
Privacy, security, infrastructure and cost issues in internet banking in the Philippines: initial trust formation

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Abstract: The overall purpose of this study is to develop an understanding of the issues that influence initial trust on behavioural intention to use internet banking in developing countries like the Philippines. The country has experienced sophisticated cyberattacks, slowest download internet speed and average internet costs per Mbps that are far above the global average standards. The study proposes and empirically tests if these issues influence initial trust formation with a sample of 454 local banks' customers who are non-users of internet banking services in the Philippines. Perceived costs, quality of infrastructure, privacy, security and disposition to trust were barriers to non-users' intentions to engage in any online financial transaction.

Keywords: internet banking; initial trust; privacy; security; infrastructure; cost issues Philippines; developing country; online banking.

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1 Introduction

The rapid diffusion of technology introduces a broad range of financial distribution channels for varying service needs of consumer segments, from Automated Teller Machines (ATMs), phone banking, PC banking to internet banking. Many banks have established their presence online, and many others are in the process of doing so. The spread of internet across the developing countries provides broadly available financial services which offer positive impact to consumers and banks' financial performance (DeYoung, 2005; DeYoung et al., 2007; Yiu et al., 2007).

The mobility of internet banking improves customer satisfaction by experiencing real-time personalised service regardless of location and time instead of visiting the bank physically (Jayawardhena and Foley, 2000; Pikkarainen et al., 2004). Competitiveness and cost effectiveness are major motivational benefits for banks to encourage customers to adopt internet banking (Polatoglu and Ekin, 2001; Khalfan et al., 2006). However, some resistance persists among non-users. Ramanathan et al. (2014) surveyed 16,000 banking customers across 13 Asian markets and found that the Philippines had the lowest digital banking penetration among all Asian markets. Unlike in many countries, the growth rate of internet banking users has not taken off in the Philippines, which raises questions about the determinants of consumers' acceptance of online banking.

Factors affecting consumer acceptance and adoption of online banking in Southeast Asian countries have been previously studied by a number of scholars such as in Brunei (Seyal, 2011; Seyal and Rahim, 2011); Indonesia (Susanto et al., 2013a; Susanto et al., 2013b); Malaysia (Ndubisi and Sinti, 2006; Nor and Pearson, 2007; Poon, 2007; Wai, 2008); Singapore (Gerrard and Cunningham, 2003); Thailand (Rotchanakitumnuai and Speece, 2003; Jaruwachirathanakul and Fink, 2005) and Vietnam (Wang and Pho, 2009; Pham et al., 2013).

Few scholars investigated the use of electronic banking in the Philippines, for example, in microfinance services (Jimenez and Roman, 2005), usefulness and ease of use of online banking (Lim, 2013) and a case study of Philippine National Bank's internet banking on customer satisfaction and loyalty (Mojares, 2014). Previous literature has analysed online banking adoption from a general perspective, so there is limited published work exploring the acceptance of internet banking from the perspectives of bank customers in the context of developing countries like the Philippines. It lacks in-depth studies on factors that play a major role in influencing the decision of Filipino in adopting internet banking services. Thus, the overall purpose of this study is to develop an understanding of the factors and the mediating effect of initial trust on behavioural intention to use internet banking.

To build a profitable long-term relationship with consumers, banks need to know the different factors influencing Filipino consumers' trust towards acceptance of internet banking. In this research, the researchers identified five main antecedents to initial trust: perceived cost, perceived privacy, perceived infrastructure quality, perceived security and disposition to trust. Insight into these core factors that determine the customers' trust in developing countries helps the local banks to devise marketing strategies for non-users to adopt internet banking services.

In this study, internet banking system is defined as banking services delivered through the web and wireless networks which permit businesses and customers to conduct banking transactions from any digital devices without having to be physically present at the bank's branches. Literature reviews are conducted on the most relevant studies with regard to key issues and challenges that banks are facing towards online banking adoption. There is an empirical test if results of previous literature are significant in the Philippine context. Finally, results of the study are described and provided significant business implications for financial institutions, policymakers and researchers to identify ways in developing strong internet banking infrastructure.

2 Philippine internet banking system

The Philippine banking system comprises five bank classifications with a total of 645 operating banking institution as of 2015: (1) universal banks, (2) commercial banks, (3) thrift banks, (4) rural banks and (5) cooperative banks. There are 12 universal banks and 13 commercial banks with 5797 branches and other offices; 69 thrift banks with 1851 branches; 513 rural banks; and 29 cooperative banks with 2065 branches (Bangko Sentral Ng Pilipinas, <http://www.bsp.gov.ph/>). The market size of the banking sector changes mainly owing to merger, acquisition, consolidation and exit of weaker players in the industry. It opens the possibility of the local banks in the Philippines to expand on the branch model, leading the majority of consumers to manage their accounts in the branches.

The need to lower the operating cost and to gain a competitive advantage is a must to distinguish itself from the competition. The pursuit of encouraging consumer to use internet banking as a convenient distribution channel will minimise the cost of staffing, advertising, handling fees and overhead expenses. For example, according to a study by Polatoglu and Ekin (2001) on Turkish internet banking, the average transaction cost is US\$0.10 compared to US\$2.1 of brick-and-mortar service. Nsouli and Schaechter (2002) added that a typical customer bank transaction was costing about a US\$1.0 in a brick-and-mortar bank branch or US\$0.60 through phone banking, but it cost only about US\$0.02 online.

Table 1 Summary of commercial and universal bank's internet banking services as of August 2016

[illegible]

Table 1 Summary of commercial and universal bank's internet banking services as of August 2016 (continued)

| No | Institution | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|----|--|---------------------------|---------------------|---------------|--------|-------------------------|----------------------|--------------------|-------------------------------------|---------------------|----------------|-----------------------|-------------------|----------------|
| | Internet banking name | Access and manage account | Local fund transfer | Bills payment | E-shop | Credit card transaction | Check account status | Chequebook request | Alert notification/ service request | Prepaid mobile load | Loans services | Remittance e services | Security reminder | 3rd party seal |
| 11 | Union Bank of the Philippines | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 12 | United Coconut Planters Bank | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes |
| 13 | Al-Amanah Islamic Investment Bank of the Philippines | No | No | No | No | No | No | No | No | No | No | No | No | No |
| 14 | Development Bank of the Philippines | Yes | Yes | Yes | No | No | No | No | No | Yes | No | No | Yes | Yes |
| 15 | Land Bank of the Philippines | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 16 | Bank of Commerce | Yes | Yes | Yes | No | Yes | No | Yes | No | Yes | No | No | Yes | Yes |
| 17 | BDO Private Bank, Inc. | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 18 | Philippine Bank of Communications | Yes | Yes | Yes | No | No | No | No | No | Yes | No | No | Yes | Yes |
| 19 | Philippine Veterans Bank | Yes | Yes | Yes | No | No | No | Yes | No | Yes | No | No | Yes | Yes |
| 20 | Robinsons Bank Corp. | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes |

DeYoung et al. (2007) analysed the US community banks and compared the click-and-mortar banks performance from 1999 to 2001. Their findings suggest that adopting an internet service improved bank profitability from deposit service charges. Also, Hernando and Nieto (2007) studied the Spanish commercial banks from 1994 to 2002; they found that the impact of internet banking increased profitability and decreased overhead expenses.

The development of electronic banking in the Philippines started in the 1980s with the introduction of ATMs. Suddenly, other e-banking innovations gradually followed in phone banking. Many of these initiatives were introduced by foreign banks in the Philippines. The internet was first introduced to the country on 29th March of 1994, and the number of internet users comprised only 0.05% of the total population of 65.8 million. For local banks to withstand competitive pressure from foreign competitors pioneering the online banking strategy, they are finding value proposition targeted at the growing digital-savvy consumer.

According to the Asian Banker and Infosys Technologies Ltd. (2010), the Philippines have reached a balance of efficiency and growth, particularly the privately owned banks. They have achieved the level of basic infrastructure development and continued to grow their customer through touch-based technology innovation to achieve process efficiency. However, internet banking is still concentrated in commercial and universal banks as shown in Table 1. It revealed that 13 domestic private universal banks and four commercial banks were offering internet banking services, while one out of three government-owned universal banks did not have internet banking service. Bancnet system still powered two out of 19 banks operating internet banking. The majority of banks in the Philippines introduced internet banking in a simplified core offering of five to six relatively simple services such as paperless account statements, fund transfer, bills payment, chequebook request, notification and service inquiry.

3 Philippines internet infrastructure quality and cost issues

3.1 Internet infrastructure quality

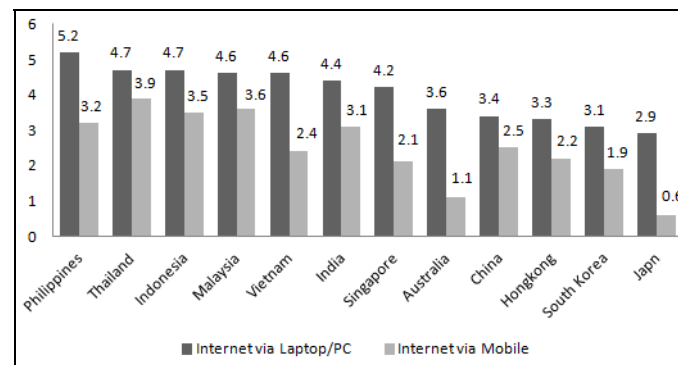
According to Miniwatts Marketing Group (2016), there are 249 million internet users in Southeast Asian countries as of June 2016 as shown in Table 2. The Philippines has 54 million internet users with 52.63% penetration from 102 million populations as of 2015, the third highest ranking in Southeast Asian countries with a digital ownership of 55% smartphones, 43% laptop or desktop computer and 24% tablet devices (Kemp, 2016). According to We Are Social's Digital Report as of January 2016, from a global average of internet use of 4.4 hours per day, the Filipinos spend an average of 5.2 hours per day using PC and laptop which is the highest among Asia-Pacific countries, while an average of 3.2 hours per day using mobile online as shown in Figure 1. The shares of webpage views using digital devices are as follows: 61% share of webpage views via laptops and desktop computers, 29% via smartphones and 7% via tablet devices (Kemp, 2016).

Table 2 Number of internet users in Southeast Asian countries as of June 2016

| <i>ASIA</i> | <i>Population</i> (2015 est.) | <i>Internet users</i> (Year 2000) | <i>Internet users</i> 30 June 2016 | <i>Penetration</i> (% population) | <i>Users</i> % Asia |
|-------------------|----------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|------------------------|
| Brunei Darussalam | 436,620 | 30,000 | 310,205 | 71.0 | 0.0 |
| Cambodia | 15,957,223 | 6000 | 4,100,000 | 25.7 | 0.2 |
| Indonesia | 258,316,051 | 2,000,000 | 88,000,000 | 34.1 | 4.9 |
| Laos | 7,019,073 | 6000 | 1,400,000 | 19.9 | 0.1 |
| Malaysia | 30,949,962 | 3,700,000 | 21,090,777 | 68.1 | 1.2 |
| Myanmar | 56,890,418 | 1000 | 11,000,000 | 19.3 | 0.6 |
| Philippines | 102,624,209 | 2,000,000 | 54,000,000 | 52.6 | 3.0 |
| Singapore | 5,781,728 | 1,200,000 | 4,699,204 | 81.3 | 0.3 |
| Thailand | 68,200,824 | 2,300,000 | 41,000,000 | 60.1 | 2.3 |
| Vietnam | 95,261,021 | 200,000 | 49,063,762 | 51.5 | 2.7 |
| Total | 641,437,129 | 11,443,000 | 274,663,948 | | |

Note: Internet users are individuals who can access the internet at home, via any type of device and connection.

