Under the Rising Wave. How Disaggregated Revenue Sources Can Tell Another Story for Québec's Top Income Share

Nicolas Zorn*
Institut du Nouveau Monde, Montréal, Québec †
Olivier Jacques‡
McGill University, Montréal, Québec

February 2018

Abstract

Top income investigations usually rely on types of earnings that remain at a relatively aggregated level. Using a novel disaggregated dataset for Québec's top earners, we map the recent evolution of different types of income for the top one percent. Hidden under the steady increase of the top income share, we find that there has been very divergent and sharp rises of different revenue sources at specific moments. When looking at disaggregated data, composition effects and historical counterfactuals in Québec invalidate market-based theories like globalization and skilled biased technical change, but not institution-based theories like financialization, taxation and union strength.

D31. Personal Income, Wealth, and their distribution.

Keywords: inequality, top income, disaggregated income source, Québec

1. Introduction

Since the 1980s, income inequality in most developed countries has risen, most notably for the top one percent, although with varying outcomes. Many explanations have been proposed, which can be broadly categorized as market-based and institution-based theories. Both have their merits, and some general conclusions have been reached (Atkinson, Piketty, and Saez 2010). However, top income

*Nicolas Zorn, Institut du Nouveau Monde, Montréal, Québec. E-mail: nicolas.zorn@umontreal.ca

†Both authors wish to thank useful comments and suggestions by Christos Koulovatianos, Thomas Lemieux, Rahim Mohamed, Alain Noël, Michael Veall, three anonymous referees and participants at the Canadian Political Science Association's annual conference in Calgary, June 2016. Both authors acknowledge the financial support of the Social Science and Humanities Research Council of Canada.

‡Olivier Jacques, McGill University, Montréal, Québec. E-mail: olivier.jacques@mail.mcgill.ca.

databases – such as the World Wealth and Income Database (Alvaredo et al. 2016) – have (up to very recently) only provided aggregated data of average income, with little or no disaggregation for revenue types and other insightful information. Observations based on general comparisons – and simple correlations using aggregated income shares – may provide an interesting first step (Piketty and Saez 2003; Roine, Vlachos, and Waldenström 2012), but compositional effects inherent to aggregated data can hinder our ability to invalidate and further explore the causal processes described by top income theories.

Using a novel disaggregated dataset of administrative tax data for Québec's top earners from 1986 to 2008, we map the evolution of different types of revenues for the top one percent and bottom 99 percent. They include salary and capital gains, but also business income, asset revenues[1], and other income sources, as well as the number of declarants and amounts for each category. Although sometimes fastidious to assemble, this disaggregation of income sources is one of the few advantages that administrative tax data provide over surveys or other data sources. This can provide critical insights that go beyond the simple share of income, allowing us to explore the different processes affecting income sources.

Using only provincial data such as Québec's also avoids discrepancies that exist between provinces, since different regions in a country like Canada's have different economic structures, relying to varying degrees on services, manufacturing, agriculture or fisheries, as well as mineral or oil and gas extraction. With its relatively generous welfare state, one of the highest tax rates of North American jurisdictions and the resulting lower levels of inequality, Québec is also an interesting case to analyze top income's evolution.

Does the disaggregated evolution of Québec's top one percent tell a different story than the aggregated one? Can the main causal mechanisms proposed by the top income literature explain the trends observed at the disaggregated level? We find that theories advanced in the top income literature can, in some cases, explain general tendencies observed at the aggregated level, but not at the disaggregated level. Of course, we do not cast the first stone to the pioneers that have groped around with the data they had. This is simply a useful demonstration, and a humble plea to refine our understanding of the dynamics of inequality, by collecting more disaggregated top income data to test top income theories.

This paper offers two specific contributions. One is methodological, demonstrating how disaggregated tax data are not only a necessary complement to aggregated top income statistics, but essential to fully understand and disentangle the different processes at work. Our second contribution is empirical, challenging the main top income theories in the case of Quebec; comparing how they hold, we find that while they may generally fit with the aggregate data's evolution, some of them lose this ability at the disaggregated level.

Hidden under the stable increase of the top income share, we find that there

have been conflicting movements and sharp increases of different sources of income at different periods of time. Looking more closely at top income data from different revenue sources enables us to have a better understanding of which policies and which tendencies would matter (or not) for top incomes. We review in this light the main theories in the literature, cross-checking their premises with our dataset and other statistics. Each of these seven theories could, at first glance, explain Québec's top income evolution. However, when looking at disaggregated data, some of them are contradicted by this closer examination, a revealing illustration of this type of data source. Our main finding is that composition effects and historical counterfactuals contradict market-based theories but not institutional theories like financialization, taxation and union strength.

Our data source and our method have one notable shortcoming. Although we wished to add econometric demonstrations to our arguments, our dataset comprises of different time series[2] of only 22 data points – for only one unit of analysis (Québec) – which represents an insurmountable obstacle for credible statistical tests.

