The Relationship Between Consumer Lending and Economic Growth

by
Andrew B. Luckman

A PROJECT

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in partial fulfillment of
the requirements for the
degree of

Honors Baccalaureate of Science in Finance (Honors Scholar)
Honors Baccalaureate of Science in Accounting (Honors Scholar)
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Presented May 28th, 2015
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AN ABSTRACT OF THE THESIS OF

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Jimmy Yang

For centuries economists have attempted to explain what causes the ebb and flow of the economy. None thus far have been able to perfectly explain the nuances of the economy as a whole. In this paper, I explore the relationship between consumer lending volume and economic growth. Consumer lending is defined as credit card debt, motor vehicle loans, and student loans taken on by individuals. Mortgages are excluded from the data as they are considered significantly different from the other mentioned forms of consumer lending. Economic growth is defined as the change in Gross Domestic Product (GDP)/capita. I have selected four countries to examine: The United States of America (USA), The United Kingdom (UK), Australia, and Japan. I use multivariate regression analysis to determine the relationship between consumer lending and economic growth in the identified nations. My findings establish a statistically significant contemporaneous and lead-lag relationship between consumer lending and GDP/capita growth. The results for each nation researched vary drastically and are discussed in detail within the paper.

Key Words: Consumer credit, GDP, Economic Growth, Japan, The United States of America (USA), The United Kingdom (UK), Australia, Balance of payments, revolving credit, non-revolving credit

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I understand that my project will become part of the permanent collection of Oregon State University, University Honors College. My signature below authorizes release of my project to any reader upon request.

Andrew B. Luckman, Author

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II. Introduction

Hypothesis:

- Changes in consumer lending volume, both revolving and non-revolving, are related to changes in economic growth as measured by GDP/capita.

Economics is a science that many take for granted. The evidence is seen on the cover of every newspaper, the headline of every talk show, and on the lips of every so called market expert. The economy is growing, shrinking, stagnant, etc. But what do any of these declarations really mean?

There are an almost never-ending number of ways to define economic expansion: trade balances, changes in production output, changes in labor productivity, changes in real incomes, changes in capital investment, etc. While all of these measures are important, one of the most widely followed economic indicators is Gross Domestic Product (GDP). GDP is composed of consumer spending, government spending, gross private investment, and net exports ("Examples of Calculating GDP", 2006). GDP is both extremely useful and slightly flawed as an indicator of economic activity.

While it is true that GDP has several weaknesses, it also has great relevance as an indicator of economic output. GDP data are readily available for many nations, often for significant periods into the past. This widespread availability of data allows businesses, investors, consumers, and governments to plan and react according to changes in national and global marketplaces. Additionally, measurement of GDP is fairly consistent over time and allows comparability between different periods observed. Lastly, GDP is inclusive of the economy as a whole and can be used to compare the total economic output of different economies.

However, as mentioned before GDP does have several weaknesses as a measure of economic output. First, GDP does not take into account leisure time or the number of hours worked each period. For instance, as shown in **Table #1**, during 2011 the average number of hours worked each year by full-time employees was 2,193 in Singapore and 1,406 in Germany (Venturi, 2014).

The GDP per capita of these countries during 2011, in current US dollars, were $52,871 and $45,871, respectively ("World DataBank", 2015). An initial inspection of the data would lead to the conclusion that citizens of Singapore produced more economic output per capita than German citizens. However, a closer examination of the numbers reveals that the average Singapore citizen works 56% more hours yearly than the average German citizen does. Additionally, each hour worked by a Singapore citizen produces 26% less GDP than an hour of work by a German citizen. Looking at raw GDP numbers does not give this type of insight into the economies of different nations.

Another key weakness of GDP as a measure of economic output is the exclusion of grey and black markets. Black markets involve trading in goods and services that are illegal or specifically prohibited. In contrast, grey markets involve the distribution of legal goods through semi-legal channels. The financial sector is one area where grey markets are extremely prevalent. For example, in China grey market lending totaled $5.8 trillion USD in 2012 (Wei, 2013). This was equal to 69% of China's GDP in 2012 ("World DataBank", 2015). This massive amount of lending is completely excluded from China's GDP figures. For this reason, and several others, GDP does not fully capture all economic activity in any nation.

Even when economic data are accurately recorded and properly representative people can misperceive economic conditions around them. This is what happened during the 1870's in the USA. During the decade from 1870-1880 most economists estimate the growth of USA GDP at 5-6% annually, one of the fastest periods of expansion on record (Morris, 2005). Within the same period wholesale prices declined 25% (Morris, 2005). This period of price deflation combined with robust output growth caused an incredible advance in the USA economy. The issue was that nominal, not real, wages were stagnant during the decade. Because of this people believed they were worse off; even though their real purchasing power increased significantly during the period. This mistaken perception of the economy is an excellent demonstration of the misinterpretation of economic information.

While all economic measures have their weaknesses, governments, businesses, and individuals use this data to plan for the future. Once we have chosen which data to use another question arises. What causes changes in economic conditions? Is it the average work week, the

investment in capital assets, the printing of money, changes in interest rates, increases in government subsidies, changes in the weather, etc.? While all of the listed items undoubtedly affect the economy, assessing the degree to which they affect it is difficult. Discussion on what causes economic expansion and contraction has been occurring for thousands of years.

Economic theory can be traced back thousands of years, but truly began to develop in the 16th century. The dominant economic school of thought from the 16th to 19th centuries was mercantilism (LaHaye, 2008). One of the main concepts of this economic theory involved maximizing a country's exports. The basic idea was that exports brought wealth into a country while imports sent wealth outward. This idea is perfectly demonstrated by the rapid growth of Japan in the latter half of the 20th century. **Table #2** shows the current account balances and yearly GDP growth for both the USA and Japan from 1960-1990. During this time the USA maintained consistent current account deficits and continued to grow during the same periods. Does this mean that the principles of mercantilism were incorrect? Not necessarily, it merely demonstrates how complex the make-up of economic growth is.

Adam Smith was another significant figure in the development of modern economics. He espoused the idea of the "invisible hand." The following excerpt from the Adam Smith Institute perfectly summarizes his ideas, "Smith showed that this vast mercantilist edifice was folly. He argued that in a free exchange, both sides became better off. Quite simply, nobody would trade if they expected to lose from it. The buyer profits, just as the seller does. Imports are just as valuable to us as our exports are to others… Smith had a radical, fresh understanding of how human societies actually work. He realized that social harmony would emerge naturally as human beings struggled to find ways to live and work with each other. Freedom and self-interest need not produce chaos, but – as if guided by an 'invisible hand' – order and concord. And as people struck bargains with each other, the nation's resources would be drawn automatically to the ends and purposes that people valued most highly ("Introduction to Adam Smith", 2014)." The invisible hand concept essentially argues that markets will correct themselves automatically to ensure the optimal allocation of resources and capital. Adam Smith's ideas stood in stark contrast to the prior assumptions of mercantilism. Additionally, many of Smith's ideas still affect economic theory and policy today.

Another figure who influenced the development of modern economics was Maynard Keynes. Keynesian theory is comprised of a multitude of different aspects. "Some of the most important include: aggregate demand is influenced by many economic decisions-public and private, prices (especially wages) respond slowly to changes in supply and demand, and changes in aggregate demand have their greatest short-run effect on real output and employment (Jahan et al., 2014)." Keynes' theories became extremely important in the beginning of the 21st century. In reaction to the global financial crisis of 2007-2008, many national governments maintained high levels of spending to combat a decrease in demand and economic output (Gupta et al., 2012). The results of these policies are unclear, but appear to have returned most of the world to modest growth.

The goal of my paper is to demonstrate a relationship between consumer lending and economic growth. I examine the relationship in both a contemporaneous and lead-lag manner. The definitions of consumer lending and economic growth are outlined in the methodology section of the paper. Before continuing there I will take some time to discuss the history of consumer lending in the selected countries as well as my reasons for believing a connection exists between consumer lending and economic growth.

II.1. The History of Consumer Lending

The United States of America:

The evolution of consumer lending in the USA has been both rapid and substantial. With the advance of the internet and consumerism, consumer borrowing is at an all-time high. Consumer credit card debt stood at $870 billion in 2012 ("Trends in Consumer Credit Card Debt", 2012). This was equal to 5% of the entire US GDP in 2012 ("World DataBank", 2015). The figure becomes even more significant when we consider that the modern day credit card did not even exist until 1950. According to the Encyclopedia Britannica, "The use of credit cards originated in the United States during the 1920s, when individual firms, such as oil companies and hotel chains, began issuing them to customers for purchases made at company outlets. The first universal credit card, which could be used at a variety of establishments, was introduced by the Diners' Club, Inc., in 1950. Another major card of this type, known as a travel and

entertainment card, was established by the American Express Company in 1958 (“Credit Card”, 2015).” The birth of modern revolving credit occurred barely 65 years ago in the USA. In a world where plastic purchasing is practically ubiquitous it is hard to imagine not having unfettered access to revolving credit.

While the history of credit cards (the most significant modern form of revolving consumer lending) is fairly recent, the other major type of consumer credit (non-revolving) has been around for much longer. Non-revolving consumer credit in the USA really began with the Singer Sewing Machine Company. In 1850, as the American Industrial Revolution was beginning, Singer sold its sewing machines on payment plans (non-revolving credit) (“Credit History: The Evolution of Consumer Credit in America”, 2013). This was one of the first major examples of non-revolving consumer credit in the USA. As the 19th century continued, the ranks of the middle class in the USA began to swell and consumerism went from being morally deplorable to the everyday norm (“Welby 'embarrassed' by Wonga Link”, 2013). By the time 1900 rolled around Americans were buying bicycles, kitchen stoves, and many other high price goods on non-revolving credit (“Credit History: The Evolution of Consumer Credit in America”, 2013).

During the 20th century the invention of the computer, internet, and the widespread availability of telecommunications all contributed to the decentralization of consumer lending. Rather than personally knowing who they were lending to financial institutions could find information on any of their customers and make informed decisions about who to lend to. These advances in technology have all contributed to a massive boom in consumer lending.

