Household wealth, financial market volatility and financialization: the effects of the 2008 financial crisis on wealth inequality in Canada and the United States

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Abstract

This paper explores the relationship between financialization and wealth inequality with a comparative case study between Canada and the United States. Specifically, it investigates the role of financialization regarding the consequences of the 2008 financial crisis on wealth inequality. The results show that the lower- and middle-income households in the United States were hit the hardest by the crisis and have not yet fully recovered. This greatly contributed to the increase in wealth inequality in the United States. In contrast, the lower- and middle-income households in Canada did not experience financial losses during the same period. In fact, their wealth even grew at a higher rate than the top deciles. This paper argues that one of the main reasons to explain the different consequences of the 2008 financial crisis between the two countries is their level of financialization and general approach to financial regulation. A cohesive society requires some level of financial security in order to strive. Irresponsible financial innovation can threaten the financial stability of a nation. State financial regulation can reduce financial insecurity. Moreover, financial regulation can protect poorer households from ill-considered access to financial markets.

Keywords: financial volatility, financialization of real estate, wealth inequality, social welfare, subprime mortgages

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Introduction

Each era has its main mechanisms contributing to wealth inequality, separating the rich from the poor. In the 21st century, financialization and deregulation are very prominent in that regard. Those two dynamics have been important drivers of wealth inequality since the 1980s, in some countries more than others (i.e. United States, Russia, India).

Financialization is a stage in the evolution of capitalism that we are currently experiencing. It is a gradual process through which financial markets, institutions and elites gain greater and greater influence over economic policies and political outcomes. The changes caused by financialization can be observed at both a macro (i.e. market values, GDP, unemployment rates) and a micro level (i.e. household wealth).

Financial deregulation is essentially the process of the government loosening its grasp on the economy and heading towards a free market. For instance, liberal market policies that reduce the proportion of capital that investment banks have to hold in reserves or policies that allow banks to resell mortgages as investments to third parties.

The goal of this paper is to analyse the relationship between financialization and wealth inequality through a comparative case study of Canada and the United States. Specifically, I investigate in this paper how financialization contributed differently to wealth inequality in both countries before, during and after the 2008 economic crisis.

The 2008 financial crisis seen in the United States and in Canada is an interesting period to study, because the dynamics and results of financialization are expressed very strongly there. In the US especially, financialization and certain forms of deregulation contributed to many social problems and led to an increase in inequality. Comparatively, in Canada, where financialization is

not as prominent, wealth inequality was more subdued. Comparing two neighboring countries facing the same crisis over the same period is a great opportunity to study the impact of financialization on wealth inequality.

Finally, unlike other similar research, the analysis I have performed does not limit itself to either relative or absolute measures of wealth inequality but articulate both a relative measure (the Gini coefficient) and several absolute measures (such as the total net wealth and the wealth median by wealth deciles).

This paper starts by drawing a general portrait of income and wealth inequality worldwide. Section 2 demonstrates how the 2008 financial crisis affected the US and Canada differently with a macroeconomic indicator such as the GDP, unemployment rate, housing prices and the homeownership rate. Section 3 first introduces the concept of financial sociology and proceeds to make an account of how financialization affects economic decisions at a micro and a macro scale. Then the contemporary controversies in the methodology of the wealth inequality study will be discussed. Finally, the research direction and aims of this paper will be explained within the context of its field of research and the literature that has been done on the subject. Section 4 presents the methodological approach of this paper and the data sources used to analyse the evolution of wealth inequality in the two countries. Section 5 offers a detailed analysis of the different ways the financial crisis affected wealth inequality in the US and in Canada. The results are summarized in Section 6, which also considers the importance of financial regulation by the state.

Section 1. The general trend of wealth and income inequality in the world over the past decades

Research has shown that the global wealth and income inequalities between countries have declined but inequalities within countries have increased. Research from the World Inequality Database (WID) shows that the gap between the richest and the poorest within a country has expanded. The WID found that, in 2020, the average income of the global top 10% of the population is 38 times higher than the average income of the bottom 50%. The gap between the average income of the top 10% and the bottom 50% of individuals within countries has almost doubled, from 8.5 times to 15 times[1].

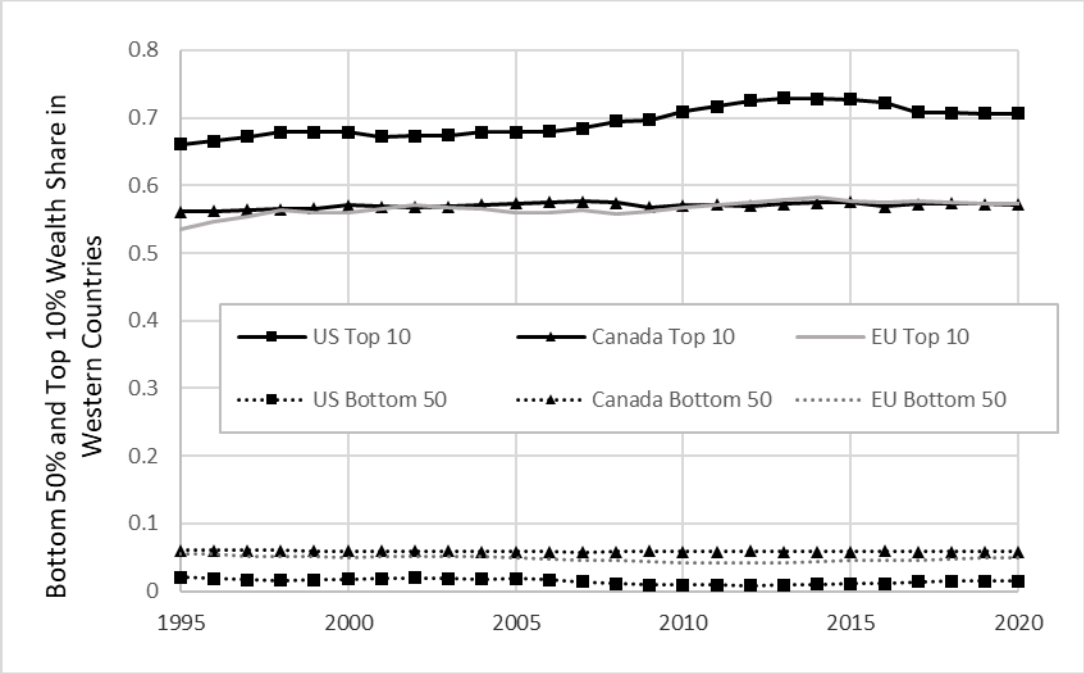
When studying the gap between the poorest and the richest, measuring the inequality of income or measuring the inequality of wealth will give drastically different results. Some research has found that there is no clear connection between wealth inequality and income inequality (Skopek et al. 2012, 2014), and analysing the gap between the poorest and the richest will show very different results depending on which one is analysed (Sierminska et al. 2006). The available data to study income inequality worldwide is proving to be more and more insufficient. That is because the gap in income inequality is not as high as in wealth inequality. The income data from the WID shows that the richest 10% of the population earned 52% of the global income in 2021, while the poorest half of the population earned only 8.5%. In sharp contrast, for the same year, the wealth data from the WID shows that the richest 10% of the global population owned 76% of all the wealth, while the poorest half of the global population owned only 2%[2].

[1] https://wir2022.wid.world/executive-summary/
[2] https://wir2022.wid.world/

WID research has shown that the increase in the wealth of billionaires contributed the most to the increase in the share of the top 10% between 1990 and 2010. During this period, the top 1% took 38% of all additional wealth accumulated since the mid-1990s, while the bottom 50% took only 2.3% of it. The richest 1% also benefited from a higher growth rate, while the poorest did not. The growth rate of the richest was 6% to 9% while it was 3% to 4% for the poorest half. The share of the top 0.01% increased from 7% to 11% between 1995 and 2021. The share of the richest individuals (billionaires) has increased from 1% to 3.5% between 1995 and 2021.

Figure 1.2 shows that wealth inequality has always been significant in Western countries (North America and the EU) since 1995. The poorest half of the population in the large majority of these countries has always owned very little wealth, i.e. between 2% to 6% of the total, whereas the richest 10% has typically owned between 55% to 72%. In the following comparison among the United States, Canada, and the EU, it can be seen that the wealth gap between the richest 10% and poorest 50% in the United States is wider than in the other two. In the United States, the bottom 50% still has a 1% share of the wealth and the richest 10%'s share has grown from 66% to 70%. Meanwhile, in Canada and the EU, the percentage of share for the bottom and the top are quite similar. In figure 2.2, the curves of Canada and the EU largely overlap. The two top 10% strata have taken approximately 57% and the two bottom 50% strata have taken around 4% respectively. In Canada and the EU, the share of wealth held by the top 10% remained essentially flat, which is noticeably different from the United States. Although the bottom 50% had a larger share than the United States, the bottom share remained unchanged over decades. All these results show that Canada and the EU have similar gaps between the rich and poor while the United States has a larger gap between them.

Figure 1.2. Bottom 50% and Top 10% Wealth Share in Western Countries.



Sources: World Income Database.