This being said, our time series have a significant advantage over other top income data: they are disaggregated in terms of types of revenue sources in a much more detailed manner that allows us to see information that is lacking in other micro-survey data (Lemieux and Riddell 2015), Canadian individual administrative fiscal data, and micro-data sets based on tax returns but linked by family (Saez and Veall 2006).

Also, a case study like this one is not without interest: "because they allow for more careful measurement and the tracing of causal processes, which statistical methods cannot normally accommodate, single case studies can be superior to aggregate analysis for testing some theories." (Hall 2003, 376) In this paper, we chose seven top income theories whose predictions fit with aggregate top income data in Québec, before confronting those theories and their causal mechanisms with our disaggregated dataset. In this sense, our method is more akin to *process tracing*, comparing evidence to sequences and conjuncture of events within a case, in order to determine the plausibility of theories and causal mechanisms (Bennett and Checkel 2015). We do not test theories in the statistical sense, so our empirical contribution should mainly be considered as an illustration of what disaggregated data can add to top income research[3].

The rest of the paper is divided as such. Section 2 presents the dataset and our main findings, and section 3 discusses dataset and disaggregation issues. Sections 4 and 5 examine how market-based and institution-based theories hold up to our disaggregated data, while section 6 concludes.

2. Dataset and main findings

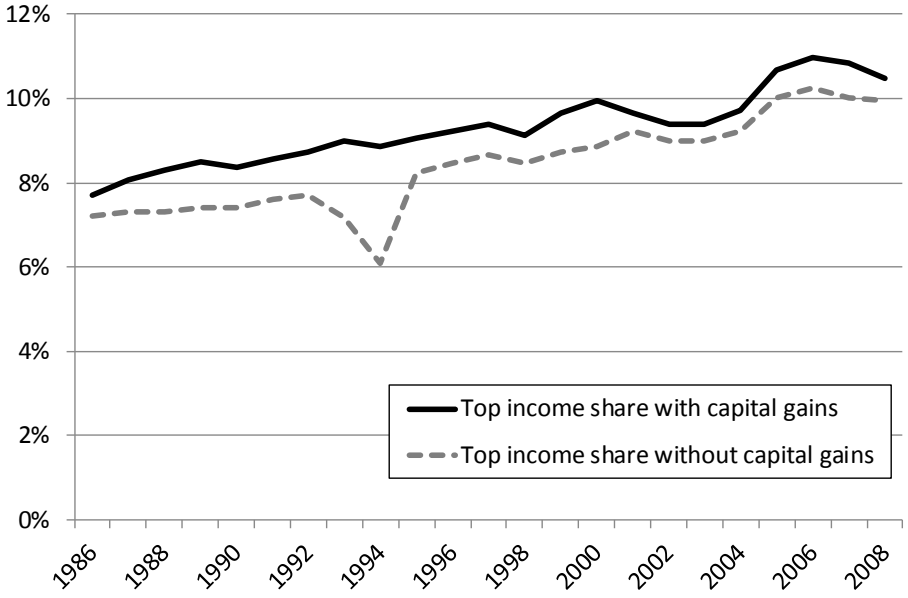
Our dataset is based on the annual publication of fiscal statistics – from the ministry of Finance of Québec – that divides individuals in twenty-five income groups, from which we have isolated the top one percent group and their income sources for each year. This group and the bottom 99 percent include all adults 18 years or older, an adjustment that follows Saez (2013). The income excludes taxes and transfers. The method we use adjusts the data has also been used in studies that are not based on top-coded data, such as Aaberge and Atkinson (2010).

Are included the (adjusted to inflation[4]) amounts and number of declarants for all the different types of income, deductions, tax credits, and so forth, from 1973 (or from 1986 for our more detailed account) to 2008, when it stopped being comparable with data beyond that year. While the detailed time series we use is only available from 1986 to 2008, those 22 years represent an interesting period as the top income share started rising in 1985 and it basically stood still since the economic crisis of 2008 (Statistic Canada, 2017). An extensive discussion of the data's methodology is detailed in Zorn (2015). Zorn (2015, 291) also compares his own dataset to similar administrative data gathered by Statistics Canada (2017). The two datasets display very similar trends[5] for the aggregated share of national income allocated to the top one percent, but the Statistics Canada data does not offer disaggregated income sources.

It is worth mentioning that the main caveat of using administrative tax data is that, because of obvious confidentiality issues, we cannot obtain additional information on top earners and combine our data with other datasets, each also having their own classification methodology. However, contrary to micro-surveys often used in the literature, our data isn't affected by underreporting issues typical of top income coding (Nau 2013)

Figure 1 shows the steady increasing trend of top incomes in Quebec from 1985 to 2008. Of all the income growth in Québec between 1986 and 2008, the top one percent claimed 16 percent of it, their income share growing from 7.7 to 10.5 percent. In this period, the top one percent's average income grew from 192 700$ to 325 800$, as shown in Table 1, which represents a 2.3 percent compound annual growth rate. In comparison, the average income of the bottom 99 percent went from 23 200$ to 28 100$. We can notice that corporate dividends clearly where the biggest growth engine for the top one percent in relative terms (+126 percent), followed by business income (+ 81 percent). Combined, they represented 34 percent of all income for the top one percent in 2008, compared to 29 percent in 1986. If labor income growth was less impressive (+66 percent), it still remained almost half of all top income revenue sources. In relative terms, capital gains and other income declined in importance, even if they increased in absolute terms (42 percent and 38 percent, respectively).