Source: Miniwatts Marketing Group (2016)

Figure 1 Average number of hours per day spent on the internet as of January 2016

Source: Kemp (2016)

Internet speed is a source of daily frustration to each Filipino, who is trying to make a quick online transaction, downloading and sending email. A bill has been filed in the Senate seeking to require telecommunication companies to provide faster internet connections in the country and a broader Wi-fi access (Calonzo, 2014). Partylist ABAKADA has urged the House Committee on Information and Communication Technology to investigate the impact of slow and expensive internet connection to consumers and businesses (House of Representative, 2015). Also, the House Committee on Trade and Industry has complained about the slow internet connection in the country (House of Representative, 2016).

Table 3 Connection speed and broadband adoption by Asia Pacific countries Q4 2015

| GR | Q4 2015 avg. con. speed Mbps | | | Q4 2015 avg. peak con. speed Mbps | | | % above 4 Mbps broadband adoption | | | % above 10 Mbps broadband adoption | | | % above 15 Mbps broadband adoption | | |
|---------|------------------------------|------|---------|-----------------------------------|---------|---------|-----------------------------------|----|---------|------------------------------------|---------|-------|------------------------------------|------|---------|
| | Country | GR | Country | GR | Country | GR | Country | GR | Country | GR | Country | GR | Country | GR | Country |
| 1/1 | South Korea | 26.7 | 1/1 | Singapore | 135.7 | 1/2 | South Korea | 97 | 1/1 | South Korea | 81 | 1/1 | South Korea | 63 | |
| 4/7 | Japan | 17.4 | 2/2 | Hong Kong | 105.2 | 4/10 | Thailand | 95 | 3/7 | Japan | 63 | 4/7 | Japan | 40 | |
| 6/5 | Hong Kong | 16.8 | 3/3 | South Korea | 95.3 | 10/11 | Hong Kong | 93 | 6/4 | Hong Kong | 61 | 6/5 | Hong Kong | 38 | |
| 16/17 | Singapore | 13.9 | 5/4 | Japan | 82.9 | 18/18 | Japan | 91 | 10/10 | Singapore | 59 | 13/14 | Singapore | 32 | |
| 21/33 | Taiwan | 12.9 | 6/72 | Indonesia | 79.8 | 20/21 | Singapore | 91 | 24/33 | Taiwan | 45 | 24/34 | Taiwan | 24 | |
| 41/42 | New Zealand | 9.3 | 8/5 | Taiwan | 78.8 | 22/25 | Taiwan | 90 | 40/43 | Thailand | 26 | 39/37 | New Zealand | 11 | |
| 42/43 | Thailand | 9.3 | 18/18 | Thailand | 63.7 | 32/31 | New Zealand | 87 | 42/40 | New Zealand | 26 | 44/39 | Australia | 8.2 | |
| 48/46 | Australia | 8.2 | 53/45 | New Zealand | 42.8 | 56/47 | Australia | 73 | 47/45 | Australia | 20 | 45/41 | Thailand | 8.2 | |
| 73/73 | Malaysia | 5.2 | 55/54 | Malaysia | 42.0 | 69/52 | Malaysia | 56 | 63/62 | Malaysia | 5.4 | 57/53 | Sri Lanka | 1.2 | |
| 78/71 | Sri Lanka | 4.8 | 60/46 | Australia | 39.3 | 74/71 | Sri Lanka | 52 | 71/66 | India | 2.8 | 61/56 | Malaysia | 1.2 | |
| 89/91 | China | 4.1 | 72/66 | Sri Lanka | 34.8 | 83/84 | China | 41 | 73/- | Philippines | 1.9 | - | India | 1.0 | |
| 92/104 | Indonesia | 3.9 | 81/92 | Vietnam | 31.4 | 84/87 | Vietnam | 40 | 74/- | Indonesia | 1.7 | - | Philippines | 0.72 | |
| 95/97 | Vietnam | 3.8 | 91/94 | Philippines | 27.0 | 88/94 | Indonesia | 36 | 75/69 | China | 1.6 | - | Indonesia | 0.5 | |
| 107/108 | Philippines | 3.2 | 92/101 | China | 26.7 | 101/98 | India | 17 | 76/71 | Vietnam | 1.0 | - | China | 0.3 | |
| 114/116 | India | 2.8 | 115/116 | India | 21.2 | 102/101 | Philippines | 14 | -/- | Sri Lanka | 0.6 | - | Vietnam | 0.1 | |

Source: Akamai Technologies, Inc. (2016)

Based on Akamai Technologies, Inc.'s Worldwide State (2016), the internet report for the fourth quarter of 2015 showing the Philippines have an average internet speed of 3.2 Mbps ranking 107th which is second to the last among APEC countries. It also has a peak average speed of 27 Mbps ranking at 91st from 97th of the third quarter of 2015. According to Akamai Technologies, Inc. (2016), two major ISPs, namely Philippine Long Distance Telephone Corp. and Globe Telecom, launched new high-speed services up to 1 Gbps in the fourth quarter which are available in more than 1600 villages across the countries. However, the Philippines is still lagging behind among ASEAN and APEC countries when it comes to broadband adoption from percent above 4 Mbps to percent above 15 Mbps as shown in Table 3. Also, the development of internet access in the majority of rural areas in the country to connect the regions with broadband services is under construction (International Telecommunication Union, 2014; International Telecommunication Union, 2015).

This poor state of internet service has a great impact on consumer and business productivity. Inadequate and inconsistent internet infrastructure is perceived as a security risk because consumers experience disruption during an electronic transaction. Gerrard and Cunningham (2003) found out that accessibility regarding internet access and internet connection speed influence Singaporean use of internet banking. In Singapore, it has been documented that the government is a key driver in the diffusion of information and communication technology (Sheshadri and Rani, 2014).

3.2 Costs

The Philippine lawmaker initiated enquiries regarding high internet subscription rate (as shown in Table 4) in comparison to average annual Filipino family income of PhP 100,000–250,000 (US\$2000–5000) (House of Representative, 2015; House of Representative, 2016; Philippine Statistics Authority, <http://www.census.gov.ph/>). It translates into US\$167–\$416 income per month. In comparison with monthly internet subscription cost in Singapore, the Philippines is rated at two to three times higher. For example, in Singapore, 100 Mbps costs US\$28, 200 Mbps costs US\$30 and 500 Mbps costs US\$43, while in the Philippines 100 Mbps costs US\$74, 200 Mbps costs US\$96 and 500 Mbps costs US\$160 a month. The one-time investment for computer devices and hardware costs should not be an impediment for any individual to invest considering the relative advantage it brings. However, the high monthly internet access expenditure has a bigger slice of their monthly income. The cost associated with internet access fees and connection charges is a significant barrier to the adoption of internet banking (Munusamy et al., 2012; Sohail and Shanmugham, 2003; Zheng and Zhong, 2005).

Table 4 List of ISP providers in the Philippines and internet broadband plan/package

| <i>Company and broadband plan</i> | <i>Speed</i> | <i>Price (peso)</i> | <i>Price (US\$)</i> |
|------------------------------------|----------------|---------------------|---------------------|
| <i>(1) Bayan Telecommunication</i> | | | |
| • BayanDSL WiFi | Up to 1 Mbps | 999 | 20 |
| <i>(2) Globe Telecom</i> | | | |
| • 1 Gbps | Up to 1 Gbps | 9499 | 190 |
| • 500 Mbps | Up to 500 Mbps | 7499 | 150 |
| • 200 Mbps | Up to 200 Mbps | 4499 | 90 |
| • 100 Mbps | Up to 100 Mbps | 3499 | 70 |
| • 50 Mbps | Up to 50 Mbps | 2499 | 50 |

Table 4 List of ISP providers in the Philippines and internet broadband plan/package (continued)

| <i>Company and broadband plan</i> | <i>Speed</i> | <i>Price (peso)</i> | <i>Price (US\$)</i> |
|--|----------------|---------------------|---------------------|
| <i>(3) Philippine Long Distance Telephone Company (PLDT)</i> | | | |
| • Home Fibr–Lite Plan | Up to 50Mbps | 1899 | 38 |
| • Home Fibr–Power Plus Plan | Up to 50Mbps | 2899 | 58 |
| • Home Fibr–Power Plus Plan + Cignal | Up to 50Mbps | 3500 | 70 |
| • Home DSL–Fam Plan | Up to 15Mbps | 3000 | 60 |
| • Home - Cignal Fam Plan Budget | Up to 15Mbps | 3650 | 73 |
| • Home - Cignal Fam Plan Basic | Up to 15Mbps | 3699 | 74 |
| • Home - Cignal Fam Plan Plus | Up to 15Mbps | 3799 | 76 |
| • Home - Cignal Fam Plan Premier | Up to 15Mbps | 3999 | 80 |
| • Home - Cignal Fam Plan Ultimate | Up to 15Mbps | 4499 | 90 |
| <i>(4) Smart Communication</i> | | | |
| • Smart Bro Prepaid LTE Plug-It | Up to 42 Mbps | 3888 | 78 |
| • Smart Bro Prepaid Power Plug It | Up to 12 Mbps | 1245 | 25 |
| • Starter Plug It | Up to 7.2 Mbps | 995 | 20 |
| • Plug-It Lite | Up to 3.6 Mbps | 795 | 16 |
| <i>(5) Sky Cable</i> | | | |
| • Sky broadband 50 | Up to 50Mbps | 2899 | 58 |
| • Sky broadband 16 | Up to 16Mbps | 1999 | 40 |
| • Sky broadband 3 | Up to 3Mbps | 999 | 20 |
| <i>(6) Sun Cellular</i> | | | |
| • Sun non-stop surf plan | 12 to 48 Kbps | 450 | 9 |
| • Sun broadband LTE | Up to 42Mbps | 999 | 20 |

Note: US\$ at US\$1 = PhP50

Source: Company website and inquiry via visit to the shops

4 Philippine internet privacy and security issues

Banks in the Philippines continue to employ various security measures to ensure that customers' transactions, banking information and personal information are protected from cybercrime or malicious activities on the internet. The risk of cyberattack is a significant issue in the Philippines. Reliance on technology to provide banking services brings new challenges such as regulatory risk because the internet is available anywhere in the world and there are grey areas that are not regulated. The banks should recognise cyber security as their core business function. Based on the study of McKinsey & Company (2014, p.64) on digital banking in Asia, the approach of banks towards cyber-security are passive, companies are usually only on the lookout for known threats,

waiting for sensors to trigger alarms indicating that an incident is occurring. The banks are still unclear on what is the nature of the attacks and how big is the cause of the damage.

