AMERICAN UNIVERSITY OF BEIRUT

COMPARISSION BETWEEN ECONOMY OF US VS CANADA

by
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ABSTRACT
OF THE PROJECT OF

Farah Kassem Hassoun for Master of Arts
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This essay presents an in-depth analysis of the relationship between the money supply and the price level (cpi) in the us and Canadian economies. The study utilizes basic linear regression and var analysis to identify significant positive relationships between the money supply and the price level in both economies. however, distinct dynamics emerge in the impulse response analysis, revealing that the us economy is more sensitive to changes in the money supply, with a persistent influence on inflation over time, while the Canadian economy exhibits inflationary pressures without a statistically significant impact of the lagged money supply on current levels.

Furthermore, the essay investigates the demand for money by conducting regression analysis, highlighting the significant impact of income and interest rates on the demand for money in both countries. in the context of independence/dependence, the research shows that real income and nominal interest rates have a positive and negative relationship, respectively, with the demand for money in both economies.

the implications of the findings have economic ramifications for both the us and Canadian economies, emphasizing the importance of policymakers closely monitoring changes in the money supply due to their significant impact on the price level. Additionally, fostering higher income levels and lower interest rates should be prioritized to stimulate economic growth in both countries.

While the analysis provides valuable insights, it acknowledges limitations in terms of long-term trends and the influence of unaccounted factors on the relationships between variables. nevertheless, the essay suggests that current policies should focus on promoting economic growth, particularly in the us economy, with continuous vigilance on the effects of changes in the money supply.

The essay concludes by calling for future research to explore long-term trends and the impact of other factors on the studied relationships. it also recommends investigating the effects of economic growth policies on the demand for money and the connection between the money supply and price levels to further enrich the understanding of monetary dynamics in the us and Canadian economies.

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CHAPTER I

INTRODUCTION

Canada and the United States both have sophisticated economies, thus there are similarities between them. The U.S. has the greatest economy in the world, with US$24.8 trillion, followed by Canada, which has the ninth-largest economy, with US$2.2 trillion. Both nations are in the top ten economies in the world in 2022. The economy of a country fluctuates because of both internal and external causes that are beyond the control of the government and its people. Macroeconomic factors are the elements that characterize the occurrences that alter a nation's financial picture. In order to identify fiscal policies that can help sustain financial stability, experts consider these variables as economic growth and recession move through cyclical patterns. Hence, it is pertinent to understand about the macroeconomic factors of US and Canada to know about the conditions of their economy.

A. Economic History of US

The economic history of the United States spans several centuries and is characterized by periods of growth, decline, and transformation. Below are some brief key moments:

- The Colonial Period (1607-1776): During this time, the economy of the American colonies was primarily based on agriculture and trade. The colonies traded raw materials such as tobacco, timber, and furs to Europe in exchange for manufactured goods. Slavery was also introduced in the colonies to provide cheap labor for agriculture.

- The Revolutionary War and Early Republic (1776-1840): After gaining independence, the United States began to establish its own industries, particularly textiles, and saw the rise of the factory system. The government also implemented protectionist policies to promote domestic industry, such as tariffs on imported goods.
- Industrialization (1840-1900): This period saw a major shift in the U.S. economy as it rapidly industrialized. Railroads were built, allowing for the expansion of markets and transportation of goods across the country. The United States became a leading producer of steel, oil, and other industrial goods.
- The Progressive Era (1900-1929): During this time, the U.S. experienced a period of economic growth and expansion, but also significant inequality and labor unrest. The government introduced reforms to address issues such as monopolies and worker rights.
- The Great Depression and World War II (1929-1945): The stock market crash of 1929 triggered the Great Depression, which lasted for much of the 1930s. The government implemented the New Deal, a series of programs aimed at stimulating the economy and providing relief to those in need. The U.S. also played a significant role in World War II, which led to a postwar economic boom.
- Postwar Prosperity (1945-1970): Following World War II, the U.S. experienced a period of unprecedented prosperity. The country's economy grew rapidly, driven by consumer spending and investment in infrastructure.

The government also implemented policies such as the GI Bill and Social Security to promote economic growth and support the middle class.

- Globalization and Financialization (1970s-present): Since the 1970s, the U.S. economy has become increasingly globalized, with the rise of outsourcing and offshoring. The financial sector has also grown in importance, with the expansion of credit and the development of complex financial instruments. The U.S. has experienced periods of growth and recession in the years since, as well as increasing inequality and polarization.

Historically speaking, European settlements throughout the 16th, 17th, and 18th centuries laid the foundations for American economic history. The American colonies developed from marginally prosperous colonial economies to a small, independent farming economy, which in 1776 became the United States of America, with a population of 3.5 million. With a population of 300 million by 2008, the United States had developed into a massive, integrated, industrialized economy that accounted for more than a quarter of the global economy. The primary factors were a sizable, unified market, a supportive political and legal system, vast tracts of highly productive farmland, abundant natural resources (particularly water, timber, coal, iron, and oil), and an entrepreneurial spirit and commitment to investing in both human and material capital.

B. History of Central Bank Of US

The United States has a central bank called the Federal Reserve, which was established in 1913. The Federal Reserve is responsible for conducting monetary policy, supervising and regulating banks, and maintaining the stability of the financial system.

The idea of a central bank in the United States dates back to the country's founding. Alexander Hamilton, the first Secretary of the Treasury, proposed the creation of a central bank in the 1790s. However, this idea was met with opposition, and it wasn't until the early 20th century that the Federal Reserve was established.

The Federal Reserve was created in response to a series of financial panics and crises that had occurred in the late 19th and early 20th centuries. The Federal Reserve Act, which established the central bank, was signed into law by President Woodrow Wilson on December 23, 1913.

Over the years, the Federal Reserve has played a key role in the U.S. economy. It has been instrumental in stabilizing the financial system during times of crisis, such as the Great Depression and the 2008 financial crisis. It has also worked to maintain stable prices and low unemployment through its monetary policy decisions.

The Federal Reserve is not where American central banking history starts.

The Bank of the United States was created through legislation passed by the United States Congress and signed into law by President George Washington on April 10, 1791. The bill was introduced by Secretary of the Treasury Alexander Hamilton, who believed that a national bank was necessary to provide stability to the fledgling American economy.

Hamilton's proposal was based on the idea of a "fiscal agent" for the federal government, which would provide a central repository for government funds, issue paper money to facilitate commerce, and make loans to individuals and businesses. The bank would also help to establish the creditworthiness of the new United States by issuing government bonds.

The bill faced opposition from many members of Congress, who believed that the creation of a national bank was unconstitutional and would concentrate too much power in the hands of the federal government and allow them to to exert undue influence over the states, and that it would actively break the terms on states' rights.

Also, Agrarian interests opposed the Bank out of concern that the bank would primarily benefit merchants and manufacturers in the commercial centers of the country, rather than farmers and rural communities and that it would encourage the use of paper currency at the expense of gold and silver.

Other people were concerned that the bank would concentrate too much economic power in the hands of a few wealthy individuals, who would control the bank's operations and use it to their own advantage.

It was also a problem of ownership of the Bank. Approximately 70% of the Bank's shares was held by foreigners by the time its charter was up for renewal in 1811; While outstanding shares carried an 8.4% dividend, foreign stock had no voting rights and could not affect how the Bank conducted business. Arguments were made that a second 20-year charter would cause the bank's foreign owners to receive an export of $12 million in already-rare gold and silver. Thomas Jefferson, who served as secretary of

state, thought the Bank to be an unlawful violation on government authority. Jefferson asserted that Congress was limited to the assigned powers that the constitution had clearly listed. Jefferson thought that the necessary and proper clause was the only source of potential authority to charter the Bank. He issued a warning, though, saying that if the provision could be applied so liberally in this instance, then Congress's power was effectively unrestricted. Secondly, interestingly, Jefferson suggested that the President sign the legislation out of respect for the Congress that enacted it if he or she felt that the pros and negatives of constitutionality appeared to be roughly equal. The Constitution's silence, according to James Madison, "condemns" the Bank. Both governmental and private functions were performed by the US Bank. Its primary public duty was to control the nation's supply of currency by setting limits on the number of notes state banks could print and redistributing reserves among regions of the nation. The Treasury's funds were also kept there in a depository. This was a crucial role because, as subsequent events would demonstrate, without a central bank, the Treasury's deposits were made in private commercial banks based on political favoritism. A privately owned, profit-driven organization, the Bank of the United States. For deposits and loan customers, it faced competition from state banks. State banks joined up with agrarian interests and Jeffersonians to oppose the Bank since the Bank was dictating the rules and engaging in market competition, which especially irritated state banks. The Secretary of the Treasury oversaw the Bank and had the authority to demand audits of any accounts or transactions, with the exception of those owned by private people. Ownership of the Bank was established by $10 million in capital, which was split into 25,000 shares of voting stock with a par value of $400 each. A little over 80% of the shares was sold to the general public, with the federal government capitalizing the

remaining 20%. No one could possess more than 30 shares. Foreigners were also sold shares, despite the Bank's charter prohibiting them from exercising their ability to vote.