Figure 1
Income share of the top one percent, Québec, 1986-2008



Sources: Ministère des Finances du Québec 1973 to 2008; Statistics Canada 2016a. Calculations from the authors.

Table 1. Income composition for the top one percent, Québec, 1986 and 2008

	Total	Labor income	Business income	Capital gains	Corporate dividends	Other income
1986 ($)	192,664	92,211	35,931	11,928	20,229	32,365
2008 ($)	325,837	153,433	65,038	16,938	45,643	44,786
Growth ($)	133,173	61,222	29,107	5,010	25,414	12,421
Growth (%)	69%	66%	81%	42%	126%	38%
Growth/tot. (2008)		46.0%	21.9%	3.8%	19.1%	9.3%
Income/tot. (1986)		47.9%	18.6%	6.2%	10.5%	16.8%
Income/tot. (2008)		47.1%	20.0%	5.2%	14.0%	13.7%

Sources: Ministère des Finances du Québec 1973 to 2008; Statistics Canada 2016a, 2016b. Calculations from the authors.

Of course, these are averages, and there are many ways to reach the one percent threshold. Earners of corporate dividends, capital gains, business income and labor income are not necessarily the same people (Lemieux and Riddell 2015). The composition of top earner's income remained roughly similar from 1986 to 2008, and their income sources haven't necessarily grown for the same reasons. For example, if labor income may be attributable to skills and performance, increasing corporate dividends might rather be caused by financial dynamics in the stock market. Even if disaggregated income data showed exactly the same shares at the beginning and end of a period, the autonomous progression of each revenue source might not be linear, which offers two opportunities for counterfactual; the speeds and moments of their progressions may contradict theories that otherwise might claim validation with aggregated data. The combined impact of these can produce composition effects that veil the evolution of the real variables of interest.

Timing counterfactuals and the resulting composition effects are particularly visible when we look at the progression of different incomes, illustrated in figure 2. We can notice that more than 90 percent of labor income's rise happened between 1994 and 2000, which is only six years for the entire 22-year period. Also, the non-labor income has mostly risen between 2003 and 2007, mainly because of the considerable rise of corporate dividends[6]. Interestingly, those combined events produced the relatively smooth rise of the top income share in figure 1.

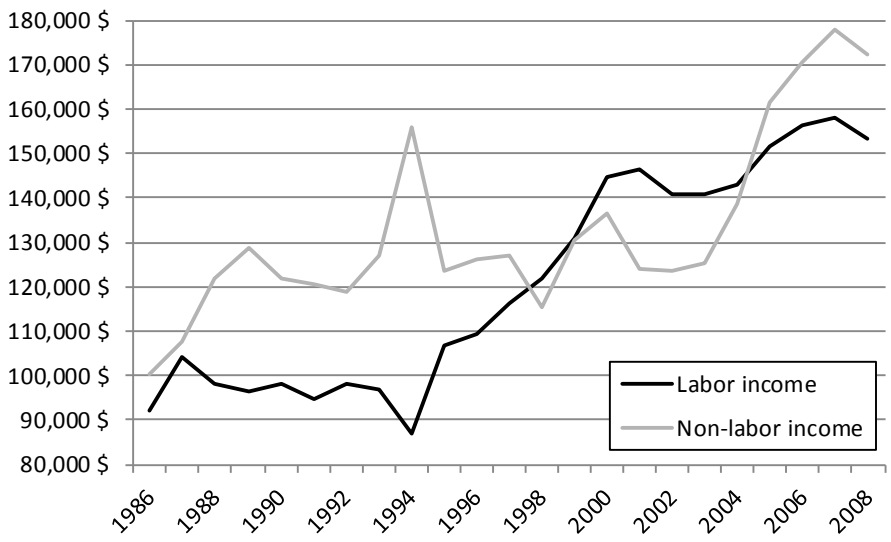
Completely invisible when looking at aggregated data, these are the two main events we are trying to explain with traditional theories of top incomes. Composition effects as shown in figure 2 clearly shows the interest of looking under the hood of top incomes with disaggregated data to avoid faulty conclusions. A priori, theories that take place in the medium to long term such as globalization or skilled biased technical change cannot necessarily account for those income surges in such short bursts. If some theories cannot explain the characteristics and patterns of the data, other explanations must be sought.

3. Comparing datasets and disaggregation issues

While an aggregated dataset allows broad pictures of general trends and levels of income disparities, a disaggregated one may be essential to understand and confirm which of the hypothesized theories can best explain the underlying causal mechanisms at work. Since income inequality affects different types of income at different periods of time, disaggregated data is needed to capture and better understand those trends and their impacts on top income growth.

