Knowledge Leadership

Credit Cards as the Optimal Way to Pay: A Cost/Benefit Analysis from the Consumer Perspective

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Launched in 1993, the MasterCard Worldwide Index of Consumer Confidence has proven to be an excellent barometer of the general consumer pulse in Asia/Pacific. The twice annual survey analyzes prevailing consumer perceptions of economic conditions for the next six months. Its insights into the dynamics of consumer sentiment, and the market paradigm deliver value to a variety of audiences, including customers and business partners.

In 2003, MasterCard established the MasterIntelligence Knowledge Panel comprising leading economists and business strategists from China, Hong Kong, India, Japan, Korea and South East Asia. In 2006, it was expanded to become a global knowledge panel, which now conducts research and provides insights on the economic and business environment globally. The panel is headed by Dr. Yuwa Hedrick-Wong, Economic Advisor (Asia/Pacific), MasterCard Worldwide.

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Credit Cards as the Optimal Way to Pay: A Cost/Benefit Analysis from the Consumer Perspective

Credit cards represent one of very few readily available personal lines of credit that people can quickly access without approval from a bank.

Executive Summary

This report develops a comprehensive analysis to assess the costs and benefits of paying with credit cards from the perspective of the consumer. The consumer perspective is particularly important today as the global credit crisis continues to unfold; the readily-available personal line of credit embodied in a credit card remains one of the few sources of credit that consumers can immediately access and manage without requiring approval from the bank.

In brief, this report concludes the following:

• Credit cards offer significant financial benefits: the payment float is longer than that of the check; and many discounts and rewards are offered to credit card holders that are not as easily available with other payment methods.

• Credit cards offer greater convenience and security as well; less cash needs to be carried and more purchase options are available when a credit card is used—such as e-commerce and cross-border purchases.

• The easy access to short-term credit that a credit card offers in a fairly unique manner is also a decided advantage. In addition to being beneficial to individual consumers, the many individuals that own small/medium enterprises (SMEs) also regularly use the credit capabilities of credit cards to overcome any difficulties they might face in accessing conventional credit. The value of this benefit will certainly become even more important in a more credit-constrained post-crisis economy.

• Credit cards also provide a unique capacity for consumers to solve certain predicaments or take advantage of unanticipated opportunities— impulse purchases can be made immediately as well as an urgent purchase to handle an emergency are also made much easier.

• Finally, credit cards also offer greater administrative benefits as well—for example, in terms of recordkeeping.

1. Introduction

Improvements in technology and innovations in the financial sector now give consumers more choices of how to pay for their purchases at the point of sale. They can use cash, checks, credit cards, debit/EFTPOS cards or stored-value cards. In the near future, payments using mobile phones will become commonplace, especially in Asia/Pacific where the highest mobile phone penetration rates are found; this is a facility that Japanese consumers already enjoy.

This proliferation of payment modes raises the question of which form of payment is the optimal one, for consumers as well as for society as a whole. Such a question is particularly pertinent given controversies over some of these payment modes. Since each alternative payment method has benefits and costs attached to its use, a cost/benefit approach is used to determine which is the most efficient method of payment.

This report approaches the question from the perspective of the consumer. After all, the intricate credit card chain—which includes the consumer as a cardholder, the issuing bank, the merchant, the merchant's bank and the network backbone for the transaction— exists in order to facilitate purchases. Moreover, it is the consumer for whom policymakers make regulations, over whom merchants compete, and for whose business the issuing banks aim to acquire. There are, of course, social costs and benefits that might exist in addition to those that consumers experience. These are also assessed in this report; but it is the net benefit to consumers that will be used in assessing the optimal mode of payment for consumers.

This study aims to understand these issues from an overall perspective, but specific attention is paid to developments in Asia/Pacific. Due to the availability of data, Australia was chosen as the case study for a quantitative assessment.

The Industry Context

The credit card industry stands out from other industries due to a number of fundamental features that need to be understood for further analysis of the subject. First, unlike others, the credit card industry is a two-sided market where there are essentially two sets of customers.[1] Firms supply products for two inter-related groups of end-users, the cardholders and the merchants.

Second, the industry functions primarily as an oligopoly where there are only a very few truly large global players. The barriers to entry are high as a result of the very substantial set-up costs involved, implying that economies of scale are important in this business. Consumers tend to gravitate towards the cards that provide maximum reach plus the most efficient services and fees.

Third, there is also some degree of interoperability among card plans, a trend that has increased in importance over time. This produces the phenomenon of collaborative competition in the industry which essentially allows credit card programs to expand in scale without new setup costs. Consumers also benefit from being able to access a greater variety of outlets and cash machines.[2]

Fourth, there is considerable heterogeneity among consumers. Some consumers may value the importance of convenience more than a faster transaction time while others may prioritize the easier access to short-term credit facilities. Studies have found that consumers exhibit strong and distinct payment preferences, with different segments valuing benefits differently.[3] This creates a vast market involving different interests. Similarly, merchants are also heterogeneous and can be characterized for their specific needs.

The Macroeconomic Context

The period of extraordinarily high global growth in 2004-2007 began to unravel with the financial turbulence which began in August 2007. The year 2008 saw this turbulence turn into a full-fledged financial crisis affecting developed and emerging markets alike. This crisis, as it happens, has important consequences for this analysis; one of which will certainly impact consumer spending in many ways. Some of the more important effects include:

- Consumers' disposable incomes have peaked: The high rates of employment and rapid expansion of wages translated into rising disposable incomes in many markets in the global economy, thus provided consumers considerable latitude in their spending and payments habits. The coming few years will see a substantial deceleration of economic growth, which will undermine consumer confidence. All of this will lower disposable incomes, either through reduced income growth, or higher precautionary savings, or both.

- Asset bubbles are bursting, deflating consumers' propensity to borrow and spend: Price bubbles in assets such as housing and equities in numerous countries bolstered consumer confidence, encouraging consumers to take on more debt on the back of inflated asset prices.[4] Consumers withdrew equity from their homes to support their consumption in some markets such as the United States; while the huge real estate

Credit cards are unique in their capacity to permit urgent purchases in unexpected situations and emergencies.

Debit cards are quickly becoming an important payment tool for people primarily interested in the convenience that these cards offer.

boom in other markets such as the United Kingdom, Spain, Denmark, Ireland, and in Eastern Europe boosted household wealth and thus spending. Since 2006, house prices have fallen significantly in all these economies. The resulting negative wealth effects will tend to impede consumers' ability and willingness to take on debt.

• Risk appetites will fall further: The unusually benign global economy in 2004-2007 lulled many into a false sense of security, encouraging consumers and financial institutions to take on more risk than previously and to price this risk in a rather careless manner. For example, banks lowered minimum income requirements and concentrated on what they thought were better credit assessment metrics in their lending practices. This probably resulted in the inclusion of many financially-weak individuals to borrow without collateral.[5] Now, the gloomier economic outlook is causing lenders to be more apprehensive about any new lending as the risks of default rise with growing unemployment. As the risk of job losses grow, consumers are also becoming warier of spending and borrowing.

Consequently, in the upcoming one to two years, the following are expected:

• Default rates to rise: Banks are becoming wary about their receivables and are beginning to be more rigorous in how they settle overdue credit card debt. Credit card charge-off rates have been rising around the world. In the United States, banks charged off 5.47% of all credit card loans in the second quarter of 2008 representing US$50 billion of debt compared to the charge-off rate in 2007 of 3.85%.[6] This figure could easily increase to around 10% in 2009 in the US, according to Innovest.[7] In Hong Kong, the charge-off rate in the third quarter of 2008 was 2.7% (quarterly annualized rate). The evidence in Singapore suggests that concerns over rising defaults are already prompting card issuers to monitor their customers more aggressively.[8]

• Increased interest rates across all credit cards: In response to higher risk of defaults, credit card issuers are already raising their interest rates. For instance, Citigroup announced higher credit card interest rates after having pledged not to do so earlier.[9] This will raise the rates to more than 20% from the current 17% in the United States, increasing the pressure on consumers. In Australia, credit card interest rates are almost 19.75%, compared to an 18.0% average in 2007.[10]

In spite of this gloomy short-term outlook, there is nothing in the global economy or in Asia/Pacific that is so broken that it cannot be fixed or rehabilitated within a reasonable period of time. The massive policy response by governments and central banks in virtually all key markets in the world—aggressive cuts in interest rates, the beginnings of direct expansion of money supply, substantial re-capitalization of financial institutions, the purchase of bad assets from these same financial institutions, innovative measures to improve liquidity in critically important financial markets such as those for commercial paper, and huge fiscal stimulus packages—will cumulatively allow the global economy to bottom out before the end of 2009.[11] Afterwards, employment conditions will start to improve, thus boosting consumer confidence and reducing the risk aversion of financial institutions. While the boom of the last half-decade will certainly not be replicated for some time to come, global and regional economic prospects will likely improve sufficiently to allow the lending and transaction use of credit cards to recover relatively quickly.

2. Trends in Payment Modes and Consumer Behavior

In general, credit card users can be placed into two categories. There are the 'transactors' who use the card only for the payment convenience it offers' and there are others who along with the basic transactional conveniences offered by the card also enjoy its credit extension ability. Those in this group are the 'revolvers.' The difference between the revolvers and transactors will be mentioned several times in the report to clarify the difference in their usage patterns. Each has its own market but often the target segments coincide.

