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Australia's Embrace of a Cashless Society: A Quantitative Analysis

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Quantitative Analysis of Australia's Embrace of a Cashless Society

Full research paper

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Abstract

The research paper is the first part of the mixed method approach to determine whether Australia is ready to become a cashless society. First, the rising trend of digital payment methods is investigated, followed by a discussion of the government policies on digital payments and a survey of the level of adoption in cashless transactions. Next, a list of cashless society readiness indicators was established, and a research model for the research topic was introduced. Data from the Global Findex database and statistical data from the Reserve Bank of Australia were analysed to highlight Australia's readiness for adopting a near-cashless society within the research period. As a mixed-method approach was adopted for the research topic, the next step is to interpret quantitative and qualitative data using an integrated approach to provide a better picture of what degree and over what period Australia will become a cashless society in the future.

Keywords: Cashless Society, Digital Payments, Quantitative Analysis, Mixed Method Approach

1   Introduction

Trading in the form of exchanging goods for business has existed since the dawn of civilisation, starting with a barter system that allows parties to obtain the products and services they need (Kenton 2022), the use of physical goods for business transactions was then replaced by commodity money in the form of tokens made from scarce natural resources (Wicks 2018). Metallic coins, made of gold and silver, were firstly introduced in Lydia (in current-day Turkey) around 600 BCE (Orrell & Chlupatý 2016), followed by the circulation of paper money by Emperor Hien Tsung (reign 806-821 AD) in China (Davies 2002). However, the use of coins, banknotes and bank cheques dominated commercial transactions from the mid-20th century (Burge 2015). With the advancements in electronic computer and communication infrastructure in the second half of the twentieth century, different types of digital payment methods were introduced, such as credit cards, bank transfers, mobile payments, pre-paid cards and e-wallets (Al-Laham, Al-Tarawneh & Abdallat 2009). Furthermore, the increasing adoption of smartphone usage enabled the concept of digital wallets, such as Apple Pay and Android Pay, which eliminates the need to carry a physical wallet to pay for goods and services (Burge 2015). Finally, the invention of blockchain technology enabled the birth of digital money in the form of Bitcoin and other cryptocurrencies (Grabowski 2019). The new form of payment raises the question of the need to use cash for business transactions and leads us to a vision of a cashless society soon. A diagram to summarise the evolution of money is shown in figure 1.
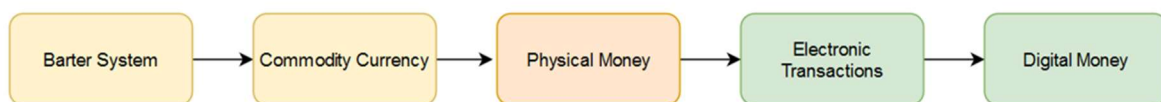

Figure 1. Evolution of Money

2   Digital Payments on the Rise, Cash in Decline

Labelled as the next revolution of financial transactions, electronic currencies and digital payments have been used as the preferred payment method for business transactions by consumers worldwide (Australian Payment Council 2015). As a result, the Australian government introduced substantial policies to promote alternative business payment methods in the mid-2000s (Garcia-Swartz *et al*. 2006). As a result, there has recently been an increasing trend in non-cash electronic payments. In 2018, the total transaction values of cards, credit transfers and electronic debits combined were around 550 billion, compared with the total of 240 billion of the same types of payment methods recorded in 2008 (Australian Payment Council 2015). Furthermore, cash constituted only 19% of Australia's total payments in 2019 (Delaney et al. 2019), as the usage of direct debit and credit cards was at an increasing rate (Finance Monthly 2017). A chart of the number of transactions per capita by year in Australia in 2018 is shown in figure 2.
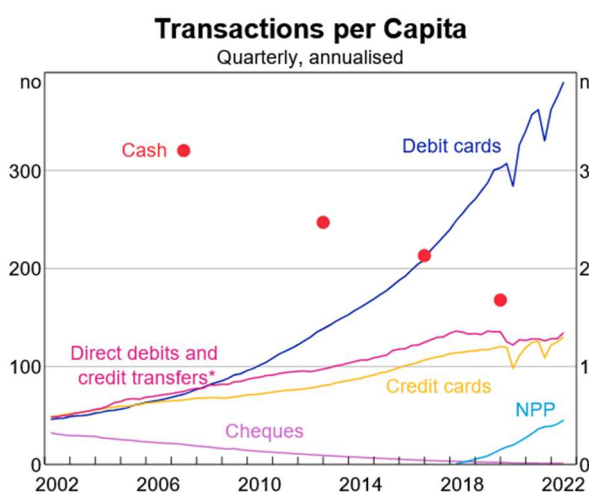

Figure 2. Number of transactions per Capita by Year (Source: RBA 2022)
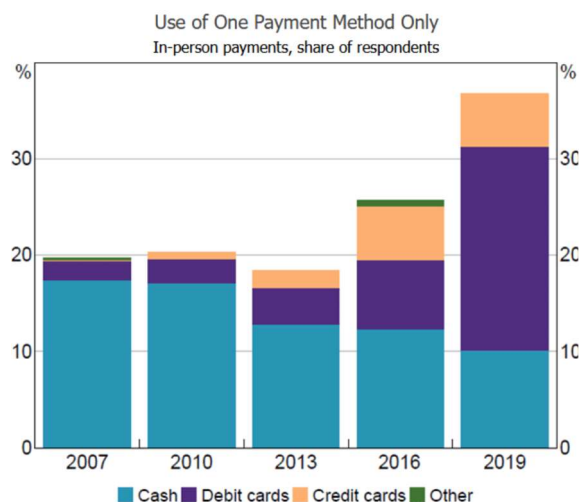