The country has experienced sophisticated cyberattacks from virus-infected emails, malware, site attacks, money laundering and suspicious activities. Hackers can obtain financial transaction information, customer's account credentials and other intellectual property that vacuum unknowingly the savings of the consumer. According to Department of Justice (DOJ) cited by Avendano (2013), "87% of Filipino internet users were identified as victims of crimes and malicious activities committed online." History of cybercrime in the Philippines includes the 'I Love You' virus in 2000, hacking into government websites on 2004, the 'Heartbleed Bug' in 2014 and the Bangladesh Central Bank cyberheist in 2016.

4.1 *I Love You virus*

There was an incident on the 4th of May 2000 of a dangerous computer virus known as 'ILOVEYOU', created by a Filipino student, attacking tens of millions of computers. The virus spread to computers around the world costing by some estimates US\$10 billion in lost data, productivity and damages. The Love Virus was received by internet users through email messages with a subject 'ILOVEYOU' and attachment 'LOVE-LETTER-FOR-YOU.txt.vbs'. It erased data and graphics in the computer. It also captured all the contact addresses in the computer's directory and sent the same email to all contacts. As stated by Orji (2014, p.32), many businesses in the USA were affected.

However, the Philippines did not have cybercrime laws during those times. Consequently, the ILOVEYOU virus had been introduced before the new law was passed. Based on the principle of 'nullum crimen sine lege' (no crime without law) and 'nullum poena sine lege' (no punishment without law), charges were dropped against the violator (Sprinkel, 2002; Sosa, 2008). Within the international context, the Philippines was held responsible for the acts and thus liable for the damages. Following the incident, the Congress of the Philippines approved E-Commerce Act No. 8792 on 14th of June 2000 aimed to prevent cybercrime and increase protection. In 2012, Republic Act 10175 or the Cybercrime Prevention Act of 2012 was enacted that described and punished cybercrimes.

4.2 *Hacking on government websites*

JJ Marina Giner, a contractual employee of the University of the Philippines, hacked the government portal 'gov.ph' and other government websites. The Department of Justice resolution indicated that Giner launched attacks three days before the country's national elections from 27th of April to 7th of May 2004 (Oliva, 2005). Judge Antonio Eugenio of the Manila Regional Trial Court ordered the arrest of Giner on 24th of January 2005, for violating Section 33(a) of the Electronic Commerce Law. He was sentenced to one to two years in prison and a fine of US\$2000.

4.3 *Heartbleed bug*

Heartbleed is a kind of security bug disclosed in April 2014. It is a programming error that is found in certain versions of Open SSL, a security software used widely that

allowed websites to communicate with computers, laptops and mobile devices. Open SSL exposes users' personal information and passwords to hackers. According to Bangko Sentral Ng Pilipinas (2014), attackers can potentially use the bug to impersonate banking services or users to gain access to internal networks. It means that computers and ATMs using Windows XP, after April 2014, will no longer receive security updates and expose them to harmful viruses, spyware and other malicious software, as well as hacking and denial of service attacks. Bangko Sentral Ng Pilipinas (2014) stated that "local banks have reported taking specific actions to manage the operational concerns. They have adopted phased transition plans where the operating system will be gradually upgraded or replaced by 2016. For this purpose, banks entered into contracts with their ATM vendors or with Microsoft for extended support agreement to ensure continued protection while the transition plan is being carried out".

4.4 Bangladesh bank cyberheist

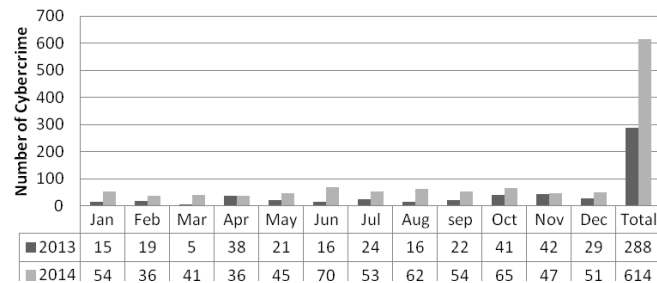
In February 2016, hackers made an illegal 35 payment orders worth US\$951 million in several countries via Swift system. Federal Reserve Bank (FED) of New York blocked 30 payment orders worth US\$850 million; however, five payment orders worth US\$101 million were executed by FED.

- 1 One payment order worth US\$20 million transferred via Pan Asia Banking Corporation to a purported Sri Lanka non-profit organisation. It was recovered after Deutsch Bank, a routing bank, queried the misspelling of 'Foundation' as 'Fandation'.
- 2 Four payment orders worth US\$81 million were transferred to RCBC, a bank in the Philippines. The money was deposited into five separate accounts in the name of William So Go and PhilRem Service Corporation. The money trail was sent to three Casino companies, namely Bloomberry Resorts worth US\$29 million, Solaire Resort worth US\$31 million and Eastern Hawaii Leisure Company worth US\$21 million.

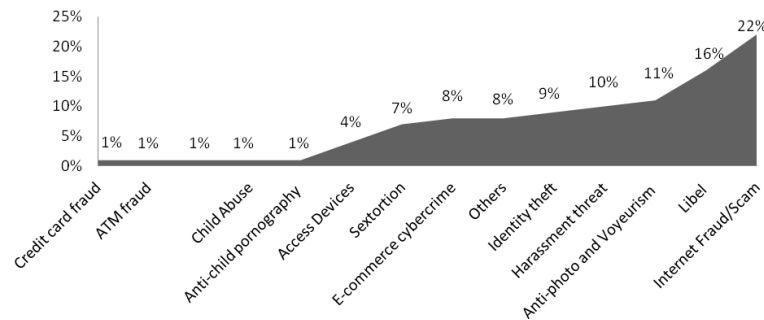
Based on the report of FireEye Inc., the company hired by the Bangladesh Central Bank to conduct the forensics investigation, the hackers used the Swift messaging system by designing a malware dubbed as Nestegg and Dyepack to navigate through the bank's network (Devnath and Riley, 2016). The heist shows that the security of banks and government against cyber attacks, cyber criminals, verifications of credentials and multi-million money laundering scheme are lax and vulnerable. It exposed weaknesses in the global financial system and banking community.

4.5 Common cybercrime

According to the Philippine National Police (PNP), from 2010 to 2013, internet fraud tops the list of cybercrime, followed by harassment, threats and libel (Feliipe, 2014). It has recorded 2778 qualified crimes through the internet from 2003 to 2012. From January to December 2014 (as shown in Figure 2), the Philippine National Police Anti-Cybercrime Group (PNP-ACG) recorded 614 cybercrime incidents, compared to only 288 incidents in 2013. The classification of cybercrime is shown in Figure 3, showing internet fraud and scam as the highest crime committed with 22%.

Figure 2 Cybercrime committed from 2013 to 2014

Source: Department of Justice (2015)

Figure 3 Classification of cybercrime for 2014

Source: Department of Justice (2015)

Internet cafes or cyber cafes are popular access points for email, social media, instant messaging, file downloading and encoding. However, the cafe operators in the Philippines have lax procedures for internet security. They are becoming accessible for cybercrime violators such as identity theft and violation of privacies. About nine out of ten Filipino internet users fall victim to cybercrimes such as utilising networks, blogs, message boards, chats and websites owing to lack of awareness on security features of social networks (Felipe, 2014). According to the Department of Justice, as of March 2015, from being ranked 35th in 2012, the Philippines have moved to the 39th rank among countries with internet threat activities (Annual Symantec Internet Security Threat Report ISTR, DOJ, 2015).

5 Hypotheses and model development

5.1 Disposition to trust

As stated by McKnight (2005), trust in technology is built in the same way as trust in people. One of the significant factors affecting consumers' trust is a person's general tendency to trust or distrust others which are referred to as the disposition or propensity to trust. The generalised expectations about the trustworthiness of other people are what

psychology relates to as personality trait formed from early childhood and developed over the course of their lives (McKnight and Chervany, 2001–2002; Tan and Sutherland, 2004). Each varies in the level of trust and has a different natural disposition to trust depending on his or her character and the environment over the course of his or her development. Some consumers tend to easily trust, whereas others are more suspicious. So if a consumer has a high disposition to trust others, there is a high probability that it will influence his or her trust, whereas a consumer with a lower disposition to trust others is likely to distrust others in the process.

Disposition to trust has two elements: faith in humanity and trusting stance (McKnight and Chervany, 2006). Faith in humanity means that a person assumes that others care enough to help other people. Individuals with high faith in humanity are inclined to trust other people, and they tend to be less judgemental and critical or more tolerant of others' mistakes. Trusting stance is a personal choice or strategy that a person assumes about other people, which is derived from a calculative-based trust. A person subjectively calculates the possible benefits gained towards taking to perform unless negative experience takes place to force him/her to change his or her mind.

Gefen (2000) found that disposition of trust influences consumer trust in the web business like Amazon.com. Lee and Turban (2001) showed that disposition to trust is positively related to the trustworthiness of internet merchant. Chen and Barnes's (2007) findings showed that there is a positive influence of trust propensity on consumers' initial trust in a web retailer. It is suggested that disposition to trust is most influential when the relationship between the trustor and trustee is new, just like in the stage of initial trust when a trustor is unfamiliar with the trustee (McKnight et al., 1998; Rotter, 1971). Based on previous findings, the disposition to trust has a significant effect on consumers' online trust.

5.2 Perceived costs

Access barriers regarding costs or affordability of internet connection is an important factor in explaining the differences in internet usage (Hoffman et al., 2000; Venkatesh and Brown, 2001). The International Telecommunication Union (ITU), a United Nations body, predicts that 3.2 billion people globally are using the internet, of which 2 billion people are from developing countries (Sanou, 2015). However, forecasts and statistics like these do not take into account the varying frequency of usage. The income level itself, as well as other demographic characteristics such as educational attainment, may also serve as predictors of perceived cost.

Along with the cost issues, there are some factors related to costs of resources such as costs of personal computer devices, costs of internet software, costs of internet connection and maintenance or replacement costs (Liao and Cheung, 2002). The cost and pricing of internet services are broken down into two components: set-up costs and operating costs (Petrizzini and Mugo, 1999). Logically, these costs are much higher in developing countries than they are in developed countries. The costs vary greatly depending on the number of Internet Service Providers (ISPs) in the country. There are also explicit regulations or government mandates which influence access and cost of internet.

Srinagesh (1995) reported the important features of internet economics which explained that substantial elements of cost are borne by the user and not the ISPs. Consequently, user costs are considerably higher than the charges set by the ISPs. The incremental costs of internet connectivity are smaller than the investments that potential customers have already made. These perceived financial cost discourage non-users from using the internet banking services because they feel that it would entail more costs than benefits (Black et al., 2002; Kuisma et al., 2007; Sathye, 1999). Non-users of internet banking are willing to pay the cost of internet connection even if they are high provided that they perceive the relative advantage or exceptional value. Likewise, they may ignore the innovation if they see it as something of little or no value. Kuisma et al. (2007) added that one of the reasons why non-users resist internet banking is the presence of 24×7 ATM which they are currently familiar with, so they may not see the added value of a new distribution channel.

