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Inequalities: Income, Wealth and Consumption

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Inequalities: Income, Wealth and Consumption

Marcel Boyer [*] [†] [‡]

Abstract

I consider as misplaced the current emphasis on income and wealth inequalities as compared to the socially more relevant consumption inequalities, which have been significantly reduced over the last decades and most likely for a much longer period of time. One important factor has been the development of social transfers in kind which add significant resources to the lowest income quintile as compared to the highest quintile. I present the main characteristics of developments of income and wealth inequalities over time (since 1920): The share of the top 1% of earners followed a downward trend until the 1970-79 decade, and an upward trend afterwards, reaching in the 2010-19 decade a level similar to that of the 1920-29 decade. The share of the top 10% of earners followed a similar movement. The same picture is observed for wealth inequality. Similar increases in income inequality over the last four decades are also observed in music and sports.

Keywords: Income Inequalities, Consumption Inequalities

Résumé

Je considère regrettable l'accent mis actuellement sur les inégalités de revenus et de richesse par rapport aux inégalités de consommation socialement plus pertinentes et considérablement réduites au cours des dernières décennies et plus. Un facteur important a été le développement des transferts sociaux en nature qui ajoutent des ressources importantes au quintile inférieur de revenu comparativement au quintile supérieur. Je présente les principales caractéristiques de l'évolution des inégalités de revenu et de richesse depuis 1920 : la part du 1% plus riche a suivi une tendance à la baisse jusqu'à la décennie 1970-79, puis une tendance à la hausse par la suite, atteignant en 2010-19 un niveau similaire à celui de la décennie 1920-29. La part du 10% plus riche a suivi un mouvement similaire. On observe un portrait similaire pour l'inégalité de richesse. Au cours des quatre dernières décennies, on observe des augmentations similaires de l'inégalité des revenus dans la musique et les sports.

Mots-clés : Inégalités de revenus, Inégalité de consommation

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Plan

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1. Introduction: Inequalities, the Research Program

The question of inequalities in society, their determining factors, and their evolution over time is a recurring theme of significant research efforts in academia and public policy circles. Together with calls for the reform of capitalism, it is a theme that attracts lots of discussions in public opinion pages of newspapers and magazines and social media platforms.

This paper presents the main characteristics of developments of income and wealth inequalities over time (since 1920), but it challenges the current emphasis on such inequalities as compared to the socially more relevant consumption inequalities, which have been significantly reduced over the last decades and most likely for a much longer period of time.

The level of inequality in income and wealth decreased between 1920 and 1980 but increased between 1980 and today with late signs of reversion, while inequality in consumption, arguably the most important form of inequality, has most likely decreased over that period, although data on a reasonably encompassing measure of consumption are lacking. However, we begin to have such a measure for a period covering the last two decades, with Statistics Canada at the forefront of those developments.

This is the second of three papers on inequalities. The first paper[1] discussed the relative compensation of CEOs, a central focus of discussions on inequalities. Based on data for 500 of the largest corporations compiled by Bloomberg (S&P500 firms) from SEC filings by firms (Table 1), we obtain that the CEOs of those large companies earned an average 14.2 million US$ and a median $12.4 million US$ in 2018-19. The CEO pay ratio, defined as the firm's CEO pay over the firm's median employee salary, reached 281 this last year for the S&P500 firms. However, firms greatly differ in size and more representative ratios are the median CEO pay ratio of 170 and the weighted average CEO pay ratio (measured as the total paid to all CEOs divided by the total of all median salaries over all 500 firms) of 185. Although media coverage reports mainly the 281 ratio, it may not be the most informative and relevant measure of the discrepancy between the CEO pay and the median pay in the firm.

Each of the 26 million employees in those 500 firms "contributes" on average $273 to the annual pay of their CEO, or about one half of one percent of their respective salary. Seen differently, if we

[1] Marcel Boyer (2019), "CEO Pay in Perspective", CIRANO 2019s-33 and Toulouse School of Economics WP 1059, 52p. http://www.cirano.qc.ca/files/publications/2019s-33.pdf
https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/wp/2019/wp_tse_1059.pdf

were to divide the CEO pay equally among all employees, the resulting employee annual pay increase would be $273. If we do it proportionately to the employee salary, the resulting employee pay increase would be one half of one percent (0.50%).

As expected, those measures, namely the CEO pay ratio, the CEO pay per employee, and the B-ratio vary across firms and industries. There are different reasons for this variability, including how critical and specific the role and importance or impact of the CEO leadership and competencies in the design, implementation, and management of the firm strategies and actions. In general, the CEO-led exercise of the firm's underlying real options have significant impacts on the performance, profitability, and growth of the firm and, in so doing, on the overall well-being of employees, shareholders, and other stakeholders, including suppliers and clients. But this CEO role and importance may differ across firms and industries as well as across countries. Understanding how and why is therefore essential.

The third (forthcoming) paper of the trilogy is "The Social Role of Inequalities: Why significant inequality levels in income and wealth are important for our prosperity and collective wellbeing". It will deal with the social role of inequalities in income and wealth. I show that inequalities in income and wealth may be understood as meeting three related incentive-based social needs or imperatives, namely the need to ensure a proper level of savings and investments, the need to allow proper creative destruction through innovation, and the need to induce the proper but individually costly development and acquisition of new competencies. Those three factors or social needs, which require some (optimal) level of income and wealth inequality, are favoring increased levels of productivity, economic growth, and prosperity for all.

I develop in this forthcoming paper the nature of these three factors or social imperatives. I define the social role of the higher income and wealth groups as "Save and Invest". This social role of the rich may have become more important in recent decades, say the last four since 1980. But who among all of us as candidates should be given this role, which comes with responsibilities but also with significant advantages?

2. Income and Wealth Inequality: An Historical Perspective

Since Atkinson and Harrison (1978) and Piketty and Saez (2003) articles on the historic perspective on inequality, the interest has been revived and the subject has seen a large influx of studies. The large majority of those studies have dealt with income and wealth distributions. More recently, some

authors attempted to characterize with a mitigated success the consumption inequality question (see below).

Chancel (2019)[2] present ten facts about income and wealth inequality measures and the trend associated with them. An important caveat is that it is hard to disentangle and measure different measures and expressions of inequality because of its complex nature and the many shapes it can take. Chancel's ten facts are the following.

The data available to measure inequality is scarce and the quality is often questionable. Across countries and over time, comparability between measures of income and wealth inequality is lacking as surveys have multiple limitations, especially at the top of the distribution. While tax data is in general better, the tax code is different between countries and exclusions/inclusions are not always perfectly matched. There is also the issue of the missing sources of information. Whereas some work is made towards reconciling both types of data, it is just in its infancy.

After 1980, income inequality started to rise, after a prolonged decline, albeit at different speeds across countries. The top 1% of earners went from capturing 17-20% of national income in the early 1900s to 8% in the 1970s and 1980s to 10%-20% as of today (see Figure 1). According to Chancel, the pre-1980 decline was probably due to the fall of capital incomes (Piketty and Saez 2003).

Osberg (2018)[3] writes: "The income share of the top one per cent in Canada and the United States was very high in the 1920s, fell abruptly during the 1940s and then edged down marginally during the 1950s, 1960s and 1970s. Since the 1980s, however, there has been a clear long-run trend upward in the income share of the top one per cent (with ups and downs around this trend during booms and recessions)."

Advanced economies have become richer, but the relative size of the government has been diminishing. There has been a transition of public wealth ownership to private wealth: in the 1970s, net private wealth (all assets net of debt detained by private actors) over national income ratios were about 200-300% and have soared to 400-600% recently. Conversely, net public wealth (all assets minus debt detained by governments) over national income ratios went from 50% to 100% in the 1970s to an average of 0% recently in most developed countries. Negative public wealth implies that debt is higher than assets (which means that the wealth is owned by private owners).

[2] Lucas Chancel (2019), "Ten Facts About Inequality in Advanced Economies", WID.world working paper 2019/15.
[3] Lars Osberg (2018), *The Age of Increasing Inequality: The Astonishing Rise of Canada's 1%*, Lorimer and Company, Toronto.

Capital is back at the top of the distribution. Wealth concentration is back to the level observed at the beginning of the 20th century, although the situation has been less dramatic in Western Europe, which experienced a larger decline in wealth concentration followed by a smaller increase since the 1980s. Also, growth of wealth (through return on capital) has been higher for the top (8,9%) than for the average (2,7%). Average incomes only grew at an average of 1% per year. Savings rate display a similar pattern. For the top 1%, the savings rate went from 30% to 35%, while for the next 9%, it went from 30% to 15%. For the bottom 90%, it went from 10% to 0%.

The Great recession has not stopped the trend of income and wealth inequality growth in most advanced economies. Top income and wealth shares fell during the recession but came back to the same level as before and even higher in some countries. For income, the situation has been much more nuanced.

The nature of inequality has changed: it is more about class than about the nationality. Income distributions in advanced economies are more in line with the global inequality spectrum.

There is a link between high inequality and low mobility. For Scandinavian countries, with a top 10% income share of 25-30%, the intergenerational income/earnings elasticity[4] is low at 0,15-0,2 indicating a relatively mobile society. In the US, where the share is 45%, the elasticity is 0,5 indicting a relatively low mobility society. This relationship, called the "Great Gatsby curve",[5] represents the fact that high inequality does not pave the way to a higher intergenerational mobility (which one might assume in theory).

While racial and gender income gaps were greatly reduced in the 20th century, they remain high even today. The workforce participation of women has risen in the past decades (it is now over 46% in most advanced countries). This has resulted in a significant reduction in income inequalities between genders, and it has reduced inequality across the entire population. However, since the 1980s, the total income gap was not significantly reduced. The pre-tax income ratio was reduced from 250-200% in the 1980s to about 180% in 2014. For full-time workers, the decrease has been a little bit steeper, from a ratio of 170% to a ratio of 130% in 2014 (differences in occupation and

[4] The intergenerational elasticity measures the percentage change in children income over the percentage change in parent income, measured by the income of children and parents at the main stage of the respective lifecycle. For Canada, a recent estimate is 0.32 (Wen-Hao Chen, Yuri Ostrovsky and Patrizio Piraino 2016, "Intergenerational Income Transmission: New Evidence from Canada," Analytical Studies Branch Research Paper Series 11F0019M No. 379, Statistics Canada), somewhat higher than the previous one of 0.2 (Miles Corak and Andrew Heisz 1999, "The Intergenerational Earnings and Income Mobility of Canadian Men: Evidence from Longitudinal Income Tax Data," *The Journal of Human Resources* 34 (3): 504–533).

[5] The expression "Great Gatsby Curve" (2012) is from the late Alan Krueger, former Chairman of the U.S. Council of Economic Advisers.

industries could represent up to 50% of the pay gap of full-time workers in the US). Also, women are underrepresented at the top of the distribution: only about 25% of the top 10% are women and the representation is worse in the higher end of the distribution (10% of top 0,1%).

The racial wealth inequalities have also decreased (especially in the second half of the 20th century: white/black earnings ratio was 250% in the 1960s and 130% in the 1980s). Since then, no further decrease in disparities happened and wealth disparities have increased. The wealth gap used to be around 500-600% but is now over 700%.

Accessibility to education, health and high-salary jobs tend to reduce the disadvantages of the individuals at the bottom of the distribution. Since technological change and the globalization are key factors of the increase in income and wealth inequality in rich countries (often called « superstar effect », where the access to a larger market means that a skilled individual might set themselves apart even more), highly skilled workers tend to have benefited from this factor. The supply of skills must increase through education to match demand increase.

The impact of education on future inequalities is high. While tax policies are important, pre-tax income inequality often mirrors post-tax inequality, which means that focusing on social policies might be more effective than focusing on the tax code. For example, Scandinavian countries and most Western European countries have more socially oriented policies and are amongst the countries with the lowest income disparities. They are also the countries associated with public health systems.

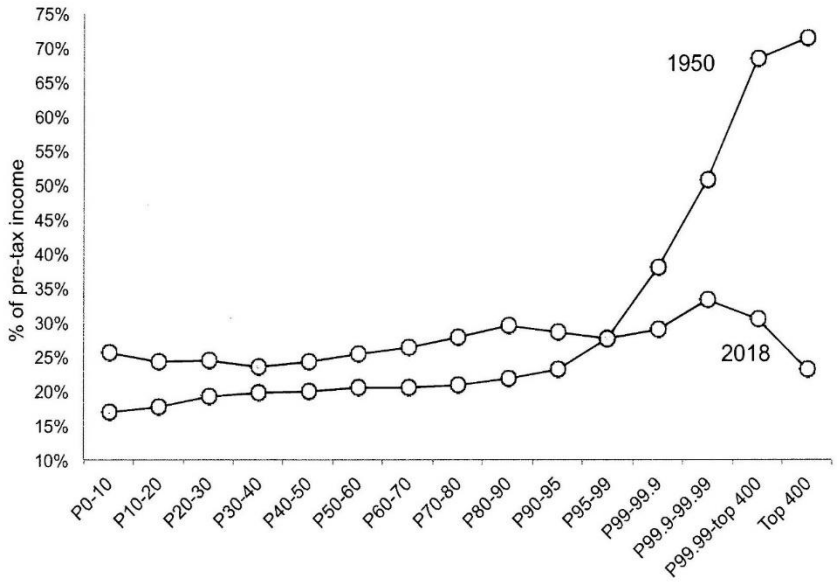
In the US, there is a 14-year life expectancy gap between the top 1% and the bottom 1%, which suggests poor health at the bottom of the distribution (resulting in reduced productivity and mobility, accentuating inequalities). Those inequalities are not seen in countries with universal public access to healthcare.