Section 2. Analysing the macroeconomic impact of the 2008 financial crisis on Canada and the United States

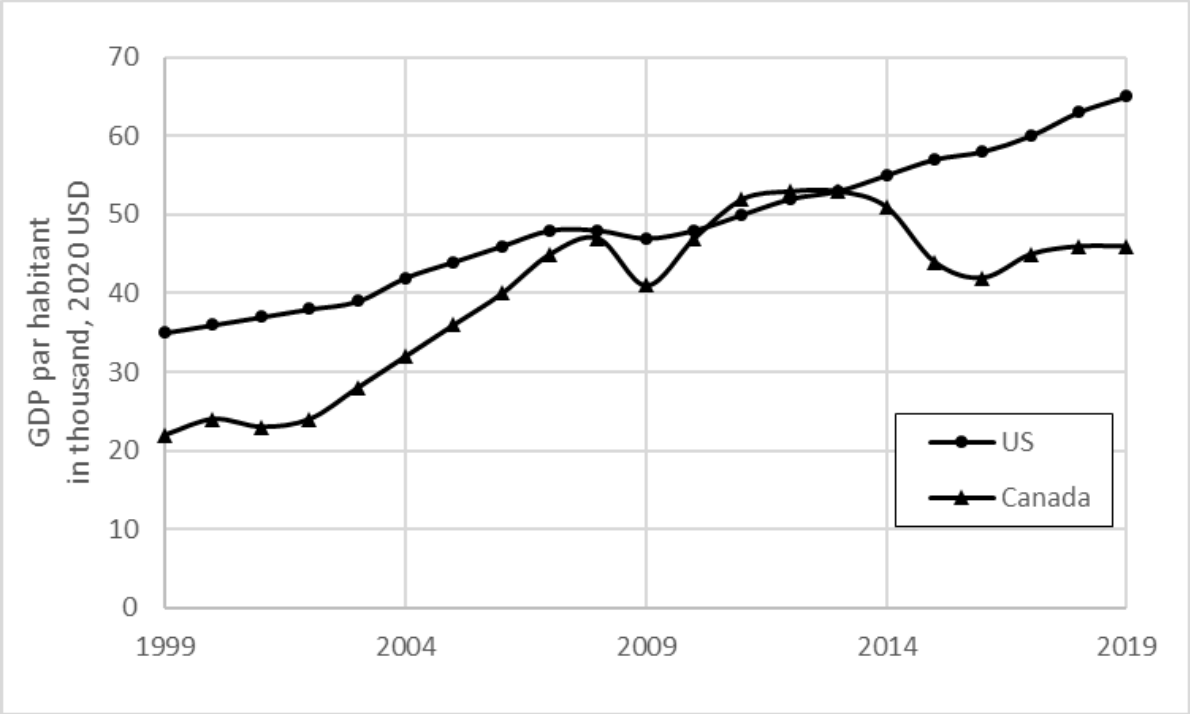
The impact of the financial crisis on Canada and the United States can be analysed both at a macro and at a micro level. This paper focuses on households' wealth inequality at a micro level. However, understanding the changes in the economy at a broader, macro level can reveal significant differences between the two countries as a whole before looking at the data to analyse the households' wealth at the micro level.

In this section, I will use the macroeconomic index: GDP per capita, the unemployment rate, the housing price index, and the homeownership rate for the United States and Canada to illustrate the impact of the 2008 financial crisis on each country. The 2008 financial crisis caused significant changes in the economies of OECD countries, just as it has greatly affected the lives of people. The impact on macroeconomics can be seen through the GDP and the unemployment rate, while the impact on individual lives and aspirations can be observed through changes in house prices and the homeownership rate. The GDP represents the total market value of all final goods and services produced and is used as an indicator of overall economic activity. The unemployment rate is an indicator of the efficiency and effectiveness of an economy to absorb its labour force in viable projects, and the house price index and house ownership rate are key components of household welfare. Homeownership is also part of the democratic ethos and American dream, which is as important in Canada as it is in the United States.

Figure 2.1 shows the evolution of the GDP per capita for the 1999-2019 period. It appears that Canada had not grown as fast as the United States, but this is just one aspect of the economy. The financial crisis led to a sharp decline in GDP per capita in both the United States and Canada, but the GDP decrease in the United States was much lower and the recovery was much more

constant. GDP per capita returned to normal growth soon after the financial crisis in the United States while Canada experienced a bumpy trend after 2008. Between 2008 and 2016, the GDP per capita in Canada experienced two obvious ups and downs. In 2019, after recovering from the second drop, Canada's GDP per capita managed to come back to the pre-crisis level.

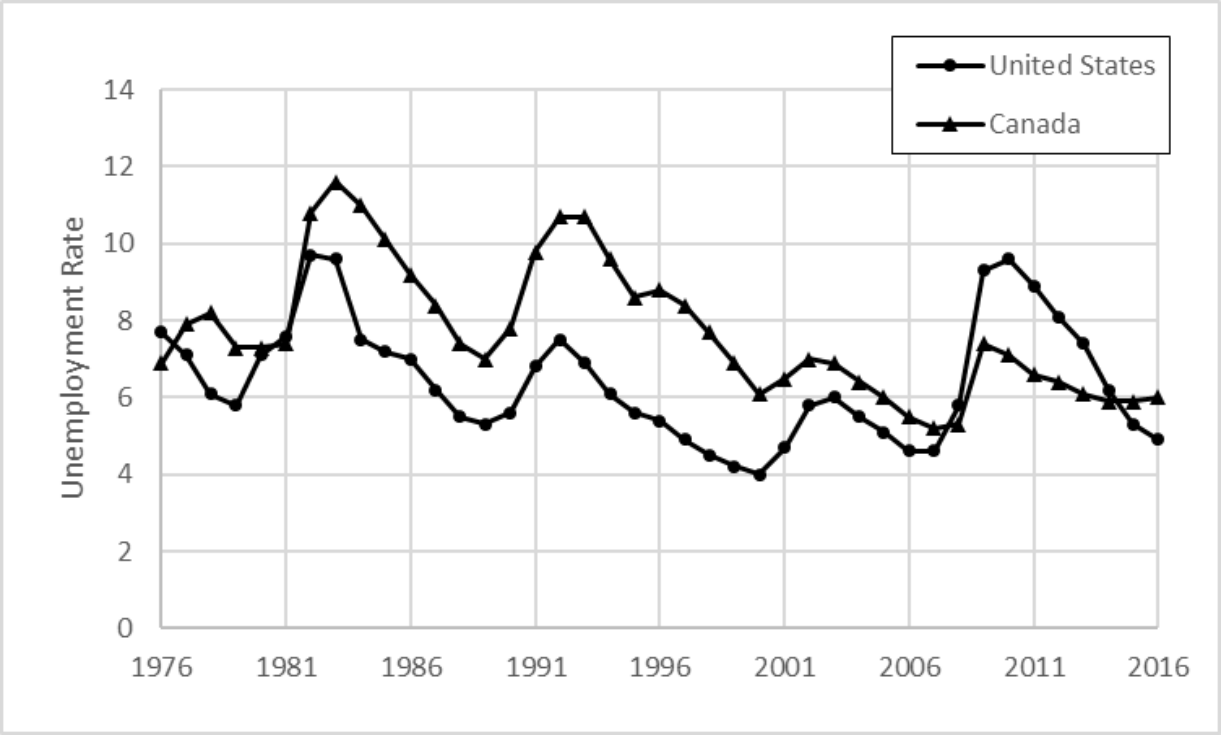
Figure 2.1 GDP per capita in Canada and the United States, in thousands, 2020 USD.



Sources: datacatalog.worldbank.org.

Figure 2.2 shows that the unemployment rates in the United States and Canada share similarities and differences. One significant similarity was that the United States and Canadian unemployment rates rose and fell mostly in the same pattern. Wolff (2017) argued that the rise in these unemployment rates after 2007 is related to the Great Recession. As a result, both countries experienced a sharp rise in unemployment from 2008 to 2010, from 4.6% to 9.6% in the United States and from 5.8% to 7.1% in Canada. The rise in unemployment lasted for two years in the United States and one year in Canada. Both countries saw their unemployment rates return to slightly lower levels than before the Great Recession in 2009. We can also notice that the unemployment rate in Canada has been consistently higher than the unemployment rate in the United States, except during the 2006–2014 period.

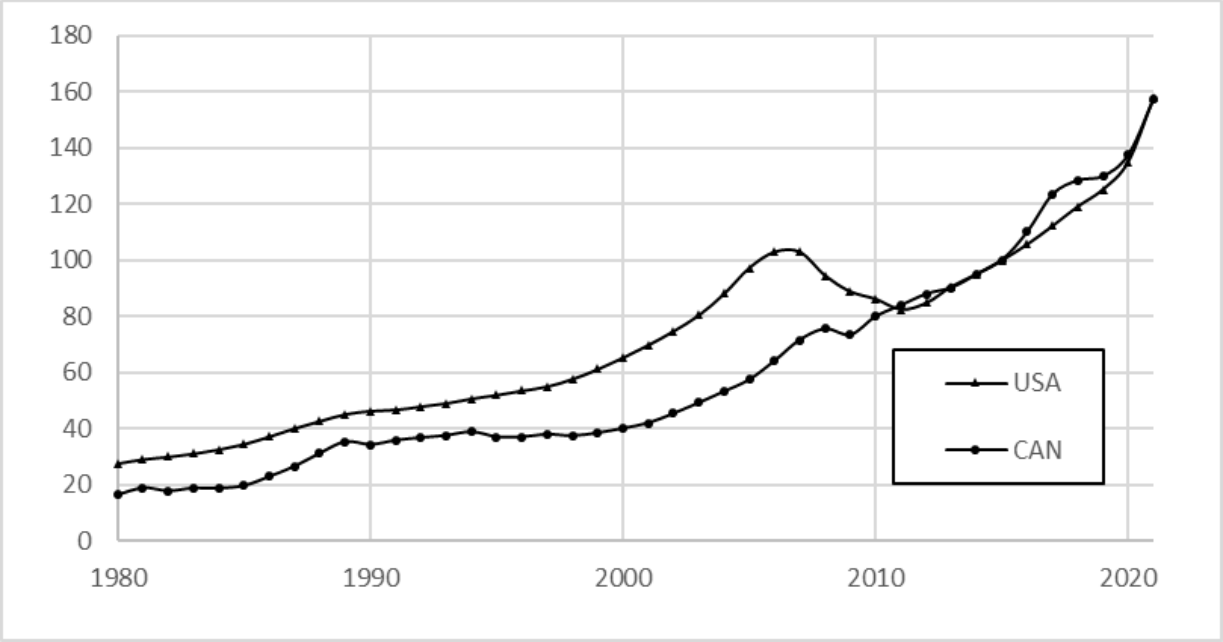
Figure 2.2 The Unemployment rate in Canada and the United States, from 1976 to 2016.



Sources: https://www150.statcan.gc.ca/n1/daily-quotidien/170707/dq170707a-eng.htm#archived, Canada data adjusted to United States concepts

Figure 2.3 shows the evolution of housing prices in Canada and the United States, and the financial crisis had much smaller impacts on the Canadian economy. The housing index increased significantly in both countries and decreased around 2007 to 2008 and then increased again. The price increased faster in the United States before 2006. However, Canadian housing prices continued to increase until late 2008. Also, the period of decline is longer in the United States market than in the Canadian market. The United States housing market declined from 2007 until 2012. Meanwhile, the housing market in Canada only experienced a short decrease from 2008 to 2009.