Figure 3. Comparison of Australian consumer payment methods from 2007 to 2019 (Source: RBA 2020)

In a consumer survey conducted by the Reserve Bank of Australia (RBA) (Doyle et al. 2017), the proportion of card payments in Australia consists of 52% of total business conducted as of 2016-17, which is higher than cash payments (37%). There is an indication of an overall increasing trend in non-cash payments for business activities (Payment Systems 2020). The increasing demand for non-cash business transactions by consumers leads to the movement to implement a worldwide cashless payment system to replace cash usage. Figure 3 shows the consumer payment methods in Australia from 2007 to 2016 RBA. Worthington (1995) described a Cashless Society as a place where coins, banknotes and cheques, which are "clumsy and expensive to handle", are not preferred as payment methods. There are credible predictions Australia will become a cashless society by 2020 (Holden 2018). The exponential growth of mobile devices as a payment method enables consumers to pay for goods and services in any location in the world (Humbani & Wiese 2018). The recent introduction of the New Payments Platform (NPP) in 2018 led to a discussion on the readiness to have a "complete cashless society" in Australia (Edwards 2017). In hindsight, we cannot yet claim Australia has completed the transformation to a cashless society. However, the spread of the COVID-19 pandemic forced countries to introduce new business practices, such as a limit on social distancing, closure of restaurants and bars and restrictions on the number of people on business premises, with work-from-home arrangements for most companies (Beck & Hensher 2020). The potential spread of disease via banknotes and coins also prompted the accelerated adoption of cashless payments in business transactions (Allam 2020).

3 Promotion of Cashless Payments in Australia

Reserve Bank of Australia (RBA), the official government body regulating financial payment systems in Australia, puts significant efforts into promoting the transition from cash-based payment to electronic payments. One major reason for the Australian government to implement a cashless-based payment ecosystem was due to the outcome presented in the final report from the Black Economy Taskforce (2017). According to the report, the benefits of replacing cash with digital payment methods are: the payment system shall be more competitive; the cost of payments will be lowered; the quality of transaction data will be improved; a range of different types of payment methods can be offered; the costs of handling physical cash such as storage cost, transportation and monitoring costs can be minimised; finally the potential risk of loss of cash due to theft and cash handling fraud can be reduced (Black Economy Taskforce 2017). In addition, as digital channels are more traceable and reportable, any potential fraud in business payments can be detected compared to cash payments (Black Economy Taskforce 2017).

The Australian government introduced a legislation in 2017 to put a cap on the transaction fee surcharges for each business transaction (McCauley 2017). Another law was established in 2019 to limit the cash payment of $10,000 on any economic activities in Australia (Treasury of Australia 2019). On the other hand, RBA established the New Payments Platform (NPP), along with the introduction of Pay ID, to allow Australians to have an instantaneous money transfer method between two parties (Reserve Bank of Australia 2018; PayID 2019). NPP exchange information relates to the payment transactions of the parties for back-office payment clearing and settlement, thanks to the data-rich nature of the NPP system (NPP 2020). The Fast Settlement Service (FSS) from RBA allows quick settlements between financial institutions' Exchange Settlement Accounts (ESAs) (Rush and Louw 2018). *So, is Australia ready to embrace digital payments for all business transactions at this stage?* In this paper, we investigate current levels of preparedness in replacing cash with cashless technologies, along with the drivers and inhibitors in achieving a cashless society in Australia.

4 Research approach

The aim of the research is to find out the current level of readiness to replace cash with digital payments and to introduce a model to measure the level of readiness for Australia by identifying the drivers and inhibitors for a cashless society in Australia. Firstly, a start on the discussion on the philosophical basis to drive the appropriate research methods for data collection and analysis. The two common research paradigms for scientific research are Positivism and Interpretivism (Galliers 1991). Saunders et al. (2015) suggested a pragmatic approach to selecting the correct methods for social science research. An optimal mix of research approaches is hence needed to find out the answers to the research topic. It was Creswell (2013) who introduced the mixed-method approach, which combines qualitative and quantitative strategies, and can provide a holistic approach to complex social issues. The mixed-method approach takes the strong aspects of quantitative and qualitative research methods to study a complex social science issue in different aspects (Recker 2012). The current study is divided into two parts as a result. The first part of our study adopts a quantitative method to analyse survey data to determine the readiness indicators for adopting digital payment methods. The second part seeks to carry out a lexical

analysis of a selected set of government and commercial documents to gain social opinions on the topics of the cashless society and the digital payment revolution. We will then combine the outcomes of the two analysed datasets to gain an integrated view of the readiness level in Australia to become a cashless society and the drivers and inhibitors to that end in Australia. In the current paper, we are going to concentrate on the first part – the quantitative method and analysis of the research topic.