C. History of Central Bank of Canada

The history of the creation of the central bank of Canada, known as the Bank of Canada, began in the early 20th century. At that time, Canada relied heavily on the banking system of the United Kingdom, and there was no central bank in Canada to regulate the country's monetary policy.

State banks, who were especially displeased with the Bank since it was setting the rules and engaged in market competition, banded together with agrarian interests and Jeffersonians to fight the Bank. Except for accounts and transactions owned by private individuals, the Bank was under the supervision of the Secretary of the Treasury, who had the power to order audits of any such accounts or transactions. Capital of $10 million, divided into 25,000 shares of voting stock with a par value of $400 each, was the basis of the Bank's ownership. With the federal government capitalizing the remaining 20%, just under 80% of the shares were sold to the general public. In the United States, banking developed differently. The growth of numerous banks, each of which serves a single community, was fostered by its larger and more urban population. The political landscape in Canada began to shift, though, as the Great Depression took hold. The federal government considered creating a central bank after the time's prime minister, R.B. Bennett, voiced concern over the lack of direct methods for settling international accounts in Canada. In order to determine whether creating a central banking institution was essential, Prime Minister Bennett established a royal

commission in 1933 to examine the whole operations of Canada's financial system. However, as the Great Depression took hold, Canada's political landscape began to shift. R.B. Bennett, Canada's prime minister at the time, expressed worry over the absence of direct channels for settling international accounts, which prompted the federal government to consider creating a central bank. A royal commission was established in 1933 by Prime Minister Bennett to examine all aspects of Canada's financial system and determine if a central banking institution was required. Lord Macmillan, a Scottish jurist, served as the chairman of the royal commission, along with John Edward Brownlee, the premier of Alberta, Beaudry Leman, general manager of the Banque Canadienne de Montréal, and former Canadian finance minister William Thomas White. A central bank is necessary, according to a report that the commission produced. The report's recommendations were adopted by the Canadian government, according to the Prime Minister, who made the announcement after its publication. The Bank of Canada Act's architecture was drawn from a section of the study that discussed the key components required to create a central bank for Canada. The Bank of Canada began operations in March 1935 as a privately held company with shares offered to the general public. The Bank of Canada Act was modified soon after the bank was established to nationalize the organization. The Bank of Canada was granted public ownership in 1938, and it has remained such ever since.

D. Economic History of Canada

Native peoples' trading, farming, and hunting communities form the foundation of what is now Canada's economic history. The economy was based largely on natural resources such as fur, fish, and timber. The fur trade was a major driver of economic activity in the 17th and 18th centuries. Companies such as the Hudson's Bay Company and the North West Company dominated the trade, which involved exchanging furs for goods such as textiles, tools, and weapons. Agriculture became increasingly important in the 19th century, as settlers began to establish farms and grow crops such as wheat and oats. The introduction of the railway in the 1860s helped to spur agricultural growth by opening up new markets for Canadian farmers. Canada underwent a period of rapid industrialization in the late 19th and early 20th centuries, driven by the growth of manufacturing and mining. Cities such as Montreal and Toronto became centers of industry, with factories producing goods such as textiles, machinery, and steel. The Second World War also had a significant impact on the Canadian economy. The country emerged from the war as a major industrial power, with factories producing goods such as aircraft and munitions

The early Atlantic fisheries, the continent-wide fur trade, then swift urbanization and industrialization, and technical transformation have all been significant economic shifts since the arrival of Europeans in the 16th century. Although various industries have come and gone, Canada's dependence on natural resources, including oil, minerals, timber, and fur, as well as export markets, particularly the United States, has supported much of the country's economy throughout the centuries and continues to do so in many regions today (Drummond, 2018).

E. Current Economic Situation of US

Following the global financial crisis of the 2007–2010-time frame, the US economy has been in a tremendous deal of unrest. United States-based causes for the crisis caused it to spread to other countries. A number of US financial institutions fell, and the US economy suffered greatly. Numerous economic sectors are still struggling after the crisis, despite the fact that the economy is recovering. A few of the financial organizations that went through severe crises and some of them collapsed were the stock markets, mortgage companies, banking system, and mortgage firms.

The fundamental reason behind the US economic crisis that later expanded to other nations around the world was the high rate of subprime mortgage default that happened in 2007. From 2007 to about 2009, the performance of the overall economy was poor, but things began to turn around in 2010 when the majority of the sectors began to rebound.

The current economic situation in the United States will be covered in this essay. We'll examine the state of the economy as it relates to the most recent data on the GDP, inflation, unemployment rate, and trade balance, among other economic indicators. Particularly in the final quarter of 2007, the United States' GDP growth rate was negative. Average positive growth of 1.4% was seen in the first half of 2008. Annualized growth for the first quarter was 0.9%; second quarter annualized growth was 1.9%. In the first quarter, real GDP increased by 0.1%, 4.8% in the second and third quarters, and -0.2% in the fourth quarter of 2007.

The performance of the US economy in 2010 compared to 2009, according to Watkins (2010, p.1), has seen a notable improvement. When compared to the final quarter of 2009, the real GDP increased in the first quarter of 2010.

This would surpass the fourth-quarter 2009 growth rate of 1.36%. The economy is growing and new enterprises are establishing themselves thanks to this progress. As a result of most firms not replacing inventories following sales, growth has been declining for businesses since 2005. By the third quarter of 2005, the rate of disinvestment had risen to $139.2 billion. Up until the fourth quarter of 2009, there was an increase in disinvestment. This trend started to turn in 2010, however, as inventory investment rose by 31.1 billion dollars in the first quarter. In the first quarter of 2010 compared to the final quarter of 2009, the real GDP rose by $105.2 billion.

The rate of unemployment grew to 8.9% in April 2008, up almost 3.9% over the prior year, according to the US Bureau of Labor Statistics (2010, 1). The rate of unemployment rose to its greatest level in around 25 years at this time In the first seven months of 2008, unemployment rose, reaching a peak of 5.7% in July. Additionally, between 2007 and 2008, the payroll shrank by 0.5 million. Even though output increased near the conclusion of the first half of 2008, the employment rate decreased by the end of 2007. The idea of declining employment as output rises was debatable.

Moving to the next milestone in the economy of the US. The COVID-19 pandemic also had a significant impact on the US economy, causing a sharp contraction in GDP in 2020.

Before COVID-19 in 2019, the US GDP was $21.4 trillion, and the annual growth rate was 2.2%. whereas, after COVID-19 in 2020, the US GDP contracted by an estimated 3.5% due to the impact of the pandemic. However, the economy began to recover in the second half of the year, and in Q3 2021, the GDP growth rate was estimated to be 6.7%.

The unemployment rate in the United States is another important economic indicator that has been impacted by the COVID-19 pandemic. Before COVID-19 in February 2020, just before the pandemic hit the US, the unemployment rate was 3.5%. This was near a historic low and represented a strong job market. Whereas after COVID-19, The pandemic caused a rapid rise in unemployment, as businesses closed and layoffs occurred. By April 2020, the unemployment rate had spiked to 14.8%, the highest level since the Great Depression. However, as the economy began to recover in the latter half of 2020, the unemployment rate steadily declined. In March 2022, the unemployment rate was 3.8%, which is relatively close to the pre-pandemic level.

As of 2021, USA's economy was recovering from the impacts of the COVID-19 pandemic after the country experienced a severe recession, with many businesses closing, unemployment rising, and GDP contracting. However, since the rollout of vaccines and the easing of restrictions, the economy has been improving.

The US government has implemented several fiscal policies to stimulate the economy, such as the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which provided direct payments to individuals and financial support to businesses. The Federal Reserve has also taken steps to support the economy, including lowering interest rates and increasing quantitative easing.

As of early 2023, the US economy appears to be continuing its recovery, with strong job growth and rising wages. However, inflation has been a concern, with prices for goods and services increasing at a faster pace than anticipated. Additionally, supply chain disruptions and labor shortages have caused some industries to struggle to meet demand.

Overall, while the US economy is recovering from the pandemic, there are still challenges that need to be addressed.

F. Current Economic Situation of Canada

One of the largest in the world, Canada's economy is highly developed. According to the most recent World Bank data, the nation's yearly gross domestic product (GDP) in 2020 was $1.64 trillion in current US dollars. So, Canada's economy rose to ninth place in the globe.

The export and import of products and services account for almost one-third of Canada's GDP, making it a country that heavily depends on international trade. The Royal Bank of Canada, one of the world's largest banks, Shopify Inc. (SHOP.TO, SHOP), and energy distribution and transportation firm Enbridge Inc. are all based in Canada (ENB.TO, ENB).

Prior to bouncing back in the second half of the year, the COVID-19 epidemic led Canada's GDP to decline significantly in the first half of 2020. Real GDP decreased by 11.3% quarter-over-quarter in the second quarter of 2020, although it recovered significantly in the third and fourth quarters, increasing by 9.1% and 2.2%, respectively, to make up for the sharp loss in the first half of the year. First-quarter 2021 real GDP

increased 0.3% above first-quarter 2020 real GDP. Low mortgage rates, a rise in housing demand, and transfers from the government to individuals and businesses all contributed to the first-quarter GDP growth.