A number of recent trends can be observed in the payments industry:

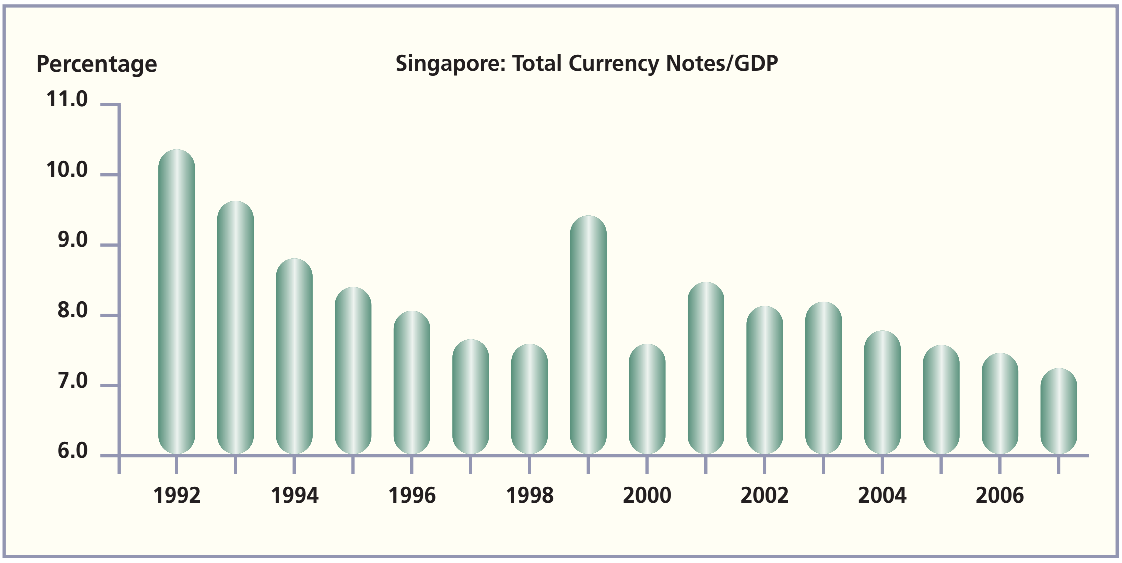
- While cash is still most commonly used in retail payment, the value of each cash transaction is decreasing;
- Debit cards are fast becoming an important payment tool for the cardholders who are only interested in the conveniences of the card;
- Checks are now being limited to large-value transactions like monthly bill payments, employee compensation, etc. The dominance of checks in the retail environment is rapidly decreasing;
- Consumers are now holding more than one card: clearly, they seek to maximize the benefits from each card; and
- The belief in using future income to purchase goods at present has become an accepted pattern of consumer spending.

Lower Reliance on Cash in the Last Five Years

The proliferation of electronic payments has become more evident in the last five years than ever before. This period has been a turning point for electronic payment schemes as the emphasis has shifted away from the use of cash at the point of sale. Chart 2.1 shows a falling trend of the total currency in circulation in Singapore as a percentage of total output.

While cash is still the most commonly used form of payment, cash is increasingly being used only for low-cost transactions.

Chart 2.1 Use of Currency Declining Sharply in Singapore



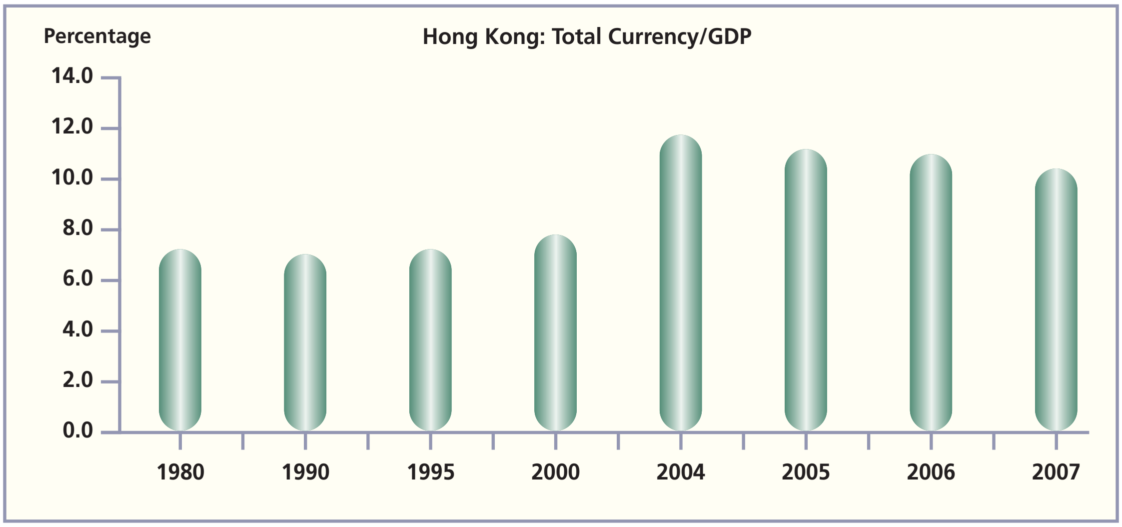
Source: Monetary Authority of Singapore and CEIC Databases.
Note: The upward blip in 1999 is a statistical quirk due to the consolidation in the banking sector that year.

A similar trend can be observed in Hong Kong as shown in Chart 2.2. This implies that the amount of physical currency required to produce an extra unit of output is decreasing. Thus, cash is being replaced by the numerous other payment schemes available in the market.

In Australia, as Chart 2.3 shows, cash remains the dominant form of payment, accounting for more than 35% of the total value of all transactions in the economy. But interestingly, cash also accounts for approximately 70% of the daily volume of transactions.[12] Once again, this suggests that consumers are increasingly using cash for small-value transactions only. Both debit cards and credit cards are believed to be replacing the retail transaction space vacated by cash transactions.

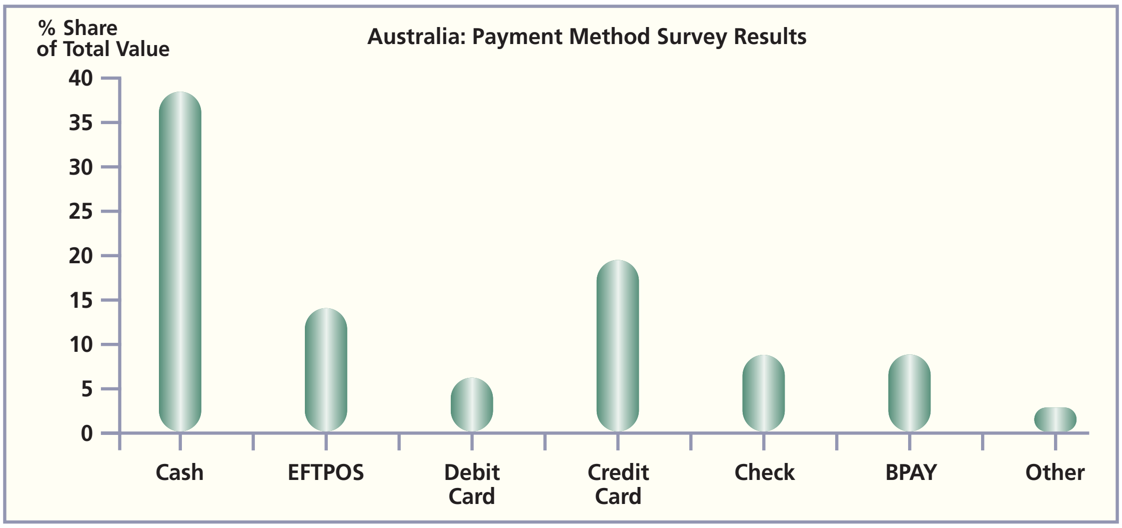
In the powerful economy of Hong Kong, cash has remained rather stagnant—representing just a modest fraction of the Gross Domestic Product.

Chart 2.2 Stagnancy in Cash Growth in Hong Kong



Source: CEIC Database.

Chart 2.3 Cash Still Has the Highest Share of Payments



Source: RBA Payment System Board Annual Report 2008, Roy Morgan Research.
Note: Rounding errors present.

New Competitors Emerging: Debit Card

As mentioned earlier, consumers today have a wide variety of payment instruments to choose from: While checks have been around longer than credit cards, new entrants include debit cards and other EFTPOS mechanisms which appeal to the convenience user. Table 2.1 shows the increasing trend of debit and credit cards per person over the years. While the acceptance of debit cards in the United States has been slow, because credit cards are so prevalent; the increase in the number of debit cards held by individuals in other countries has grown rapidly.

In all other countries mentioned in Table 2.1, the average individual holds more debit cards than credit cards. This suggests two important points:

• First, consumers who already own a high number of cards will be reluctant to shift to a new system. This is evident in the case of the United States where the number of credit cards held by a consumer was already more than four cards in 2000. Thus, there is a reluctance to let go and accept a new type of card when cardholders are satisfied with what they presently have.

• Second, many consumers appear to be more interested in the transactional convenience offered by a card rather than credit.

Although relatively new, debit cards are a convenient payment choice and have quickly become popular for many of the world's shoppers.

Table 2.1 Number of Cards per Inhabitant in Various Economies

	Debit Cards			Credit Cards		
	2000	2003	2007	2000	2003	2007
Canada	1.2	NA	NA	0.3	1.7	2.0
Japan	NA	3.1	3.3	1.8	2.1	2.3 (1)
Singapore	0.7	1.4	1.9 (2)	0.6	0.9	1.2
United Kingdom	0.8	1.1	1.2	0.9	1.1	1.1
United States	0.9	0.9	0.9	4.5	4.4	4.4

Source: BIS Statistics on payment and settlement systems in selected countries– Figures for 2007.
Note: (1) Refers to 2005 figure (2) Refers to 2006 figure (3) Debit cards include immediate debit like an EFTPOS and delayed debit function cards.