4.1 Cashless Payments Activities through the lens of Activity Theory

A Cultural-Historical Activity Model (Activity Model, AT) is used as a lens to identify the parties of the cashless payment activities in Australia (Figure 4). Activity Theory provides a tool to understand the interactions between the subject, the object (or objective) and the outcomes and aids in understanding the human activities of the subject being studied (Hasan & Kazlauskas 2014). The main purpose of the use of Activity Theory is to identify the major players for cashless payment for further study. We can see from figure 4 that the major parties for cashless payment activities include rules such as government regulations, the community being the Australian government, the Reserve Bank and other institutions. The tools of the AT model are payment methods and the division of labour. The subject of the AT is the Australian public, and the object is cashless payments. The identified parties are then referred to as the research area in the subsequence research methods. The outcome of the Activity Model provided an informed picture of the network of parties involved in the cashless payment activities. The AT model also helped to identify issues that enable or hinder non-cash payment activities.
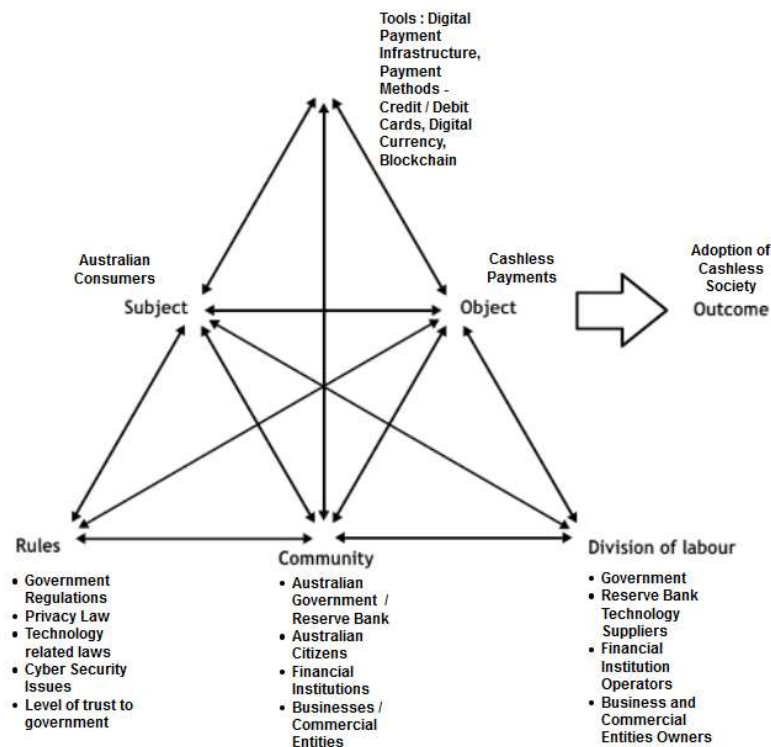

Figure 4. A Cultural-Historical Activity Model for cashless payment activities in Australia

4.2 Cashless Readiness Indicators

In the current research, we seek to define a benchmark to measure the level of readiness for the adoption of digital payment methods in Australia. MasterCard Advisors (Thomas, Jain and Angus 2013) provided a set of indicators for a business environment to move from cash-based payments to a near-cashless business environment. The indicators are: access to financial services, i.e. the level of availability and affordability of financial services and the use of bank accounts and digital payments; macro-economic and cultural factors or the measurements related to cultural and macro-economic satiation, including the level of cash usage, the convenience level of conducting business activities, and the size of the non-official economy; merchant scale and competition meaning the measurements on whether major merchants can take on new payment methods, as well as the level of competition between local businesses; and technology and infrastructure comprising indicators of the ability to access and adopt new technologies and innovations and the advancement of necessary infrastructure. The readiness indicators from the Mastercard Advisors influence the choice of data for the current research.

4.3   A Quantitative Approach

This paper presents the result of the quantitative analysis of data collected for the analysis of the level of Australian financial inclusion compared to the two of the top Cashless states in the world, Sweden and Canada. The first part of the quantitative analysis is to carry out a comparison of financial inclusion indicators from the Global Findex database for Australia and two other countries. The second part of the quantitative analysis is on statistical data from the Reserve Bank of Australia (RBA), with an emphasis on the usage of cashless payment methods, as well as the level of participation in non-cash business transactions in Australia. A conclusion of the analysed results of the two data sets is then presented at the end of the paper.

4.3.1   Global Findex database

The Global Findex database by the World Bank was established to measure and promote financial inclusion status in countries around the world (Demirgüç-Kunt et al. 2018). The data in the Global Findex database was corrected every three years, with three sets of data collected in 2011, 2014 and 2017. The cashless readiness indicators introduced by the Mastercard advisors led to the selection of the following quantitative datasets in the Global Findex database to measure the current situation in Australia: bank account ownership, savings in bank account, debit card ownership, use of the internet for banking, and finally, the use of the internet for shopping. The same dataset category will be compared between different years whenever possible to gain insights on adoption levels through the years. A pictorial view of the financial inclusion indicators selected from the Global Findex database is shown in figure 5.
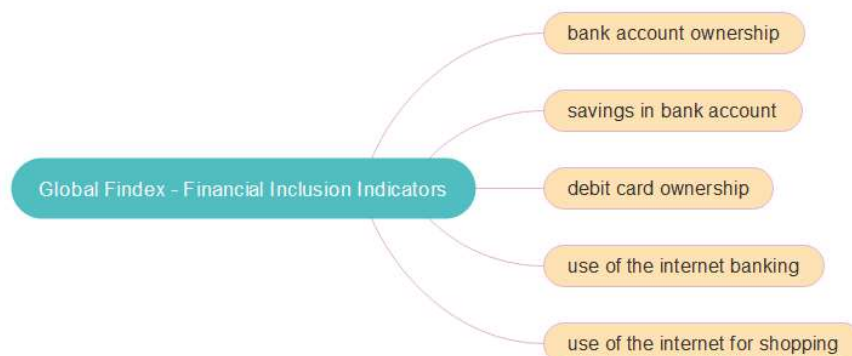