Minimum wage is also a lot higher in proportion to the average income than it is in the US. It might be due to the importance of unions which is correlated with pre-tax income inequality.

These different impacts suggest that the trade growth or the technological changes might not have been the main factors to explain the rising trend in inequality.

Tax policies are still important (progressiveness), especially at the top of the income distribution. After the 1970s, top tax rates were greatly reduced, and pre-tax income shares grew across both rich and emerging countries. The figure below, which presents average federal, state and local tax rate by pretax income group in the US between 1950 and 2018 (*Source*. Lucas Chancel 2019, Appendix

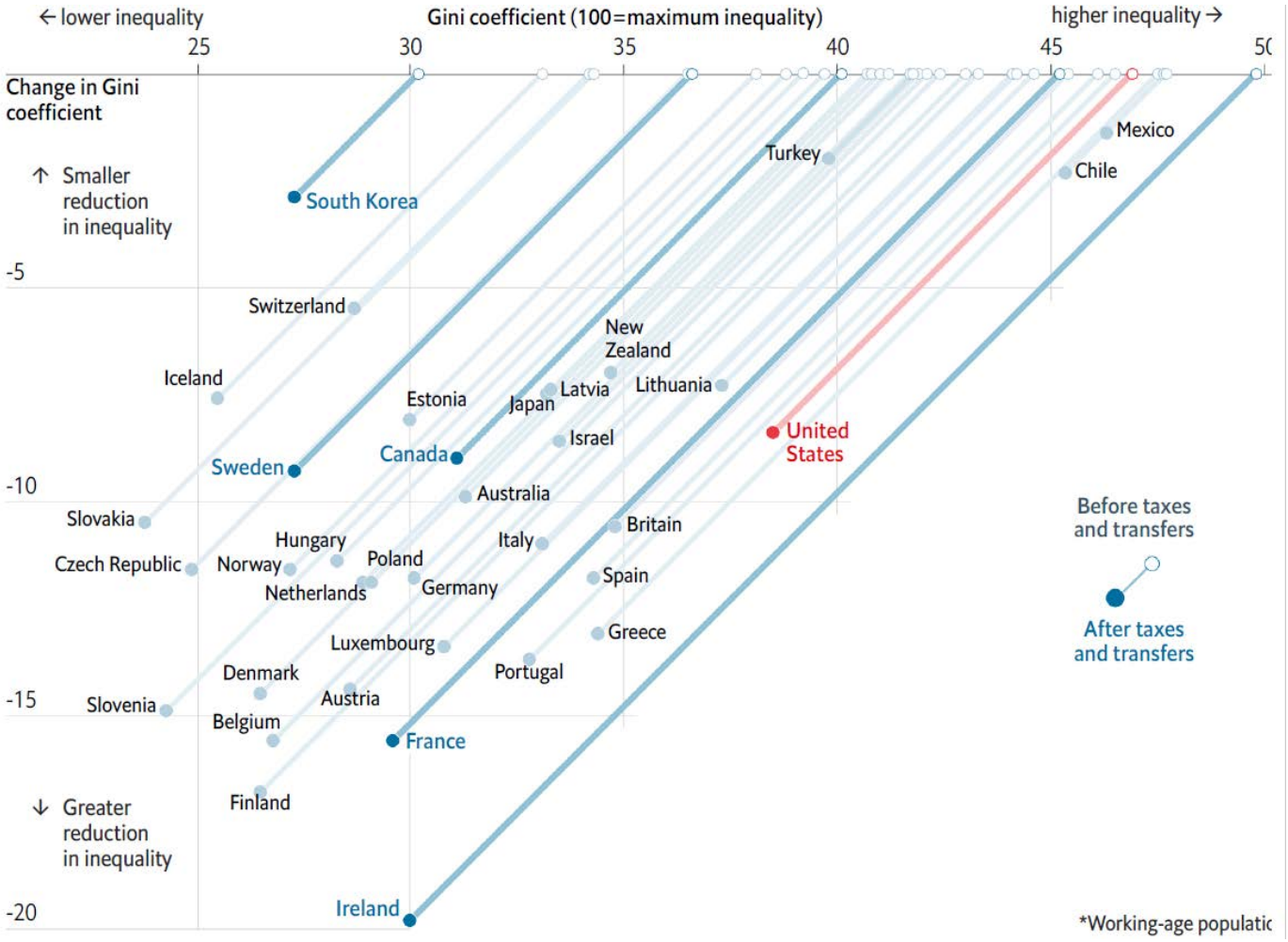
Figure 15), shows that tax rates have increased by an average of five percentage points, except for the 99th percentile, for which rates have dropped significantly.



Effective taxation for the top 0,01% went from 50% in the 1950s to less than 40% after the 1980s. For the top 400 in the US, it declined from 60% in the 1960s to about 30% more recently (which is less than the rest of the population in proportion paid). Fall in corporate taxation increased the alternative compensations of CEOs. This reduction was also accompanied by a rise of the middle-class tax rate.

Other factors might also explain and drive trends in income and wealth inequality in the future, such as automation, artificial intelligence, biogenetic, climate change. Regarding the last factor, Chancel states that carbon taxes are inherently regressive. But given that carbon taxes are environmental prices, their regressivity is not surprising as all prices of all goods and services, seen from a taxation viewpoint, are in a way regressive.

The following figure is from *The Economist* (13th April 2019). It compares pre-tax Gini coefficient to after-tax Gini coefficient to show how taxes and transfers affect the redistribution of income: The difference between the two measures reflects approximately how progressive the system of taxes and transfers is in each country. Since the pre-tax Gini coefficient is high for the United States, it must redistribute more than most countries to have low after-tax income inequality. On the other hand, South Korea must do less to achieve low income inequality.



Also, the after-tax measure is strongly correlated with the size of the government (share of GDP). While France and the United States have close levels of income inequality before taxes, after-tax inequality of France is lower than the United States. The respective shares of GDP of their government are 57% and 35%. For Ireland, the change in the coefficient is the highest, because income taxes are high (while corporate taxes, which represent most of the tax revenue, are low).

Tables 1 to 4 show that income and wealth inequalities in Canada, France, the UK and the USA generally decreased from the early 1920 till 1980 and increased afterwards.

For Canada (Table 1), we observe that the income share of the top 1% of earners followed a downward trend until the 1970-79 decade, and an upward trend afterwards, reaching in the 2010-19 decade a level similar to that of the 1920-29 decade. The share of the top 10% of earners followed a similar movement.

Table 1: Pre-tax income shares – decadal averages (Canada)
(WID - World Inequality Database https://wid.world/data/ 21-09-2019;
Note that the last decade has missing entries.)

	Income share of the top 10%	Income share of the top 1%
1920-1929		14,9%
1930-1939		17,2%
1940-1949	38,8%	11,3%
1950-1959	37,7%	10,0%
1960-1969	37,7%	9,3%
1970-1979	37,2%	8,6%
1980-1989	36,7%	9,4%
1990-1999	39,0%	11,5%
2000-2009	41,4%	14,2%
2010-2019	41,4%	13,6%
	Variations decade over decade	
1920-1929		
1930-1939		15,4%
1940-1949		-34,3%
1950-1959	-3,0%	-11,4%
1960-1969	-0,1%	-7,3%
1970-1979	-1,2%	-6,8%
1980-1989	-1,4%	9,1%
1990-1999	6,3%	21,6%
2000-2009	6,1%	24,2%
2010-2019	0,0%	-4,4%

For France (Table 2), we observe that the income shares of the top 1% of earners followed a downward trend until the 1980-89 decade and an upward trend afterwards, without reaching in the 2010-16 period a level similar to that of the 1920-29 and 1930-39 decades. The share of the top 10% followed a similar movement if less pronounced. As for wealth distribution, we observe similar trends, a reduction in the top 1% and the top 10% wealth shares between 1920 and 1990 followed by an upward trend.

Table 2: Pre-tax income shares – decadal averages (France)
(WID - World Inequality Database https://wid.world/data/ 21-09-2019;
Note that the last decade has missing entries.)

Period	Income shares top 10%	Income shares top 1%	Wealth shares top 10%	Wealth shares top 1%
1920-1929	47,0%	20,9%	80,3%	47,8%
1930-1939	44,8%	17,2%	77,3%	43,9%
1940-1949	35,7%	11,9%	72,6%	34,2%
1950-1959	35,6%	10,9%	70,9%	32,0%
1960-1969	36,9%	10,8%	68,0%	29,6%
1970-1979	32,8%	9,2%	55,2%	18,9%
1980-1989	30,8%	8,2%	50,5%	16,7%
1990-1999	32,1%	9,6%	52,8%	21,4%
2000-2009	33,2%	11,2%	54,1%	23,9%
2010-2016	32,7%	10,9%	55,1%	23,0%
		Variations decade over decade		
1920-1929				
1930-1939	-4,6%	-17,8%	-3,8%	-8,3%
1940-1949	-20,3%	-30,8%	-6,1%	-22,1%
1950-1959	-0,3%	-8,5%	-2,3%	-6,4%
1960-1969	3,4%	-0,9%	-4,1%	-7,5%
1970-1979	-10,9%	-14,6%	-18,9%	-36,2%
1980-1989	-6,2%	-10,7%	-8,4%	-11,6%
1990-1999	4,2%	16,9%	4,5%	28,1%
2000-2009	3,5%	16,7%	2,4%	12,0%
2010-2016	-1,8%	-3,4%	2,0%	-3,8%

For the UK (Table 3), data on income inequality are missing before 1980. From 1980 till today, the trend is positive and the shares of the top 1% and the top 10% of income earners are increasing. As for wealth distribution, we observe a negative trend in the top 1% and the top 10% wealth shares between 1920 and 1990 followed by an upward trend.

Table 3: Pre-tax income shares – decadal averages (UK)
(WID - World Inequality Database https://wid.world/data/ 21-09-2019;
Note that the last decade has missing entries.)

Period	Income shares top 10%	Income shares top 1%	Wealth shares top 10%	Wealth shares top 1%
1920-1929			87,8%	58,8%
1930-1939			85,6%	54,0%
1940-1949			83,0%	46,6%
1950-1959			75,5%	38,7%
1960-1969			67,7%	31,5%
1970-1979			60,8%	23,8%
1980-1989	29,9%	7,3%	49,8%	16,7%
1990-1999	32,3%	9,0%	48,8%	17,6%
2000-2009	34,6%	11,4%	51,3%	18,8%
2010-2016	33,6%	11,2%	51,9%	19,9%
		Variations decade over decade		
1920-1929				
1930-1939			-2,5%	-8,2%
1940-1949			-3,0%	-13,7%
1950-1959			-9,1%	-16,9%
1960-1969			-10,3%	-18,8%
1970-1979			-10,1%	-24,2%
1980-1989			-18,1%	-30,1%
1990-1999	7,7%	23,6%	-2,1%	5,8%
2000-2009	7,2%	26,7%	5,2%	6,6%
2010-2016	-2,8%	-1,7%	1,2%	5,9%

For the USA (Table 4), we observe that the income shares, measured in the WID database, of the top 1% and the top 10% of earners followed a downward trend until the 1970-79 decade and an upward trend afterwards, reaching in the 2010-16 period a level similar to that of the 1920-29 decade. The corrections proposed by Geloso et al. (2020) reduce the USA pre-1950 income inequality but do not change the picture in a significant way. As for the wealth distribution, we observe similar trends, a reduction in the top 1% and the top 10% wealth shares between 1920 and 1980 or 1990, followed by an upward trend to a level just below the level of the 1920-29 decade.

Table 4: Pre-tax income and wealth shares – decadal averages (USA)
(WID - World Inequality Database https://wid.world/data/ 21-09-2019)
(Geloso: Geloso, Magness, Moore, Schlosser, EJ 2020)

Period	Income shares top 10%		Income shares top 1%		Wealth shares top 10%	Wealth shares top 1%
	WID	Geloso	WID	Geloso		
1920-1929	46,0%	39,0%	19,3%	15,9%	81,5%	41,0%
1930-1939	46,8%	37,6%	17,1%	13,5%	82,6%	40,9%
1940-1949	39,6%	34,5%	16,3%	10,8%	71,9%	31,9%
1950-1959	36,5%		13,8%		68,4%	27,6%
1960-1969	35,7%		12,4%		70,1%	28,3%
1970-1979	34,5%		10,8%		66,5%	24,1%
1980-1989	36,4%		12,4%		62,5%	24,3%
1990-1999	40,7%		15,5%		65,7%	29,0%
2000-2009	44,3%		18,6%		69,0%	33,4%
2010-2016	46,4%		20,0%		73,6%	38,4%
*the last decade has missing entries.						
			Variations decade over decade			
1920-1929						
1930-1939	1,7%		-11,4%		1,4%	-0,1%
1940-1949	-15,3%		-4,3%		-12,9%	-22,1%
1950-1959	-8,0%		-15,5%		-4,9%	-13,3%
1960-1969	-2,0%		-10,1%		2,5%	2,4%
1970-1979	-3,5%		-12,9%		-5,1%	-14,6%
1980-1989	5,6%		15,1%		-6,0%	0,8%
1990-1999	11,7%		24,8%		5,2%	19,1%
2000-2009	8,8%		19,5%		5,0%	15,2%
2010-2016	4,9%		7,8%		6,7%	15,1%

Geloso (2019)[6] claim that most studies treat inequality as an aggregate, while it comes from many subcomponents. The general narrative is that inequality in the US plummeted from the late 19th century to the 1960s and then started to rise after 1975 (in between those years, inequality seems to have plateaued). What different authors have called « The great-levelling » (convergence of shares of income) comes down to multiple factors, such as geography, gender and ethnic gaps, immigration, and much more.