In essence, the correct level of disaggregation depends on the level at which the causal mechanisms of the targeted group plays out; the smaller and more specific an income group is, and the more causal mechanisms can only be captured at meso- or micro-levels of analysis, the less adequate aggregated data become. This is why,

Figure 2
Labor and non-labor income for the top one percent, 1986-2008



Sources: Ministère des Finances du Québec 1973 to 2008; Statistics Canada 2016a, 2016b. Calculations from the authors.

for example, income data on the 0.001 percent is needed to fully comprehend top income dynamics. However, if an income group should be distinguished not by the *level* of their income (like that of the top 0.001 percent), but by *their* type of income (like doctors or rentiers in the top one percent), then data disaggregated in such a way is needed.

The top income literature hasn't explored specifically this issue so far. One very prominent use of disaggregated data by types of income is Bell and Van Reenen's (2014) analysis of top income trends in the United Kingdom which shows that bankers represent a growing share of top income earners. Their disaggregated data uncovers that increases of bonuses are the main driver of banker's income. However, in most articles, when disaggregated data in terms of income is used, it is usually done in a descriptive way, those articles' main goal being to present a new dataset (Kopczuk and Saez 2004, figure 9; Piketty, Saez and Zucman 2016, figure 1), sometimes adding comments on its compatibility with existing theories. Instead, we propose to *start* from specific hypotheses, and then to choose the appropriate disaggregated data. Of course, the appropriate data needs to be available, but important progress is being made with the World Wealth and Income Database. Our paper shows how this opportunity can be engaged.

We contend that the most valuable level of disaggregation for research on income distribution is by types of income because theories of income distribution contain propositions on the impact of different variables on specific types of in-

comes. By disaggregating up to the type of income source, we are better able to verify if predictions of these theories fit with the trends observed in one or multiple cases. This is the level of disaggregation our dataset provides. Other Canadian or Québec data sources have their own advantages and limitations. For example, Lemieux and Riddell's micro-survey data (2015) offers unique information on top income earners' educational level, major field of study, occupation, fraction of income from earnings, as well as industries with the largest relative share of top-1-percent-income earners. Canadian individual administrative fiscal data, and micro-data sets for households (Saez and Veall 2006) or individuals (Statistics Canada, 2017) can provide valuable information on the percentage of income from wages and salaries, or the percentage of top income earners in the same quantile or top 5 percent in preceding years. And all these datasets provide information on high income earners' income thresholds, share of income, as well as age, gender, and region or city of residence.

These datasets can be useful to challenge top-income theories and our article relies on them to provide additional support for our enquiry. However, our own dataset offers valuable insights (unavailable with the other datasets) with regards to the evolution of certain revenue sources directly affected by said theories. Also, the above data sources haven't uncovered the intriguing trends and sharp increases such as Figures 2 and 7, hidden trends that contradict the impression left by the slow upward progression that aggregated top income shares, seen in Figure 1. This exercise – comparing disaggregated trends with aggregated ones – can be particularly revealing of hidden or problematic causal mechanisms. Generalizing this practice would certainly strengthen top income research.

4. Challenging market-based theories

In this section, we confront three of the main market-based theories for the rise of top incomes, each being a variant of either globalization or technological innovation arguments. First, recent technological innovation – commonly referred to as skill-biased technical change – could impact the labor market by stimulating demand for highly qualified workers and rewarding them accordingly (Acemoglu 2002). When we look at the top one percent's labor income growth in table 1 (line 4), it has risen by 66 percent from 1986 to 2008. This is three times faster than the bottom 99 percent's labor income growth. However, this progression is not exceptional for top incomes, as we have seen that corporate dividends and business income for self-employed liberal professions have risen even more.

Lemieux and Riddell (2015) analyzed occupational data for top incomes in Canada and concluded that no such income surge happened in the likeliest sectors prone to technological innovation (IT specialists, for example). Instead, the Canadian top income surge originates mainly with workers in finance, senior executives

and the oil and gas sector, something that evokes rent extraction. Even without similar data for Québec, it is difficult to imagine what could considerably alter this result for the province. Also, a long-term process like skilled biased technical changes cannot explain by itself the sharp rise of labor incomes limited to six years in the second half of the 90s.

Even if we could extrapolate that the higher rate of growth for business income and corporate dividends happened because of technological innovation, it is necessary to put them in perspective. As shown in line 5 of table 1, these impressive growth rates only amount to about a third of total top income growth for the period. Also, as lines 6 and 7 of table 1 indicate, the structure of income remained roughly the same. To sum up, skill-biased technical change seems to offer at best very modest and partial explanations of top income growth in Québec.