5.3 *Perceived quality of infrastructure*

A well-functioning internet banking network is dependent on technological infrastructure and functionality, which include accessibility, availability, connectivity, speed, navigability, reliability and security of network connecting the whole network to the central bank via different methods (Al-Somali et al., 2009; Lee and Turban, 2001; Waite and Harrison, 2004). These factors discourage certain people from adopting online banking (Gerrard et al., 2006). Pikkarainen et al. (2004) identifies the importance of quality internet connection in adopting internet banking because without proper internet connection, the use of internet banking is not possible. Individuals conduct their financial transactions over the internet as the internet becomes more widely accessible. Almogbil's (2005) study confirmed that there is a significant relationship between the speed of internet access and the use of online banking services in Saudi Arabia. Individuals will conduct their financial transactions over the internet as the internet becomes more widely accessible.

5.4 *Perceived privacy*

Hiltgen et al. (2006, pp.21–23) presented two common privacy attacks on internet banking: offline credential-stealing attacks and online channel-breaking attacks. Offline credential-stealing attacks refer to fraudulently attempting to acquire sensitive information such as usernames, passwords, credentials and credit card information from protected consumer's computer devices via malicious software such as virus, worm or Trojan horse. An example is phishing, which is a malicious technique used to deceive users by email spoofing or instant messaging and exploits the user to enter their confidential details at a fake website. Another example is pharming that targets vulnerable Domain Name System (DNS) server software such as altering customer's desktop computer IP addresses. Both phishing and pharming are used to gain information from online identity theft. Online channel-breaking attacks, on the other hand, refer to intruder hijacking or silently manipulated transaction data or mostly the authenticated public-key certificates when a Secure Sockets Layer (SSL)/Transport Layer Security (TLS) session is established that typically require the user-initiated banking session to work properly.

Privacy refers to loss of control over personal information without any knowledge and permission from invasion, interception and theft (Cheung and Lee, 2001; Mukherjee and Nath, 2003; Lee, 2009; Littler and Melanthiou, 2006). It is a form of opportunistic behaviour by the merchants or third parties (Clay and Strauss, 2000). Companies whose private policy, practices and procedures are disclosed on the site are patronised by consumers than those without any such statements (Benassi, 1999; Culnan and Armstrong, 1999; McKnight and Chervany, 2001–2002; Yousafzai et al., 2003). Hain et al. (2003) found that non-users of internet banking were much more concerned about privacy issues. Customers' lack of trust on security and privacy concerns both in the attributes of the bank and in the online environment are major barriers to widespread adoption of internet banking (Lee and Turban, 2001; Yousafzai et al., 2010).

5.5 Perceived security

Since the introduction of commercial activity on the internet, security has been the major barrier and the most challenging issue facing organisations in doing business over the internet (White and Nteli, 2004). The probability of a customer making a risky decision to transact business online depends on their assessment of bank's security (Koufaris and Hampton-Sosa, 2004). Aladwani (2001) found that IT managers considered security as the most important challenge of online banking such as the internet, modem to dial-up and Extranet. Nsouli and Schaechter (2002) stated that security threats could come from inside or outside the online system, and it may result in a loss of consumer confidence in internet banking. Many customers are afraid of monetary loss while performing financial transactions over the internet because they have difficulties in asking for compensation owing to lack of physical connections (Kuisma et al., 2007). Therefore, it is essential in an online banking environment that banks take precautions to avoid security hazards such as widespread cybercrime.

Merritt (2010) defines cybercrime as any crime that is committed using a computer, a network or a hardware device. Attacks include keystroke loggers, viruses, Trojan horses, phishing, pharming, data manipulation via hacking or viruses, identity theft and e-commerce fraud. Most of the referred cases involve financial loss. It reduces the customers' level of trust believing that they are vulnerable to any fraudulent attacks, discouraging them from engaging in online transactions (Littler and Melanthiou, 2006). Customers face difficulty judging if a website is trustworthy; hence, banks must implement security measures, safety nets and performance structures of this electronic medium to mitigate fear and risks perceived by customers towards the intention to use the internet for the financial transaction (Gerrard and Cunningham, 2003; Jiang et al., 2008).

5.6 Initial trust online

As the complexity of online environment multiplies through development, trust becomes a baseline expectation and prerequisite of consumer decision-making. Jarvenpaa et al. (2004) argues that the lack of consumer trust on merchant's honesty and competence in internet stores are the most significant barrier for realising the potential of internet marketing. Trust plays a critical factor in the absence of physical presence, and the unpredictability of the internet generates a degree of uncertainty for the online consumer

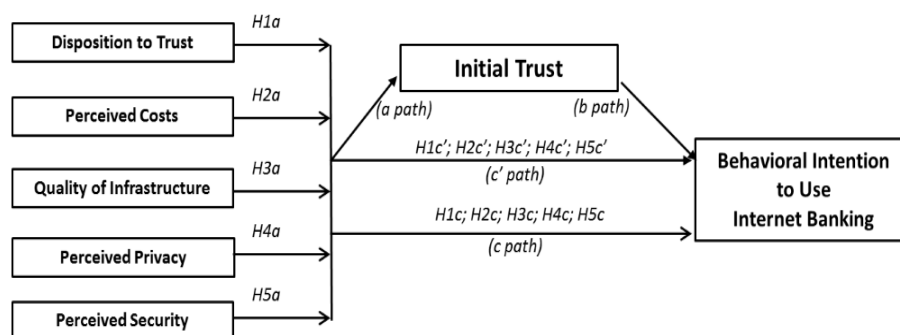
transactions (Al-Gahtani, 2011). The low usage of online banking transaction is attributed to the fact that non-users perceive high risk and uncertainty in trusting an open technological infrastructure like the internet as banking medium (Yousafzai et al., 2003).

Study of Lewicki and Bunker (1995) and Cheskin and SA (1999) stated that initial trust is the initial perception of a customer who is unaware of the online environment which is considered as the early stage of consumer trust. McKnight et al. (1998) proposed initial trust formation model that consumers go through in deciding whether or not to explore or to transact with an online business. Initial trust is the inception stage of unfamiliarity where a customer lacks first-hand knowledge, credible information and experience (Gefen et al., 2003; McKnight and Chervany, 2006; McKnight et al., 1998; McKnight et al., 2002; McKnight et al., 2003–2004). It is considered as a temporary stage which is formed in a short time and fades in the long run as the consumer gains experience and forms gradual trust (McKnight and Chervany, 2001–2002; Gefen 2000; Kim and Tadisina, 2007).

Previous studies between initial trust and intention to transact with online companies show a significant relationship. Koufaris and Hampton-Sosa (2004) found some factors that affect initial trust in a web-based business. Chen and Barnes (2007) discovered that online initial trust and familiarity with online purchasing have a positive impact on purchase intention. Wu et al. (2010) found that initial online trust influences consumer's attitude towards an e-vendor and its website. Brengman and Karimov (2012) found that unfamiliar e-retailers perceived integrity by utilising text blogs into their websites influence initial trust towards unfamiliar e-vendor and subsequent consumer purchase intentions.

On mobile banking, Kim et al. (2009) found consumer perception of initial trust and relative benefits vital in promoting personal intention to use mobile banking, while Zhou (2011) indicated that initial trust affects the usage intention of mobile banking. In the case of internet banking, Kim and Prabhakar (2004) found that initial trust in the electronic channel as banking medium and trust in the bank are the two principal determinants of adoption behaviour. Susanto et al. (2013a) stated that initial trust formation influences Indonesian customers' intention to use internet banking services.

Figure 4 Conceptual model



Independent variables are expected to affect behavioural intention to use internet banking through its effect on initial trust. Evaluating the statement of the problem requires the following hypothesis and tests all the paths' overall significance. Drawing from previous

literature review and findings between antecedents of initial trust and behavioural intention to use internet banking, the research model is depicted in Figure 4, and the generated hypotheses for this study are as follows:

Hypothesis 1a: Disposition to trust significantly influences customer's initial trust.

Hypothesis 1c: Disposition to trust significantly influences behavioural intention to use internet banking.

Hypothesis 1c': The relationship between disposition to trust and behavioural intention to use internet banking is fully mediated by initial trust.

Hypothesis 2a: Perceived costs significantly influence customer's initial trust.

Hypothesis 2c: Perceived costs significantly influence behavioural intention to use internet banking.

Hypothesis 2c': The relationship between perceived costs and behavioural intention to use internet banking is fully mediated by initial trust.

Hypothesis 3a: Quality of infrastructure significantly influences customer's initial trust.

Hypothesis 3c: Quality of infrastructure significantly influences behavioural intention to use internet banking.

Hypothesis 3c': The relationship between perceived quality of infrastructure and behavioural intention to use internet banking is fully mediated by initial trust.

Hypothesis 4a: Perceived privacy significantly influences customer's initial trust.

Hypothesis 4c: Perceived privacy significantly influences behavioural intention to use internet banking.

Hypothesis 4c': The relationship between perceived privacy and behavioural intention to use internet banking is fully mediated by initial trust.

Hypothesis 5a: Perceived security significantly influences customer's initial trust.

Hypothesis 5c: Perceived security significantly influences behavioural intention to use internet banking.

Hypothesis 5c': The relationship between perceived security and behavioural intention to use internet banking is fully mediated by initial trust.

6 Research methodology

This study uses both qualitative and quantitative research methods. The qualitative method explains the perception of non-users towards internet banking and helps identify some factors that affect initial trust and behavioural intention to use internet banking as shown in Table 5. This method helps identify possible factors not captured by previous studies.

Table 5 Summary of perception of respondents towards internet banking

| <i>Factors</i> | <i>Non-users' opinion towards internet banking</i> |
|-------------------------------------|---|
| Perceived costs | <ul style="list-style-type: none"> • Internet connection in the Philippines is too expensive in comparison with other countries whose standard of living is greater than our country. • To connect to the internet, I still need to buy a computer, then pay a monthly service fee for internet connection. It is not affordable to pay the monthly fee especially if you can have access in your office because it is too expensive. • Monthly internet connection costs a lot just to use internet banking. ATMs are accessible everywhere. • Wi-fi connection in retail shops such as cafes are free in the Philippines, so why I need to pay. |
| Perceived quality of infrastructure | <ul style="list-style-type: none"> • The Philippines has one of the slowest internet speed connections in the world. • Availability of internet connections is only centred in the cities. If you travel to the suburban area, you will not have hope to connect. • I am already paying the highest monthly fee just to get better connection, but I still face internet connection disruption and long downloading time. • The government bodies, officials, congressman and senators are all complaining about the speed of the internet since 2012 but nothing happens. |
| Perceived privacy | <ul style="list-style-type: none"> • I am afraid to use the internet banking because my money online will be stolen without the bank's knowledge. • I don't want to share my personal information online. I want face-to-face contact with bank's personnel. • The only thing that goes between you and your money online is your username and password, so I don't think it is safe. • The banks may not have strict laws regarding data protection. |
| Perceived security | <ul style="list-style-type: none"> • There are a lot of cybercrimes in the country. • Money transfer online is not secure; even rich countries cannot control hackers. • I am afraid to share my information as unauthorised personnel from the bank may share it to third parties without the bank's knowledge. • Using services at the bank branches and ATM is more secured than using services online. |

We developed 23 questions regarding non-users' opinions towards internet banking. All variables were measured on a five-point Likert scale, which ranges from strongly disagree (1) to strongly agree (5). A pre-testing of the questionnaires was done with customers from the 20 local banks. As the result of the pre-test, several items were refined. Some initial items were found to be unclear for the respondents and these items were eliminated.

