of the personal need for structure scale (NFS5) to ensure the exact meaning of the English scale.

Not only university professors examined both versions of the questionnaire, but also mobile banking experts from the most well-known Lebanese banks (Lebanese Central Bank, Bank Med SAL, BLOM Bank SAL, Byblos Bank SAL, and BBAC SAL) were asked to review the entire questionnaire.

Some of the pre-examiners claimed that the questionnaire was time consuming. Some of them as well mentioned that the questionnaire comprised some repeated items. This comment was mentioned regarding two items describing hedonic motivation (HM1: Using mobile banking is fun and HM2: Using mobile banking is enjoyable). However, in the study by Venkatesh, Thonh, and Xu (2012), from which the items of hedonic motivation were retrieved, these items were scientifically

validated and approved. Not only but also, many further studies have applied the same items to address hedonic motivation. Thus, the researcher decided to keep these two items of hedonic motivation in the final version of this study's questionnaire.

3.5.5 Questionnaire Final Procedure

A field survey method was then conducted by distributing 450 full questionnaires over each targeted category (Lebanese mobile banking users, and Lebanese mobile banking non-users) during the months of February, March and April of 2016. Each respondent was asked to fill the appropriate questionnaire based on his/her status regarding the use or non-use of mobile banking services in Lebanon. Further, diversity among banking customers (respondents)' profiles and characteristics (example: age, gender, employment, near branch, etc.) was taken into account by the researcher in order to reach the best representation of the targeted population.

Data collection was achieved through several approaches. During its first phase, the questionnaire was allocated to Lebanese bank clients by the means of different banking staff. The banking staff would invite all Lebanese clients who visited their bank branches to fill out the questionnaire. Clients were asked by the staff to fill out the questionnaire at any time they preferred, in any place they wanted and then return it back to the bank at the earliest possible time. Not surprisingly, this approach's response rate was too low compared to time consumption.

According to Churchill, (1995) and Zikmund, (2003), low response rates can be followed-up by the means of several alternative approaches that help enhance low rates with less time consumption. Hence, other questionnaire allocation strategies were discussed with several banking employees, and it was finally agreed to use bank branches where more Lebanese banking clients were concentrated. Moreover, it was also discussed how banking staff could motivate and encourage clients to fill out and hand back the questionnaire as soon as possible.

Additionally, the researcher personally engaged in the process of questionnaire distribution. Thus, the researcher distributed the

questionnaire to Lebanese banking clients and recollected them personally. To do so, the researcher asked for permission to personally contact bank clients (e.g. university staff and students, employees in the public and private sectors, non-profit organizations' staff, commercial complexes and shopping centers' staff and customers) even at their personal working places, homes, and daily sites. This approach allowed the researcher to directly (face to face) contact respondents, explain the aim and the objective of the questionnaire, help respondents with the filling process, and insures questionnaire re-collection. Furthermore, visiting the respondents at their personal working or living places gave them the opportunity to calmly fill out the questionnaire and facilitated the process of questionnaire re-submission.

All in all, the researcher was able to allocate a set of 900 questionnaires distributed over 450 Lebanese mobile banking users and 450 non-users. From the 900 questionnaires, sums of 647 questionnaires were collected, from which 625 questionnaires were found to be valid responses. The final 625 valid responses were divided between Lebanese mobile banking users (306) and Lebanese mobile banking non-users (316).

3.5.6 Non-Response Bias

Non-response bias refers to the difference between individuals who choose to participate in the questionnaire and those who choose not to participate. According to Fowler (2002), non-response bias may be summarized under two categories. The existence of the first type of non-response bias occurs when respondents do not respond to a few questions of the whole survey. On the other side, the second type of non-response bias occurs when respondents do not respond to almost all questions of the questionnaire or when they fail to return back the survey. Based on previous studies, it was noticed that the second kind of non-response bias occurs more frequently in the case of field surveys.

Different reasons can be the cause of the second category of non-response bias. The first cause may be the nature of respondents. Some respondents may consider that the questionnaire is embarrassing, addresses sensitive information, or asks about illegal activities. Others

could be less active in the community and less inclined to answer surveys. The next cause may be poor survey structure. This refers to the inability of respondents to properly understand the language used, poor consistency of the items used and survey length. A third cause can be poor individual abilities. Individuals under certain health conditions or with insufficient reading or writing skills face difficulties filling out a survey, and thus prefer not to respond. A fourth cause for not filling out a questionnaire or handing it back is an inconvenient communication channel for distributing the data collection instrument. For instance, allocating questionnaires throughout e-mail channels where mail invites may not circulate properly or might be directed to spam folders. All the above mentioned reasons may result in high non-response bias.

To address the issue of non-response bias, the researcher adopted some precautions, procedures and pre-considerations. As mentioned before, the researcher employed the easiest, clearest, and shortest language possible. The language in both versions was deprived from any redundancy and contradiction, described as accurate and understandable. In addition, the questionnaire went under translation and back translation processes from English to Arabic to overcome the language difference obstacle between the Lebanese respondents' mother language and the original language of the research. The process was conducted by credible and legal translators. Not only but also the Arabic version of the questionnaire was verified by five Lebanese experts (who had Arabic as mother language and were fluent in English as a second language). Finally, the researcher also adopted all scales, and items from pre-validated and established studies and researches to avoid language and content considerations (Featherman & Pavlou, 2003; Venkatesh, Thonh, & Xu, 2012).

Finally, the researcher main data collection method was through a self-administrated questionnaire. Through this technique the researcher was able personally to contact respondents, provide further explanations, clarify any doubts or vague questions, and provide motivation to participate.

3.6 DATA ANALYSES

The main aim of this study is to empirically examine and validate a concept model regarding the factors that influence the use or non-use of mobile banking in Lebanon. The mentioned aim of the current study was accomplished through a set of statistical analysis conducted over the collected data. Coorley (1978, p. 13), mentioned that statistical data analysis is mainly found to “assist in establishing the plausibility of the theoretical model and to estimate the degree to which the various explanatory variables seem to be influencing the dependent variable”. In order for data analysis to achieve its goals, it should undergo several different phases.

Accordingly, data analysis started by exposing the collected data to a number of preliminary tests. These preliminary data testing focused on data coding and editing and data screening. The next step in data analysis was related to the measurement and validation of constructs and was conducted by the means of structural equation modelling analysis using the statistical software program EQS 6.1.

3.7 PRELIMINARY DATA ANALYSIS

This phase enables the researcher to detect whether the data fulfils the required standards, conditions and accuracy (Coakes, 2006; Kline, 2005; Tabachnick & Fidell, 2001). As a result, preliminary data analysis is the prerequisite of any further multivariate data analysis. Accordingly, in the current study, the collected data was exposed to two main data treatments in the phase of preliminary data analysis.

3.7.1 Data Editing and Coding

The first process after data collection is called data editing and coding. According to Tabachnick and Fidell (2007) and Zikmund (2003) data editing enables the researcher to certify that the collected data is presented in a reliable way under certain recommendable conditions. This process meant that not all returned questionnaires were considered valid, depending on the form of the returned questionnaire and how it was filled. Some of the questionnaires were ignored due to incomplete form response or invalid data responses.

Discussions over the standards of data omission are plenty and vary from one scholar to other. Some have suggested that incomplete responses can be considered cancelled, where others have suggested that invalid responses are those who score over 25% as missing data or non-accomplished questions of the whole questionnaire (Sekaran, 2003). This generates a further discussion concerning the treatment of missing data in the collected data base that will be addressed in upcoming sections.

As any other statistical study, data collected through questionnaires must be converted into numerical characters and imported to statistical programs for analysis. The first program that was used in the current study to transfer the collected data is SPSS. According to Malhotra, Agarwal, and Peterson (1996) the use of the SPSS software enables the researcher to transform the data from the used data collection instruments into numerical sequences throughout coding procedures. Hence, a coding procedure, initiating a new SPSS data base file, was implanted by the researcher by the means of the SPSS program. This SPSS data file included all the mentioned scales (questions) in the questionnaire, and the collected answers were transformed and entered as numerical values.

Since the questionnaire questions were of different types, as mentioned in previous sections, numerical data entry to the SPSS was as well in different forms. For case in point, all questions that included two answer choices and all yes or no questions found in the questionnaire were coded using the numerical values of zero (0) and one (1). For example, the construct employment included two possible choices: unemployed and employed; all answers marked as unemployed by respondents were coded by the numerical value "0", whereas all the choices marked as employed were coded by the numerical value "1". On the other side, questions formulated using the five-point Likert scale were all coded using the numbers one to five; so that, the number "1" corresponds to the answer "Totally Disagree", number "2" corresponds to "Disagree", number "3" corresponds to "Nor disagree Nor agree", number "4" corresponds to "Agree" and finally number "5" corresponds to "Totally Agree". In addition, the same method was used to code the intensity of usage of mobile banking services and activities. For example, people who responded "never", they were coded by the number "1"

while individuals who answered “many times per day” were coded by the number “5”.

As in any other coding process, data entry to the SPSS program may be subject to error. But for the researcher to avoid any kind of data entry bias or mistakes, all data entries were revised and re-checked.

3.7.1.1 Data Screening

Data screening ensures the valid and precise importation of data to the indicated SPSS file. Coakes, (2006), Kline, (2005) and Tabachnick and Fidell, (2001) all stated that data screening enables the researcher to identify the existence of outliers in the data sets. Moreover, another aspect of data screening is detecting missing values after data entry phases. Thus, in the further sections, these aspects of data screening will be discussed more in details.

3.7.1.2 Missing Data

Missing data is a terminology used to describe null data fields. Throughout statistical data sets, missing data may exist. According to Hair, Anderson, Tatham, and Black (1995) missing data occurs when respondents skip or fail to respond to a certain item (question) in a survey.

Different tests can be applied over missing data. One method measures the amount of missing data in a given data set; while other method is concerned with data missing patterns (Tabachnick & Fidell, 2007). These patterns of missing data can be classified into two categories: random distribution of missing patterns and non-random distribution of missing data. Tabachnick and Fidell (2007) confirmed that unbiased studies are those that present randomly distributed missing data. Tabachnick and Fidell (2007) also stated in their study that the volume of missing data in statistical data sets is of chief importance, but patterns of such missing data remain of more significance while treating missing data. Thus, this does not withdraw importance to the quantity of missing data that can be found in a data set, but instead it favours the relevance of missing data distribution over missing data quantity.

An acceptable amount of missing data can be considered when a proportion less than 5 percent is scored regarding one construct item (i.e. missing data must not be greater than 5 percent of the whole construct responses) (Churchill, 1995). On the other side, missing data patterns can be examined using a common technique in statistical programs known as MCAR “Missing Completely At Random”. Missing data patterns, indicates that missing data are considered to be random if the MCAR test is not significant, showing a p-value greater than 0.05.

Thus, regarding the current study, the researcher was able to conduct the above mentioned tests using SPSS. Results of both analytic techniques were positively recorded. None of the missing values recorded a percentage greater than 5% of the whole construct responses. This indicates that the amount of missing data can be treated. In addition the p-value of MCAR ($p = 0.612$) was found to be non-significant (greater than 0.05), which, in turn, demonstrated that the existing missing data was distributed in a random manner (Little, 1988). Therefore, regarding this research, all missing values were substituted by a valid variable mean, as suggested by Hair, Black, Babin, Anderson, and Tatham (2006) and Tabachnick and Fidell (2007).

3.7.1.3 Outliers

An outlier is a value (response) totally different from other collected values. More specifically, an outlier can be defined as an observation of irrational cases with precise characteristics that are absolutely dissimilar to the rest of cases in a given data set (Hair, Anderson, Tatham, & Black, 1998; Kline, 2005). Accordingly outliers are aspects to be considered in statistical analyses and representations of data sets. Bollen (1987), Dillon, Kumar, and Mulani (1987) and West, Finch, and Curran (1995) all stated that simple statistical analyses, such as means, standard deviation, frequencies etc., as well as advanced statistical analyses, such as R square values, regression analysis, fit indices etc., are all influenced by outliers, which could lead to unrepresentative and misleading results.

Outliers can be differentiated into two categories: univariate and multivariate outliers (Kline, 2005). A univariate outlier is defined as any extreme (out of scope) data point that corresponds to one single variable.

However, ranges to determine univariate outliers are still arguable. For instance, Hair, Anderson, Tatham, and Black (1998) indicated that outliers depend on sample size. They suggested that in samples with more than 80 cases, univariate outliers correspond to a cut-off point of 3 to 4 standard deviation. In opposition, Kline (2005) stated that a mean value with a standard deviation value greater than three could be considered a univariate outlier regardless of sample size. Anyway, Z-scores have been reflected as one of the simplest ways to detect univariate outliers (Kline, 2005).

On the other hand, Byrne (2010), Hair, Black, Babin, and Anderson (2010), Kline (2005), and Tabachnick and Fidell (2007) defined multivariate outliers as extreme cases of data points but regarding a group of items instead of one single item. A multivariate outlier can also be detected by statistical approaches, being Mahalanobis distance (D^2) the simplest method to detect multivariate outliers (Hair, Black, Babin, Anderson, & Tatham, 2006; Kline, 2005). This approach is mainly based on the variation of the standard deviation of a mean response in comparison to the score of all other responses.

Assessing for univariate outliers, it was noticed that few outlier values exist in the current study (only one univariate outlier). This is due to the kind of scales used to measure the existing items. Using a five-point Likert scale enabled the respondents to answer within a specific set of responses ranging from strongly disagree to strongly agree, which reduces the possibility of outliers. Since univariate outliers were few, the researcher decided to keep the value of the existing univariate outlier.

Next, Mahalanobis D-Squared was performed to detect multivariate outliers. Through this statistical analysis (Mahalanobis D-Square) a D^2 value and a P-value for each response item is marked and recorded, so that multivariate outliers can be detected (Hair, Black, Babin, Anderson, & Tatham, 2006; Kline, 2005). The P-value for each item must score above the cut-off point of 0.001. In this study almost all scales showed a statistical P-value greater than 0.001. There are 72 outlier cases with a p value lower than the cut-off point of 0.001, as shown in table 3.2. Table 3.2 lists the whole set of outliers showing the observation number with

its corresponding D^2 values and P-value. Due to the large sample size collected by the researcher, the small number of outliers (72 out of 625) should not be problematic (Kline, 1998; Tabachnick and Fidell, 2007). Accordingly, the decision to keep these outliers was made.

Table 3.2: Multivariate Outlier (Mahalanobis Distance)

Observation Number	Mahalanobis D-squared	P-Value	Observation Number	Mahalanobis D-squared	P-Value
2	149.86	0.0000	334	123.12	0.0001
4	113.83	0.0009	336	119.03	0.0003
6	131.58	0.0000	342	123.02	0.0001
7	133.66	0.0000	343	115.70	0.0006
8	174.04	0.0000	344	136.67	0.0000
10	190.38	0.0000	345	149.90	0.0000
11	120.80	0.0002	346	114.56	0.0008
12	154.56	0.0000	349	114.14	0.0000
13	140.74	0.0000	358	129.81	0.0000
15	161.77	0.0000	381	114.79	0.0008
17	120.09	0.0002	402	116.02	0.0006
18	147.79	0.0000	412	125.84	0.0000
19	133.47	0.0000	432	150.05	0.0000
20	128.80	0.0000	461	114.83	0.0008
21	120.90	0.0002	473	144.20	0.0000
22	126.26	0.0000	479	122.18	0.0002
84	116.09	0.0005	484	143.92	0.0000
86	118.37	0.0003	485	144.88	0.0000
95	117.66	0.0004	500	123.94	0.0001
111	132.31	0.0000	509	155.28	0.0000
116	140.67	0.0000	537	140.65	0.0000

Observation Number	Mahalanobis D-squared	P-Value	Observation Number	Mahalanobis D-squared	P-Value
130	122.85	0.0001	546	142.11	0.0000
139	115.04	0.0007	548	116.96	0.0005
142	178.60	0.0000	559	116.28	0.0006
143	136.94	0.0000	561	116.20	0.0006
145	114.10	0.0009	563	152.33	0.0000
153	164.13	0.0000	567	137.58	0.0000
168	116.63	0.0005	572	118.87	0.0003
191	133.33	0.0000	590	169.80	0.0000
214	121.64	0.0001	593	169.92	0.0000
219	122.44	0.0001	612	115.15	0.0007
228	128.08	0.0000	613	160.51	0.0000
255	130.12	0.0000	614	115.61	0.0007
291	194.76	0.0000	619	163.99	0.0000
311	144.19	0.0000	620	127.89	0.0000
312	129.44	0.0000	621	154.97	0.0000

3.7.2 Descriptive Analysis of The Study

This section provides a statistical description of the current study regarding the respondents’ profile and characteristics and the usage behaviour of mobile banking.

3.7.2.1 Respondents Profile and Characteristics

As it has already been mentioned, the researcher was able to collect a set of 625 valid responses from customers of banking services in Lebanon.

Figure 3.1 below summarizes the demographical distribution regarding gender of the whole data set. The distribution between males

and females in this study was almost near; only a little bit more than half of the respondents were males (52.16%).

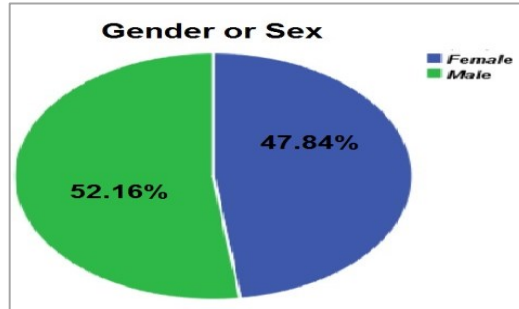


Figure 3.1: Gender Distribution Among Respondents

On the other hand, respondents were of different ages ranging from 18 years old to 70 years old. The table below shows a detailed description regarding age distribution among all respondents. Among 625 cases, the average age recorded is 31.68 years old, with a standard deviation of 9.2.

Table 3.3: Age Statistical Description Among Respondents

Age Statistics of the Data Set		
Number of Respondents	Valid N = 625	Missing N = 0
Minimum	18 Years Old	
Maximum	70 Years Old	
Average / Mean	31.68 Years Old	
Frequencies	Of Minimum (18 Years Old)	Of Maximum (70 years Old)
	10 Cases	1 Case
Percentages	Of Minimum (18 Years Old)	Of Maximum (70 years Old)
	1.6 %	0.2 % (Approximated)
Age Highest Frequencies	29 years Old	33 Frequencies
Age Lowest Frequencies	56, 61, 63 and 70 Years Old	1 Frequency (1 Case Each)

Regarding the employment status, figure 3.2 below demonstrates that most respondents (75.04%) were employed (had a job) whereas the rest of the respondents (24.96%) were unemployed (had no job).

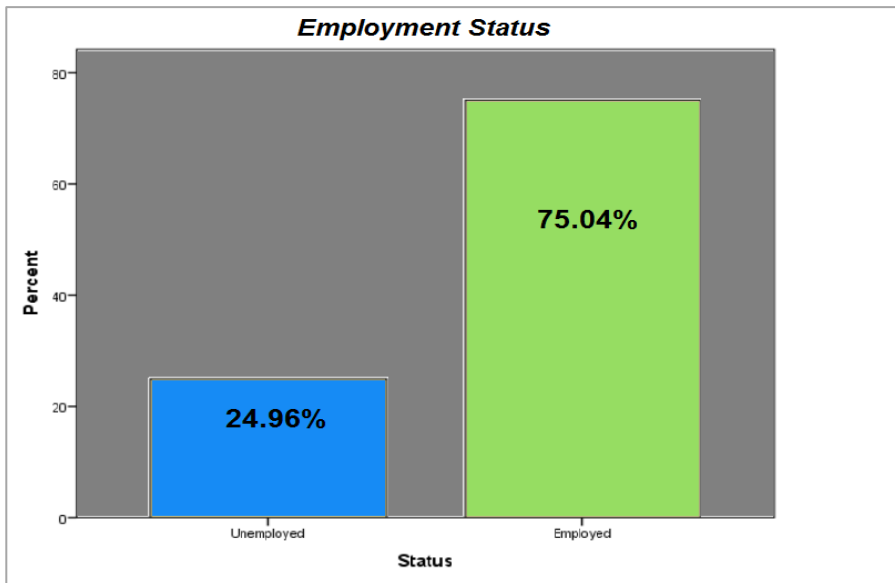


Figure 3.2: Respondents Employment Status

As mentioned previously the questionnaire addressed whether mobile banking customers in Lebanon have daily free time to access bank branches, and whether these branches exists in near proximities, in order to determine the accessibility of banking activities in Lebanon.