Figure 5. Global Findex financial inclusion indicators (source: Global Findex year 2017)

4.3.2   Statistical Data from Reserve Bank

The Reserve Bank of Australia (RBA) publishes a range of economic and financial data for research purposes. For the current research, we selected a list of statistical data related to using cash and non-cash payments in Australia. The list of datasets from the RBA Statistics website was selected for quantitative data analysis: Banknotes on Issue by Denomination, Detected Australian Counterfeits by Denomination, Debit Cards, Direct Entry and NPP, ATMs, Cheques and Average Merchant Fees for Debit, Credit and Charge Cards. Each RBA dataset will be compared between different years to understand the trend of the development of cash usage in Australia.

5   Quantitative Result Analysis

In this section, we analysed the quantitative data and summarised the findings for further discussion. The selected data sets from the Global Findex database are Bank account ownership, Internet use for bills or purchasing, Debit card ownership and Percentage of debit or credit cards to make a purchase. The selected data sets from RBA are Issue of banknotes in Australia, Credit and debit card transactions, Cash withdrawals by debit cards and Direct entry payments.

5.1   Bank Account Ownership

A graph showing bank account ownership percentages across Australia, Sweden and Canada are shown in Figure 6. From the graph, we can see that Australia's bank account ownership level is close to Sweden

and Canada, the top two cashless countries in the world. Australia displayed a rising trend in the level of bank account ownership throughout the years surveyed.

5.2   Internet use for bills or purchasing

A graph shows the measures of "the percentage of individuals using the internet to pay bills or buy something online in the past year" for Australia, Sweden, and Canada, shown in figure 7. Observation of the graph shows that Sweden and Canada had high percentages of individuals using the internet to pay bills or buy goods and services online than Australia. Therefore, Australia needs to increase internet payment use to over 80% to become a cashless society.
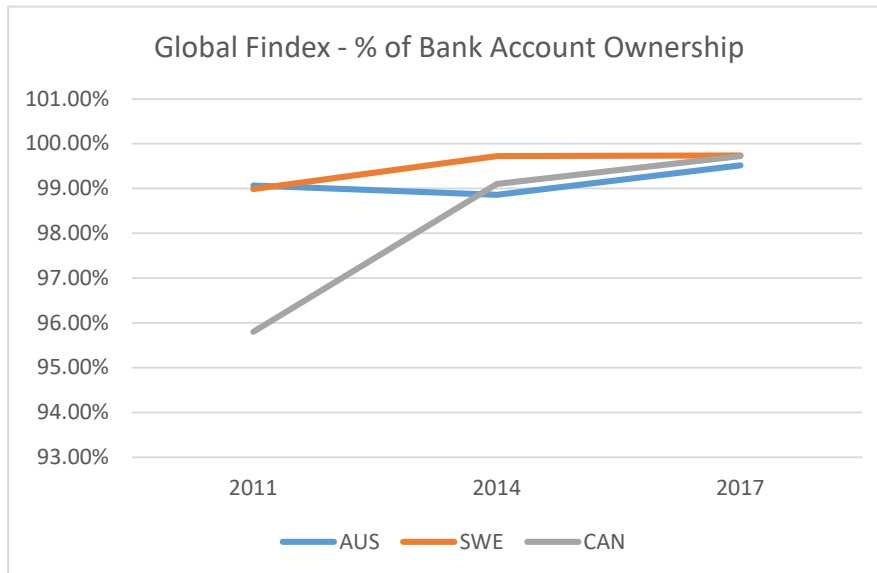

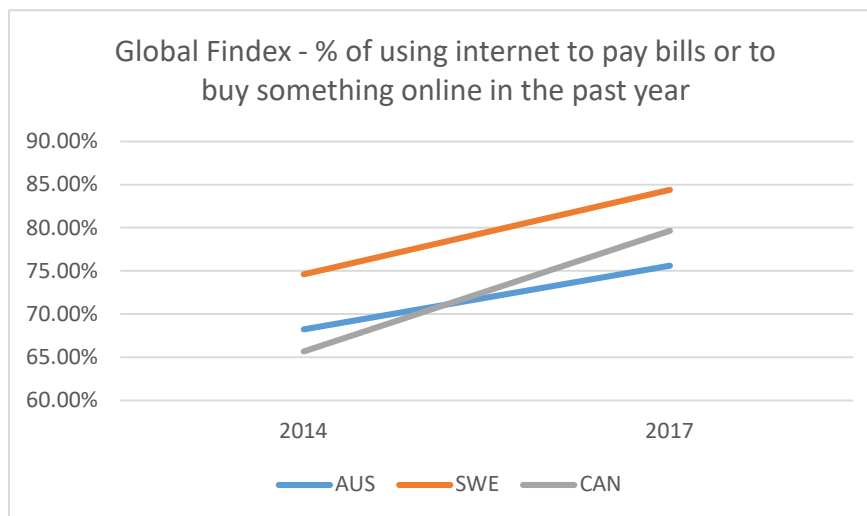*Figure 6. Global Findex - % of Bank Account Ownership*

Figure 7. Global Findex - % of using internet to pay bills or to buy something online in the past year

5.3   Debit Card Ownership

A graph on the percentage of debit card ownership for Australia, Sweden and Canada is shown in figure 8. Both Sweden and Canada had a very high percentage of debit card ownership (98.2% for Sweden and 96.8% for Canada), while debit card ownership in Australia was 90.0%, close behind Sweden and Canada. Australia should aim to raise debit card ownership to over 95% in order to increase its cashless status.