The United Kingdom:

Consumer credit trends in the UK closely mimicked those of the USA. According to The Oxford Encyclopedia of Economic History, consumer credit began to grow during the Industrial Revolution of the late 19th century in England (Mokyr, 2003). Additionally, growth accelerated massively during the 1920’s in both the USA and UK (Mokyr, 2003).

Japan:

Unlike the UK and the USA, Japan did not become a serious global power until after World War II. Therefore, the development of consumer credit in this nation was slightly different than the two previously examined nations. The rise of revolving credit mirrored the USA and UK, as these developments really only took hold after 1950, but the story of non-revolving credit in Japan is slightly different.

Before and for the decade following World War II, Japan was not a significant economic power. In 1952, Japan's Gross National Product (GNP) was $16.3 billion or $188 per capita (Das, 1993). For comparison this was lower than that of Brazil, Chile, and Malaysia (Das, 1993). During the years following WW II, Japan had a number of favorable factors which contributed to its rapid economic growth. These included: a surplus of educated workers, expansion of global free trade policies, and a surplus of private savings for investment (Ellington, 2004). With these factors in place Japan has become a major economic power; currently the 3rd largest economy in the world as measured by nominal GDP ("World DataBank", 2015).

Non-revolving consumer credit began rapidly growing in Japan along with economic growth in the 1950's (Mokyr, 2003). This growth has continued to today, with one significant exception. Personal savings are much higher in the Japan than the rest of the developed world; consumer credit in Japan equaled 2% of 2007 GDP versus 6% of GDP in the USA and 5% of GDP in the UK (Nakagawa & Yasui, 2009). The lower level of consumer borrowing in Japan is an important consideration when examining the relationship that consumer lending has with economic growth.

Australia:

The history of consumer lending in Australia also took a unique path to its current state. According to a working paper written by Pierre Eng, "Formal consumer credit grew quickly in Australia after World War II as a major source of finance for the purchase of goods and services for which households and individuals lacked funds. Per head of the population, the level of consumer debt amounted to A$233 in 1950, increasing more than tenfold to over A$4,500 in 2007 (in 1989/90 prices). Just after the war, hire-purchase companies were about the only source

of formal consumer credit. Today, anyone wishing to borrow money for the purchase of goods and services can choose from a wide range of financial institutions for a loan on conditions that suit the borrower best (Eng, 2008).” Much like Japan, it was not until after World War II that Australia truly began to rise in economic importance.

“Before World War I, consumer credit in Australia was most likely largely informal. Except for the purchase of houses, trading banks were not interested in lending to individuals and households, certainly not in extending unsecured personal loans. This was a time when most people in Australia did not have bank accounts, because their savings were only marginal (Eng, 2008).” The lack of well-developed and highly regulated financial markets led to a vast undersupply of consumer credit in Australia.

However, during the years following World War II a boom began in “hire-purchase” lending (Eng, 2008). Hire-purchase lending involved finance companies that were non-banking entities. Because they did not participate in banking they were allowed to operate largely unregulated by the Australian government (Eng, 2008). Lending by these entities, “increased by a factor of 30 from A$39 million in 1947 to A$1,157 million in 1960 (Eng, 2008).” The boom in lending by mostly unregulated finance companies caused banks to pressure the government to loosen regulations on consumer lending (Eng, 2008). The government eventually capitulated and allowed banks to enter the consumer lending industry during the 1970’s (Eng, 2008). Following the deregulation of the consumer lending industry more entities began to offer consumers credit in Australia. This expansion of lending fueled continued growth in the consumer lending market leaving Australia where it is today.

II.2. Consumer Lending & Economic Growth

Now that I have briefly discussed the history of consumer lending and several different schools of economic thought I want to examine the reasoning behind my hypothesis. Why would changes in consumer lending have any effect on economic growth? One possible explanation is that credit allows consumers to purchase beyond their cash incomes. Because consumer spending is a component of GDP more spending directly leads to an increase in GDP, This is extremely important in modern industrial economies. For example, in the USA and UK consumer spending

makes up almost two-thirds of total GDP ("World DataBank", 2015). Similar trends can be observed in Australia and Japan ("World DataBank", 2015). It is for this reason that I investigated the relationship between consumer lending and economic growth.

Another potential reason for a relationship could be that consumer lending is self-perpetuating. As consumers borrow they spend more money. This in turn boosts GDP. As GDP rises, companies increase their output in expectation of greater demand. Once again GDP is boosted and banks begin to lend more money in expectation of further economic growth. The cycle continues as consumers borrow more money and so on. This continuous circle could explain changes to consumer lending cascading through the economy and affecting economic growth.

In addition to situations that support my hypothesis, there are several scenarios where it may be unsupported. For example, there is potential for a large expansion in consumer lending volume to cause an increase in defaults. As credit grows faster than real incomes, consumers may be unable to repay their obligations. The resulting defaults would wreak havoc on the financial system and could lead to GDP/capita contraction.

Lastly, large increases in consumer lending could potentially divert funding from other uses. For example, if consumer lending grew too large it could lead to businesses being unable to fund their continuing operations. The lack of funding might force businesses to become insolvent and declare bankruptcy. These bankruptcies would cascade through the economy and seriously depress economic growth. These examples highlight ways in which my hypothesis could be correct or incorrect.

III. Methodology

My goal was to compare the growth of consumer lending with the growth of the overall economy. I define consumer lending as all borrowing by individuals excluding mortgages. Mortgages are significantly different from other forms of consumer lending in two ways. First, mortgage lending is long-term in nature, usually 15-30 years. Credit card debt is very short term in nature, typically being repaid in one month to a year, while auto lending is mid-term, two to five years. Student loan debt is long term in nature, 10-25 years, but is a form of unsecured

borrowing (“Repayment Plans”, 2015). The fact that student lending is unsecured significantly differentiates it from mortgage lending. Lastly, mortgages fulfill an essential need while consumer lending does not. Mortgages allow consumers to purchase homes which provide shelter. Credit cards, car loans, and student borrowing allow consumers to improve their standard of living, but not fulfill a basic requirement of life.

There are two major types of consumer credit: revolving and non-revolving. The Federal Reserve website explains the two types of credit in the following manner. “Revolving credit plans may be unsecured or secured by collateral and allow a consumer to borrow up to a prearranged limit and repay the debt in one or more installments. Credit card loans comprise most of revolving consumer credit measured in the G.19, but other types, such as prearranged overdraft plans, are also included. Non-revolving credit is closed-end credit extended to consumers that is repaid on a prearranged repayment schedule and may be secured or unsecured. To borrow additional funds, the consumer must enter into an additional contract with the lender. Consumer motor vehicle and education loans comprise the majority of non-revolving credit, but other loan types, such as boat loans, recreational vehicle loans, and personal loans, are also included (“Consumer Credit - G.19”, 2014).” I used the Federal Reserve’s definition of consumer credit in my paper.

The dependent variable for my regressions was economic growth. I decided to measure this using year over year (YoY) growth of GDP/capita. By using per capita data I can control for changes in population. As mentioned before, GDP is composed of consumer spending, government spending, gross private investment, and net exports (“Examples of Calculating GDP”, 2006). GDP data is widely reported and readily available. It is also fairly representative of the economy as a whole. For these reasons, I believe GDP/capita is a good proxy for economic growth.

I selected four countries to study for my paper: the USA, the UK, Japan, and Australia. All of these countries have excellent economic data and have maintained a consistent currency for the period of observation. These factors make them prime candidates for selection in my research. Additionally, I believe that comparing different nations will allow me to more thoroughly test my hypothesis.

I performed a series of multivariate regressions in order to discern any relationship between consumer lending and economic growth. I included several control variables which I believe improved the results of my regressions. These included: prevailing interest rates, inflation, stock market return (based on broad indices), and balance of payments data. Prevailing interest rates are obtained from the World Bank and are defined as follows, "Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector ("World Databank", 2015)." Inflation is calculated using the GDP deflator from the World Databank. Balance of payments data include goods imports/exports, services imports/exports, and the current account balance excluding trade (except for Japan which uses goods and services trade balances). While these factors cannot encompass the complexity of a national economy in its entirety, I believe that for the purpose of my research they are sufficient.

The variables were combined in seven different models. This was done in an effort to examine the significance of consumer lending in the presence of different control variables. By developing a variety of models I believe that the true relationship between consumer lending and economic growth was better demonstrated. I have included in **Table #3** a description of the combinations of variables used in each regression model.

Due to differences in data availability, I have different periods of observation for each nation. Australia and Japan were observed from 1990-2012, the UK from 1994-2012, and the USA from both 1980-2012 and 1990-2012 for contemporaneous regressions. For the lead-lag regressions the dates were 1991-2012 for Australia and Japan, 1995-2012 for the UK, and 1980-2012/1990-2012 for the USA. I believe that conducting two regression periods for the USA allowed me to better compare the results of my regressions across the observed countries.

In addition to running regressions on the assumption of a contemporaneous relationship (changes in year 2000 consumer lending lead to changes in year 2000 economic growth) I also ran regressions assuming a lead-lag relationship between consumer lending and economic growth. This is to say that changes in year 2000 consumer lending would show a relationship with economic growth in the year 2001. By running both types of regressions I hope to obtain a full and vivid picture of the relationship between consumer lending and economic growth.

Lastly, I conducted all regressions series using both GDP/capita and GNI/capita as the dependent variable. For the selected countries these numbers were often nearly identical (+/- 1%). This led to the regressions results for the two measures being identical. For this reason I have only included the results of the GDP/capita regressions. I believe this sufficiently demonstrates my findings and improves the readability of this paper.

IV. Summary Statistics

*IV.1. The United States of America (**Table #4**)*

*IV.2. The United Kingdom (**Table #5**)*

*IV.3. Japan (**Table #6**)*

*IV.4. Australia (**Table #7**)*

IV.5. Comparisons

I compared some of the most significant factors for different countries to frame my exploration of the data. Additionally, I would like to note that all figures in this section are measured in current US dollars. As measured by mean GDP from 1980-2012 the countries from largest to smallest are: The USA, Japan, the UK, and Australia. In 2012 the USA had a GDP of $16.2 trillion, Japan $6.0 trillion, UK $2.6 trillion, and Australia $1.5 trillion. On a GDP/capita basis the countries rank as follows: Australia $67,512, USA $51,489, Japan $46,679, and UK $41,358 ("World DataBank", 2015). All the countries observed have highly developed industrial economies.