However, it appears that they do prefer to keep a credit card for urgent purchases whenever they're required. This is evident from Chart 2.4 which shows that while total billings have been increasing in Singapore, rollover balances have risen only gradually.[13]

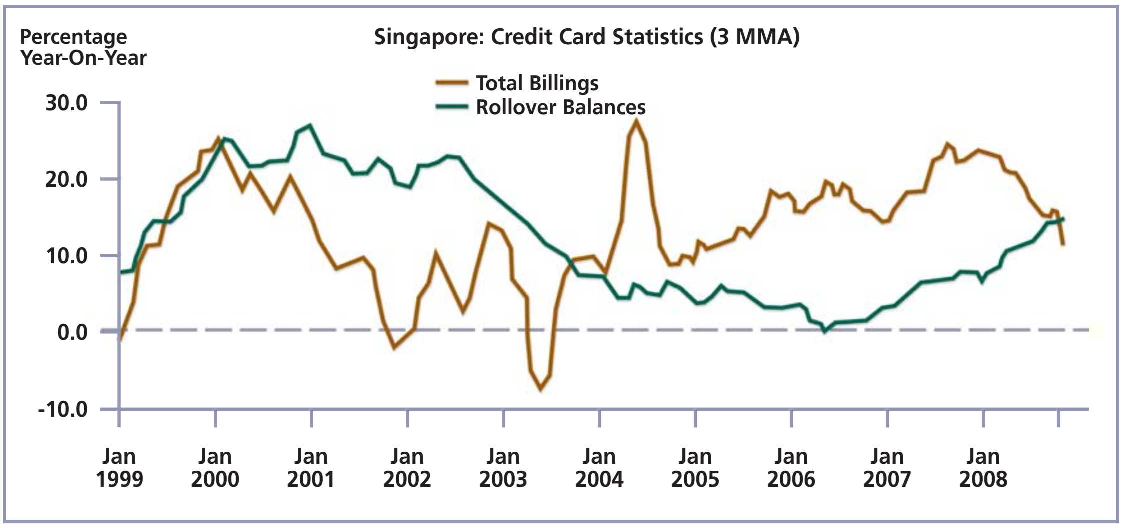
• A trend similar to that of Singapore can also be seen in Hong Kong as shown in Chart 2.5.

In Singapore, while the amount being spent by cardholders has risen, the balance being rolled over has seen only a gradual increase.

Checks Becoming Obsolete as a Retail Payment Tool

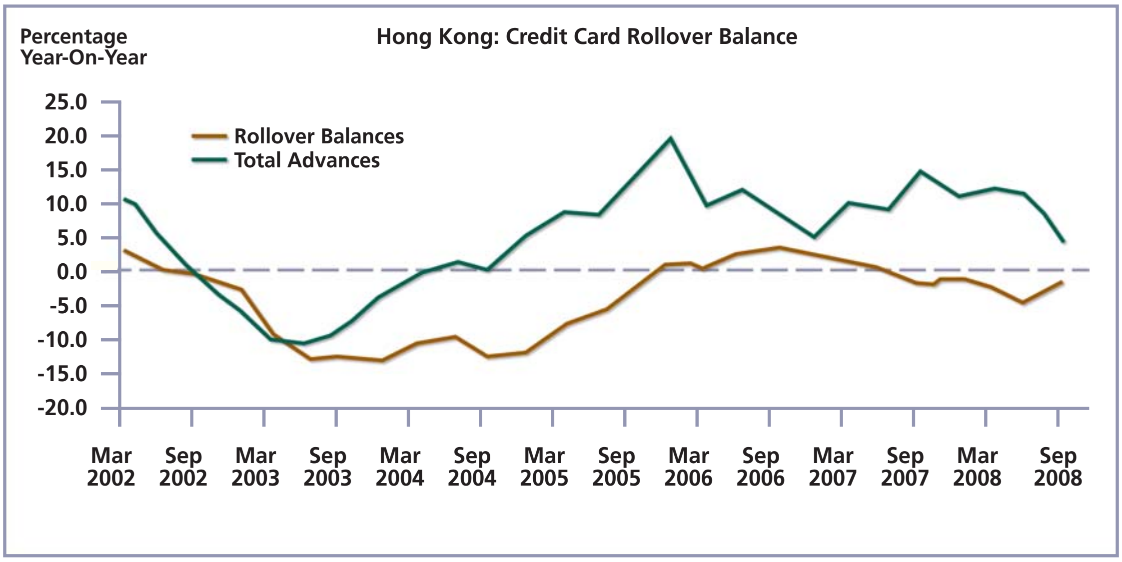
Checks are now becoming limited to large-value transactions like bill payments and salary compensation. In Singapore, a total of 85.6 million checks were used for transactions in 2007 compared to 87.6 million in 2003, with this decreasing trend being quite consistent over time. However the total value of transactions

Chart 2.4 Total Billings Surpass Rollovers



Source: CEIC Database.

Chart 2.5 Transactional Use Growing Faster



Source: CEIC Database.

completed using checks has increased from SG$392 million in 2003 to SG$670 million in 2007.[14] The data show that while the volume of transactions is falling, the value is increasing; which suggests that per-transaction value has risen considerably.

The possible explanation for this trend in check usage could be:

- The processing time is too long: When compared to other payment tools, the time consumed in the process of a check payment is substantially higher. Card payments are short and completed in a matter of seconds. On the other hand, larger value transactions like bill payments and employee compensations do not need to be serviced as quickly as in the case of retail transactions.

- The risk of the check being dishonored: With check payments, the merchant undergoes the concern whether the consumer has sufficient funds in the bank for the check to be honored.

Check usage is now gradually being replaced by credit cards that are now also being used for higher-value transactions.

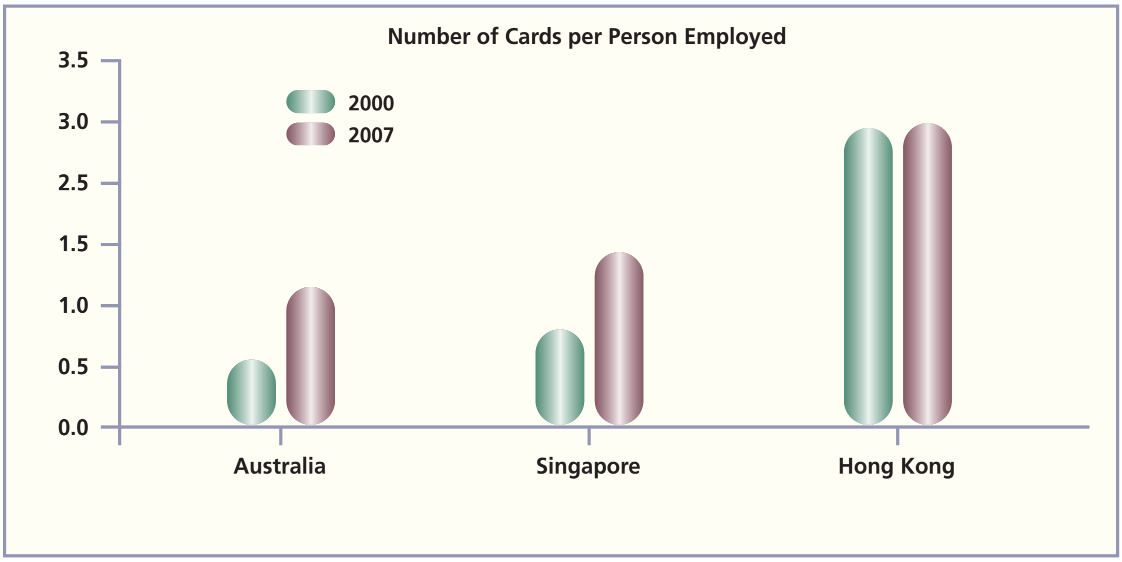
Credit Card Issuance: Consumers Holding More Than One Card

As credit cards permeate the economy, the customer's willingness to carry more than one card also increases. Quite often, each card has specific benefits and consumers are able to reap different benefits specific to each. However, as Chart 2.6 shows, in economies where individuals already hold more than two cards, the marginal benefit from an extra card is limited and as a result the growth is slower.

- Card with specific benefits: Citibank Singapore joined with the Singapore Mass Rapid Transit (SMRT) Corporation, a multi-modal transport provider, to develop a credit card that serves the commuter market.[15] Recently, the Land Transport Authority (LTA) of Singapore introduced credit cards as a means of payment for road usage charges in the Electronic Road Pricing (ERP) system.[16]

Today, checks are more often being used for larger-value transactions like paying monthly bills rather than for retail shopping.

Chart 2.6 Consumers Now Holding More Than One Card



Source: Collated by Centennial Group using CEIC Database and Reserve Bank of Australia statistics.

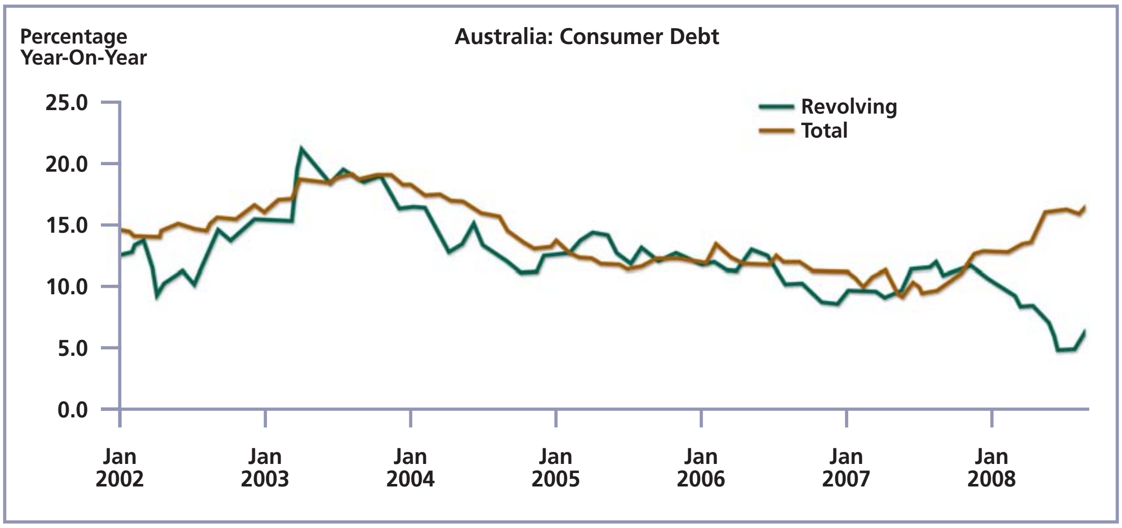
• Maximize easy access to short-term credit: Having a larger number of cards is an advantage to the cardholder as each credit card has a maximum limit and having more cards increases the total borrowing ability of the cardholder.