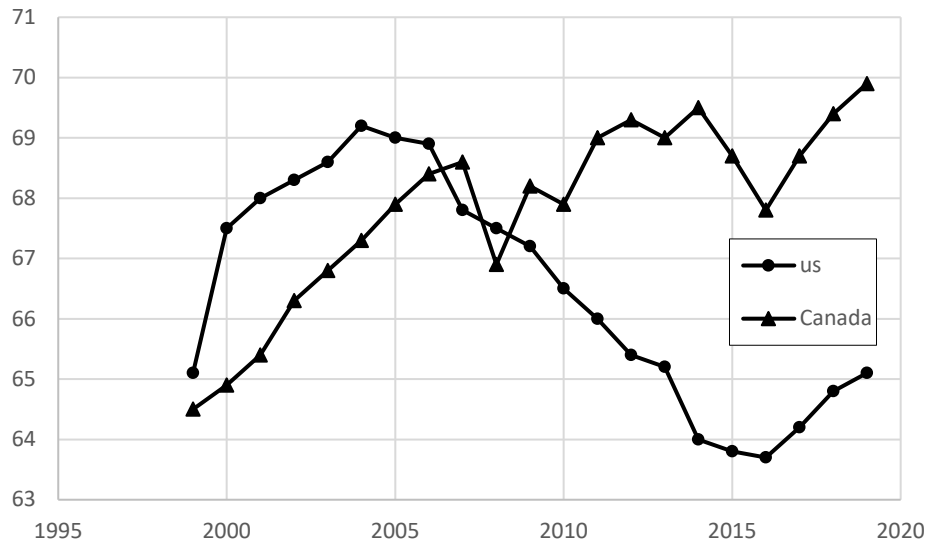
Figure 2.3 the United States and Canada nominal home price index (base 2015 = 100)



Sources: the OECD Analytical House Price Database

Figure 2.4 highlights the homeownership rate in Canada and the United States for the 1995 to 2020 period. Homeownership affects households' investment, consumption, and savings decisions and plays an important role in retirement well-being (Kendig 1984; Engelhardt 2008). It is also one of the most important investments for individuals and families. As such, it leads to the accumulation of wealth over the individual's life course (Crossley and Ostrovsky 2003; Thomas 2005).

Figure 2.4. Homeownership rates in Canada and the United States, 1999 to 2016.



Sources: for Canada: https://www150.statcan.gc.ca/n1/daily-quotidien/171025/cg-c001-eng.htm; for the United States: https://www.statista.com/statistics/184902/homeownership-rate-in-the-us-since-2003/

The homeownership rate in the United States began to decline in 2005 until it reached its lowest point in 2016, and so far, it has not returned to pre-2005 levels. In contrast, Canadian homeownership experienced two short-term declines in 2007 and 2014 but experienced an upward trend between 2005 and 2019. Before 2006, the homeownership rate in the United States was higher than in Canada. After 2008, while Canada kept an increasing homeownership rate, the United States experienced a huge drop in it. As a result, the homeownership rate in Canada is now higher than in the United States. Furthermore, the homeownership gap between the two countries has remained very wide since 2014.

Before 2005, the macroeconomic situation in the United States was stable and optimistic and consumer power was high, so financial institutions issued loans on a wide scale[3]. For these reasons, more people could get a loan to buy a house, so the real estate market was booming. However, financial institutions lent money to people with bad credit through subprime lending. When the subprime borrowers were unable to repay their loans, a high rate of foreclosures became commonplace. As a result, the homeownership rate decreased. To see how the distribution of mortgage debt has changed, we examine the distribution of the ratio of the outstanding loan to house value (the LTV) of borrowers (from Table 2.5). A high LTV implies that a small decline in housing prices would leave the owner with negative equity. As Table 2.5 illustrates, Canada has fewer households with LTV ratios above 80% than the United States.

Table 2.5. Distribution of Mortgages by Loan-to-Value Ratio (in %)

	The United States			**Canada**
LTV ratios	1999	2005	2007	2006
0–80	76.48	79.14	78.12	84.79
80–90	10.55	8.98	9.66	8.81
90–100	7.56	6.37	6.93	1.53
100+	5.41	5.51	5.28	4.87

Sources: Bank of Canada Financial System Review December 2007; American Housing Survey. The American Housing Survey reports the ratio of all outstanding mortgages (excluding home equity lines of credit) to the value of the house.

[3] https://www.thebalance.com/subprime-mortgage-crisis-effect-and-timeline-3305745

Coupled with the crash of the real estate market and the financial crisis, the macro economy began to deteriorate, the unemployment rates rose, more people could not afford their mortgages, and many families went bankrupt, thus losing their homes. Although the real estate market returned to prosperity after the financial crisis, for example, home prices had rebounded to their original levels by 2012, homeownership continued to decline until 2016.

Section 3. Financialized capitalism and how it impacted households

3.1. The sociology of financialization

First, let's clarify the differences between the concepts of economy and finance. The economy is a complex system of interrelated production, consumption and exchange activities that ultimately determine the way resources are allocated among all participants. Finance refers to the management, creation and study of both money and investments. It involves the use of credit and debt, securities and investments to finance current projects using future income streams.

Financialization, broadly defined, refers to the increasing role of financial motives, markets, actors, and institutions in the operation of economies and their environment (Epstein 2005: 3). As a result, actors in the economic market have become relatively less concerned with product output and the real economy. Although today we live in a financialized world, financialization in sociology was not a widely discussed topic until the 2008 financial crisis. The aftermath of the 2008 economic crisis and the European debt crisis of 2010-2011 attracted sociologists to the study of financialized societies. Scholars argue that in financialized economies, financial logic and modes of thinking begin to dominate institutions (Karin Knorr Cetina, 2012; Lapavitsas, 2009). Shareholder value becomes the purpose of the corporate governance model and household assets are increasingly perceived as an alternative or an addition to the welfare state (Froud, 2002). In the neoliberal theory, households are expected to provide their welfare and should no longer depend on social transfers from the state (Doling and Ronald, 2009). In such a financialized state, individuals and households treat life as investment decisions, allocating and planning their assets throughout their life span (Watson, 2009). The process of financialization also makes households become experts in financial language and practices. The ethics, morality, and mindset of finance have penetrated social and individual life. Consequently, as Lapavitsas mentioned, the concept of

financial risk which was used by financiers has become prominent in public discourse and accepted by households.

3.2. Financialization of the global economy: how finance affects the economy which affects household finances in return

3.2.1. Changes in the financial reward structure of corporate executives

Morgan and Takahashi (2001) summarized that the development of a compensation plan and career hierarchy for senior management facilitates the rewarding of managers who are expert in using financial instruments to generate investment returns. One effective way to incentivize can be to control agency fees by writing results-based management compensation contracts (Eisenhardt 1989). In practice, in addition to the performance and stock options approach, this includes the establishment of independent non-executive directors, remuneration and audit committees (Erturk, 2004).

The nature of the company under the financialization of the economy leads managers to seek large short-term returns. In the 1990s, bull markets[4] have been dominated by private companies and management seeking profits. Corporations were redefined as bondholders and as producers of financial surpluses with the responsibility to generate profit for their shareholders (rather than as production machines that create jobs and products). During this period, capital markets[5] provided an active market for corporate control and an outlet for household savings, so

[4] A bull market is the condition of a financial market in which prices are rising or are expected to rise. It often refers to the stock market but can also be applied to bonds, real estate, currencies, and commodities.
A bear market is when a market experiences prolonged price declines.
[5] Capital markets are an important part of the financial markets and are where stocks and bonds are traded. These stocks and bonds are long-term assets.

it was the guardian of household wealth and long-term social security for the upper half of all income distribution.

Corporate executives can find ways to maximize leverage to expand their gains in bull markets and narrow their losses in bear markets more easily than ordinary citizens. In financial trading activities, managers typically use the most leveraged financial instruments. In the 2000s, debt and indebtedness became the talk of the financial markets. Corporate bankruptcy restructuring showed a double standard for employees, and corporate executives could protect their property through, for example, trusts, while ordinary employees' property could not be protected, for example, by investing in company stock.

3.2.2. Increasing influence of the financial markets

The reason for the change in the structure of financial rewards for the company's executives as described in 3.2.1 is the shift in the focus of economic activity: the emergence of a business model dominated by financial activities rather than by the real economy (output). This business model is a balance between the business strategies of the participants of economic activity, such as companies, regarding the production and financial elements. Froud showed that because the role of stock market is increasing in the whole economy, companies care more on gaining profit for shareholders. Financialization is also a process of value-based management. The concept of 'shareholder value' is to align the interests between the owners and managers of capital to maximize profit. Profits are no longer primarily driven by increasing production, the quality of products, or cutting costs but by increasing investment rewards (Froud, 2002, 2004). The economic reward of managers is now much more based on company equity instead of a salary (Froud, 2002). Therefore, the corporate manager becomes oriented toward increasing shareholders' value. They

progressively use "financial engineering" to achieve "shareholder value" (Froud, 2002). Furthermore, some scholars such as Erturk (2004) argued that financialization is related to the growing influence of financial markets. Since the 1990s, "Financial democratization" has become an economic commitment and a political aspiration, which promised that all households can make money by buying appropriate financial services products.

The "democratization of finance" mentioned in the previous section advocates equality in the capital market, but in fact, the financial market is not equal for ordinary household investors and corporate investors. There is a power relationship between investors in the capital markets. Froud argues that households are disadvantaged by the joint entry of households and corporations into the financial markets (what he calls "coupon pool capitalism") (Froud, 2002). However, people with more wealth, financial knowledge, and access to information, such as the owners of the giant corporations, and senior managers mentioned above, are more likely to profit in bullish financial markets and less likely to lose in bearish financial markets (Froud 2000, Brenner 1997). Also, finance itself is becoming a form of power (Tickell & Peck 1992).

The capital market was originally an intermediary for a company's revenues, but under finance capitalism it has become a place where capital owners seek to preserve the value of their capital. Froud calls this type of capitalism, in which families and businesses are jointly involved, "Coupon pool capitalism". Households transfer a large portion of their long-term savings (or pension reserves) into securities, resulting in significant flows to secondary markets[6] (Froud, 2002).

[6] Transactions that occur on the secondary market are termed secondary simply because they are one step removed from the transaction that originally created the securities in question. For example, a financial institution writes a mortgage for a consumer, creating the mortgage security. The bank can then sell it to mortgage company such as Fannie Mae on the secondary market in a secondary transaction.