5.4   Percentage of debit or credit cards to make a purchase

The percentages of debit or credit cards used for purchases in the past year for Australia, Sweden and Canada are shown in figure 9. The combined % of payments of both debit and credit cards provided a

clear indication of the level of cashless transaction adoption in a country. In particular, both Canada and Sweden show a high percentage of card payments. Australia should aim to raise the percentage of card payments for purchases to over 95% for better adoption as a cashless society.

5.5   Issue of Banknotes in Australia

A graph of the values of banknotes issued by the RBA by different types of denominations is illustrated in figure 10. The figures from RBA showed that there is an increasing year-on-year demand for high-value banknotes in Australia. This phenomenon exists even though Australia has increasingly adopted digital payment methods throughout the years. However, cash is still an important monetary tool for backup payments and storage of wealth (Guttmann et al. 2021).
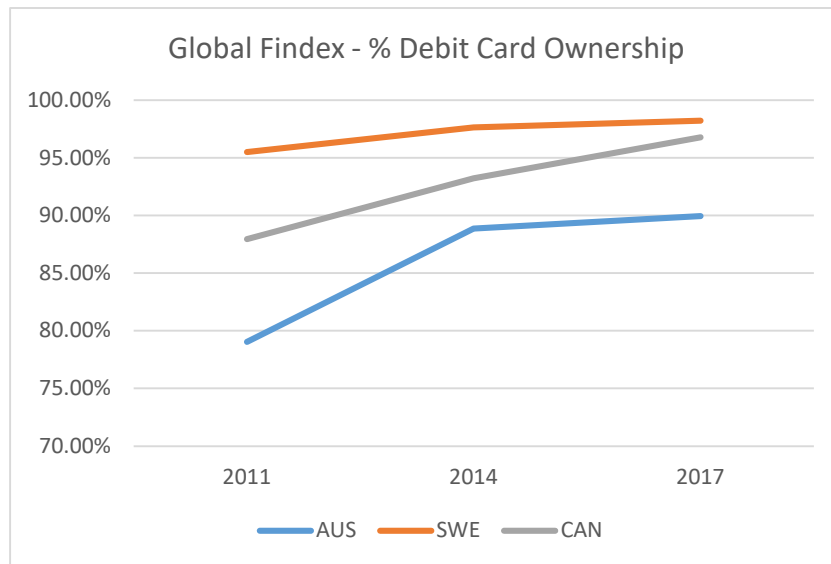

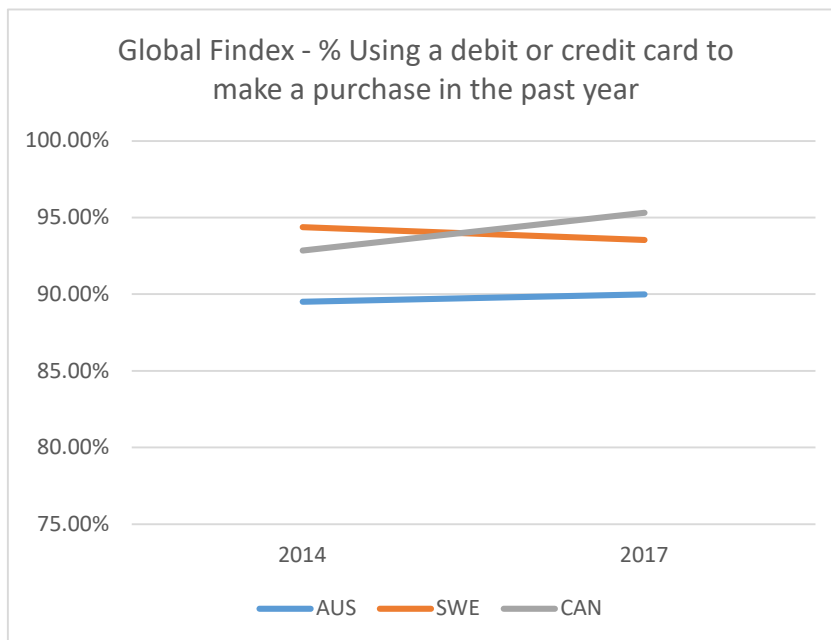*Figure 8. Global Findex - % of Debit Card Ownership*

Figure 9. Global Findex - % of Debit Card Ownership

5.6   Credit and Debit Card Transactions

A graph of the number of credit and debit card transactions in Australia is shown in figure 11. From the graph, we can see there is an increasing trend in using credit and debit cards for business transaction payments. Debit card payments have become more popular than credit card payments since 2007.

5.7 Cash Withdrawals by Debit Cards

A graph of the total number of cash withdrawals by debit cards in Australia is shown in figure 12. We can see from the graph that the total number of cash withdrawals by debit cards has declined since December 2008 due to the reduction of cash usage by business payments. Furthermore, a sharp fall in the total number of cash withdrawals by debit cards in April 2020 due to the Covid lockdown is noted.