After the pre-test, the original questions were refined. Self-administered method was used to gather data from various bank customers from October 2015 until February 2016.

All respondents are clients who have bank accounts in the local banks in the country. An implicit assumption that these customers who are non-users of online banking would be potential adopters of internet banking services in the future. 500 questionnaires were sent to respondents, and 454 surveys were returned at the end of data collection process. Table 6 provides the profile of the respondents and their internet use.

Table 6 Profile of respondents and their internet use

| <i>Profile</i> | | <i>Frequency</i> | <i>Percentage</i> |
|---|--------------------|------------------|-------------------|
| Gender | Male | 210 | 46.26 |
| | Female | 245 | 53.96 |
| Age | Below 20 | 95 | 20.93 |
| | 20–25 | 111 | 24.45 |
| | 26–30 | 56 | 12.33 |
| | 31–35 | 95 | 20.93 |
| | 36–40 | 44 | 9.69 |
| | Above 40 | 54 | 11.89 |
| Marital status | Not married | 309 | 68.06 |
| | Married | 146 | 32.16 |
| Educational level | High school | 74 | 16.3 |
| | Bachelor's degree | 301 | 66.3 |
| | Master's degree | 63 | 13.88 |
| | Doctoral degree | 17 | 3.74 |
| Your income per month in US\$ | Below 200 | 76 | 16.74 |
| | 200–400 | 142 | 31.28 |
| | 401–600 | 75 | 16.52 |
| | 601–800 | 91 | 20.04 |
| | 801–1000 | 41 | 9.03 |
| | above 1000 | 30 | 6.61 |
| Do you have a computer at home? | Yes | 438 | 96.48 |
| | No | 17 | 3.74 |
| Do you have internet at home? | Yes | 434 | 95.6 |
| | No | 21 | 4.63 |
| Do you have a computer at work? | Yes | 367 | 80.84 |
| | No | 88 | 19.38 |
| Do you have an internet at work? | Yes | 351 | 77.31 |
| | No | 104 | 22.91 |
| How long have you been using the Internet (including using e-mail, etc.)? | Less than 6 months | 34 | 7.49 |
| | 6–12 months | 37 | 8.15 |
| | 1–3 years | 75 | 16.52 |
| | 4–6 years | 124 | 27.31 |
| | 7 years or more | 185 | 40.75 |

Table 6 Profile of respondents and their internet use (continued)

| <i>Profile</i> | | <i>Frequency</i> | <i>Percentage</i> |
|--|----------------------|------------------|-------------------|
| On average, how many hours per week do you use the internet? | Less than 1 hour | 47 | 10.35 |
| | 1–5 hours | 94 | 20.7 |
| | 6–10 hours | 97 | 21.37 |
| | 11–20 hours | 76 | 16.74 |
| | 21–40 hours | 62 | 13.66 |
| | Over 40 hours | 79 | 17.4 |
| Do you usually access internet from? | Home | 115 | 25.33 |
| | Office | 30 | 6.61 |
| | Both home and office | 287 | 63.22 |
| | Others | 23 | 5.07 |

Note: US\$1 = PHP50.

7 Results and discussion

In this research, the impact of key antecedent factors was tested, which influence customer initial trust in internet banking, and in turn affect behavioural intention. Some of the key findings from the data analysis are highlighted below.

7.1 Validity and reliability

The reliability of the variables was assessed using internal consistency measure of Cronbach's alpha. The alpha values of all the independent and dependent variables are shown in Table 7. Nunnally (1978) explained that the closer the value of alpha to 1, the higher the internal consistency and reliability of the instrument. He also stated that 0.7 is the minimum acceptable value. Therefore, no item was deleted from the variables because they range from 0.810 to 0.951, which exceeded the minimum acceptable value.

Table 7 Cronbach's alpha

| <i>Variables</i> | <i>No. of items</i> | <i>Cronbach's alpha</i> |
|---------------------------|---------------------|-------------------------|
| Disposition of trust | 4 | .910 |
| Perceived costs | 3 | .901 |
| Quality of infrastructure | 3 | .886 |
| Privacy | 3 | .810 |
| Safety | 3 | .951 |
| Trust | 3 | .896 |
| Intentions | 4 | .888 |

7.2 Relationships between the variable

To determine the strength and relationships between the dependent and independent variables, correlation matrix analysis was carried out. Table 8 shows that there was a

very high significant correlation between behavioural intention as the dependent variable and three independent variables, namely disposition of trust, perceived costs and quality of infrastructure with a perceived value of ($r = .901$, $p = .000$), ($r = .941$, $p = .000$) and ($r = .840$, $p = .000$). Privacy and security showed high correlation with the behavioural intention to use internet banking with a perceived value of ($r = .788$ and $r = .667$, respectively, with $p = .000$). It meant that all independent variables influence behavioural intention to use internet banking.

Table 8 Correlation matrix (independent variables and dependent variable)

| | | <i>Disposition of trust</i> | <i>Perceived costs</i> | <i>Infrastructure quality</i> | <i>Privacy</i> | <i>Security</i> |
|----------------------|---------------------|-----------------------------|------------------------|-------------------------------|------------------|------------------|
| Intention | Pearson correlation | .901** | .941** | .840** | .788** | .667** |
| | Sig (2-tailed) | .000 | .000 | .000 | .000 | .000 |
| | <i>N</i> | 454 | 454 | 454 | 454 | 454 |
| Value interpretation | | Very high correlation | Very high correlation | Very high correlation | High correlation | High correlation |

Notes: **Correlation is significant at the 0.01 level (2-tailed).

Table 9 shows the relationship between independent and mediating variables. The results verified a very high significant correlation between initial trust as the mediating variable and independent variables which included the disposition of trust, perceived costs, quality of infrastructure, privacy and security with a perceived value range of ($r = .996$ to $r = .802$, $p = .000$). Table 10 shows that mediating and dependent variable had a very high correlation. It implied that initial trust influenced the behavioural intention of using internet banking.

Table 9 Correlation matrix (independent variables and mediating variable)

| | | <i>Disposition of trust</i> | <i>Perceived costs</i> | <i>Infrastructure quality</i> | <i>Privacy</i> | <i>Security</i> |
|----------------------|---------------------|-----------------------------|------------------------|-------------------------------|-----------------------|-----------------------|
| Initial trust | Pearson correlation | .980** | .996** | .943** | .818** | .802** |
| | Sig (2-tailed) | .000 | .000 | .000 | .000 | .000 |
| | <i>N</i> | 454 | 454 | 454 | 454 | 454 |
| Value interpretation | | Very high correlation | Very high correlation | Very high correlation | Very high correlation | Very high correlation |

Notes: **Correlation is significant at the 0.01 level (2-tailed).

Table 10 Correlation matrix (mediating variable and dependent variable)

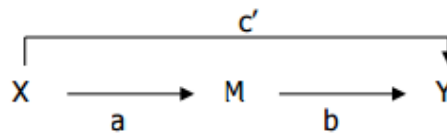
| | | <i>Initial trust</i> |
|----------------------|---------------------|-----------------------|
| Intention | Pearson correlation | .942** |
| | Sig (2-tailed) | .000 |
| | <i>N</i> | 454 |
| Value interpretation | | Very high correlation |

Notes: **Correlation is significant at the 0.01 level (2-tailed).

7.3 Regression analysis – process Macro

Baron and Kenny (1986), Judd and Kenny (1981) and James and Brett (1984) proposed a four-step mediation approach in which several path analysis multiple regression steps are conducted, and significance of the coefficients are examined at each step. The aim was to describe the entire structure of cause and effect linkages of all paths and determine the magnitude of direct and indirect influences that each variable has on the other variables. Figure 5 shows the Baron and Kenny (1986) mediation model in which paths a and b are called direct effects. The mediational effect, in which X (independent variable) leads to Y (dependent variable) via an intervening variable called a mediator (M) or known as indirect effect or ‘ c' ’. The indirect effect represents the portion of the relationship between X and Y that is mediated by M .

Figure 5 Baron and Kenny (1986) mediation model



To confirm initial trust as the mediating variable and its significance in the model, it was shown that while the mediator was caused by the independent variable (IV) and dependent variable (DV), the IV lost its significance when the mediator was included in the model. The four steps are as follows:

- 1 Confirm the significance of the relationship between the independent variable (IV) and dependent variable (DV): $X \rightarrow Y$ (Hypothesis c).
- 2 Confirm the significance of the relationship between the IV and the mediator: $X \rightarrow M$ (Hypothesis a).
- 3 Confirm the significance of relationship between the mediator and the DV: $M \rightarrow Y$ (Hypothesis b).
- 4 Confirm the insignificance or the meaningful reduction in effect of the relationship between the IV and the DV in the presence of the mediator: $X \rightarrow M \rightarrow Y$ (Hypothesis c')

Table 11 Summary of mediation analysis using Hayes' Process Macro at df (452)

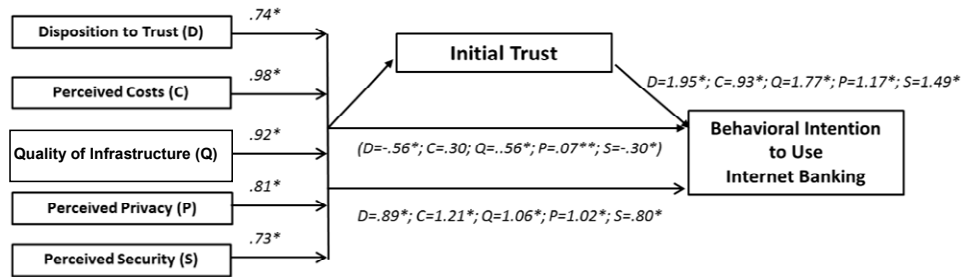
| Step 1: $X \rightarrow Y$ path (c) | R | R^2 | coeff | se | t | p | LLCI | ULCI |
|---------------------------------------|-------|-------|--------|-------|---------|-------|--------|--------|
| Disposition of trust | .9798 | .9600 | .8894 | .0202 | 44.0997 | .000* | .8497 | .9290 |
| Perceived costs | .9964 | .9928 | 1.2132 | .0206 | 58.9002 | .000* | 1.1727 | 1.2537 |
| Quality of infrastructure | .9434 | .8899 | 1.0641 | .0323 | 32.9208 | .000* | 1.0006 | 1.1277 |
| Privacy | .8401 | .7057 | 1.0230 | .0375 | 27.2499 | .000* | .9492 | 1.0968 |
| Security | .8176 | .6685 | .7959 | .0419 | 19.0129 | .000* | .7137 | .8782 |