3.3. The financialization of households

Financialisation of households is a process in which financial practices are increasingly embodied into the lives of ordinary individuals (Martin, 2002). Households now often save their money to invest it, and investing implies taking risks (Fligstein and Goldstein, 2015). The context of Household Financialization is financialized capitalism, declining state welfare, and stagnant wage growth (see, for example Fligstein et al, 2015; Erturk et al, 2007; Martin, 2002). Households are expected to be self-sufficient, especially during economic downturns, and are expected to take financial risks (Martin, 2002; Bryan & Rafferty, 2014; Watson, 2009).

3.3.1 Financialization of the family in a liberal welfare regime

To understand this phenomenon, let's start with an introduction to the social welfare systems in the United States and Canada. Esping-Andersen identifies three types of welfare states, the Liberal type, such as the US, Canada, and Australia; the Conservative type, such as Germany, Austria, Italy, and France; and the Social-democratic type, such as Denmark, Sweden, and Norway. This approach is based on the three following principles: decommodification (the extent to which an individual's welfare is reliant upon the market, particularly in terms of pensions, unemployment benefit and sickness insurance), social stratification (the role of welfare states in maintaining or breaking down social stratification) and the private–public mix (the relative roles of the state, the family, the voluntary sector and the market in welfare provision).

In liberal states, state provision is minimal, benefits are modest and often have strict entitlement criteria, and recipients are usually means-tested and stigmatized. Conservative welfare state regimes are usually income-related, administered through employers, and geared toward

maintaining the existing social model. Social democratic regime welfare provision is characterized by universal and relative generosity, with a commitment to full employment and income protection (Esping-Andersen, 1991).

3.3.2. Why are households starting to financialize?

Compared to conservative and social democratic welfare states, the United States and Canada have highly market-oriented social welfare systems with a high degree of commoditization of social services (Esping-Andersen, 1991). In such a social context, households that become entrepreneurial will have more investment opportunities (Froud, 2002). Households tend to view life choices as investments. Households will plan how to invest in, buy and sell assets hoping to make a profit (assets can be their house but also all other valuable assets they have). In the case of the 2008 crash, or right before the crash, many households decided to "trade up" their assets, essentially trading everything they have, to buy the best house they can afford as an investment. Education, pension, and saving accounts are usually considered as investments with good results that protect households from financial difficulty (Sherraden & Wolff, 1993). Buying all types of financial products made households increasingly like entrepreneurs and investors. A consequence of households becoming investors is that they are more and more subject to market vulnerability and flexibility (French et al., 2011). But many families can't take market risks like entrepreneurs.

Like other initial assets, homeownership has also become financialized and treated as an investment (Fligstein and Goldstein, 2015). Homeownership is the biggest investment for households and the largest expense in the budget of the middle class. Household property investments are in the form of mortgages (Lapavisas, 2009, Stockhammer, 2013) that bring families into the global housing finance system.

3.3.3. In which way does household financialization make household finances vulnerable?

Some scholars believe that financialization is harmful to individuals. Households' involvement in different financial products may take away all their savings, and lead to a condition known as "house poor", or to personal bankruptcy or homelessness, phenomena that were seen in 2008 in the US. Through household financialization, financial institutions extract financial profit from the personal income of workers (Martin, 2002, Lapavisas 2009).

Loose lending and borrowing practices and the increase in subprime mortgages have increased the number of the "house poor" in society. The "house poor" fall into two categories: households whose housing expenses (e.g. monthly mortgage payments) account for a disproportionate share of their monthly budgets, and households that can easily pay their mortgage but cannot sell their homes because their property values have declined significantly. The crash of the property market devalued the asset and made it difficult for families to sell their asset on the market (Aalbers, 2008).

The common characteristic of households that are in financial distress after buying a home is that they have a high concentration of assets and are highly leveraged, meaning that if the value of the home goes down, all their assets go down, and being highly leveraged means, they will rely on a lot of borrowed money and will face a lot of interests to pay. If a household is buying a home as an investment to gain profit in the long run, once they have invested everything in that home, if the value of the home goes down, they still have the same debt and interests to pay, although the home won't have the same value in the end, causing huge losses, commonly causing bankruptcy in the 2008 crisis.

3.4. Theories to explain the 2008 financial crisis

3.4.1. Minsky's Financial Instability Hypothesis

Minsky (1992) predicted the financial crisis by proposing the Financial Instability Hypothesis (FIH), which argues that financial stability leads to economic instability. Because investors become increasingly speculative and leveraged, based on their experience of prior investment success in a stable financial environment and expectations made of stable markets. This theory argues that lending goes through three distinct stages. Investment flows from "hedge finance" where income from asset ownership pays both principal and interest to "speculative finance" where income from assets only pays interest to "Ponzi finance". Ponzi finance has no real interest payments on the principal or interest in a few years, but investors have strong hope for future revenue. In the Ponzi stage, investors are willing to use the new loan to pay for the previous interest payments and are hopeful that future asset reporting will cover the current and previous loans. Ponzi finance is unsustainable because once investors realize that there is little room for additional higher returns, they will begin to withdraw their capital, triggering a financial crisis.

3.4.2 The result of expansion of mortgage lending

Some scholars argued that the 2008 crisis was caused by financial deregulation and the expansion of mortgage lending. Aalbers showed that there was expanding access to credit, which got more households involved in the mortgage market (Aalbers, 2008). Easy access to loans and irresponsible lending practices have led to more households with poor creditworthiness and low repayment capacity (often from the poorer segments of society) having easier access to loans and to financial markets. Commercial banks turned from industrial and commercial capital towards

individual incomes as a source of profits (Lapavisas 2009), and this change in their lending behaviour spread financial risk to the poorer households.

The financial crisis first appeared in the housing market. The poorest workers in the United States couldn't afford to pay their housing debt and then home prices fell. The delinquency rate shows how many lenders were unable to repay the loan. The delinquency rate before 2006 was always 0.2 to 0.3 but increased more than fourfold after 2007. The rise in delinquency rates is directly related to the development of household investment behaviour, primarily housing expenses (Lapavisas, 2009, Stockhammer, 2013). Before the crisis happened, mortgage lending increased rapidly from 2001 to 2003, subsequently declining but remaining at a high level until 2006, accounting for $1.75 trillion in obligations. This lending spread to the poorer classes who did not traditionally have access to loans from the bank. The loans they usually got were Adjustable-Rate Mortgages (ARM), which has an initially low rate of interest but subsequently adjusted upwards. The increasing mortgage lending increased the housing demand. For example, people who were not able to afford a house could now buy a house with a mortgage, thus, the housing price increased. As house prices rose, homeowners were encouraged to remortgage and use the housing investment profits for other purposes. However, if the real estate market goes down, the result of the deep financialization of households is a decrease in personal savings.

In late 2006, the price of the house market reached its peak in the US and started dropping, announcing the beginning of the house market crisis and steadily sinking towards the 2008 crash. House prices fell by 5–10% in 2007 and the fall accelerated throughout 2008. But many people who bought their house during the housing boom were in greater debt. Data shows that in the last quarter of 2007, 2.1 million people were struggling with their housing payments. Because of the decrease in housing prices, households found it was impossible to sell their house. That is also the

time when the foreclosure rates rose. Since banks held large volumes of mortgage-backed securities or supported financial institutions that held them, the bank found themselves in a liquidity shortage. Thus, the housing-market crisis started in subprime mortgages but then spread to the prime sector.

Canadian real estate sales and values did not decline during the economic crisis, nor were there any bank failures. However, Canada, like the United States, also saw mortgage securitization and a reduction in mortgage lending standards, which are generally considered to be the cause of the economic crisis. However, Canadian banks were not as innovative as U.S. banks, and did not have many financial derivatives, so the "quality"[7] of Canadian bank loans was relatively high. This way, Canadian banks were able to operate normally, and the government responded to their requests in a timely manner when they approached the government (Ratnovski & Huang, 2009; Walks, 2012).

3.5. Controversies in inequality research methods and the typology of wealth inequality scenarios

The Gini coefficient is a single number that demonstrates a degree of inequality in a distribution of income/wealth. It is used to estimate how far a country's wealth or income distribution deviates from a totally equal distribution[8]. It is important to mention that the use of the Gini coefficient as a single indicator of inequality is very controversial. First, the Gini coefficient is biased at measuring general change in the middle of a distribution. Accordingly, it does not capture wealth concentration in the top percentiles. This means that only using the Gini coefficient will result in

[7] The concept of high quality loans is derived from the loan rating system, where borrowers with high quality loans have a lower probability of not being able to pay back their loans.
[8] https://en.wikipedia.org/wiki/Gini_coefficient#Definition also see annex for a more detailed explanation.

underestimating the level of inequality. Next, the Gini coefficient does not capture changes in a distribution; for example, if the middle class in society becomes poorer and the gap between the wealth of the middle class and the top increases, it is possible that the Gini coefficient will remain the same (Lars Osberg, 2016). Finally, the Gini coefficient is a relative measure, so it is not adequate to show fluctuations in total wealth. Wealth inequality is more vulnerable to financial volatility than income inequality, so the total wealth of households can vary significantly from year to year (Forsé and Lizotte, 2020).

Economists such as Piketty (2014) argue that inequality studies should analyse different levels of the wealth distribution separately. The wealth share held by the top percentiles of the wealth distribution is a widely used alternative method. It is an absolute measure of wealth inequality so it can show the actual change in wealth (such as the value of a household's investments, savings, and assets).

To study the issue between relative and absolute measures of inequality, Forsé and Lizotte (2020) developed a typology that synthesizes both absolute and relative measures in an understandable way. They present four scenarios for the evolution of wealth and inequality.

In the first one, like in Finland, the total wealth and wealth inequality increase in tandem, in which case it is usually the top 10% of households that become richer, corresponding to the relative sacrifice of the middle class or the bottom poor (Finland experienced a loss of wealth for the middle class rather than the bottom). In the second one, like in Norway, where wealth increases and inequality decreases, in this case, not only has wealth grown, but wealth is shared more equally. In the third scenario, like in Italy, wealth and inequality decrease simultaneously, which means that all groups in society become poorer in an absolute sense. In the fourth scenario, like in Greece,

wealth decreases and inequality increases, which means that in the face of a decline in total social wealth, households in the lower and middle of the distribution bear a larger part of these economic losses.