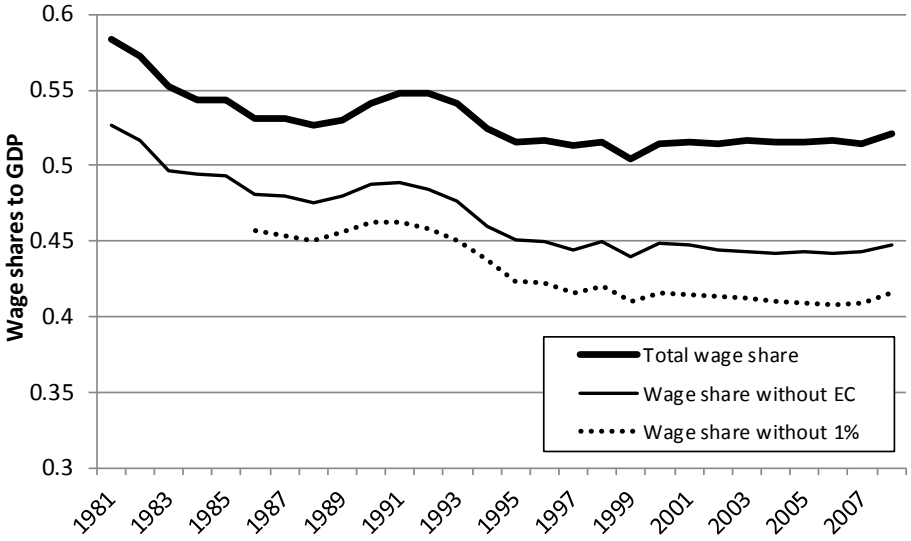
The second theory is the intensification of globalization (ILO 2013). Because it increases international competition and trade openness, it could favor financial capital by playing workers of different countries one against the other, creating a race to the bottom for salaries with outsourcing as the Damocles sword on labor's neck. This would result in a declining wage share relative to countries' GDP, which is strongly associated with the rise of top incomes (Kristal 2010). Capital owners are particularly well represented within the top one percent, since top income earners have the highest propensity to save. As the wage share would decline, top earners' non-labor income should increase correspondingly.

An initial look at Figure 3 seems to confirm this argument; the wage share tended to decrease, and even more so when the top one percent's employment income is excluded. However, the top income share began its rise only in 1985, and most of it took place after 1995, when the wage share stabilized. The latter doesn't seem to be affected by the rise of the one percent's non-labor income from 1986 to 1992, nor by the sharp increase in corporate dividend income in the mid-2000s. Therefore, this theory cannot explain Québec's top income growth, since it occurred *after* the drop in the wage share and it doesn't coincide with the periods of increasing non-labor income.

Our third market-based theory is globalization as the growing importance of international trade, which could increase the profitability of Québec's firms (Markusen 2004). Free trade treaties having considerably decreased or abolished tariffs and regulatory barriers, firms can now access much broader markets, which can largely increase their sales, profits and shareholder value. Senior executives and shareholders would directly benefit from this, thereby increasing the top income share.

This hypothesis is credible for Québec because its participation in the North American Free-Trade Agreement (NAFTA) corresponds to an important increase in trade in the early 1990s, as illustrated in Figure 4. This rise in exports also corresponds to the steep increase in the one percent's labor income in the second half of the 90s. Moreover, imports didn't rise as much as exports, the balance of

Figure 3
Total wage share (with social insurance contributions paid by employers), and wage share without employer contributions (both for all workers), and without the top one percent wage share, all in percentage of GDP, Québec, 1981-2008



Sources: Ministère des Finances du Québec 1973 to 2008; Statistics Canada 2016a, 2016b, 2016c. Calculations and compilation from the authors.

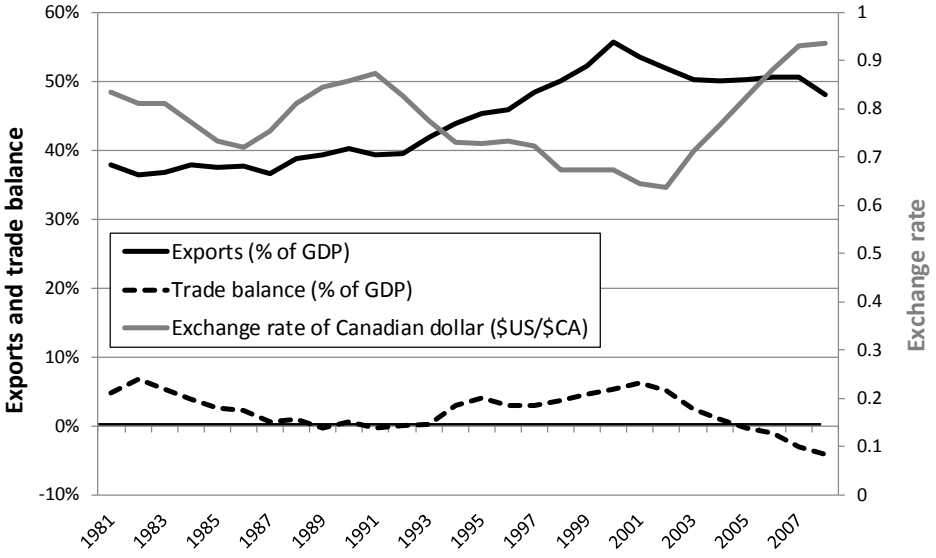
payments being positive in the same period.