Table 11 Summary of mediation analysis using Hayes' Process Macro at df (452) (continued)

| <i>Step 2: $X \rightarrow M$ path (a)</i> | <i>coeff</i> | <i>se</i> | <i>t</i> | <i>p</i> | <i>LLCI</i> | <i>ULCI</i> |
|--|--------------|-----------|----------|----------|-------------|-------------|
| Disposition of trust | .7410 | .0071 | 104.2034 | .000* | .7271 | .7550 |
| Perceived costs | .9845 | .0039 | 250.4564 | .000* | .9767 | .9922 |
| Quality of infrastructure | .9154 | .0151 | 60.4511 | .000* | .8856 | .9451 |
| Privacy | .8126 | .0269 | 30.1925 | .000* | .7597 | .8655 |
| Security | .7336 | .0257 | 28.5514 | .000* | .6831 | .7841 |
| <i>Step 3: $M \rightarrow Y$ path (b)</i> | <i>coeff</i> | <i>se</i> | <i>t</i> | <i>p</i> | <i>LLCI</i> | <i>ULCI</i> |
| Trust in disposition of trust path | 1.9504 | .0969 | 20.1192 | .000* | 1.7599 | 2.1409 |
| Trust in perceived costs path | .9265 | .2429 | 3.8150 | .000* | .4493 | 1.4038 |
| Trust in quality of infrastructure path | 1.7771 | .057 | 31.9086 | .000* | 1.6676 | 1.8865 |
| Trust in privacy path | 1.1723 | .0356 | 32.9432 | .000* | 1.1024 | 1.2422 |
| Trust in security path | 1.4919 | .0308 | 48.3814 | .000* | 1.4313 | 1.5526 |
| <i>Step 4: $X \rightarrow M \rightarrow Y$ (c')</i> | <i>coeff</i> | <i>se</i> | <i>t</i> | <i>P</i> | <i>LLCI</i> | <i>ULCI</i> |
| Disposition of trust | -.5559 | .0733 | -7.5826 | .000* | -.7000 | -.4118 |
| Perceived costs | .3011 | .2400 | 1.2547 | .210 | -.1705 | .7726 |
| Quality of infrastructure | -.5625 | .0540 | -10.4098 | .000* | -.6687 | -.4563 |
| Privacy | .0703 | .0354 | 1.9884 | .047** | .0008 | .1398 |
| Security | -.2985 | .0282 | -10.5841 | .000* | -.3539 | -.2431 |

Notes: * $p < 0.01$; ** $p < 0.05$.

The Hayes' Process Macro, developed by Andrew F. Hayes (2012), was used as a statistical mediation and moderation analysis in SPSS. It provided insights into the direct and indirect effects of the IV on the DV through the existence of an MV. Utilising the method, particularly Bias-Corrected (BC) estimation with 1000 resampling and 95% confidence intervals results are shown in Table 11 and a summary of the effect of IV to behavioural intention through the initial trust is shown in Figure 6.

Figure 6 Summary of effect of independent variables to behavioural intention through initial trust

Note: * $p < 0.01$, ** $p < 0.05$

In Step 1 of $X \rightarrow Y$ path (Hypothesis c), the regression shows that all IVs were statistically significant with behavioural intention to use internet banking, ignoring the initial trust as the mediator. Confirming a positive relationship between IV and DV with $p < 0.01$. Hence, Hypotheses 1c, 2c, 3c, 4c and 5c were supported. In Step 2 of $X \rightarrow M$ path (Hypothesis a), the regression analysis confirmed a positive association between all the IV and initial trust as mediating variable, without the presence of behavioural intention. Hence, Hypotheses 1a, 2a, 3a, 4a and 5a were supported. In Step 3 of $M \rightarrow Y$ path (Hypothesis b), the results showed that initial trust as the mediator positively associated with behavioural intention. Lastly in Step 4 of $X \rightarrow M \rightarrow Y$ (Hypothesis c'), while the IVs were significant predictors for both the DV and the MV, both path a and path b were significant and the following results were obtained:

- Direct effect of IV, namely disposition to trust ($B = -.56$, $t(452) = -7.5826$, $p = .000$), quality of infrastructure ($B = -.56$, $t(452) = -10.4098$, $p = .000$), perceived privacy ($B = .07$, $t(452) = 1.9884$, $p = .0474$) and perceived security ($B = -.30$, $t(452) = -10.5841$, $p = .000$), was positively associated with behavioural intention to use the internet banking with the presence of initial trust as MV. Also, partial mediation was observed with the disposition to trust, quality of infrastructure, privacy and security because the impact of IV and DV remains statistically significant when initial trust as intervening mediator was considered. Hence, Hypotheses 1c', 3c', 4c' and 5c' were supported.
- Direct effect of perceived costs ($B = .301$, $t(452) = 1.2547$, $p = .210$) was no longer significant in the presence of the MV, confirming the mediation effect. Hence, full mediation was inferred. Full mediation was observed with perceived costs because the impact of IV and DV fell to non-significant levels when initial trust, as intervening mediator, was considered. This suggested that all of the relationship between X and Y was transmitted through the mediator. Hence, Hypothesis 2c' was rejected.

A measure for the indirect effect of X on Y was presented after the regression models, as shown in Table 12. According to Preacher and Hayes (2004), indirect effect of X on Y in this situation was defined as the product of the $X \rightarrow M$ path (a) and the $M \rightarrow Y$ path (b) or ab . In most situations, ab ($c - c'$), where c is the simple (i.e. total) effect of X on Y , not controlling for M , and c' was the $X \rightarrow Y$ path coefficient after the addition of M to the model. The significance of the indirect effect can be determined by examining the lower

and upper bounds of the 95% confidence intervals. Indirect effect was statistically significant because all the IV confidence intervals did not include zero and they were greater than zero. Initial trust mediation was supported.

Table 12 Indirect effect of IV and DV

| <i>Indirect effect</i> | <i>Effect</i> | <i>Boot se</i> | <i>Boot LLCI</i> | <i>Boot ULCI</i> | <i>z</i> | <i>p</i> |
|---------------------------|---------------|----------------|------------------|------------------|----------|----------|
| Disposition of trust | 1.4453 | .1102 | 1.2209 | 1.6597 | 19.7335 | .000* |
| Perceived cost | .9121 | .2294 | .4003 | 1.2871 | 3.8146 | .000* |
| Quality of infrastructure | 1.6267 | .0648 | 1.5038 | 1.7545 | 28.2157 | .000* |
| Privacy | .9527 | .0393 | .8878 | 1.0285 | 22.2528 | .000* |
| Security | 1.0945 | .0430 | 1.0088 | 1.1732 | 24.5851 | .000* |

Notes: * $p < 0.01$; ** $p < 0.05$.

In the case of the effect size, the indirect effect with a 95% confidence interval did not include zero; all were significantly greater than zero. The p -values are drawn from the unit normal distribution under the assumption of a two-tailed z -test of the hypothesis that the mediated effect equals zero in the population. The value of ± 1.96 was the critical value of the test ratio which contained the central 95% of the unit normal distribution (Preacher and Leonadelli, 2010). Since the calculated values of z for the Sobel test were all above 1.96, it meant that mediation existed.

Costs, quality of infrastructure, privacy and security are widely recognised as the main obstacles to the adoption of internet banking in the Philippines. The prevailing responses of non-users of internet banking asserted that initial trust played a significant effect on behavioural intention to use internet banking. Similar finding had been found in previous studies (Al-Gahtani, 2011; Brengman and Karimov, 2012; Chen and Barnes, 2007; Cheskin and SA, 1999; Gefen 2000; Gefen et al., 2003; Jarvenpaa et al., 2004; Kim and Prabhakar, 2004; Kim and Tadisina, 2007; Kim and Tadisina, 2010; Kim et al., 2009; Koufaris and Hampton-Sosa, 2004; Lewicki and Bunker 1995; McKnight and Chervany, 2001–2002; McKnight and Chervany, 2006; McKnight et al., 1998; McKnight et al., 2002; McKnight et al., 2003–2004; Susanto et al., 2013a; Susanto et al., 2013b; Yousafzai et al., 2003; Wu et al., 2010; Zhou, 2011). They supported that disposition to trust was the most influential in the stage of initial trust when the trustor is unfamiliar with the technology (Gefen, 2000; McKnight et al., 1998; Rotter, 1971). This study increased the appropriateness of understanding antecedent factors of initial trust specifically in the self-service technology setting, such as internet banking.

All these lead to antecedents of initial trust and thus to develop a trust-based relationship with the customer, local banks must strive to ensure a culture of customer privacy and security to encourage customer willingness to engage in internet financial transactions. It underlies the quality of infrastructure and the affordability of internet connection that makes for an enabling internet banking environment in the Philippines. The construct has been tailored to suit the Filipino context. The models suggested are useful for banks' research and practice of online retail banking for the improvement of strategic marketing planning in the Philippines.

8 Conclusion and implications

Internet banking enhances the development of the banking system in the Philippines. However, diffusion of internet banking services cannot fully achieve expected benefits if they are not used by all banking customers. The present paper made a modest attempt to identify various factors that influence non-users' initial trust on internet banking through an antecedent consequences approach. The banks could take advantage of the proposed model to identify the most effective mechanisms to expand their current customer base. It offers banks a framework to enhance their marketing mix and strategies in encouraging non-users to convert to internet banking user.

The identified set of factors can be managed by banks actively before an internet banking service is introduced. It points to the existence of a large, untapped non-user market as the financial marketplace and available technologies move ahead. The way non-users perceived costs or affordability, quality of infrastructure, privacy and security provides unique challenges to banks to find ways in which to initiate a relationship and secure consumers' future commitment. The issue of initial trust for Filipino customers of local banks is increasingly recognised as a critical success factor in the emergence of internet banking services in the country. Banks should place more emphasis on the awareness of the benefits of internet banking services through educating the non-users of their competencies in their particular expertise of internet banking services and by highlighting their ability to provide safe and quality internet banking services.

Like any other study, this study is not without its limitations. The study did not test the role of the customer profile in the initial trust stage, as it was beyond the scope of this study. Future studies are expected to validate and expand the model of this study based on the demographic profile of the respondents. Larger and wider population and cultural background should be considered in building an initial trust model that fits any non-users. Future research would benefit from observing actual interactions of banks and non-users in developing concrete marketing strategies. Researchers can also test the validity of other factors of initial trust work over time or how initial trust will develop over time.