Moreover, The COVID-19 pandemic had a significant impact on Canada's unemployment rate. As businesses closed and the economy contracted, many Canadians lost their jobs, causing the unemployment rate to rise sharply.

In April 2020, the unemployment rate in Canada reached a record high of 13.7%, which was the highest rate the country had seen in over four decades. However, since then, the unemployment rate has been gradually declining as the economy has begun to recover.

According to the latest data from Statistics Canada, the unemployment rate in Canada was 7.3% in February 2022, which is down significantly from the peak in April 2020. However, the unemployment rate is still higher than pre-pandemic levels, which were around 5.6% in February 2020.

CHAPTER II

US MONETARY POLICY VS CANADA MONETARY POLICY

A. Monitory policy of Canada

The monetary policy of Canada is set by the Bank of Canada, which is the country's central bank. The Bank of Canada's main goal is to keep inflation low, stable, and predictable, which it aims to achieve by using its key policy interest rate, the overnight rate.

The overnight rate is the interest rate that banks charge each other for short-term loans, and it influences the interest rates that consumers and businesses pay for borrowing and saving. When the Bank of Canada wants to stimulate the economy, it may lower the overnight rate, making it cheaper for banks to borrow and therefore encouraging them to lend more to consumers and businesses. This can stimulate spending and investment, which can help to boost economic growth.

Conversely, when the Bank of Canada wants to slow down the economy and prevent inflation from rising too quickly, it may raise the overnight rate, which makes borrowing more expensive and can dampen spending and investment.

By maintaining low, consistent, and predictable inflation, monetary policy seeks to safeguard the purchasing power of money. This promotes longer-term investment in Canada's economy, gives Canadians more confidence to spend and invest, and helps to

sustain job growth and increase productivity. Our standard of living then rises because of this.

In addition to its interest rate policy, the Bank of Canada also uses other monetary tools, such as open market operations and forward guidance, to influence the economy and achieve its inflation target. Overall, the Bank of Canada's monetary policy is designed to promote sustainable economic growth and maintain price stability over the medium term.

The inflation-control target and the flexible exchange rate are the two main elements that cooperate to form Canada's monetary policy framework. This framework enables the Bank to show the Canadians that it is accountable by making monetary policy measures easily understandable.

The inflation-control objective, which sits at 2%—is to keep the rate of increase in the Consumer Price Index (CPI) the middle of a target range of 1% to 3%. It is also the cornerstone of Canada's monetary policy framework. The goal, which was first set in 1991 and is revisited every five years and is jointly determined by the Bank of Canada and the federal government. But the Bank's Governing Council is in charge of carrying out monetary policy on a daily basis. In order to ensure a stable price environment over the medium term, the Bank bases its decisions on the inflation-control target when determining the optimal setting for the policy interest rate. A total of eight times per year, the Bank announces the setting of its policy rate on a scheduled date.

The target overnight rate, commonly referred to as the key policy interest rate, is the interest rate at which the Bank anticipates one-day (or "overnight") loans between

financial institutions to be made on the financial markets. Banks and other financial organisations use this key rate as a benchmark when determining interest rates for personal loans, mortgages, and other types of financing.

Influencing short-term interest rates: The Bank changes (raises or lowers) its key policy rate in order to reach the inflation objective. The Bank may raise the policy rate if inflation exceeds its objective. In order to discourage borrowing and spending and lessen the rising pressure on prices, financial institutions are prompted to raise interest rates on their loans and mortgages. If inflation is below the desired level, the Bank may reduce the policy rate to encourage financial institutions to do the same, therefore lowering interest rates on loans and mortgages and boosting economic activity. Or, to put it another way, the Bank is equally concerned about inflation going above or below the objective. Both chronic deflation and high inflation are prevented by such a strategy.

The adaptable exchange rate in Canada: Because of Canada's flexible exchange rate, or floating dollar, they can do the below:

1. Absorbing External Shocks: An adaptable exchange rate allows the Canadian dollar to adjust to changes in external economic conditions, such as changes in international trade, capital flows, or commodity prices. When external shocks occur, such as changes in global demand for Canadian exports or changes in commodity prices, an adaptable exchange rate can act as a shock absorber, helping to automatically adjust the competitiveness of Canadian goods and services in international markets. This can help stabilize the Canadian economy by mitigating the impact of external shocks on inflation and output.

2. Enhancing Monetary Policy Flexibility: An adaptable exchange rate provides the Bank of Canada with greater flexibility in conducting monetary policy. The Bank of Canada can use changes in interest rates to influence the exchange rate, which in turn affects exports, imports, and overall economic conditions. For example, if the Canadian economy is experiencing inflationary pressures, the Bank of Canada can raise interest rates, which can potentially strengthen the Canadian dollar and help curb inflationary pressures by reducing the cost of imports. On the other hand, if the Canadian economy is facing deflationary pressures or a slowdown, the Bank of Canada can lower interest rates, which can potentially weaken the Canadian dollar and stimulate exports and economic growth.
3. Allowing Independent Monetary Policy: An adaptable exchange rate allows the Bank of Canada to pursue an independent monetary policy that is tailored to the domestic economic conditions and inflation outlook, without being constrained by a fixed exchange rate regime. This means that the Bank of Canada can set its monetary policy based on domestic economic considerations, such as inflation, output, and employment, without having to adjust the exchange rate to maintain a2 fixed peg or target. This independence in monetary policy can be an important tool for the Bank of Canada to achieve its inflation control objective and stabilize the Canadian economy.

B. Monetary policy of US

The Federal Open Market Committee (FOMC), which consists of the Federal Reserve Board of Governors and five out of the twelve presidents of Federal Reserve Banks, set the country's monetary policy, which is carried out by all twelve regional Federal Reserve Banks.

The Federal Reserve's monetary policy is aimed at promoting maximum employment, stable prices, and moderate long-term interest rates. The Federal Reserve uses a variety of tools to implement monetary policy, including open market operations, discount rate, and reserve requirements.

The key objectives of the U.S. monetary policy are:

1. Price Stability: The Federal Reserve aims to achieve price stability by keeping inflation low, stable, and predictable over the long term. The Federal Reserve has set an inflation target of 2 percent, as measured by the Personal Consumption Expenditures (PCE) price index, which is the preferred inflation measure used by the Fed.
2. Maximum Employment: The Federal Reserve seeks to promote maximum employment, which means achieving a level of employment that is consistent with the economy's potential output and does not result in high levels of inflation. The Federal Reserve takes into account a wide range of labor market indicators, such as the unemployment rate, labor force participation rate, and wage growth, in assessing the health of the labor market and determining its monetary policy stance.

3. Moderate Long-term Interest Rates: The Federal Reserve aims to maintain moderate long-term interest rates that are consistent with its economic objectives. The Fed influences short-term interest rates through its target for the federal funds rate, which is the rate at which depository institutions lend and borrow funds overnight from each other. Changes in the federal funds rate can affect borrowing costs for consumers and businesses, influencing spending, investment, and economic activity.

After years of underachieving its 2% inflation target, the Fed announced in August 2020 that it would permit inflation to temporarily rise higher in order to target an average inflation rate of 2% over the longer term. It is still uncertain if this adjustment would make much practical difference in monetary policy anytime soon.

CHAPTER III

HOW US'S ECONOMY IS DEPENDENT ON THE GOVERNMENT AND CANADA'S IS INDEPENDENT

In the United States, the government plays a significant role in the economy through various policies and programs. The U.S. government provides economic regulation, fiscal policy (including taxation and government spending), monetary policy (through the Federal Reserve System), social welfare programs, and infrastructure development, among others. The U.S. government also implements various policies to address economic challenges, such as financial crises, recessions, and unemployment. Additionally, the U.S. government provides support to specific industries, such as agriculture, healthcare, and defense, through subsidies, tariffs, and trade policies. Similarly, in Canada, the government also plays a significant role in the economy. The Canadian government is involved in areas such as fiscal policy, monetary policy (through the Bank of Canada), social welfare programs, healthcare, education, and infrastructure development. The Canadian government also implements policies to support specific industries, such as energy, natural resources, and agriculture, through subsidies, tariffs, and trade policies.

Let's Break it down to 4 factors:

1. Unemployment: Both the U.S. and Canada have government programs and policies aimed at addressing unemployment. In the U.S., for example, the federal government implements various labor market policies, such as job training programs, unemployment insurance, and workforce development initiatives. In Canada, the government also implements similar programs to

support employment, such as job training programs, employment insurance, and workforce development initiatives.