The globalization argument shouldn't be overstated, however, because exports depend as much on trade openness as on currency fluctuations. When the exchange rate became particularly favorable to Canada's currency in the mid-2000s (also shown in Figure 4), it coincided with a decrease of exports to the United States, Québec's main business partner.

Understandably, globalization can generate the opposite result, since increased competition between firms can also decrease their profitability. However, this doesn't seem to have occurred in overwhelming proportions, an important hint being the rise in net profits for Québec firms increased when exports rose, as illustrated by Figure 5. Notwithstanding the sharp drops of the first two years of the period and the beginning of the 1990s (recession years), we can distinguish two different periods, illustrated by the dotted lines. The profit share is higher and increasing in the second period. This second phase corresponds to the most important growth period of the top one percent, with 66 percent of their average individual income increase between 1986 and 2008 taking place after 1998, with the average income growing from 237 400$ in 1998 to 325 800$ in 2008. A priori, it looks like this globalization-increases-profit-and-inequality argument could stick.

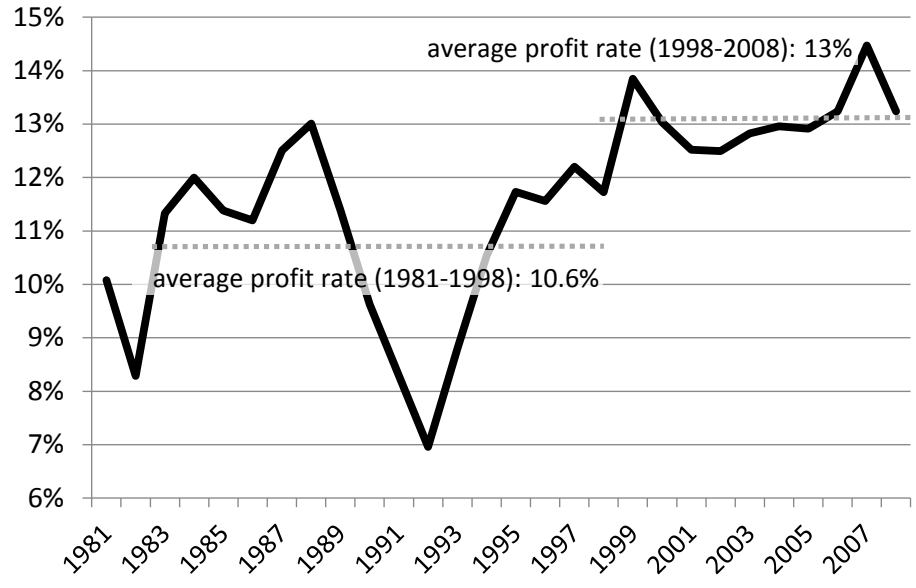
This being said, some counterfactuals diminish this argument's explanatory

Figure 4
Exports (goods and services) and trade balance of Québec in percentage of the GDP, and exchange rate (Canadian-to-United-States dollar), 1981-2008



Sources: Statistics Canada 2016d; Bank of Canada 2016. Calculations and compilation of the authors.

Figure 5
Net profits of firms to GDP, Québec, 1981-2008



Sources: Statistics Canada 2016c. Calculations and compilation of the authors.

power. For example, this upward trend reverses in the following years, not illustrated in the figure; this constant decline of the profit share after 2008 reached 10.7 percent in 2014, its lowest level since 1994. Of course, the Great Recession is probably the main culprit for this drop, but this also means that the increase preceding the 2008 crisis lasted only a couple of years, while globalization should be a more long-term phenomenon.

Moreover, the 1998-2008 period corresponds to the only growth period of the income of the bottom 99 percent, in particular because economic growth was strong and unemployment declined. And if the second period corresponds to the notable rise of the top one percent's corporate dividend and business incomes, it also saw top income *wages* rise considerably too, as we saw in Figure 2. In fact, the wage share remained stable, even when excluding the top one percent, as shown in Figure 3. If profits increased while wages where stable, this means that investments declined, a hint of financialization's tendency of rent extracting in favor of shareholders (Bourque 2013), as we will see in the next section.

Furthermore, even business income could only remotely be connected to globalization, since roughly 80 percent of this category is comprised of net incomes of profession, declared by self-employed individuals exercising a liberal profession (doctors, engineers, lawyer, veterinarians, architects, notaries, etc.) that generally rely on domestic markets. As for corporate dividends, the individual amounts did double from 1998 to 2008, but 70 percent of this increase took place between 2003 and 2006 (+ 15.2 percent a year, on average). Québec's increase of exports does not match with this period, and the internationalization of trade happens in a much longer timeframe. Financialization offers a much more convincing explanation of this trend, as described in the next section.

To summarize, rentiers and top income investors gained ground, as seen with corporate dividends and capital gains, as did liberal professions and high-income wage-earners, whereas some exporting entrepreneurs probably gained considerably from trade internationalization. However, none of the market-based factors clearly seem to explain the growth of the top income share, especially when we look at the short burst in specific types of income uncovered in the disaggregated data. The numerous counterfactuals we have presented allow us to conclude that, like technological innovation, globalization can at most explain only a modest proportion of the income growth of Québec's top one percent. As the next section shows, some of the institutional-based factors hold greater explanatory power and fit better with the data.