E-commerce has become very popular for both households and businesses. People are attracted by lower prices, the ability to find new products, and make purchases at any hour of the day.

Household Financing

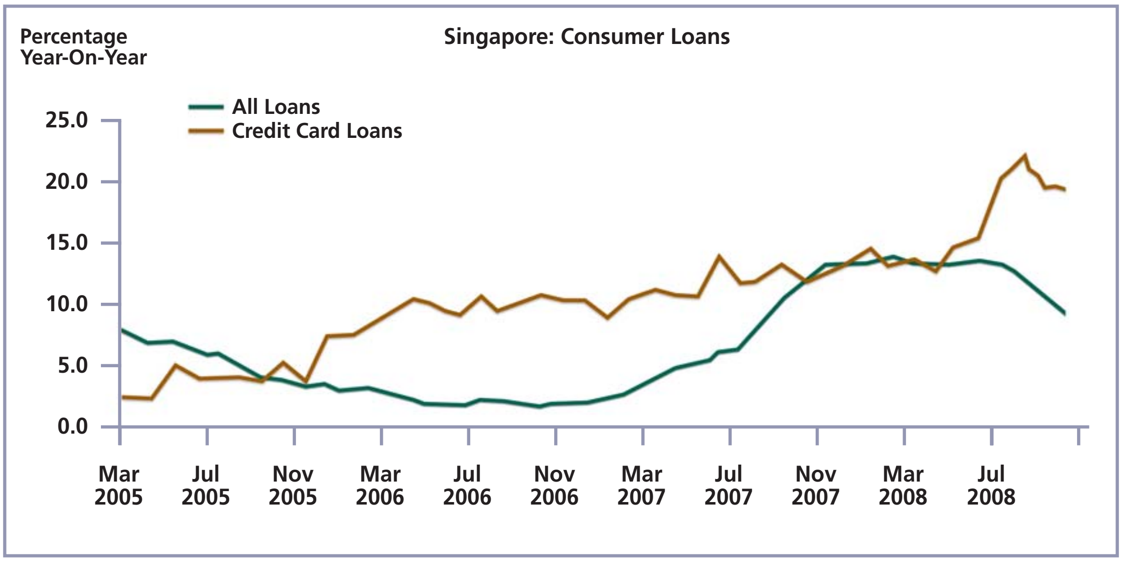
Households have become less averse to the idea of using a loan to translate future earnings capacity into the ability to purchase goods at present. With strong efforts by banks and retailers to promote a high-consumption economy and given the proliferation of numerous credit schemes, the new generation of consumers has overcome the wariness for borrowing of previous generations. The current financial crisis is certainly a setback to such borrowing behavior,

Chart 2.7 Rising Consumer Debt in Australia



Source: CEIC Database and Reserve Bank of Australia statistics.

Chart 2.8 Rising Consumer Debt in Singapore



Source: CEIC Database and Reserve Bank of Australia statistics.

especially in the United States, but we believe that the damage will be less evident in emerging-market economies such as those in Asia, where household debt levels have not been excessive and where middle-classes are expanding substantially.

Consumer borrowing growth has been positive as is evident from Charts 2.7 showing the trend in Australia.

A similar trend can be observed in Singapore as well as seen in Chart 2.8.

• Lower and middle-income families have access to credit: The key reason behind this shifting trend is that low-income households have seen their access to uncollateralized credit grow, principally via the credit card.[17] This enhances the ability of the household to deal with individual-specific and economy-wide risks by borrowing when times are bad.

• More nuclear families: Households today are shrinking in size, especially in Asia. It is not uncommon for children of the family to leave their parents to settle down elsewhere. This translates to new set-ups costs for these individuals including payments for durable goods, housing, taxes etc. Aware that cashflows are low at the early stages of their careers but will be larger in future years, these consumers are willing to borrow now and pay later.

E-commerce Becoming Accepted by Households

E-commerce is becoming the new wave of business for both households and firms. This space automatically eliminates certain conventional payment methods (like cash and check) but also introduces new competition (PayPal and eNETS in Singapore) in the final objective to achieve optimal efficiency in B2B, B2C and B2G transactions.[18] E-commerce has the potential to change with the changing consumer and offer a diversified variety of services and products.[19]

• Better social mediation: Like traditional shopping, consumption is still socially mediated in online shopping. In traditional shopping contexts, consumers use their social networks to ask for support and suggestions on the goods they intend to buy. While online, new forms of social network (interaction on the web between people who may or may not know each other) also contribute to the social mediation in consumption processes. Online interaction and discussions in forums on goods and services, improve the opportunities to compare goods and services in the market. The explosion in "Consumer Generated Media" (for example, blogs and online forums) over the last year means that this reliance on word of mouth, over other forms of referrals, looks set to increase.

• Increased autonomy: One of the main consequences of internet use is increased autonomy in both preference formation and consumption choices for the consumer.[20] Higher levels of information provide better opportunities to compare prices and quality of goods and services in the market.

• Reduced search costs: Reduction in search costs is supported by a lower price, a greater ease of finding products, the ability to purchase foreign products and the ability to buy 24/7. The ability to buy 24/7 translates into increased flexibility and ease of shopping. Businesses can connect to consumers across the globe, removing obstacles such as physical distances and differences in time zones. Between July and September 2005, online spending by cardholders with E-commerce merchants outside their home countries grew 71% over the same period in 2004.

in Asia today, it's not uncommon for young people to live away from their parents. This creates a need for household goods of their own.

Aware that they will earn more as they advance their careers, these consumers are willing to borrow now and pay later.

Growth of Point of Sale retail transactions have been outpaced by Point of Sale E-commerce transactions in the last five years. The latter has grown by over 10% annually in the United States.[21] The adaptability of credit cards to online payments is a significant advantage compared to other payment schemes and this multiple platform usage will become more valuable in the future, thereby drawing a new section of users.

In today's fast-paced world, people have less spare time than ever before. While the amount of time saved by using a credit card for a purchase may not seem all that significant, when one considers the number of people in a given population, the amount of time saved is multiplied by the millions.

More Demand for Convenience

Consumers today are much more demanding in terms of the conveniences they expect. There are a number of reasons for this:

- Increasing value of time: Saving time is becoming important in today's fast-track economy. According to the United States Bureau of Labor Statistics, the median hourly wage in the United States is US$19.60 while the median chief executive earns US$73 per hour. The value of time saved per transaction may be small when concerning an individual but when accumulated across the population, the savings to the economy can be considerable. The recent increasing trend of valuing one's time arises from the constrained notion of time. As average hourly wages rise, the effective opportunity cost of time increases.

- Mitigating inconveniences: While increasing consumer convenience is important, it is also useful to mitigate existing inconveniences. This applies, for example, to the need for security. The security risks of carrying large sums of cash can be overcome with electronic payments. Similarly, other complex tools have substantially overcome the fear of identity theft.

In short, credit cards can be instrumental in maximizing conveniences when compared to other payment means.

Booming Retail Industry

The growth of the global retail industry is likely to be only temporarily interrupted by the current economic slowdown. The emerging markets of Asia, especially giants China and India, offer the industry massive opportunities for new growth. The population sizes of these economies allow for lucrative retail potential. As incomes grow, the untapped middle classes in these countries are becoming more willing to use credit for their purchases. Recent regulatory concessions have boosted the presence of larger merchant participation and resulted in higher retail consumption.

Growth Prospects

Based on the discussion above, the main trends that will affect credit card use in coming years can be summarized as:

- Greater reliance on cards for smaller transactions: The benefits of credit card use will not be undermined during the current economic crisis. We believe that while transaction sizes may remain small during the crisis, a larger number of transactions will be handled using credit cards. This will extend across all countries, but more so for newly-industrialized markets. The average per-transaction amount will decrease because consumers will be using credit cards for more transactions, including lower-value transactions that were previously conducted using cash.

- Increased use of credit cards for short-term borrowing rather than conventional consumer loans: Post-crisis, its expected that structural changes in lending practices will occur. Thus, due to the easily-accessible nature of short-term 'loans' of using credit cards, it will not be surprising to see more borrowing done this way rather than with conventional consumer loans— although higher interest rates for credit card loans may deter some portion.

• Debit cards continue to gain in popularity: Credit card companies will not hesitate to issue debit cards during the crisis since there is no lending involved. Similarly, consumers will continue to use the debit facility even when they are unsure of future cashflows because of the convenience factor. We had argued on page 7 that markets where consumers' attachment to credit cards was entrenched would see a limited switch to debit cards. Still, we believe that markets with low credit card penetration rates will see more people switch to debit card usage, especially for small value transactions.

• Growth of E-commerce transactions: Credit card usage will be augmented by its use in online transactions as it is easily adapted to E-commerce transactions.

3. Most Preferred by Consumers

Credit cards are most preferred by consumers because of a range of distinctive benefits compared with alternative payments methods.

Payment Float

A key benefit that credit cards offer customers is the float. The payment float period is generally defined as the time between when a consumer incurs a debt and the disbursement of the money to repay the debt without incurring an additional interest cost. More specifically, in the context of the credit card, the float refers to time between the date of transaction and the last date of the consumers' credit card grace period for bill payment. During this time period, the money in the customer's account is available for withdrawal or interest accumulation. In other words, the consumer unambiguously gains a double benefit— they have secured the utility and benefits of the good or service purchased but still retain the interest-earning cash in their bank deposit that will pay for this utility.

Of course, this float benefit is not unique to credit cards; consumers using checks also enjoy it. However, the float in the case of the credit card is probably longer and therefore more beneficial than the float when using a check. In terms of check usage, the float refers to the time between the issuing of a check and the clearing of the check by the bank. With enhanced methods of check clearance in recent times, the period of the float for checks has shortened.

There is a significant difference between the use of a credit card as a float and its use as a borrowing tool. While checks, charge cards, debit cards and credit cards offer the float, credit cards offer the largest possible transaction amount and a longer time period for payments. However, once the grace period expires, the float then becomes a revolving loan. The option of credit is not available in case of the other payment systems but this will be discussed later in this report.