Overall, the main writers on the subject, such as Piketty, have argued that inequality fell because of the rise of the welfare state. While it could have played its part, Geloso notes that a lot of the government decisions were regressive (Jim Crow laws, taxes that the blacks were forced to pay even if they were not benefiting from social programs, etc.). Evidence is not so clear also after 1970, when government spending was high and redistributive policies were flourishing, but inequality was on a rising trajectory. He also disagrees with Piketty's view that the reason behind the rise in inequality was due to the fact that return on capital was higher than the growth rate, which would in turn imply higher revenue growth for the rich.

Geloso attributes the fall and the rise of inequality to the following factors instead: immigration, relative factor price, discrimination, regulation, international trade, urbanization, labour force participation, skill-biased technological change, market integration, etc. Before the 1970s, inequality measures are based on tax data, which is sensitive to the problem of tax evasion. Thus, those measures would be understating inequality in this period.

Also, the income gap between whites and blacks was very large. Throughout the 20th century, blacks started migrating from the South to the North of the United States, making regions more homogeneous (reducing inequality). For example, the income ratio (blacks/whites) increased from 25% to 40% by 1940 and to 55% by 1970. The income gap between men and women fell too, mostly because of technological reasons which made work more accessible for women (contraception, running water, appliances, and many others). Immigration restrictions during this period also played a major role in bringing down inequality, since immigration is inequality inducing by definition (if an individual diverges from the median, he increases inequality). The fact that the share of immigrants in the entire population fell from 13,2% to 4,7% between 1920 to 1970 convinces Geloso that this effect has been considerable.

[6] Vincent Geloso (2019), "The Fall and Rise of Inequality: Disaggregating Narratives", chapter 10 in *Austrian Economics: The Next Generation*, Advances in Austrian Economics, Volume 23, 161–175 (Emerald Publishing Limited).

After 1970, except for shrinking gender differences (more accessibility to enter the workforce), most factors reversed in trends, and started contributing towards a rise in inequality. For example, the immigration share went up, regional differences too, which is mostly related to different price variations between groups. While controversial, the income gap between whites and blacks might have started to rise, but surveys may not paint an accurate representation, since they skim the population in prison, which earns mostly nothing. Housing and zoning laws are another suggestion, since owners are benefiting from a rent increase while renters have a larger share of their income dedicated to rent as limiting supply increases prices. Since renters tend to be in the lower end of the distribution and owners on the higher end, this could have resulted in an increase in inequality.

All in all, it is important when analyzing inequality to look not only at aggregated measures, but also at measures that include micro foundations to avoid broad statements that could miss the true nature of inequality. However, the general U-shape movement in income and wealth inequality appear to resist to criticisms although the exact curvature remains at issue.

Figure 1 illustrates the U-shape curve of the top 1% national income share across the world. And Figure 2 illustrates quite clearly the U-shape curve of the top 1% personal wealth share in rich countries. As for Figure 3, it illustrates the income growth between 1980 and 2015 in France and the USA for different income groups. The analysis of the income growth will be developed in the third paper of the trilogy ("The Social Role of Inequalities: Why significant inequality levels in income and wealth are important for our prosperity and collective wellbeing").

Figure 1: Income (pretax NI per adult) inequality U-shape curve over time
Top 1% national income share across the world, 1900-2018
(*Source*. Lucas Chancel 2019, Figure 3; Western Europe is the average of France, UK, Germany and Sweden)

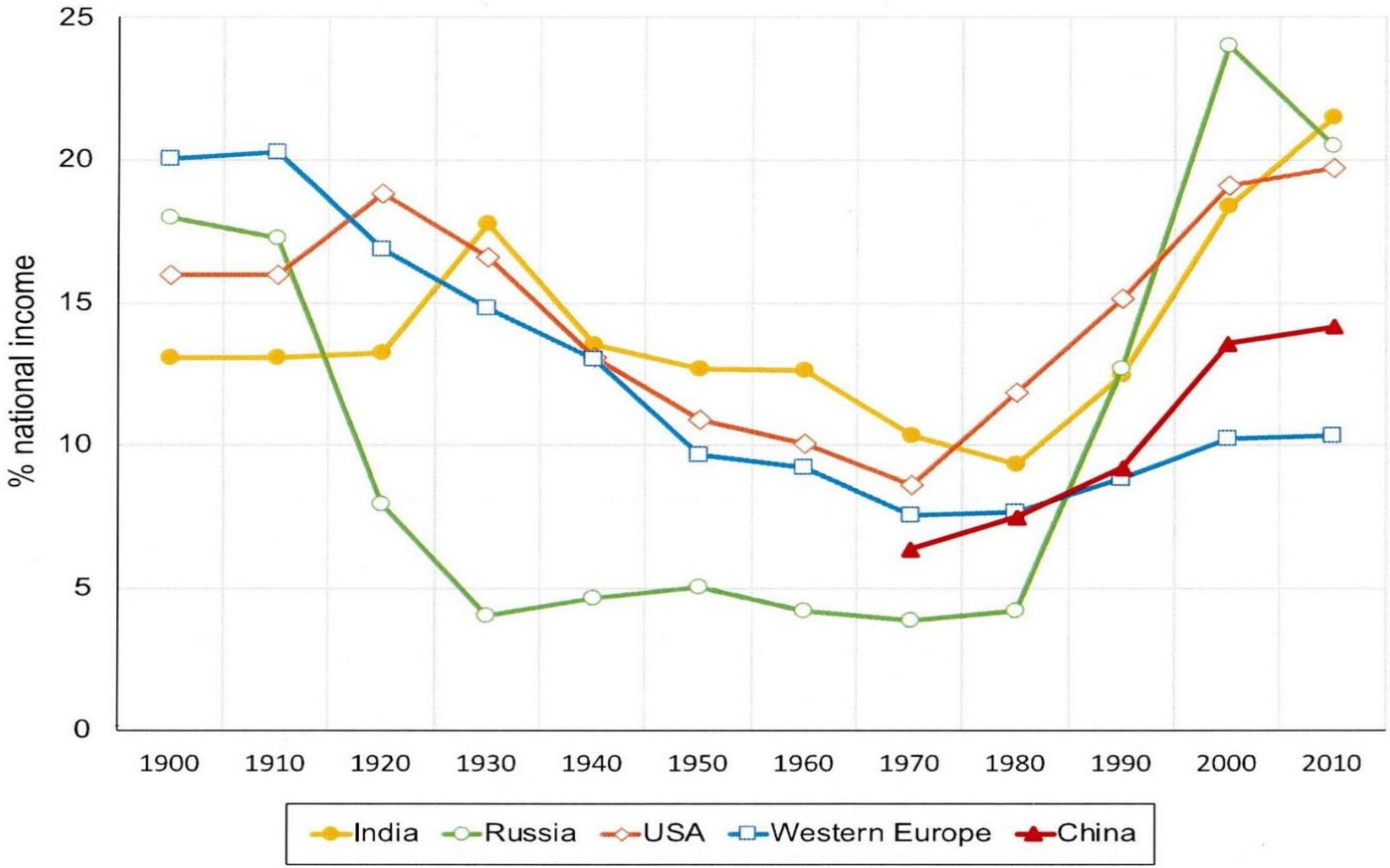


Figure 2: Wealth inequality U-shape curve over time

Top 1% personal wealth share in rich countries, 1915-2014
(*Source*. Lucas Chancel 2019, Figure 6)

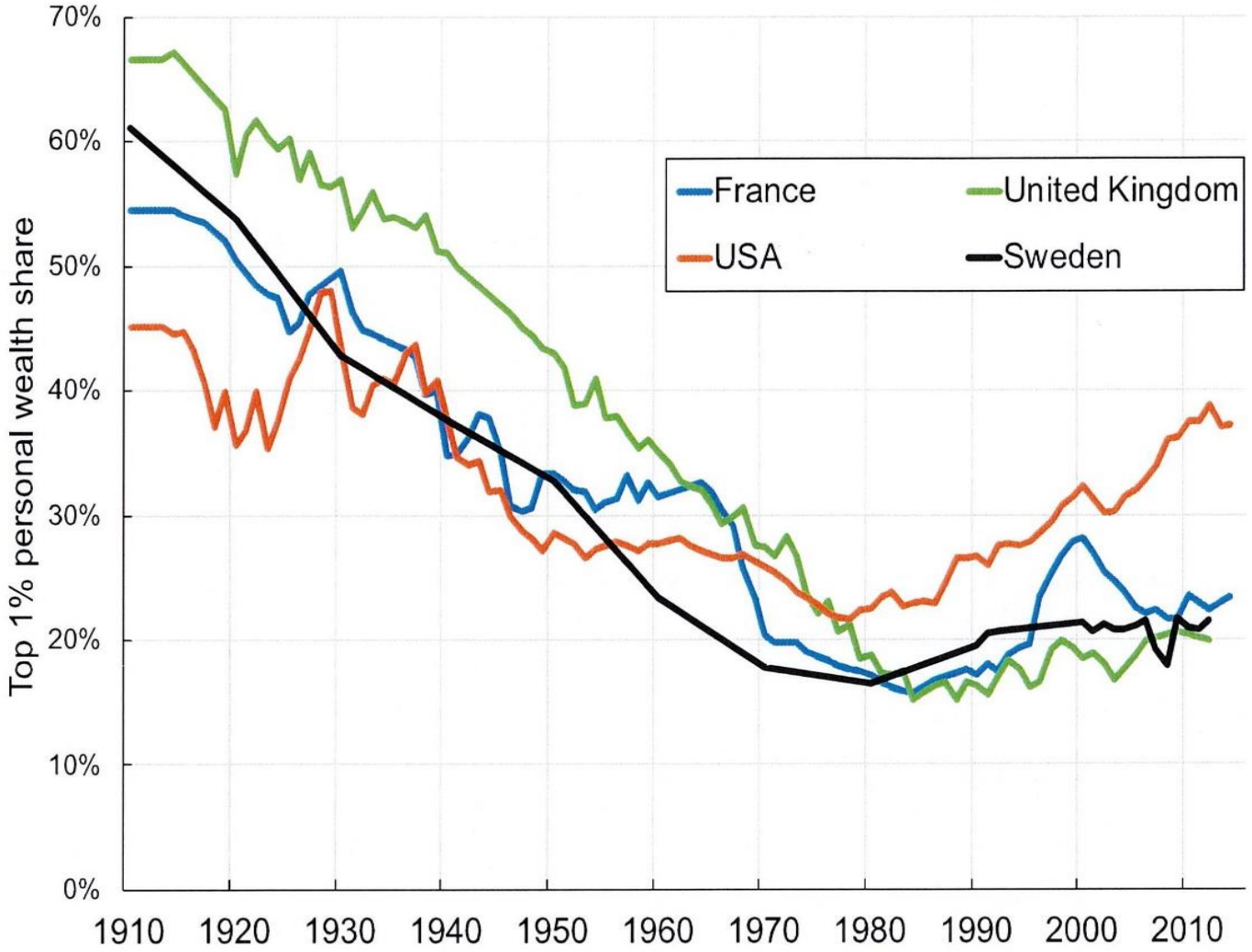
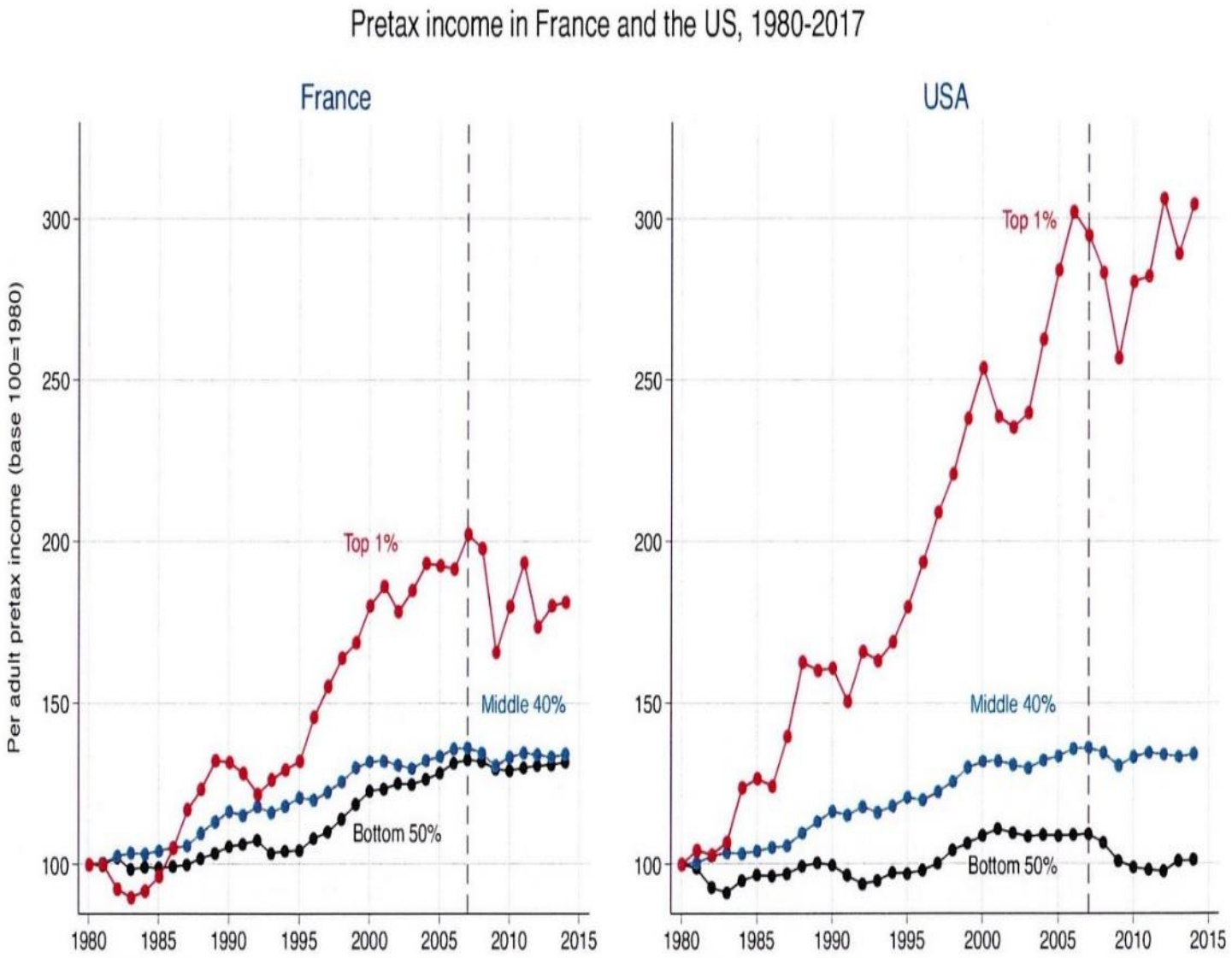