5.8 Direct Entry Payments

A graph of the total number of direct entry payments (for credit and debit transfers) in Australia is shown in figure 13. Based on the graph, the total number of direct entry payments in Australia saw a rising trend throughout the survey period.
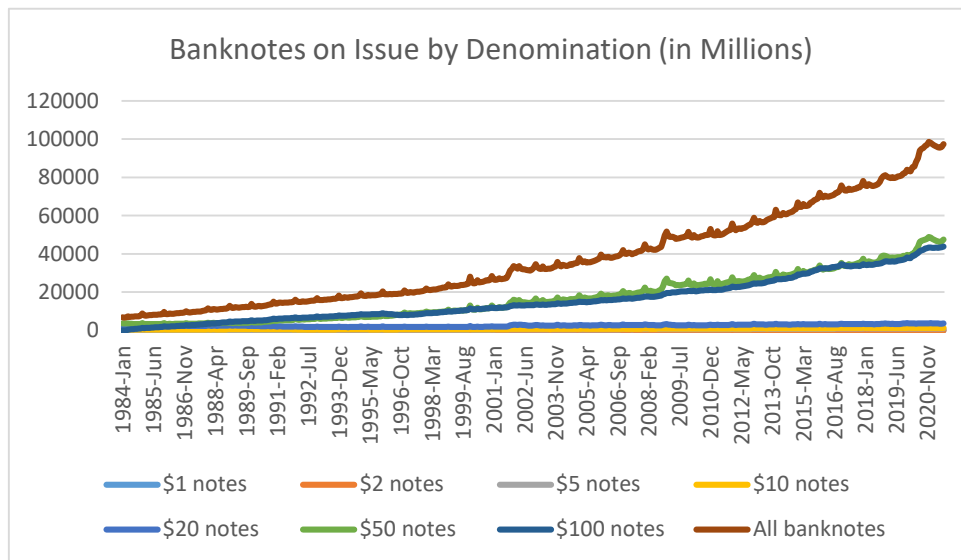

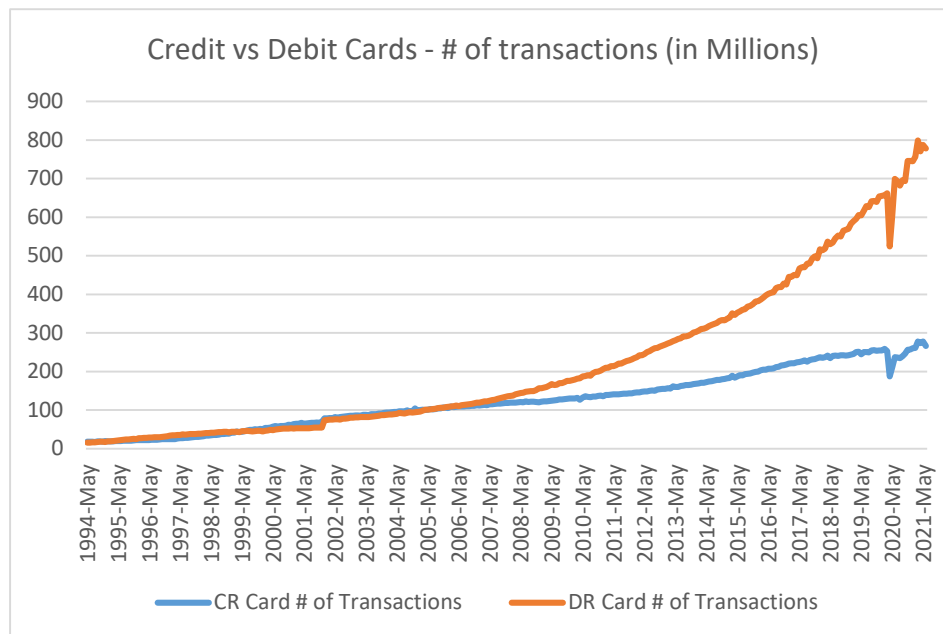*Figure 10. RBA Data - Banknotes on Issue by Denomination*

Figure 11. RBA Data - Number of Credit and Debit Card Transactions in Australia

6 Conclusion

The current chapter aims to determine Australia's readiness to become a Cashless society through collected statistical data from different sources. The first set of quantitative data was extracted from the survey data between 2012 and 2017 in the Global Findex database. The analysed bank account ownership result showed that the bank account ownership level in Australia is comparable to the top