3.6. Research questions

The purpose of the study is to find the impact of the financialization of the economy has on the inequality within the population. More precisely, while other studies have analysed this dynamic, this paper will analyse the key differences of that dynamic within two different contexts: the United States, which has a more financialized and less regulated economy, and Canada, which regulates its economy more, and will strongly regulate risky financial practices like subprime. The data used for the analysis covers before, during, and after the 2008 financial crisis that affected those two countries, where all those dynamics are expressed strongly.

There have been several studies that have examined wealth inequality in the US and in Canada, individually (Wolff, 2017; Davies, 2020; Morissette, 2002). However, these studies typically only use a relative or an absolute measure of inequality. This paper is an original contribution by examining wealth inequality using both relative and absolute measures of inequality and by comparing the Canadian situation to the one in the United States.

Section 4. Methodology

4.1 Discussion on comparative issues

The concepts of economic growth and wealth distribution are the heart of inequality study: how big the whole economy pie is and how equally the pie is shared among people. So first, examining Canada and the United States, we need the total net wealth of these two nations to give us a general picture of the volume of their economies. When the total net wealth increases, for example, is everyone getting the same share, or do some people get bigger slices while others are left with smaller slices? I will use both the Gini coefficient and the decile to assess the distribution of wealth. Therefore, next, we will use the median total household wealth in deciles to look at changes in the amount of wealth in each decile and to determine in which decile inequality occurs. We will evaluate the state of well-being by observing the total wealth in each decile's median household. Over time, the number of households with negative wealth, or debt, demonstrates the impact of inequality on lowest-income families as well as the influence on household debt.

4.2 The Luxembourg wealth study (LWS)

The data in this article comes from the Luxembourg Wealth Study (LWS), which is a cross-country database that now provides standardized wealth data for 18 countries. The LWS wealth data are drawn from existing, high-quality nationally representative survey data in most of the countries. For our analysis, we chose the United States and Canada[9].

[9] For the United States, the LWS incorporates data from two national surveys: the Survey of Consumer Finances and the Consumer Expenditure Survey (SCF, 1998, 2001, 2004, 2007, 2010, 2013, and 2016). It comprises statistics from the Survey of Financial Securities for Canada (SFS 1999, 2005, 2012, and 2016).

Household wealth surveys rely on a series of questions designed to elicit information on the value of respondents' wealth holdings and to assess the components of their assets. The components of the assets will be described in depth in the next section. In short, household assets comprise financial assets, non-housing real estate assets, and debt.

From 1998 to 2016, the number of observations in the United States ranged between 4305 and 6482. There were 15933 observations in Canada in 1999, 5267 observations in 2005, 12003 observations in 2012 data, and 12429 observations in 2016.

Sampling for both Survey of Consumer Finances (SCF) in the United States and Canada were done with a dual-frame sample design that included a typical multi-stage area-probability sample as well as a sample from statistics data. The first sample frame was designed to give enough coverage of traits that are widely dispersed in the population, such as house ownership. The second, Individual Research Tax File (IRTF) for the United States and T1 Family File (T1FF) for Canada, was designed to disproportionately select families that were likely to be relatively wealthy; these records were made available under strict rules governing confidentiality, potential respondents' rights to refuse participation in the survey, and the types of information that can be made available[10].

[10] [1] Board of Governors of the Federal Reserve System (2016), Codebook of 2016 Survey of Consumer Finances, retrieved from http://www.federalreserve.gov/econresdata/scf/scfindex.htm.
[2] Board of Governors of the Federal Reserve System (2016), Changes in United State. Family Finances from 2013 to 2016: Evidence from the Survey of Consumer Finances, Federal Reserve Bulletin, Volume 103, Number 3, retrieved from https://www.federalreserve.gov/publications/files/scf17.pdf

4.3 The measures of wealth and wealth inequality

4.3.1 The Definitions of wealth and wealth totals

Wealth can be defined as a basic stock of assets, a measure of control over resources, or a critical component of economic power (Vickrey, 1947, p. 340; OECD, 2013). Wolff (1999; 2007) gives an improved and more accurate definition in terms of Canada and the United States. He separated the name of marketable wealth, marketable asset, and augmented wealth. Frank Cowell and Philippe Van Kerm (2015) and Wolff (2015) have also provided definitions (1999 and 2007). According to Cowell and Van Kerm, for empirical purposes, wealth is defined as current net wealth or net wealth, which is calculated as the difference between assets and debts. Net wealth can be expressed in the following manner:

$$w = \sum_{j=1}^{m} \pi_j A_j - D \qquad (1)$$

Where Aj≥0 denotes the quantity owned of asset type j, π_j is its price, and D is the debt. In other words, wealth=price*asset-debt, according to this formula. The definition of assets might vary from country to country. For example, individual assets such as houses and pensions may be excluded in some countries. And the price of an asset has different evaluation methods from country to country. For example, the price used for each asset type j can be either the market price or an imputed price.

Cowell and Van Kerm (2015) define household wealth in the following manner: the sum of all assets minus debts for all household members. All the assets refer to the sum of real assets

and financial assets[11]. Real assets can be classified by five components: 1) the value of the household's main residence, 2) real estate property other than the main residence, 3) self-employment businesses, 4) vehicles, 5) jewellery and others. Financial assets include 1) deposits on current or savings accounts, 2) voluntary private pensions and life insurance, and 3) mutual funds, bonds, shares, and other financial assets. Debts include 1) mortgages, 2) vehicle loans, 3) educational student loans, 4) lines of credit and credit card balance, 5) any other financial loans and informal debts.

In Wolff's definition, marketable wealth, which is also called the net wealth, is the amount of current value of all marketable assets[12] minus debts. The amount of the current value of all marketable assets consists of real estate, consumer durables, deposits, financial securities, cash surrender value, as well as equities in corporate stock, funds, and all kinds of other businesses (Wolff , 1999; 2007).

Real estate refers to the gross value of owner-occupied housing and other real estates. Deposits refer to cash and demand deposits, time, and savings deposits. Financial securities refer to bonds which include government bonds, corporate bonds, foreign bonds, and other financial securities. The cash surrender value includes the cash surrender value of life insurance plans and the cash surrender value of defined contribution pension plans, including IRAs, Keogh plans, and 401 (k) plans in the case of the United States. Fund investments include equity in mutual funds, trust funds and equity in unincorporated businesses. Debt, same with Cowell and Van Kerm (2015), includes mortgage debt, consumer debt such as auto loans, and other debts such as student loans.

[11] A financial asset is a liquid asset that gets its value from a contractual right or ownership claim, such as bank deposits, bonds, and participations in companies' share capital.
[12] Marketable securities are assets that can be liquidated to cash quickly.

Augmented wealth is the sum of marketable wealth, pension wealth and social security wealth. Augmented wealth includes marketable wealth and the present value of discounted future pension and social security benefits (Wolff, 1999, 2007).

We also have definition from the Luxembourg wealth study (LWS). In LWS, Total Net Wealth (*tnw*) can be expressed in the following manner:

$$tnw = anw + haso + hass \tag{2}$$

Where *anw* means Adjusted Deposable Net Wealth, *haso* means Occupational pensions and *hass* means Social Security Pension Entitlements. And the definition *anw* can continue to be split into two parts as the equation shows below.

$$anw = dnw + hasi \tag{3}$$

Where *dnw* means Disposable Net Wealth, *hasi* means Life Insurance and Voluntary Individual Pensions. And *dnw* can be split into three parts as equation 4 shows.

$$dnw = han + haf - hl \tag{4}$$

Where *han* means Non-Financial Assets, *haf* means Financial Assets excluding pensions, and *hl* means Total Liabilities.

So, if we put equation 2, 3, and 4 together, we have equation 5 with all the components.

$$tnw = han + haf - hl + hasi + haso + hass \tag{5}$$

Table 4.2 below shows four definitions of Wealth including one definition from Cowell and Van Kerm, two definitions from Wolff and one from LWS.

Table 4.2 Definitions of Wealth

Definition 1: Wealth by Frank and Philippe (2015)			
definition	(Price*Asset)-Debt		
components	Asset=real asset+ financial assets		Debts
details	real asset	financial assets	1) home secured debts (principal residence mortgage primarily) 2) vehicle loans 3) educational loans 4) lines of credit and credit card balance 5) any other financial loans and informal debts
	1) value of household's main residence 2) real estate property other than the main residence 3) self-employment businesses 4) vehicles 5) jewellery and other	1) deposits on current or savings accounts 2) voluntary private pensions and life insurance 3) mutual funds, bonds, shares, and other financial assets	
Definition 2: Marketable wealth (net wealth) by Wolff (2017)			
definition	all Marketable assets – Debts		
components	all Marketable assets		Debts

details	Real estate (owner-occupied housing + other real estate) consumer durables deposit (cash and demand deposits + time and savings deposits) financial securities (government bonds, corporate bonds, foreign bonds, other financial securities) insurance plans and pension plans (the cash surrender value of life insurance plans + the cash surrender value of defined contribution pension plans, including IRAs, Keogh plans, and 401 (k) plans in the case of the United States) corporate stock equity in unincorporated businesses and trust funds	mortgage debt consumer debt (auto loans) other debt(education loans)

Definition 3: Augmented wealth by Wolff (2017)

definition	marketable wealth+ pension wealth+ social security wealth	
components	marketable wealth	pension wealth+ social security wealth
details	all marketable assets – debts	present value of discounted future pension and social security benefits

Definition 4: Total Net Wealth by LWS

definition	Adjusted Disposable net wealth+ Occupational pensions+ Social security pension entitlements	
components	Adjusted Disposable net wealth	
details	Disposable net wealth	life insurance and voluntary individual pensions
	Non-Financial assets + Financial assets (excl. Pensions) – liabilities	life insurance account individual voluntary pension accounts

4.3.2 Explain the Gini coefficient corrections for negative values

As we have discussed, using only a relative or absolute measure of inequality gives an incomplete picture of inequality. Accordingly, in this paper, we analysed the wealth inequality in both countries by using both a relative and an absolute measure of inequality. For the relative measure, we will use the Gini coefficient, and, more precisely, a revised version of the Gini that allows for negative values. For an absolute measure of inequality, we simply used the total of wealth in the economy and the wealth medians by wealth deciles.