Figure 3.3 shows that more than half of the respondents (68.3%) had near a bank branch, whereas 198 stated that they do not have a bank branch in their near proximity (representing 31.7%).

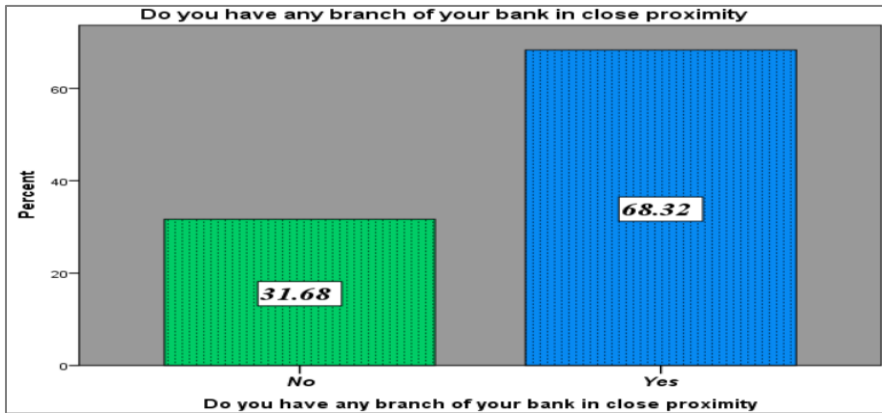


Figure 3.3: Lebanese Respondents Concerning Bank Branches Availability

On the other side, results showed in figure 3.4 indicated that the majority of Lebanese people do not have free time to access bank branches in their working hours. Only 35.7% of the addressed Lebanese customers had available time to visit bank branches whereas on the other side, 64.3% declared that they did not have free time. This result may favour the hypothesis that mobile banking will rise in the near future in Lebanon.

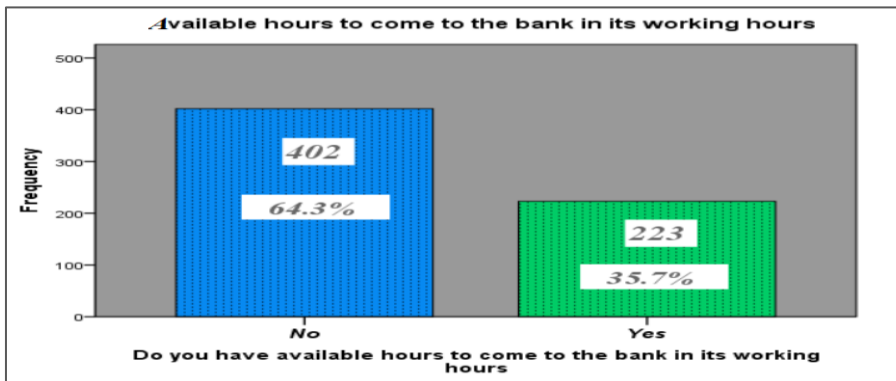


Figure 3.4: Lebanese Respondents Regarding Available Hours to Visit Bank Branches

3.7.3 Structural Equational Modeling

The terminology “structural equation modelling” simplified as SEM was defined by Tabachnick and Fidell (2007, p. 676) as a “collection of statistical techniques that allows a set of relationships between one or more independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete, to be examined”. Accordingly, the current study implemented the SEM technique to validate the conceptual model, test the hypotheses and approve relations among constructs.

SEM was considered the best statistical approach for the current study, due to the following rational considerations. According to Hair, Black, Babin, Anderson, and Tatham (2006) and Tabachnick and Fidell, (2007), the basic function of SEM is providing multi concurrent investigations of inter-related relations between dependent and independent variables in a conceptual model. Using the structural model analysis approach, path relations among constructs can be easily verified (Byrne, 2010; Kline, 2005). Path analysis is considered a form of multiple regression statistical analysis that is used to evaluate causal models. Hence using this method the researcher can estimate both the magnitude and significance of causal connections between variables.

SEM also enables to test the reliability and validity of each construct separately (Anderson & Gerbing, 1988; Kline, 2005). Moreover, SEM allows a detailed measurement regarding the degree of model fitness with the given data set. Not only but also in comparison with other data analysis techniques such as analysis of variance (ANOVA) or linear regression analysis, SEM evaluates error variance parameters as well as measurement errors of the data set (Hair, Black, Babin, Anderson, & Tatham, 2006; Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell 2007). Scholars have thus established that SEM best fits complex models composed of several causal relationships (Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell 2007).

Anderson and Gerbing, (1988) indicated that when applying SEM, researchers must choose between a one-stage approach or a two-stage approach. Even though both approaches address both measurement and structural models, the difference remains in the way they are performed. According to Anderson and Gerbing, (1982), the one-stage approach conducts the measurement model analysis and the structural model analysis at the same time (in parallel) while the two-stage approach considers the measurement model analysis as an important pre-requisite before examining the structural model as a next step analysis. Scholars mostly recommend the use of the two-stage approach over the one-stage approach while applying SEM techniques (Anderson & Gerbing, 1982; Bagozzi, 1981), as the two-stage approach admits additional inspections regarding constructs' reliability and validity (Hair, Anderson, Tatham, & Black, 1995).

Therefore the researcher in this study adopted the two-stage approach as suggested by most all scholars. This implies that measurement models as well as structural models were performed. Constructs' reliability and validity in addition to model fitness, were all assessed in the measurement model phase. Next, to evaluate the causal relationships among endogenous variables and exogenous variables, structural path analysis was applied (Byrne, 2010; Hair, Black, Babin, Anderson, & Tatham, 2006).

3.7.3.1 Analysis of the Measurement Scales and Model

Identifying how observed variables load into their fundamental unobserved (latent) constructs is the core function of measurement models (Byrne, 2010). Arbuckle (2005) mentioned that for scholars to explain the unified connections between observed variables (indicating variables) and unobserved variables (composite variables), measurement models must be applied.

To assess the reliability and validity of the constructs, Cronbach alpha, composite reliability, average extracted variance, discriminant validity and convergent validity were all analysed by the means of EQS 6.1 and STATA 14.

The term construct reliability was defined as “the degree to which the measure of a construct is consistent or dependable” (Bhattacharjee, 2012, p. 56). In details Bhattacharjee (2012, p. 57) specified internal consistency reliability as “the measurement of consistency between different items of the same construct”. To confirm a tolerable level of the constructs’ reliability, the average variance extracted (AVE) test and the composite reliability test were both adopted in this study.

Average variance extracted (AVE) is often used to assess internal consistency reliability. Fornell and Larcker, (1981, p. 45) defined AVE as “the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error”. To ensure constructs’ reliability, AVE values for each of the latent constructs should score above 0.45 (Hair, Black, Babin, & Anderson, 2010). Such score is obtained using the following formula (“Formula A”).

$$\text{Formula A: AVE} = [(\sum \text{FL})^2 / \text{NI}]$$

Where FL symbolizes the factor loadings of each latent construct (lambda standardized regression weights), and NI represents the number of items that composes the construct (Fornell & Larcker, 1981).

Composite reliability is the other testing technique for checking constructs’ internal consistency. To confirm the constructs’ reliability, values of composite reliability must score above 0.6 (Bagozzi & Yi, 1988). The following formula (“Formula B”) was used to estimate composite reliability values of the latent constructs.

$$\text{Formula B: Composite Reliability} = [(\sum \text{FL})^2 / [(\sum \text{FL})^2 + \sum (\text{E})]]$$

Where FL symbolizes the factor loadings of each latent construct (lambda standardized regression weights), and E refers to the error of variance for each latent construct (Hair, Black, Babin, Anderson, & Tatham, 2006; Fornell & Larcker, 1981)

On the other hand, construct validity refers to “the extent to which a measure adequately represents the underlying construct that is supposed to measure” (Bhattacharjee, 2012, p. 58). Hence, to validate the scales

used to measure the constructs, two assessments must be supported: discriminant validity and convergent validity (Bhattacharjee, 2012; Straub, Boudreau, & Gefen, 2004).

The first, discriminant validity can be examined using two different techniques. The first implies calculating the confidence intervals between correlated constructs. Thus, to support discriminant validity, correlations among all variables must show confidence intervals that do not include the unit value (1) (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). The second technique implies computing the square value of the correlations between construct and comparing it to the AVE value of the corresponding constructs. To consider the used constructs valid, the squared values of the correlations between constructs should be lower than their AVE values (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005).

Convergent validity analysis assesses the degree to which a measure relates to (converges on) the construct which it is supposed to measure (Bhattacharjee, 2012). To support convergent validity the standard regression weight of each item must be greater than 0.05 and significant (Anderson & Gerbing, 1988; Hair, Black, Babin, & Anderson, 2010; Holmes-Smith, Coote, & Cunningham, 2006).

Next, model fitness was examined as well to assess the whole model validity, since the conceptualized model must fit positively the collected data set (Holmes-Smith, Coote, & Cunningham, 2006; Jöreskog & Sörbom, 1993). Two different kinds of model fit indices were analysed in the current study in order to omit any doubts regarding the fitness of the conceptual model (Byrne, 2010; Hooper, Coughlan, & Mullen, 2008; McDonald & Ho, 2002). These two types of model fit indices are known as absolute fit indices and incremental fit indices.

With the absolute fit indices, researchers are able to assess the level of integration of the proposed conceptual model and the collected data set (Hooper, Coughlan, & Mullen, 2008; McDonald & Ho, 2002). Absolute fit indices address the goodness of fit of a model regardless of any comparison with other models; as the model is statistically assessed

based on the collected data sets (Hair, Black, Babin, Anderson, & Tatham, 2006). This study examined the following absolute fit indices: Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR).

Standardized root mean square residual (SRMR) is a measure of badness of fit commonly used in the context of evaluating variable models (Hu & Bentler, 1998). Bentler (1995) stated that SRMR presents the average difference between the predicted variances and covariance and those really found in the model. Scholars have reported that studies recording a SRMR similar or lower to 0.08 are of acceptable model fitness (Bentler, 1995; Hu & Bentler, 1999).

Root Mean Square Error of Approximation (RMSEA) mainly focuses on the non-centrality of parameters. Precisely it tests the variances between consistent elements of the observed and prophesied covariance matrix (Hair, Black, Babin, Anderson, & Tatham, 2006). Scholars have reported that a RMSEA value lower than 0.08 shows a good model fit (Byrne, 2001; Hair, Black, Babin, Anderson, & Tatham, 2006; MacCallum, Browne, & Sugawara, 1996; Tabachnick & Fidell, 2007).

The second kind of fit indices, incremental fit indices, have also been known as comparative fit indices or even relative fit indices (McDonald & Ho, 2002; Miles & Shevlin, 2007). Incremental fit indices are based on the comparison of the chi-square value with a considered baseline model. The incremental fit indicators used in this research are: Comparative Fit Index (CFI) and Incremental Fit Index (IFI) (Hair et al., 2006).

Comparative Fit Index (CFI) is one of the more reliable and used in the marketing literature incremental fit indices (McDonald & Ho, 2002). CFI compares the chi-squared value of the existing model to a null model, where such null model represents the assumption that all measured variables are uncorrelated (Hooper, Coughlan, & Mullen, 2008). CFI takes into account small sample sizes of useful indexes (Tabachnick & Fidell, 2007) to overcome the null hypothesis of the

model. Scholars have agreed that values of CFI above 0.90 are considered to be of good fit (Byrne, 2001; Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2007).

Incremental fit index (IFI) or Bollen's IFI is regularly used when assessing the fit of structural equation models. IFI is based on the comparison of the fit of a target model to that of a null model (Bentler, 1990; Bollen, 1989). Incremental fit index is relatively insensitive to sample size. Values that exceed 0.90 are regarded as acceptable (Schmukle & Hardt, 2005; Hu & Bentler, 1999).

Finally, the researcher also analysed the chi square value to ensure the fitness of the model. Chi square compares the observed variance-covariance matrix to the predicted variance-covariance matrix. Theoretically values of chi square range from 0 (perfect fit) to infinity (poor fit). Thus, for a model to have a satisfactory fit, chi square values must be non-significant with a P value greater than 0.05. However, it has been noticed that sample sizes are an important determinant of chi square values, indicating that problems usually emerge in large samples (Byrne, 2001; Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2007).

The above mentioned analyses may in some studies indicate poor fit results among measurement models and data sets. In this case, a refinement process at the statistical level may be helpful. For instance, model fitness can be improved based on superfluous reviews over factor loadings (standardized regression weights), standard covariance matrix, and modification indices (Byrne, 2010; Hair, Anderson, Tatham, & Black, 1995; Hair, Black, Babin, Anderson, & Tatham, 2006; Holmes-Smith, Coote, & Cunningham, 2006). Still if poor results remain, modifications over the conceptual model should be made (Anderson & Gerbing, 1988; Byrne, 2010; Hair, Black, Babin, & Anderson, 2010; Kline, 2005).

Since the current study involves a quite big group of constructs, each with a big set of items, and many hypotheses and relations analysing such model with its items, constructs and relations all at once was not

possible. Thus, the researcher divided the model into two separate sub-models. The first sub-model incorporates the big five constructs and the compound personality traits, whereas the second sub-model involves the compound personality traits and the UTAUT2 constructs.

Thus, two measurement models were analysed separately, which implies that Cronbach's Alpha, composite reliability, average extracted variance, discriminant validity, convergent validity and model fitness were examined for each sub-model.

3.7.3.1.1 Analysis of the Measurement Scales and sub-Model One

Sub-model one included the 10 different constructs which form the elemental personality traits and compound personality traits (Extraversion, conscientiousness, openness to experience, agreeableness, neuroticism, proactive personality, need for affiliation, need for structure, need for cognition, and general self-efficacy).

3.7.3.1.1.1 Cronbach's Alpha

The first analysis technique applied was the Cronbach's alpha. Hence, using the STATA program, the retrieved responses from Lebanese mobile banking users and non-users were analysed, showing the following Cronbach's alpha values (table 3.4).

As some Cronbach's alpha coefficients scored below the threshold level of 0.70 (Nunnally, 1978), not all constructs demonstrated an adequate level of internal consistency. In particular, two constructs, neuroticism (NE) and agreeableness (AG), present Cronbach's alpha scores of .50 and 0.67 respectively. In contrast, the construct with the highest Cronbach's alpha value was general self-efficacy, which scored 0.96. The remaining constructs were able to pass the threshold level with an acceptable score

Table 3.4: Sub-Model One Cronbach's Alpha Analysis

Construct	Cronbach's alpha (α) (> .70) Mobile Banking
Openness To Experience (OE)	0.852
Extraversion (EX)	0.830
Conscientiousness (CON)	0.770
Agreeableness (AG)	0.670
Neuroticism (NE)	0.500
Proactive Personality (PP)	0.860
General Self-Efficacy (GSE)	0.960
Need For Affiliation (NFA)	0.933
Need For Structure (NFS)	0.798
Need For Cognition (NFC)	0.862

3.7.3.1.1.2 Construct Reliability and Validity

To test the reliability of the constructs, both composite reliability and AVE were calculated. Table 3.5 shows the results of composite reliability and average variance extracted (AVE) for all constructs of sub-model one.

Table 3.5: Sub-Model One Construct Reliability Analysis

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
Need For Cognition (NFC)	NFC1	0.754*	0.87	0.57
	NFC2	0.786*		
	NFC3	0.729*		
	NFC4	0.799*		
	NFC5	0.729*		
Proactive Personality (PP)	PP1	0.641*	0.86	0.38
	PP2	0.626*		
	PP3	0.552*		
	PP4	0.55*		

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
	PP5	0.607*		
	PP6	0.608*		
	PP7	0.642*		
	PP8	0.663*		
	PP9	0.637*		
	PP10	0.602*		
Need For Structure (NFS)	NFS1	0.71*	0.73	0.28
	NFS2	-0.089		
	NFS3	0.708*		
	NFS4	0.658*		
	NFS5	-0.169		
	NFS6	-0.14		
	NFS7	0.659*		
	NFS8	0.689*		
	NFS9	0.662*		
	NFS10	0.534*		
	NFS11	0.026		
	NFS12	0.522*		
Need For Affiliation (NFA)	NFA1	0.571*	0.85	0.54
	NFA2	0.766*		
	NFA3	0.805*		
	NFA4	0.765*		
	NFA5	0.733*		
General Self-efficacy (GSE)	GSE1	0.715*	0.82	0.61
	GSE2	0.802*		
	GSE3	0.822*		
Extraversion (EX)	EX1	0.961*	0.85	0.52
	EX2	-0.037		
	EX3	0.913*		
	EX4	0.895*		
	EX5	0.054		
	EX6	0.888*		
	EX7	0.045		
	EX8	0.884*		
Agreeableness (AG)	AG1	0.035	0.74	0.37
	AG2	0.654*		
	AG3	-0.019		

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
	AG4	0.767*		
	AG5	0.927*		
	AG6	-0.016		
	AG7	0.811*		
	AG8	0.011		
	AG9	0.884*		
Conscientiousness (CON)	CON1	0.857*	0.78	0.41
	CON2	-0.059		
	CON3	0.941*		
	CON4	0.109		
	CON5	0.022		
	CON6	0.779*		
	CON7	0.865*		
	CON8	0.856*		
	CON9	0.011		
Neuroticism (NE)	NE1	0.005	0.49	0.24
	NE2	0.852*		
	NE3	0.001		
	NE4	0.021		
	NE5	0.702*		
	NE6	-0.03		
	NE7	0.852*		
	NE8	-0.003		
Openness To Experience (OE)	OE1	0.622*	0.87	0.47
	OE2	0.628*		
	OE3	0.497		
	OE4	0.829*		
	OE5	0.723*		
	OE6	0.955*		
	OE7	0.208		
	OE8	0.817*		
	OE9	-0.168		
	OE10	0.821*		

(*) = Significant Item

Starting by AVE, its cut-off point is 0.45 (Hair, Black, Babin, & Anderson, 2010); however, as shown in table 3.5, the constructs proactive personality (PP), need for structure (NFS), agreeableness (AG), conscientiousness (CON), and neuroticism (NE) all scored below this cut-off point.

Composite reliability was the second analysis performed to check construct reliability. Bagozzi and Yi (1988) indicated that for constructs to achieve internal consistency reliability, they must score above 0.6 which is the cut-off point of the composite reliability analysis. In the current study, only one construct, neuroticism (NE), recorded a score of 0.47, below the cut-off point. In opposition, all the remaining constructs scored above the cut-off point.

Next, discriminant validity and convergent validity analyses were performed to ensure constructs' validity.

Regarding convergent validity analysis, not all the observed factor loadings are of acceptable values and significant. A set of low standardized lambdas, scoring less than 0.50, are presented in table 3.5. Items NFS2, NFS5, NFS6, NFS11, EX2, EX5, EX7, AG1, AG3, AG6, AG8, CON2, CON4, CON5, CON9, NE1, NE3, NE4, NE6, NE8, OE3, OE7, and OE9 were all below the cut-off point. Moreover, the items NFS11, EX2, EX5, EX7, AG1, AG3, AG6, AG8, CON2, CON5, CON9, NE1, NE5, and NE7 were all non-significant. Hence considering that some items were found to be non-significant and have low standardized regression weights (lambdas less than 0.5), convergent validity among these constructs is not supported (Hair, Black, Babin, & Anderson, 2010).

On the other side, discriminant validity analysis was performed using EQS windows 6.1. Table 3.6 shows all the correlations among factors in sub-model one. The table also presents the 95% confidence intervals and the squared correlations.