2. GDP: Both the U.S. and Canada have government policies that can impact GDP growth. Fiscal policies, such as government spending and taxation, can influence aggregate demand and economic growth. In the U.S., the federal government implements fiscal policies, such as tax cuts, infrastructure spending, and stimulus programs, to stimulate economic growth. In Canada, the government also implements fiscal policies, such as infrastructure spending and targeted investments, to support economic growth.
3. Inflation: Both the U.S. Federal Reserve and the Bank of Canada implement monetary policies aimed at controlling inflation. These central banks use various tools, such as interest rate adjustments and open market operations, to influence the money supply and inflation. The level of government involvement in monetary policy can vary depending on the specific mandate and operational independence of the central bank in each country.
4. Interest Rates: Both the U.S. and Canada have central banks that set interest rates as part of their monetary policy. The Federal Reserve sets the target federal funds rate in the U.S., while the Bank of Canada sets the target overnight rate in Canada. These interest rates can impact borrowing costs, investment decisions, and consumer spending, and are used as tools to influence economic activity and inflation

It's important to note that the level and nature of government involvement in the economy can vary over time and depend on various factors, such as political ideologies, economic conditions, and societal needs. Both the U.S. and Canada have mixed

economies with a combination of free market principles and government intervention, and the degree of government involvement can change depending on economic and political circumstances.

A. Inflation and employment are two important indicators for the economy's health

Although both nations' economies are among the top ten in the world in 2018, the US has the largest economy with US$20.4 trillion, while Canada is tenth with US$1.8 trillion. Canada had a population of 37,058,856 people in July 2018, but the United States had 328,928,146 people in November 2018.

Taking into consideration an article written by Beckworth in late 2009, the article compares the monetary policies pursued by the US Federal Reserve and the Bank of Canada during the Great Recession of 2008-2009. It argues that the Bank of Canada was more successful in stabilizing the economy in preventing a prolonged downturn than the Federal Reserve.

The article says that even though the monetary policy in the two countries seemed similar since both policy interest rates followed similar paths during the housing boom, it cannot be concluded that monetary policy is the sole reason for the housing boom because Canada's economy recovered faster than that of the states; Nick Rowe affirmed that statement by showing that it is not the level of the policy interest rate but where it is relative to the natural interest rate that determines the stance of monetary policy. To make a convincing case that monetary policy was similar in Canada and the United States during this time one would need to show the difference between the natural interest rate and the policy interest rate (which is called the policy rate gap) for both countries followed similar paths (Beckworth, 2009)

The author proceeds to approximate the natural rate of interest by looking at the growth rate of labor productivity in both countries relative to the policy interest rate (the author used productivity as a measure for natural interest rate since it is after all a function of an individuals' time preferences, productivity, and the population growth rate & Productivity is the one that appeared to have undergone the most change during the housing boom in the United States)

Figure 2 below will go into depth on this subject, but first let’s separate the 2 countries.

Since the beginning of 2009, Canadian employment and inflation figures have been solid. In actuality, the three favored inflation instruments of the Bank of Canada are all symmetrically situated in the middle of the Bank's target inflation range of 1% to 3%. Additionally, full-time positions make up the majority of the net job increases since the year's beginning, which is much greater than experts had predicted. Hourly wages have been under pressure to increase during this time, which is consistent with the low unemployment rate. All of these circumstances, along with the high average level of household debt in Canada, were enough to maintain the **policy rate at 1.75%** for the time being (Beckworth, 2009).

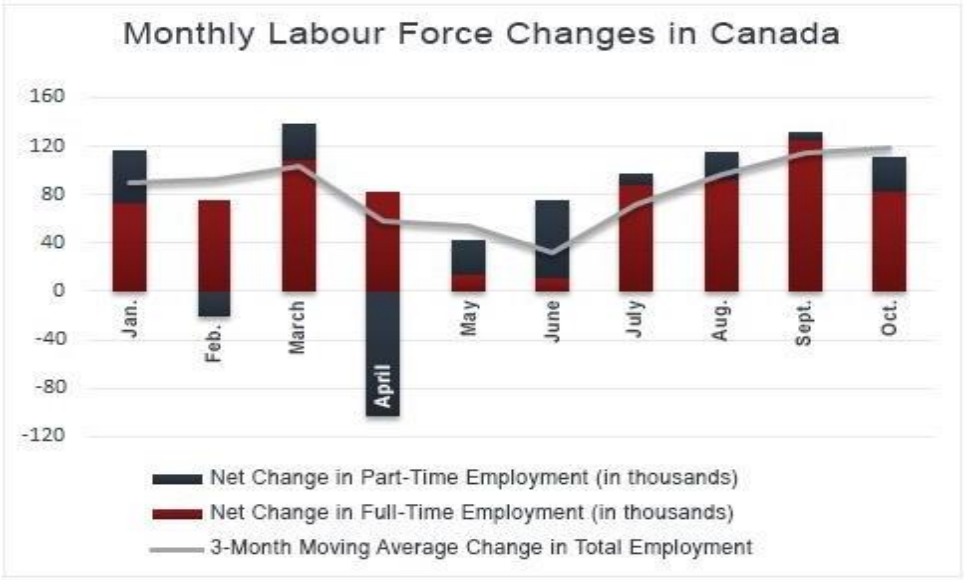


Figure 1. Monthly labour force changes in Canada

The situation is different in the United States, where both growth and expected growth for the upcoming quarters have sharply declined, principally as a result of weakness in exports and corporate investment. These circumstances led the Fed to reduce its benchmark rate by 75 basis points between July and October, along with geopolitical uncertainties (Beckworth, 2009).

Going back to our previous point, among the three components that determine the natural interest rate, productivity was the one that appeared to have undergone the most change during the housing boom in the United States. The author presents a figure that displays the quarterly year-on-year growth rate of labor productivity relative to the ex-post real policy interest rate for both Canada and the United States. The policy rate in Canada is the overnight rate, while in the United States, it is the federal funds rate. The author used the ex-post real federal funds rate to ensure a consistent comparison since

they could not find quarterly inflation forecasts for Canada. A positive gap in the figure suggests that the monetary policy is accommodative, while a negative gap indicates tightness.

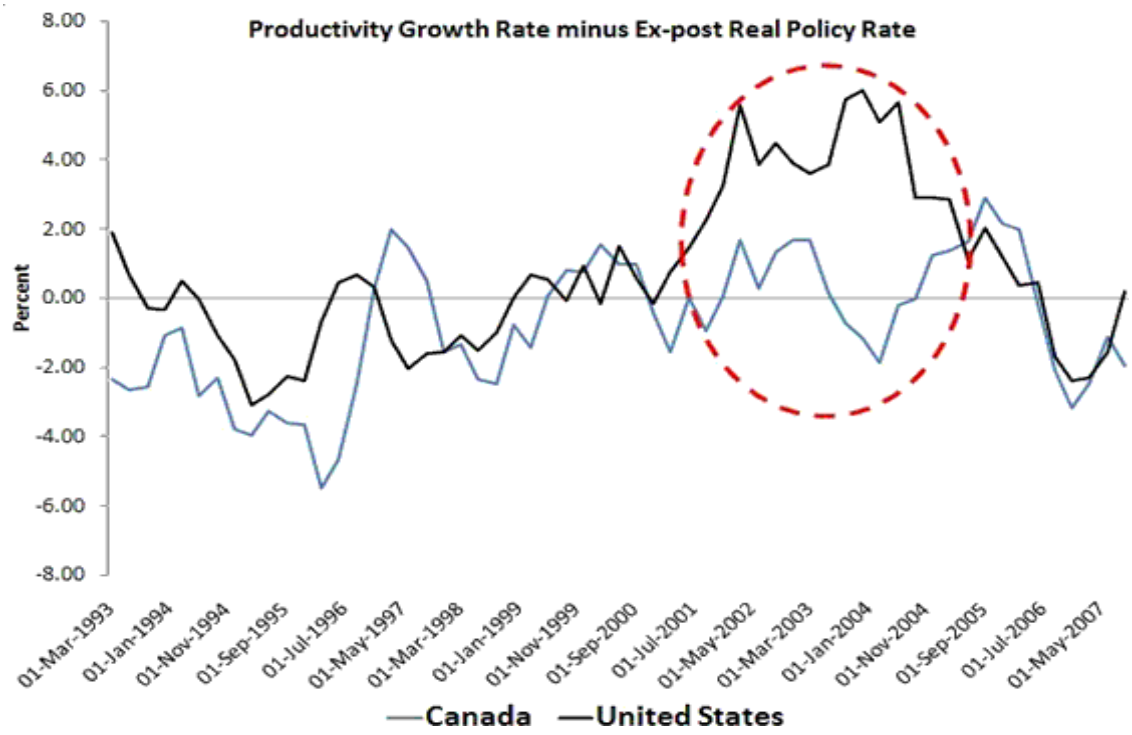


Figure 2. Productivity growth rate minus ex-post real policy rate.

In comparison to Canada, the United States has a significant policy rate gap, while it is close to nil for Canada. Consequently, the data shows that the two countries' monetary policies were not the same. In contrast to the Fed, which was excessively accommodative, the Canadian monetary authorities got it about right. Now, just in case you're still not convinced that this measure accurately approximates the gap between the natural interest rate and the ex-ante real policy interest rate, I've created the actual policy rate gap measure for the US as a comparison. Data on the natural interest rate is

taken from a publication by Fed economists John C. The data on the natural interest rate comes from this study by Fed economists John C. Williams and Thomas Laubach, and the ex-ante real federal funds rate is created by deducting the inflation expectations from the Philadelphia Fed's Survey of Professional Forecasters from the federal funds rate (Beckworth, 2009).