Figure 3: Income growth in France and the US, 1980-2017
(*Source*. Lucas Chancel 2019, Appendix Figure 7)



The effect of taxes

One expects that the effect of taxes and transfers will be to reduce income inequalities. Indeed, taxes do so in a significant way. The next figure and table shed light on this reality and the information they contain complements the information conveyed in the previous figures.

The first figure shows the effect of taxes and transfers on the ratio of the top 10% to the bottom 50% average income in four non-intersecting regions of Europe. We observe that "pre-tax and transfers" inequality, measured by the [(top 10%) / (bottom 50%)] ratio is higher in Western Europe than in the other regions. However, the effect of taxes and transfers is more important in Western Europe as it translates into a reduction of 29% in the ratio, compared to 15% for Eastern Europe, 23% for Southern Europe, and 23% for Northern Europe. Post-taxes and transfers income inequality becomes lower in Western Europe than in Eastern Europe but remains higher than in Southern Europe and Northern Europe.

Figure 4: Pre-tax/transfers vs. Post-tax/transfers income inequality in Europe, 2017
(*Source*. Thomas Blanchet, Lucas Chancel, Amory Gethin 2019, Figure 20)
The boxed percentages represent the reduction in inequality due to the tax and transfer systems

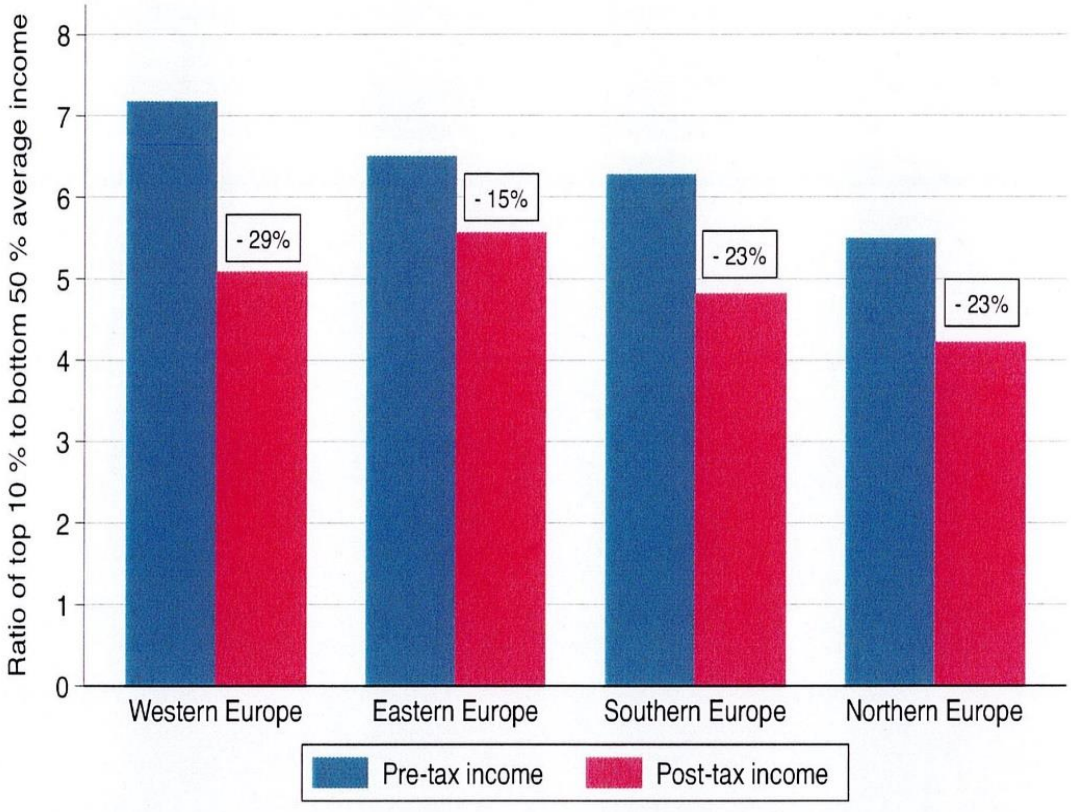


Table 5 indicates that for Canada, the progressivity of taxation has increased between 1999 and 2018. We observe that the shares of total taxes paid by the highest quintile have increased while that of the lowest quintile has decreased. The ratio of shares [(highest quintile) / (lowest quintile)] has increased from 41.3 to 53.9, which means that the top 20% of income earners pays in 2018 close to 54 times more taxes than the bottom 20% of income earners, while it was 41 times in 1999.

Table 5: Share (%) of taxes paid per quintile[7]
Canada 1999-2017

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile	Ratio highest/lowest
1999	1.3	6.2	14.1	22.9	55.5	41.3
2000	2.1	6.4	13.8	22.3	55.5	26.9
2001	1.1	6.1	13.7	22.2	56.8	52.9
2002	1.3	6.3	13.3	22.1	57.0	43.6
2003	1.2	6.1	13.5	22.6	56.6	47.4
2004	1.1	5.9	13.4	22.3	57.4	54.1
2005	1.3	6.1	13.2	22.7	56.7	44.3
2006	1.3	6.1	13.5	22.8	56.2	43.6
2007	1.2	5.5	12.9	22.6	57.8	49.0
2008	1.0	5.8	13.0	22.9	57.3	60.3
2009	0.7	5.2	12.8	23.2	58.1	85.3
2010	1.2	5.1	12.6	22.8	58.3	47.8
2011	0.9	5.5	13.3	23.4	56.9	66.1
2012	1.2	5.8	13.5	22.8	56.7	48.5
2013	0.9	5.6	13.1	23.0	57.5	62.0
2014	1.4	5.7	13.1	22.7	57.1	41.0
2015	1.1	5.8	13.2	22.8	57.2	52.1
2016	1.1	6.0	12.9	22.7	57.2	51.1
2017	1.1	5.4	12.8	22.3	58.4	53.9
Change	-19.5%	-12.8%	-9.0%	-2.2%	5.1%	30.5%

[7] Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv!recreate.action?pid=1110019301&selectedNodeIds=2D2,2D3,3D2,3D3&checkedLevels=0D1,3D1,3D2&refPeriods=19990101,20170101&dimensionLayouts=layout2,layout2,layout2,layout2,layout3&vectorDisplay=false

3. Measuring Consumption Inequality: Challenges and Pitfalls

Income inequality estimates come mostly from disposable income. However, there is more to well-being than disposable income insofar as consumption of health, education, access to public goods, quality of the environment, public safety, etc., may not require financial outlays.

I first review some research articles and papers that look at consumption inequality before looking at the OECD program on the definition of a more comprehensive measure of disposable income. The program objective is to obtain a more informative characterization of income inequality across countries and within countries. A key element of the program is the measurement of social transfers in kind (STiK) in different countries.

Statistics Canada released new measures of household actual final consumption (HAFC) in March 2019,[8] by adding to household final consumption expenditure (HFCE) the social transfers in kind (STiK). Statistics Canada defines the social transfers in-kind as transfers in kind to households made by the various levels of government as well as by non-profit institutions serving households (NPISH). Those transfers include off-market production (services with zero or insignificant prices) of household services. They also include the purchase of goods and services intended to be transferred to households. Using the data released by Statistics Canada will allow a better characterization of consumption inequality.

A short review of research on consumption inequality

Gravel et al. (2005)[9] aim to expand the notion of inequality beyond disposable income. They write: "Disposable income is not the only ingredient of well-being. Also important are health, education (or information) and free access to various public goods such as roads and public transportation, quality of the environment, public safety, etc. Hence a mere focus on the distribution of disposable income fall quite short of providing us with an adequate picture of the distribution of well-being in the population."

They first introduce besides disposable income two public goods: infant mortality, a proxy for health system efficiency and coverage, and pupil/teacher ratio at public schools, a proxy for education spending. In spite of significant data challenges, they conclude that "a comparison of standard unidimensional inequality indices based on the distribution of disposable income alone with multidimensional ones suggests a strong correlation between the behavior of the indices. This at least suggests that the widespread practice of focusing only on unidimensional income inequality

[8] Released at 8:30 a.m. Eastern time in The Daily, Wednesday, March 20, 2019

[9] Nicolas Gravel, Arnaud Lefranc, Nicolas Pistolesi, Benoit Tarroux, Alain Trannoy (2005), "Appraising Inequalities in the Western World: Is individual disposable income all that matters?" mimeo.

does not provide a too bad information of the overall performance of the OECD countries in terms multidimensional inequalities with respect to both disposable income and public good."

They then use a dataset containing national household surveys for nine countries to analyze the inequality of opportunity compared to the inequality of outcomes. They find that "there is a correlation between the ranking of countries based on disposable income and that based on the equality of opportunity approach. This at least suggests that the standard practice of focusing on income inequality alone does not provide a bad approximation of the ranking of countries that would emerge from an equality of opportunity view point. Yet the correlation is not perfect."[10]

Meyer and Sullivan (2017)[11] claim that inequality is often measured with income data while consumption data shows a view more reflective of overall economic wellbeing. Indeed, income is more variable than consumption because of saving and dissaving factors depending on the current state of individuals. It also does not reflect the flow of consumption that ownership of houses or cars might give. Consumption measures give a better picture of the effect of changes in the value of assets or of debt burden and access to credit.

However, concerns with consumption measures reside in data quality. For consumption, under-reporting is an issue and different surveys yield different results as a recall survey is less of a burden than a diary survey for participants. To avoid this problem, the authors suggest focusing on consumption categories that are well measured and equally important across household, such as food at home, gas expenses, rental value of housing or vehicles, etc., while taking into account price changes to reflect changes in overall spending.

Official measures based on pre-tax money income do not account for tax credits or transfers in-kind such as housing benefits and food stamps. Using consumption inequality measure 90% / 10%, the authors show that consumption inequality has risen moderately by 5% between the 1960s and 1990s, while after-tax income inequality has risen by about 28% in the same timeframe. Using 50% / 10% or 90% / 50% ratios, the pattern is similar. Changes in the top 1% income share are not included because consumption data for these individuals might be poorly measured.

The difference between income and consumption measures stems from the under-reporting of income by low income families and its growth overtime. Also, for groups that receive high transfer income,

[10] They add: "And the imperfection seems to take place in the set of countries that appear to show a 'middle-ground' performance in terms of both inequality of disposable income and inequality of opportunity. Specifically, it appears that countries like France, Italy and Spain do worse in terms of equality of opportunity than in term of equality of disposable income while a somewhat converse verdict holds for countries like Netherlands and Germany."

[11] Bruce Meyer and James Sullivan (2017), "Consumption and Income Inequality in the US Since the 1960s", NBER Working Paper No. 23655.

such as single-parent families, a difference is expected. Changes in asset values could explain why consumption inequality fell after 2006 as data show that consumption rose for the lowest quintile but fell for the other four.

Norris and Pendakur (2015)[12] provide an estimate of the evolution of consumption inequality in Canada from 1997 to 2009. Using consumption to measure inequality is better in theory because the level of consumption is a choice by the household that depends on past, current and future income. So, it is more representative of permanent income. It is also seen as the main generator of well-being. From an empirical point of view, survey data on consumption might be better than on income, most notably in the tails of the distribution (tax avoidance at the top and multiple sources of income at the bottom).