References

- Akamai Technologies, Inc. (2016) *Fourth quarter, 2015 state of the internet report*. Available online at: <https://www.akamai.com/us/en/about/news/press/2016-press/akamai-releases-fourth-quarter-2015-state-of-the-internet-report.jsp>
- Aladwani, A.M. (2001) 'Online banking: a field study of drivers, development challenges, and expectations', *International Journal of Information Management*, Vol. 21, No. 2, pp.213–225.
- Al-Gahtani, S.S. (2011) 'Modeling the electronic transactions acceptance using an extended technology acceptance model', *Applied Computing and Informatics*, Vol. 9, No. 1, pp.47–77.
- Almogbil, A. (2005) *Security, Perceptions, and Practices: Challenges Facing Adoption of Online Banking in Saudi Arabia*, Doctoral Dissertation, George Washington University, Washington, DC. Available online at: <http://www.growingscience.com/msl/metadata/j.msl.2012.04.022.html>
- Al-Somali, S., Gholami, R. and Clegg, B. (2009) 'An investigation into the acceptance of online banking in Saudi Arabia', *Technovation*, Vol. 29, No. 2, pp.130–141.
- Avendano, C. (2013) *87% of Filipino internet users have been victims of cybercrimes – DOJ*. Available online at: <http://technology.inquirer.net/21557/87-of-filipino-internet-users-have-been-victims-of-cybercrimes-doj>

- Bangko Sentral ng Pilipinas (2014) *Advisory on Windows XP End-of-Support*. Available online at: <http://www.bsp.gov.ph/publications/media.asp?id=3410>
- Baron, R.M. and Kenny, D.A. (1986) 'The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations', *Journal of Personality and Social Psychology*, Vol. 51, No. 6, pp.1173–1182.
- Benassi, P. (1999) 'TRUSTe: an online privacy seal program', *Communications of the ACM*, Vol. 42, No. 2, pp.56–59.
- Black, N.J., Lockett, A., Winklhofer, H. and McKechnie, S. (2002) 'Modeling consumer choice of distribution channels: an illustration from financial services', *International Journal of Bank Marketing*, Vol. 20, No. 4, pp.161–173.
- Brengman, M. and Karimov, F.P. (2012) 'The effect of web communities on consumers' initial trust in B2C E-commerce websites', *Management Research Review, Special Issue on Social Media Marketing*, Vol. 35, No. 9, pp.791–817.
- Calonzo, A. (2014) *Senate bill seeks to put up free Wi-Fi in Metro*. Available online at: <http://www.gmanetwork.com/news/story/362007/scitech/technology/senate-bill-seeks-to-put-up-free-wi-fi-in-metro>
- Chen, Y. and Barnes, S. (2007) 'Initial trust and online buyer behaviour', *Industrial Management & Data Systems*, Vol. 107, No. 1, pp.21–36.
- Cheskin and SA (Cheskin Research, Studio Archetype/Sapient) (1999) *E-Commerce trust study*. Available online at: <http://experiencecurve.com/articles/ecommerceTrustCheskin.pdf>
- Cheung, C. and Lee, M. (2001) 'Trust in internet shopping: instrument development and validation through classical and modern approaches', *Journal of Global Information Management*, Vol. 9, No. 3, pp.23–35.
- Clay, K. and Strauss, R. (2000) 'Trust, risk and electronic commerce: nineteenth century lessons for the 21st century', *Proceedings: Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association*, Vol. 93, pp.53–63.
- Culnan, M.J. and Armstrong, P.K. (1999) 'Information privacy concerns, procedural fairness, and impersonal trust: an empirical investigation', *Organization Science*, Vol. 10, No. 1, pp.104–115.
- Department of Justice (2015) *Philippines 2014-2015 Cybercrime Report: The Rule of Law in Cyberspace*. Available online at: https://www.doj.gov.ph/files/cybercrime_office/2014-2015_Annual_Cybercrime_Report.pdf
- Devnath, A. and Michael, R. (2016) *Bangladesh heist probe said to find three groups of hackers*. *Bloomberg*. Available online at: <http://www.bloomberg.com/news/articles/2016-05-10/bangladesh-bank-heist-probe-said-to-find-three-groups-of-hackers>
- DeYoung, R. (2005) 'The performance of internet-based business models: evidence from the banking industry', *Journal of Business*, Vol. 78, No. 3, pp.893–947.
- DeYoung, R., Lang, W. and Nolle, D. (2007) 'How the internet affects output and performance at community banks', *Journal of Banking and Finance*, Vol. 31, pp.1033–1060.
- Felipe, C.S. (2014) *9 of 10 Pinoys are cyber victims*. Available online at: <http://www.philstar.com/headlines/2014/03/19/1302540/9-10-pinoys-are-cyber-victims>
- Gefen, D. (2000) 'E-commerce: the role of familiarity and trust', *Omega*, Vol. 28, No. 6, pp.725–737.
- Gefen, D., Karahanna, E. and Straub, D.W. (2003) 'Inexperience and experience with online stores: the importance of TAM and trust', *IEEE Transactions on Engineering Management*, Vol. 50, No. 3, pp.307–321.
- Gerrard, P. and Cunningham, J.B. (2003) 'The diffusion of internet banking among Singapore consumers', *International Journal of Bank Marketing*, Vol. 21, No. 1, pp.16–28.
- Gerrard, P., Cunningham, J.B. and Devlin, J.F. (2006) 'Why consumers are not using internet banking: a qualitative study', *Journal of Services Marketing*, Vol. 20, No. 3, pp.160–168.

- Hain, D., Tootell, H. and Alcock, C. (2002) 'Understanding attitudes towards internet banking', *Proceedings of the 7th Annual Conference on Electronic Commerce*, 1–2 December, Melbourne, VIC.
- Hayes, A.F. (2012) *PROCESS: a versatile computational tool for observed variable mediation, moderation, and conditional process modeling*. Available online at: <http://www.afhayes.com/public/process2012.pdf>
- Hernando, I. and Nieto, M.J. (2007) 'Is the internet delivery channel changing banks' performance? The case of Spanish banks', *Journal of Banking and Finance*, Vol. 31, No. 4, pp.1083–1099.
- Hiltgen, A., Kramp, T. and Weigold, T. (2006) 'Secure Internet banking authentication', *IEEE Security & Privacy*, Vol. 4, No. 2, pp.21–29.
- Hoffman, D.L., Novak, T.P. and Peralta, M. (1999) 'Building consumer trust online', *Communications of the ACM*, Vol. 42, No. 4, pp.80–85.
- House of Representative (2015) *House to probe slow internet connection in the country*. Available online at: <http://www.congress.gov.ph/press/details.php?pressid=9115>
- House of Representative (2016) *Solon bewails poor internet connection in the country*. Available online at: <http://www.congress.gov.ph/press/details.php?pressid=926>
- International Telecommunication Union (2014) *The world in 2014: ICT facts and figures*. <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>
- International Telecommunication Union (2015) *The world in 2015: ICT facts and figures*. Available online at: <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf>
- James, L.R. and Brett, J.M. (1984) 'Mediators, moderators and tests for mediation', *Journal of Applied Psychology*, Vol. 69, No. 2, pp.307–321.
- Jaruwachirathanakul, B. and Fink, D. (2005) 'Internet banking adoption strategies for a developing country: the case of Thailand', *Internet Research*, Vol. 15, No. 3, pp.295–311.
- Jarvenpaa, S., Shaw, T. and Staples, D. (2004) 'Toward contextualized theories of trust: the role of trust in global virtual teams', *Information Systems Research*, Vol. 15, No. 3, pp.250–267.
- Jayawardhena, C. and Foley, P. (2000) 'Changes in the banking sector: the case of internet banking in the UK', *Internet Research*, Vol. 10, No. 1, pp.19–30.
- Jiang, P., Jones, D.B. and Javie, S. (2008) 'How third-party certification programs relate to consumer trust in online transactions: an exploratory study', *Psychology and Marketing*, Vol. 25, No. 9, pp.839–858.
- Jimenez, E.C. and Roman, P.B. (2005) *Electronic banking: delivering microfinance services to the poor in the Philippines: banking with the poor network*. Available online at: https://www.researchgate.net/publication/265009504_Case_Study_on_Philippines_Electronic_Banking_Delivering_Microfinance_Services_to_the_Poor_in_the_Philippines_i
- Judd, C.M. and Kenny, D.A. (1981) 'Process analysis: estimating mediation in treatment evaluations', *Evaluation Review*, Vol. 5, No. 5, pp.602–619.
- Kemp, S. (2016) *Digital, mobile, and social in APAC 2016*. Available online at: <http://wearesocial.sg/blog/2015/03/digital-social-mobile-in-apac-in-2015>
- Khalfan, A.M.S., Al Refaei, Y.S.Y. and Al-Hajery, M. (2006) 'Factors influencing the adoption of internet banking in Oman: a descriptive case study analysis', *International Journal of Financial Services Management*, Vol. 1, Nos. 2–3, pp.155–172.
- Kim, E. and Tadisina, S. (2007) 'A model of customers' trust in e-businesses: microlevel inter-party trust formation', *Journal of Computer Information Systems*, Vol. 48, No. 1, pp.88–104.
- Kim, E. and Tadisina, S. (2010) 'A model of customers' initial trust in unknown online retailers: an empirical study', *International Journal of Business Information Systems*, Vol. 6, no. 4, pp.419–443.
- Kim, K. and Prabhakar, B. (2004) 'Initial trust and the adoption of B2C e-commerce: the case of internet banking', *Database for Advances in Information Systems*, Vol. 35, No. 2, pp.50–64.