5. Confronting institution-based theories

In this section, we confront four of the main institution-based theories claiming to explain the rise of top incomes, which are financialization, personal taxation, cor-

porate taxation, and union strength. Firstly, the financialization of the economy is often regarded as one of the main causes of the rise of the top one percent's income share in rich countries (Flaherty 2015). It can be defined as "*the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies*." (Epstein 2005, 3)

This theory argues that the deregulation of the financial sector and the adoption of corporate governance have empowered shareholders, who increasingly rely on rent extraction to increase their income and income share, at the expense of workers and consumers (Stiglitz 2012). We can define rent extraction as the use by an economic agent of his economic, social or political resources to extract additional economic gains, without participating in its creation. The same can be true for the financial sector extracting rents from the real economy, where shareholders act as a social class. Shareholders can increase their rents by furthering a particular vision of corporate governance, which aligns the interests of business executives with theirs. They do so by giving these managers pay incentives and stock options, so as to focus on maximising stock valuation and shareholder's dividend payments (Bourque 2013).

If financialization certainly entails bigger gains for top managers and financial workers, which represent about a quarter of top income earners in Canada (Fortin et al. 2015), it also means increased corporate dividends to top income earners in other professions or with different occupations. Wealth being more unequally distributed than income and top income earners having a lower propensity to spend (Dynan et al. 2004), those savings may end up in the financial market, especially since "*financial assets are less equally distributed than nonfinancial assets*" (Davies and Shorrocks 2000, 607). Therefore, financialization will favor this additional revenue stream, something disaggregated data allows us to look at.

Financialization should translate in higher stock prices and a larger share of the financial sector in the economy because maximizing shareholder value is increasingly manager's prime focus, both in financial and non-financial sectors (Tomaskovic-Devey and Lin 2011; Van Treeck 2009). If large enough, these processes should be visible at the aggregate level with Québec's top one percent's income share, and at the disaggregated level with corporate dividends paid to the top one percent. Figure 6 shows a steep increase in stock prices on the Toronto Stock Exchange in the 2000s, which is reflected in the top one percent's important increase in dividend income during the same period. This is not surprising, since our measure of corporate dividend is by definition disposable income from Canadian firms, the latter being well represented in the TSX index.

This being said, financialization may not be the only culprit in this case since this steep rise of corporate dividends match the price increase of energy commodities in the mid-2000s, which are overrepresented in the TSX. This does not contradict financialization *per se* since higher revenues for oil and gas firms could have

been reinvested, saved or converted to in higher employee pay and lower consumer prices, but were still transferred to stockholders. Here again, disaggregated data allow nuances that would have been invisible in aggregated data.

The size of the financial services sector in Québec's economy is our second measure of financialization, which conveys an adequate representation of the importance of finance relative to other sectors (Krippner 2011; Roberts and Kwon 2017). Ideally, we would present the share of the financial sector's profits as a percentage of all corporate profits (Tomaskovic-Devey and Lin 2011) or financial sector's gross operating surpluses as a percentage of all economic sectors (Flaherty 2015), but these measures are unavailable for Quebec.

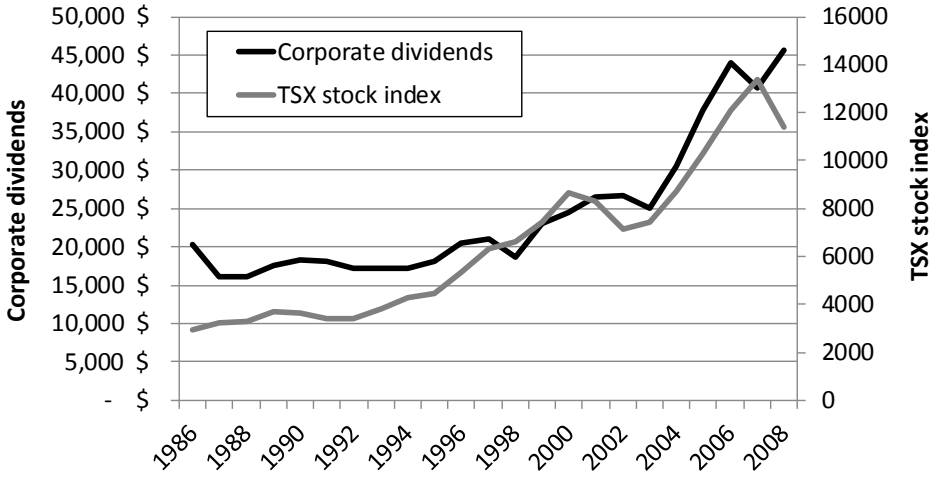
Quebec's financial sector has grown by 21 percent since the middle of the 1980s, from 5.2 percent of GDP in 1986, to 6.3 percent in 2008, as shown in Figure 7. It does fit the evolution of the top income share at the aggregated level, as both variables follow a moderate and steady tendency to rise. This being said, a third of this increase happened between 2003 and 2006, which coincides with the sharp rise in corporate dividends, as shown in Figure 7. The correlation between this measure and corporate dividends is strong, at 0.82. However, the increasing size of the financial sector between 1990 and 1995 wasn't accompanied by a similar rise in corporate dividends over the same period, which shows that the causal mechanism involved isn't always as clear as we could think. Nevertheless, like stock valuations and corporate dividends, the size of the financial services sector has increased.