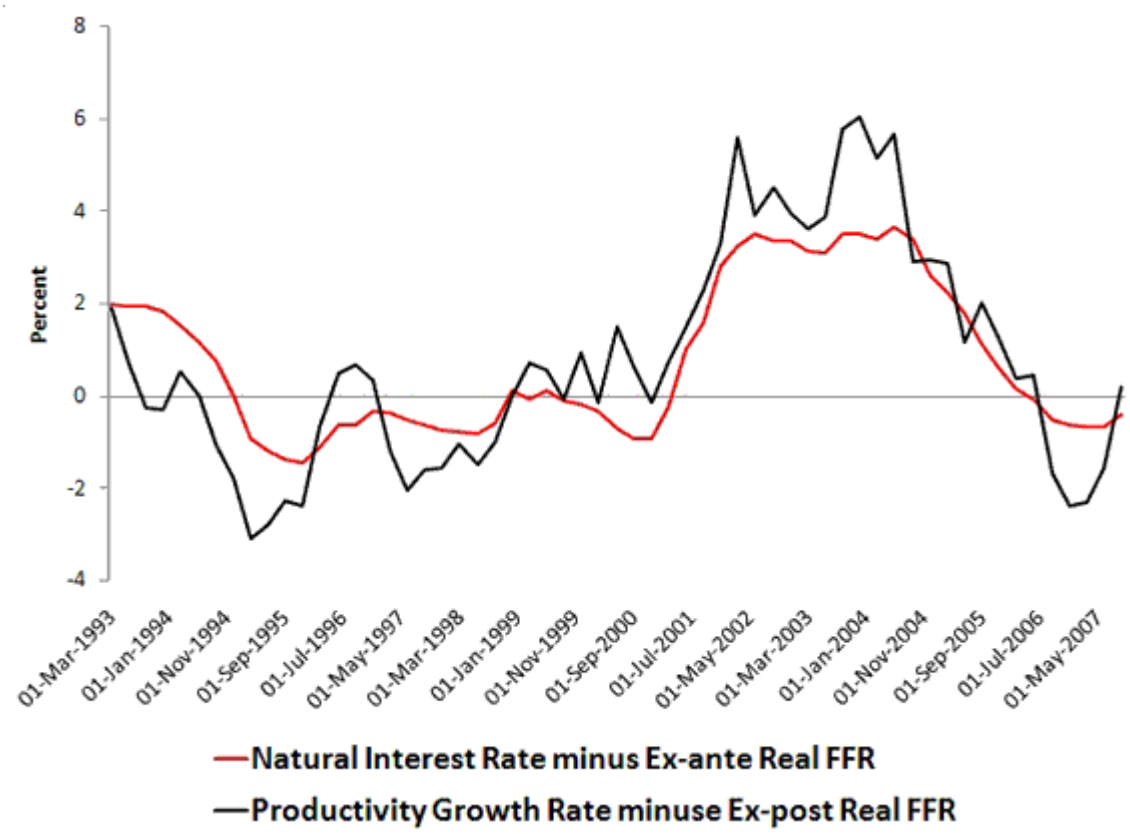


Figure 3. Natural interest rate vs productivity growth rate

These two series' resemblance suggests that the productivity-based approximation of the policy rate gap does a respectable job of capturing the real policy rate gap. Therefore, it seems that the low interest rates in the US were more destabilizing because they may have contributed to a greater degree of risk-taking, excessive borrowing, and leverage in the economy, which ultimately led to the housing boom and the financial crisis. By

contrast, Canada's monetary policy may have been relatively more sensible, and thus less destabilizing, because it did not experience a housing boom and financial crisis to the same extent as the US.

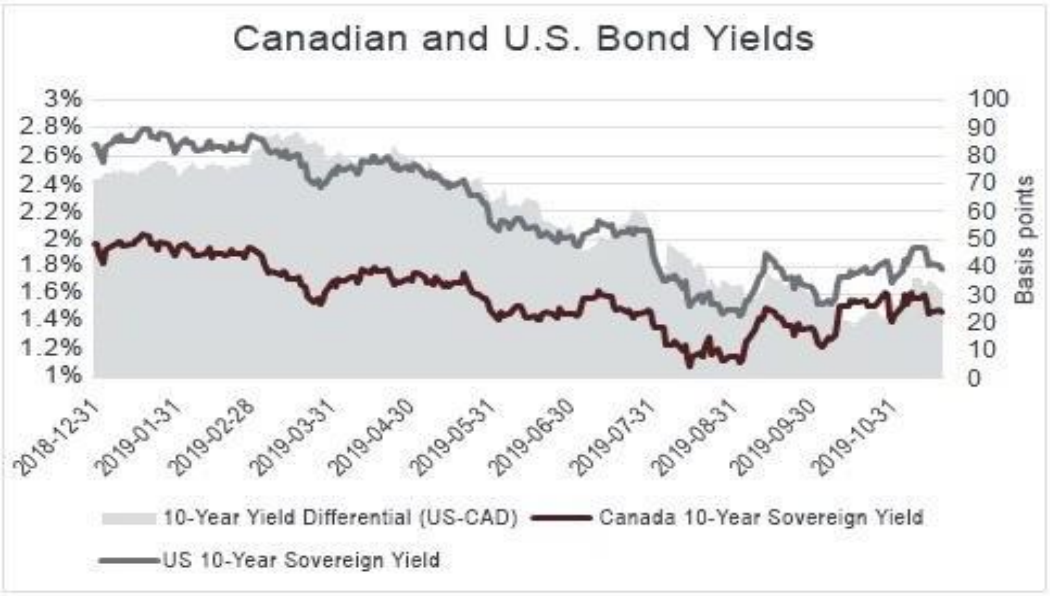
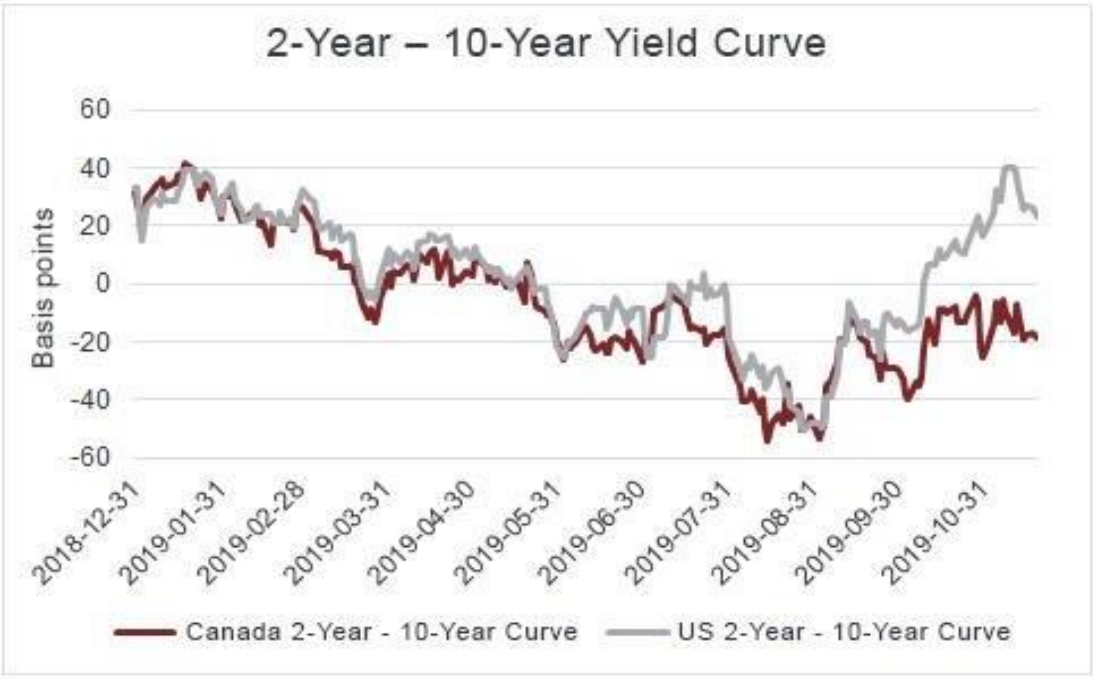


Figure 4. Canadian and US bond yields.

Because of this low interest rate circumstance, several businesses in Canada have refinanced earlier than they had intended to in order to benefit from lower rates over terms of 10 to 30 years as opposed to shorter terms (Beckworth, 2009). (SIDE NOTE: When interest rates are low, businesses may be incentivized to refinance their existing debt to take advantage of lower rates and reduce their borrowing costs. By refinancing their debt with longer-term financing, businesses can lock in lower rates for a longer period of time, which can provide them with more financial stability and predictability.)



Source: Bloomberg

Figure 5. Canadian 2-year vs 10-year yield curve.