However, measuring consumption inequality introduces some technical problems. It is not as simple as adding expenditures of households because it would not accurately capture the consumption of durables, such as houses and cars. For example, owner-occupiers of houses don't report their shelter expenditures by year, which would represent the « flow » of consumption provided by the utilization of the house. This correction is important if we want to compare inequality as the ownership rate is different between groups of people. The authors use the Surveys of Household Spending (SHS) from 1997 to 2009 to impute rent from an estimator that corrects for selection bias and then to estimate inequality using the Gini measure. They also use price data to see if the Gini coefficient is sensible to adjustments in prices. In theory, it should not, but if growth in prices have been asymmetrical between groups of households, there could be differences.

They find that consumption inequality rose from 1997 to 2006, from 0,251 to 0,275 Gini points, an increase of 2,4 percentage points, but declined between 2007 and 2009, from 0,275 to 0,264 Gini points, a decrease of 1,1 percentage point. They also find that while income inequality increased from 1997 to 2006, the decrease afterwards compensated for it, which means that during the entire period 1997-2009, income inequality has essentially been flat. Considering this post-2006 decline in inequality, they speculate that the minimum wage increases and the solidity of the labour market could have contributed to a higher growth in wages at the bottom of the distribution than at the top. The poor stock market performance during this period might also have contributed to a reduction in inequality: asset prices fell and since most assets are held by individuals at the top of the distribution, inequality fell.

[12] Sam Norris and Krishna Pendakur (2015), "Consumption Inequality in Canada, 1997 to 2009", *Canadian Journal of Economics*, 48(2), pp 773-792.

Sarlo (2016)[13] states that income inequality depends on the measure of income used, market revenue, total income, after-tax income, household size adjusted after-tax income, etc. and that consumption is a better measure, since it is a direct proxy of choices that agents make to maximize their well-being.

Trends in consumption and income are essentially explained by age: the young (0-25) and the old (65+) have lower income than individuals 25-65. In relative terms, it is in this age range that income is at its highest, and that expenses are at the lowest. This means that savings are at their highest. The young and the old, on the contrary, have the tendency to save and dissave to smooth consumption while taking into account their intertemporal wealth.

Thus, following this hypothesis, consumption is less volatile and sensitive to demographic changes than income. It is also less affected by transitory shocks that impede income earning (job loss, promotions, separation, illnesses to name a few).

Underreporting is also less of a problem than for income (through fiscal avoidance and evasion, mostly –in percentage- from low-income individuals), implying that the inequality might seem more important than they are. However, consumption still has notable problems: low response rate in surveys, measurement errors (recalling the exact amounts of spending is unlikely). However, if these errors are random, it should not affect inequality measures.

Sarlo does not use a flow of consumption (imputed rent) instead of punctual purchases. For example, buying a house in 2015 gives of utility not only in 2015, but also in 2016, etc. so that the present value of the flow is equivalent to the 2015 purchase. The reasoning for not using this concept is that if there are not enough differences in time that would skew inequality towards a direction more than another, his simpler approach would make sense.

Other studies sometimes adjust for price changes to obtain a real consumption inequality measure. However, finding decent regional price indexes is arduous and not readily available. A major problem with consumption as a measure of inequality is substitution (buying similar products at lower prices) and price-searching. It is known that the poor tend to have a lower opportunity cost of time than individuals at the higher end of the distribution, which implies that they might tend to search for better deals while using less money to buy the same goods as the rich. Not adjusting for this problem would imply greater measured inequality than realised.

Another problem is that data ignores improvements in quality for appliances, cars, electronic devices, etc., which would tend to benefit the poor, thereby overstating inequality.

[13] Christopher Sarlo (2016), “Consumption Inequality in Canada: Is the Gap Growing?”, Fraser Institute.

To adjust for these considerations and get pure results (untainted by unnecessary adjustments), Sarlo uses an adjustment for the size of the household, namely the square root of the household size. This correction is applied because real consumption of individuals is lower than the consumption of the household, but higher than if they were living alone.

So, changes in prices or in the household sizes could have appreciable impacts on inequality trends. If relative prices of comparable goods change more for the rich than for the poor, the latter could substitute and pay less for a similar good basket. Furthermore, households are on average smaller than they were in 1970, implying that consumption is now distributed between a smaller group of individuals. Therefore, using an adult-equivalent factor is a must.

Using data from the survey of family expenditures (1969-1997) and the survey of household spending (1997-2009),[14] arguably the most comprehensive surveys available in Canada, Sarlo finds that consumption inequality is lower than income inequality. More interestingly, income inequality has risen by 11% over the 40-year period up to 2009 using after-tax-adjusted income, while consumption inequality has risen by 3% over the same period.

It would then be unwise to argue that the living standard is more unequal in 2009 than in 1969, which is surprising considering all of the changes that occurred within society, namely demography, population aging, higher divorce rates and more single parent families, higher labour force participation of women, the expansion of the tertiary sector of the economy, higher college attendance, more two-salary families, etc. While the 11% increase in income inequality is significant, it might overstate real inequality if we were to consider quality improvement and substitution behaviours of low-income consumers. While these results are interesting, Sarlo warns the reader than one should not make definitive conclusions, because the data used is not without major flaws.

The OECD program

The OECD program to obtain a more comprehensive measure of disposable income concentrates in part on identifying social transfers in kind (STiK) in different countries. STiK turn out to represent roughly 20% of the household actual final consumption expenditures (HAFC), which is defined as the household final consumption expenditures (HFCE) plus the social transfers in kind (STiK).

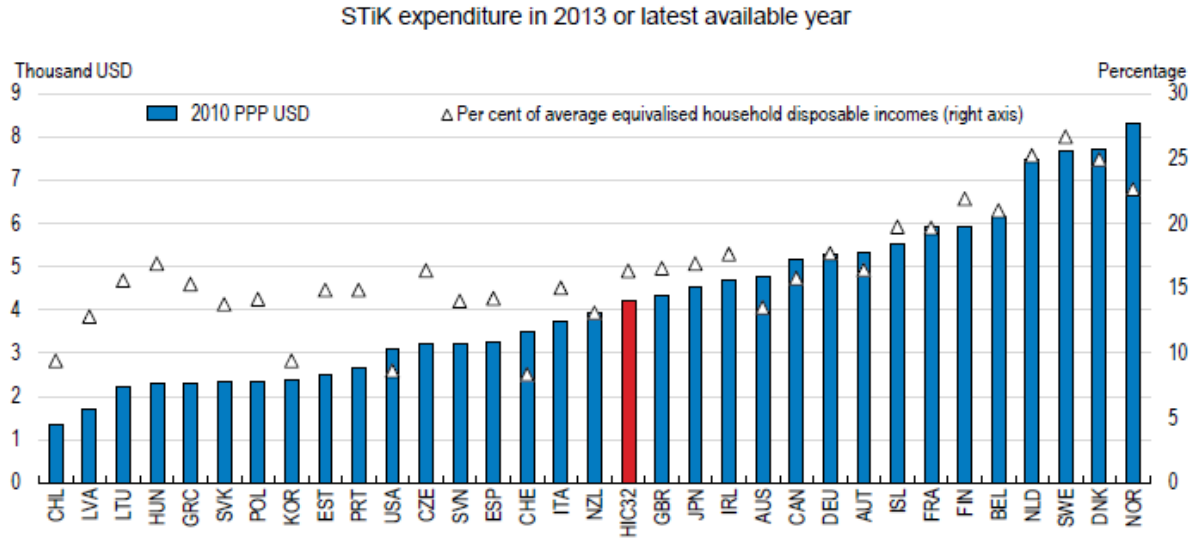
Hermansen (2017)[15] relies on the OECD Income Distribution Database to characterize the global income distribution between all individuals living in the developed world. He shows that global

[14] The survey of family expenditures has been integrated into the survey of household spending as of 1997.
[15] Mikkel Hermansen (2017), "The Global Income Distribution for High-Income Countries," Economics Department WP no. 1402, OECD ECO/WKP(2017)34.

inequality for the group of high-income countries, as measured by the Gini coefficient, has increased by almost 3 Gini points from 1995 to 2013, in contrast to global inequality at the world level estimated to have fallen by more than 2 Gini points from 1988 to 2008 (Lakner and Milanovic2016).

According to Hermansen, his result is "mainly driven by top 10% incomes growing more than middle and lower incomes and the bottom 10% falling behind. Rising inequality within the United States drives almost half of the inequality increase among high-income countries, a combination of a sizeable rise in inequality and a population share around a third in the sample." The result also reflects the impact of the 2008-09 crisis, and is sensitive to the inclusion of Japan, which experienced a substantial decline in real incomes.

Furthermore, to check for robustness, Hermansen analyzes explicitly the inclusion of social transfers in kind (STiK) in the framework. STiK can be useful because they are sizeable and differences between countries are important. For example, in nordic countries, STiK represent about 25% of average household disposable income, which is more than twice what they represent in the US. Using national accounts aggregates indicate that adding STiK to household disposable incomes may lift household income growth substantially. Decomposing the rise in global inequality for high-income countries into within- and between country contributions shows that the bulk of the increase is due to the increase in within country inequality in a majority of high-income countries.



Statistics Canada: A more sophisticated treatment of STiK

Statistics Canada released new measures of household actual final consumption (HAFC) in March 2019,[16] justifying and characterizing those new measures as supplementing traditional estimates of household final consumption expenditure (HFCE) by including "social transfers in kind" (STiK), which represents the value of services and some specific goods that are financed by governments and non-profit institutions but consumed by households. These services include mainly health and education services, along with a range of other categories.

The “Social Transfers in-Kind” (STiK) measure transfers in kind to households made by the various levels of government as well as by non-profit institutions serving households (NPISH). STiK include off-market production (services with zero or insignificant prices) of household services. They also include the purchase of goods and services intended to be transferred to households.

The provision of these services to households can also be considered as income, provided to the user in kind rather than as a money transfer. The broader income concept is referred to as household adjusted disposable income (HADI). Statistics Canada: “These new measures are in line with international standards, which recommend including social transfers in kind to calculate supplementary measures of consumption and income. The measures facilitate cross-national comparisons, as social transfers in kind consumed by households are financed to varying degrees across countries.”

Table 6 shows that social transfers in kind in Canada increased steadily from $132 billion in 1999 to $224 billion in 2008 to $315 billion in 2018, in nominal terms. Most social transfers in kind are financed by governments, representing $281 billion (89.2%) in 2018, while those financed by non-profit institutions accounted for $34 billion (10.8%). As a proportion of total household consumption, social transfers in kind have remained relatively stable at about 20%, a significant amount.

Table 6 shows how STiK from governments and from non-profit institutions are distributed by expenditures items. Statistics Canada: “Social transfers in kind from governments are primarily composed of health and education services, which account for 90% of the government transfers in kind. Health services represent just over half, and their share edged up from 52.5% in 2008 to 54.3% in 2018. Education services were the second largest category (34.8%), and have remained stable over the 10-year period.” Other categories are housing, recreation and culture, and social protection.

Although the nominal value of the services they provided in kind is smaller in relation to governments, non-profit institutions (NPISH) generally offered different types of services. These include social

[16] Released at 8:30 a.m. Eastern time in The Daily, Wednesday, March 20, 2019

protection, such as childcare and old age protection, which accounted for $8.0 billion (23.5% of their STiK spending) in 2018, as well as other services, such as religious services and those provided by grant-making and giving organizations.

Table 6: The composition of total social transfers in kind (STiK) in $million and their share in the household actual final consumption (HAFC).
All households.
Canada as a whole 1999-2018

Year	Social Transfers in kind (StiK)	STiK Education	STiK Health	STiK Other	Household final consumption expenditure HFCE	Household actual final consumption expenditure HAFC = HFCE+STiK	Share STiK/HAFC in %
1999	132,720	46,502	59,519	26,699	550,621	683,341	19.4%
	141,755	48,526	64,702	28,527	585,931	727,686	19.5%
	151,304	51,096	69,632	30,576	612,157	763,461	19.8%
	160,333	53,420	73,951	32,962	648,425	808,758	19.8%
	168,914	55,619	78,929	34,366	677,936	846,850	19.9%
	176,134	58,221	82,360	35,553	709,483	885,617	19.9%
	185,461	61,494	86,085	37,882	749,063	934,524	19.8%
	198,823	66,632	91,990	40,201	790,454	989,277	20.1%
	209,376	68,398	99,016	41,962	838,954	1,048,330	20.0%
2008	224,274	72,399	106,208	45,667	875,201	1,099,475	20.4%
	234,351	76,145	112,557	45,649	878,203	1,112,554	21.1%
	243,381	79,387	117,727	46,267	923,451	1,166,832	20.9%
	255,838	83,227	123,927	48,684	963,912	1,219,750	21.0%
	262,570	84,913	127,760	49,897	995,045	1,257,615	20.9%
	269,324	87,040	132,000	50,284	1,034,803	1,304,127	20.7%
	277,382	90,460	136,364	50,558	1,083,056	1,360,438	20.4%
	286,904	92,656	141,318	52,930	1,118,491	1,405,395	20.4%
	294,350	94,679	144,408	55,263	1,153,256	1,447,606	20.3%
	302,353	96,879	148,091	57,383	1,208,437	1,510,790	20.0%
2018	315,358	101,011	154,392	59,955	1,254,489	1,569,847	20.1%
2018/1999	*237.6%*	*217.2%*	*259.4%*	*224.6%*	*227.8%*	*229.7%*	

STiK data come from a variety of aggregated sources. STiK from governments are taken from the Canadian Classification of Functions of Government (CCOFOG) which separates the proportions of government spending according to whether it is collective spending (such as defense) or individual spending (health, education, etc.). These data come from the Canadian Government Finance Statistics (CGFS), which collects public data through various administrative files.