Effective Pricing Benefits Through Discounts and Reward Schemes

Banks and credit card schemes usually offer benefits and rewards to cardholders when they issue a card as well as benefits per transaction. According to a 2007 survey, about 48% of cardholders use cards which accumulate points. This is up from 23% in 2003.[22] The same study also found that the use of general purpose credit cards offering no benefits decreased from 38% in 2003 to 31% in 2007. Another study conducted in September 2008 found that two-thirds of survey respondents would consider switching their primary credit card if better features were offered.[23]

• Direct discounts: Some merchants have agreements with specific cards to provide discounts on their products and services. This is especially common in restaurants and retail outlets. The discounted price results in direct savings for the consumer. Another

Credit cards are ideally suited to purchases made by telephone and online e-commerce. This advantage will become even more valuable in the future and attract additional users.

type of loyalty plan offers consumers a cash-back option which could be as much as 5% of the transacted amount. The cash-back facility can then be redeemed at other pre-determined stores.

• Indirect discounts: These include free services like invitations to certain performances, spa vouchers and holiday packages. In situations where consumer interests coincide with these offers, the consumer can effectively enjoy a discount.

• Free Insurance: Some cards offer free insurance that usually covers rail, road and air accidents, accident-related hospitalization, etc.[24] Individuals gain the benefits of credit card use not only as consumers but also as businesses owners.

• Air miles redemption: A popular incentive offered in many credit card plans is the system of accumulating points for money spent on credit card transactions. These can later be redeemed for airline tickets through the process of air miles. Table 3.1 gives an example from Australia on the importance of such rewards programs.

Many people prefer using their cards because of the benefits and rewards they receive. According to a recent survey, nearly half have cards that let them accumulate points for their purchases.

Shorter Transaction Time

When comparing two payment instruments, all other factors constant, the payment instrument with a quicker transaction time will be preferred by consumers. Since time has a certain value, minimizing the cost of any transaction requires the minimization of the time take taken to process the entire transaction. The exact value of money can be calculated as a function of the cardholder's hourly wage rate.[25] Since consumers vary in income and wealth, the opportunity cost of their time will differ considerably. As a result, different categories of consumers will prioritize their time spent at the cashier differently. However, since no individual has a negative opportunity cost, it can be safely assumed that a faster transaction would be preferred to a slower transaction.

The time for a transaction is the time required to consummate an entire transaction without including the time the buyer may wait in queue as this is independent of our research.[26] There are two methods of calculating transaction time.

Table 3.1 Australian Credit Card Rewards Programs (Four Largest Banks, June 2008)

	Average Spending Required for $100 Voucher	Benefit to Cardholder as a Proportion of Spending (%)
2003	12,400	0.81
2004	14,400	0.69
2005	15,100	0.66
2006	16,000	0.63
2007	16,300	0.61
2008	16,700	0.60

Source: RBA Payment System Board Annual Report 2008

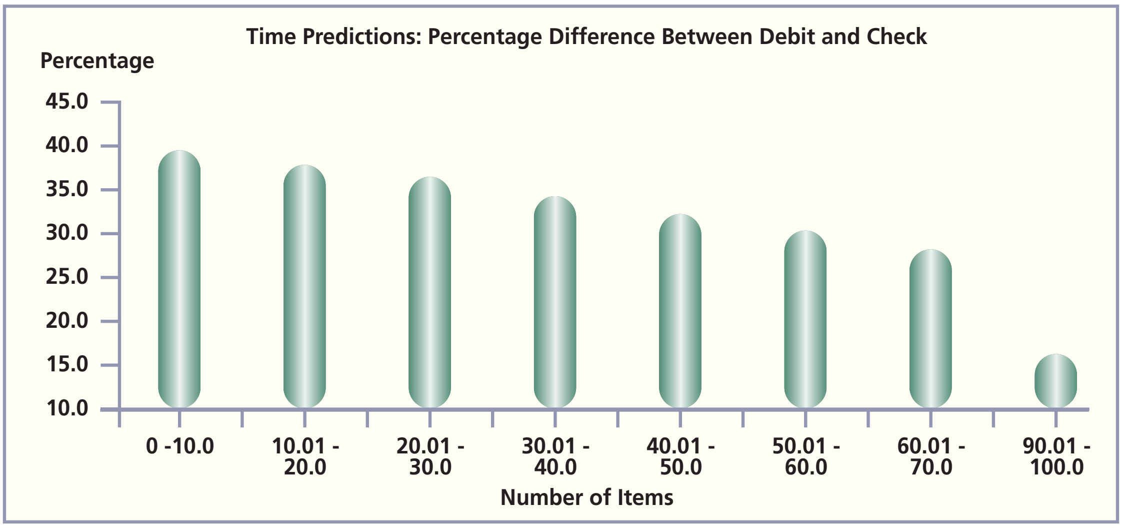
The first method is on the basis of "ring" time. Here, the transaction time is calculated as the time spent by the consumer at the register awaiting completion of the transaction. Calculated in this manner, average check transactions last 139 seconds compared to debit card transactions which last 101 seconds, a difference of 38 seconds. Chart 3.1 shows that the percentage difference in the transaction time decreases as the number of items increases.

This suggests that time costs involved with checks are fixed costs rather than variable to the number of items bought. Moreover, if the number of items is large enough, it is likely that the consumer can complete most of the check information during the time the cashier is running the scanner.

Another interesting method of studying the time differential associated with different pay-

A very popular loyalty incentive for business people and those who simply love to travel rewards them with free airline tickets after they've accumulated enough points for the air miles they've travelled.

Chart 3.1 Debit Cards are Faster When Fewer Items are Scanned



Source: 'Paper or plastic? The effect of time on check and debit card use at grocery stores,' Elizabeth Klee, February 2006

Table 3.2 Australia Consumer Time: POS Payments

Seconds per Transaction	Credit Card	EFTPOS	Cash	Check
Tender Time	45	35	20	90
ATM Withdrawal Time	-	-	9-16	-
Statement Reconciliation	5	5	1	5
Bill Payment	13	-	-	-
Total	63	40	30-37	95

Source: RBA Payment Costs in Australia, November 2007 ment systems would be to focus solely on the processing/tender time. In this case, transaction time starts when the card is pulled from a wallet and ends when the consumer walks away from the cash register. The idea is to focus on the card authorization process. Using this definition, it is found that checks take the longest time during a transaction and cash the least amount of time as shown in Table 3.2. A credit card transaction takes about a minute.

Multi Platform Usage

The functionality of the credit card has grown beyond conventional uses. The convenience offered now involves newer dimensions.

- Internet transactions: Credit cards offer the consumer the ability to interact in e-commerce transactions without the need to adopt a new payment technology like PayPal. Using the cardholder's current card, they are able to transact online. Table 3.3 shows the multiple-use benefits of the credit card.

- International use: As globalization expands, there is greater interaction between nations and travel across borders for both work and leisure. Most credit card companies are global conglomerates which allow cardholders to use their cards in countries beside the country of issue, rendering the need for trips to money exchangers redundant. Additionally, it provides a safety net in case a traveler is short of foreign-currency notes.

In today's globalized world, when cardholders travel overseas for business or pleasure, their credit cards can be used nearly everywhere. This eliminates the need to convert large sums into foreign currencies and also the worry about getting an exchange rate that's fair.

Easy Access to Short-Term Credit

Among the different electronic payment options available to a customer at the point of sale, the only choice which allows the customer to purchase without having the necessary funds in cash or corresponding bank account is the credit card.[28] Thus, the benefit offered to the consumer is the availability of a short-term loan anytime and anywhere without any security coverage; a benefit that is not available with any other payment option except the credit card.

However, beyond the actual point of sale, consumers have more options to access credit. Other credit options include bank overdrafts, personal loans and non-institutional borrowing from loan sharks or family and friends. These are summarized in Table 3.4.

Table 3.3 Multi Platform Use of Payment Systems[27]

	In Person		Phone		Internet		Mail	
	Number	Value	Number	Value	Number	Value	Number	Value
Cash	100	100	0	0	0	0	0	0
EFTPOS	99	97	0	1	1	2	0	0
Scheme Debit	87	77	6	9	6	14	1	0
Credit/Charge	86	73	6	12	7	13	1	2
Check	57	81	0	0	0	0	43	19

Source: Roy Morgan Research & RBA 2007

Table 3.4 Comparing Different Sources of Short-Term Credit

Parameters	Bank Overdraft	Credit Cards	Personal Bank Loans	Loan Sharks	Friends and Family
Accessibility	• Depends on prearranged agreement with the lending institution which allows the facility. • Discretionary access depending on borrowers' credit status, income etc, collateral ability etc. • A large overdraft facility is usually offered only to select bank clients.	• If the individual already has a credit card account, an incremental short term loan on the card is available with no hesitation. • However to produce a card the individual needs to prove a steady flow of income and good credit rating.	• Involves an application process of 1 - 3 weeks. • The loan is dependent on many factors such as credit rating, income, family wealth, etc. • Usually requires a collateral like house, car, etc.	• An illegal form of borrowing without any legal paperwork involved. • Usually is not difficult to obtain and does not involve a long credit assessment time period.	• Uncertainty of access depending on family's financial position and intimacy of relationship.
Minimum Loan Size	• There is usually no predetermined minimum. • The borrower pays interest only on the additional amount withdrawn over the bank balance.	• No minimum borrowing amount.	• Usually have a minimum borrowing amount. • In Australia the amount is about AUD5,000.		
Maximum Loan Size	• Very wide range and depends on the pre-arranged limits. • Most overdrafts are around $500	• Usually twice the borrower's salary is the maximum loan permitted in one month.	• There is always a maximum loan size agreed upon. • In Australia this is approximately AUD20,000 to AUD50,000.		
Duration of Loan Payment	• Usually limited to one year.	• Loan duration is not fixed however minimum monthly payment is required.	• They have a minimum duration of 1 year and maximum of 7 years.[29] • This allows smaller installment pay-outs.	• Very short durations like a few days to a few months.	• Flexible length but usually expected to be paid within a year.
Payment Flexibility	• They are similar to Bank Loans but there is more discretion on part of the Bank to levy fees for late payment, etc.	• Flexibility of payment as long as regular minimum payments is made.	• Flexibility exists within restrictions. • Minimum payments include interest and principal.	• Due to the lawless nature of the loan, there is little flexibility in the payment process.	• Very high flexibility
Costs:					
A. Interest Costs	• Normally 1% -2% over prime rates	• Interest rates could range from 10%-30%. • October 2008 credit card standard rate in Australia was 19.75%.	• Rates vary from country to country but are usually 5% - 10%. • October 2008 unsecured personal loans interest rate in Australia was 14.1%. • The Prime lending rate in Singapore is 5.38% as of October 2008. • Most loans have a fixed rate so borrowers don't benefit if the market rate falls.[30]	• Usuriously high interest rates, depending on location.	• Discretionary but can be as little as 0%.
B. Risk of Defaulting	• Individual needs to file for bankruptcy to be allowed to default. • Usually collateral is involved whose ownership will be switched. • The banks may close off the bank account to threaten the borrower to pay.	• Individual needs to file for bankruptcy to be allowed to default.	• Usually collateral is involved whose ownership will be switched.	• Lender may resort to blackmail, threats and other unlawful means to get the money.	• May create devastating rifts among family and friends but could also be accepted well.
C. Other Costs				• Risk of debt trap is highest because of usurious lending rates.	