Table 3.6: Sub-Model One Construct Validity Analysis

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
EX - AG	-0.049	0.002	-0.018	-0.080
EX - CON	-0.031	0.001	0.036	-0.098
EX - NE	-0.008	0.000	0.017	-0.033
EX - OE	0.004	0.000	0.041	-0.033
EX - NFC	0.095	0.009	0.164	0.026
EX - PP	-0.028	0.001	0.017	-0.073
EX - NFS	0.068	0.005	0.129	0.007
EX - NFA	-0.061	0.004	-0.014	-0.108
EX - GSE	-0.068	0.005	-0.019	-0.117
AG - CON	0.136	0.018	0.171	0.101
AG - NE	0.054	0.003	0.068	0.040
AG - OE	0.26	0.068	0.282	0.238
AG - NFC	-0.104	0.011	-0.067	-0.141
AG - PP	0.145	0.021	0.170	0.120
AG - NFS	0.007	0.000	0.038	-0.024
AG - NFA	0.088	0.008	0.113	0.063
AG - GSE	0.18	0.032	0.207	0.153
CON - NE	0.006	0.000	0.033	-0.021
CON - OE	0.068	0.005	0.109	0.027
CON - NFC	-0.079	0.006	-0.005	-0.153
CON - PP	0.116	0.013	0.165	0.067
CON - NFS	0.163	0.027	0.230	0.096
CON - NFA	0.019	0.000	0.070	-0.032
CON - GSE	0.054	0.003	0.107	0.001
NE - OE	-0.037	0.001	-0.021	-0.053
NE - NFC	-0.069	0.005	-0.042	-0.096
NE - PP	0.068	0.005	0.086	0.050
NE - NFS	0.1	0.010	0.125	0.075
NE - NFA	0.075	0.006	0.095	0.055
NE - GSE	0.107	0.011	0.127	0.087

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
OE - NFC	-0.128	0.016	-0.085	-0.171
OE - PP	0.22	0.048	0.249	0.191
OE - NFS	-0.155	0.024	-0.116	-0.194
OE - NFA	0.057	0.003	0.086	0.028
OE - GSE	0.213	0.045	0.244	0.182
NFC - PP	-0.2	0.040	-0.147	-0.253
NFC - NFS	0.07	0.005	0.139	0.001
NFC - NFA	0.149	0.022	0.204	0.094
NFC - GSE	-0.306	0.094	-0.245	-0.367
PP - NFS	0.125	0.016	0.170	0.080
PP - NFA	0.087	0.008	0.122	0.052
PP - GSE	0.376	0.141	0.417	0.335
NFS - NFA	0.11	0.012	0.157	0.063
NFS - GSE	-0.048	0.002	0.001	-0.097

Starting by the first technique that analyses discriminant validity, all the squared correlations were below the average value extracted (AVE) of each correlated construct. Thus, with respect to this method, discriminant validity was supported (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005).

Results of the second analysis that addresses discriminant validity show that all the 95% confidence intervals among the correlations excluded the unit value (1). In other words, none of the intervals shown in the table above include the unit value (1). Hence, the second method also supports discriminant validity for the constructs in sub-model one (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005).

3.7.3.1.1.3 Model Fitness

The final analysis is the model fitness analysis. Part one of the full research model was able to achieve the model fit indexes scores recorded in table 3.7.

According to the model fit indexes shown in the above table, sub-model one has poor model fitness. Comparative fit index (CFI) scored 0.80, which is below the cut-off point 0.90. Similarly, incremental fit index (IFI) was lower than the cut-off point 0.90, scoring only 0.80. Furthermore, the chi-square was significant, when instead the chi square must be non-significant ($p\text{-value} > 0.05$) to be considered a good indicator of model fitness.

Table 3.7: Sub-Model One Fit Indices

<i>Model Fit Indices</i>	<i>Cut-off Point</i>	<i>Value Recorded</i>
Comparative Fit Index (CFI)	Above 0.9	0.800
Incremental Fit Index (IFI)	Above 0.9	0.801
Root Mean Square Error of Approximation (RMSEA)	Below 0.08	0.052
Standardized Root Mean Square Residual (SRMR)	Below 0.08	0.063
Chi-Square (X^2)= 7858.174 with DF = 2957 and P-value = 0.000		

Still, there are some good indicators regarding model fitness. Both, root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR), show values below the cut-off points of 0.08 Hence, these two indicators showed good fit.

As a conclusion for the analyses performed, model corrections must be taken into consideration before progressing, to achieve good and significant model fit indices and measures.

3.7.3.1.2 Analysis of the Measurement Scales and Sub-Model Two

Sub-model two included the 10 different constructs which form the compound personality traits and UTAUT2 constructs (Proactive personality, need for affiliation, need for structure, need for cognition, general self-efficacy, performance expectancy, effort expectancy, hedonic motivation, social influence, and facilitating conditions).

3.7.3.1.2.1 Cronbach's alpha

Cronbach's alpha was also performed over part two of the research model. The following Cronbach's alpha values were obtained (table 3.8).

Table 3.8: Sub-Model Two Cronbach's Alpha Analysis

Construct	Cronbach's alpha (α) (> .70) Mobile Banking
Proactive Personality (PP)	0.860
General Self-Efficacy (GSE)	0.960
Need For Affiliation (NFA)	0.933
Need For Structure (NFS)	0.798
Need For Cognition (NFC)	0.862
Performance Expectancy (PE)	0.913
Effort Expectancy (EE)	0.905
Social Influence (SI)	0.941
Facilitating Conditions (FC)	0.868
Hedonic Motivation (HM)	0.920

All constructs in sub-model 2 demonstrated an adequate level of Cronbach's alpha. All values scored greater than the threshold level of 0.7 (Nunnally, 1978) as shown in the table 3.8. Hence, all items of the specified constructs demonstrated internal consistency.

3.7.3.1.2.2 Construct Reliability and Validity

To test the reliability of the constructs, both composite reliability and AVE were calculated. Table 3.9 shows the results of composite reliability and average variance extracted (AVE) for all constructs of sub-model two.

Regarding AVE, its cut-off point is 0.45 (Hair, Black, Babin, & Anderson, 2010); however, as shown in table 3.9, the constructs proactive personality (PP), and need for structure (NFS) scored 0.38 and 0.28 respectively, which are both below this cut-off point.

Table 3.9: Sub-Model Two Construct Reliability Analysis

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
Need For Cognition (NFC)	NFC1	0.754*	0.87	0.58
	NFC2	0.790*		
	NFC3	0.729*		
	NFC4	0.800*		
	NFC5	0.730*		
Proactive Personality (PP)	PP1	0.641*	0.86	0.38
	PP2	0.630*		
	PP3	0.556*		
	PP4	0.555*		
	PP5	0.610*		
	PP6	0.617*		
	PP7	0.651*		
	PP8	0.664*		
	PP9	0.643*		
	PP10	0.609*		
Need For Structure (NFS)	NFS1	0.711*	0.73	0.28
	NFS2	-0.074		
	NFS3	0.715*		
	NFS4	0.659*		
	NFS5	-0.158*		
	NFS6	-0.129*		
	NFS7	0.661*		
	NFS8	0.691*		
	NFS9	0.665*		
	NFS10	0.514*		
	NFS11	0.041		
	NFS12	0.526*		
Need For Affiliation	NFA1	0.565*	0.85	0.54
	NFA2	0.768*		

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
(NFA)	NFA3	0.806*		
	NFA4	0.772*		
	NFA5	0.733*		
General Self-efficacy (GSE)	GSE1	0.717*	0.82	0.61
	GSE2	0.794*		
	GSE3	0.829*		
Performance Expectancy (PE)	PE1	0.815*	0.92	0.73
	PE2	0.909*		
	PE3	0.847*		
	PE4	0.843*		
Effort Expectancy (EE)	EE1	0.831*	0.91	0.71
	EE2	0.855*		
	EE3	0.883*		
	EE4	0.793*		
Social Influence (SI)	SI1	0.922*	0.94	0.84
	SI2	0.925*		
	SI3	0.903*		
Facilitating Conditions (FC)	FC1	0.788*	0.87	0.63
	FC2	0.877*		
	FC3	0.792*		
	FC4	0.704*		
Hedonic Motivation (HM)	HM1	0.888*	0.92	0.80
	HM2	0.910*		
	HM3	0.878*		
(*) = Significant Item				

Composite reliability was the second analysis performed to check the constructs' reliability. Bagozzi and Yi (1988) indicated that for constructs to achieve internal consistency reliability, they must score

above 0.6 which is the cut-off point of the composite reliability analysis. In sub-model two, none of the construct scored below this cut-off point.

Regarding convergent validity, not all observed factor loadings are significant. In addition, a set of low standardized lambdas, scoring less than 0.50, are presented in table 3.9. Items NFS2, NFS5, NFS6, and NFS11 were all below the cut-off point.

In reference to discriminant validity, results of the analysis performed, with the 95% confidence intervals and the squared correlations, are shown in table 3.10.

Table 3.10: Sub-Model Two Construct Validity Analysis

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
PE - EE	0.671	0.450	0.745	0.597
PE - SI	0.6	0.360	0.692	0.508
PE - FC	0.627	0.393	0.707	0.547
PE - HM	0.51	0.260	0.586	0.434
PE - NFC	-0.115	0.013	-0.044	-0.186
PE - PP	0.239	0.057	0.286	0.192
PE - NFS	-0.019	0.000	0.042	-0.080
PE - NFA	0.024	0.001	0.071	-0.023
PE - GSE	0.196	0.038	0.247	0.145
EE - SI	0.417	0.174	0.493	0.341
EE - FC	0.727	0.529	0.805	0.649
EE - HM	0.369	0.136	0.436	0.302
EE - NFC	-0.129	0.017	-0.064	-0.194
EE - PP	0.292	0.085	0.337	0.247
EE - NFS	-0.026	0.001	0.031	-0.083
EE - NFA	0.033	0.001	0.076	-0.010
EE - GSE	0.278	0.077	0.327	0.229
SI - FC	0.514	0.264	0.602	0.426
SI - HM	0.425	0.181	0.513	0.337

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
SI - NFC	-0.11	0.012	-0.026	-0.194
SI - PP	0.122	0.015	0.177	0.067
SI - NFS	-0.092	0.008	-0.018	-0.166
SI - NFA	0.012	0.000	0.069	-0.045
SI - GSE	0.169	0.029	0.230	0.108
FC - HM	0.357	0.127	0.430	0.284
FC - NFC	-0.108	0.012	-0.037	-0.179
FC - PP	0.277	0.077	0.326	0.228
FC - NFS	-0.018	0.000	0.045	-0.081
FC - NFA	0.016	0.000	0.063	-0.031
FC - GSE	0.25	0.063	0.303	0.197
HM - NFC	-0.033	0.001	0.041	-0.107
HM - PP	0.238	0.057	0.289	0.187
HM - NFS	0.043	0.002	0.108	-0.022
HM - NFA	0.058	0.003	0.109	0.007
HM - GSE	0.237	0.056	0.292	0.182
NFC - PP	-0.205	0.042	-0.152	-0.258
NFC - NFS	0.064	0.004	0.133	-0.005
NFC - NFA	0.144	0.021	0.199	0.089
NFC - GSE	-0.307	0.094	-0.246	-0.368
PP - NFS	0.132	0.017	0.177	0.087
PP - NFA	0.093	0.009	0.128	0.058
PP - GSE	0.376	0.141	0.417	0.335
NFS - NFA	0.115	0.013	0.162	0.068
NFS - GSE	-0.047	0.002	0.002	-0.096
NFA - GSE	0.008	0.000	0.045	-0.029

All squared correlations were below the average value extracted (AVE) of each correlated construct. This supports discriminant validity (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). Moreover, all the 95% confidence intervals among the

correlations excluded the unit value (1). In other words, none of the intervals shown in the table above included the unit vale. Hence, this second method to test discriminant validity also supports it.

3.7.3.1.2.3 Model Fitness

The final analysis is the model fitness analysis. Part two of the full research model was able to achieve the model fit indexes records presented in table 3.11.

Table 3.11: Sub-Model Two Fit Indices

Model Fit Indices	Cut-off Point	Value Recorded
Comparative Fit Index (CFI)	Above 0.9	0.810
Incremental Fit Index (IFI)	Above 0.9	0.811
Root Mean Square Error of Approximation (RMSEA)	Below 0.08	0.067
Standardized Root Mean Square Residual (SRMR)	Below 0.08	0.061
Chi-Square (χ^2) = 4991.005 with DF = 1322 and P-value = 0.000		

According to the model fit indexes shown in the above table, sub-model two has poor model fitness. Comparative fit index (CFI) scored 0.810, which is below the cut-off point 0.900. Similarly, incremental fit index (IFI) scored 0.811, which is lower than the cut-off point 0.900. Furthermore, the chi-square was also significant, when instead the chi-square must be non-significant (p-value > 0.05) to be considered a good indicator of model fitness.

Still, there are some good indicators regarding the model fitness. Both, root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR), show values below the cut-off points of 0.08. Hence, these two indicators showed good fit.

To conclude, taking into consideration the results of the analyses performed, model corrections must be made before progressing, in order to achieve good and significant model fit indices.

3.7.3.1.3 Analysis and Measurement Scales and Model: Modified Sub-Models One and Two

Results demonstrated insufficient significance at the level of constructs reliability and model fitness for both parts of the research model. Therefore, and after a thorough analysis, the researcher proceed to eliminate some items and to create a second order factor to enhance model fitness.

Table 3.12: Results of the Second Order Factor of Proactive Personality

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
Proactive Personality A (PPA)	PPA1	0.792*	0.78	0.48
	PPA2	0.690*		
	PPA3	0.633*		
	PPA4	0.638*		
Proactive Personality B (PPB)	PPB1	0.670*	0.84	0.46
	PPB2	0.632*		
	PPB3	0.743*		
	PPB4	0.668*		
	PPB5	0.663*		
	PPB6	0.69*		
Proactive Personality (PP)	PPA	0.903*	0.87	0.76
	PPB	0.845*		
(*) = Significant Item				

To enhance model fitness and to achieve better reliability and validity results, some items with insufficient factor loadings were dropped. In addition, one construct was transformed into a second order factor; the construct proactive personality, in line with previous literature, incorporated two different dimensions. Reliability and validity results for the proactive personality second order factor are presented in table 3.12.

After dividing the construct into two different dimensions, proactive personality showed a composite reliability and AVE above the cut-off points of 0.60 and 0.45 respectively. Not only but also all the values of the standardized lambda in both dimensions were significant and scoring above the threshold level 0.50.

3.7.3.1.3.1 Cronbach's alpha Sub-Model One

After the modification of some constructs, the retrieved responses of Lebanese mobile banking customers were re-analysed, indicating acceptable Cronbach's alpha values, as shown in table 3.13.

Table 3.13: Modified Sub-Model One Cronbach's Alpha Analysis

Construct	Cronbach's alpha (α) (> .70) Mobile Banking
Openness To Experience (OE)	0.906
Extraversion (EX)	0.959
Conscientiousness (CON)	0.933
Agreeableness (AG)	0.907
Neuroticism (NE)	0.862
Proactive Personality (PP)	0.768
General Self-Efficacy (GSE)	0.959
Need For Affiliation (NFA)	0.933
Need For Structure (NFS)	0.824
Need For Cognition (NFC)	0.862

All constructs demonstrated an adequate level of Cronbach's alpha, as all of them scored greater than the threshold level of 0.7 (Nunnally, 1978). This supports internal consistence reliability of the items used.

3.7.3.1.3.2 Construct Reliability and Validity Sub-Model One

Table 3.14 includes new values of composite reliability and AVE after the modification of part one.

Table 3.14: Modified Sub-Model One Reliability Analysis

<i>Variables (Constructs)</i>	<i>Items (Scales)</i>	<i>Lambda Standardized</i>	<i>Composite Reliability Indexes</i>	<i>Average Variance Extracted (AVE)</i>
<i>Need For Cognition (NFC)</i>	NFC1	0.754*	0.87	0.58
	NFC2	0.786*		
	NFC3	0.729*		
	NFC4	0.799*		
	NFC5	0.729*		
<i>Proactive Personality A (PPA)</i>	PPA1	0.795*	0.78	0.47
	PPA2	0.692*		
	PPA3	0.622*		
	PPA4	0.634*		
<i>Proactive Personality B (PPB)</i>	PPB5	0.795*	0.84	0.47
	PPB6	0.692*		
	PPB7	0.622*		
	PPB8	0.634*		
	PPB9	0.658*		
	PPB10	0.688*		
<i>Need For Structure (NFS)</i>	NFS1	0.764*	0.85	0.48
	NFS3	0.678*		
	NFS7	0.670*		

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
	NFS8	0.706*		
	NFS9	0.679*		
	NFS10	0.643*		
Need For Affiliation (NFA)	NFA1	0.573*	0.85	0.54
	NFA2	0.767*		
	NFA3	0.806*		
	NFA4	0.764*		
	NFA5	0.731*		
General Self- efficacy (GSE)	GSE1	0.715*	0.83	0.61
	GSE2	0.802*		
	GSE3	0.822*		
Extraversion (EX)	EX1	0.961*	0.96	0.83
	EX3	0.912*		
	EX4	0.895*		
	EX6	0.888*		
	EX8	0.884*		
Agreeableness (AG)	AG2	0.654*	0.91	0.66
	AG4	0.768*		
	AG5	0.927*		
	AG7	0.811*		
	AG9	0.884*		
Conscientiousness (CON)	CON1	0.857*	0.93	0.74
	CON3	0.942*		
	CON6	0.779*		
	CON7	0.865*		

<i>Variables (Constructs)</i>	<i>Items (Scales)</i>	<i>Lambda Standardized</i>	<i>Composite Reliability Indexes</i>	<i>Average Variance Extracted (AVE)</i>
	CON8	0.856*		
<i>Neuroticism (NE)</i>	NE1	0.543*	0.88	0.61
	NE3	0.806*		
	NE4	0.780*		
	NE6	0.869*		
	NE8	0.856*		
<i>Openness To Experience (OE)</i>	OE1	0.626*	0.91	0.57
	OE2	0.634*		
	OE3	0.502*		
	OE4	0.833*		
	OE5	0.727*		
	OE6	0.956*		
	OE8	0.820*		
	OE10	0.824*		
<i>Proactive Personality (PP)</i>	PPA	0.904*	0.87	0.77
	PPB	0.846*		
<i>(*) = Significant Item</i>				

AVE values for sub-model one ranged after the modification between 0.47 and 0.84, above the cut-off point 0.45 (Hair, Black, Babin, & Anderson, 2010).

Composite reliability marked high values in the corrected part one of the research model ranging from 0.78 as the lowest value to 0.96 the highest value. Thus, all the corrected constructs used in sub-model one achieved internal consistency reliability by scoring above 0.6 (Bagozzi & Yi, 1988).

At the level of convergent validity, factor loadings for each item were re-tested separately. The lowest factor loading or lambda score (0.502) was recorded by the third item of the construct openness to experience (OE3), and was greater than 0.5 that is considered the cut-off point. In addition, all items were found to be significant. Thus, convergent validity was supported, as the lambda values were significant and scored over 0.5 (Hair, Black, Babin, & Anderson, 2010).

Regarding discriminant validity analysis, all correlations among factors that were re-established in the first part of the research model are presented in table 3.15.

Table 3.15: Modified Sub-Model One Construct Validity Analysis

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
EX - AG	-0.049	0.002	0.033	-0.131
EX - CON	-0.032	0.001	0.050	-0.114
EX - NE	-0.008	0.000	0.076	-0.092
EX - OE	0.005	0.000	0.087	-0.077
EX - NFC	0.095	0.009	0.179	0.011
EX - PP	-0.037	0.001	0.055	-0.129
EX - NFS	0.069	0.005	0.155	-0.017
EX - NFA	-0.061	0.004	0.025	-0.147
EX - GSE	-0.069	0.005	0.019	-0.157
AG - CON	0.135	0.018	0.217	0.053
AG - NE	0.053	0.003	0.139	-0.033
AG - OE	0.259	0.067	0.337	0.181
AG - NFC	-0.103	0.011	-0.017	-0.189
AG - PP	0.176	0.031	0.272	0.080
AG - NFS	0.017	0.000	0.105	-0.071
AG - NFA	0.087	0.008	0.175	-0.001
AG - GSE	0.18	0.032	0.266	0.094
CON - NE	0.008	0.000	0.092	-0.076
CON - OE	0.068	0.005	0.150	-0.014

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
CON - NFC	-0.079	0.006	0.007	-0.165
CON - PP	0.134	0.018	0.228	0.040
CON - NFS	0.17	0.029	0.256	0.084
CON - NFA	0.019	0.000	0.105	-0.067
CON - GSE	0.054	0.003	0.142	-0.034
NE - OE	-0.036	0.001	0.048	-0.120
NE - NFC	-0.071	0.005	0.017	-0.159
NE - PP	0.079	0.006	0.175	-0.017
NE - NFS	0.096	0.009	0.184	0.008
NE - NFA	0.073	0.005	0.161	-0.015
NE - GSE	0.108	0.012	0.198	0.018
OE - NFC	-0.127	0.016	-0.043	-0.211
OE - PP	0.226	0.051	0.322	0.130
OE - NFS	-0.145	0.021	-0.059	-0.231
OE - NFA	0.057	0.003	0.143	-0.029
OE - GSE	0.211	0.045	0.295	0.127
NFC - PP	-0.211	0.045	-0.113	-0.309
NFC - NFS	0.083	0.007	0.173	-0.007
NFC - NFA	0.149	0.022	0.237	0.061
NFC - GSE	-0.305	0.093	-0.219	-0.391
PP - NFS	0.117	0.014	0.215	0.019
PP - NFA	0.07	0.005	0.168	-0.028
PP - GSE	0.387	0.150	0.493	0.281
NFS - NFA	0.112	0.013	0.202	0.022
NFS - GSE	-0.064	0.004	0.030	-0.158
NFA - GSE	0.01	0.000	0.102	-0.082

None of the intervals shown in table 3.15 included the unit value (1) (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). In the same line, the squared correlations were lower than the average variance extracted (AVE) of the constructs involved

(Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). Hence, discriminant validity was also supported. Therefore, all the constructs used in sub-model one were now valid.