We applied the solution by Emanuela Raffinetti, Elena Siletti and Achille Vernizzi (2015) showed in Eq. 2, which overcomes some of the restrictions.

$$G = \frac{\Delta_Y}{2\mu_Y} = \frac{1}{2\mu_Y N^2} \sum_{i=1}^{H} \sum_{j=1}^{H} |y_i - y_j| p_i \, p_j \qquad (2)$$

Where Y is the vector of incomes (included the negative values), H is the total number of households, p_i and p_j are weights associated with y_i and y_j. The sum of p_i equals the population of households N $\sum_{i=1}^{H} p_i = N$. μ_Y^* is the new normalization term, $\mu_Y^* = (T_Y^+ + T_Y^-)/N$, with T_Y^+ is the overall amount of the positive income values : $T_Y^+ = \sum_{i=1}^{H} max(0, y_i)p_i$ and T_Y^- means the overall amount of the absolute negative income values, $T_Y^- = \left|\sum_{i=1}^{H} min(0, y_i)p_i\right|$.

This Gini formula is used in order to reduce the bias in the estimations from the varying percentage of negative wealth households, since the Gini coefficient, in its original formulation, cannot be used with negative values (i.e. conventionally, negative values were simply excluded from the estimation). This new method allows the estimation of the Gini coefficient for negative values.

4.3.3 Wealth deciles with median and Share of Negative wealth households

For this paper, we have chosen to use the Gini coefficient for the relative measure and the total household wealth for the absolute measure. The Gini depicts the growth of wealth inequality from the standpoint of relative measurement, based on its distribution in the population. However, as a relative measure of inequality, the Gini cannot represent the absolute wealth change in the distribution. Wealth by deciles, on the other hand, illustrates the absolute change in each decile. Accordingly, we examine the median wealth in each decile and determine households' level of well-being.

The Gini coefficient also does not show the indebtedness of households in society. When the assets of a household is smaller than its liabilities, households have negative wealth. To determine the proportion of households with negative wealth, the total household wealth can be

calculated using Equation 1, and then the number of households with negative total values can be determined, which can then be calculated as a percentage of all households.

Section 5. Results

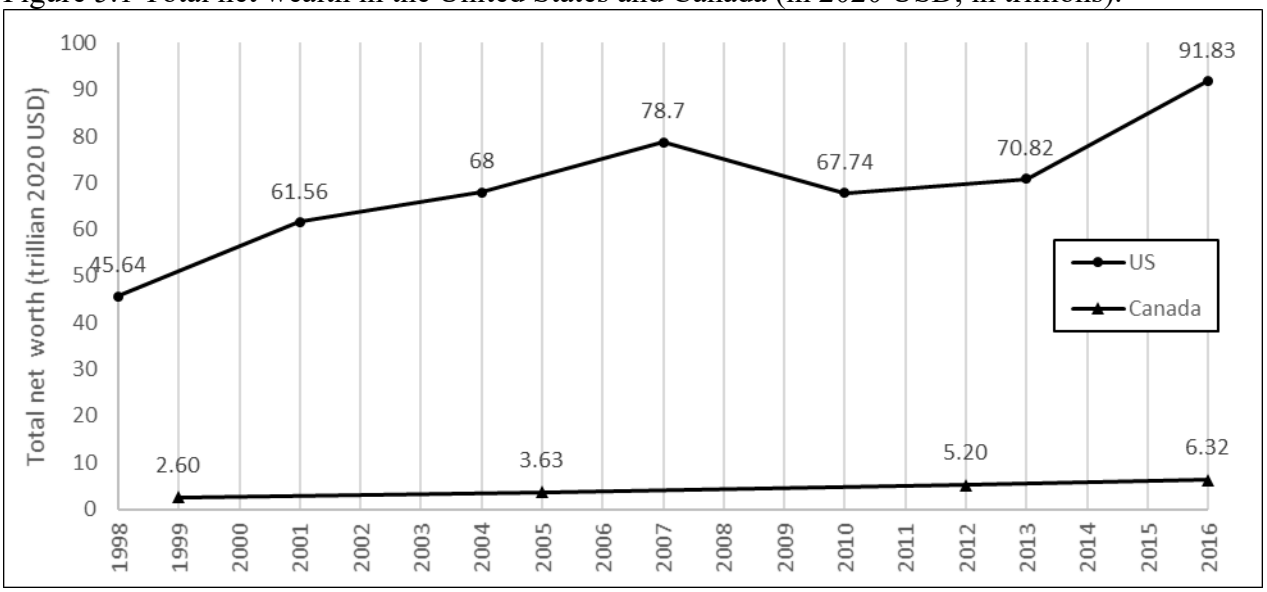
5.1. The evolution of total net wealth

Subsections 5.1 and 5.2 present trends in total net wealth, and trends in median net wealth, respectively. Their purpose is to understand the trends in the overall national economy and the financial situation of the average household. The reason I do not use traditional averages to examine trends in wealth change is that averages do not accurately represent the financial situation of the average level household, as they are affected by individual values that are too high or too low. Comparison of trends in total net wealth and trends in median net wealth indicates how the evolution of the total net wealth translates to the median person.

Figure 5.1 shows that the total net wealth changed at a national level for the period of interest. During the years covered in my data, which doesn't cover every relevant year, the total net wealth in the United States and Canada both saw an increase during 1998 and 2016.

Canada experienced a very different evolution than the United States. In the US, the total net wealth increased until 2007. Scholars like Lapavitsas said that it was a financial bubble (Lapavitsas, 2009) because, while real economic growth was slow, the financial sector saw an extraordinary growth.

Figure 5.1 Total net wealth in the United States and Canada (in 2020 USD, in trillions).



Data: LWS database.

The bubble burst in 2007 and the United States economy fell sharply in a deep recession that lasted until 2010. One of the important reasons behind the bubble was the situation in the housing market. The housing price index reached its peak in 2006 and started falling until 2009. The housing prices decreased due to the widespread failure to pay mortgages, as well as the informal and unregulated subprime loans, especially among low-income households.

After 2010, the economy started recovering gradually, as can be assessed from the recovery in the housing market, the stock market, and financial resources. Various assets such as business assets, non-home assets, financial assets and real estate assets all started to recover after the financial crisis. After 2009, financial assets rose sharply at first, and real estate assets only started rising rapidly in 2013 (Wolff, 2017). This shows that real estate assets are a strong driver of the evolution of the total net wealth in the United States. Consequently, the national total wealth bounced back to pre-crisis level during the 2010 to 2016 period. The rise of the total net wealth in

the United States from 2010 to 2013 was slow but accelerated from 2013 to 2016. Meanwhile, in Canada, the growth rate of the total net wealth was modest but continuous. The growth rate in Canada is almost the same in each statistical year. In the selected years, Canada had barely experienced a decrease in its total net wealth[13]. Subprimes were the initial cause of the wealth crash in the United States. Since Canada had very few subprime loans in comparison, it was largely spared from the crash.

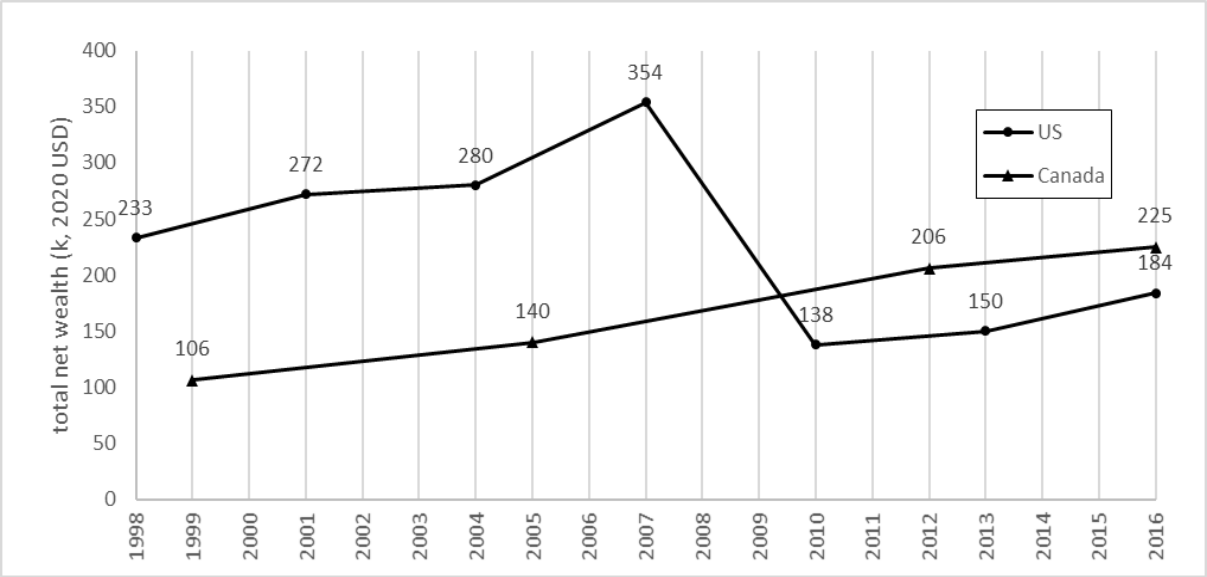
The increase in the foreclosure rate was announced at the beginning of the financial crisis, followed by the fall of the stock prices, and then by the bankruptcy and collapse of several key financial lending institutions, after which even banks were facing a risk of bankruptcy.

5.2. The evolution of the median net wealth

The median net wealth in figure 5.2 illustrates the financial state of the average household in 2020 USD. Canada's median household net wealth increased considerably, from nearly 106k in 1999 to 225k in 2016. The median net wealth in the United States increased from 233k in 1998 to 354k in 2007, which is the year it reached its peak. The increase in median net wealth has been accompanied by a decline in unemployment, an increase in median household income, and a spike in housing prices.

[13] If data was available on a yearly basis, which it is not, a decreased in net worth would have probably been observed for 2009 due to the short-lived crash of Canadian home prices from October 2008 to September 2009. Note: the average home price recovered within a 12-month period.
Data resources: https://www150.statcan.gc.ca/

Figure 5.2 Median total net wealth of the United States and Canada, in thousands, 2020 USD.



Data: LWS database

However, the median total net wealth in the United States fell sharply to 138k USD between 2007 and 2010. This is due to a collapse of personal savings because of financialization. By being involved in the financial market, such as mortgage lending, households gave their savings to the bank for getting loans and then to invest in real estate. Thus, the fate of median household wealth has been tied to the fate of the financial market. Therefore, when the financial market crashed, median household net wealth decreased correspondingly.