Another key element is average GDP growth during the observed period. The mean GDP growth for each nation from 1980-2012 is as follows: USA 4.62%, UK 6.15%, Japan 2.02%, and Australia 6.05% ("World DataBank", 2015). This shows that the UK and Australia were relatively fast growing economies during the observed period. In contrast, the US

experienced moderate growth while the growth of Japan's economy was muted. Differences in GDP growth could have serious effects on my regression analysis.

Lastly, I compare consumer credit in each nation. The total size of the consumer credit market in 2012 is as follows: US $2.9 trillion, UK $260 billion, Japan $95 billion, Australia $102 billion. As a % of 2012 GDP each country ranks as follows: US 18.1%, UK 9.9%, Japan 1.9%, and Australia 6.7% ("World DataBank", 2015). Consumer credit is clearly the most prevalent in the USA and the least so in Japan. This can be explained by social trends. In the USA the use of credit is not stigmatized. In contrast, use of credit in Japan is considered shameful and should be avoided at all costs ("A Borrower Be", 2001). The UK has level of consumer lending somewhat similar to the US. Australia has a lower level, most likely due to the fact that its financial markets are newer and less developed than those of the US and UK (Eng, 2008). These comparisons put a little bit of context on the observations made later in the paper.

V. Contemporaneous Relationship

For my contemporaneous regressions I included YoY growth in GDP/capita as the dependent variable and the following as independent variables: YoY growth of revolving consumer credit, YoY growth of non-revolving consumer credit, YoY change of prevailing lending interest rates, inflation, stock market returns, YoY growth of goods imports/exports, YoY growth of services imports/exports, and YoY growth of the current account balance excluding trade. The independent variables were regressed in a variety of combinations in an attempt to develop models with high R-squared values which explain the majority of the variation in GDP/capita growth.

V.1. The United States of America

Due to differences in available economic data, only the USA has readily available consumer credit information prior to 1990. Because of this two sets of regressions were conducted for the USA; one from 1980-2012 and one from 1990-2012. The results of these two

regressions sets turned out to be substantially different and for that purpose I have decided to include them both in this paper rather than just 1990-2012 data.

V.1.i. 1980-2012

I conducted seven regressions based on an assumed contemporaneous relationship between changes in consumer lending and GDP/capita growth from the years 1980-2012 in the USA. I have included a summary of all regression results in **Table #8**.

The regressions produced five significant (those with a P-value below 0.05) independent variables: revolving consumer credit, non-revolving consumer credit, inflation, lending interest rates, and goods imports. Revolving credit was significant in four of four models. The sign of the coefficient was positive in all four models. This indicates a strong positive contemporaneous relationship between revolving credit and GDP/capita growth. Non-revolving credit was only found to be significant in one of four regressions and therefore is only marginally significant.

Lending interest rates were significant in two of four regressions both with positive coefficients. This leads me to assume a significant positive relationship between interest rate levels and GDP/capita growth. Inflation was significant in four of four regressions. The sign of the coefficient was positive indicating a very significant positive contemporaneous relationship between inflation and GDP/capita growth. Lastly, goods imports showed significance in three of four regressions all with positive coefficients. This is slightly odd as none of the other components of the balance of payments appeared to show significance. This result could either indicate goods imports on their own relate to GDP/capita growth or could simply be happenstance.

Overall, the data show that there is a statistically significant positive contemporaneous relationship between changes in revolving consumer credit and GDP/capita growth. The results are less clear in regards to non-revolving credit, but is still strong enough to provide marginal support for a relationship. The results for this set of regressions strongly support the connection between consumer lending, at least revolving credit, and GDP/capita growth.

V.1.ii. 1990-2012

As mentioned before, a second series of regressions was conducted for the USA to improve the comparability of results with the other countries examined. Seven regressions were conducted in the same manner as the 1980-2012 contemporaneous regressions. Summary results of all regressions can be found in **Table #9**. The regressions showed six variables which had significant relationships with GDP/capita: revolving credit, lending interest rates, inflation, stock market returns, goods exports, and goods imports. Revolving credit was statistically significant in two of four models. The sign of the coefficient was positive indicating a significant positive contemporaneous relationship between revolving credit and GDP/capita growth.

Lending interest rates were significant in one of four models. This connection seems inconsequential to marginal, at best. Inflation showed a significant relationship in two of four models. The sign of the coefficient was positive demonstrating a significant positive contemporaneous relationship between inflation and GDP/capita growth. Stock market returns were significant in 2 of 4 models with positive coefficients. This indicates a significant positive relationship between stock market returns and GDP/capita growth.

Goods exports were statistically significant in two of four models and had a negative coefficient. This demonstrates a significant negative contemporaneous relationship between goods exports and GDP/capita growth. On the other hand goods imports were significant in four of four models and had a positive coefficient. This shows that there is a very significant positive contemporaneous relationship between goods imports and GDP/capita growth.

Period comparisons

It would appear that there are somewhat conflicting results for the USA regressions. From 1980-2012 there seemed to be a very significant relationship between revolving credit and GDP/capita. There was also a marginal relationship between non-revolving credit and GDP/capita growth. These findings support my assertion that a relationship exists between consumer lending and GDP/capita growth. However, the results for the period 1990-2012 somewhat confound my findings.

From 1990-2012 revolving credit showed a much weaker relationship with GDP/capita while non-revolving credit showed no relationship whatsoever. The change between the two time periods could be explained in a number of ways. The structure of the economy and consumer lending market could have changed between the two time periods observed. Additionally, it may be that the data sets are small enough that minor changes in their makeup have significant impacts on end results. Whatever the cause it would appear that I have a somewhat strong cause to assert a positive contemporaneous relationship between revolving credit and GDP/capita growth. Non-revolving credit seems to have a marginal positive contemporaneous relationship with GDP/capita in the USA.

V.2. The United Kingdom (1994-2012)

The period explored is shorter than that for the USA due to a lack of consumer credit data prior to 1994 in the UK. I performed seven regressions over the time period 1994-2012 for the UK. The results of these seven regressions are shown in **Table #10**.

The regressions performed showed a total of four significant variables: non-revolving credit, lending interest rates, inflation, and services imports. Revolving credit was significant in zero of four models showing no significant relationship with GDP/capita growth. Non-revolving credit was significant in two of four models and had positive coefficients. This would appear to suggest that a significant positive contemporaneous relationship exists between non-revolving credit and GDP/capita growth.

Lending interest rates were significant in four of four models and had a positive coefficient. In the UK, changes in lending interest rates had a strong positive contemporaneous relationship to GDP/capita growth. Inflation and services imports showed only a marginal relationship with GDP/capita growth. Both variables were marginally significant in one model each. Due to a larger than 0.05 P-value and a lack of consistency between different models, I believe that the relevance of these two variables in the UK is inconsequential.

It would appear that when assuming a contemporaneous relationship between revolving credit and GDP/capita growth there is little support for a connection. On the other hand, non-revolving credit was found to have a significant positive relationship with GDP/capita growth.

These results could be attributed to a variety of factors. It could be that the time-series data was not extensive enough to produce meaningful statistical analysis. It is also possible that there are structural differences between the UK and the other economies observed which would lead to such vast differences in regression results. Either way, it is clear to see that based on my methodology, non-revolving credit has a positive contemporaneous relationship with GDP/capita growth in the UK over the time period observed.

V.3. Japan (1990-2012)

Japanese statistics required me to conduct a slightly different regression analysis. Rather than use individual components of international trade, I decided to use balances of trade. This is due to the fact that Japanese data only presented a single services balance, instead of a credit and debit scheme, in their data releases. I believe that balance data will provide similar results to export and import data as they are merely aggregated versions of the same information. I conducted seven regressions on the contemporaneous relationship between consumer lending and GDP/capita growth. I included results of the regressions in **Table #11**.

Two variables showed significance in this series of regressions: revolving credit and inflation. Revolving credit was significant in two of four models with positive coefficients. This suggests a significant positive contemporaneous relationship between revolving credit and GDP/capita growth. Inflation was significant in two of four regressions with a positive coefficient. There appears to be a significant positive contemporaneous relationship between inflation and GDP/capita growth.

It would appear that the contemporaneous link between consumer credit and GDP/capita growth is weak, but existent in Japan. There are several potential explanations for the lack of significant proof for my hypothesis. First, Japan has seen a sustained period of economic slowdown over the past 20 years. For example, in 1990 Japan's GDP was 450 trillion Japanese yen ("World DataBank", 2015). In 2012, the GDP of Japan was 475 trillion Japanese yen ("World DataBank", 2015). This stagnation in GDP growth could cause connections between consumer lending and GDP/capita to be lost. Additionally, levels of consumer lending are much

lower in Japan than the rest of the world. The lower importance of consumer lending to the economy could mean there actually is a lesser link between consumer lending and GDP/capita.

V.4. Australia (1990-2012)

I conducted seven regressions on the contemporaneous relationship between consumer lending and GDP/capita in Australia. I included a summary of the regression results in **Table #12**. The regressions produced four significant variables: non-revolving credit, inflation, services exports, services imports, and the current account balance excluding trade. Revolving credit was significant in zero of four models suggesting it had no significance as an independent variable. Non-revolving credit was significant in two of four models with a positive coefficient. This seemed to demonstrate a significant positive contemporaneous relationship between non-revolving credit and GDP/capita growth.

Inflation showed significance in four of four models with a positive coefficient. This suggests an extremely strong positive contemporaneous relationship between inflation and GDP/capita growth. Service exports were marginally significant in two of four models with negative coefficients. Services imports were significant in three of four models with positive coefficients. I conclude that the relationship for services exports is marginal while services imports have a significant positive contemporaneous relationship with GDP/capita growth.