3.7.3.1.3.3 Model Fitness Part One

Model fit analysis was also repeated after the modifications that were done to the first part of the research model. The new results of sub-model one fitness analysis are presented in table 3.16.

Table 3.16: Modified Sub-Model One Fit Indices

<i>Model Fit Indices</i>	<i>Cut-off Point</i>	<i>Value Recorded</i>
<i>Comparative Fit Index (CFI)</i>	Above 0.9	0.937
<i>Incremental Fit Index (IFI)</i>	Above 0.9	0.937
<i>Root Mean Square Error of Approximation (RMSEA)</i>	Below 0.08	0.04
<i>Standardized Root Mean Square Residual (SRMR)</i>	Below 0.08	0.044
<i>Chi-Square (χ^2)= 2952.735 with DF = 1502 and P-value = 0.000</i>		

All recorded values were above the cut-off points except the chi-square value. CFI and IFI scored the same value 0.937, which is higher than 0.90. Similarly RMSEA and SRMR scored 0.04 and 0.044 respectively which are both below the cut-off point of 0.08. Regarding the chi-square, chi-square values are highly influenced by the total number of cases used in each study. Therefore, even though the chi-square is not considered acceptable, as the rest of the fit indices of sub-model one were within their recommended values, the modified measurement model was considered to have adequate goodness of fit to the data.

3.7.3.1.3.4 Cronbach's alpha Sub-Model Two

Table 3.17 presents the results obtained from the Cronbach's alpha test that was done after the modification of the second part of the research model.

Table 3.17: Modified Sub-Model Two Cronbach's Alpha Analysis

Construct	Cronbach's alpha (α) (> .70) Mobile Banking
Proactive Personality (PP)	0.768
General Self-Efficacy (GSE)	0.959
Need For Affiliation (NFA)	0.933
Need For Structure (NFS)	0.824
Need For Cognition (NFC)	0.862
Performance Expectancy (PE)	0.913
Effort Expectancy (EE)	0.905
Social Influence (SI)	0.941
Facilitating Conditions (FC)	0.868
Hedonic Motivation (HM)	0.920

All constructs in sub-model two demonstrated an adequate level of internal consistency after the modifications made, as all Cronbach's alpha coefficients were greater than the threshold level of 0.70 (Nunnally, 1978).

3.7.3.1.3.5 Construct Reliability and Validity Sub-Model Two

Table 3.18 shows the new values of composite reliability and AVE after the modification in sub-model two.

Regarding AVE, all values ranged between 0.46 and 0.84 after the modification, above the cut-off point 0.45 (Hair, Black, Babin, & Anderson, 2010).

Table 3.18: Modified Sub-Model Two Reliability Analysis

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
Need For Cognition (NFC)	NFC1	0.756*	0.87	0.58
	NFC2	0.789*		
	NFC3	0.728*		
	NFC4	0.799*		
	NFC5	0.730*		
Proactive Personality A (PPA)	PPA1	0.794*	0.78	0.47
	PPA2	0.694*		
	PPA3	0.618*		
	PPA4	0.635*		
Proactive Personality B (PPB)	PPB5	0.669*	0.84	0.46
	PPB6	0.629*		
	PPB7	0.745*		
	PPB8	0.670*		
	PPB9	0.658*		
	PPB10	0.690*		
Proactive Personality (PP)	PP1	0.904*	0.87	0.77
	PP2	0.847*		
Need For Structure (NFS)	NFS1	0.766*	0.85	0.48
	NFS3	0.684*		
	NFS7	0.671*		
	NFS8	0.706*		
	NFS9	0.679*		
	NFS10	0.635*		
Need For Affiliation (NFA)	NFA1	0.574*	0.85	0.54
	NFA2	0.770*		
	NFA3	0.809*		
	NFA4	0.764*		
	NFA5	0.728*		
General Self-	GSE1	0.718*	0.82	0.61

Variables (Constructs)	Items (Scales)	Lambda Standardized	Composite Reliability Indexes	Average Variance Extracted (AVE)
<i>efficacy (GSE)</i>	<i>GSE2</i>	0.795*		
	<i>GSE3</i>	0.828*		
<i>Performance Expectancy (PE)</i>	<i>PE1</i>	0.814*	0.91	0.73
	<i>PE2</i>	0.909*		
	<i>PE3</i>	0.847*		
	<i>PE4</i>	0.843*		
<i>Effort Expectancy (EE)</i>	<i>EE1</i>	0.831*	0.91	0.71
	<i>EE2</i>	0.854*		
	<i>EE3</i>	0.884*		
	<i>EE4</i>	0.793*		
<i>Social Influence (SI)</i>	<i>SI1</i>	0.921*	0.94	0.84
	<i>SI2</i>	0.925*		
	<i>SI3</i>	0.904*		
<i>Facilitating Conditions (FC)</i>	<i>FC1</i>	0.782*	0.87	0.63
	<i>FC2</i>	0.875*		
	<i>FC3</i>	0.799*		
	<i>FC4</i>	0.705*		
<i>Hedonic Motivation (HM)</i>	<i>HM1</i>	0.887*	0.92	0.80
	<i>HM2</i>	0.911*		
	<i>HM3</i>	0.877*		
(*) = Significant Item				

Composite reliability marked high values in the corrected part two of the research model, ranging from 0.78 to 0.94. This indicates that all the corrected constructs achieved internal consistency reliability by scoring above 0.6 (Bagozzi & Yi, 1988).

In order to discuss the convergent validity of the constructs used, factor loadings were re-evaluated. The lowest factor loading or lambda score (0.574) was recorded by the first item of need for affiliation

(NFA1), and was greater than 0.50 that is considered the cut-off point. Furthermore, all items were found to be significant. Thus, convergent validity was supported, as all items were significant and lambda values were above 0.5 (Hair, Black, Babin, & Anderson, 2010).

Regarding discriminant validity, table 3.19 shows that none of the 95% confidence intervals among the correlations included the unit value (1) (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). In the same line, the squared correlations were all below the average extracted variance (AVE) of the constructs involved (Boudreau, Gefen, & Straub, 2001; Fornell & Larcker, 1981; Gefen & Straub, 2005). Hence, discriminant validity was also supported. Therefore, all the constructs in sub-model two were valid after the implemented changes.

Table 3.19: Modified Sub-Model Two Construct Validity Analysis

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
PE - EE	0.671	0.450	0.722	0.620
PE - SI	0.601	0.361	0.658	0.544
PE - FC	0.626	0.392	0.683	0.569
PE - HM	0.51	0.260	0.575	0.445
PE - NFC	-0.115	0.013	-0.029	-0.201
PE - PP	0.26	0.068	0.358	0.162
PE - NFS	-0.007	0.000	0.081	-0.095
PE - NFA	0.024	0.001	0.112	-0.064
PE - GSE	0.195	0.038	0.281	0.109
EE - SI	0.418	0.175	0.489	0.347
EE - FC	0.728	0.530	0.775	0.681
EE - HM	0.369	0.136	0.443	0.295
EE - NFC	-0.129	0.017	-0.043	-0.215

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Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
EE - PP	0.308	0.095	0.408	0.208
EE - NFS	-0.015	0.000	0.075	-0.105
EE - NFA	0.033	0.001	0.121	-0.055
EE - GSE	0.277	0.077	0.361	0.193
SI - FC	0.513	0.263	0.580	0.446
SI - HM	0.426	0.181	0.497	0.355
SI - NFC	-0.109	0.012	-0.023	-0.195
SI - PP	0.134	0.018	0.228	0.040
SI - NFS	-0.076	0.006	0.012	-0.164
SI - NFA	0.012	0.000	0.100	-0.076
SI - GSE	0.168	0.028	0.254	0.082
FC - HM	0.359	0.129	0.435	0.283
FC - NFC	-0.107	0.011	-0.019	-0.195
FC - PP	0.31	0.096	0.410	0.210
FC - NFS	-0.002	0.000	0.088	-0.092
FC - NFA	0.018	0.000	0.108	-0.072
FC - GSE	0.249	0.062	0.335	0.163
HM - NFC	-0.033	0.001	0.055	-0.121
HM - PP	0.258	0.067	0.356	0.160
HM - NFS	0.051	0.003	0.139	-0.037
HM - NFA	0.057	0.003	0.145	-0.031
HM - GSE	0.237	0.056	0.323	0.151
NFC - PP	-0.216	0.047	-0.118	-0.314
NFC - NFS	0.077	0.006	0.167	-0.013
NFC - NFA	0.145	0.021	0.233	0.057
NFC - GSE	-0.307	0.094	-0.223	-0.391

Intervals	Normal Correlations	Squared Correlations	95% Confidence Interval	
			Minimum	Maximum
PP - NFS	0.122	0.015	0.220	0.024
PP - NFA	0.074	0.005	0.172	-0.024
PP - GSE	0.387	0.150	0.493	0.281
NFS - NFA	0.114	0.013	0.204	0.024
NFS - GSE	-0.062	0.004	0.032	-0.156
NFA - GSE	0.006	0.000	0.098	-0.086

3.7.3.1.3.6 Model Fitness Sub-Model Two

Table 3.20 presents the results of the model fit analysis that was performed after the modification done to the second part of the research model.

Table 3.20: Modified Sub-Model Two Fit Indices

Model Fit Indices	Cut-off Point	Value Recorded
Comparative Fit Index (CFI)	Above 0.9	0.904
Incremental Fit Index (IFI)	Above 0.9	0.904
Root Mean Square Error of Approximation (RMSEA)	Below 0.08	0.048
Standardized Root Mean Square Residual (SRMR)	Below 0.08	0.047
Chi-Square (X^2) = 3055.384 with DF = 996 and P-value = 0.000		

All recorded values were above the cut-off points except the chi-square value. CFI and IFI scored the same value 0.904, which is higher than 0.90. Similarly, RMSEA and SRMR scored 0.048 and 0.047 respectively, which are both below the cut-off point of 0.08. Regarding

chi-square, chi-squared values, as explained before, are highly influenced by the total number of cases used in each study. Therefore, even though the value of chi-square is still inadequate, as the remaining fit indices of sub-model two were within their recommended values, the modified measurement model was considered to have adequate goodness of fit to the data.

3.7.3.2 Structural Model

The structural model analysis is the next stage, where previous suggested research models and hypothesis are to be validated (Anderson & Gerbing, 1988; Byrne, 2010; Hair, Black, Babin, & Anderson, 2010). In other words, this stage is where the research hypotheses proposed are verified, by addressing the patterns and degrees of causal relationships between the constructs (Anderson & Gerbing, 1988; Byrne, 2010; Hair, Black, Babin, & Anderson, 2010).

As mentioned and explained in previous sections, structural equations model was applied to the current study using Stata 14.0. The customer's age, gender, employment, and free time availability were included as control variables. Due to the number of variables involved in the model, to simplify it, the researcher replaced the constructs by the average score of the indicators, grouping them in a single measure, hence, using a path analysis. Moreover, to avoid interpretation problems with some coefficients, given the measurement scales of some of the considered variables (which do not include the value zero), the researcher proceeded to the mean centring of the variables. Finally, as mobile banking use is a categorical variable, the researcher had to carry out two path analyses to assess the proposed framework, one that considered the discrete nature of the dependent variable and another one that analysed the rest of the model.

3.7.3.2.1 *Analysis of Results*

To take into consideration the binary nature of mobile banking use, a Generalized Structural Equations Model (GSEM) using a "probit" estimation was applied to test the impact of all variables on this outcome.

The results reported in Table 3.21 regarding the UTAUT2 constructs reveal that effort expectancy and facilitating conditions have a positive and significant relationship with mobile banking use, supporting hypotheses H1b and H1d. Moreover, the findings also support a negative significant relationship between hedonic motivation and mobile banking use, as proposed on hypothesis H1e. However, the impact of performance expectancy and social influence on mobile banking use is non-significant; thus, hypotheses H1a and H1c have to be rejected. On the other hand, in relation to the compound traits, the findings show a positive and significant relationship between need for cognition and mobile banking use, in line with hypothesis H2b. Furthermore, need for structure and need for affiliation are negatively and significantly associated with mobile banking use, supporting hypotheses H3b and H4c. Proactive personality is also negatively and significantly related to mobile banking use, however, a positive relationship was proposed, hence, hypothesis H6e has to be rejected. The impact of general self-efficacy on mobile banking use is non-significant; thus, hypothesis H5d also has to be rejected. Regarding the big five constructs, only two of them are significantly related to mobile banking use, neuroticism positively and agreeableness negatively, supporting hypothesis 17d but rejecting hypothesis 17c, as a positive relationship between agreeableness and use was proposed. The rest of the big five construct were non-significantly related to mobile banking use, thus, hypotheses H17a, H17b and H17e also have to be rejected. Finally, three control variables are significantly associated with use, employment positively and free hours' availability and age negatively.

Table 3.21: Results of GSEM model for mobile banking use

Independent variable	Coef.	S.D.	z	95% Conf. Interval	
Performance expectancy	-.154	.097	-1.58	-.345	.037
Effort expectancy	.199*	.104	1.91	-.005	.403
Social influence	.116	.074	1.57	-.029	.261
Facilitating conditions	.805***	.106	7.59	.597	1.013
Hedonic motivation	-.365***	.074	-4.96	-.510	-.221

Independent variable	Coef.	S.D.	z	95% Conf. Interval	
Need for cognition	.193***	.072	2.68	.052	.333
Need for structure	-.212***	.084	-2.52	-.376	-.047
Need for affiliation	-.243***	.081	-3.00	-.402	-.084
Proactive personality	-.307***	.113	-2.71	-.528	-.085
General self-efficacy	.022	.092	0.24	-.158	.202
Openness	.074	.096	0.78	-.113	.262
Neuroticism	.321***	.108	2.99	.110	.532
Conscientiousness	-.106	.068	-1.56	-.239	.027
Agreeability	-.243**	.100	-2.42	-.440	-.046
Extraversion	-.056	.089	-0.62	-.231	.120
Ln_age	-.392*	.237	-1.66	-.856	.072
Gender	.162	.125	1.29	-.083	.407
Employment	.573***	.152	3.77	.275	.871
Hours	-1.183***	.134	-8.81	-1.447	-.920

Note: *** p<0.01, ** p<0.05, and * p<0.10

Next, to analyse the rest of the proposed hypotheses, a SEM model was tested. Due to its length, to present its results, the researcher has divided them into two tables, one showing the effects on the motivational variables (UTAUT2) and another showing the effects on the compound traits.

Starting with the effect on the motivational variables (UTAUT2), table 3.22 reports a positive significant impact of proactive personality on performance expectancy as proposed on hypothesis H6a. However, need for affiliation has non-significant influence on performance expectancy, thus failing to support hypothesis H4a. Furthermore, effort expectancy was positively and significantly related to both general self-efficacy and proactive personality, supporting hypotheses H5a and H6b respectively. However, the impact of need for cognition on effort expectancy was non-significant; hence, hypothesis H2a has to be

rejected. Regarding social influence, hypothesis H4b is also rejected, as need for affiliation revealed a non-significant impact on social influence. On the other hand, hypothesis H3a is supported, since need for structure and social influence demonstrated a negative significant relationship. Proactive personality and general self-efficacy also show a significant impact on social influence, although in this case it was not proposed and the effect is positive. Table 3.22 also shows a positive significant impact of general self-efficacy and proactive personality on hedonic motivation, supporting hypotheses H5b and H6c respectively. Likewise, the findings also support a positive significant relationship between general self-efficacy and facilitating conditions, in line with hypothesis H5c. Hypothesis H6d is also supported as proactive personality has a positive significant impact on facilitating conditions. With regards to the big five constructs, only five hypotheses were supported. Consciousness has a positive significant relationship with hedonic motivation; hence, supporting hypothesis H12c. Agreeableness is significantly and positively related to effort expectancy and social influence; thus, supporting hypotheses H14a and H14c. Finally, openness to experience is positively and significantly associated with performance expectancy and social influence, in line with hypotheses H16b and H16c. Neuroticism also has a positive and significant impact on social influence, but, as hypothesis H15c proposed a negative effect, it has to be rejected. Finally, the rest of the hypotheses concerning the impact of the big five constructs on the UTAUT2 constructs also have to be rejected.

Table 3.22: Results of SEM model for UTAUT2 variables

	Coef.	S.D.	z	95% Conf. Interval	
Performance expectancy					
Need for cognition	.0438	.043	1.01	-.041	.129
Need for structure	-.025	.049	-0.50	-.121	.072
Need for affiliation	.028	.047	0.59	-.065	.121
Proactive personality	.269***	.065	4.16	.142	.395
General self-efficacy	.100*	.055	1.83	-.007	2.07
Openness	.099*	.058	1.71	-.015	.213

	Coef.	S.D.	z	95% Conf. Interval	
Neuroticism	.026	.065	0.39	-.102	.154
Conscientiousness	.049	.042	1.17	-.033	.132
Agreeability	.0822	.060	1.38	-.035	.199
Extraversion	.002	.052	0.04	-.101	.105
Ln_age	.246*	.140	1.76	-.028	.520
Gender	.083	.075	1.10	-.065	.231
<i>Effort expectancy</i>					
Need for cognition	.039	.037	1.04	-.034	.112
Need for structure	.003	.042	0.08	-.079	.086
Need for affiliation	.035	.041	0.86	-.045	.115
Proactive personality	.239***	.056	4.30	.130	.349
General self-efficacy	.186***	.047	3.94	.093	.278
Openness	.135***	.050	2.69	.036	.233
Neuroticism	-.032	.056	-0.57	-.142	.079
Conscientiousness	-.051	.036	-1.42	-.123	.020
Agreeability	.135***	.051	2.62	.034	.235
Extraversion	.049	.045	1.08	-.040	.137
Ln_age	-.030	.120	-0.25	-.266	.206
Gender	.127**	.065	1.95	-.001	.254
<i>Social influence</i>					
Need for cognition	.053	.048	1.11	-.041	.148
Need for structure	-.125**	.054	-2.29	-.231	-.018
Need for affiliation	.026	.052	0.50	-.077	.129
Proactive personality	.130*	.072	1.82	-.010	.270
General self-efficacy	.109*	.060	1.81	-.009	.228
Openness	.048	.064	0.75	-.078	.175
Neuroticism	.130*	.072	1.80	-.012	.272
Conscientiousness	.063	.047	1.36	-.028	.155

	Coef.	S.D.	z	95% Conf. Interval	
Agreeability	.086	.066	1.30	-.044	.215
Extraversion	.001	.058	0.02	-.112	.115
Ln_age	.420***	.155	2.72	.117	.723
Gender	.129	.084	1.55	-.034	.293
<i>Facilitating conditions</i>					
Need for cognition	.006	.038	0.17	-.068	.081
Need for structure	.006	.043	0.14	-.078	.090
Need for affiliation	.015	.041	0.36	-.066	.096
Proactive personality	.224***	.056	3.97	.113	.334
General self-efficacy	.140***	.048	2.93	.046	.233
Openness	.250***	.051	4.93	.151	.350
Neuroticism	.031	.058	0.55	-.081	.143
Conscientiousness	-.019	.037	-0.50	-.091	.053
Agreeability	.127**	.052	2.44	.025	.229
Extraversion	.066	.046	1.45	-.024	.156
Ln_age	.276**	.122	2.26	.037	.515
Gender	.140**	.066	2.13	.011	.270
<i>Hedonic motivation</i>					
Need for cognition	-.050	.043	-1.16	-.138	.035
Need for structure	.018	.049	0.36	-.078	.113
Need for affiliation	.044	.047	0.94	-.048	.137
Proactive personality	.244***	.064	3.80	.118	.370
General self-efficacy	.218***	.054	4.01	.111	.324
Openness	.092	.058	1.59	-.022	.205
Neuroticism	.025	.065	0.39	-.102	.153
Conscientiousness	.114***	.042	2.71	.032	.196
Agreeability	-.072	.059	-1.21	-.188	.044
Extraversion	.002	.052	0.04	-.100	.104

	Coef.	S.D.	z	95% Conf. Interval	
Ln_age	.194	.139	1.40	-.078	.467
Gender	.117	.075	1.56	-.030	.265

Note: *** p<0.01, ** p<0.05, and * p<0.10

Concerning the second part of the results related to the compound personality traits, table 3.23 illustrate positive significant influence of the openness to experience and the extraversion on the need for cognition, thus supporting the proposed hypotheses H7a and H7c respectively. However the impact of the conscientiousness on the need for cognition is non-significant, hence hypothesis H7b is rejected. On the other side, the need for structure was positively and significantly predicted by the conscientiousness and neuroticism, supporting hypothesis H8a and H8c respectively. As well the need for structure was significantly and negatively predicted by the openness to experience, fulfilling the proposed hypothesis H8b. In the same line, and as proposed by hypothesis H9b, the agreeableness was found to be positively and significantly associated with the need for affiliation. However, the impact of the extraversion and neuroticism over the need for affiliation is non-significant; hence hypotheses H9a and H9c are to be rejected. In the same sense, the extraversion and conscientiousness over the general self-efficacy illustrated non-significant relationships, leading to reject hypothesis H10a and H10c respectively. Instead, results revealed the general self-efficacy to be positively predicted by the agreeableness and openness to experience, supporting what have been proposed by hypotheses H10b and H10d. Likewise; results also supported the proposed hypothesis H10e indicating that the neuroticism has a negative significant impact over the general self-efficacy. Finally table 3.23 reveals a positive significant influence of the openness to experience and the conscientiousness over the proactive personality, thus supporting the proposed hypothesis H11b and H11c. But conversely hypothesis H11a is to be rejected where the relation of the extraversion with the proactive personality was found to be non-significant.