In the United States, from 2010 to 2016, the recovery in the stock market and real estate contributed to the increase in the total net wealth and the median net wealth as well (Wolff, 2016). The median net wealth slowly recovered to $184k USD from 2010 to 2016. The total net wealth in the United States rebounded from the 2007 financial crisis to 2016 (figure 5.1), however, the median net wealth was considerably lower than it was before 2007, which meant median net wealth had not recovered by that time. From 2007 to 2016, the total net wealth increased from

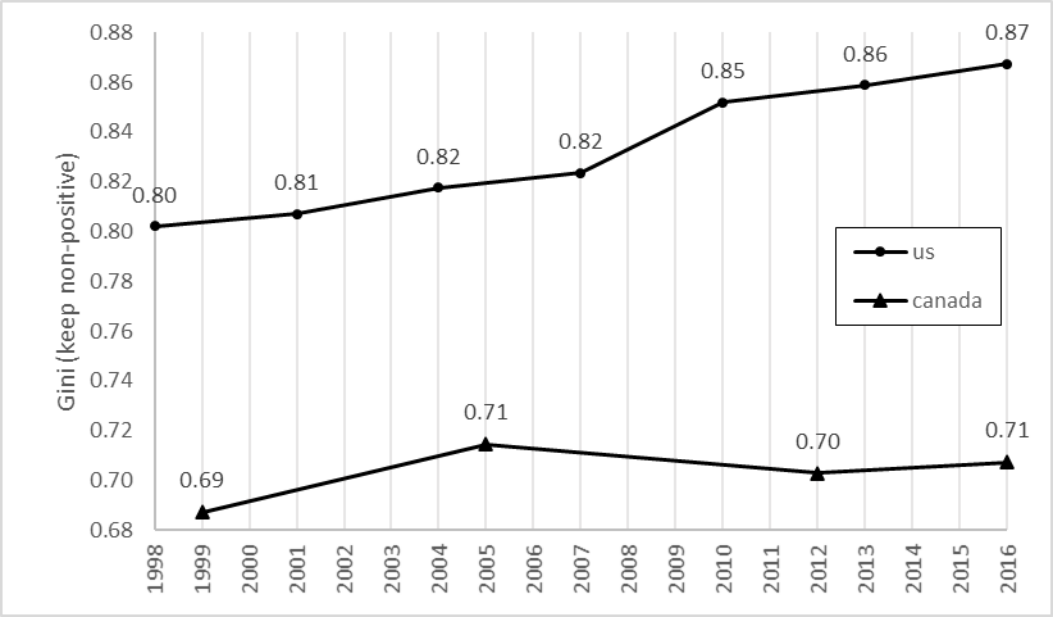
$78.7 trillion to $91.83 trillion, while the median net wealth decreased from $354k USD in 2007 to $184k USD in 2016. The wealth of the median household is held back by household debts.

Compared to the United States, Canada experienced a steady gain in the median household net wealth. In Canada, the trending curve of the total net wealth and median household wealth was in the same rising direction (as shown in figures 5.1 and 5.2). On the contrary, in the United States, the assets of wealthy households increased whereas middle- and low-income households' assets decreased, which showed that inequality had become more serious in the United States. After the financial crisis, the decrease in the median net wealth and the increase in the total net wealth suggested that the United States economy recovered at the expense of decreasing wealth of the average American.

5.3 The evolution of the Gini

Figure 5.3 shows that from 2007 to 2010, the Gini index in the United States rose considerably from 0.82 to 0.85 within three years (0.01 per year), compared to a small increase of 0.02 from 1998 to 2007 over a 9-year period (0.002 per year, five times slower). During the same time, the total net wealth and the median household wealth decreased. In Canada, the Gini index decreased from 0.71 to 0.70 and the total net wealth and the median household wealth increased. The difference between two countries' Gini coefficients means that the total wealth in the United States decreased and was distributed less equally, whereas in Canada the total wealth increased and was distributed more evenly.

Figure 5.3 Gini coefficient of the United States and Canada.



Data: LWS database

For the whole period depicted, the Gini grew in both the United States and Canada (figure 5.3). On the other hand, in Canada, if we look at the general evolution of the Gini coefficient from 1990 to 2016, despite some slight ups and downs, Canada saw a fairly constant and slow rise. The Gini in the United States drastically increased from 0.80 in 1998 to 0.87 in 2016, and in Canada, it increased modestly from 0.69 in 1999 to 0.71 in 2016. During the years of the crisis, the wealth inequality in the United States rose faster, whereas, in Canada, wealth inequality fell slightly. In the United States, the Gini rose, and the total net wealth fell between 2007 and 2010. In Canada, the Gini fell, and the overall net wealth rose.

The Gini shows that in the United States, financial gains and losses were not distributed equally among the classes. The financial losses experienced by the median families was much greater than the state. While the overall total net wealth recovered and resumed a constant growth

rate (figure 5.1), the cause of this growth changed. The median household lost net wealth, but the richest households gained so much value that it went beyond compensating for this loss in value.

In Canada, the total net wealth rose, as did the median total wealth, and the Gini coefficient fell. From 2005 to 2016, its total net wealth rose from 3.6 trillion to 6.2 trillion USD, the Gini experienced a slight decrease from 0.714 to 0.707 and median household wealth increased from 140,000 USD to 225,000 USD. In Canada, the continuous growth in the total and median wealth corresponded with relatively little change in wealth inequality.

5.4 The evolution of the household median wealth by wealth deciles

The tables of median wealth by deciles for the United States and Canada show the wealth values of the middle households in each decile for a given year in each country. The wealth values of the median households are representative of the distribution of their deciles. The tables also show the change in the wealth of these households over time in the given year, as represented by the absolute amount of change and the rate of change. These tables allow us to make several comparisons and examine the evolution of wealth inequality[14] in detail. Section 5.4.1 and 5.4.2 compare different time periods for Canada and the United States because the data collection for the US and CAN survey are done on different years; therefore, it is not possible to compare identical years.

[14] This comparison is complementary to the evidence provided by the Gini coefficient, since the Gini coefficient does not show the value of wealth owned by each household.
For instance, between 1999 and 2005, the first decile median household experienced a change of -2200 USD, which represents a change rate of 100% in their debt. A horizontal comparison of the amount and rate of change in households' wealth across deciles shows how inequality has evolved. For example, as we can see in the following sections, while households from some deciles increased their wealth, others decreased their wealth from 2010 to 2016 in the US.
We can also use this table to compare the difference in the change in wealth of these households across year intervals. For example, the difference between the change in wealth of these households during the economic crisis and the change in wealth after the economic crisis. Finally, we can compare the differences between the above comparison results in the United States and Canada.

5.4.1 Evolution in the United States

As mentioned earlier, after 2007, the total net worth in the United States plummeted. The recovery took a long time and did not climb back to 2007's net worth until 2016. At the same time, the median household net wealth saw a very extreme decline, and only just recovered to half of its 2007 value in 2016. In this regard, in this part of the decile analysis, I chose 2007 as an important midpoint and analysed the growth of each decile wealth before and after 2007 separately.

As shown in the Table 1a, from 1998 to 2007, D9 and D10 households had the highest wealth growth and reaped the most benefits from the economic expansion. Their wealth growth is the main contributor to the growth of total net wealth. During this period, the median household wealth of the top decile increased from 4895k to 8284k. Its increasing rate was 69%. In D9 its increasing rate was 43%. The increasing rates of D2 to D8, however, were lower than D9 and D10. On the other hand, D1's Household wealth is negative, meaning that the households hold more liabilities than assets. From 1998 to 2007, their wealth or debt expanded, compared to the wealth expansion of the other classes. The wealth of D1 fell from -4,010 to -6,415 USD, expressing that D1's indebtedness increased greatly.

Table 1a Change amount and change rate of the US

Median Total Household wealth by Decile

	Median Total Household wealth by Decile from 1998 to 2007									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1998	-4k	2k	14k	41k	82k	139k	207k	327k	554k	4895k
2007	-6k	3k	15k	49k	104k	182k	288k	450k	794k	8284k
	Change amount and change rate from 1998 to 2007									
Change amount	-2k	1k	2k	8k	22k	43k	82k	123k	241k	3389k
Change rate	-56%	33%	12%	18%	27%	31%	39%	37%	43%	69%

Note: In 2020 USD

Data: LWS database.

Now, let us consider the crisis. From 2007 to 2010, the total net wealth of the state decreased (See Table 1b). Unlike the period of economic growth from 1998 to 2007, during the crisis, every decile's household wealth was reduced. However, while the top decile lost 26% of their wealth, the second decile lost all of their wealth, and the first tripled their debt.

Table 1b Change amount and change rate of the US from 2007 to 2010

Median Total Household wealth by Decile

	Median Total Household wealth by Decile from 2007 to 2010									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2007	-6k	3k	15k	49k	104k	182k	288k	450k	794k	8284k
2010	-21k	0k	9k	26k	61k	116k	200k	345k	682k	6108k
	Change amount and change rate from 2007 to 2010									
Change amount	-14k	-3k	-7k	-23k	-43k	-66k	-88k	-105k	-113k	-2176k
Change rate	-220%	-91%	-45%	-48%	-41%	-36%	-31%	-23%	-14%	-26%

Note: In 2020 USD

Data: LWS database.

From D7 to D10, although the absolute change amount was the greatest (in terms of dollars), their relative change rates were the lowest (in terms of percentage). As shows in Table 1b, D7 to D10's change rates were -23%, -14%, and -26%, respectively. The middle and bottom deciles suffered a lot, especially the lowest wealth households. D1's wealth decreased from -6,415 USD to -20,480 USD by 219%. The wealth of D2-D6 was not affected as much as D1. Since households in the bottom middle suffered more losses than households in the upper deciles, this stretched the wealth gap.

After the economic crisis, starting in 2010, at the national level, the economy began to recover, but the economic situation of the middle decile households did not really recover from the crisis, furthermore, wealth inequality increased (See Table 1c).

Table 1c Change amount and change rate of the US from 2010 to 2016

Median Total Household wealth by Decile

	Median Total Household wealth by Decile from 2010 to 2016									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2010	-20.5k	0.3k	8.5k	25.6k	61.3k	116k	200k	345k	682k	6.108mil
2016	-21.4k	0.6k	9.3k	29.1k	68.6k	124k	217k	376k	754k	8.048mil
	Change amount and change rate from 2010 to 2016									
Change amount	-0.9k	0.3k	0.8k	3.5k	7.3k	8k	17k	31k	72k	1.940mil
Change rate	4%	100%	9%	14%	12%	7%	8%	9%	11%	32%

Note: In 2020 USD

Data: LWS database.