Based on my regressions it would appear that there is little link between revolving consumer lending and GDP/capita growth. Conversely, the link between non-revolving consumer credit and GDP/capita appeared statistically significant. This leads me to believe that there is a significant relationship between non-revolving consumer credit and GDP/capita growth.

V.5. Comparisons

In total I conducted five series of regressions to test the contemporaneous relationship between consumer lending and GDP/capita growth: USA 1980-2012, USA 1990-2012, UK 1994-2012, Japan 1990-2012, and Australia 1990-2012. The results for each country, and in the

case of the USA each time frame, varied widely. Links between consumer credit and GDP/capita growth were shown in every country to different degrees.

In three of the five series, revolving consumer credit demonstrated a positive contemporaneous relationship to GDP/capita growth. The strongest relationship was seen in the 1980-2012 USA regression. Over this time period every regression produced a statistically significant relationship between revolving credit and GDP/capita growth. However, from 1990-2012 this relationship weakened and was only somewhat significant. Japan also showed a significant positive relationship between revolving credit and GDP/capita growth. On the other hand, no statistically significant relationship was observed for the UK or Australia. When taken as a whole it would appear that the links between revolving credit and GDP/capita growth are significantly influenced by the differing structures and mechanisms of national economies.

In three of the five series, non-revolving consumer credit showed a significant positive contemporaneous relationship with GDP/capita growth. The relationship was the strongest in Australia and the UK. The USA showed a marginal relationship from 1980-2012 and no relationship from 1990-2012. Additionally, Japan did not demonstrate any statistically significant relationship.

One of the most interesting findings is that at least one form of consumer credit always demonstrated a significant contemporaneous relationship to GDP/capita growth. In the USA, revolving credit demonstrated a strong relationship while non-revolving had a marginal relationship. In the UK, non-revolving credit demonstrated a significant relationship. In Japan, revolving credit demonstrated a significant relationship. Lastly, in Australia non-revolving credit demonstrated a significant relationship. Additionally, all models demonstrating a significant relationship between consumer lending and GDP/capita growth had positive coefficients. This result supports my hypothesis that changes in consumer lending are related to changes in GDP/capita growth as measured by GDP/capita.

Also of note, inflation was significant in all five contemporaneous series all of which had positive coefficients. This suggests a very strong positive contemporaneous relationship between inflation and GDP/capita growth. Lending interest rates were significant in three of five series. Other than these two variables no other independent variable was significant in more than one or

two series of regressions. This could be due to the short duration of the time-series or could potentially highlight differences in national economies.

VI. Lead-Lag Relationship

For these regressions all independent variables were held constant while GDP/capita growth figures were advanced one year. This means that all independent 2010 data was compared to 2011 GDP/capita growth. This was done for each country in an attempt to show a lead-lag relationship between consumer lending and economic growth.

VI.1. The United States of America

Once again two sets of regressions were completed for the USA. One from 1980-2012 and one from 1990-2012. This is in an attempt to maximize the time period observed while also providing a regression that is comparable to the data from the other countries observed.

VI.1.i. 1980-2012

I conducted seven regressions assuming a lead-lag relationship between all independent variables and GDP/capita. I have included the results of the regressions in **Table #13**. The regressions displayed four significant variables: inflation, stock market returns, services exports, and goods imports. Inflation was significant in four of four models and had a positive coefficient. These results seems strange because inflation was also strongly related to GDP/capita growth in the contemporaneous regressions. Stock market returns were significant in four of four models and had positive coefficients. These results support an extremely significant positive lead-lag relationship between stock market returns and GDP/capita growth.

Services exports were marginally significant in only one model with a negative coefficient. This provides little support for a lead-lag relationship between services exports and GDP/capita growth. Goods imports were significant in two of four models with positive coefficients suggesting a significant positive lead-lag relationship with GDP/capita growth. I think it is also interesting to note that no lead-lag relationship appears to exist between either form of consumer lending and GDP/capita growth.

VI.1.ii. 1990-2012

Seven regressions were conducted for this time period. The results are shown in **Table #14**. The regressions produced four significant variables: inflation, stock market returns, goods exports, and goods imports. Inflation was marginally related to GDP/capita in one of four models. This relationship seems insignificant. Stock market returns were significant in all four of four models and had a positive coefficient. This replicates the results of the 1980-2012 regressions. It would appear that stock market returns have a very strong lead-lag relationship with GDP/capita growth.

Both goods exports and imports were significant in four of four models. Goods exports had a negative coefficient while goods imports had a positive coefficient. This suggests that there is a strong lead-lag relationship between goods trade and GDP/capita growth. It is also interesting to note that no significant lead-lag relationship between consumer lending and GDP/capita was observed during this time period.

Period Comparisons

Based on the regression analysis performed growth in consumer lending does not seem to have a lead-lag relationship with GDP/capita growth in the USA. This was shown in both the 1980-2012 and 1990-2012 periods. This could be caused by a number of different factors. My best guess is that the short term nature of consumer credit is the cause. Consumer credit, as mentioned before, is composed of credit card purchases, student loans, and automotive loans. These three forms of lending appear to be quickly reflected in GDP/capita figures. For this reason, a contemporaneous relationship, rather than lead-lag, best explains the interactions between consumer lending and economic expansion in the USA.

VI.2. The United Kingdom (1995-2012)

In order to examine a potential lead-lag relationship between consumer lending and GDP/capita growth in the UK I conducted seven regressions. The results of these regressions are shown in **Table #15**. The regressions produced four significant variables: non-revolving credit, stock market returns, services exports, and services imports.

The most significant result would be non-revolving credit producing statistically significant P-values in four of four models and a positive coefficient. This is especially interesting to note because the contemporaneous regressions for the UK only demonstrated a marginal relationship between non-revolving credit and GDP/capita growth. At least in the UK it might be possible that a lead-lag relationship exists between non-revolving credit and GDP/capita growth.

Stock market returns were only marginally significant in one of four models and therefore are likely insignificant. Both services exports and imports were significant in two of four models. Services exports had a positive coefficient while services imports had a negative coefficient. These results suggest a significant lead-lag relationship between services imports/exports and GDP/capita in the UK.

My most substantial finding is that non-revolving credit was shown to have a very strong positive lead-lag relationship with GDP/capita growth. This could be explained by the longer term nature of non-revolving consumer credit. The largest component of non-revolving consumer credit is automobile lending. These types of purchases are usually made on 3-5 year terms. The longer term nature of this borrowing could lead to a delay between growth in non-revolving credit and changes to GDP/capita growth.

Additionally, since a strong lead-lag relationship was shown between non-revolving credit and economic growth it is possible to construct a basic model of the effect changes in lending have on GDP/capita. Holding all independent variables constant, except non-revolving lending, the equation which predicts GDP/capita growth in the UK is as follows:

$$y = 0.0289 + 0.1860 * x$$

In the equation y equals GDP/capita growth while x equals non-revolving credit growth. The values for the constant, coefficient of non-revolving credit, and standard deviation are based on the mean values for regression models 1-4. Therefore, a change of one standard deviation (equal to 0.0607) in non-revolving credit would result in a GDP/capita change of 0.0402. This model is useful for attempting to predict the effect that changes in non-revolving credit will have on GDP/capita growth.

VI.3. Japan (1991-2012)

Seven regressions were conducted to investigate a potential lead-lag relationship between the independent variables and GDP/capita growth. The results of these regressions have been included in **Table #16**. The regressions produced five significant variables: Revolving credit, non-revolving credit, lending interest rates, inflation, and stock market returns.

Both revolving and non-revolving credit demonstrated a statistically significant relationship with GDP/capita. Revolving credit was significant in four of four models with a positive coefficient while non-revolving credit was significant in two of four with a negative coefficient. This stands in stark contrast to the contemporaneous Japanese regressions which showed no relationship between non-revolving credit and GDP/capita growth and a much less significant relationship between revolving credit and GDP/capita growth. It would appear that in Japan a very strong lead-lag connection between consumer lending and GDP/capita growth exists. It also interesting to note that non-revolving credit produced a negative coefficient. All other models in all other countries produced positive coefficients for consumer credit variables.

Lending interest rates were only significant in one of four models. These results demonstrate an insignificant relationship between lending interest rates and GDP/capita. Inflation was significant in two of four models with positive coefficients, suggesting a significant positive lead-lag relationship with GDP/capita growth. Stock market returns showed significance in four of four regression models and had positive coefficients. This suggests a very strong lead-lag relationship between stock market returns and GDP/capita. The results for stock market returns also concur with the lead-lag results for the USA and the UK.

Lastly, since a strong lead-lag relationship was shown between both types of credit and economic growth it is possible to construct a basic model of the effect changes in lending have on GDP/capita. Holding all independent variables constant, except consumer lending, the equation which predicts GDP/capita growth in the Japan is as follows:

$$y = -0.0050 + 0.1724 * x - 0.1214 * z$$

In the equation y equals GDP/capita growth while x equals revolving credit growth and z equals non-revolving credit growth. The values for the constant, coefficient of non-revolving/revolving credit, and standard deviation are based on the mean values for models 1-4. Therefore, a change of one standard deviation (equal to 0.0416 for revolving credit and 0.0648 for non-revolving credit) for both types of credit would result in a GDP/capita change of -0.0057. This model is useful for attempting to predict the effect that changes in non-revolving credit will have on GDP/capita growth.

VI.4. Australia (1991-2012)

Seven regressions were conducted for Australia. The results of these regressions have been included in **Table #17**. The regressions produced three significant variables: non-revolving credit, lending interest rates, and current account balance excluding trade. Non-revolving credit was found to be significant in one of four models and had a positive coefficient. This would suggest only a marginal lead-lag relationship between non-revolving credit and GDP/capita.

Lending interest rates showed significance in two of four models and had positive coefficients. This suggests a significant lead-lag relationship between lending interest rates and GDP/capita growth. Current account balance excluding trade was marginally significant in one of four models. This suggests that the relationship between the current account balance excluding trade and GDP/capita growth is insignificant.

My regressions showed a weak lead-lag relationship between non-revolving consumer credit and GDP/capita growth. Revolving credit showed no statistically significant relationship with GDP/capita growth. The results for Australia support the idea that there lead-lag relationship between consumer lending and GDP/capita growth does not exist.