Table 3.23: Results of SEM model for compound traits

	Coef.	S.D.	z	95% Conf. Interval	
<i>Need for cognition</i>					
Openness	.155***	.055	2.83	.047	.262
Neuroticism	.109*	.062	1.75	-.013	.231
Conscientiousness	.038	.040	0.94	-.041	.117
Agreeability	.069	.057	1.21	-.043	.181
Extraversion	-.124***	.050	-2.48	-.223	-.026
Ln_age	.211	.133	1.58	-.050	.472
Gender	-.145**	.072	-2.03	-.286	-.005
<i>Need for structure</i>					
Openness	-.157***	.047	-3.34	-.249	-.065
Neuroticism	.104**	.054	1.94	-.001	.209
Conscientiousness	.119***	.035	3.45	.051	.187
Agreeability	.030	.049	0.61	-.066	.126
Extraversion	.069	.043	1.61	-.015	.154
Ln_age	.238**	.115	2.07	.013	.463
Gender	-.011	.062	-0.18	-.132	.110
<i>Need for affiliation</i>					
Openness	.030	.049	0.61	-.066	.125
Neuroticism	.074	.056	1.32	-.036	.183
Conscientiousness	.005	.036	0.13	-.066	.075
Agreeability	.084*	.051	1.66	-.015	.184
Extraversion	-.040	.015	-0.89	-.128	.048
Ln_age	.078	.119	0.65	-.155	.311
Gender	-.215***	.064	-3.37	-.341	-.090
<i>Proactive personality</i>					
Openness	.122***	.037	3.29	.049	.194
Neuroticism	.063	.042	1.49	-.020	.146

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	Coef.	S.D.	z	95% Conf. Interval	
Conscientiousness	.067***	.027	2.45	.013	.120
Agreeability	.086**	.039	2.22	.010	.161
Extraversion	-.007	.034	-0.20	-.073	.060
Ln_age	-.157*	.091	-1.74	-.333	.020
Gender	-.097**	.048	-2.01	-.192	-.002
<i>General self-efficacy</i>					
Openness	.162***	.044	3.67	.075	.248
Neuroticism	.126***	.050	2.50	.027	.225
Conscientiousness	.017	.032	0.51	-.047	.080
Agreeability	.121***	.046	2.64	.031	.211
Extraversion	-.073	.040	-1.81	-.153	.006
Ln_age	.138	.108	1.28	-.073	.348
Gender	-.156***	.058	-2.70	-.269	-.042
Note: *** p<0.01, ** p<0.05, and * p<0.10					

CHAPTER FOUR

DISCUSSION

4 DISCUSSION

4.1 INTRODUCTION

In the previous chapter, aside from explaining the statistical methods employed, results were revealed. Subsequently, this chapter comments the theoretical model presented in previous chapters with regards to the obtained statistical results on the factors that influence the use of mobile banking in Lebanon. Thus, this chapter will provide a further discussion and rationalization of such results taking into consideration what was theoretically hypothesized in the conceptual model.

4.2 RESEARCH HYPOTHESIS TESTING

Aside from constructs and models' measurement, hypotheses' testing is a crucial aspect that was examined using STATA 14 through path analysis. Hence, as explained in previous chapters, several research hypotheses were tested to analyse the relationships among different exogenous and endogenous constructs (see the literature review chapter). Table 4.1 shows a brief summary exposing whether the obtained results support or do not support proposed hypotheses.

Table 4.1: Summary of Empirical Analysis

Hyp.	Indep. Variable	Dep. Variable	Result	Hyp.	Indep. Variable	Dep. Variable	Result
H1a	Performance Expectancy	Use Behaviour	Not Sup.	H1b	Effort Expectancy	Use Behaviour	Sup.
H1c	Social Influence	Use Behaviour	Not Sup.	H1d	Facilitating Conditions	Use Behaviour	Sup.
H1e	Hedonic Motivation	Use Behaviour	Sup.	H2a	Need for Cognition	Effort Expectancy	Not Sup.
H2d	Need for Cognition	Use Behaviour	Sup.	H3a	Need for Structure	Social Influence	Sup.

Hyp.	Indep. Variable	Dep. Variable	Result	Hyp.	Indep. Variable	Dep. Variable	Result
H3b	Need for Structure	Use Behaviour	Sup.	H4a	Need for Affiliation	Performance Expectancy	Not Sup.
H4b	Need for Affiliation	Social Influence	Not Sup.	H4c	Need for Affiliation	Use Behaviour	Sup.
H5a	General Self-efficacy	Effort Expectancy	Sup.	H5b	General Self-efficacy	Hedonic Motivation	Sup.
H5c	General Self-efficacy	Facilitating Conditions	Sup.	H13c	Extraversion	Social Influence	Not Sup.
H5d	General Self-efficacy	Use Behaviour	Not Sup.	H6a	Proactive Personality	Performance Expectancy	Sup.
H6b	Proactive Personality	Effort Expectancy	Sup.	H6c	Proactive Personality	Hedonic Motivation	Sup.
H6d	Proactive Personality	Facilitating Conditions	Sup.	H6e	Proactive Personality	Use Behaviour	Not Sup.
H7a	Openness to Experience	Need for Cognition	Sup.	H7b	Conscientiousness	Need for Cognition	Not Sup.
H7c	Extraversion	Need for Cognition	Sup.	H8a	Conscientiousness	Need for Structure	Sup.
H8b	Openness to Experience	Need for Structure	Sup.	H8c	Neuroticism	Need for Structure	Sup.
H9a	Extraversion	Need for Affiliation	Not Sup.	H9b	Agreeableness	Need for Affiliation	Sup.
H9c	Neuroticism	Need for Affiliation	Not Sup.	H10a	Extraversion	General Self-efficacy	Not Sup.
H10b	Agreeableness	General Self-efficacy	Sup.	H10c	Conscientiousness	General Self-efficacy	Not Sup.
H10d	Openness to Experience	General Self-efficacy	Sup.	H10e	Neuroticism	General Self-efficacy	Not Sup.

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Hyp.	Indep. Variable	Dep. Variable	Result	Hyp.	Indep. Variable	Dep. Variable	Result
H11 a	Extraversion	Proactive Personality	Not Sup.	H11 b	Openness to Experience	Proactive Personality	Sup.
H11 c	Conscientiousness	Proactive Personality	Sup.	H12 a	Conscientiousness	Effort Expectancy	Not Sup.
H12 b	Conscientiousness	Social Influence	Not Sup.	H12 c	Conscientiousness	Hedonic Motivation	Sup.
H12 d	Conscientiousness	Facilitating Conditions	Not Sup.	H12 e	Conscientiousness	Performance Expectancy	Not Sup.
H13 a	Extraversion	Effort Expectancy	Not Sup.	H13 b	Extraversion	Performance Expectancy	Not Sup.
H13 c	Extraversion	Social Influence	Not Sup.	H13 d	Extraversion	Hedonic Motivation	Not Sup.
H13 e	Extraversion	Facilitating Conditions	Not Sup.	H14 a	Agreeableness	Effort Expectancy	Sup.
H14 b	Agreeableness	Performance Expectancy	Not Sup.	H14 c	Agreeableness	Social Influence	Sup.
H14 d	Agreeableness	Hedonic Motivation	Not Sup.	H14 e	Agreeableness	Facilitating Conditions	Not Sup.
H15 a	Neuroticism	Effort Expectancy	Not Sup.	H15 b	Neuroticism	Performance Expectancy	Not Sup.
H15 c	Neuroticism	Social Influence	Not Sup.	H15 d	Neuroticism	Hedonic Motivation	Not Sup.
H15 e	Neuroticism	Facilitating Conditions	Not Sup.	H16 a	Openness to Experience	Effort Expectancy	Not Sup.
H16 b	Openness to Experience	Performance Expectancy	Sup.	H16 c	Openness to Experience	Social Influence	Sup.

Hyp.	Indep. Variable	Dep. Variable	Result	Hyp.	Indep. Variable	Dep. Variable	Result
H16 d	Openness to Experience	Hedonic Motivation	Not Sup.	H16 e	Openness to Experience	Facilitating Conditions	Not Sup.
H17 a	Conscientiousness	Use Behaviour	Not Sup.	H17 b	Extraversion	Use Behaviour	Not Sup.
H17 c	Agreeableness	Use Behaviour	Not Sup.	H17 d	Neuroticism	Use Behaviour	Sup.
H17 c	Openness to Experience	Use Behaviour	Not Sup.				

In the below sections, a detailed discussion regarding each construct is presented.

4.2.1 Big Five Personality Traits

The general explanation of the big five personality traits was offered in detail in the literature review chapter. This kind of personality traits includes five different constructs that are used in the current study. According to the 3M model of motivation and personality, these five constructs are predicted to have an impact on other personality constructs known as compound personality traits, as well as motivational constructs and behaviour. Hence, the results of the established relations among the big five personality traits and other constructs are discussed below in view of the existence of logical and theoretical evidence.

4.2.1.1 Extraversion

The first elemental personality trait that was included in the current investigation was extraversion. As discussed previously, extraversion was hypothesized to impact four compound personality constructs. The literature review chapter and the research model section explains the paths of extraversion with need for cognition, need for affiliation, general self-efficacy and proactive personality.

As shown in the results above, extraversion showed a poor impact on three compound personality constructs. None of the proposed relations of extraversion with need for affiliation, general self-efficacy and proactive personality were found to be statistically significant. In other words, extraversion was found to have no impact on these three compound personality traits in the current study. But on the other side, extraversion was found to have a negative significant effect on need for cognition as previously proposed by hypothesis H7c.

The need for affiliation among Lebanese banking customers was not influenced by their extraversion. This can be explained because individuals with high levels of extraversion have high quality relationships with others; thus, integrating in other groups to establish new relationships is not a major concern for them. Results obtained from a study done by Abood & Ashouari-Idri (2016) demonstrated that there is no relation between extraversion and need for affiliation. These results can be explained based on the nature of the Lebanese society as well. A huge set of groups are defined in Lebanon based on specific criteria regardless of personal characteristics (i.e., social groups are formed based on characteristics such as religion, family, gender etc. and not on personal specific characteristics such as being sociable or open minded).

According to the statistical results obtained, extraversion does not influence the general self-efficacy of Lebanese banking customers. Even though a relation between the two constructs was found in other studies and targeted groups, among the Lebanese banking customers it was not established. Levels of general self-efficacy may be obtained based on many other aspects. The feeling of certainty and the ability to cope with situations effectively in Lebanon can be had regardless of having an extravert personality. General self-efficacy among Lebanese banking users may be developed based on the influence of personal knowledge and experience in several life fields. Individuals with high levels of extraversion may show high levels of confidence among social relationships; however, being extravert does not imply confidence among other general life aspects (i.e., extraversion may influence confidence in the field of social relations but not general self-efficacy or general confidence).

The hypothesis linking extraversion with proactive personality was found non-significant as well. In other words, the level of proactivity among Lebanese banking customers is not influenced by the level of extraversion.

Proactive personality (as seen in the literature review chapter) can be described with several characteristics. Aside from being sociable, optimistic, ambitious, gregarious, and risk takers, proactive individuals are concerned with problem solving, finding new opportunities, action taking and altering situations (Bateman & Crant, 1993). This explanation helps justify that proactivity is a wide personality construct where a lot of factors may influence its formation. Thus, being a problem solver or action taker may be independent to whether an individual is generous or ambitious, which are characteristics of extraversion (McElroy, Hendrickson, Townsend, & DeMarie, 2007). Being proactive according to the Lebanese society may be unrelated to being social, active or assertive. Changing and altering the environment which is an essential characteristic of proactive personality may occur without being optimistic or generous. Taking the example of “Asperger individuals”, they are considered to have great capabilities in their fields of interest, whereas, at the same time, they are considered to be the less social individuals among society (Myles & Simpson, 2002 and Wilson, Hay, Beamish, & Attwood, 2017). Therefore this may explain the non-significant path among extraversion and proactive personality.

On the other hand, results regarding the relationship of extraversion with need for cognition are in line with the proposed hypothesis, demonstrating a negative and significant relation. Lebanese banking customers with high levels of extraversion tend to integrate in less effortful activities, as effortful activities may comprise constructive arguments and doubtful thoughts that sociable and assertive individuals do not prefer. According to Lebanese banking customers, the fact of being a social and warm individual leads to lower need for cognition. Nussbaum and Bendixen (2003) proved that extravert individuals tend to avoid arguments, hence, not integrating in effortful thoughts.

4.2.1.2 Agreeableness

Agreeableness, another elemental personality trait, was also used in the current investigation, demonstrating path relations with two compound personality traits, two UTAUT2 constructs, and mobile banking use. The compound personality traits are: need for affiliation and general self-efficacy whereas the UTAUT2 constructs are: effort expectancy and facilitating conditions. Agreeableness showed a positive significant impact on need for affiliation and general self-efficacy, as hypothesized. Such results indicate that Lebanese banking customers with high levels of agreeableness demonstrated high levels of need for affiliation and general self-efficacy.

Lebanese banking customers who were more interested in affiliating to groups were those who demonstrated higher levels of friendliness, unselfishness, soft-heartedness and trustworthiness. High levels of need for affiliation can be related as well to high levels of helpfulness, corporation, and unselfishness, which are all main characteristic of agreeableness. Previous studies have supported results in parallel with the findings of the current study. Goldberg (1992) in his study found that people who aim to collaborate and achieve social coherence in groups are those with high agreeableness propensity. Costa and McCrae (1988) and Emmerik, Gardner, Wendt, & Fischer (2010) reported a positive impact of agreeableness on need for affiliation.

The same positive significant result was obtained between agreeableness and general self-efficacy. Lebanese banking customers demonstrated that the more agreeable the individual is, the more general self-efficacy he/she presents. This demonstrates that Lebanese individuals with high levels of cooperation, broad-mindedness, flexibility, friendliness and trust present observable degrees of general self-efficacy. In other words, the more cooperative, social and open-minded the Lebanese bank customers are, the more confidence they have on their coping abilities across a wide range of different situations. The relationship between agreeableness and general self-efficacy has been poorly empirically tested. One of the few studies that have analysed the relation of agreeableness with general self-efficacy was done by Thoms, Moore, and Scott (1996). They were able to demonstrate a significant

impact of agreeableness on general self-efficacy while participating in team group projects. In the same sense Larson, Rottinghuas, and Borgen (2002) and Barrick, Mount, and Gupta (2003) addressed similar relations but with different concepts. They both showed that individuals with adequate levels of friendliness and flexibility had the confidence of successfully performing in various careers and activities.

At the level of the motivational and behavioural constructs, agreeableness was found to have a significant impact on use behaviour, effort expectancy and facilitating conditions. A negative significant relation describes the effect of agreeableness on use of mobile banking in Lebanon, whereas positive significant paths describe the relations of agreeableness with effort expectancy and facilitating conditions.

The inverse relation between agreeability and use of mobile banking indicates that Lebanese individuals with high levels of agreeability express low tendencies to use mobile banking technology. The fact that agreeable individuals are more social and appreciate personal relations more (Mount, Murray, & Steve, 2005) seems to make them more oriented toward traditional forms of banking, preferring to perform banking transactions at bank branches with direct contact with employees. Moreover, according to Goldberg (1992), agreeable individuals aim to achieve social coherence and collaboration; thus, the act of replacing personal interactions with digital technology is not preferable to them (i.e. they do not prefer to use mobile banking technology over traditional banking forms). Therefore, the negative relation of agreeability with the use of mobile banking is reasonable.

Agreeability was positively associated with effort expectancy. Lebanese individuals with high levels of agreeability expect mobile banking to be ease to use. Agreeable individuals are more likely to view complicated tasks easier compared to other individuals based on their interpersonal interactions and leadership skills (Barrick, Mount, & Judge, 2001). Further, according to Devaraja, Easley, and Crant (2008), people with the agreeability trait will have positive beliefs of ease of use regarding new technology.

Likewise, agreeability demonstrated a significant positive linkage with facilitating conditions. Agreeability involves the trait of helpfulness, in other words, agreeable individuals are considered helpful and expect also the help from others. Hence, Lebanese individuals with high levels of agreeability believe that they have more external resources that facilitate the engagement in mobile banking technology.

4.2.1.3 Neuroticism

Three compound personalities in the current study were expected to be influenced by neuroticism. The first path was established between neuroticism and need for structure, the second with need for affiliation, and the third with general self-efficacy. Results were unexpected and opposite to what were previously proposed at the level of need for affiliation and general self-efficacy. The relation of neuroticism with need for affiliation was non-significant whereas with general self-efficacy, it was significant but with a positive correlation as shown in the previous chapter. On the other hand, the path between neuroticism and need for structure was in the same sense as predicted. Neuroticism and need for structure showed a positive and significant relation.

The positive and significant relation of neuroticism with need for structure supports that, the more neurotic Lebanese banking customers are, the greater their tendency to be structured. This result is found to be in line with what have been previously hypothesized. Lebanese banking customers who demonstrate high levels of fear, negative emotions and frustration are more likely to be repelled from ambiguous situations. Cattell and Mead (2008) indicated that high neurotic individuals are meant to be more mature and prefer structure routine situations. Moreover, they also highlighted that individuals with high levels of neuroticism prefer clear and defined situations to ambiguous ones. The feelings of stress and anxiety of neurotic individuals favour their tendency toward secured, planned and structured situations.

Statistical analysis indicated that the need for affiliation among Lebanese banking customers is not related to their levels of neuroticism. Whether a Lebanese banking customer scores high or low on neuroticism will not affect the need for affiliation of those individuals. Neurotic

individuals are not easily affected by the surrounding (Costa & McCrae, 1992); this could explain the non-significant relationship with need for affiliation. Moreover, the Lebanese society and targeted group have their own special characteristics and features. The feeling of need for affiliation in the Lebanese society is regardless of whether such individuals are anxious, angry or moody. Being emotionally irritable and stressful will not affect a Lebanese individual's need to affiliate. The need to affiliate among Lebanese individuals is not based on personal characteristics such as fear, sadness, or embarrassment (which are features of neuroticism), instead need for affiliation may be affected by social, economic, cultural, or religious factors that are considered more crucial in the Lebanese society.

On the other hand, statistical analysis indicated that neuroticism is positively correlated to general self-efficacy, which differs from what was proposed in previous chapters. Such result indicates that the more neurotic Lebanese banking customers are, the higher their general self-efficacy is. The sensation of being vulnerable, with negative feeling and emotions, may result in a reverse effect and motivate individuals to perform and achieve in certain tasks. General self-efficacy among Lebanese banking customers may rise as a drawback effect of feeling down, negative or vulnerable.