We learn from Statistics Canada,[17] that the distinction between individual and collective consumption expenditure was introduced in SNA 1993. Individual services or consumption expenditure is the amount spent by an institutional unit during an accounting period to purchase consumption goods and services for the benefit of a specific individual or group of individuals that could, in principle, be identified. Collective services or consumption expenditure is the amount spent by an institutional unit during an accounting period to purchase consumption goods and services for the benefit of the collectivity living within or visiting a local community, or a city, or a province, or the country as a whole.

Individual consumption expenditure includes both purchases of goods and services by households for their own use and the provision of goods and services to specific households or groups of households by government and NPISH units. The former includes purchases of food, clothing, transportation and a wide range of other consumer products by households. The latter includes, for example, the provision of elementary and secondary schooling to children and the provision of health care services.

Collective consumption expenditure, in contrast, corresponds (broadly? Since it is not only pure public goods?) to the economic concept of the 'public good'—products that an individual cannot be effectively excluded from using and for which one individual's consumption does not significantly reduce the availability of the good or service for others. Examples of collective consumption expenditures include spending on policing, defence services, Parliament and general public administration.

Thus, the aggregated individual services expenditure (IS) data represent the STiK of the various levels of government. For example, for health, the individual expenditure categories are: "Medical products, appliances, and equipment", "Outpatient services", "Hospital services" and "Public health

[17] https://www150.statcan.gc.ca/n1/pub/13-606-g/2016001/article/14618-eng.htm

services". For education, the categories are: "Primary and Secondary education", "College education", "University education", "Education not definable by level" and "Subsidiary services to education".

The objective of Statistics Canada is to estimate the social transfers in kind (STiK) to households from government and from non-profit institutions serving households (NPISH).[18] The estimates are then added to household final consumption expenditure (HFCE) to get household actual final consumption (HAFC).

It is useful to recall the definition of household actual final HAFC consumption, which can be summarized as the sum of household final consumption expenditure (HFCE), social transfers in kind from governments and social transfers in kind from NPISH. Moreover, social transfers in kind exist only for certain household expenditure categories: Housing, water, electricity, gas and other fuels; health; recreation and culture; education; miscellaneous goods and services (including social protection); other services (religion, political parties, labour and professional organisations, environmental protection.[19]

To obtain data between 1999 and 2018 (in accordance with DHEA[20]), Statistics Canada uses OECD data to measure STiK retroactively. So, with the total of government STiK and NPISH STiK, it only remains to show how these data are allocated to the different economic agents. Statistics Canada has survey data on disposable income as well as consumption (mainly from the Survey of Household Spending (SHS)). In this way, it obtains an estimate of the distribution of income and consumption in the population. With this distribution, households are grouped by income quintile.

The distribution of STiK across quintiles

To distribute STiK, Statistics Canada uses proxy variables to estimate the proportions of STiK going to different types of households, and then impute this data to the income quintiles defined earlier.

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[18] https://www150.statcan.gc.ca/n1/pub/13-607-x/2016001/1390-eng.htm

[19] For STiK coming from NPISH, Statistics Canada uses final demand data between 2008 and 2018, as estimated with the "Supply Use Tables" (SUT), which make it possible to obtain the amounts that the NPISH spent to provide services to households, which is considered equal to the total consumption of their services by households. To obtain more recent data, Statistics Canada also uses NPISH T4 "wages and salaries" to estimate the growth in final demand for their services.

[20] The Distributions of Household Economic Accounts (DHEA) data available from Statistics Canada. Tables 36-10-0585-01, 36-10-0586-01, 36-10-0589-01 and 36-10-0590-01 contain the data related to the wealth distributions, tables 36-10-0587-01 and 36-10-0588-01 contain the distributions related to income, consumption and saving, and table 36-10-0101-01 contains the distributions related to household counts.

It uses various socio-demographic information sources to refine allocations by quintile. For instance, Canadian Institute for Health Information is used to differentiate spending proportions by age, sex and geography. If there is no proxy variable available, it separates STiK uniformly according to quintiles; this is a very small proportion, so it shouldn't have a big impact. The following table presents some proxy variables used to distribute the STiK to the different quintiles.[21]

DHEA STiK category	Distribution variable/proxy
Education	• Post-secondary tuition fees • Number of kids attending elementary and secondary schools
Health	• Provincial government health care expenditures by age, sex and province or territory
Other	• Various estimates for spending on recreation, etc. • Union dues

Source: Statistics Canada: System of Macroeconomic Accounts, Social Policy Simulation Database and Model, Survey of Household Spending; Canadian Institute for Health Information, National Health Expenditure Database.

Table 7 shows how STiK from governments and from non-profit institutions are distributed by expenditure items for different quintiles (we show the first and fifth quintiles only). We observe that the most important STiK expenditure items in 2018 is health for both the lowest quintile (45%) and the highest quintile (51%). We observe also that between 1999 and 2018, STiK expenditures on education increased by 54.6% and 65.4% respectively for the lowest and highest quintiles, while STiK expenditures on health increased by 119.0% and 95.5% respectively for the lowest and highest quintiles.[22]

[21] Although STiK data exist for most advanced countries under OECD methodological instructions; see Mikkel Hermansen (2017) cited above #15. Statistics Canada is the first government statistics institution to rigorously allocate STiK spending (in total and by component) across groups of households, more precisely across quintiles at this time. The standard procedure until now (and still used in most if not all empirical studies) is to distribute STiK spending equally across all households.

[22] These results show the importance of path-breaking efforts by Statistics Canada to allocate STiK spending across households.

Table 7. Allocation of social transfers in kind (STiK) across quintiles.
Value per household, lowest and highest quintiles.
Canada as a whole 1999-2018
(10.721 = 10 721$)

	L	K	M	N	O	P	Q	R	S
	STiK			STiK: education		STiK: health		STiK: other	
	lowest	highest		lowest	highest	lowest	highest	lowest	Highest
	N+P+R	O+Q+S	K/L						
1999	10.721	10.384	0.97	4.229	3.198	4.032	4.893	2.460	2.293
2000	11.117	10.954	0.99	4.132	3.455	4.374	5.091	2.612	2.408
2001	11.575	11.479	0.99	4.294	3.529	4.541	5.430	2.740	2.520
2002	12.419	11.850	0.95	4.622	3.606	4.848	5.543	2.949	2.701
2003	13.025	12.026	0.92	4.854	3.590	5.113	5.670	3.058	2.766
2004	13.036	12.588	0.97	4.811	3.902	5.046	5.871	3.179	2.815
2005	13.363	13.050	0.98	4.696	4.032	5.358	6.041	3.309	2.977
2006	14.071	13.949	0.99	4.785	4.382	5.818	6.487	3.468	3.080
2007	14.873	14.676	0.99	4.977	4.422	6.313	7.098	3.583	3.156
2008	15.516	15.547	1.00	5.189	4.634	6.525	7.482	3.802	3.432
2009	15.988	15.813	0.99	5.512	4.491	6.686	7.934	3.790	3.388
2010	16.195	16.295	1.01	5.403	4.982	6.99	7.959	3.802	3.354
2011	16.895	17.158	1.02	5.834	5.360	7.181	8.330	3.880	3.468
2012	17.965	17.456	0.97	6.384	5.099	7.514	8.800	4.067	3.557
2013	18.126	17.740	0.98	6.557	5.258	7.555	9.001	4.015	3.480
2014	18.282	17.616	0.96	6.350	5.394	7.982	8.737	3.950	3.485
2015	18.597	17.853	0.96	6.471	5.114	8.040	9.156	4.086	3.583
2016	18.847	18.138	0.96	6.548	5.056	8.107	9.379	4.192	3.704
2017	19.105	18.263	0.96	6.368	5.160	8.436	9.317	4.301	3.787
2018	19.807	18.773	0.95	6.537	5.290	8.829	9.567	4.441	3.916

Combining STiK data, disposable income, and consumption data

Finally, the STiK are added to the disposable household income (it is as if the STiK were an income that the government gives to households which makes it possible to buy the STiK consumed) as well as to the final consumption expenditure to give the "Adjusted household disposable income" and "Household actual final consumption". Since STiK are added to the two measures, net household savings remain unchanged.

The introduction of social transfers in kind estimates complements current existing measures, notably household final consumption expenditures and household disposable income. By adding

STiK to these measures, we now obtain household actual final consumption (HAFC) and household adjusted disposable income (HADI): HAFC is the sum of household final consumption expenditure, individual consumption of goods and services from government, and individual consumption of goods and services from NPISH.

HAFC is an important component of Canadian macroeconomic statistics and allows for a more meaningful understanding of living standards by considering the consumption of households, not only from their own final expenditure but also from the final expenditure of other sectors that benefit them. Health care and education are high costs that Canadians benefit from through policies and programs that are funded through the tax system. These types of consumption are important considerations as it enhances the understanding of economic well-being of Canadians.

Corrected consumption inequalities

We observe in Table 8 that STiK represent in 1999 about 74.2% of disposable income for households in the lowest quintile, but about 11.2% of disposable income for households in the highest quintile. In 2018, those percentages reach 84.2% and 11.6% respectively. Clearly, STiK will have an impact on consumption inequality measures based on HAFC as well as on income inequality based on HADI.

Table 8 presents partially corrected consumption inequality changes over the last twenty years or so. We see that the traditional measure of disposable income indicates that the ratio of average disposable income (highest quintile over lowest quintile), C/B in Table 8, has increased by 7.4% from 6.42 to 6.89, a significant increase. But the ratio of household adjusted final consumption (HAFC), L/K in Table 8, has decreased by 17.1% from 2,49 to 2,06. This is a rather significant change in just two decades.

The change in disposable income has been more important for the highest quintile (+74.9%) than for the lowest quintile (+62.8%), that is, the change in disposable income of the highest quintile has been 119.2% that of the lowest quintile, which suggest a notable increase in income inequality over the last two decades.

But the change in consumption (HFCE) has been much less important for the highest quintile (+70.3%) than for lowest quintile (+116.9%), that is, the increase for the highest quintile has been 60.2% the increase for the lowest quintile, which is in line with the original hypothesis of this

paper: the rich were consuming a lot already at the beginning of the period and there is a limit to consumption, so the gains in wellbeing have been more important for the lowest quintile.

In addition, we have STiK whose increase has been more important for lowest quintile (+84.7%) than for highest quintile (+80.8%), although by a slight margin. The total increase in consumption (HAFC) has therefore been more important for lowest quintile (+106.8%) than for highest quintile (+71.6%), that is, the increase for the highest quintile has been 67.0% the increase for the lowest quintile, which is a significant development. It suggests both a significant increase in wellbeing for both quintiles but mainly for the lowest quintile and a significant decrease in consumption inequality, over the last two decades.

The distribution of government common spending across quintiles

In addition to social transfers in kind distributed over income quintiles, we have the government spending, which is common to all and cannot be distributed or assigned to individual households in any simple way. As shown in Table 9, the level of such spending has increased by 38.8%, at an annual rate of 3.3%, between 2008 and 2018.

Clearly, these expenditures contribute to the wellbeing of the population, although its allocation among households (quintiles) cannot be done with confidence. As for information goods and services and assets in general, the allocation would require estimates of how the typical household in each quintile value those expenditures, through some form of Lindahl pricing or value,[23] that is, through some form of willingness to pay estimates and cooperative game allocation procedure, which cannot be done with confidence at this time. The most one could do at this time is to allocate the general government common spending on items 707-710 in the same way as STiK were distributed across quintiles. It is not done here.

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[23] See Marcel Boyer and Anne Catherine Faye (2018), "Music Royalty Rates for Different Business Models: Lindahl Pricing and Nash Bargaining," In: Marciano A. and Ramello G. (eds) *Encyclopedia of Law and Economics*. Springer, New York, NY, 2018. DOI: https://doi.org/10.1007/978-1-4614-7883-6. See also Marcel Boyer (2019), "The Three-Legged Stool of Music Value: Hertzian Radio, SiriusXM, Spotify", pp. 13-40 in Ysolde Gendreau (ed.), *Le Droit d'Auteur en Action : Perspectives Internationales sur les Recours / Copyright in Action: International Perspectives on Remedies / El Derecho de Autor en Acción: Perspectivas Internationales sobre los Medios de Protección,* Proceedings of the 2018 World Congress of ALAI (Alliance littéraire et artistique internationale), Éditions Thémis, Montréal 2019, 490 pages.

Table 8: STiK and HAFC

Value per household - Canada as a whole 1999-2018

CANADA: Household Income and consumption by quintile

Income quintiles are assigned based on the equalized household disposable income.

This takes into account differences in household size and composition. The Oxford-modified equivalence scale is used;

it assigns a value of 1 to the first adult, 0.5 to each additional person aged 14 and over, and 0.3 for all children under 14.