VI.5. Comparisons

As with the contemporaneous regressions, results for each country varied widely. In one of five regressions, revolving credit demonstrated a significant lead-lag relationship with GDP/capita growth. This occurred in Japan where the regressions provided very strong support

for a lead-lag relationship with GDP/capita growth. Both USA time frames, the UK, and Australia showed no lead-lag relationship between revolving credit and GDP/capita growth.

Non-revolving credit was found to be significant in three of five regression series. In the UK the relationship was the strongest with every regression producing a significant lead-lag relationship between non-revolving and GDP/capita growth. Japan showed the next most significant relationship and produced negative coefficients. This is odd as no other regression for consumer credit produced negative coefficients. After Japan, Australia was shown to have marginal relationship between non-revolving credit and GDP/capita growth. Both USA time frames demonstrated no relationship between non-revolving credit and GDP/capita growth.

Other than consumer credit both inflation and stock market returns demonstrated significant lead-lag relationships with economic growth. Inflation was significant in three of five regressions series while stock market returns were significant in four of five regression series. Several other variables were significant in one or two countries, but did not demonstrate relationship as strong as inflation and stock market returns.

VII. Conclusions

My goal was to compare changes in consumer lending, both revolving and non-revolving, to economic growth as measured by GDP/capita. I conducted a series of regressions assuming both a contemporaneous and a lead-lag relationship between consumer lending and GDP/capita growth. I included several control variables (lending interest rates, inflation, stock market returns, and balance of payments data) in an attempt to strengthen my analysis. My hypothesis is that changes in consumer lending volume are related to economic growth as measured by GDP/capita.

A summary of the most significant relationships is shown in **Table #18, Table #19, Table #20, and Table #21**. First, revolving consumer credit appears to have a strong contemporaneous relationship to GDP/capita growth in the USA. This relationship is strongest in the 1980-2012 regressions and slightly weaker in the 1990-2012 regressions. The cause of this difference is unclear, but either way revolving credit seems to have a significant relationship to GDP/capita growth in the USA. Revolving credit also had significant relationship with GDP/capita growth in

the Japan, although to a lesser degree than the USA. Australia and the UK did not show any statistically significant contemporaneous relationship between revolving credit and GDP/capita growth.

Non-revolving credit showed a significant contemporaneous relationship to GDP/capita growth in both Australia. A relationship was also observed in the UK and US (1980-2012), but both of these relationships were marginal. Japan and the US (1990-2012) showed no statistically significant contemporaneous relationship between non-revolving credit and GDP/capita growth.

The regressions assuming a lead-lag relationship returned slightly different results. Revolving credit showed a very significant lead-lag relationship to GDP/capita growth in only Japan. The US (for both time periods), the UK, and Australia demonstrated a significant relationship between revolving credit and GDP/capita growth in zero of four models each.

Non-revolving credit on the other hand showed a significant lead-lag relationship with GDP/capita growth in the UK. Non-revolving credit was significant in four of four models for the UK. Australia and the Japan demonstrated only a marginal lead-lag relationship between non-revolving credit and GDP/capita growth. The US, in contrast, showed no relationship between non-revolving credit and GDP/capita growth in either observation period.

All regressions which produced significant relationships between consumer lending and economic growth had positive coefficients. The one exception would be the lead-lag regressions for Japan. This regression series showed that non-revolving credit in Japan produced negative coefficients. The results suggest a negative lead-lag relationship between non-revolving credit and GDP/capita growth in Japan.

Overall, it would appear that each nation has a different interaction between consumer lending and GDP/capita growth. In every case, some form of consumer credit, in either a contemporaneous or lead-lag fashion, seemed to relate to GDP/capita growth. This supports my hypothesis of a connection between consumer lending and GDP/capita growth. While inconclusive, I still believe that these findings are relevant in the study of consumer credit and the economy.

VIII. Limitations

While I believe that my findings are grounded in sound logic and accepted practices, there are several limitations to my findings. First, as discussed in the introduction, GDP/capita growth is a vast and complex subject. Scores of brilliant economists have spent their entire lives trying to understand the workings of the economy. Even with all of their efforts, economic theory is still far from a hard science. It is because of this that I must be cautious in confusing correlation or a simple relationship with causation. I cannot assert causation based on my study, but I believe that a solid relationship has been established.

Second, my economic data are over a fairly limited time frame. It is possible that the smaller size of my data set limits the validity of my findings. In future studies, it may be appropriate to expand the window of observation to maximize the statistical significance of the regressions results.

Lastly, national economies are constantly changing. As mentioned in the introduction to consumer credit, Australia's economy went through a period of massive expansion in consumer lending over the course of less than fifty years. Because the make-up of the economy is constantly shifting, it becomes even more difficult to establish a connection between consumer lending and GDP/capita growth. This should be taken into consideration in future studies and could possibly be controlled for.

IX. Tables

Table #1: GDP/Capita vs. hours worked

	Singapore	**Germany**
GDP/Capita	$ 52,871	$ 45,871
Hours worked (yearly)	2,193	1,406
GDP/Capita/Hour worked	$ 24.11	$ 32.63

Table #2: GDP vs. current account balance in Japan and the USA

	1960-1969	1970-1979	1980-1989
*Japan GDP Growth**	10.44%	4.11%	4.37%
*Current Account***	$ 3,011	$ 31,258	$ 415,493
*USA GDP Growth**	4.74%	3.24%	3.15%
*Current Account***	$ 33,325	$ (3,148)	$ (777,851)

(Source: World Bank DataBank)
*Growth is annualized average.
**Current Account is cumulative balance for 10 year period.

Table #3: Independent Variables used in Regression Models

Model 1	Model 2	Model 3
Revolving consumer credit	Revolving consumer credit	Revolving consumer credit
Non-revolving consumer credit	Non-revolving consumer credit	Non-revolving consumer credit
Lending Interest Rate	Goods exports	Lending Interest Rate
Inflation	Goods imports	Inflation
Stock Market Return	Services Exports	Stock Market Return
Goods exports	Services imports	
Goods imports	Curr. Acct. Bal. w/o trade	
Services Exports		
Services imports		
Curr. Acct. Bal. w/o trade		

Model 4	Model 5	Model 6
Revolving consumer credit	Lending Interest Rate	Goods exports
Non-revolving consumer credit	Inflation	Goods imports
	Stock Market Return	Services Exports
	Goods exports	Services imports
	Goods imports	Curr. Acct. Bal. w/o trade
	Services Exports	
	Services imports	
	Curr. Acct. Bal. w/o trade	

Model 7
Lending Interest Rate
Inflation
Stock Market Return

Table #4: Summary Statistics for the United States of America

Economic Factors	Mean	Min	Max	Stan. Dev.
GDP	$ 8,809,012	$ 2,862,500	$ 16,163,200	$ 4,117,155
Growth (YoY)	*5.68%*	*-2.04%*	*12.17%*	*2.55%*
GDP/capita	$ 31,487	$ 12,598	$ 51,489	$ 11,980
Growth (YoY)	*4.62%*	*-2.89%*	*11.08%*	*2.53%*
Credit Factors				
Revolving Credit	$ 503,237	$ 58,506	$ 1,004,738	$ 319,363
% change (YoY)	*8.81%*	*-8.76%*	*26.79%*	*7.91%*
% of total credit	*32.14%*	*16.34%*	*41.47%*	*8.04%*
Non-Revolving Credit	$ 941,282	$ 299,538	$ 2,076,922	$ 521,897
% change (YoY)	*6.17%*	*-6.10%*	*16.41%*	*4.82%*
% of total credit	*67.86%*	*58.53%*	*83.66%*	*8.04%*
Total Consumer Credit	$ 1,444,519	$ 358,044	$ 2,923,613	$ 828,120
% change (YoY)	*6.71%*	*-3.69%*	*18.37%*	*4.78%*
Control Factors				
S&P 500 Return	9.50%	-38.49%	34.11%	16.25%
Lending interest rate	8.12%	3.25%	18.87%	3.54%
Change (YoY)	*-2.04%*	*-36.80%*	*42.61%*	*19.52%*
GDP deflator	82.95	48.36	114.34	18.52
Change/Inflation (YoY)	*2.93%*	*0.79%*	*9.39%*	*1.90%*
Goods Exports	$ 652,032	$ 201,799	$ 1,561,689	$ 389,864
Growth (YoY)	*7.11%*	*-18.22%*	*27.99%*	*9.28%*
Services Exports	$ 259,651	$ 47,585	$ 654,850	$ 173,098
Growth (YoY)	*9.05%*	*-5.53%*	*20.53%*	*6.29%*
Goods Imports	$ 989,574	$ 247,642	$ 2,303,785	$ 650,030
Growth (YoY)	*7.93%*	*-26.21%*	*23.62%*	*9.15%*
Services Imports	$ 195,181	$ 41,492	$ 450,360	$ 125,464
Growth (YoY)	*8.03%*	*-5.44%*	*23.24%*	*5.34%*
Curr. Acc. Bal. (w/o trade)	*$ (3,387)*	*$ (48,922)*	*$ 89,281*	*$ 32,520*
Growth (YoY)	*90.38%*	*-331.93%*	*1694.99%*	*405.45%*

(Millions of current USD, except per capita data)

Table #5: Summary Statistics for the United Kingdom

Economic Factors	Mean	Min	Max	Stan. Dev.
GDP	£ 883,691	£ 244,023	£ 1,655,384	£ 442,225
Growth (YoY)	*6.53%*	*-2.41%*	*16.89%*	*3.29%*
GDP	$ 1,467,276	$ 459,229	$ 2,963,265	$ 768,981
Growth (YoY)	*6.03%*	*-17.30%*	*28.27%*	*10.22%*
GDP/capita	£ 14,836	£ 4,333	£ 26,181	£ 6,970
Growth (YoY)	*6.15%*	*-3.06%*	*16.75%*	*3.44%*
GDP/capita	$ 24,627	$ 8,139	$ 48,589	$ 12,175
Growth (YoY)	*5.65%*	*-17.86%*	*28.12%*	*10.21%*