In addition, the results also recorded a positive impact of neuroticism on social influence and use of mobile banking in Lebanon.

The positive path between neuroticism and social influence although unexpected is reasonable. As stated before, Lebanon is a developing country expressing high market penetration rates at the level of technology. The rapid innovation in the field of technology in the Lebanese market compels Lebanese individuals to use some new technological channels and innovations even though these individuals may express fear, stress and anxiousness regarding such innovations. Thus, Lebanese individuals with high levels of neuroticism perceive that others believe that they should use mobile banking technology. Neurotic individuals are characterized by their deficiency in psychological adjustments and emotional stability; henceforth, they are likely to be

more influenced by the beliefs and thoughts of their social surrounding. Furthermore, the anxiety, fear, and embarrassment felt by neurotic individuals lead them to consider more relevant what the nearby society or entities think or reflect. According to Heppner, Cook, Wright, and Johnson (1995), individuals with high levels of neuroticism are wishful thinkers and self-criticizers who are easily influenced by others' thoughts and perceptions.

Several researchers have revealed a negative relationship between neurotic personalities and innovations or adoption of new technologies. Devaraja, Easley, and Crant (2008) argued that new technologies seem to be threatening and stressful to neurotic personalities. Moreover, neurotic individuals expect to exert big efforts to use new technologies; therefore, they tend to use these channels less. In addition, the feelings of anxiety, stress and fear among neurotic individuals lead them to behave based on traditional well-known bases and forms (Ostendorf & Angleitner, 1992), in line with the relationship found between neuroticism and need for structure. However, at the same time, the current study showed a positive impact of neuroticism on general self-efficacy and social influence. The explanation given for these associations may also help explain the positive relationship between neurotic personalities and mobile banking use.

4.2.1.4 Conscientiousness

Conscientiousness was predicted to have a direct impact on need for structure, need for cognition, general self-efficacy and proactive personality. Results support the positive effect of conscientiousness on need for structure and proactive personality. However, conscientiousness showed a non-significant relationship with need for cognition and general self-efficacy.

In line to what was hypothesized, the more conscientious individuals are the more need for structure they have. Individuals who are organized, responsible and strong willing tend to have a well-structured future planning life style (Burch & Anderson, 2008). Saucier and Goldberg (1998) also indicated in their study that highly conscientious individuals are well organized and avoid uncertainty. People who like to carry out

efficient tasks and simplify ambiguous situations are those who are considered to be organized, responsible, ordered and hard working. In this line, previous studies have found a positive significant effect of conscientiousness over the desired need for structure relation (Kashihara, 2016; and Neuberg and Newsom, 1993).

The correlation of conscientiousness with proactive personality was found to be positive and significant as hypothesized. Indeed, individuals who are organized, hardworking, and responsible are more oriented toward taking accurate actions, detecting problems and solving them, and identifying new opportunities. Conscientious individuals are strong willing individuals who plan, analyse, and measure situations, which enable them to be task oriented action takers and environment changers (McElroy, Hendrickson, Townsend, & DeMarie, 2007). In other words, proactive individuals, who are action takers, task oriented, problem solvers, opportunity identifiers and environmental changers, are more likely to be organized, solid, scheduled, achievement oriented, hard-workers, structured and future planners (Cattell & Mead, 2008). This is in line with previous studies that have backed up the positive path between conscientiousness and proactive personality (Fuller and Marler, 2009; Grant & Ashford, 2008; Major, Turner, and Fletcher, 2006; Thomas, Whitman, and Viswesvaran, 2010).

On the other side, in this study, conscientiousness showed no direct impact on need for cognition. The facts of being organized, responsible and hard-working do not encourage Lebanese banking customers to integrate in effortful activities. In the Lebanese society, banking customers may tend to engage in cognitive thoughts and activities regardless of whether they are motivated, hard-workers, or consistent. Lebanese people may overcome social gaps, or fulfil the need of integration in society, by their tendency to engage in effortful activities.

Moreover, scholars have stated that the tendency to engage in effortful activities is a result of many other social or individual issues. For example, Haugtvedt, Petty, and Cacioppo (1992) argued that high need of cognition refers to the personal tendency to integrate all details and relevant information regarding a certain issue for personal benefits.

Similarly, Cacioppo and Petty (1982) indicated that high levels of need for cognition imply personal enjoyment; in other words, people who enjoy cognitive efforts tend to demonstrate high levels of need for cognition. Taking this into account, it may be considered that a Lebanese banking customer's need for cognition may be related to the presence of enjoyment or the search for personal benefits, regardless of his/her conscientious personality level.

Conscientiousness showed, as well, no relation with general self-efficacy, opposite to what was hypothesized. Results indicated that the general self-efficacy of Lebanese banking customers does not associate with their conscientiousness level. More accurately and according to results, general self-efficacy of Lebanese banking customers may be influenced by many other factors regardless of being conscientious or not. This is in line with previous studies, which have not demonstrated a significant linkage between conscientiousness and general self-efficacy, but have indicated several other sources of general self-efficacy. Hence, according to prior investigations, general self-efficacy depends on personal coping abilities across a wide range of situations (Schwarzer, Bäßler, Kwiatek, Schröder, & Zhang, 1997; Schwarzer & Jerusalem, 1999; Sherer & Maddux, 1982; Skinner, Chapman, & Baltes, 1988), as general self-efficacy is the tendency of being capable of managing situations and handling and meeting tasks requirements in diversified circumstances (Chen, Gully, & Eden, 2001). This may explain why Lebanese banking customers' general self-efficacy did not result from the fact of being conscientious or not.

Regarding the motivational constructs, conscientiousness was found to have a significant and positive impact on hedonic motivation. Conscientious individuals are more oriented to perform actions due to internal satisfaction and rewards. In fact, conscientious individuals consider involving in actions that are beneficial and seem wise for them. Conscientious individuals that are well-structured and organized are more oriented toward utilitarian aspects that relate to usefulness, value, efficiency, and performance (Barrick, Mount, & Judge, 2001). Mobile banking is a utilitarian technology, thus, it seems logical that conscientious individuals find this technology more pleasurable.

4.2.1.5 Openness to Experience

General self-efficacy, need for structure, need for cognition, and proactive personality were all hypothesized to be influenced by openness to experience. Results of all these paths were found to be supported. More detailed, this illustrates the positive impact of Lebanese banking customers' openness to experience on their general self-efficacy, need for cognition and proactive personality, in addition to its negative impact on their need for structure.

Openness to experience involves being sensitive to your thoughts and the ability to evaluate situations differently (Cattell & Mead, 2008), which influences individual levels of general self-efficacy. Goldberg (1993) and McCrae and John (1992) indicated that open to experience people are experienced, more imaginative, independent and curious towards new ideas. Such individuals' desire for exploring new ideas based on previous experiences increases their general self-efficacy levels. Moreover, openness to experience can be positively linked with general self-efficacy based on the common features that describe both personalities (Komarraju & Nadler, 2013), since openness to experience and general self-efficacy are both oriented toward exploration and embracement of challenge, and new goal identifications.

Openness to experience also showed a positive significant impact on need for cognition. Individuals with high levels of need for cognition show as well high levels of creativity, imagination, curiosity and attentiveness to inner feelings. Thus, individuals who tend toward intellectual curiosity, variety preference and new ideas exploration are more likely to engage in effortful thoughts. More specifically, the current path illustrates that the tendency toward effortful ideas and thoughts is influenced by levels of intellectual curiosity, imagination and tolerance among Lebanese banking customers. This result matches those of preceding researchers (Cacioppo, Petty, Feinstein, and Jarvis, 1996; Sadowski & Cogburn, 1997; Verplanken, Hazenberg and Palenewen, 1992).

Regarding proactive personality, taking into account that proactive individuals tend to search for new opportunities and take new actions,

they can be logically linked to people who are intellectually curious, aim for variety and seek new opportunities. This shows that those proactive Lebanese banking customers who tend to try to change the environment and seek new opportunities are those with an active imagination and preference for variety. Several researchers were able to achieve the same empirical result demonstrating a significant path between openness to experience and proactive personality. One of the major studies that related proactivity to openness to experience was Digman (1990). This study highlighted the common features of both openness to experience and proactivity ensuring as well a positive empirical result. Crant and Bateman (2000) also reasoned that the imaginary characteristics of open to experience individuals can be associated with those of proactive individuals. Hence, the resulted positive impact of proactive personality on openness to experience among Lebanese banking customers is in line with previous empirical findings.

With reference to the relation of openness to experience and need for structure, results demonstrated a negative significant path. Not surprisingly, people with high levels of imaginary thoughts, and intellectual curiosity tend to be less structured. Furthermore, it can be expected that people with high levels of openness to experience, who like variety and exploring new ideas, score less on need for structure, which is characterized by a desire for clarity, centricity and low ambiguity. In this line, Neuberg and Newsom (1993) stated that structured individuals express a dislike for uncertainty, a preference for routine and high levels of predictability, which are features that oppose high levels of openness to experience. Similarly, in the current study, Lebanese banking customers high on openness to experience demonstrated a low tendency towards need for structure.

On the other hand, results also supported additional positive correlations of openness to experience with performance expectancy, effort expectancy, and facilitating conditions.

The characteristics of individuals with high levels of openness to experience explain their expectations of mobile banking being useful and ease to use. Mount et al., (2005) argued that high levels of openness to

experience favours individuals' curiosity towards mysterious situations, allowing them to be more experienced, deductive and foretellers. Individuals who are high in openness are predisposed to fetch new experience and ideas in life. Devaraja, Easley, and Crant (2008) argued that open to experience people expect new distinct performance from using new technologies. They also stated that they expect minor effort to be exerted while using such new technology since individuals who are open to experience have previous experience in technology usage.

Openness to experience was also found to have a positive impact on facilitating conditions. Lebanese individuals with high levels of openness to experience consider the external resources that facilitate engagement in mobile banking greater. Being curious toward new ideas, such as this technology, drives individuals to cogitate the available and facilitated external resources of mobile banking. In fact, the more curious and experienced a person is the more observant and perceptive he/she will be. Therefore, in the current study, Lebanese open to experience individuals are more likely to evaluate and consider the external resources available regarding mobile banking. Thus, these customers will probably believe in existence of the organizational and technical infrastructure to support the use of mobile banking in Lebanon.

4.2.2 Compound Personality Traits

Five main constructs representing compound personality traits are included in the current investigation. Need for affiliation, general self-efficacy, need for cognition, need for structure and proactive personality were predicted to have a direct influence on constructs adopted from the UTAUT2 theory and as well as on behaviour (i.e., use of mobile banking). These relations are discussed in details in the following section.

4.2.2.1 Need for Affiliation

Need for affiliation as a compound personality trait was linked to three other constructs, named performance expectancy, social influence and usage behaviour of mobile banking. Results show a non-significant relation of need for affiliation with performance expectancy and social

influence. On the other side, the proposed path regarding the negative impact of need for affiliation on use behaviour was significant.

Performance expectancy of mobile banking by Lebanese banking users was not influenced their need for affiliation. This result is different from what was previously proposed. This means that Lebanese respondents are not affected by their personal level of need for affiliation in order to specify their performance expectancies regarding mobile banking. In other words, the degree of usefulness of mobile banking perceived among banking customers in Lebanon is regardless of their need for affiliation.

Need for affiliation neither had an effect on social influence. Lebanese banking users with high need for affiliation do not consider that their social environment is more interested in them using mobile banking than low need for affiliation customers. This means that the level of need for affiliation of banking customers in Lebanon does not determine their perception of the number of people that support mobile banking or/and the relevance they give to their social environment opinions.

Finally, results clearly indicated that the need for affiliation among Lebanese respondents negatively impacts the use of mobile banking technology. In other words, results showed that users of mobile banking technology in Lebanon demonstrate low levels of need for affiliation whereas those respondents with high levels of need for affiliation were non-users of mobile banking technology. People with high need for affiliation prefer personal contact (McClelland, 1985) and consider the interaction with others as a primary concern (Hill, 2009). Moreover, such individuals prefer depending on others in cooperative situations and desire to maintain close relationships (Klein & Pridemore, 1992). Since the use of mobile banking technology will actually reduce personal interactions and close relationships with employees and clients, such behaviour is adopted by individual with low need for affiliation. Individuals who prefer face to face and group communications are less oriented toward the use of new technologies. Therefore, regarding

Lebanese banking customers, mobile banking is less used by individuals with high need for affiliation.

4.2.2.2 General Self-Efficacy

General self-efficacy was hypothesized to influence effort expectancy, hedonic motivation and use behaviour. Part of the results achieved in the current study was in the same line as expected. According to the empirical analyses, general self-efficacy was positively and significantly related to effort expectancy. Similarly, it was also positively and significantly associated with hedonic motivation. Such results indicate that the levels of general self-efficacy among Lebanese respondents influence their hedonic motivation and effort expectations of mobile banking. On the other side, the path of general self-efficacy with use behaviour of mobile banking in Lebanon was non-significant. This means that among Lebanese respondents their levels of general self-efficacy do not influence mobile banking use.

The path between general self-efficacy and effort expectancy has been intensely analysed in previous studies in the context of technology adoption. Logically, high beliefs in personal abilities favour the expectations that tasks or activities are easy to perform or achieve (Hamari & Koivisto, 2015). The expectations of ease to use (effort expectation) are influenced by one's personal beliefs regarding his/her abilities. Individuals' high general beliefs concerning their abilities positively influence their expectations (i.e. the higher their beliefs in their abilities, the easier they will expect the task to be). Plenty of previous theoretical and empirical studies have emphasized the impact of general self-efficacy on ease of use or effort expectancy in technology adoption contexts (Hsu, Wang, & Chiu, 2009; Igbaria & Iivari, 1995; Padilla-Melendez, Garrido-Moreno, & Aguila-Obra, 2008; Macharia & Pelsler, 2014; Sung, Jeong, Jeong, & Shin, 2015; Venkatesh, 2000; Venkatesh & Davis, 1996; Venkatesh and Davis, 2000). In the same line, this study showed that Lebanese respondents with high levels of general self-efficacy consider mobile banking to be easy to use.

Significant positive results also described the path of general self-efficacy with hedonic motivation for Lebanese banking customers. In

other words, the higher an individual's belief in his/her personal abilities regarding certain tasks (high general self-efficacy) the more mobile banking seems to be entertaining and fun. The direct path of general self-efficacy with hedonic motivation has not been deeply examined empirically. However, some researchers have been able to find significant paths among the characteristics of both constructs. For instance, Bandura (1982) stated that self-efficacy regulates human behaviour throughout motivation. Schunk and Dale (1990) found that individuals are more hedonically motivated to perform tasks when they demonstrate high levels of self-efficacy. This study followed this line of research and obtained results that support that Lebanese respondent with high levels of general self-efficacy are the ones scoring high on hedonic motivation regarding mobile banking technology.

On the other hand, general self-efficacy was unable to directly impact mobile banking use among Lebanese banking customers. This means that the use behaviour of mobile banking in Lebanon is regardless of the customers' beliefs concerning their personal abilities. These days, the actual decision of using new technologies, such as mobile banking, is not directly based on personal self-confidence and self-abilities. For highly innovative and useful technologies (i.e., mobile banking), individuals are less likely to be concerned with the issue of confidence and personal abilities to use such technologies. Several other factors may be involved in deciding whether or not to use mobile banking. Regarding the Lebanese context, mobile banking technology's ease of use of facilitating conditions as well as personality types reflecting change and innovation may be of great concern to influence Lebanese banking customers' usage.

4.2.2.3 Need for Cognition

The compound personality trait need for cognition was hypothesized to influence effort expectancy and use behaviour. Findings showed that need for cognition and effort expectancy are not significantly related. Thus, the need for cognition of Lebanese banking customers does not impact their effort expectancies concerning mobile banking technology. On the contrary, need for cognition was found to be significantly associated with mobile banking use. In other words, mobile banking

technology is used by Lebanese banking customers who demonstrate high levels of need for cognition.

The non-significant relationship of need for cognition with effort expectancy means that the ease or difficulty expectations regarding the use of mobile banking technology did not depend on the propensity to seek, acquire, think about and engage in effortful thoughts. Taking into account that the Lebanese respondents targeted in the current study were of sufficient experience and mature age, their expectations seemed to be more based on mobile banking technology evaluation and experience rather than the tendency to elaborate, organize and inspect information. Reinhard and Dickhauser (2009) emphasized that effort expectations are formed based on task difficulties. This strongly supports the idea that Lebanese banking customers consider the ease or difficulty of mobile banking use based on its own features and characteristics, whereas personal needs for cognition may have a bigger influence on use behaviour directly.

Results indicated that the use of mobile banking technology is directly influenced by the need for cognition personality trait. In Lebanon, individuals with high levels of need for cognition tend to use mobile banking technology more. As mentioned in previous chapters, mobile banking technology is considered to be a new modern technology in Lebanon. In addition, high need for cognition describes the tendency among individuals to participate in new activities. Thus, the behaviour of experiencing with a new technology, such as mobile banking, best describes highly cognitive individuals. From another perspective, individuals with high need for cognition prefer to consider all details and relevant information regarding any activity (Cacioppo & Petty, 1982). Such possibility is provided by mobile banking technology, as it allows individuals to track, obtain, and access all kinds of detailed information regarding their banking and financial services. Previously, few studies have considered the effect of need for cognition on the use of new technology (for example, mobile banking). Still, such investigations were able to demonstrate similar results to those of the current study. Wood and Swait (2002) indicated that need for cognition can be a direct determinant of innovative technology adoption behaviour. Moreover,

Cho and Park (2014) found that technology users are individuals with high levels of need for cognition.

4.2.2.4 Proactive Personality

The compound personality trait proactive personality has been discussed in plenty of researches and studies from different fields. This allows such trait to be more predictable. In the current study, proactive personality was hypothesized to influence five constructs. Four out of the five paths demonstrated significant results, indicating positive relations of proactive personality with performance expectancy, effort expectancy, hedonic motivation, and facilitating conditions. On the other hand, proactive personality was negatively and significantly related to mobile banking use; however, a positive relationship was proposed, hence, the proposed hypothesis had to be rejected.

There are no previous studies that addressed the relation of proactive personality with technology expectancy constructs (i.e. proactive personality influence on performance expectancy and effort expectancy). Nevertheless, proactive personality's characteristics help explain why it predicts the expectations of usefulness and ease of use of new technologies. Individuals who look forward to change and want to alter the environment are more likely to have positive expectations regarding new innovative technologies. In the same line, people described by their abilities to identify new opportunities and solve problems seem to be more tolerant and oriented toward new technologies and expect them to be useful and ease to use. Proactive individuals' forward thinking may also explain the significant positive relation of proactivity with performance and effort expectations concerning new technologies, as it has been argued that being a forward thinker increases your sense of positive future expectations (Bateman & Crant, 1993). Forward thinkers find it easy to imagine, anticipate and predict the future benefits and conveniences of employing new technologies. In this line, proactive Lebanese banking customers, who are forward thinkers, will expect mobile banking to be useful and ease to use.

The construct hedonic motivation was as well influenced by proactive personality. Literature supporting the direct relationship

between proactive personality and hedonic motivation is almost nonexistent. However, different studies help support the correlation of proactivity with hedonic motivation showed in the current study. Brown and Venkatesh (2005) and Van der Heijden, (2004) indicated that innovative technologies comprise novelty seeking and uniqueness. From another perspective some scholars such as Parker and Collins (2010) and Lin, Lu, Chen, and Chen (2014) highlighted that proactive personality motivates individuals intrinsically to produce better outcomes. Others indicated that proactive individuals are more personally motivated (Parker, Bindl, & Strauss, 2010). In other words, proactive individuals are more self-initiated individuals. They tend to resolve threats, achieve goals and alter situations since they consider such actions entertaining and fun. Thus, such motivational aspects help produce better outcomes among proactive individuals (Lin, Lu, Chen, & Chen, 2014). Thus, it can be deducted that proactive individuals tend to seek personal novelty and uniqueness through the use of new technologies, which gives rise to enjoyment and entertainment, and gets them to be hedonically motivated toward these technologies. In this line, high proactive Lebanese banking customers showed high levels of hedonic motivation regarding mobile banking technology.