Sources: Prepared by Centennial Group using Media Reports

Credit cards are a very useful tool for small and medium enterprises in helping smooth things out during those occasions when cashflow is uneven.

Credit card holders can also take cash advances from an ATM using their credit card, while paying a daily interest and fee on the transaction. While the costs are high, the flexibility to withdraw cash in this manner can be very useful. For example, when applying for a long-term loan, the applicant is often required to make a down payment of at least about 3%-5% of the total purchase value. Where the consumer does not have such funds readily at hand, they can take a credit card advance if in possession of a credit card. A National Association of Realtors survey[31] found that a good proportion of buyers get their down payments from credit card cash advances, though they found it difficult to ascertain the exact percentage.

The importance of the option for a consumer to borrow for short-term needs is more significant today as the global economy is heading into a period of constrained credit. Banks have been tightening lending standards rapidly in 2008 and it is expected to worsen in 2009. Even after the worst of the crisis is over, banks and financial institutions will remain much more risk averse and careful about lending, making for a world of tighter liquidity than in the recent past. In this more credit-constrained period, it is possible that even consumers of reasonably good financial standing may be denied credit because banks have become highly risk averse. Having the option that a credit card holder has, to obtain short-term credit easily, simply by virtue of having a credit card, has several advantages in this new period. First, the consumer who has a credit card is more assured of accessing short-term credit when they need it, enhancing their welfare. Second, there is a macro-economic benefit as well— such access to short-term credit could ease the credit constraint on consumer spending to some extent, thereby improving aggregate demand in the economy.

Advantages to Individuals Who Own Small and Medium Enterprises

Closely following the benefits of the easy access to short-term credit to finance consumer spending is the credit access for owners of small businesses. Although small and medium enterprises (SMEs) play a large role in most economies in terms of their share of employment and output, their higher risk often means that the sector receives less credit than it needs. Any instrument that alleviates this credit shortage helps not only the individual owners of the SMEs but also improves the functioning of the economy by boosting the prospects of this key sector. It is here that the individual credit card of the company's main or controlling shareholders can provide support:

- Easy access to immediate financing: The need to purchase raw materials and intermediate goods prior to the invoicing process could put an undue strain on a small firm's working capital. The use of a credit card allows the SME to borrow when purchasing but pay the suppliers once invoicing and payments are received. SMEs are not always in a bargaining position to demand a timely payment deal.

- Smoothening out cashflow bumps: The cashflow for SMEs may not always be consistent and regular. Large sums may be transferred at infrequent intervals which could unduly affect regular fixed-cost payments like rent, utilities, employee compensation etc. The flow of cash can thus be evened by the use of credit cards to borrow for short-term periods.

In an assessment done by JP Morgan in Australia it was found that credit cards received the highest ranking in working best for SMEs.[32] A study by the United States Small Business Administration found that more than 80% of all small businesses had used some kind of credit previously, and thus had outstanding debt on their books at the end of 1998. Fifty-five percent of small firms used traditional loans, while 71% used non-traditional sources, mainly owners' loans and credit cards, for their credit needs. Among the different types of credit used, credit cards (both personal and business), credit lines, and vehicle loans were the most commonly used types or sources of credit. 46% and 34%, respectively, of small firms used personal and business credit cards, 28% used credit lines; and 21%, vehicle loans.[33]

Facilitating Different Types of Consumption Spending

In addition, credit cards also play an enabling role in facilitating consumer activity.

- Enables impulse purchases: Consumers who may not have funds in their bank accounts at the point of desiring an unplanned purchase can use their credit card to effect such purchases or to make impulse purchases. By expanding the scope for fulfilling consumer desires, the credit card improves consumer welfare.

- Payment for urgent transactions: Consumers will every now and then face occasions when they have to make urgent and unexpected payments. These could include the need to purchase air tickets suddenly, pay for unexpected medical expenses or pay for urgent household repairs, among others. Unlike a debit card or check payment, the consumer can go ahead in their moment of urgency and anxiety without having to worry about precisely how much funds they have in a particular bank account to which a certain debit card or check is linked.

The advantages of these benefits also accrue to merchants. Since every transaction using a credit card involves a cost to the merchant (the interchange fee), there has to be an offsetting benefit to incentivize the merchant to permit credit card funded purchases. This benefit comes in the form of impulse purchases or unplanned purchases by consumers actually materializing, whereas they would not have occurred without the convenience of the credit card. Consequently, it is not surprising that studies have found that merchants who accept credit cards sell more and earn more profit than otherwise identical firms do. Industry output is found to be higher when credit cards are accepted.[34] Customers tend to spend, on average, 16% more than when they pay by check or cash.[35] So, this additional increase in spending volume offsets the interchange fee.

Enhancing Administrative Convenience

The last decade has also seen the introduction of corporate cards, issued by large corporations to their employees for expenditures on company purposes. This allows many benefits both to the employee and the organization.

- Easier reimbursements: The corporate credit card eases the process of disbursement to compensate employees when they spend for legitimate company purposes. This is simpler than the less-efficient arrangement of payment receipts and petty cash disbursements.

- Better logging and account filing: The corporate card also simplifies the process of logging and accounting. The details of the transactions are explicitly recorded by the payment machine and are available electronically to the employer. Thus employees don't need to waste valuable time recording every transaction on their own.

- Perks and rewards: Business users who travel will receive the air miles perks mentioned on page 14. Another benefit is the regulation and monitoring of business travel by employees when payment is with a credit card. Some credit cards give rebates on business spending. These can provide significant savings to the company. Additionally points are often given for each dollar spent with the small-business credit card. These points can then be exchanged for a range of merchandise.

Studies show that merchants who accept credit cards enjoy more sales and also earn more profit than firms that do not.

• Record Keeping: Every transaction is systematically recorded, processed, and sent to the cardholder's bank. The monthly transcript sent to the cardholder includes the details of all transactions. Thus, without incurring any extra cost, the cardholder is able to keep a record of the date, time, place, size, etc. of the transaction. Other payment methods such as checks and debit cards offer some but not all the advantages of this facility. For cash transactions, all details must be recorded by the consumer.

Corporate credit cards simplify the logging and accounting process. Details of every transaction are recorded and are readily available to the employer. In addition, employees don't need to waste time on paperwork to document every transaction.

4. Drawbacks to Credit Card Usage

A complete assessment of the benefits of the credit card requires that drawbacks associated with the credit card be also considered. Three such drawbacks are identified, focusing on the most important factors which have deterred consumers and the financial institutions from using the credit card.

The Debt Trap is Becoming a Growing Concern

The risk of cardholders becoming trapped in a permanent revolving debt cycle is real. This problem has received intensive public scrutiny as the number of individuals caught in such a debt trap and then defaulting, has been rising in many countries. There are a number of factors to consider in assessing this area:

Adverse selection is the primary reason for high default rates in the credit card market. It explains how the market for unsecured credit is different from the normal consumer loan market.

• Asymmetrical information: This is the case where there are at least two parties involved in a business trade and at least one of the parties has better access to relevant information than the other party. In the case of the credit card market, this could mean a situation where the party with better access to information only shares information which is in their own favor—to the possible detriment of the less-informed party. Thus, individuals with below-average credit quality often tend to provide limited information to the credit card issuing company, preventing the latter from correctly assessing the card applicant's true risk. On the other hand, other types of consumer loans such as car loans and mortgages require collateral from the loan applicant— this helps to offset the risks posed to the financial institution from any shortfall in risk assessment. Thus a firm, operating in the context of asymmetrical information, that offers a contract to the general population, may find that the composition of the pool of customers who accept the firm's contract is inferior to the composition of the entire population.[36]

• Underestimation hypothesis: This was a proposition suggested by Asubel in 1991 when he hypothesized that consumers systematically underestimate the extent of their current and future credit card borrowing and under these estimates make sub-optimal decisions regarding the choice and usage of the card. Consumers may misperceive their future borrowing both in terms of quantity as well as the systematic duration in which they err.[37]

The key to minimizing credit defaults is to harmonize credit information across participants. Better use of information technology and enhanced credit assessment tools are available today to assess the credibility of a credit card applicant, thus mitigating this particular drawback.

Identity Theft Risks Large Losses

No payment system can be perfectly secure. Each is prone to different risks of theft. The insecurity involved with any form of electronic payment is if the card falls into the wrong hands, a thief can assume the card owner's identity. Identity theft can vary depending on the nature of the transaction, whether it is a physical point of sale or an E-commerce transaction. Four out of five victims have reported being unaware of how and when the thief obtained their personal information.[38] Now, group identity theft is becoming a growing concern. This occurs when thieves target the identities of entire groups of people from collective information centers like stores, fitness centers, card dealers, schools, etc.