Credit Factors

Revolving Credit	£ 40,721	£ 10,658	£ 59,692	£ 17,720
% change	*9.73%*	*-5.49%*	*42.43%*	*11.43%*
% of total	*26.39%*	*16.27%*	*36.94%*	*6.61%*
Non-Revolving Credit	£ 105,281	£ 54,366	£ 150,655	£ 26,027
% change	*4.00%*	*-16.16%*	*14.40%*	*7.99%*
% of total	*73.61%*	*63.06%*	*83.73%*	*6.61%*
Total Consumer Credit	£ 146,002	£ 65,024	£ 206,452	£ 42,070
% change	*5.28%*	*-11.65%*	*17.16%*	*7.60%*

Control Factors

FTSE 100 Return	7.60%	-30.93%	27.66%	15.66%
Lending interest rate	7.31%	0.50%	16.17%	4.19%
Change (YoY)	*-5.13%*	*-86.49%*	*35.22%*	*22.02%*
GDP deflator	79.01	35.75	118.74	24.17
Change/Inflation (YoY)	*4.32%*	*1.09%*	*19.48%*	*3.48%*
Goods Exports	£ 154,029	£ 47,493	£ 309,184	£ 74,456
Growth (YoY)	*6.56%*	*-9.50%*	*17.37%*	*7.61%*
Services Exports	£ 78,910	£ 15,795	£ 195,593	£ 56,223
Growth (YoY)	*8.24%*	*1.95%*	*15.98%*	*3.65%*
Goods Imports	£ 190,224	£ 46,369	£ 414,114	£ 106,951
Growth (YoY)	*7.22%*	*-10.54%*	*21.35%*	*6.75%*
Services Imports	£ 56,430	£ 11,381	£ 121,090	£ 36,856
Growth (YoY)	*7.91%*	*-0.33%*	*13.36%*	*3.87%*
Curr. Acc. Bal. (w/o trade)	-£ 5,937	-£ 38,100	£ 18,538	£ 11,175
Growth (YoY)	*-68.56%*	*-840.63%*	*657.58%*	*280.51%*

(Millions of current USD and GBP, except per capita data)

Table #6: Summary Statistics for Japan

Economic Factors	Mean	Min	Max	Stan. Dev.
GDP	¥443,059,173	¥475,110,400	¥523,198,300	¥523,198,300
Growth (YoY)	*2.32%*	*0.81%*	*8.41%*	*8.41%*
GDP	$ 3,540,460	$ 3,724,560	$ 4,149,371	$ 4,149,371
Growth (YoY)	*2.02%*	*1.01%*	*7.60%*	*7.60%*
GDP/capita	¥ 3,718,087	¥ 5,954,477	¥ 5,954,477	¥ 5,954,477
Growth (YoY)	*6.00%*	*0.83%*	*48.14%*	*48.14%*
GDP/capita	$ 29,567	$ 46,679	$ 46,679	$ 46,679
Growth (YoY)	*5.69%*	*1.03%*	*47.24%*	*47.24%*

Credit Factors

Revolving Credit	¥ 5,731,708	¥ 3,958,900	¥ 9,118,200	¥ 9,118,200
% change	*0.59%*	*4.91%*	*63.49%*	*63.49%*
% of total	*39.60%*	*45.15%*	*45.15%*	*45.15%*
Non-Revolving Credit	¥ 8,953,471	¥ 4,809,700	¥ 15,368,400	¥ 15,368,400
% change	*-3.49%*	*1.17%*	*24.49%*	*24.49%*
% of total	*60.40%*	*54.85%*	*73.54%*	*73.54%*
Total Consumer Credit	¥ 14,685,179	¥ 8,768,600	¥ 23,947,300	¥ 23,947,300
% change	*-2.20%*	*2.82%*	*34.81%*	*34.81%*

Control Factors

Nikkei 225 Return	4.12%	24.86%	43.85%	43.85%
Lending interest rate	3.97%	1.41%	8.35%	8.35%
Change (YoY)	*-3.84%*	*-6.22%*	*31.04%*	*31.04%*
GDP deflator	102.04	91.55	110.96	110.96
Change/Inflation (YoY)	*0.18%*	*-0.93%*	*5.44%*	*5.44%*
Goods Exports	¥ 47,379,060	¥ 61,956,800	¥ 80,023,600	¥ 80,023,600
Growth (YoY)	*3.85%*	*-1.60%*	*29.54%*	*29.54%*
Services Exports	¥ 15,288,751	¥ 7,142,108	¥ 25,392,752	¥ 25,392,752
Growth (YoY)	*10.75%*	*-16.64%*	*38.58%*	*38.58%*
Goods Imports	¥ 37,038,349	¥ 66,228,700	¥ 71,808,100	¥ 71,808,100
Growth (YoY)	*4.58%*	*4.63%*	*29.73%*	*29.73%*
Services Imports	¥ 17,073,478	¥ 9,714,029	¥ 27,771,672	¥ 27,771,672
Growth (YoY)	*8.89%*	*-0.31%*	*39.48%*	*39.48%*
Curr. Acc. Bal. (w/o trade)	¥ 4,762,217	¥ 12,846,900	¥ 15,123,700	¥ 15,123,700
Growth (YoY)	*14.76%*	*-4.92%*	*547.11%*	*547.11%*

(Millions of current USD and JPY, except per capita data)

Table #7: Summary Statistics for Australia

Economic Factors	Mean	Min	Max	Stan. Dev.
GDP	$ 685,383	$ 175,536	$ 1,520,944	$ 1,520,944
Growth (YoY)	*7.51%*	*1.95%*	*15.43%*	*15.43%*
GDP (USD)	$ 543,964	$ 176,929	$ 1,560,372	$ 1,560,372
Growth (YoY)	*7.62%*	*-12.20%*	*31.39%*	*31.39%*
GDP/capita	$ 34,560	$ 11,565	$ 65,758	$ 65,758
Growth (YoY)	*6.05%*	*0.44%*	*13.52%*	*13.52%*
GDP/capita (USD)	$ 27,180	$ 11,364	$ 67,512	$ 67,512
Growth (YoY)	*6.16%*	*-13.99%*	*29.88%*	*29.88%*

Credit Factors				
Revolving Credit	$ 34,943	$ 9,106	$ 65,903	$ 65,903
% change	*8.26%*	*-4.88%*	*26.86%*	*26.86%*
% of total	*50.56%*	*32.94%*	*65.56%*	*65.56%*
Non-Revolving Credit	$ 28,498	$ 16,867	$ 52,784	$ 52,784
% change	*3.26%*	*-17.57%*	*27.23%*	*27.23%*
% of total	*49.44%*	*34.44%*	*67.06%*	*67.06%*
Total Consumer Credit	$ 63,442	$ 26,694	$ 111,662	$ 111,662
% change	*5.45%*	*-6.58%*	*20.38%*	*20.38%*

Control Factors				
ASX 200 Return	7.58%	-37.34%	46.07%	46.07%
Lending interest rate	1084.05%	595.00%	1948.75%	1948.75%
Change (YoY)	*-1.77%*	*-32.41%*	*32.27%*	*32.27%*
GDP deflator	64.32	30.65	100.29	100.29
Change/Inflation (YoY)	*4.17%*	*-0.29%*	*11.72%*	*11.72%*
Goods Exports	$ 109,072	$ 19,742	$ 273,815	$ 273,815
Growth (YoY)	*8.78%*	*-12.87%*	*26.62%*	*26.62%*
Services Exports	$ 27,997	$ 4,032	$ 57,250	$ 57,250
Growth (YoY)	*8.94%*	*-3.58%*	*25.54%*	*25.54%*
Goods Imports	$ 113,314	$ 22,006	$ 267,405	$ 267,405
Growth (YoY)	*8.50%*	*-6.25%*	*27.93%*	*27.93%*
Services Imports	$ 31,312	$ 6,961	$ 71,219	$ 71,219
Growth (YoY)	*7.92%*	*-5.87%*	*24.22%*	*24.22%*
Curr. Acc. Bal. (w/o trade)	$ (23,164)	$ (58,344)	$ (2,222)	$ (2,222)
Growth (YoY)	*-10.69%*	*-75.65%*	*18.85%*	*18.85%*

(Millions of current AUD, unless indicated, except per capita data)

Table #8: USA Regressions-Contemporaneous Relationship (1980-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0072*	*0.0122*	*0.0091*	*0.0265*	*0.0137*	*0.0243*	*0.0285*
	0.3854	0.1516	0.2014	0.0003	0.0639	0.0014	0.0002
Revolving Credit	*0.0968*	*0.1277*	*0.1069*	*0.1758*			
	0.0078	0.0097	0.0057	0.0014			
Non-revolving Credit	*0.0379*	*0.0643*	*0.1390*	*0.0694*			
	0.6021	0.5114	0.0280	0.4050			
Lending interest rate	*0.0086*		*0.0333*		*0.0137*		*0.0516*
	0.6235		0.0261		0.4877		0.0079
Inflation	*0.7328*		*0.6826*		*0.7740*		*0.6417*
	0.0001		0.0001		0.0002		0.0015
Stock Market Return	*0.0119*		*-0.0016*		*0.0203*		*0.0004*
	0.4131		0.9174		0.2267		0.9859
Goods Exports	*-0.0245*	*-0.0572*			*-0.0449*	*-0.0720*	
	0.6337	0.3878			0.4379	0.3246	
Services Exports	*-0.0306*	*0.1409*			*-0.0586*	*0.1196*	
	0.6538	0.1077			0.4185	0.1644	
Goods Imports	*0.1434*	*0.1190*			*0.1712*	*0.1649*	
	0.0112	0.1156			0.0037	0.0288	
Services Imports	*-0.0047*	*0.0084*			*0.0522*	*0.0558*	
	0.9438	0.9270			0.4888	0.5848	
Curr. Acct. Bal. ex-trade	*-0.0008*				*-0.0012*	*-0.0014*	
	0.2031				0.1045	0.1294	
F-Ratio	12.03	7.25	16.17	9.1	9.90	5.61	10.34
P-Value	0.0000	0.0001	0.0000	0.0008	0.0000	0.0011	0.0001
R-squared (adjusted for d.f.)	77.52%	53.97%	70.33%	33.60%	68.99%	41.87%	46.67%