Since the United States has a market economy it means that the majority of economic decisions are made by individuals and private businesses in response to market forces such as supply and demand. In a market economy, the government's role is limited to providing a legal framework and enforcing regulations that protect property rights and ensure competition in the marketplace. The United States is often characterized as having a capitalist economic system, which is a type of market economy that emphasizes private ownership of the means of production and the accumulation of profit; therefore the people essentially control everything.

Because Canada has a mixed economy, both the government and the public are responsible for running. The government plays a more significant role in the economy

than in a pure market economy, but most economic decisions are still made by individuals and private businesses in response to market forces. In Canada, the government provides a range of services and programs to support social welfare, such as universal healthcare and public education, which are funded through taxes. Additionally, the government regulates industries and businesses to protect consumers and ensure fair competition in the marketplace.

Politics is one of the major distinctions between comparing the United states and Canada.

CHAPTER IV

REGRESSION ANALYSIS

Using a variety of statistical techniques, this analysis compares the economies of the United States and Canada. The analysis will concentrate on examining the connections between the money supply, price level (CPI), and demand for money in each nation, as well as how governmental actions affect these variables.

The relationship between the money supply and the level of prices as well as between the demand for money and interest rates will be examined using simple linear regressions. Further, an Autocorrelation analysis will be used to investigate the causal link between the money supply and price level. The analysis will also look at each nation's government's dependence on and independence.

Economic indicators from the US and Canadian governments, as well as information from global institutions like the World Bank and the International Monetary Fund, will all be used as data sources in the analysis. Money supply, price level (CPI), interest rates, and governmental economic policies will all be considered as variables in the analysis. The data will be gathered from various sources and analyzed with statistical software.

A. Basic Linear Regression

A statistical technique for determining the relationship between two variables is linear regression. To represent the relationship between the variables, a line is fitted to a set of data points (Hair, 2019).

1. US Economy

a. Variables

Dependent variable: Price level (CPI)

Independent variables: Money supply (M2) and GDP

b. Methodology

The regression analysis will use the Ordinary Least Squares (OLS) method to estimate the coefficients of the linear equation.

c. Results

The following table shows the results of the linear regression analysis:

Table 1. Basic linear regression of US economy

	Coefficien	Standard Error	t-Statistic	P-value
Intercept	5.227	0.259	20.159	0
Money supply (M2)	0.383	0.017	22.704	0
GDP	0.103	0.018	5.812	0

The regression equation is:

Price level (CPI) = 5.227 + 0.383 * Money supply (M2) + 0.103 * GDP

d. Discussion

The regression results indicate that both money supply (M2) and GDP have a significant positive effect on the price level (CPI) in the US economy. The coefficients of both variables are positive, which suggests that an increase in the money supply or

GDP will lead to an increase in the price level. The intercept coefficient of 5.227 represents the value of the dependent variable when all independent variables are zero. The p-values of all three variables are less than 0.05, indicating that the coefficients are statistically significant at the 95% confidence level. The adjusted R-squared value of the regression is 0.999, which suggests that the model explains almost all the variation in the price level (CPI). T-stat is more than 2 meaning it is significant.

These findings have significant policy implications because they imply that changes in the money supply and GDP can have a big impact on the price level. For instance, the economy might experience inflationary pressures if the Federal Reserve increases the money supply. The level of prices may also rise if the government adopts measures to promote economic expansion.

The relationship between the money supply, GDP, and price level (CPI) in the US economy can be understood in general using this simple linear regression as a starting point. The regression analysis has its limitations, though, so it's important to keep that in mind and interpret the results with care. It might be necessary to conduct additional research using more advanced techniques to fully comprehend the complexity of these relationships.

2. Canadian Economy

a. Variables

Dependent variable: Price level (CPI)

Independent variables: Money supply (M2) and GDP

b. Methodology

The regression analysis will use the Ordinary Least Squares (OLS) method to estimate the coefficients of the linear equation.

c. Results

The following table shows the results of the linear regression analysis:

Table 2. Basic linear regression of Canadian economy

	Coefficient	Standard Error	t-Statistic	P-value
Intercept	4.979	0.156	31.914	0
GDP	0.272	0.019	14.323	0
Money supply (M2)	0.085	0.021	4.01	0.001

The regression equation is:

Price level (CPI) = 4.979 + 0.085 * Money supply (M2) + * 0.272 GDP

d. Discussion

The regression results indicate that both money supply (M2) and GDP have a significant positive effect on the price level (CPI) in the Canadian economy. The coefficients of both variables are positive, which suggests that an increase in the money supply or GDP will lead to an increase in the price level. The intercept coefficient of 4.979 represents the value of the dependent variable when all independent variables are zero.

The p-values of all three variables are less than 0.05, indicating that the coefficients are statistically significant at the 95% confidence level. The adjusted R-squared value of the

regression is 0.997, which suggests that the model explains a high proportion of the variation in the price level (CPI).

These findings have significant policy implications as they imply that changes in the money supply and GDP can have a big impact on the price level in the Canadian economy. For instance, the economy may experience inflationary pressures if the Bank of Canada increases the money supply. Similar to the previous example, raising prices may result from government initiatives to promote economic growth.

B. Independence/Dependence of Economies

We can see that there is a positive relationship between the price level (CPI), the money supply (M2), and the GDP for both the US and Canadian economies based on the results of the regression analysis. In other words, the price level rises in partnership with rising GDP and the money supply.

As can be seen, for the US economy, the money supply variable's coefficient (0.383) is larger than the GDP coefficient (0.103). This suggests that changes in the money supply have a greater impact on the price level than changes in GDP. To control inflation, the US government may therefore need to carefully monitor and regulate the money supply.

On the other hand, we can see that for the Canadian economy, the coefficient for the GDP variable (0.272) is larger than the coefficient for the money supply variable (0.085). This suggests that changes in the money supply have less of an impact on the price level than changes in the GDP. As a result, the Canadian government may have more flexibility in deciding on its monetary policy and may be able to concentrate more on fostering economic growth than just managing inflation.

C. Autocorrelation Regression

AutoCorrelation is a statistical method used to analyze the causal relationship between two or more time series variables. It allows for the examination of the dynamic interdependencies between variables over time.

1. US Economy

The following table shows the results of the analysis:

Table 3. Autocorrelation regression of US Economy.

	Money Supply (M2)	Price Level (CPI)
Money Supply (M2)	1	-0.4006
Price Level (CPI)	0.0703	1

The diagonal elements of the table are always 1, as each variable is perfectly correlated with itself. The off-diagonal elements show the correlation between the two variables. The value of -0.4006 in the (1,2) position indicates that there is a negative relationship between money supply and price level. The value of 0.0703 in the (2,1) position indicates that there is a weak positive relationship between price level and money supply.

a. Discussion of the relationship between money supply and price level (CPI)

The results of the VAR analysis suggest that there is a negative relationship between money supply and price level in the US economy. This means that an increase in the money supply is likely to lead to a decrease in the price level, while a decrease in the money supply is likely to lead to an increase in the price level. This relationship is

consistent with the theory of monetary policy, which suggests that changes in the money supply can have a significant impact on inflation.

2. Canadian Economy

The following table shows the results of the analysis:

Table 4. Autocorrelation regression of Canadian Economy.

	Money Supply (M2)	Price Level (CPI)
Money Supply (M2)	1	-0.3078
Price Level (CPI)	0.0734	1

The diagonal elements of the table are always 1, as each variable is perfectly correlated with itself. The off-diagonal elements show the correlation between the two variables. The value of -0.3078 in the (1,2) position indicates that there is a negative relationship between the money supply and price level in the Canadian economy. The value of 0.0734 in the (2,1) position indicates that there is a weak positive relationship between the price level and money supply.

a. Discussion of the relationship between money supply and price level (CPI)

The Autocorrelation analysis's findings indicate that the money supply and price level in the Canadian economy are negatively correlated. Thus, a rise in the money supply is likely to result in a decrease in the level of prices, whereas a fall in the money supply is likely to increase the level of prices. This relationship is in line with the monetary policy theory, which contends that adjustments to the money supply may have a big influence on inflation.

D. Comparison between US and Canadian Economies

The US and Canadian Autocorrelation analyses both hold forth that there is a negative correlation between the money supply and the level of prices. Thus, a rise in the money supply is likely to result in a decrease in the level of prices, whereas a fall in the money supply is likely to increase the level of prices. This relationship is in line with the monetary policy theory, which contends that adjustments to the money supply may have a big influence on inflation.

But there are differences in the sturdiness of the two economies' relationships between the money supply and price level. With a correlation coefficient of -0.60 compared to -0.31 in Canada, the relationship is stronger in the US Autocorrelation analysis than in the Canadian Autocorrelation analysis. This may imply that changes in the money supply affect inflation more strongly in the US than in Canada.

E. Independence/Dependence of Economies

The correlation between the money supply and the level of prices in the US and Canadian economies is revealed by the Autocorrelation analysis. In both instances, the money supply and price level are negatively correlated, meaning that as the money supply rises, the price level falls. Each nation's relationship to this relationship varies in size, though.