HFCE (Householf Final Consumption Expenditures), StiK (Social Transfer in Kind), HAFC (Household Adjusted Consumption Expenditures)

Statistics Canada - Table: 36-10-0587-01 (formerly CANSIM 378-0152)

	Disposable Income			HFCE			STiK					HAFC		
	lowest	highest	ratio	lowest	highest	ratio	lowest		highest		ratio	lowest	highest	ratio
	B	C	C/B	E	F	F/E	H	H/B	I	I/C	I/H	K	L	L/K
1999	14.455	92.747	6.42	23.640	75.144	3.18	10.721	74.2%	10.384	11.2%	0.97	34.361	85.528	2.49
2000	14.264	100.350	7.04	24.935	79.300	3.18	11.117	77.9%	10.954	10.9%	0.99	36.052	90.254	2.50
2001	15.620	103.269	6.61	25.096	81.032	3.23	11.575	74.1%	11.479	11.1%	0.99	36.671	92.511	2.52
2002	16.204	105.937	6.54	26.997	84.767	3.14	12.419	76.6%	11.850	11.2%	0.95	39.416	96.617	2.45
2003	16.836	108.378	6.44	27.600	87.130	3.16	13.025	77.4%	12.026	11.1%	0.92	40.625	99.156	2.44
2004	16.730	113.539	6.79	29.968	90.605	3.02	13.036	77.9%	12.588	11.1%	0.97	43.004	103.193	2.40
2005	16.500	116.768	7.08	32.370	94.106	2.91	13.363	81.0%	13.050	11.2%	0.98	45.733	107.156	2.34
2006	17.814	125.223	7.03	35.849	96.807	2.70	14.071	79.0%	13.949	11.1%	0.99	49.920	110.756	2.22
2007	19.150	129.668	6.77	37.665	101.159	2.69	14.873	77.7%	14.676	11.3%	0.99	52.538	115.835	2.20
2008	19.461	135.060	6.94	39.221	102.903	2.62	15.516	79.7%	15.547	11.5%	1.00	54.737	118.450	2.16
2009	19.963	135.642	6.79	38.577	102.079	2.65	15.988	80.1%	15.813	11.7%	0.99	54.565	117.892	2.16
2010	21.142	138.108	6.53	40.886	105.479	2.58	16.195	76.6%	16.295	11.8%	1.01	57.081	121.774	2.13
2011	21.351	141.864	6.64	41.080	107.348	2.61	16.895	79.1%	17.158	12.1%	1.02	57.975	124.506	2.15
2012	22.404	145.500	6.49	42.591	109.955	2.58	17.965	80.2%	17.456	12.0%	0.97	60.556	127.411	2.10
2013	21.946	151.454	6.90	44.536	112.345	2.52	18.126	82.6%	17.740	11.7%	0.98	62.662	130.085	2.08
2014	22.831	152.976	6.70	46.055	116.353	2.53	18.282	80.1%	17.616	11.5%	0.96	64.337	133.969	2.08
2015	22.104	159.154	7.20	46.566	119.903	2.57	18.597	84.1%	17.853	11.2%	0.96	65.163	137.756	2.11
2016	21.760	153.566	7.06	47.676	121.816	2.56	18.847	86.6%	18.138	11.8%	0.96	66.523	139.954	2.10
2017	22.563	159.543	7.07	49.805	125.468	2.52	19.105	84.7%	18.263	11.4%	0.96	68.910	143.731	2.09
2018	23.537	162.231	6.89	51.264	127.963	2.50	19.807	84.2%	18.773	11.6%	0.95	71.071	146.736	2.06
Change*	***62.8%***	***74.9%***	***7.4%***	***116.9%***	***70.3%***	***-21.5%***	***84.7%***	***13.5%***	***80.8%***	***3.4%***	***-2.1%***	***106.8%***	***71.6%***	***-17.1%***
Change High/low			***119.2%***			***60.2%***					***95.3%***			***67.0%***

* 2018/1999

Statistics Canada. Table 36-10-0587-01 Distributions of household economic accounts, income, consumption and saving, by characteristic

https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610058701

DOI: https://doi.org/10.25318/3610058701-eng

Table 9: Consolidated Canadian General Government Spending (millions)
Canada as a whole 2008-2018

Reference period	General public services [701]+Defence [702]+Public order and safety [703]+Economic affairs [704]+Environmental protection [705]+Housing and community amenities [706]	Health [707]	Recreation, culture and religion [708]	Education [709]	Social protection [710]	SUM 701-710	SUM 707-710	STiK from GG in 707-710	STiK from NPISH	STiK total	GG common spending in 707-710	TOTAL GG common spending
2008	204.431	125.458	14.547	72.348	123.892	540.676	336,245	200,337	23,937	224,274	135,908	340,339
2009	210.951	133.246	14.527	76.766	134.802	570.292	359,341	211,383	22,968	234,351	147,958	358,909
2010	221.853	138.998	14.796	80.145	137.155	592.947	371,094	220,482	22,899	243,381	150,612	372,465
2011	227.879	145.819	15.707	83.711	140.713	613.829	385,950	231,172	24,666	255,838	154,778	382,657
2012	226.184	149.139	16.610	85.743	141.348	619.024	392,840	237,017	25,553	262,570	155,823	382,007
2013	226.313	154.292	16.679	88.536	144.774	630.594	404,281	242,895	26,429	269,324	161,386	387,699
2014	228.258	159.331	16.335	90.489	149.281	643.694	415,436	250,556	26,826	277,382	164,880	393,138
2015	232.318	165.025	17.423	91.762	157.582	664.110	431,792	258,329	28,575	286,904	173,463	405,781
2016	237.986	170.053	17.545	94.463	167.464	687.511	449,525	263,375	30,975	294,350	186,150	424,136
2017r	252.395	176.145	18.524	101.342	175.208	723.614	471,219	269,864	32,490	302,353	201,355	453,750
2018p	266.896	178.744	19.283	104.153	184.704	753.780	486,884	281,333	34,025	315,358	205,551	472,447
2018/2008	*30.6%*	*42.5%*	*32.6%*	*44.0%*	*49.1%*	*39.4%*	*44.8%*	*40.4%*	*42.1%*	*40.6%*	*51.2%*	*38.8%*
Annual rate	*2.7%*	*3.6%*	*2.9%*	*3.7%*	*4.1%*	*3.4%*	*3.8%*	*3.5%*	*3.6%*	*3.5%*	*4.2%*	*3.3%*

Statistics Canada. Table 10-10-0005-01 Canadian Classification of Functions of Government (CCOFOG) by consolidated component

4. Adjusted disposable income, Consumption (HFCE, HAFC) and Savings.

In Table 10 below, we present macroeconomic accounts (MEA) data on compensation of employees, mixed income, property income received and paid, transfers in dollars to and from governments (including taxes paid), disposable income, social transfers in kind (STiK), adjusted disposable income, consumption (both HFCE and HAFC) and net savings.

The Table presents the most complete and inclusive data available, in particular regarding the STiK accounts, for which Statistics Canada is one of the first statistical agencies, if not the very first, to distribute those on a household income quintile basis. Such a distribution is essential for our purpose here of characterizing the evolution of consumption inequalities.

The estimate of employment income includes wages and salaries as well as the broader concept of employers' social contributions, including social contributions such as those to the CPP or QPP, workers' compensation plans, pension plans and other benefit plans. It is closer to global compensation. Scholarships, bursaries and research grants are included as current transfers in dollars to households paid from governments.[24]

In addition to including actual rental income from property owners as part of mixed income from self-employment, the MEA also includes an imputed rent calculation equivalent to the rental income homeowners would receive if they rented their dwelling.

The MEA includes investment income from life insurance and pension plans, savings deposits, and other types of insurance. Actual rental income is included under mixed income. Although property income received includes investment income earned in pension plans, this amount is subsequently transferred out in current transfers paid. Also,[25] property income paid includes interest payments on consumer credit, as well as interest on mortgages and non-mortgage loans.

Government transfers include all transfer payments from federal and provincial governments programs intended to provide income support to certain groups, such as seniors, families and those injured in the workplace. The MEA also include scholarships, bursaries and research grants as well as transfers received from corporations for pension plan benefits.

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[24] https://www150.statcan.gc.ca/n1/pub/13-607-x/2016001/944-eng.htm

[25] The following paragraphs on term definitions of terms are taken from https://www150.statcan.gc.ca/n1/pub/13-607-x/2016001/944-eng.htm

The MEA include transfers from non-profit institutions serving households (NPISH) and transfers received from non-residents, mainly through pensions paid by foreign governments and from non-resident households for purposes such as providing financial assistance.

Current transfers paid represents the income tax paid. For practical and quality reasons, the macroeconomic reference period for income taxes is on a cash basis instead of using an accrual method referring to the period of the economic activity: all amounts paid during the year as income tax are counted whether they are for past, current or future liabilities.

In addition to government income taxes paid, the MEA concept includes both employees' and employers' contributions to those social insurance plans. employer pension plan income (benefits) are included in the current transfers received from corporations, while the current transfers paid to corporations include all income that is not actually received by households (contributions and investment income).

Transfers to NPISH mainly include charitable donations, while transfers to non-residents are mainly payments of income taxes to foreign government on earnings received from investments in foreign securities, as well as transfers to non-resident households for purposes such as providing financial assistance.

Household disposable income is the sum of all revenue sources minus "current transfers paid" and "property income paid".

Statistics Canada characterizes the adjustment for changes in pension entitlements (see L63 in Table 10 below) as follows: The use of disposable income account also contains an adjustment for changes in pension entitlements. The secondary distribution of income account determines gross disposable income. In doing so, it excludes the contributions of employers and employees to pension funds since these contributions, once made, reduce the amount of income that is 'disposable'. However, these contributions are considered to be additions to the financial assets of the household sector and to the liabilities of the financial corporations and government sectors. They are therefore a form of gross saving, adding to households' equity in the pension funds. In addition, there can be other adjustments to households' net equity in these pension funds as, for example, when pension managers deduct fees from the account balance. If gross saving were determined simply by deducting final consumption expenditure from gross disposable income,

which excludes these contributions and other changes in entitlements, gross saving would be misstated. Accordingly, the additional 'resource' (for the household sector) and 'use' (for the financial corporations and government sectors) known as the 'adjustment for changes in pension entitlements' is added to the use of disposable income account. This brings gross saving back to its proper level.

The adjustment is equal to: the total value of the actual and imputed social contributions payable into pension schemes, plus the total value of contribution supplements payable out of the property income attributed to pension fund beneficiaries, minus the value of the associated service charges, minus the total value of the pensions paid out as social insurance benefits by pensions schemes.

Accordingly, the household sector's use of disposable income account includes gross disposable income and the adjustment for changes in pension entitlements as its 'resources' and final consumption expenditure and the balancing item, gross saving, as its 'uses'. The use of disposable income accounts for the government and NPISH sectors also include gross disposable income as their sole 'resource' and potentially include both individual consumption expenditure and collective consumption expenditure as well as the adjustment for changes in pension entitlements and gross saving as their 'uses'. There are no entries in the use of disposable income account for non-financial corporations, other than gross disposable income and gross saving which are equal since the sector does not make final consumption expenditures. Finally, the account for the financial corporation’s sector, and possibly also for the non-resident sector, includes as 'uses', in addition to gross saving, the adjustment for changes in pension entitlements which is the counterpart entry for the adjustment in the households account.

In Table 10, we present data for years 1999-2002 and 2015-2018, although data exist for the in-between years. The data must be read as follows. Employment income has increased for the lowest [highest] quintile households by 49.0% [72.7%] between 1999 and 2018. The ratio of household employment income of the highest quintile over the lowest quintile was 12.4 in 1999 and 14.4 in 2018. The average “avg3” was 12.6 for years 1999-2001 and 15.3 for years 2016-2018, an increase of 21.3%, indicating an increase in household employment income inequality between the former and the latter periods. The corresponding increase in mixed income inequality is smaller at 13.5%.

Net transfers in dollars, which subtracts from transfers received the taxes paid to governments, are positive for lowest quintile households and increased by 100.4% between 1999 and 2018, while they are negative for highest quintile households and decreased by 57.0%, that is, became more negative. The ratio**, equal to -40,543 / (40,543 + 5,113), reaches -8.9 in 1999 and -7.2 in 2018.

The avg3 ratio of net transfers in dollars decreased by 27.6% between the early three-year period and the late three-year period, indicating that the net transfers for the lowest quintile increased more than the net transfers for the highest quintile decreased. The difference in net transfers between the lowest and the highest quintiles increased by 61.9% from $45,656 in 1999 to $73,932 in 2018. This reduces income inequality.

The total effect of changes in income (employment, mixed and property) and net transfers in dollars is that household disposable income has increased between 1999 and 2018 by 62.8% for the lowest quintile and 74.9% for the highest quintile, translating into a slight increase of 4.8% in the avg3 ratio.

The household final consumption expenditures (HFCE) has increased for the lowest [highest] quintile households by 116.9% [70.3%] between 1999 and 2018. The ratio of HFCE of household highest quintile over the lowest quintile was 3.2 in 1999 and 2.5 in 2018, the same levels as the avg3 ratios, a reduction of 21.0%, indicating a significant drop in consumption inequality.