Table #9: USA Regressions-Contemporaneous Relationship (1990-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*-0.0025*	*0.0203*	*0.0055*	*0.0213*	*0.0004*	*0.0207*	*0.0294*
	0.8537	0.0098	0.8107	0.0014	0.9573	0.0002	0.0214
Revolving Credit	*0.0183*	*0.0734*	*0.0459*	*0.1269*			
	0.5659	0.0529	0.3980	0.0168			
Non-revolving Credit	*0.0277*	*-0.0281*	*0.1377*	*0.1179*			
	0.7114	0.7179	0.2196	0.1137			
Lending interest rate	*-0.0014*		*0.0284*		*0.0026*		*0.0594*
	0.9332		0.2946		0.8480		0.0037
Inflation	*1.1007*		*0.9211*		*1.1181*		*0.4047*
	0.0302		0.2528		0.0046		0.4152
Stock Market Return	*0.0323*		*0.0093*		*0.0321*		*-0.0044*
	0.0314		0.6797		0.0129		0.8185
Goods Exports	*-0.1510*	*-0.1331*			*-0.1503*	*-0.1510*	
	0.0456	0.1542			0.0336	0.1167	
Services Exports	*0.0014*	*0.0464*			*-0.0155*	*0.1032*	
	0.9866	0.6729			0.8258	0.2591	
Goods Imports	*0.2238*	*0.2116*			*0.2314*	*0.2180*	
	0.0004	0.0035			0.0001	0.0030	
Services Imports	*0.0572*	*0.0478*			*0.0630*	*0.0394*	
	0.3670	0.5608			0.2861	0.6442	
Curr. Acct. Bal. ex-trade	*-0.0007*	*-0.0005*			*-0.0008*	*-0.0008*	
	0.1609	0.3665			0.0922	0.1981	
F-Ratio	11.97	8.54	4.69	5.56	16.38	9.70	6.12
P-Value	0.0001	0.0003	0.0072	0.012	0.0000	0.0002	0.0043
R-squared (adjusted for d.f.)	83.30%	70.59%	45.59%	29.29%	84.84%	66.40%	41.13%

Table #10: UK Regressions-Contemporaneous Relationship (1994-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0021*	*0.0061*	*0.0170*	*0.0355*	*0.0070*	*0.0041*	*0.0322*
	0.8983	0.6008	0.1658	0.0000	0.6683	0.6831	0.0274
Revolving Credit	*0.0359*	*0.0097*	*0.0320*	*0.0111*			
	0.4569	0.8535	0.3097	0.8176			
Non-revolving Credit	*0.0562*	*0.0505*	*0.0967*	*0.1342*			
	0.3666	0.4701	0.0457	0.0644			
Lending interest rate	*0.0428*		*0.0515*		*0.0428*		*0.0624*
	0.0454		0.0016		0.0381		0.0013
Inflation	*0.8076*		*0.8989*		*0.5097*		*0.5680*
	0.1797		0.0523		0.3467		0.2883
Stock Market Return	*-0.0137*		*-0.0170*		*0.0065*		*-0.0065*
	0.5826		0.3384		0.7517		0.7641
Goods Exports	*-0.0452*	*-0.2122*			*-0.0446*	*-0.2172*	
	0.8118	0.2831			0.8014	0.2219	
Services Exports	*0.1550*	*0.2223*			*0.1112*	*0.2140*	
	0.2902	0.1852			0.3899	0.1407	
Goods Imports	*0.0472*	*0.3371*			*0.0676*	*0.3510*	
	0.8491	0.1945			0.7753	0.1420	
Services Imports	*0.0754*	*0.0859*			*0.2151*	*0.1616*	
	0.6051	0.5718			0.0614	0.1730	
Curr. Acct. Bal. ex-trade	*-0.0004*	*0.0001*			*0.0005*	*0.0002*	
	0.8295	0.9561			0.7796	0.9035	
F-Ratio	4.25	3.14	8.72	3.15	4.91	4.58	6.71
P-Value	0.0258	0.044	0.0008	0.0701	0.0111	0.0125	0.0043
R-squared (adjusted for d.f.)	64.35%	45.45%	68.21%	19.30%	63.45%	49.88%	48.75%

Table #11: Japan Regressions-Contemporaneous Relationship (1990-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0110*	*0.0065*	*1.5075*	*1.3044*	*0.0137*	*0.0051*	*0.0141*
	0.1879	0.2788	0.1500	0.2069	0.0391	0.4206	0.0176
Revolving Credit	*0.0538*	*0.0970*	*0.7428*	*2.1319*			
	0.4767	0.0612	0.4678	0.0456			
Non-revolving Credit	*0.1024*	*0.0804*	*1.2357*	*0.9751*			
	0.2942	0.3580	0.2334	0.3412			
Lending interest rate	*0.0011*		*-0.1622*		*0.0852*		*0.0706*
	0.9882		0.8730		0.1277		0.1171
Inflation	*0.6708*		*1.2456*		*1.2095*		*1.1500*
	0.2825		0.2298		0.0129		0.0077
Stock Market Return	*0.0051*		*0.0788*		*-0.0025*		*-0.0025*
	0.8373		0.9381		0.9208		0.9095
Balance on goods	*0.0004*	*0.0008*			*-0.0008*	*0.0008*	
	0.8413	0.6829			0.6894	0.7622	
Balance on services	*0.0019*	*0.0003*			*0.0019*	*-0.0169*	
	0.8826	0.9785			0.8873	0.2256	
Curr. Acct. Bal. ex-trade	*0.0044*	*0.0031*			*0.0053*	*-0.0143*	
	0.7089	0.7606			0.6624	0.2400	
F-Ratio	2.37	3.78	4.31	10.28	2.52	0.54	5.36
P-Value	0.0758	0.0175	0.0102	0.0009	0.0657	0.6628	0.0076
R-squared (adjusted for d.f.)	33.21%	38.72%	42.95%	45.75%	29.25%	0.00%	37.31%

Table #12: Australia Regressions-Contemporaneous Relationship (1990-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0197*	*0.0337*	*0.0286*	*0.0470*	*0.0243*	*0.0358*	*0.0329*
	0.0134	0.0001	0.0003	0.0000	0.0040	0.0000	0.0000
Revolving Credit	*0.0323*	*0.0016*	*0.0252*	*0.0071*			
	0.2260	0.9618	0.3878	0.8926			
Non-revolving Credit	*0.0558*	*0.0626*	*0.0340*	*0.0420*			
	0.0247	0.0466	0.1291	0.3197			
Lending interest rate	*0.0281*		*0.0044*		*-0.0163*		*-0.0022*
	0.2475		0.8086		0.5246		0.9097
Inflation	*0.6576*		*0.6578*		*0.7080*		*0.6368*
	0.0047		0.0002		0.0077		0.0003
Stock Market Return	*0.0005*		*-0.0086*		*-0.0055*		*-0.0058*
	0.9694		0.5120		0.7268		0.6634
Goods Exports	*-0.0124*	*0.0530*			*-0.0462*	*0.0503*	
	0.7093	0.1196			0.2786	0.1650	
Services Exports	*0.0018*	*-0.1083*			*0.0304*	*-0.1053*	
	0.9666	0.0660			0.6032	0.0966	
Goods Imports	*-0.0071*	*-0.0426*			*0.0303*	*-0.0047*	
	0.8817	0.4677			0.6027	0.9376	
Services Imports	*0.1539*	*0.2712*			*0.0720*	*0.2086*	
	0.0399	0.0021			0.3696	0.0114	
Curr. Acct. Bal. ex-trade	*0.0197*	*-0.0289*			*-0.0152*	*-0.0448*	
	0.3090	0.1630			0.4641	0.0417	
F-Ratio	6.74	5.67	6.6	0.67	3.85	5.66	7.71
P-Value	0.0042	0.0024	0.0024	0.524	0.0212	0.0030	0.0021
R-squared (adjusted for d.f.)	75.14%	59.78%	59.58%	0.00%	54.52%	51.45%	51.43%

Table #13: USA Regressions-Lead Lag Relationship (1980-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0197*	*0.0409*	*0.0107*	*0.0367*	*0.0112*	*0.0387*	*0.0200*
	0.0893	0.0051	0.2437	0.0000	0.1975	0.0004	0.0074
Revolving Credit	*0.0248*	*0.0939*	*0.0304*	*0.1022*			
	0.6037	0.2043	0.5417	0.1078			
Non-revolving Credit	*-0.1264*	*-0.1109*	*0.0863*	*-0.0005*			
	0.2195	0.4709	0.2841	0.9958			
Lending interest rate	*-0.0259*		*-0.0196*		*-0.0339*		*-0.0095*
	0.2939		0.3102		0.1545		0.6050
Inflation	*0.7165*		*0.6059*		*0.7211*		*0.5788*
	0.0006		0.0029		0.0004		0.0027
Stock Market Return	*0.0982*		*0.0860*		*0.0997*		*0.0858*
	0.0001		0.0003		0.0000		0.0003
Goods Exports	*-0.0613*	*-0.0412*			*-0.0417*	*-0.0316*	
	0.3290	0.6363			0.4849	0.7114	
Services Exports	*-0.1572*	*-0.0571*			*-0.0988*	*-0.0156*	
	0.0766	0.6521			0.1676	0.8822	
Goods Imports	*0.1745*	*0.0928*			*0.1334*	*0.0596*	
	0.0209	0.3966			0.0394	0.5278	
Services Imports	*0.0690*	*0.0566*			*0.0566*	*0.0845*	
	0.4506	0.6858			0.5141	0.5273	
Curr. Acct. Bal. ex-trade	*-0.0010*	*-0.0006*			*-0.0009*	*-0.0007*	
	0.2436	0.6660			0.2736	0.5789	
F-Ratio	5.15	0.67	6.44	1.71	6.35	0.59	9.58
P-Value	0.0007	0.6978	0.0005	0.1984	0.0002	0.7098	0.0001
R-squared (adjusted for d.f.)	56.49%	0.00%	45.93%	4.24%	57.21%	0.00%	44.57%