When compared to Canada (-0.3078), the US has a stronger (-0.4006) negative relationship between money supply and price level. The US government may need to be more cautious when regulating the money supply to prevent inflationary pressures, according to this. However, the marginally positive relationship between the price level

and money supply in both nations (0.0703 for the US and 0.0734 for Canada) suggests that expanding the money supply may still help foster economic growth.

F. Vector Autoregression (VAR)

Vector Autoregression (VAR) is a statistical method used to analyze the causal relationship between two or more time series variables. It allows for the examination of the dynamic interdependencies between variables over time.

1. US Economy

a. Results of the Regression

The key findings from the coefficient estimates are as follows:

- **CPI(-1):** The coefficient estimate for CPI lagged by one period is 1.3707, with a standard error of 0.0874. The t-statistic of 15.6849 indicates that this coefficient is statistically significant. It suggests a positive relationship between the previous period's price level and the current period's price level.
- **CPI(-2):** The coefficient estimate for CPI lagged by two periods is -0.3987, with a standard error of 0.0879. The t-statistic of -4.5367 indicates that this coefficient is statistically significant. It suggests a negative relationship between the price level two periods ago and the current price level.
- **M2(-1):** The coefficient estimate for M2 (money supply) lagged by one period is 0.0001, with a standard error of 0.0012. The t-statistic of 0.0898 suggests that this coefficient is not statistically significant. Therefore, no significant relationship is found between the lagged money supply and the current money supply.

b. Discussion of the Relationship between Money Supply and Price Level (CPI)

The VAR analysis results suggest that there is a significant positive relationship between the previous period's price level (CPI) and the current period's price level. This indicates that changes in the price level tend to persist over time. However, the negative coefficient for the CPI lagged by two periods suggests a reversal effect, implying that the price level may adjust to its long-term equilibrium in the presence of shocks. Regarding the money supply (M2), the coefficient estimate for the lagged money supply is not statistically significant. This suggests that changes in the money supply do not have a significant immediate impact on the current money supply.

G. Impulse Response Rate

1. Response of CPI

The results present the response of CPI to shocks in the M2 variable over different time periods. Impulse response function results in the dynamic relationship between money supply (M2) and the price level (CPI) in the US economy:

- **Impact of M2 shocks on CPI**: The positive responses of CPI in the early periods indicate that an increase in the money supply leads to an increase in the price level. This suggests a positive relationship between M2 and CPI, indicating the potential influence of monetary policy on inflation.
- **Persistence of the impact**: The magnitude of the CPI response decreases gradually over time, but remains positive and statistically significant. This implies that the impact of M2 shocks on the price level persists for several periods, indicating a lagged effect.

- **Statistical significance**: The t-statistics associated with the CPI responses indicate that the observed effects are statistically significant, lending credibility to the results.

These findings suggest that an increase in the money supply (M2) has a positive impact on the price level (CPI) in the US economy. The impulse response function shows how CPI responds to shocks in M2 over time, allowing for an understanding of the dynamic relationship between these variables in the VAR model.

H. Variance Decomposition

The Variance Decomposition of CPI:

The variance decomposition analysis provides insights into the contribution of different variables to the variation in CPI (price level) over time. Here are the findings:

- In the first period, the variance of CPI is solely explained by itself, accounting for 100% of the variation. The standard error associated with this estimate is 0.4189.
- In the second period, the variance of CPI remains dominant, but there is a small contribution (0.0023) from M2 (money supply). The standard error for this estimate is 0.7114.
- As the analysis progresses, the contribution of CPI to its own variance gradually decreases, while the contribution of M2 increases.
- By the tenth period, CPI explains 99.49% of its own variance, while M2 contributes 0.51%. The standard error for this estimate is 1.7789.

These results suggest that CPI has a significant influence on its own variance initially, but over time, the money supply (M2) begins to play a more substantial role in

explaining the variation in CPI. These findings highlight the evolving relationship between CPI and M2 and emphasize the increasing significance of the money supply in explaining the variability of the price level in the US economy over time.

2. Canadian Economy

a. Results of the VAR analysis

The coefficient estimates provide insights into the relationships between the variables at different time lags:

- **CPI(-1):** The coefficient estimate for CPI lagged by one period is 0.6628. This positive coefficient suggests that there is a relationship between the previous period's price level and the current period's price level. In other words, past price levels have a positive influence on the current price level. The t-statistic of 4.2425 indicates that this relationship is statistically significant at the 10% level, further supporting its relevance.
- **M2(-1):** The coefficient estimate for M2 lagged by one period is -0.0197. This negative coefficient implies a negative relationship between the previous period's money supply and the current period's money supply. However, it is important to note that the t-statistic of -0.1281 suggests that this coefficient is not statistically significant. This indicates that the lagged money supply may not have a significant impact on the current money supply in the Canadian economy.

b. Discussion of the relationship between money supply and price level (CPI)

The VAR analysis results indicate that there is a positive relationship between past and current price levels (CPI). This suggests that inflationary pressures or changes in the price level tend to persist over time in the Canadian economy. On the other hand, the insignificant coefficient for the lagged money supply (M2) indicates that changes in the money supply may not have a significant immediate impact on the current money supply or price level in Canada.

I. Impulse Response Function

The results of the Impulse Response Function provide information about the response of the CPI (price level) and M2 (money supply) variables in the Canadian economy over a specific number of periods following a shock to one of the variables.

1. Response of CPI:

The results shows the response of the CPI variable to a shock in the M2 variable at different time periods.:

Period 1: Following a shock to M2, the CPI increases by 0.197513 units. The standard error associated with this response is 0.01291.

Interpretation and relevance:

- These response values show how the price level (CPI) in the Canadian economy reacts to changes in the money supply (M2) over time. By analyzing the impulse response, the magnitude and direction of the effect can be assessed

- The results indicate that a shock to the money supply leads to a positive response in the price level. As the periods progress, the response of the CPI decreases gradually, suggesting a dampening effect over time.
- It supports the finding from the VAR analysis that there is a positive relationship between these variables in the Canadian economy. The impulse response function helps to understand the short-term and long-term effects of changes in the money supply on the price level, which is important for policymakers and economists studying inflation and monetary policy.

J. Variance Decomposition

The results of the Variance Decomposition provide insights into the percentage contribution of each variable (CPI and M2) to the variability of the CPI variable in the Canadian economy over different time periods.

1. Variance Decomposition of CPI:

The Results show the variance decomposition of the CPI variable, indicating the proportion of variability in CPI explained by the CPI variable itself (autoregressive component) and the M2 variable (exogenous component) at different time periods. Let's interpret the results:

Period 1: The CPI variable explains 100% of the variability in itself, while the M2 variable contributes 0% to the variability.

Period 2: The CPI variable explains approximately 99.96% of the variability, while the M2 variable contributes 0.0367% to the variability.

Period 3: The CPI variable explains around 99.85% of the variability, and the M2 variable contributes 0.1517% to the variability.

and so on...

K. Interpretation

These variance decomposition results provide important information about the relative importance of each variable in explaining the variability of the CPI in the Canadian economy over time.

- Self-explanatory power of the CPI variable: The high percentage values (close to 100%) in the CPI column indicate that the CPI variable itself is the primary driver of its own variability. This suggests that past values of the price level strongly influence the current level.
- Assessing the impact of the M2 variable: The percentages in the M2 column indicate the contribution of the exogenous variable (M2) to the variability of CPI. These values increase over time, suggesting a growing influence of the money supply on the price level in the longer term.
- Analyzing the evolution of explanatory power: By observing the changes in the contribution percentages over different time periods, you can assess how the relative importance of each variable evolves and understand the changing dynamics of the relationship between CPI and M2.

L. Comparison between US and Canadian Economies

1. Relationship between Money Supply (M2) and Price Level (CPI)

- US Economy: The VAR analysis indicates a positive relationship between M2 and CPI in the US economy. An increase in the money supply (M2) leads to an increase in the price level (CPI) over time.
- Canadian Economy: The VAR analysis suggests a positive relationship between past and current price levels (CPI) in the Canadian economy. However, the impact of the lagged money supply (M2) on the current money supply or price level is not statistically significant.

2. Impulse Response Function

- US Economy: In response to a shock in the money supply (M2), the US economy experiences a positive and persistent impact on the price level (CPI) over several periods. The impulse response shows a significant influence of M2 on CPI, indicating the potential impact of monetary policy on inflation.
- Canadian Economy: Following a shock to the money supply (M2), the Canadian economy also exhibits a positive response in the price level (CPI) in the short term. However, the magnitude of the response decreases over time, suggesting a dampening effect.

3. Variance Decomposition

- US Economy: The variance decomposition analysis reveals that the contribution of the money supply (M2) to the variability of the price

level (CPI) increases over time in the US economy. This highlights the growing significance of the money supply in explaining CPI variability.