Finally, proactive personality was predicted to positively impact mobile banking use in Lebanon. However, proactive personality had a direct but negative influence on the use of mobile banking among Lebanese respondents. More specifically, the higher the proactivity levels among Lebanese customers, the less they incline toward the usage of mobile banking technology. Such result may be explained by the following reason. Proactive people are always motivated to alter the environment (Chen, 2011). In the case of Lebanon, altering the environment requires many effective social relationships. According to the Lebanese society and culture, one of the major sources of deep social relationships is daily business contacts and interactions. Thus, Lebanese banking customers scoring high on proactive personality will want to maintain social relationships throughout their daily contact with banking employees. Using mobile banking technology limits daily interactions with bank staff, hence, leading to reduced social connections. Thus, proactive Lebanese banking customers who wish to maintain social

relationships are more oriented toward using traditional banking forms instead of using new banking technologies such as mobile banking.

4.2.2.5 Need for Structure

The final compound personality trait used in the current study is need for structure. Findings indicate that personal need for structure among Lebanese respondents negatively impacts their perception of social influence and their use regarding mobile banking technology.

There are no previous studies that addressed the relation of proactive personality need for structure with the UTAUT2 construct, social influence. Nevertheless, in line with what was hypothesised, individuals with high personal need for structure who are more confident in their decisions (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994), give less value to friends and family's opinions regarding the use of mobile banking.

The negative relation of need for structure with mobile banking usage was also based on the characteristics of individuals with need for structure. Since individuals with high need to structure are considered to be less flexible (Rietzschel, Nijstad, & Stroebe, 2006), traditional in their ideas and not interested in change (Wood & Swait, 2002), they seem less likely to adopt new technologies. As mobile banking is a new technology, it is viewed as part of a changing process. Moreover, mobile banking is still considered an unclear and uncertain technology by some people. Studies analysing the direct path between need for structure and mobile banking use were not found. However, investigations were able to demonstrate a negative relation of need for structure with related constructs, such as creativity (Wood & Swait, 2002), task orientation (Rietzschel, Slijkhuis, & Van-Yperen, 2014), task structure, (Ehrhart & Klein, 2001), uncertain situations and unclear ideas (Kay, Laurin, Fitzsimons, & Landau, 2014), and flexibility in mental set of thoughts (Rietzschel, Nijstad, & Stroebe, 2006). Henceforth, in line with these arguments, findings showed that Lebanese banking customer with high need for structure prefer traditional, old, clear and guaranteed ways of performing things, and, consequently, are less likely to use mobile banking.

4.2.3 UTAUT2 Variables

All the five constructs adopted from the UTAUT2 theory were hypothesized to have positive relations to mobile banking use in Lebanon. The results of these hypothesized relations are discussed below.

4.2.3.1 Performance Expectancy

As previously discussed, performance expectancy had a positive impact on intentions to adopt new technologies in almost all previous studies (Hanafizadeh, Behboudi, Koshksaray, and Tabar, 2014; Koenig-Lewis, Palmer, and Moll, 2010; Luarn and Lin, 2005; Riquelme and Rios, 2010; Wessel and Drennan, 2010), and was present in almost all technological theories. However, these scholars and theories considered that actual behaviour does not directly depend on performance expectancy but on intentions to adopt the technology. As a consequence, the impact of performance expectancy on actual use of new technologies has been scarcely studied, and even less its influence when the effect of personality is also incorporated. In the current study the hypothesized relationship between performance expectancy and mobile banking technology use was found to be non-significant. This means that the use of mobile banking technology in Lebanon is not influenced by Lebanese respondents' performance expectations of mobile banking. Perceiving mobile banking as an effective, productive, and useful technology among Lebanese respondents may affect their intentions to use mobile banking but not their actual behaviour. Moreover, it was previously discussed that Lebanese adopters of mobile banking technology are considered to be part of early majority or even late adopters, which means that they probably already have a clear idea of its benefits. This fact favours the possibility that Lebanese banking customers do not use this technology based on its advantages or usefulness. Instead, results showed that their actual behaviour depends more on personality traits and personal factors such as facilitating conditions, effort expectancies or free time availability.

4.2.3.2 Effort Expectancy

Effort expectancy was conceptualized in the current study as the extent of customers' perceptions regarding the ease or difficulty of using

mobile banking technology (Venkatesh, Davis, Morris, & Davis, 2003). This construct was obtained from UTAUT2 and was hypothesized to be related to the actual behaviour of using mobile banking among Lebanese banking customers. Empirical results in the current study were found to be supportive of the relationship of effort expectancy with use of mobile banking technology. This means that Lebanese respondents' use behaviour is dependent on the degree of ease of use pertaining to mobile banking. In other words, Lebanese people who consider mobile banking easy, free of mental efforts, will probably be users of this technology.

Cheung, Chang, and Lai (2000), stated that the more complex an innovation is, the lower its rate of adoption. If a service is perceived to be very complicated and difficult to understand, it will take a lot more time for it to win over consumers. Results supported this argument, as Lebanese respondents who considered mobile banking interfaces user friendly and easy to navigate have a greater probability of becoming mobile banking users. In the same line, Engotoit et al. (2016) found that effort expectancy has a positive influence on mobile-based communication use behaviour. Likewise, e-tax system usage was also positively predicted by effort expectancy in a study done by Moya et al, (2016). In addition, Lukwago et al. (2017) also found support for the positive influence of customer effort expectancy on use behaviour regarding mobile money transfer services.

4.2.3.3 Social Influence

Empirical results performed by the current study did not support the hypothesized path between social influence and mobile banking use in Lebanon. Literature regarding mobile banking has shown that the importance of the role of social influence on new technology adoption fluctuates. Plenty of other studies related to online banking channels such as Curran and Meuter (2007), Gerrard and Cunningham (2003), Shih and Fang (2004), Tan and Teo (2000), and Wan and Che (2004) all demonstrated non-significant outcomes regarding the path between social influence or similar factors (e.g. subjective norm, image, social desirability, and reference group) and customers' use of online banking channels. The variation in the importance of social influence on the adoption of innovations could be ascribed to a number of factors

including: the location of the study, how developed the target area is, the nature of the technology (i.e. individual and personal technologies versus common and sociable technologies), and the individual differences of those studied (attitudes, perceptions, experiences, and skills) as stated by Burton-Jones and Hubona (2006), Davis, Bagozzi, and Warshaw (1989), Malhotra and Galletta (1999), Oliver and Bearden (1985), Titah and Barki (2009) and Venkatesh and Davis (2000).

Inevitably, individuals that through daily interactions are more knowledgeable and experienced with technology, are more capable to evaluate a new technology and rely less on information derived from their social system (Shih & Fang, 2004; Venkatesh & Davis, 2000; Venkatesh, Davis, Morris, & Davis, 2003; and Wan & Che, 2004). Venkatesh, Davis, Morris, and Davis (2003) also suggests that elderly people tend to have less experience with technology and so will be more highly influenced by the social system. The participants in the current study are young adults (average age 35 years old), highly educated and with adequate experience, who are considered to have sufficient everyday experience with mobile technologies and, hence, are not considered very susceptible to their social system. Moreover, other studies in Arabic countries have found results in line with those of this investigation. Abbad, Morris, and De Nahlik (2009) concluded that amongst the student population of a Jordanian university, subjective norms cannot be said to significantly be used to predict students' behaviour towards e-learning. Similarly, Alshehri, Drew, Alhussain, and Alghamdi (2012) conducted a study in Saudi Arabia, which is geographical close to Lebanon, and also found social influence not to be related to the level of acceptance of e-government services. For the specific context of banking, Al-Qeisi and Abdallah (2013) showed that Internet banking use in Jordan is not associated with social influences. Not only but also in a study done over Egypt by El-Kasheir, Ashour, and Yacout (2009), they documented that social norms have no significant impact on the continued intention to use online banking services. All of this supports the fact that mobile banking use in Lebanon is not predicted by social influence.

4.2.3.4 Facilitating Conditions

The variable facilitating conditions has been used in different forms and under different labels during the years. Studies have used perceived behavioural control as a related factor to predict behaviour (Jaruwachirathanakul and Fink, 2005; Liao, Shao, Wang, and Chen, 1999; Lu, Chou, and Ling, 2009). Moreover, the variable compatibility has appeared in many investigations, such as in Brown, Cajee, Davies, and Stroebel (2003), Chen and Huang (2006), Gounaris and Koritos (2008), and Koenig-Lewis, Palmer and Moll (2010). Not only but also, the variable accessibility has been considered a predictor of behaviour in technology adoption literatures (Dabholkar, Bobbitt, & Lee, 2003; Gerrard & Cunningham, 2003; Howcroft, Hamilton, & Hewer, 2002). However, recently, the UTAUT and UTAUT2 theories presented the term facilitating conditions summarizing all the previous given labels, and proposed its direct impact on actual behaviour in the context of technology adoption (AbuShanab, Pearson, & Setterstrom, 2010; Chiu, Fang, & Tseng, 2010; Foon & Fah, 2011; Martins, Oliveira, & Popovic, 2014; Riffai, Grant, & Edgar, 2012; Wang & Shih, 2009; Yu, 2012). Facilitating conditions was thus another motivational construct adopted in the current study from the UTAUT2 theory.

Findings recorded a positive significant association between facilitating conditions and actual use of mobile banking, in line with what was proposed and prior research (Wang and Shih, 2009; Yu, 2012; Zhou, Lu, and Wang, 2010). In other words, Lebanese respondents take into consideration compatibility, help, skills, and resources, such as internet access, secured apps, etc., as basic requirements to use mobile banking technology effectively, smoothly and easily in Lebanon. Individuals need special support and facilities, such as resources, compatibility with other used technologies, technical infrastructure, skills, etc. in order to be able to effectively adopt and use new technologies (Alryalat, Dwivedi, & Williams, 2013; Celik, 2008; Martins, Oliveira, & Popovic, 2014; Ramayah & Ling, 2002; Riffai, Grant, & Edgar, 2012; Sathye, 1999; Venkatesh, Davis, Morris, & Davis, 2003 and Yeow, Yuen, Tong, & Lim, 2008). Moreover, taking into account that the targeted segment (Lebanon) is a developing country, technological infrastructure (i.e. internet access, banking systems,

websites and apps, etc.) is of great importance when considering the use of new technologies, such as mobile banking. Thus, the availability of technical and informational support (e.g. smart phones, banking sites and apps, etc.) remains of vital in developing countries.

4.2.3.5 Hedonic Motivation

Technology adoption literature has demonstrated that hedonic motivation or similar variables are crucial factors in determining intentions to adopt technology (Brown and Venkatesh, 2005; Davis et al., 1992; Vallerand, 1997; Van der Heijden, 2004; Venkatesh, 1999). Such studies have also supported a direct impact of hedonic motivation on actual behaviour based on the assumption that motivational factors influence consumer behaviours directly. However, the nature of the path between motivational factors and behaviours depends intensively on the subject addressed. More specifically, hedonic motivation does not always present a positive impact on behaviour. In this line, the current investigation proposed a negative path between hedonic motivation and mobile banking use. Findings support this negative relation between both constructs among Lebanese banking customers. This demonstrates that Lebanese respondents, who are less hedonically motivated, are more likely to consider using mobile banking technology.

The positive impact of hedonic motivation or similar factors such as fun, enjoyment, playfulness and perceived entertainment on behaviour can be obvious. But as mentioned in previous chapters, mobile banking technology is not considered a fun and entertaining technology. In fact it is categorized as a self-business and serious financial service, not employed for its entertaining nature. Therefore, this study proposed, tested and showed that the use of mobile banking technology is less among Lebanese respondents who seek more entertainment, pleasure and joy.

4.3 RESEARCH CONTRIBUTIONS

The current results have widened the current understanding of mobile banking technology and provided valuable contributions for scholars as well as technology providers.

4.3.1 Contributions to Theory

At the level of theory, the current study has provided added value over several theoretical aspects. The first contribution was understanding how customers determine their behaviours towards mobile banking technology, as “the challenge for technology providers is to understand what features of the technology will attract or repel potential users as well as understanding how to present the technologies as an attractive alternative for customers” (Curran & Meuter, 2007, p. 283).

The current investigation was able to integrate different literatures on technology adoption in general and mobile banking in particular with relevant studies in psychology and personality. Actually this study addressed areas where more investigation was required based on previous literature. According to Venkatesh, Thonh, and Xu (2012, p. 173), “future research can identify other relevant factors that may help increase the applicability of UTAUT2 to a wide range of consumer technology use contexts”, Thus, the current study provided a detailed theoretical summary over personality and motivational factors that may impact use behaviour of mobile banking technology in Lebanon. Based on the hierarchal approach proposed by the 3M model, it integrated personal consumer variables (personality traits) with technology related factors (motivational constructs) to predict use behaviour. Moreover, the investigation’s results provided an overview of factor power in determining Lebanese respondents’ adoption behaviour (i.e. whether personality factors have more impact than motivational ones). Therefore, the current study was able to identify underestimated aspects that influence Lebanese individuals’ use of mobile banking technology.

Additionally, another contribution was to use the hierarchical structure of the 3M model of personality and motivation (Mowen, 2000) and integrate it partially to the context of technology adoption, drawing attention to the importance of personality constructs in predicting behaviour. The current study provides a structure within which the variables are arranged, with different levels of abstractness, each involving different sets of constructs (i.e. elementary personality traits, compound personality traits, and motivational factors) that all influence behaviour.

Furthermore, this study contributes to the literature by discussing and proofing new causal paths between big five personality traits and compound ones. For example, it examined the path of extraversion with need for affiliation, general self-efficacy and proactive personality. Not only but also, new causal paths were proposed and analysed at the level of compound personality traits with motivational factors. For example, the current study showed new significant effects of proactive personality on performance expectancy, effort expectancy and hedonic motivation. Therefore, while the main goal of this investigation was to look at consumer behaviour in technological contexts, it has also enriched the psychology literature by identifying new relationships among personality and motivational constructs.

Examining new technology adoption in the Lebanese market can also be considered a key contribution. Few or almost no studies have examined the adoption factors of new technologies such as mobile banking in Lebanon. The current results helped discover what factors significantly influence the adoption of new technologies in Lebanon. In addition, the current study provided a deep look at the Lebanese segment, enhancing knowledge of the Lebanese banking system and structure. Mobile banking has not been intensely studied in developing Mediterranean countries such as Lebanon, in particular, taking into consideration both psychological and motivational constructs. For example Venkatesh, Thonh, and Xu (2012) empirically examined the validity of UTAUT2 to explain the acceptance of new mobile services in Hong Kong, a highly developed country. Thus, the present study enhances current knowledge by examining the applicability of some of the UTAUT2 constructs to mobile banking adoption in new contexts (a developing country, Lebanon).

4.3.2 Contributions to Practice

Meuter, Bitner, Ostrom, and Brown (2005, p. 78) stated that “for many firms, often the challenge is not managing the technology, but rather getting consumers to try the technology”. Customers are still hesitating in the use of new technologies; new technology acceptance rates in developing and developed countries are still not what has been expected nor proportional to what has been invested (Chiu, Fang, &

Tseng, 2010; Cruz, Neto, Munoz-Gallego, & Laukkanen, 2010; Ding, Verma, & Iqbal, 2007; Hung, Yen, & Ou, 2012; Liljander, Gillberg, Gummerus, & Riedl, 2006; Meuter, Ostrom, Bitner, & Roundtree, 2003; Meuter, Bitner, Ostrom, & Brown, 2005; Salomann, Kolbe, & Brenner, 2006; Weijters, Rangarajan, Falk, & Schillewaert, 2007; and Zurek, Chatham, Porth, Child, & Nakashima, 2001). In this line, Lebanon is a good example of lack of usage of mobile banking technology.

Results of the current study help understand the different factors that influence Lebanese banking customers' behaviour toward using mobile banking technology. Chiu, Fang and Tseng (2010), and Simintiras, Dwivedi and Rana (2014) stated that planning a suitable way to convince customers about the importance of using modern banking channels (mobile banking) must be the focus of banks and service providers. Specifically, the present investigation warns mobile banking service providers in Lebanon to focus their attention on personality and motivational factors and helps them build a suitable efficient marketing strategy to achieve the desired behaviour (using mobile banking).

In particular, the role of psychology in predicting consumer behaviour was clear. Compound personality traits (need for affiliation, proactive personality, need for cognition and need for structure) as well as elementary personality traits (neuroticism and agreeableness) had a big impact on the behaviour of Lebanese respondents. Thus, the current study alerts service providers to consider personality factors when designing their strategy regarding mobile banking use and can help banks establish an effective marketing strategy that explains mobile banking technology to each customer in a way that suites his/her personality (Laukkanen & Cruz, 2009; Jaruwachirathanakul & Fink, 2005). Indeed, based on these findings, providers should prioritize building new, specific and personal communication strategies that contemplate these traits and orient Lebanese individual's behaviour towards using mobile banking technology. Laukkanen and Cruz (2009) argued that personal communication (one-to-one marketing actions based on characteristics of each individual) is one of the most valuable communication strategy to convince potential users to start using the online banking channels since they are more useful than traditional banking means.

In order to apply these one-to-one marketing actions based on each individual's personality, service providers in Lebanon must give their employees training and a detailed standard to evaluate and identify personality traits. A wide range of questionnaires, inventories, and adjectives scales are used for assessing personality types. Thus, service providers' employees must learn how to obtain information that helps them identify bank customers personality traits based on certain standards adopted from reliable personality scales.

Once the customer's personality has been identified, service providers could carry out different actions based on personality type. Service providers may, for example, allow individuals with high need for structure to try using mobile banking technology through experimental demos that create a positive personal experience and show how efficient, useful and easy the technology is (Dwivedi & Irani, 2009; Ho & Ko, 2008; Irani, Dwivedi, & Williams, 2009; Jaruwachirathanakul & Fink, 2005; Shareef, Kumar, Kumar, & Dwivedi, 2011).

In addition, service providers must also try to compensate the negative effects of other personality traits. Thus, they must be responsive to their customers' need for affiliation, in other words, their need for integration and social interaction, throughout their mobile banking technologies. In the same line, bank customers with high proactive personality trait want to maintain social relationships throughout their daily contact with banking employees to be able to fulfil their need to alter the environment. To counteract these need for interaction, service providers in Lebanon could provide their mobile banking technology platforms with blogs, forums, and FAQ platforms that facilitate the interaction, integration and contact of bank customers (Katz, Gurevitch, & Haas, 1973) .

Moreover, service providers must also pay attention to their customers' level of need for cognition, as those with high levels are more predisposed to the use of mobile banking. To enhance these customers' predisposition towards using mobile banking, service providers must widen the range of activities available via this technology, providing additional intellectually complex activities, such as encrypted currency

transfers or virtual banking assistance. In addition, it would also be advisable to offer interface and application's customization options, which allow each customer to customize the platform based on his/her preferences.

On the other side, the role of motivational factors in predicting Lebanese respondents' mobile banking use was less important than expected. Nevertheless, three constructs (effort expectancy, facilitating conditions and hedonic motivation) had a significant impact on mobile banking use.

Results demonstrated that effort expectancy has an influence on using mobile banking in Lebanon. Given the particular nature of Lebanese individuals the ease of use of mobile banking is a direct reason behind the use of this technology. Consequently, mobile banking service providers should develop simple and friendly mobile applications, with unassuming and attractive interfaces that allow banking customers to use such technology fluently.

Furthermore, empirical results at the level of hedonic motivation provided a crucial point of view. This study showed banks and service providers the negative effect of hedonic motivation on using mobile banking technology with respect to Lebanese banking customers. Not only but as well it could be concluded that the use of mobile banking technology among Lebanese banking customers may be positively influenced by utilitarian motivations. Accordingly, it would be advisable to conceptualize mobile banking technology as a serious and utilitarian technology, not as a hedonic and entertaining technology. Banks and service providers should therefore spend more time on teaching and educating their clients about the utilitarian advantages and benefits of using modern banking channels such as mobile banking.

Finally, the current study warns banks and service providers to pay sufficient attention to facilitating conditions. Since results indicated that Lebanese respondents' behaviour related to mobile banking use derives from the availability of help, support and resources, service providers and banks must demonstrate high levels of availability of the latter.

Banks and service providers should offer mobile banking technologies compatible with the common used ones (Koenig-Lewis, Palmer, & Moll, 2010; Simintiras, Dwivedi, & Rana, 2014). Moreover, banks and service providers should develop effective procedures in order to assist Lebanese customers with mobile banking and cope with any problems that could arise while using mobile banking. In addition, Lebanese banks and service providers should help in improving the technological infrastructure in Lebanon, as well as in the development of Arabic language mobile banking channels.