two cashless countries in the world. Regarding debit and credit card ownership, Australia needs to raise the level of debit and credit card ownership and usage to promote its cashless status. Also, on the usage of the internet for business transaction activities, Australia needs to increase the usage of the internet to pay bills or buy something online in order to be comparable to the top cashless countries like Sweden and Canada. The second set of quantitative data was extracted from the statistical data from the Reserve Bank of Australia. Firstly, figures from RBA showed that despite an increase in the level of adoption of digital payment methods, there is surprisingly an increasing year-on-year demand for high-value banknotes in Australia. There is, however, a decline in the number and the value of cash withdrawals by debit cards, indicating that Australia has shifted to paying for goods and services via digital methods instead of cash. Regarding the usage of credit and debit cards, the RBA data showed that both numbers of transactions and the total values of payments for business transactions by cards are increasing throughout the surveyed years. RBA data showed that debit card payments have become more popular than credit card payments. Also, the number of direct debit payments and usage of the New Payment Platform (NPP) is in steady increase throughout the survey years. Finally, the number of counterfeit banknotes detected and the usage of cheques as a payment method have declined in recent years, probably due to the demise of cash payments.As a mixed-method approach was adopted for the research topic, the next step is to combine quantitative and qualitative data using an integrated approach to provide a better picture of what degree and over what period Australia will become a cashless society in the future.
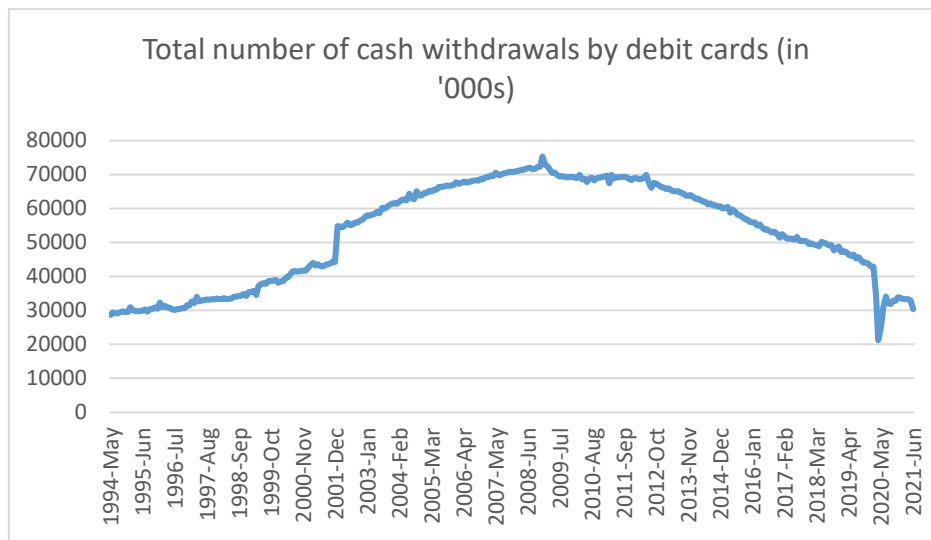

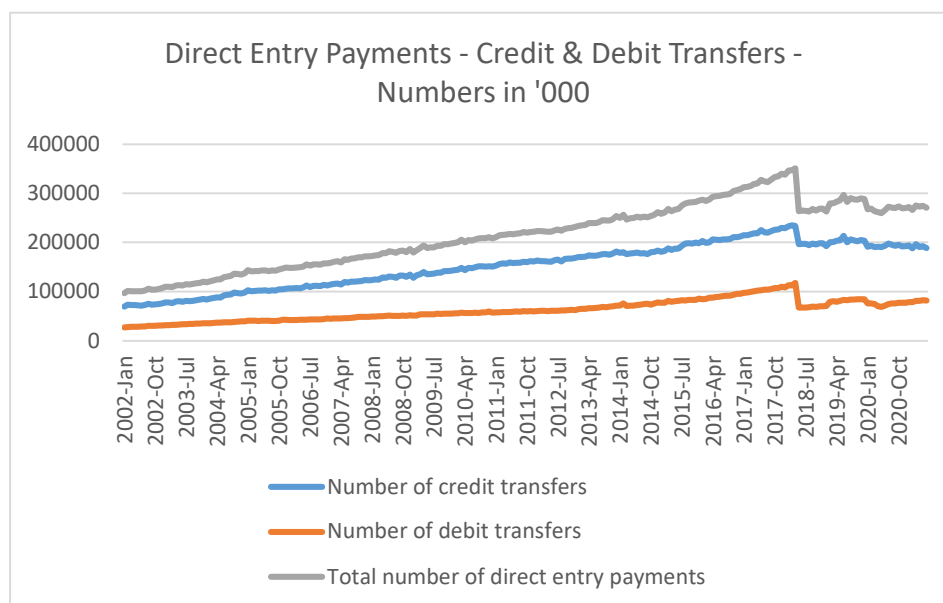*Figure 12. RBA Data – Total Value of Cash Withdrawals by Debit Cards in Australia*

Figure 13. RBA Data – Total Number of Direct Entry Payments in Australia

7 References

Al-Laham, M., Al-Tarawneh, H. and Abdallat, N., (2009). Development of electronic money and its impact on the central bank role and monetary policy. Issues in Informing Science and Information Technology, 6, pp.339-349.

Allam, Z., (2020). *The Forceful Re-evaluation of Cash-Based Transactions by COVID-19 and Its Opportunities to Transition to Cashless Systems in Digital Urban Networks. Surveying the Covid-19 Pandemic and its Implications*, viewed 2 November 2020 https://www.ncbi.nlm.nih .gov/pmc/articles/PMC7378511/ p.107.

Australian Payment Council (2015). *Fact Based Australian Payment Plan*, viewed 26/10/2019, https://australianpaymentscouncil.com.au/wp-content/uploads/2015/12/Australian-Payments-Plan-Fact-Base.pdf

Australian Payment Network (2019). *Australia's move towards a less cash economy*. Australian Payment Network.

Beck, M.J. and Hensher, D.A., (2020). *Insights into the impact of COVID-19 on household travel and activities in Australia–The early days under restrictions*. Transport Policy.