The social transfers in kind (STiK) increased for the lowest [highest] quintile households by 84.7% [80.8%] between 1999 and 2018. The ratio of STiK, for the highest quintile over the lowest quintile, remained at close to 1 for the entire period 1999-2018, translating into a small drop of -2.7% in the avg3 ratio.

Adding up the HFCE and STiK, one obtains the household actual final consumption (HAFC), which increased by 106.8% [71.6%] for the lowest [highest] quintile households between 1999 and 2018, for a reduction in the avg3 ratio of 16.8%. This shows a significant increase in consumption (106.8%) for the lowest quintile, which together with the smaller increase in consumption (71.6%) for the highest quintile translates into a significant drop in consumption inequality between the highest and the lowest quintiles.

Table 10: Disposable income, Adjusted disposable income, Consumption and Savings per Household by Quintile, Canada as a whole 1999-2018

	1999	2000	2001	2002	2015	2016	2017	2018	Variation
L3	**Employment income**								
lowest quintile	7,431	8,085	8,043	7,772	9,667	9,321	9,834	11,070	*49.0%*
highest quintile	92,031	102,729	103,404	109,175	154,244	149,596	153,853	158,904	*72.7%*
ratio	12.4	12.7	12.9	14.0	16.0	16.0	15.6	14.4	
avg 3		12.6					15.3		**21.3%**
L9	**Mixed Income**								
lowest quintile	2,512	2,621	2,351	2,769	3,087	3,110	3,212	3,420	
highest quintile	18,617	19,259	20,555	20,158	27,355	28,194	29,232	29,104	
ratio	7.4	7.3	8.7	7.3	8.9	9.1	9.1	8.5	
avg 3		7.8					8.9		**13.5%**
L15	**SUM of employment and mixed incomes**								
lowest quintile	9,943	10,706	10,394	10,541	12,754	12,431	13,046	14,490	*45.7%*
highest quintile	110,648	121,988	123,959	129,333	181,599	177,790	183,085	188,008	*69.9%*
ratio	11.1	11.4	11.9	12.3	14.2	14.3	14.0	13.0	
avg 3		11.5					13.8		**19.9%**
L21	**Net property income**								
lowest quintile	-600	-626	-934	-564	-817	-821	-790	-1,197	
highest quintile	22,643	23,210	23,271	21,192	38,329	34,389	36,872	37,891	
ratio*	38.7	38.1	25.9	38.6	47.9	42.9	47.7	32.7	
avg 3		34.2					41.1		**19.9%**
L27	**Net transfers $ = transfers received in $ minus transfers paid in $ (taxes)**								
lowest quintile	5,113	4,183	6,160	6,227	10,167	10,149	10,306	10,244	*100.4%*
highest quintile	-40,543	-44,848	-43,962	-44,587	-60,774	-58,614	-60,414	-63,668	*-57.0%*
ratio**	-8.9	-11.7	-8.1	-8.2	-7.0	-6.8	-6.9	-7.2	
avg 3		-9.6					-7.0		**-27.6%**
L33	**Household disposable income = total income (L15+L21) plus nets tranfers in $ (L27)**								
lowest quintile	14,455	14,264	15,620	16,204	22,104	21,760	22,563	23,537	*62.8%*
highest quintile	92,747	100,350	103,269	105,937	159,154	153,566	159,543	162,231	*74.9%*
ratio	6.4	7.0	6.6	6.5	7.2	7.1	7.1	6.9	
avg 3		6.7					7.0		**4.8%**
L39	**Household final consumption expenditure (HFCE)**								
lowest quintile	23,640	24,935	25,096	26,997	46,566	47,676	49,805	51,264	*116.9%*
highest quintile	75,144	79,300	81,032	84,767	119,903	121,816	125,468	127,963	*70.3%*
ratio	3.2	3.2	3.2	3.1	2.6	2.6	2.5	2.5	
avg 3		3.2					2.5		**-21.0%**
L45	**Social Transfers in Kind (STiK)**								
lowest quintile	10,721	11,117	11,575	12,419	18,597	18,847	19,105	19,807	*84.7%*
highest quintile	10,384	10,954	11,479	11,850	17,853	18,138	18,263	18,773	*80.8%*
ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	
avg 3		1.0					1.0		**-2.7%**
L51	**Household adjusted disposable income = Household disp. Inc. (L33) plus STiK (L45)**								
lowest quintile	25,176	25,381	27,195	28,623	40,701	40,607	41,668	43,344	*72.2%*
highest quintile	103,131	111,304	114,748	117,787	177,007	171,704	177,806	181,004	*75.5%*
ratio	4.1	4.4	4.2	4.1	4.3	4.2	4.3	4.2	
avg 3		4.2					4.2		**-0.2%**
L57	**Household actual final consumption (HAFC)**								
lowest quintile	34,361	36,052	36,671	39,416	65,163	66,523	68,910	71,071	*106.8%*
highest quintile	85,528	90,254	92,511	96,617	137,756	139,954	143,731	146,736	*71.6%*
ratio	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.1	
avg 3		2.5					2.1		**-16.8%**
L63	**Household net saving = L33 - L39 (or L51 - L57) plus Changes in pension entitlements**								
lowest quintile	-8,848	-10,096	-9,287	-10,841	-24,844	-26,277	-27,415	-27,935	*-215.7%*
highest quintile	22,546	27,510	27,223	27,410	46,287	37,820	40,209	41,393	*83.6%*
ratio*	3.5	3.7	3.9	3.5	2.9	2.4	2.5	2.5	
avg 3		3.7					2.5		**-34.1%**

In terms of household net saving, one observes that between 1999 and 2018 the value of consumption minus the value of incomes/resources has increased by 215.7% for the lowest quintile, while the value of incomes/resources minus the value of consumption has increased by 83.6% for the highest quintile: in a sense, the surge in consumption of the lowest quintile of households has been made possible by the surge in savings by the highest quintile of households.

5. Conclusion

After reviewing the developments of income and wealth inequalities since 1920, we tackled the task of characterizing the development of consumption inequality, which is arguably the more important and socially relevant type of inequality. Consumption inequalities have been significantly reduced over the last decades and most likely for a much longer period of time. One important factor has been the development of social transfers in kind which add significant resources equal to about 80% of disposable income. In comparison, social transfers in kind represent a 10% addition to disposable income for the highest quintile.

The nature of the links between wealth creation, the distribution of income and wealth and their redistribution remain front row elements of recurring debates in democracies. However, not all kinds or sources of inequality should be considered worrisome: inequality resulting from the choice of effort for example is presumably more ethical compared to inequality related to pure luck factors.

A crystallizing element is the fact that CEOs of large corporations earned this last year an average 281 times (a median 170 times) the median salary of their employees.[26] Similarly, income distribution has become more unequal recently in the arts and sports. In recorded music, according to Thomson (2014),[27] the top 1% of bands and solo artists earn 77% of all revenue from recorded music. In terms of concert revenues, Kruger (2013)[28] claims that the top 1% of performers captured 26% of revenues in 1982 and 56% in 2003, when the top 5 percent took home close to 90% of all

[26] Marcel Boyer (2019) cited above #1.
[27] Derek Thomson (2014), « The Shazam Effect », *The Atlantic*, December 2014. The author writes also "Even when offered a universe of music, most of us prefer to listen to what we think everyone else is hearing"!
[28] Alan Kruger (2013), "Land of Hope and Dreams: Rock and Roll, Economics and Rebuilding the Middle Class", Rock & Roll Hall of Fame, Cleveland (OH), June 12 2013.

concert revenues. Lunny[29] claims that in 2019 the top 1% now commands a whopping 60% of revenue.

In sports, according to Zingales (2010),[30] the winner of the Masters golf tournament earned in 2008 a prize equal to 103 times the annual salary of a groundkeeper, while it was three times in 1948. Expressed in expected terms, as the number of golfers has increased a lot and the competition has become worldwide, the ratio falls from 103 to 13 according to Zingales. He adds: "The golf example is illuminating because the same two phenomena that are driving the rise in golf prizes – enhanced competition and the increased value of being at the top – have also occurred in the corporate world, roughly at the same time. As the world market becomes integrated, it is more difficult for a company to survive. In turn, a lot of executives who would have earned a decent living running mediocre companies are wiped out. At the same time, the most efficient firms can apply their advantage over the entire world market now. The value of being the best has increased disproportionately, and companies – just like the Augusta Golf Club – are not going to run the risk of losing the jackpot to save a few dollars on the executives."

One potential factor is that the size and complexity of companies and "tournaments", where there is a winner-take-all syndrome, have increased with globalization: where there were two, three and more CEOs, there is now only one and where there were more winners in more (local) tournaments, there are fewer winners in fewer grand tournament contests.

As Freeland (2012)[31] puts it: "The average tenure of a Fortune 500 CEO has fallen from 9.5 years to 3.5 years over the past decade. That's true lower down the food chain, too. Thomas Philippon, the economist who documented the connection between deregulation and soaring salaries on Wall Street, also found that the jobs of financiers were very insecure. Nor does being your own boss protect you from the uncertainty of the markets. At a 2011 seminar at the Central European University in Budapest devoted to the psychology of investing, George Soros told the gathered academics that 'the markets are a machine for destroying the ego'."

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[29] Oisin Lunny (2019), "Record Breaking Revenues in the Music Business, But Are Musicians Getting a Raw Deal?", *Forbes*, May 15 2019.

[30] Luigi Zingales (2012), *A Capitalism for the People*, Basic Books 2012, page 20-25. The data is from 2008. It probably kept increasing during the last decade and more.

[31] Chrystia Freeland (2012), *Plutocrats: The Rise of the New Global Super-Rich and the Fall of Everyone Else*, Doubleday Canada.

One has to be careful before getting offended by the increase in income and wealth inequality.

Watson (2015)[32] writes: Our "preoccupation with inequality is an error and a trap. It is an error because inequality, unlike poverty, is not the problem it is so widely presumed to be. Inequality can be good, it can be bad, and it can be neither good nor bad but benign… Inequality is also a trap – not a trap anyone has set for us but one of our own making – because concern with it leads us to focus on the top end of the income distribution when our preoccupation should instead be the bottom where the bulk of human misery almost certainly resides."

The creation of wealth and the increase in productivity and wellbeing do not fall from the sky by the divine grace but are the fruit of the actions, research and reflections of creators, innovators and entrepreneurs who manage to produce more goods and services of better quality and greater value with the available resources (labor, materials, environment, capital).

The distribution of wealth is much more egalitarian in developed countries and has become more egalitarian as the level of development has increased, but for the last four decades or so. Wealth creation in an economy or society is shared between and captured through labor compensation, corporate profits, interest and investment income, net income of farmers, taxes less subsidies (governments).

A distinction must be made between the short term and the long term in wealth creation. In a period of accelerated technological transformation and wealth creation, income and wealth distribution becomes temporarily more unequal before becoming more egalitarian (the Kuznets hypothesis). The new wealth is first captured by those who are primarily responsible for its creation and better equipped or have better competencies to thrive in the new technological environment. The restructuring and reorganization of economic activities and the more widespread acquisition of newly valued skills increase productivity and favor less unequal distribution. We may have reached the peak of income and wealth inequality in western countries. A non-random group of economists surveyed by Alan Kruger in the mid-1990s named technological change as the main factor of income polarization followed by "unknown" and globalization.[33]

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[32] William Watson (2015), *The Inequality Trap: Fighting Capitalism instead of Poverty*, University of Toronto Press, Toronto.

[33] As reported by Chrystia Freeland (2012), *Plutocrats: The Rise of the New Global Super-Rich and the Fall of Everyone Else*, Doubleday Canada.

There is a level of inequality in the distribution of income or wealth that enhances the well-being of all by contributing to three related incentive-based social needs or imperatives: first, the need to ensure a proper level of savings and investments; second, the need to allow and induce a proper level of creative destruction through creativity, innovation and entrepreneurship; and third, the need to induce the proper but individually costly development and acquisition of new competencies. Those imperatives may be the most important determinants of gains in social well-being.

The redistribution of income and wealth can only be done in an effective and sustainable way by adapting the skills portfolio of individuals in order to increase their contribution to their fellow citizens' wellbeing and therefore their own value on labor markets at all levels. It is through institutions and mechanisms for the continuous, rapid and orderly adaptation of skills portfolios that individuals, their institutions and their governments can at best combine income generation and wealth creation with responsible redistribution. The best way to redistribute income and wealth is to promote everyone's participation in their generation and creation.

And the most significant socially relevant inequality is the inequality of consumption. Although data are not available for a long history, we have seen that consumption inequality has significantly decreased in Canada and most probably around the world over the last two decades and most probably much more.

As mentioned by Amartya Sen (2001)[34], "Pervasive poverty and lives that were "nasty, brutish and short," as Thomas Hobbes put it, dominated the world not many centuries ago, with only a few pockets of rare affluence. In overcoming that penury, modern technology as well as economic interrelations have been influential. The predicament of the poor across the world cannot be reversed by withholding from them the great advantages of contemporary technology, the well-established efficiency of international trade and exchange, and the social as well as economic merits of living in open, rather than closed, societies. What is needed is a fairer distribution of the fruits of globalization."

[34] Amartya Sen (2001), "If It's Fair, It's Good: 10 Truths About Globalization," *International Herald Tribune,* July 14, 2001.