It has been estimated that one out of three internet users is buying less online because of security concerns related to data breaches, identity theft and phishing attacks. Sadly, such threats seem to be increasing in scale— there was a 50% increase in the number of victims of identity-theft related fraud in the 12 months prior to mid-2006 compared to same period to mid-2003. In the second quarter of 2007, there was a 20% increase in the number of companies whose customers were targeted by phishing attacks.[39] There exists an entire market for exchanging such stolen personal information in the underground economy. Hackers bought and sold US$276 million worth of such data from July 2007 to June 2008 according to security company Symantec.[40]

Preventing identity theft requires vigilance from cardholders. Innovation in encryption science also continues to hamper the ability of identity thieves to conduct their trade. There have been measures to specifically contain the spread of credit card fraud. For example, Personal Identification (PIN) based chip cards substantially reduce the risk of fraud when a card is stolen and thus are more secure than the magnetic-stripe signature-based system.

Insufficient Anonymity Dissuades Some Users

When a payment instrument provides systematic records of each transaction; the benefits of anonymity in a transaction (which some consumers want) could be lost. This has been voiced as a concern by consumers who prefer to use cash in personal transactions to maintain non-disclosure.

Certainly, cash has unparalleled benefits to the customer in terms of assuring privacy and anonymity. Cash transactions are not recorded separately by the system— only withdrawals from a bank teller or an ATM are recorded. How the withdrawn cash is spent is not recorded anywhere. However, the problem of anonymity is not insurmountable.

For example, advances in security technology now make it possible for credit cards to be issued that permit cardholders to use any name on the credit card. The only information that interests the card issuer is the credit card number and its expiration date. The name and address of the credit card user are not needed. The entire transaction is based on a set of numbers assigned to the cardholders. However, this technology is still in the process of development and at present its use is limited to low-value transactions. Also, upgrades involved can be expensive and credit card companies will only invest if they feel that anonymity will increase the volume or value of transactions.

In conclusion, the drawbacks discussed are either real or relevant only to particular sub-sets of consumers. However, it is also the case that, increasingly, well established and improved means of mitigating these drawbacks are underway in most cases.

No form of payment— whether cash or card based— can be 100% secure. Each is prone to different types of theft. Preventing identity theft requires vigilance by cardholders.

5. Quantifying the Analysis

The costs and benefits associated with credit card usage discussed thus far can now be quantified in order to better judge the net benefits of the credit card as a payment mode compared to others. Four payment methods are compared: (i) cash; (ii) checks; (iii) credit cards; and (iv) PIN-operated debit cards/EFTPOS.

Review of Existing Studies

There have been a number of studies that have sought to determine the complete impact of a cashless society based on credit card use.

- A study based on Netherlands data calculates that the social cost of all point-of-sale payment methods amount to 0.65% of GDP.[41]

- Another study conducted in Belgium suggests that the social cost of such schemes cost 0.75% of GDP.[42]

- Similarly, a study in Norway finds that the cost savings from shifting from a fully paper-based system (checks, cash, paper and GIRO) to a fully-electronic system (debit cards, credit cards and electronic GIRO) at the bank level is just 0.6% of GDP.[43]

- Taking this a step further, a study attempted to find the total cost benefit of switching from a paper-based payment system to an electronic system for 12 economies.[44] The study finds that switching to an electronic scheme would save 1% of the combined GDP of the countries.[45]

Preliminary Assumptions

The approach employed here is essentially a cost/benefit analysis, focusing on the marginal gains from a given transaction. The primary assumptions used are:

- First, it is assumed that the transaction is a necessary one and that there is a certain utility derived from its occurrence. Thus, the incremental benefit from the transaction is estimated when different payment schemes are used.

- Second, only the net benefit to the consumer is estimated.

- Third, the concept of opportunity cost is used to calculate the cost of the availability of any particular benefit.

- Fourth, it is assumed that all consumers prioritize each of the benefits equally.

Calculating the Net Marginal Benefit to the Consumer

While there are many benefits that a consumer enjoys while transacting with each different payment method; only those where data of sufficient quality exists for making a sound quantitative analysis are used.

Marginal Benefits

(i) Float. To calculate the benefit of the float, the interest income which collects in the bank account during the float period is used. Cash and EFTPOS transactions offer no float as the entire amount is immediately paid. A check offers a fixed float; which is the time period until the check is cleared. This is usually two working days. The float offered by a credit card is similarly calculated. Here, it is assumed that the average period from the time the cardholder makes a purchase to the time the payment is made is approximately 25 days.[46] The interest they collect during this period before they must make a payment on the transaction is the benefit of the float.

(ii) The option to borrow. Credit cards are the only payment method that allows the consumer to borrow freely at the point-of-sale. The value of this benefit is estimated by comparing it to the next best alternative; that of taking an unsecured consumer loan from a financial institution. To obtain a consumer loan, the borrower must pay an annual fee which is not the case with the credit card.[47] Data from the Citibank Australia website are used for information on the personal revolving line of credit. This is scaled to the minimum loan amount and then standardized to the average value of the transaction. It is also corrected for the percentage of people who use the credit facility offered.

(iii) Recordkeeping. With the exception of cash, the other payment methods record transactions in a similar manner and can be said to equally proficient at recordkeeping. Here, data on the United States from the study by Swartz, Hahn and Layne-Farrar referred to earlier has been used. The data presented here has been adjusted for inflation and exchange rates.

(iv) Privacy. Estimating a value to privacy is heavily subjective and can vary significantly in different countries and cultures. In the case of Australia, this is defined according to loyalty card discounts, which can be read as an implicit price paid by the merchant for the customer's personal information. Concurrently, refusing the loyalty card and thereby refusing to accept the discount, is an act on the part of the customer to withhold their private information. This is assumed to be the cost of keeping their information private. In the case of Australia, data from FlyBuy's discount and reward offers are used.

(v) Rewards. Rewards are closely associated with credit cards while the other payment methods mentioned here do not have specific reward programs. For this, the data presented in Table 3.1 was used.[48]

Marginal Costs

(i) Preparation costs. While all payment methods require a first visit to the bank, cash requires frequent visits to an ATM. This is called the preparation cost; an item that must be completed prior to a transaction. Here, we assume that each trip to the ATM takes approximately 5 minutes. The average value of an ATM withdrawal is AU$183.[49] By calculating how many POS transactions this withdrawal amount serves, the total time spent visiting the ATM per POS transaction can then be computed. The amount of time used can then be quantified by using hourly wages as the basis for each unit of time. In addition, each visit to an ATM is not necessarily a specific transaction-oriented trip. ATM cardholders often withdraw cash from an ATM during the process of another activity. This is also factored into the preparation costs.

(ii) Regular bank charges. Certain bank charges apply to electronic payments only and not to cash. In the case of checks, the cost per individual check is calculated by dividing from the cost of one full checkbook. For the others, annual fee data according to Citibank are used, and are then standardized for the cost per transaction.

(iii) Processing time. All transactions involve a certain amount of time to complete and it's in the consumers' best interest to increase the speed of the transaction. Here, data from Table 3.2 are combined and quantified according to Australian hourly wage data. Thus the cost of each different method can be estimated.

Once the net marginal benefit is calculated, it is standardized to a transaction of AU$100 for better comparison. The final results of the analysis are shown in Table 5.1.

Table 5.1 Marginal Cost and Benefits per Transaction

AU$	Cash	Check	Credit Card	EFTPOS
Average Value Per Transaction	**28.00**	**387.00**	**96.00**	**65.00**
Benefits				
Float	0.00	0.05	0.15	0.00
Credit option	0.00	0.00	0.72	0.00
Record keeping	0.00	0.75	0.75	0.75
Privacy	0.36	0.00	0.00	0.00
Rewards	0.00	0.00	0.17	
Total Benefits	**0.36**	**0.80**	**1.79**	**0.75**
Costs				
Preparation costs	0.11	0.00	0.00	0.00
Bank charges	0.00	0.17	0.64	0.06
Processing time cost	0.26	0.69	0.46	0.29
Total Costs	0.37	0.86	1.10	0.35
Net Benefits	-0.01	-0.06	0.69	0.40
Net Benefit on AUD100	-0.03	-0.02	0.72	0.62

Conclusions from the Cost/Benefit Analysis

A number of conclusions can be inferred from this analysis.

- Most cost-efficient: It can be clearly concluded that the most cost-efficient payment tool is the credit card, with a marginal net benefit of AU$0.72 in every transaction.

- Cash vs. Debit: Interestingly, the debit card is a better alternative to using cash, largely due to the benefit of recordkeeping, which cash is unable to fulfill. Even if other benefits of the debit card were to be ignored, it is still more beneficial because of its lower marginal costs.

- Credit vs. Debit: For cardholders who are only interested in the conveniences of a card (transactors) but do not want to use credit, a debit card is most appropriate. When the benefits from the option to borrow are removed, the debit card is more cost-efficient than a credit card. However, for those seeking credit (revolvers), the benefits of using a credit card outweigh the use of a debit card.

- Negative marginal benefit: With the information technology available with other means of payment, it is not surprising to find that checks and cash have negative net marginal benefits. For both checks and cash, their high cost-per-transaction overshadow the other benefits they can provide to consumers.

- Cost of capital: Based on this analysis, a comparison can also be made between the costs of short-term borrowing by means of a credit card versus a personal unsecured loan (ignoring for the moment all other benefits of a credit card). The credit card clearly stands out as the least-expensive option: the administrative cost of an unsecured loan works out to AU$0.72 per AU$96 (the average value of a credit card transaction) while the administrative cost of a credit card is AU$0.64 for the same amount. In addition, the interest rates for the two are almost the same. In addition, there are other added costs attached to short-term unsecured personal loans; such as trips to the bank, longer application procedures, and a higher incidence of application rejection.