- Kim, K., Prabhakar, B. and Park, S. (2009) 'Trust, perceived risk, and trusting behavior in internet banking', *Asia Pacific Journal of Information Systems*, Vol. 19, No. 3. Available online at: <http://www.apjis.or.kr/pdf/MIS019-003-1.pdf>
- Koufaris, M. and Hampton-Sosa, W. (2004) 'The development of initial trust in an online company by new customers', *Journal Information and Management*, Vol. 41, No. 3, pp.377–397.
- Kuisma, T., Laukkanen, T. and Hiltunen, M. (2007) 'Mapping the reasons for resistance to internet banking: a means-end approach', *International Journal of Information Management*, Vol. 27, No. 2, pp.75–85.
- Lee, M. (2009) 'Factors influencing the adoption of internet banking: an integration of TAM and TPB with perceived risk and perceived benefit', *E-Commerce Research and Application*, Vol. 8, No. 3, pp.130–141.
- Lee, M.K.O. and Turban, E. (2001) 'A trust model for consumer internet shopping', *International Journal of Electronic Commerce*, Vol. 6, No. 4, pp.75–91.
- Lewicki, R.J. and Bunker, B.B. (1995) 'Trust in relationships: a model of trust development and decline', in Bunker, B.B. and Rubin, J.Z. (Eds): *Conflict, Cooperation, and Justice*, Jossey-Bass, San Francisco, CA, pp.133–173.
- Liao, Z. and Cheung, M.T. (2002) 'Internet-based e-banking and consumer attitudes: an empirical study', *Information & Management*, Vol. 39, No. 4, pp.283–295.
- Lim, E. (2013) 'Adoption of online banking in Manila: what the commercial banks should learn to be competitive', *International Journal of Information Technology and Business Management*, Vol. 10, No. 1, pp.1–7.
- Littler, D. and Melanthiou, D. (2006) 'Consumer perceptions of risk and uncertainty and the implications for behaviour towards innovative retail services: the case of Internet banking', *Journal of Retailing and Consumer Services*, Vol. 13, No. 6, pp.431–443.
- McKinsey & Company (2014) *Asian Financial Institutions: Digital Banking in Asia. Winning Approaches in a New Generation of Financial Services*, McKinsey & Company, New York.
- McKnight, D.H. (2005) 'Trust in information technology', in Davis, G.B. (Ed.): *The Blackwell Encyclopedia of Management, Vol. 7: Management Information Systems*, Blackwell, Malden, MA, pp.329–331
- McKnight, D.H. and Chervany, N.L. (2001–2002) 'What trust means in E-Commerce customer relationships: An interdisciplinary conceptual typology', *International Journal of Electronic Commerce*, Vol. 6, No. 2, pp.35–59.
- McKnight, D.H. and Chervany, N.L. (2006) 'Reflections on an initial trust-building model', in Bachmann, R. and Zaheer, A. (Eds): *Handbook of Trust Research*, Edward Elgar Publishing, Cheltenham, YK, pp.29–51.
- McKnight, D.H., Choudhury, V. and Kacmar, C. (2002) 'The impact of initial consumer trust on intentions to transact with a web site: a trust building model', *The Journal of Strategic Information Systems*, Vol. 11, Nos. 3–4, pp.297–323.
- McKnight, D.H., Cummings, L.L. and Chervany, N.L. (1998) 'Initial trust formation in new organizational relationships', *Academy of Management Review*, Vol. 23, No. 3, pp.472–490.
- McKnight, D.H., Kacmar, C.J. and Choudhury, V. (2003–2004) 'Dispositional trust and distrust distinctions in predicting high-and low-risk internet expert advice site perceptions', *E-Service Journal*, Vol. 3, No. 2, pp.35–58.
- Merritt, M. (2010) *Cybercrime exposed*. Available online at: https://www.symantec.com/content/en/us/home_homeoffice/media/pdf/norton_cybercrime_exposed_booklet.pdf
- Miniwatts Marketing Group (2016) *Internet world statistics*. Available online at: <http://www.internetworldstats.com/>
- Mojares, E. (2014) 'Customer satisfaction and loyalty among Internet banking users of Philippine National Bank in Batangas City', *Asia Pacific Journal of Multidisciplinary Research*, Vol. 2, No. 2, pp.41–48.
- Mukherjee, A. and Nath, P. (2003) 'A model of trust in online relationship banking', *International Journal of Bank Marketing*, Vol. 21, No. 1, pp.5–15.

- Munusamy, J., Run E., Chelliah, S. and Annamalah, S. (2012) 'Adoption of retail Internet banking: a study of demographic factors', *Journal of Internet Banking and Commerce*, Vol. 17, No. 3, pp.1–14.
- Ndubisi, N.O. and Sinti, Q. (2006) 'Consumer attitudes, system's characteristics and internet banking adoption in Malaysia', *Management Research News*, Vol. 29, Nos. 1–2, pp.16–27.
- Nor, M. and Pearson, J.M. (2007) 'The influence of trust on internet banking acceptance', *Journal of Internet Banking and Commerce*, Vol. 12, No. 2, pp.1–10.
- Nsouli, S.M. and Schaechter, A. (2002) Challenges of the e-banking revolution', *Finance and Development – Quarterly Magazine of IMF*, Vol. 39, No. 3, pp.48–51.
- Nunnally, J.C. (1978) *Psychometric Theory*, 2nd ed., McGraw-Hill, New York.
- Oliva, E. (2005) 'Manhunt on Filipino hacker', *Philippine Daily Inquirer*. Available online at: <https://news.google.com/newspapers?nid=2479&dat=20050207&id=Olc1AAAAIIBAJ&sjid=hyUMAAAAIIBAJ&pg=1874,16863947&hl=ko>
- Orji, U. (2014) 'Deterring cyberterrorism in the global information society: a case for the collective responsibility of states', *Defence Against Terrorism Review*, Vol. 6, No. 1, pp.31–46.
- Petrizzini, B. and Mugo, K. (1999) 'The internet in developing countries', *Communications of the ACM*, Vol. 42, No. 6, pp.31–36.
- Pham, L., Cao, N.Y., Nguyen, T.D. and Tran, P.T. (2013) 'Structural models for e-banking adoption in Vietnam', *International Journal of Enterprise Information Systems*, Vol. 9, No. 1, pp.31–48.
- Pikkarainen, T., Pikkarainen, K., Karjaluo, H. and Pahlila, S. (2004) 'Consumer acceptance of online banking: an extension of the technology acceptance model', *Internet Research*, Vol. 14, No. 3, pp.224–235.
- Polatoglu, V.N. and Ekin, S. (2001) 'An empirical investigation of the Turkish consumers' acceptance on Internet banking services', *International Journal of Bank Marketing*, Vol. 19, No. 4, pp.156–166.
- Poon, W-C. (2007) 'Users' adoption of e-banking services: the Malaysian perspective', *Journal of Business & Industrial Marketing*, Vol. 23, No. 1, pp.59–69.
- Preacher, K.J. and Hayes, A.F. (2004) 'SPSS and SAS procedures for estimating indirect effects in simple mediation models', *Behavior Research Methods, Instruments, & Computers*, Vol. 36, No. 4, pp.717–731.
- Preacher, K.J. and Leonardelli, G.J. (2010) *Calculation for the Sobel test website*. Available online at: <http://quantpsy.org/sobel/sobel.htm>
- Ramanathan, B., Roland, C. and Romano, K. (2014) *Philippines Late to Join Digital Banking, but Change Is Coming*, Mckinsey & Company, New York.
- Rotchanakitumnuai, S. and Speece, M. (2003) 'Barriers to internet banking adoption: a qualitative study among corporate customers in Thailand', *International Journal of Bank Marketing*, Vol. 21, Nos. 6–7, pp.312–323.
- Rotter, J.B. (1971) 'Generalized expectancies for interpersonal trust', *American Psychologist*, Vol. 26, pp.443–452.
- Sanou, B. (2015) *ICT facts and figures: the World 2015*, International Telecommunication Union, Geneva, Switzerland. Available online at: <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf>
- Sathye, M. (1999) 'Adoption of Internet banking by Australian consumers: an empirical investigation', *International Journal of Bank Marketing*, Vol. 17, No. 7, pp.324–334.
- Seyal, A.H. (2011) 'Determinants of e-banking among Bruneian corporate customers: an application of theory of planned behavior', *International Journal of E-Adoption*, Vol. 3, No. 4, pp.13–28.
- Seyal, A.H. and Rahim, M.M. (2011) 'Customer satisfaction with internet banking in Brunei Darussalam: Evaluating the role of demographic factors', *E-Service Journal*, Vol. 7, No. 3, pp.47–68.

- Sheshadri, P. and Rani, S. (2014) 'The influence of government support in the adoption of internet banking', *International Journal of Applied Business and Economic Research*, Vol. 12, No. 3, pp.803–811.
- Sohail, M. and Shanmugham, B. (2003) 'E-banking and customer preferences in Malaysia: an empirical investigation', *Information Sciences*, Vol. 150, Nos. 3–4, pp.207–217.
- Sosa, G. (2008) *Country report on cybercrime: the Philippines*. Available online at: http://www.unafei.or.jp/english/pdf/RS_No79/No79_12PA_Sosa.pdf
- Sprinkel, S. (2002) 'Global internet regulation: the residual effects of the "Iloveyou" computer virus and the draft convention on cyber-crime', *Suffolk Transnational Law Review*, Vol. 491, No. 25.
- Srinagesh, P. (1995) 'Internet cost structure and interconnection agreements', in Brock, G. (Ed.): *Toward a Competitive Telecommunication Industry*, Lawrence Erlbaum, Hillsdale, NJ.
- Susanto, A., Lee, H., Zo, H. and Ciganek, A. (2013a) 'User acceptance of internet banking in Indonesia: initial trust formation', *Information Development*, Vol. 29, No. 4, pp.309–322.
- Susanto, A., Lee, H., Zo, H. and Ciganek, A. (2013b) 'Factors affecting internet banking success: a comparative investigation between Indonesia and South Korea', *Journal of Global Information Management*, Vol. 21, No. 2, pp.72–95.
- Tan, F.B. and Sutherland, P. (2004) 'Online consumer trust: a multi-dimensional model', *Journal of Electronic Commerce in Organization*, Vol. 2, No. 3, pp.40–58.
- The Asian Banker and Infosys Technologies Ltd. (2010) *Innovation in retail banking: Asia Pacific*. Available online at: <http://retailbanking.theasianbanker.com/assets/media/dl/whitepaper/InnovationReport22Septembe2010.pdf>
- Venkatesh, V. and Brown, S.A. (2001) 'A longitudinal investigation of personal computers in homes: adoption determinants and emerging challenges', *MIS Quarterly*, Vol. 25, No. 1, pp.71–102.
- Wai, C.P. (2008) 'Users' adoption of e-banking services: the Malaysian perspective', *Journal of Business and Industrial Marketing*, Vol. 23, No. 1, pp.59–69.
- Waite, K. and Harrison, T. (2004) 'Online banking information: what we want and what we get?' *Qualitative Market Research: An International Journal*, Vol. 7, No. 1, pp.67–79.
- Wang, J. and Pho, T. (2009) 'Drivers of customer intention to use online banking: an empirical study in Vietnam', *African Journal of Business Management*, Vol. 3, No. 11, pp.669–677.
- White, H. and Nteli, F. (2004) 'Internet banking in the UK: why are there not more customers?' *Journal of Financial Services Marketing*, Vol. 9, No. 1, pp.49–56.
- Wu, H.Y., Lin, C.C., Li, C.L. and Lin, H.H. (2010) 'A study of bank customers' perceived usefulness of adopting online banking', *Global Journal of Business Research*, Vol. 4, No. 3, pp.101–108.
- Yiu, C.S. Grant, K. and Edgar, D. (2007) 'Factors affecting the adoption of Internet banking in Hong Kong implications for the banking sector', *International Journal of Information Management*, Vol. 27, No. 5, pp.336–351.
- Yousafzai, S., Pallister, J. and Foxall, G. (2003) 'A proposed model of e-trust for electronic banking', *Technovation*, Vol. 23, No. 11, pp.847–860.
- Yousafzai, S., Foxall, G. and Pallister, J. (2010) 'Explaining internet banking behavior: theory of reasoned action, theory of planned behavior, or technology acceptance model', *Journal of Applied Social Psychology*, Vol. 40, No. 5, pp.1172–1202.
- Zheng, L. and Zhong, Y. (2005) 'The adoption of virtual banking in China: an empirical study', *Chinese Business Review*, Vol. 4, No. 24, pp.75–78.
- Zhou, T. (2011) 'An empirical examination of initial trust in mobile banking', *Internet Research*, Vol. 21, No. 5, pp.527–540.