CHAPTER FIVE

CONCLUSION

5 CONCLUSION

5.1 INTRODUCTION

In the preceding chapter (discussion chapter) the main statistical findings that were exposed in chapter three (methodology chapter) were discussed in detail based on what had been hypothesized in chapter two (literature review chapter). The current chapter presents a general description of the paramount conclusions deduced from the current research's results and discussions.

5.2 RESEARCH REVIEW

Chapter 1 described modern banking technologies in general and mobile banking technology in specific. It highlighted the vital motivations that encouraged the current investigation. More precisely, chapter one reflected on the fact that despite the big amounts of efforts and money spent by Lebanese banks, mobile banking adoption rates are still below expectations. Furthermore, chapter one also highlighted the scarcity of researches and studies in the field of mobile banking in Lebanon. Even though understanding which factors influence mobile service use in Lebanon is of great importance, there is no empirical analysis yet that pinpoints these elements. Hence, chapter one emphasized the need for empirical studies regarding mobile banking usage in the Lebanese context in order to identify the most relevant factors favouring and disfavouring actual usage.

Chapter 2 moved forward to discuss the main theoretical researches and studies in the domain of technology adoption and acceptance. This chapter featured and discussed the most valuable technology adoption theories that have been used while studying the factors that influence new technologies adoption's intention and behaviour. Since a large number of theories was examined, for clarity and precision, chapter two categorized technology adoption theories into subsections where theories

such as the theory of reasoned action (TRA); the theory of planned behaviour (TPB); the decomposed theory of planned behaviour (DTPB); the technology acceptance model (TAM); the unified theory of acceptance and use technology (UTAUT); and the extension of the unified theory of acceptance and use technology (UTAUT2), were discussed separately.

However, as the main aim of the current study was to address all factors that influence mobile banking use in Lebanon, chapter two also presented literature concerning personality theories. In this sense, this chapter provided a closer look at the 3M model of personality and motivation as to be related to the current study and provided a deep discussion regarding personality constructs of different levels. Due to the particular nature of mobile banking in Lebanon, several of these factors were considered influential in determining the use of this technology. Chapter two then explained five different basic personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) in addition to other five compound personality traits (need for affiliation, need for cognition, proactive personality, general self-efficacy and need for structure), and related these personality factors to motivational factors and behaviour.

Hence, this chapter discussed as well the proposed this thesis' conceptual model. Based on what had been exposed in reference to technology adoption theories and personality factors, chapter two was able to formulate several hypotheses that associated personality, motivational and behavioural constructs. As UTAUT2 was developed to explain technology acceptance from the customer's perspective, it was considered an appropriate theory to be part of the theoretical foundation of the conceptual model. The 3M model of motivation and personality was also deemed as another appropriate theoretical foundation to complete the conceptual model.

Chapter 3 is a crucial part of the thesis. It summarized all the procedures employed to test the proposed hypotheses and the main outcomes. Chapter three explained why the quantitative approach was the selected method to investigate the behaviour of Lebanese banking

customers towards mobile banking. Further, in a second step, this chapter justified using field survey as the proper research method to conduct the empirical analysis of the current study. Next, this chapter clarified sampling issues, defined the targeted sample and its size, and defended the use of self-administrated questionnaire as the data collection instrument. Chapter three then provided details regarding the analysis techniques applied in order to achieve appropriate data validation and to test the proposed hypotheses. Results of variable validity and reliability as well as results of the structural models were all presented in this chapter. The main findings were displayed and evaluated by looking at the coefficients and p-values of each of the proposed causal paths.

Chapter 4: is the discussion chapter, where all the obtained results are discussed in detail. More accurately, this chapter provided a fundamental discussion of the findings in line prior literature and what had been proposed in the conceptual model. In other words, this chapter had logically and theoretically justified the whole results regarding the paths established in the conceptual model from previous literatures. Further, after the discussion and validation of certain paths in the current study, chapter four in its last section was also able to convey the main contributions extracted by the current study at both academic and practical perspectives. Mainly this chapter clearly exposed the theoretical and practical contributions that are achieved based on the current investigation that tackled the Lebanese behaviour regarding mobile banking services in Lebanon.

5.3 MAIN CONCLUSIONS

After performing the current investigation, which included theoretical reviews, empirical analyses and supported discussions, several main conclusions can be derived. Such conclusions are detailed below:

- In reference to technology adoption theories, Unified Theory of Acceptance and Use of Technology Two (UTAUT2) was selected as an appropriate theoretical foundation

- The hierarchical structure of the 3M model of motivation and personality was followed in the current study to predict behaviour through motivational factors and personality traits at distinct levels.
- Thirty two causal paths were suggested in the conceptual model of the current study to illustrate the relation between exogenous (independent) constructs and endogenous (dependent) constructs.
- The constructs' measures used in the current study are of high reliability (Cronbach's alpha, CR, and AVE) and validity (convergent validity and discriminant validity).
- Model fit was deemed acceptable according to appropriate fit indices (CMIN/DF; CFI; IFI; RMSEA; SRMR; and CHI-SQUARE) that were all above the cut-off points.
- Findings highlighted the great importance of personality factors in shaping consumer behaviour toward using mobile banking.
- Elementary traits influenced compound personality traits, UTAUT2 constructs, and mobile banking use, while compound personality traits were also able to impact motivational constructs and actual usage of mobile banking.
- Results supported new significant relations among personality constructs of different levels and UTAUT2 variables; for example, the relationship between conscientiousness and need for structure, or between agreeableness and effort expectancy, among others.
- Findings showed that the construct proactive personality was significantly associated with all the proposed constructs: performance expectancy, effort expectancy, hedonic motivation, facilitating conditions and use behaviour.
- According to path analysis, of the motivational factors, only effort expectancy, hedonic motivation and facilitating conditions

were related to use behaviour of mobile banking technology in Lebanon.

5.4 LIMITATIONS

Before finalizing this research work, it seems indispensable to present the different aspects that limited the scope of the results obtained. Therefore, research limitations are presented below.

The current investigation employed data obtained from a convenience sample of Lebanese bank customers' residing in the capital of Lebanon (individuals living in Beirut). This data collection method may limit results' generalizability across the whole Lebanon.

From another perspective, this study was carried out in a concrete moment of time. The cross-sectional nature of the data implies that causality can only be inferred from these data.

In addition, the current investigation used self-reported measures. This means that respondents were asked to personally note down their own perceptions. Although this is a widely used research technique for data collection, it may result in common method bias (Northrup, 1996; Lacey, Suh, & Morgan, 2007).

One more limitation refers to the applicability of the current study to other new technologies. The current study only addressed the usage of mobile banking technology; the factors that influence the use of mobile banking may differ from those that impact the employment of other new technologies, such as e-learning, mobile shopping, etc.

Furthermore, the current study did not consider cultural factors, which may be specific to the Lebanese culture, such as masculinity, femininity, communism, individualism, etc. These characteristics may play an important role in giving rise to specific psychological concerns, adopting certain beliefs, and predicting behaviours (Al Sukkar & Hasan, 2005; Constantiou, Papazafeiropoulou, & Vendelo, 2009).

Finally, this investigation was oriented towards customers' perceptions while studying the factors that influence mobile banking

usage. This may be a limitation of the current study, as it does not comprise the service providers' perceptive and, hence, cannot provide a complete image that clarifies all aspects related to the use of mobile banking technology in Lebanon.

5.5 FUTURE RESEARCH

Lastly, it would be interesting to discuss future research that could overcome the above mentioned limitations.

First, future studies could analyse the same conceptual model employing a mixed-method approach to provide more detailed explanations of the results, a longitudinal analysis to ensure causality, and a new sample frame to enhance generalizability. For example, future studies could conduct a comparison study, in other words, they could examine the factors that influence mobile banking actual use among two different countries, so that results can be compared and contrasted.

Second, the non-significant results obtained in the current study also call for further examination. The non-significant effects of performance expectancy, social influence and general self-efficacy on mobile banking use in Lebanon must be re-addressed in future researches. Future investigations could incorporate more demographical, cultural, technical, and personal factors, aside with the non-significant variables of the current study, to predict this behaviour. For example, they could include additional motivational factors and constructs that could influence mobile banking use, such as privacy, security, utilitarian motivation, etc. Not only but also, researchers could consider integrating new personality levels (surface or situational personality traits) to the current conceptual model.

Third, future research could examine mediating and moderating effects among the constructs of the proposed model. Due to the large number of constructs and hypotheses under study, these effects have not been included in this investigation. However, a moderated mediation model of personality and motivational constructs seems an interesting line for future analyses.

Fourth, researchers could also address intensity of use, not only the actual use behaviour of mobile banking. However, if this was the case, it should be taken into consideration that this study targeted mobile banking users and non-users, and, consequently, the variable “habit” was removed from the current investigation, as in UTAUT2 it referred to how automatic mobile banking use is. Thus, for future studies analysing the intensity of mobile banking use, not just whether or not there is usage, the role of the concept “habit” should be addressed based on its theoretical and practical importance.

Fifth, this study focused on usage of mobile banking technology only; hence, future research could apply the constructs used in this investigation, and other new ones, to examine use behaviour of other new technologies available in Lebanon (for example, e-learning, etc.).

Sixth, and last, future research could consider some changes regarding the kind of population targeted. Indeed, future studies could address the factors that impact mobile banking use from the customers and service providers’ perspectives.

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APPENDICES

APPENDIX 1 (List of Lebanese Banks)

List of Lebanese Banks			
Num	Bank Name	Num	Bank Name
1	Fransabank Sal	22	Banque Bemo Sal
2	Banque Misr Liban S.A.L.	23	Lebanon And Gulf Bank S.A.L.
3	Arab Bank Plc	24	Saudi Lebanese Bank Sal
4	Rafidain Bank	25	Cedrus Bank Sal
5	Banque Libano-Francaise S.A.L.	26	Al-Mawarid Bank S.A.L.
6	B.L.C. Bank S.A.L.	27	Creditbank S.A.L.
7	Blom Bank S.A.L	28	United Credit Bank S.A.L.
8	Federal Bank Of Lebanon S.A.L.	39	Bank Al Madina S.A.L.
9	Societe Generale De Banque Au Liban S.A.L.	30	First National Bank S.A.L.
10	Bankmed Sal	31	Al Baraka Bank Sal
11	Audi Private Bank Sal	32	MEAB Sal
12	BBAC S.A.L	33	Blominvest Bank S.A.L.
13	Audi Investment Bank S.A.L	34	Medinvestment Bank Sal
14	Syrian Lebanese Commercial Bank S.A.L.	35	Credit Libanais Investment Bank - S.A.L.
15	Banque De Crédit National S.A.L.	36	Citibank, N.A.
16	Byblos Bank Sal	37	Arab Investment Bank S.A.L.
17	Banque De L'habitat S.A.L.	38	Fransa Invest Bank Sal (Fib)
18	Finance Bank S.A.L.	39	Byblos Invest Bank Sal
19	Saradar Bank S.A.L	40	Arab Finance House Sal (Islamic Bank)
20	IBL Bank S.A.L.	41	Lebanese Islamic Bank Sal
21	Credit Libanais S.A.L.	42	Blom Development Bank S.A.L

NUM	Bank Name	NUM	Bank Name
43	Bank Audi Sal	55	FFA Sal (Private Bank)
44	Fencia Bank Sal	56	Bank Of Beirut Invest S.A.L
45	North Africa Commercial Bank S.A.L.	57	Bank Of Baghdad (Private S.A.Co.)
46	Lebanese Swiss Bank S.A.L.	58	CSCbank Sal
47	Bank Saderat Iran	59	Al- Bilad Islamic Bank For Investment & Finance
48	BSL Bank Sal	60	Ibl Investment Bank S.A.L
59	National Bank Of Kuwait (Lebanon) S.A.L.	61	Qatar National Bank (Qatari Societe Anonyme)
50	Bank Of Beirut S.A.L	62	Cedrus Invest Bank S.A.L.
51	Jammal Trust Bank S.A.L.	63	Libank S.A.L. (Levant Investment Bank)
52	Habib Bank Limited	64	Invest Bank
53	Arab African International Bank	65	Lucid Investment Bank S.A.L
54	Emirates Lebanon Bank S.A.L.		


Source: Banque Du Liban, 2018

APPENDIX 2 (List of Lebanese Banks Providing Mobile Banking)

List of Lebanese Banks Offering Mobile Banking Services			
NUM	Bank Name	NUM	Bank Name
1	Fransabank Sal	8	Saradar Bank S.A.L
2	B.L.C. Bank S.A.L.	9	Byblos Bank Sal
3	Blom Bank S.A.L	10	Bank Audi Sal
4	Bankmed Sal	11	Jammal Trust Bank S.A.L.
5	BBAC S.A.L	12	Bank Of Beirut S.A.L
6	Al-Mawarid Bank S.A.L.	13	Lebanese Swiss Bank S.A.L.
7	First National Bank S.A.L.	14	Federal Bank Of Lebanon S.A.L.

Source: Banque Du Liban, 2018

APPENDIX 3 (Questionnaire)

	<p>PRESENTATION: Good morning/good evening. We, a group of researchers from the University of Santiago de Compostela in Spain, are carrying out a research on the adoption of mobile banking by consumers. We appreciate that you dedicate for us a few minutes to contribute to this research. Obviously, data is <u>anonymous</u> and the information will be processed at the <u>confidential level</u> and <u>in global manner</u>, without using them for other purposes than those mentioned above.</p>
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Do you have any mobile device in which you can use mobile banking (smartphone, tablet)?

No (THANK YOU, END OF THE SURVEY)

Yes Approximately since how long? _____ Months

Do you use mobile banking (access banking and allied financial services such as savings, funds transfer, or stock market transactions via a mobile device)?

No

Yes

Indicate your degree of agreement with the following affirmations concerning your opinion on mobile banking (1= in total disagreement and 5= in total agreement)

Performance Expectancy

I find mobile banking useful in my daily life	1	2	3	4	5
Using mobile banking increases my chances of achieving things that are important to me	1	2	3	4	5
Using mobile banking helps me accomplish things more quickly	1	2	3	4	5
Using mobile banking increases my productivity	1	2	3	4	5

Effort Expectancy

Learning how to use mobile banking is easy for me	1	2	3	4	5
My interaction with mobile banking is clear and understandable	1	2	3	4	5
I find mobile banking easy to use	1	2	3	4	5
It is easy for me to become skilful at using mobile banking	1	2	3	4	5

Social Influence

People who are important to me think that I should use mobile banking	1	2	3	4	5
People who influence my behaviour think that I should use mobile banking	1	2	3	4	5
People whose opinions that I value prefer that I use mobile banking	1	2	3	4	5

Facilitating Conditions

I have the resources necessary to use mobile banking	1	2	3	4	5
I have the knowledge necessary to use mobile banking	1	2	3	4	5
Mobile banking is compatible with other technologies I use	1	2	3	4	5

I can get help from others when I have difficulties using mobile banking	1	2	3	4	5
--	---	---	---	---	---

Hedonic Motivation

Using mobile banking is fun	1	2	3	4	5
Using mobile banking is enjoyable	1	2	3	4	5
Using mobile banking is very entertaining	1	2	3	4	5

Elementary Personality Traits

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please indicate the extents to which you agree or disagree with each statement, being 1 strongly disagree and 5 strongly agree.

I see myself as someone who ...

Is talkative	1	2	3	4	5
Tends to find fault with others	1	2	3	4	5
Does a thorough job	1	2	3	4	5
Is depressed, blue	1	2	3	4	5
Is original, comes up with new ideas	1	2	3	4	5
Is reserved	1	2	3	4	5
Is helpful and unselfish with others	1	2	3	4	5
Can be somewhat careless	1	2	3	4	5
Is relaxed, handles stress well	1	2	3	4	5

Tends to be lazy	1	2	3	4	5
Is emotionally stable, not easily upset	1	2	3	4	5
Is inventive	1	2	3	4	5
Has an assertive personality	1	2	3	4	5
Can be cold and aloof	1	2	3	4	5
Perseveres until the task is finished	1	2	3	4	5
Can be moody	1	2	3	4	5
Values artistic, aesthetic experiences	1	2	3	4	5
Is sometimes shy, inhibited	1	2	3	4	5

Is curious about many different things	1	2	3	4	5
Is full of energy	1	2	3	4	5
Starts quarrels with others	1	2	3	4	5
Is a reliable worker	1	2	3	4	5
Can be tense	1	2	3	4	5
Is ingenious, a deep thinker	1	2	3	4	5
Generates a lot of enthusiasm	1	2	3	4	5
Has a forgiving nature	1	2	3	4	5
Tends to be disorganized	1	2	3	4	5
Worries a lot	1	2	3	4	5
Has an active imagination	1	2	3	4	5
Tends to be quiet	1	2	3	4	5
Is generally trusting	1	2	3	4	5

Is considerate and kind to almost everyone	1	2	3	4	5
Does things efficiently	1	2	3	4	5
Remains calm in tense situations	1	2	3	4	5
Prefers work that is routine	1	2	3	4	5
Is outgoing, sociable	1	2	3	4	5
Is sometimes rude to others	1	2	3	4	5
Makes plans and follows through with them	1	2	3	4	5
Gets nervous easily	1	2	3	4	5
Likes to reflect, play with ideas	1	2	3	4	5
Has few artistic interests	1	2	3	4	5
Likes to cooperate with others	1	2	3	4	5
Is easily distracted	1	2	3	4	5
Is sophisticated in art, music, or literature	1	2	3	4	5

Compound Personality Traits

Read each of the following statements. Using the scale to the right, mark the response that best describes how true each statement is for you (1= in total disagreement y 5= in total agreement)

Need for Cognition

I would rather do something that requires little thought than something that is sure to challenge my thinking abilities	1	2	3	4	5
I try to anticipate and avoid situations where there is a likely change I'll have to think in depth about something	1	2	3	4	5
I only think as hard as I have to	1	2	3	4	5
The idea of relying on thought to get my way to the top does not appeal to me	1	2	3	4	5
The notion of thinking abstractly is not appealing to me	1	2	3	4	5

Proactive Personality

I am constantly on the lookout for new ways to improve my life	1	2	3	4	5
Wherever I have been, I have been a powerful force for constructive change	1	2	3	4	5
Nothing is more exciting than seeing my ideas turn into reality	1	2	3	4	5
If I see something I don't like, I fix it	1	2	3	4	5
No matter what the odds, if I believe in something I will make it happen	1	2	3	4	5
I love being a champion for my ideas, even against others' opposition	1	2	3	4	5
I excel at identifying opportunities	1	2	3	4	5
I am always looking for better ways to do things	1	2	3	4	5
If I believe in an idea, no obstacle will prevent me from making it happen	1	2	3	4	5
I can spot a good opportunity long before others can	1	2	3	4	5

Need for Structure

It upsets me to go into a situation without knowing what I can expect from it	1	2	3	4	5
I'm not bothered by things that upset my daily routine	1	2	3	4	5
I enjoy having a clear and structured mode of life	1	2	3	4	5
I like a place for everything and everything in its place	1	2	3	4	5
I like being spontaneous	1	2	3	4	5
I find that a well ordered life with regular hours makes my life tedious	1	2	3	4	5
I don't like situations that are uncertain	1	2	3	4	5
I hate to change my plans at the last minute	1	2	3	4	5
I hate to be with people that are unpredictable	1	2	3	4	5
I find that a consistent routine enables me to enjoy life more	1	2	3	4	5
I enjoy the exhilaration of being put in unpredictable situations	1	2	3	4	5
I become uncomfortable when the rules in a situation are not clear	1	2	3	4	5

Need for Affiliation

One of the most enjoyable things I can think of that I like to do is just watching people and seeing what they are like	1	2	3	4	5
I think being close to others, listening to them, and relating to them on a one-to-one level is one of my favourite and most satisfying pastimes	1	2	3	4	5
Just being around others and finding out about them is one of the most interesting things I can think of doing	1	2	3	4	5
I feel like I have really accomplished something valuable when I am able to get close to someone	1	2	3	4	5
I would find it very satisfying to be able to form new friendships with whomever I liked	1	2	3	4	5

General Self-Efficacy

How often do you feel/act this way (1=never, 5=always)

I feel in control of what is happening to me	1	2	3	4	5
I find that once I make up my mind, I can accomplish my goals	1	2	3	4	5
I have a great deal of will power	1	2	3	4	5

Finally, a few questions to end the questionnaire:

Do you have any branch of your bank in close proximity?

Yes No

Do you have available hours to come to the bank during its working hours?

Yes No

EMPLOYMENT: Employed Unemployed

AGE:

GENDER (SEX): Male Female

¡THANK YOU FOR YOUR COOPERATION!