Table #14: USA Regressions-Lead Lag Relationship (1990-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0162*	*0.0318*	*0.0202*	*0.0300*	*0.0168*	*0.0351*	*0.0329*
	0.2274	0.0211	0.3224	0.0004	0.0617	0.0002	0.0068
Revolving Credit	*-0.0139*	*0.0584*	*0.0078*	*0.0476*			
	0.7057	0.3816	0.8931	0.4263			
Non-revolving Credit	*0.0012*	*0.0136*	*0.0814*	*0.0489*			
	0.9871	0.9210	0.4462	0.5819			
Lending interest rate	*0.0059*		*-0.0016*		*0.0056*		*0.0142*
	0.7517		0.9511		0.7162		0.4342
Inflation	*0.7133*		*0.1968*		*0.6485*		*-0.0952*
	0.1308		0.7731		0.0869		0.8283
Stock Market Return	*0.0794*		*0.0724*		*0.0783*		*0.0657*
	0.0001		0.0032		0.0000		0.0019
Goods Exports	*-0.3663*	*-0.3396*			*-0.3649*	*-0.3383*	
	0.0006	0.0539			0.0002	0.0401	
Services Exports	*0.0822*	*0.1788*			*0.0829*	*0.1986*	
	0.3903	0.3386			0.3071	0.1746	
Goods Imports	*0.2884*	*0.2597*			*0.2862*	*0.2699*	
	0.0002	0.0346			0.0000	0.0194	
Services Imports	*-0.0638*	*-0.1571*			*-0.0644*	*-0.1658*	
	0.3520	0.2575			0.3118	0.2121	
Curr. Acct. Bal. ex-trade	*0.0001*	*0.0004*			*0.0002*	*0.0000*	
	0.7816	0.7422			0.6758	0.9838	
F-Ratio	8.59	1.07	3.65	0.59	12.34	1.41	6.23
P-Value	0.0005	0.4253	0.0200	0.5645	0.0000	0.2704	0.0040
R-squared (adjusted for d.f.)	77.53%	2.32%	37.59%	0.00%	80.49%	8.52%	41.61%

Table #15: UK Regressions-Lead Lag Relationship (1995-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*0.0179*	*0.0310*	*0.0351*	*0.0317*	*0.0293*	*0.0219*	*0.0547*
	0.3640	0.0137	0.0671	0.0000	0.3535	0.1889	0.0134
Revolving Credit	*0.0626*	*0.0702*	*0.0199*	*0.0316*			
	0.3126	0.1539	0.6617	0.4721			
Non-revolving Credit	*0.2204*	*0.2098*	*0.1584*	*0.1553*			
	0.0106	0.0050	0.0226	0.0203			
Lending interest rate	*-0.0189*		*-0.0101*		*-0.0154*		*0.0062*
	0.2938		0.5822		0.6372		0.7848
Inflation	*0.3187*		*-0.1933*		*-0.6098*		*-0.6402*
	0.5626		0.7581		0.5212		0.4057
Stock Market Return	*0.0037*		*0.0401*		*0.0602*		*0.0545*
	0.8786		0.1157		0.1152		0.0899
Goods Exports	*-0.1422*	*-0.0329*			*-0.0586*	*-0.0664*	
	0.4685	0.8323			0.8486	0.8031	
Services Exports	*0.3434*	*0.3471*			*0.2819*	*0.2985*	
	0.0712	0.0280			0.2382	0.1881	
Goods Imports	*0.0369*	*-0.1053*			*0.0069*	*-0.0362*	
	0.8821	0.5928			0.9865	0.9183	
Services Imports	*-0.3349*	*-0.3558*			*0.0540*	*0.0201*	
	0.0383	0.0058			0.7674	0.9071	
Curr. Acct. Bal. ex-trade	*-0.0004*	*0.0000*			*0.0023*	*0.0008*	
	0.8308	0.9868			0.4725	0.7832	
F-Ratio	5.05	8.1	3.51	6.92	0.87	0.69	1.20
P-Value	0.0214	0.0019	0.0347	0.0074	0.5721	0.6379	0.3454
R-squared (adjusted for d.f.)	70.42%	74.50%	42.46%	41.07%	0.00%	0.00%	3.43%

Table #16: Japan Regressions-Lead Lag Relationship (1991-2012)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Constant	*-0.0046*	*-0.0060*	*-0.0056*	*-0.0037*	*0.0102*	*0.0011*	*0.0095*
	0.3090	0.2667	0.2342	0.4656	0.0687	0.8391	0.0751
Revolving Credit	*0.2006*	*0.1467*	*0.2105*	*0.1318*			
	0.0002	0.0040	0.0001	0.0044			
Non-revolving Credit	*-0.1246*	*-0.1507*	*-0.0879*	*-0.1226*			
	0.0349	0.0710	0.1195	0.1180			
Lending interest rate	*-0.0467*		*-0.0857*		*0.0424*		*0.0267*
	0.2781		0.0391		0.3581		0.5005
Inflation	*0.0466*		*-0.2304*		*1.1320*		*0.9580*
	0.8955		0.4999		0.0090		0.0131
Stock Market Return	*0.0640*		*0.0612*		*0.0529*		*0.0476*
	0.0003		0.0004		0.0228		0.0294
Balance on goods	*-0.0132*	*-0.0117*			*-0.0173*	*-0.0048*	
	0.1275	0.3220			0.1633	0.7326	
Balance on services	*0.0010*	*-0.0047*			*0.0001*	*-0.0151*	
	0.8896	0.6407			0.9900	0.1968	
Curr. Acct. Bal. ex-trade	*0.0045*	*0.0004*			*0.0037*	*-0.0104*	
	0.4806	0.9654			0.7127	0.3044	
F-Ratio	8.07	3.04	10.27	6.03	2.52	0.71	3.79
P-Value	0.0006	0.0408	0.0002	0.0094	0.0689	0.5590	0.0287
R-squared (adjusted for d.f.)	72.93%	32.67%	68.82%	32.40%	30.22%	0.00%	28.51%

Table #17: Australia Regressions-Lead Lag Relationship (1991-2012)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	*0.0382*	*0.0394*	*0.0432*	*0.0394*	*0.0433*	*0.0477*	*0.0499*
	0.0085	0.0007	0.0001	0.0000	0.0004	0.0000	0.0000
Revolving Credit	*0.0334*	*0.0638*	*0.0326*	*0.0650*			
	0.4532	0.2222	0.3650	0.1741			
Non-revolving Credit	*0.0408*	*0.0250*	*0.0613*	*0.0548*			
	0.2682	0.5419	0.0205	0.1290			
Lending interest rate	*0.0601*		*0.0850*		*0.0248*		*0.0718*
	0.1403		0.0010		0.4400		0.0118
Inflation	*0.2433*		*0.0993*		*0.2606*		*0.0637*
	0.4229		0.5330		0.3576		0.7289
Stock Market Return	*-0.0049*		*0.0024*		*-0.0102*		*0.0085*
	0.8007		0.8692		0.6041		0.6199
Goods Exports	*-0.0376*	*-0.0391*			*-0.0628*	*-0.0539*	
	0.4912	0.3911			0.2403	0.2441	
Services Exports	*0.0868*	*-0.0130*			*0.1070*	*-0.0291*	
	0.2861	0.8738			0.1903	0.7258	
Goods Imports	*0.0276*	*0.1287*			*0.0534*	*0.1527*	
	0.7242	0.1284			0.4787	0.0735	
Services Imports	*-0.0803*	*-0.1118*			*-0.1399*	*-0.1314*	
	0.4687	0.2841			0.1758	0.1828	
Curr. Acct. Bal. ex-trade	*-0.0238*	*-0.0342*			*-0.0517*	*-0.0398*	
	0.4680	0.2759			0.0873	0.1893	
F-Ratio	2.03	1.64	4.96	3.6	2.03	1.53	2.75
P-Value	0.1642	0.2041	0.0092	0.0473	0.1461	0.2351	0.0794
R-squared (adjusted for d.f.)	36.35%	17.57%	52.40%	19.83%	31.37%	11.26%	22.57%

Table #18: Revolving Credit Results (Contemporaneous)

Country	Marginal (0.05-0.10)	Significant (<0.05)	Coefficient	Determination
USA (1980-2012)	0 of 4	4 of 4	Positive	Very Significant
USA (1990-2012)	1 of 4	1 of 4	Positive	Significant
UK	0 of 4	0 of 4	Positive	Insignificant
Japan	1 of 4	1 of 4	Positive	Significant
Australia	0 of 4	0 of 4	Positive	Insignificant

Table #19: Non-revolving Credit Results (Contemporaneous)

Country	Marginal (0.05-0.10)	Significant (<0.05)	Coefficient	Determination
USA (1980-2012)	0 of 4	1 of 4	Positive	Marginal
USA (1990-2012)	0 of 4	0 of 4	Positive	Insignificant
UK	1 of 4	1 of 4	Positive	Significant
Japan	0 of 4	0 of 4	Positive	Insignificant
Australia	0 of 4	2 of 4	Positive	Significant

Table #20: Revolving Credit Results (Lead-Lag)

Country	Marginal (0.05-0.10)	Significant (<0.05)	Coefficient	Determination
USA (1980-2012)	0 of 4	0 of 4	Positive	Insignificant
USA (1990-2012)	0 of 4	0 of 4	Positive	Insignificant
UK	0 of 4	0 of 4	Positive	Insignificant
Japan	0 of 4	4 of 4	Positive	Very Significant
Australia	0 of 4	0 of 4	Positive	Insignificant

Table #21: Non-revolving Credit Results (Lead-Lag)

Country	Marginal (0.05-0.10)	Significant (<0.05)	Coefficient	Determination
USA (1980-2012)	0 of 4	0 of 4	Negative	Insignificant
USA (1990-2012)	0 of 4	0 of 4	Positive	Insignificant
UK	0 of 4	4 of 4	Positive	Very Significant
Japan	1 of 4	1 of 4	Negative	Significant
Australia	0 of 4	1 of 4	Positive	Marginal

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