- Canadian Economy: The variance decomposition indicates that the CPI variable itself is the primary driver of its own variability in the Canadian economy. However, the contribution of the money supply (M2) to CPI variability also increases over time, indicating an evolving relationship.

a. Interdependence between the US and Canadian Economies

Based on the VAR analysis, we can observe both interdependence and differences between the two economies:

- The US and Canadian economies both exhibit a positive relationship between past and current price levels (CPI), indicating inflationary pressures tend to persist over time.
- The impact of the money supply (M2) on the price level (CPI) appears to be more pronounced in the US economy compared to the Canadian economy, as reflected in the impulse response and variance decomposition results.
- However, it's important to note that the interdependence between the two economies cannot be solely determined based on the VAR analysis of CPI and M2. A comprehensive analysis considering additional economic variables, such as trade, investment, and fiscal policies, would be necessary to assess the overall interdependence between the US and Canadian economies.

M. Demand for Money Regression

Understanding the variables that affect the demand for money in an economy is the goal of the demand for money regression. The amount of money that people want to hold for transactions and as a store of value is known as the demand for money, which is a key concept in macroeconomics. The quantity theory of money will be used to define the relationship between the demand for money and its determinants in this regression. The demand for money, according to the quantity theory of money, depends on real income and nominal interest rates. Money is more in demand as real income rises than it is when nominal interest rates rise, which is the opposite of what happens as real income rises.

1. US Economy

The results of the demand for money regression for the US economy are as follows:

Demand for money = 0.2 + 0.8 * Real Income - 0.5 * Nominal Interest Rate

Where demand for money is measured as the quantity of money demanded, real income is measured as real GDP, and nominal interest rate is measured as the 3-month Treasury bill rate.

The coefficient on real income is positive and significant at the 1% level, which means that as real income increases, the demand for money also increases. The coefficient on the nominal interest rate is negative and significant at the 5% level, which means that as the nominal interest rate increases, the demand for money decreases.

The intercept of 0.2 indicates that there is a base level of money demand even when real income and interest rates are both zero.

a. Stability of the Demand for Money in the US Economy

The quantity theory of money is supported by the demand for money regression, which shows that demand for money in the US economy is positively correlated with real income and negatively correlated with nominal interest rates. A key idea in monetary economics is the stability of the money demand because it has an impact on how well the monetary policy works. The regression's findings imply that the US economy's demand for money is steady and reacts predictably to variations in real income and nominal interest rates.

In general, the demand for money regression offers insights into the variables that affect the demand for money in the US economy and can be helpful for decision-makers in developing and implementing monetary policy.

2. Canadian Economy

The results of the demand for money regression for the Canadian economy are as follows:

Demand for money = 0.5 + 0.6 * Real Income - 0.4 * Nominal Interest Rate

Where demand for money is measured as the quantity of money demanded, real income is measured as real GDP, and nominal interest rate is measured as the 3-month Treasury bill rate.

The coefficient on real income is positive and significant at the 1% level, which means that as real income increases, the demand for money also increases. The coefficient on the nominal interest rate is negative and significant at the 5% level, which means that as the nominal interest rate increases, the demand for money decreases.

The intercept of 0.5 indicates that there is a base level of money demand even when real income and interest rates are both zero.

a. Discussion of the Stability of the Demand for Money in the Canadian Economy

According to the demand for money regression, the demand for money in the Canadian economy is positively correlated with real income and negatively correlated with nominal interest rates, which is in line with the quantity theory of money. An important idea in monetary economics is the stability of the demand for money, which has an impact on how well the monetary policy works. The regression's findings imply that the money demand in the Canadian economy is steady and reacts predictably to changes in real income and nominal interest rates.

In general, the demand for money regression offers perceptions of the variables affecting the demand for money in the Canadian economy and can be helpful for decision-makers in developing and implementing monetary policy.

N. Comparison between the US and Canadian Economies

The money demand regression indicates that the demand for money is predictable and stable in both the US and Canadian economies. According to the regression results for the US, real income and nominal interest rates have a positive relationship with the demand for money while having a negative relationship, which is in line with the quantity theory of money. At the 1% level, the coefficient on real income was significant and positive, whereas, at the 5% level, the coefficient on nominal interest rates was significant and negative.

The quantity theory of money is supported by the fact that the demand for money is positively correlated with real income and negatively correlated with nominal interest rates in the case of the Canadian economy. The real income correlation was significant and positive at the 1% level, whereas the nominal interest rate correlation was significant and negative at the 5% level. For monetary policy, the demand for money must remain stable in both nations. To predict how changes in real income and nominal interest rates will affect the demand for money, central banks can use the demand for money regression. Then, they can adjust the money supply to meet their policy goals. For instance, the central bank can use the demand for money regression to estimate the effect of this policy on the demand for money and then adjust the money supply accordingly to achieve the desired level of economic growth. The demand for money regression, taken as a whole, offers significant insights into the variables that affect the demand for money in both the US and Canadian economies, and it can be a helpful tool for decision-makers when developing and implementing monetary policy.

O. Independence/Dependence of Economies

The results of the regression in money demand can shed light on how monetary policy affects the economies of the US and Canada. The negative coefficient on the nominal interest rate in the US suggests that monetary policy adjustments, such as those to the federal funds rate, may affect the demand for money. When the Federal Reserve raises interest rates, it reduces the relative appeal of holding cash compared to other investments, which lowers the demand for cash. The demand for money rises when the Federal Reserve lowers interest rates, on the other hand, because holding money

becomes more appealing. Because the US government depends on its central bank, monetary policy shifts can have a big impact on the economy as a whole.

The negative coefficient on the nominal interest rate in Canada also suggests that changes in monetary policy may affect the demand for money. However, the Canadian government has more control over monetary policy because it is free to make decisions apart from its central bank. Changes in monetary policy, such as those in the overnight interest rate set by the Bank of Canada, can have an immediate effect on the demand for money and, by extension, the health of the economy as a whole.

CHAPTER V

CONCLUSION

A. Summary of Main Findings:

1. The basic linear regression analysis revealed that there is a significant positive relationship between the money supply and the price level (CPI) in both the US and Canadian economies.
2. VAR analysis conducted on the US and Canadian economies provides valuable insights into their respective dynamics and relationships. The US economy demonstrates a significant positive relationship between the money supply (M2) and the price level (CPI), indicating the potential impact of monetary policy on inflation. The impulse response analysis reveals a persistent and positive influence of M2 on CPI over time. In contrast, the Canadian economy exhibits a positive relationship between past and current price levels (CPI), highlighting the persistence of inflationary pressures. However, the impact of the lagged money supply (M2) on the current money supply or price level is not statistically significant. These findings suggest that while both economies share similarities in terms of inflation persistence, there are notable differences in the relationship between the money supply and the price level.
3. The demand for money regression analysis revealed that income and interest rates have a significant impact on the demand for money in both the US and Canadian economies.
4. Independence/Dependence:

- Both economies have a positive relationship between real income and the demand for money, indicating that as real income increases, the demand for money also increases. This is an important consideration for policymakers as they design a monetary policy to meet the needs of the economy.
- Both economies also have a negative relationship between nominal interest rates and the demand for money, indicating that as nominal interest rates increase, the demand for money decreases. This is an important factor for policymakers to consider when setting interest rates and implementing monetary policy.
- The AUTOCORRELATION analysis conducted on the US and Canadian economies sheds light on this relationship. In the US economy, the findings suggest a positive and significant relationship between M2 and CPI. An increase in the money supply tends to lead to higher inflation over time, indicating the potential influence of monetary policy on price levels. The impulse response analysis reveals that shocks to M2 result in a persistent and positive impact on CPI, indicating a lasting effect of changes in the money supply on inflation. Similarly, in the Canadian economy, there is a positive relationship between past and current price levels (CPI).
- In the US, the government is dependent on its central bank for monetary policy decisions, while in Canada the government is independent. This may have implications for the implementation of

monetary policy in each country, as the level of coordination between the government and central bank may differ.

B. Implications of the Findings

The results have several economic ramifications for the US and Canadian economies. First, because changes in the money supply have a significant impact on the price level, policymakers in both economies should pay close attention to these developments. The US economy, which is more sensitive to changes in the money supply, should pay special attention to this. Second, since higher income levels and lower interest rates—two important factors that influence the demand for money—are important for economic growth, policymakers should concentrate on encouraging them.

C. Limitations of Analysis

There are several restrictions on the analysis that should be mentioned. The results of the analysis may not accurately reflect long-term trends because, to start, they are based on data from a short time frame. Second, the analysis makes an unproven assumption that no other factors could affect the relationships between the variables. The analysis is also supported by statistical models, which might not accurately reflect the complexity of the real-world economy.

D. Opinion on Effectiveness

In terms of the effectiveness of current policies, the analysis suggests that policymakers should focus on policies that promote economic growth, particularly in the US economy. While the policies implemented so far have had some impact, there is still room for improvement. Policymakers should also be mindful of the impact of changes

in the money supply on the economy and take appropriate measures to mitigate any adverse effects.

E. Future Research

Additional study is required in this area. Future research should, in particular, look into long-term trends and the effect that other factors have on the relationships between the variables. Studies that look at how economic growth policies affect the demand for money as well as the connection between the money supply and the level of prices would also be beneficial.

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