6. Conclusion: The Smartest Way to Pay

This comprehensive cost/benefit analysis concludes unambiguously that credit cards are the optimal means of effecting payments. The outlook of constrained credit availability and industry trends such as the growing scope of E-commerce further bolster the attractiveness of credit cards. More to the point, the multiple benefits of the credit card clearly outweigh those of other payment alternatives. It is also found that while there are certain costs and drawbacks associated with the use of credit cards; these are found to be small and are easily mitigated.

References

Household Payment Patterns in Australia: A study of the use of payment methods, RBA, Nov 2007

Statistics on payment and settlement systems in selected countries, Committee on Payment and Settlement Systems, November 2008

Social Benefits of E-Commerce, Centennial Asia Advisors, August 2008

E-Commerce on Consumers and Small Firms, Edited by Salvatore Zappala and Colin Gray, November 2006

Payments are no free lunch, Hans Brits, and Carlo Winder, Occasional Studies, De Nederlandsche Bank, Vol. 3, No. 2, 2005

Costs, advantages, and disadvantages of different payment methods, Guy Quaden, National Bank of Belgium, December 2005

Benefits from a changing payment technology in European banking, David B. Humphrey, Magnus Willesson, Göran Bergendahl, and Ted Lindblom, Journal of Banking and Finance, Vol. 30, No. 6, June, pp. 1631-1652, June 2006

The Move Toward a Cashless Society: A closer look at payment instrument economics, Daniel D. Garcia Swartz, Robert W. Hahn, Anne Layne Farrar, Review of Network Economics, June 2006

Paper or Plastic? The Effect of Time on Check and Debit Card Use at Grocery Stores, Elizabeth Klee, February 2006

The Value of Time and the Transactions Demand for Money, Kevin Dowd, Journal of Money, Credit and Banking, Vol. 22, No. 1, pp. 51-64, February 1990

A Theory of credit cards, Sujit Chakravorti and Ted To, International Journal of Industrial Organization, Vol 25, No. 3 pp 583-595, June 2007

Australian SME Market: Coming to Grips with Australian SME Lending - Volume 1, Australia Equity Research, J. P. Morgan, June 2007

An Empirical Analysis of Payment Card Usage, Marc Rysman, Boston University, May 2006

Credit cards at a Tipping Point, Gregory Larkin and Laura Nishikawa, Innovest, October 2008

Market Structure and Credit Card Pricing: What Drives the Interchange?, Zhu Wang, Payment System Research, Federal Reserve Bank of Kansas City, December 2006

Features of Credit Card Networks, Federal Reserve Bank of St. Louis Review, Vol 77, No. 6, November/December 1995

Study of Consumer Payment Preferences Focusing on Online and Offline Debit, American Bankers Association and Dove Associates, 1999

The Growth of unsecured credit: Are we better off?, Kartik Athreya, Federal Reserve Bank of Richmond Economic Quarterly Volume 87/3, Summer 2001

Why do firms accept credit cards?, Julian Wright

Adverse Selection in the Credit Card Market, Lawrence M. Ausubel, June 1991

Appendix A: List of Abbreviations

ATM	-	Automated Teller Machine
EFTPOS	-	Electronic funds transfer at the point of sale
EZ Link	-	The Singapore touch free pre-paid card used mainly for commuting
LTA	-	Land Transport Authority, Singapore
JCB	-	Japan Credit Bureau
NETS	-	Network for Electronic Transfer (Singapore)
PIN	-	Personal identification number
POS	-	Point of sale
SME	-	Small and Medium Enterprise
SMRT	-	Singapore Mass Rapid Transit
MIAA	-	Mortgage Industry Association of Australia

1. Payment cards are one type of two sided market platform. Other types of two-sided market platforms include computer game platforms, newspapers and online dating sites. The markets have platforms that provide goods and services to two distinct sets of end users and must convince both sides to participate.

2. Features of Credit Card Networks, Federal Reserve Bank of St. Louis Review, Vol 77, No. 6, November/December 1995

3. Study of Consumer Payment Preferences Focusing on Online and Offline Debit, American Bankers Association and Dove Associates, 1999

4. Dying of Consumption, Stephen Roach, The New York Times, 28th November 2008

5. Citibank's new credit card targeted at those earning less than $30,000, Tung Shing Yi, Channel News Asia, Posted on 18th July 2007

6. Charge-off amount refers to the total amount of credit card receivables written off the loan book during a period (irrespective of when a charge is made to the profit and loss account, which may be earlier if it is the institution's policy to create provisions at an earlier time than the amount is written off). Charge-off policies vary from institution to institution. Normally, an account will be written off when the receivable has been overdue for more than 180 days or when the ultimate repayment of the receivable is unlikely (e.g. the cardholder is bankrupt or cannot be located).

7. See http://www.creditcards.com/credit-card-news/moodys-credit-card-charge-offs-august-2008-1276.php

8. Consumer Debt goes up, Straits Times, 3rd November 2008

9. Despite pledge, Citigroup to raise credit card rates, blame difficult environment, The New York Times, 14th November 2008

10. Credit card rate rises threaten recovery, Jacob Saulwick, The Sydney Morning Herald, 11th November 2008

11. Notwithstanding their longer term impacts in terms of market distortion.

12. Household Payment Patterns in Australia: A study of the use of payment methods, RBA, Nov 2007

13. Rollover balances refer to the amount of total credit card debt receivable in respect of which the cardholder has not fully repaid the statement balance but has at least made the minimum amount of payment required by the authorized institution. It does not include amounts that are overdue. An account is overdue only when the minimum payment is not made upon the due date.

14. Statistics on payment and settlement systems in selected countries, Committee on Payment and Settlement Systems, November 2008

15. Citibank, SMRT launch co-brand card in Singapore, Cards International, 11th January 2007

16. Credit cards can be used for ERP, Straits Times, 25th October 2008

17. The Growth of unsecured credit: Are we better off?, Kartik Athreya, Federal Reserve Bank of Richmond Economic Quarterly Volume 87/3, Summer 2001

18. B2B, B2C and B2G transactions refer to business to business, business to customer and business to government transactions.

19. Social Benefits of E-Commerce, Centennial Asia Advisors, Nov-08.

20. 'E-Commerce on Consumers and Small Firms', Edited by Salvatore Zappala and Colin Gray, November 2006

21. The State of E-Commerce: Online Shopping Trends, retrieved from http://www.ecommerce-guide.com/news/trends/article.php/3524581 on 5 June 2008

22. Vertis Customer Focus Financial Study, May 2007. Data retrieved from www.creditcards.com

23. ComScore, September 2008, Data retrieved from www.creditcards.com

24. What's on the Cards, Avijit Nanda, The Times of India, 2 December 2008

25. The Value of Time and the Transactions Demand for Money, Kevin Dowd, Journal of Money, Credit and Banking, Vol. 22, No. 1, pp. 51-64, February 1990

26. From a society point of view if all participants agreed to use the quicker method, the waiting time in the queue will effectively fall benefiting everyone and thus the society.

27. The survey mentioned here was carried out by Roy Morgan and commissioned by the Reserve Bank of Australia. 1000 participants were recruited and asked to record the details of every purchase they made over a two week period in Jun-07.

28. A Theory of credit cards, Sujit Chakravorti and Ted To, International Journal of Industrial Organization, Vol 25, No. 3 pp 583-595, June 2007

29 The information here has been collated from an Accredited Mortgage Industry Association of Australia Finance provider. The details can be found here:http://www.easy-loans.com.au/unsecured_loans.asp

30. Credit cards versus loans, Adelaide Advertiser, 10th November 2008

31. Credit card cash advances for home down payments?, 28th November 2008

32. Australian SME Market: Coming to Grips with Australian SME Lending: Volume 1, Australia Equity Research, J. P. Morgan, June 2007. Downloaded from http://www.fujitsu.com/downloads/AU/sme_report_vol1.pdf

33. Banking and SME Financing in the United States, Charles Ou, Ph.D. Office of Economic Research U.S. Small Business Administration, June 2006.

34. Why do firms accept credit cards?, Julian Wright

35. MasterCard Data Warehouse Q4 2006, Issue Case Studies conducted in 2006 and MasterCard PayPassPerformance Insights

36. The Market for 'Lemons': Quality Uncertainty and the Market Mechanism, George Akerlof, Quarterly Journal of Economics, 1970

37. Adverse Selection in the Credit Card Market, Lawrence M. Ausubel, June 1991

38. Identity Theft: Protect Yourself. FRB Boston

39. Retrieved from http://www.infoworld.com/article/07/08/20/data-is-less-safe_1.html on 12 June 2008

40. 'Rise in identity theft online', Straits Times Editorial, 1st December 2008

41. 'Payments are no free lunch', Hans Brits, and Carlo Winder, Occasional Studies, De Nederlandsche Bank, Vol. 3, No. 2, 2005

42. Costs, advantages, and disadvantages of different payment methods, Guy Quaden, National Bank of Belgium, December 2005

43. Realizing the gains from electronic payments: Costs, pricing and payment choice, David B. Humphrey, Moshe Kim and Bent Vale, Journal of Money, Credit and Banking Vol. 33 No. 2, May 2001

44. These 12 countries are Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom.

45. Benefits from a changing payment technology in European banking, David B. Humphrey, Magnus Willesson, Göran Bergendahl, and Ted Lindblom, Journal of Banking and Finance, Vol. 30,No. 6, June, pp. 1631–1652, June 2006

46. The Move Toward a Cashless Society: A closer look at payment instrument economics, Daniel D. Garcia Swartz, Robert W. Hahn, Anne Layne Farrar, Review of Network Economics, June 2006

47. The credit cardholders' needs to make a minimum monthly payment to be able to clear the interest accrued on the debt but there is no mandatory fee payment. Borrowers of the unsecured personal loan scheme need to pay an annual fee charged from the first withdrawal of the loan and on every subsequent anniversary of the first withdrawal.

48. FlyBuy is Australian loyalty program which has about 36% of the country's household participating and has issued six million cards.

49. Calculated using data from the Reserve Bank of Australia

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