Black Economy Taskforce (2017). *Black Economy Taskforce Final Report*, The Treasury, Australian Government.

Burge, B. (2015) Old and Stable Versus Young and Restless. Counting Currency website.

Buzan, T. and Buzan, B., (2006). *The mind map book*. Pearson Education.

Creswell, J.W., (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Davies (2002). A History of Money. From Ancient Times to the Present Day. UNIVERSITY OF WALES PRESS, CARDIFF 2002.

Delany et al. (2019). *Cash Use in Australia: Results from the 2019 Consumer Payments Survey*. Reserve Bank of Australia.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. and Hess, J., 2018. *The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution*. The World Bank.

Edwards, M (2017). *Is Australia on the brink of becoming a completely cashless society?* ABC.net.au Website, viewed 26/10/2019. https://www.abc.net.au/news/2017-03-27/is-australia-on-the-brink-of-becoming-cashless-society/8377288

Finance Monthly (2017). *The World's Top 10 Cashless Countries in 2017*, viewed 26/10/2019, https://www.finance-monthly.com/2017/10/the-worlds-top-10-cashless-countries-in-2017/

Galliers, Robert. (1991). *Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy*. The Information Research Arena of the 90s. 155–173.

Garcia-Swartz, D.D., Hahn, R.W. and Layne-Farrar, A., (2006). The move toward a cashless society: a closer look at payment instrument economics. *Review of network economics*, 5(2) pp.175-198.

Grabowski, M., (2019). Cryptocurrencies: A Primer on Digital Money. Routledge.

Guttmann, R., Pavlik, C., Ung, B. and Wang, G., 2021. Cash Demand during COVID-19. 1. 1 Cash Demand During COVID-19 2. 12 Property Settlement in RITS 3. 21 From the Archives: The London Letters 4. The Anatomy of a Banking Crisis: Household Depositors in the Australian 33 Depressions, p.1.

Hasan, H. and Kazlauskas, A., (2014). *Activity theory: Who is doing what, why and how*. University of Wollongong Faculty of Business Archive.

Holden, R (2018). Welcome to cash-free Australia, University of NSW Website, viewed 26/10/2019. https://newsroom.unsw.edu.au/news/business-law/welcome-cash-free-australia

Humbani, M. and Wiese, M., 2018. A cashless society for all: Determining consumers' readiness to adopt mobile payment services. *Journal of African Business*, 19(3), pp.409-429.

Kenton, W. (2022) Barter (or Bartering). Investopedia website. Retrieved on 9 May 2022. https://www.investopedia.com/terms/b/barter.asp

McCauley (2017). *Excessive credit card surcharges are now illegal across Australia*, news.com.au, viewed 26/10/2019, https://www.news.com.au/finance/money/costs/excessive-credit-card-surcharges-are-now-illegal-across-australia/news-story/d88cafbf97096fcc56f63951e388057f

NPP 2020. NPP - *The Platform* viewed 26/04/2020, https://nppa.com.au/the-platform/

Orrell, D. and Chlupatý, R., (2016). The evolution of money. In The Evolution of Money. Columbia University Press.

PayID (2019). *How does PayID work*, viewed 26/10/2019, https://payid.com.au/#what

Payment System (2020), *Reserve Banks of Australia*. Viewed 26/10/2019, https://www.rba.gov.au/payments-and-infrastructure/payments-system.html

RBA (2020). *Consumer Payment Behaviour in Australia: Evidence from the 2019 Consumer Payments Survey*. Reserve Bank of Australia, September 2020.

RBA (2022). *Payments System Board Annual Report – 2022*. Reserve Bank of Australia, September 2022.

Recker, J., (2012). *Scientific research in information systems: a beginner's guide*. Springer Science & Business Media

Reserve Bank of Australia (2018). *The New Payments Platform and Fast Settlement Service*, viewed 26/10/2019, https://www.rba.gov.au/publications/bulletin/2018/sep/the-new-payments-platform-and-fast-settlement-service.html

Rush, A. and Louw, R., (2018). *The New Payments Platform and Fast Settlement Service*. RBA Bulletin, September.

Saunders, M., Lewis, P. and Thornhill, A. (2015). *Research methods for business students*. 7th ed. Pearson Education U.K.

Thomas, H., Jain, A. and Angus, M., (2013). *The global journey from cash to cashless*. MasterCard Advisors' Cashless Journey, pp.1-15.

Treasury of Australia (2019). $10,000 cash payment limit. The Treasury of Australian Government. Viewed 07 Aug 2022, https://treasury.gov.au/sites/default/files/2019-10/28454_factsheet_addressing_the_myths_about_the_cash_payment_limit_.pdf

Watson (2020). *Australians shun cash in 2020, but 70% still oppose a cashless society*. Mozo website, viewed 18 August 2020, https://mozo.com.au/bank-accounts/articles/australians-shun-cash-in-2020-but-70-still-oppose-cashless-society

Wicks, R.S., (2018). Money, markets, and trade in early Southeast Asia: the development of indigenous monetary systems to AD 1400. Cornell University Press.Weatherford, J., 2009. The history of money. Currency.

World Bank (2020). *Global Financial Inclusion (Global Findex) Database - About*. The World Bank, viewed 18 August 2020, https://microdata.worldbank.org/index.php/catalog/global-findex/about

Worthington, S., (1995). The cashless society. *International Journal of Retail & Distribution Management*. 23(7) pp.31-40.

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