The extreme indebtedness of the bottom decile remained at a similar level as before (which is -21k 2020 USD) – they clearly did not benefit by the increase in the country's total wealth. The same can be said regarding D2 and D3. In fact, the wealth of all the deciles except D10 did not change considerably. Table 1b shows that the wealth gap increased during the economic crisis in the US. Table 1c shows that after the crisis, the wealth growth only occurs in the top 10%. If we consider these three tables, we can observe two different causes that explain the growth of the Gini, one during the crisis, one after the crisis.

5.4.2 Evolution in Canada

The financial crisis did not devastate the Canadian economy as much as the United States. Unlike in the United States, all deciles in Canada experienced an increase in their wealth during the financial crisis from 2005 to 2012, except for the bottom decile.

Comparatively speaking, before the economic crisis, as presented in Figure 5.3, Canada had a smaller Gini coefficient (0.69 in Canada, compared to 0.80 in the United States) and a smaller wealth gap. Table 2a and Table 1a demonstrate that the debt of the bottom households was smaller than in the United States[15], and the wealth of the top households was also smaller than in the United States (937k in Canada, 4895k in the United States). Although similar to the trend seen in the United States where the growth rate of the top decile is much higher than the other deciles, it is much smaller in Canada (42% in Canada compared to 69% in the United States).

[15] In 1998 the US D1 debt was 4000 USD, in a similar period in 1999 in Canada the D1 debt was 2000 USD.

Table 2a Change amount and change rate of Canada from 1999 to 2005

Median Total Household wealth by Decile

	Median Total Household wealth by Decile from 1999 to 2005									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1999	-2k	3k	15k	40k	71k	112k	167k	243k	377k	937k
2005	-4k	3k	15k	39k	82k	133k	199k	290k	466k	1330k
	Change amount and change rate from 1999 to 2005									
change amount	-2k	-1k	-1k	0k	10k	21k	32k	47k	89k	393k
change rate	-100%	-18%	-5%	0%	14%	19%	19%	19%	24%	42%

Note: In 2020 USD

Data: LWS database.

During the financial crisis of 2005 to 2012 (see Table 2b), while decreasing in the United States, most of the household wealth increased in Canada. Also, Canadian society became slightly more equal since the growth rates of wealth among the middle deciles (D3 to D7) were larger than those of the top decile. The wealth of the middle and lower decile households benefited more than those of the top. The increase rates for D4 to D9 were above 33%, while D10's growth rate was 7%. This suggests that the financial advantages were distributed more evenly among the lower and middle groups.

Table 2b Change amount and change rate of Canada from 2005 to 2012

Median Total Household wealth by Decile

	Median Total Household wealth by Decile from 2005 to 2012									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2005	-4k	3k	15k	39k	82k	133k	199k	290k	466k	1330k
2012	-6k	3k	16k	52k	110k	183k	278k	406k	637k	1426k
	Change amount and change rate from 2005 to 2012									
change amount	-1k	0k	1k	13k	28k	50k	79k	116k	172k	96k
change rate	27%	0%	8%	33%	35%	38%	40%	40%	37%	7%

Note: In 2020 USD

Data: LWS database.

Also, because most Canadian deciles did not experience a decline in wealth (except D1) between 2005 and 2012, and households in the middle and lower classes did not experience a loss of all their wealth or a significant increase in debt, Canada's inequality level did not change dramatically (see Table 2b and Figure 5.3).

Table 2c Change amount and change rate of Canada from 2012 to 2016

Median Total Household wealth by Decile

	Change amount and change rate from 2012 to 2016									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2012	-6k	3k	16k	52k	110k	183k	278k	406k	637k	1426k
2016	-3k	4k	19k	58k	119k	206k	313k	464k	731k	1667k
	Change amount and change rate from 2005 to 2016									
change amount	3k	2k	3k	5k	9k	23k	35k	58k	93k	241k
change rate	-48%	56%	20%	10%	8%	13%	13%	14%	15%	17%

Note: In 2020 USD

This situation continued during the 2012-2016 period (Figure 5.3). It is also reflected in Table 2c: the debt of the bottom decile decreased, low- and middle-income households maintained steady wealth growth, and the growth rate of the top decile was not significantly higher than that of the other deciles. The wealth of each decile increased with the increase in total net wealth.

Section 6 Discussion

6.1 To what extent has the middle class recovered since the crash?

Low- and middle-income households in the United States not only suffered severe financial losses but their wealth level has been slow to recover compared to Canada, which was less affected overall by the crisis. In the United States, middle and low-income households still had not recovered from the losses of the crisis by 2016. Figure 5.2 shows that the wealth of middle income households in the United States is still well below pre-crisis levels, despite the favourable recovery between 2010 and 2016. As can be seen in Figure 5.5, despite a slight decline in 2013, the share of bankrupt households in the United States has been at the highest level since the financial crisis in 2007. From this perspective, the bottom households have not yet recovered from the crisis in terms of their financial situation.

The main findings also allowed us to apply the typology of wealth inequality scenarios by Forsé and Lizotte (2020) to the North American continent. The evolution of wealth inequality of the United States and Canada took different routes during and after the financial crisis. Compared to the pre-crisis period, the United States went from a joint increase in total wealth and inequality to a decrease in total wealth and an increase in inequality. In other words, the crisis has not only made the poor in the United States hold a smaller share of the metaphorical pie, but the size of the pie has also decreased in absolute terms. Unlike the United States, Canada's wealth inequality has been relatively stable: inequality levels are lower than before the crisis while the total household wealth has been steadily increasing. This is due to the difference in growth rates of different deciles. Before 2005, top households grew at a much higher rate than other households, and after 2005, the economic growth rate of the top Canadian households was lower than the growth rate of the wealth

of some middle-class households. Thus, the decline in Canada's Gini coefficient has benefited from the higher increase rate in the wealth of middle-class households.

Comparing figures 5.1 and 5.2 shows that the median United States' household was more vulnerable to the volatility of financial markets during the financial crisis than Canada's. This resulted in their standard of living also changing with the fluctuations in the financial markets.

6.2 Financial instability and regulation

In conclusion, when we look deeper into the deciles, we see that it is the lower and middle income households in the United States that have been hit the hardest by the crisis. Their slow and incomplete recovery has contributed to the increase in wealth inequality. In contrast, the lower and middle income households in Canada did not experience financial losses during the same period. In fact, their wealth even grew at a higher rate than the top households. How can this difference be explained? The main reason is known: the U.S. is more financialized than Canada, Canadian institutions are traditionally more conservative than the U.S., and Canadian financial institutions are rarely involved in financial innovation (i.e. the securitization of mortgage debt).

Differences can also be observed in the countries' financial security and stability. A cohesive society requires some level of financial security in order to strive: it needs to have a reasonable political compromise between the different ideological factions and interest groups. The main goal of the state when legislating financial regulations is to minimize financial insecurity within their country.

By extension, irresponsible financial innovation threatens the country's financial stability. If lenders are not held accountable for their loans, they can eventually turn a portion of the financial

markets into a "Ponzi" scheme. Ponzi finance is unsustainable because once investors realize that there is little room for additional higher returns, they will begin to withdraw their capital, triggering a financial crisis.

Before the financial crisis of 2008, based on the banks' speculations, the governments of the United States and Canada (although with more regulations), created policies to encourage and stimulate the growth of the secondary mortgage market, which led to the securitization of mortgages. By securitizing mortgages, lenders had no incentive to worry about the borrowers' long-term capacity to repay their loans because they did not, from the start, intend to hold the debt claims in their own asset portfolios. Lenders could offload their mortgage bonds to other investors. By doing so, they effectively transferred the risk of the loan, so they did not have to be as responsible as before in their lending practices.

The main difference between the U.S. and Canada in terms of financial regulation is that Canadian institutions tend to be more conservative than those in the U.S. This limits the Canadian institutions in their potential financial growth during periods of financial innovation, because they will be slower to adopt new financial products and practices (such as debt securitization). On the other side, this conservatism also protects the Canadian economy in periods of international financial crises and protects the middle to low income households from unnecessary financial losses.

Annex

Definitions of assets and liabilities on LWS database

Assets (ha) :

- Non-financial assets (han)
  - Real estate (hanr)
    - Principal residence (hanrp)
    - Other real estate (hanro)
  - Non-housing assets (hann)
    - Business equity (hannb)
    - Consumer goods (hannc)
      - Vehicles (hanncv)
      - Other durables and valuables (hanncd)
      - Other non-financial assets (hanno)

- Financial assets (excl. pensions) (haf)
  - Deposit accounts and cash (hafc)
  - Financial investments (hafi)
    - Bonds and other debt securities (hafib)
    - Stocks and other equity (hafis)
    - Investment funds and alternative investments (hafil)
    - Other non-pension financial assets (hafo)

- Pension assets and other long-term savings (has)
  - Life insurance and voluntary individual pensions (hasi)
    - Life insurance accounts (hasil)
      - Individual voluntary pension accounts (hasip)
  - Occupational pensions (haso)
    - Occupational pensions (DB schemes) (hasodb)
    - Occupational pensions (DC schemes) (hasodc)
  - Social security pension entitlements (hass)
    - Social security (DB schemes) (hassdb)
    - Social security (DC schemes) (hassdc)

Liabilities (hi)

Main breakdown of liabilities (by purpose)

- Real estate liabilities (hir)
  - Principal residence loans (hirp)
  - Other real estate loans (hiro)
- Non-housing liabilities (hin)
  - Investment loans (hini)
  - Consumer goods loans (hinc)
    - Vehicle loans (hincv)
    - Other loans for goods and consumption (hincd)
- Education loans (hine)
- Other non-housing liabilities (hino)

Alternative breakdown of liabilities (by security)

- Institutional loans secured by real estate (hisr)
  - Secured by principal residence (hisrp)
  - Secured by other real estate (hisro)
- Loans not secured by real estate (hisn)
  - Guaranteed institutional loans (hisng)
  - Non-quaranteed institutional loans (hisnn)
  - Informal (non-insitutional) loans (hisni)

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