Even if our two financialization measures stick relatively well to this story of rising corporate dividends, they represented only 14 percent of the one percent's total income in 2008, as shown in table 1. Did they really have a significant impact on the rise of the top one percent? When we look at the last ten years of our dataset (1999-2008), which is the period when corporate dividends took off, they account for a third (+35 percent) of the increase in the one percent's total income[3]. From 1986 to 2008, they account for 19 percent of the increase of total income. Therefore, the financialization of the economy can explain a significant part of Québec's top income rise, especially in the 2000s.

This is a good example of the usefulness of disaggregated data, since financialization would be more or less assessed at the aggregate level, with all the imprecision involved. Most notably, the evolution at the aggregated level of high income earners income does not follow the same trend as the TSX index. Although they both show a rising trend, the share of the top one percent increases in a much more linear and regular way than the TSX index, which displayed steep increases after recessions.

Our second institution-based theory of top income growth is related to top marginal tax rates (TMTR) applied to personal income. They are shown to be an important factor restraining top income growth (Atkinson, Piketty, and Saez 2010; Huber et al. 2017). Some authors credit between a third and half of top

Figure 6
Corporate dividends of Québec's top one percent (individual mean) and TSX stock index annual average, 1986-2008



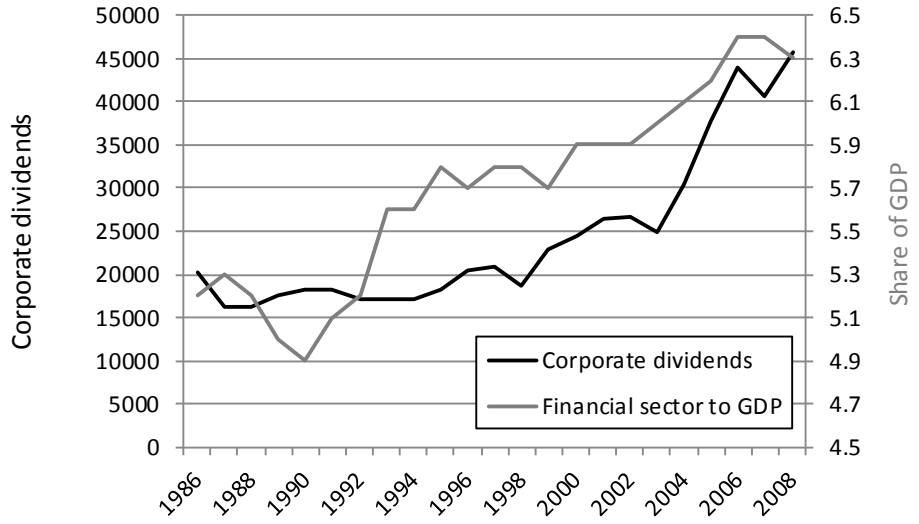
Sources: Ministère des Finances du Québec 1986 to 2008; Statistics Canada 2016a, 2016b; 1Stock1 2016. Calculations and compilation of the authors.

income growth to changes in these tax rates (Atkinson and Leigh 2010, 33). Non-coincidentally, TMTRs have declined considerably in the last decades, although with notable differences among countries.

The causal mechanisms are rather indirect, because our dataset (as most of the literature and databases) focuses on market, or pre-tax, income. Four more-or-less indirect causal mechanisms can come into play. A higher TMTR can push top one percenters to 1) reduce work effort and working hours, 2) engage in income shifting and other tax avoidance strategies, 3) reduce rent (or surplus) extraction efforts that will increase their income at the expense of others, and 4) reduce their capacity to accumulate income-generating capital. A lower tax rate would have the opposite effect.

If taxable income elasticities are high with top income earners, tax avoidance is actually a better explanation than supply-side responses in terms of efforts and work hours (Saez, Slemrod, and Giertz. 2012). Rent extraction is another channel with important explanatory power; when TMTRs are lower, there are more incentives for top income earners to bargain a wage hike without a corresponding increase in productivity. This additional compensation will be at the expense of the less powerful stakeholders of an organization such as workers or tax payers, meaning that what the top one percent gains, the bottom 99 percent will lose (Piketty, Saez, and Stantcheva 2014). As for the accumulation of income-generating capital made possible by low TMTRs, its impact can be important, but only in the long term, sometimes after a couple of decades (Kopczuk and Saez 2004; Piketty 2010, 830).

Figure 7
Average corporate dividend income declared by declarants in top one percent and financial sector as a share of GDP, Québec, 1986-2008

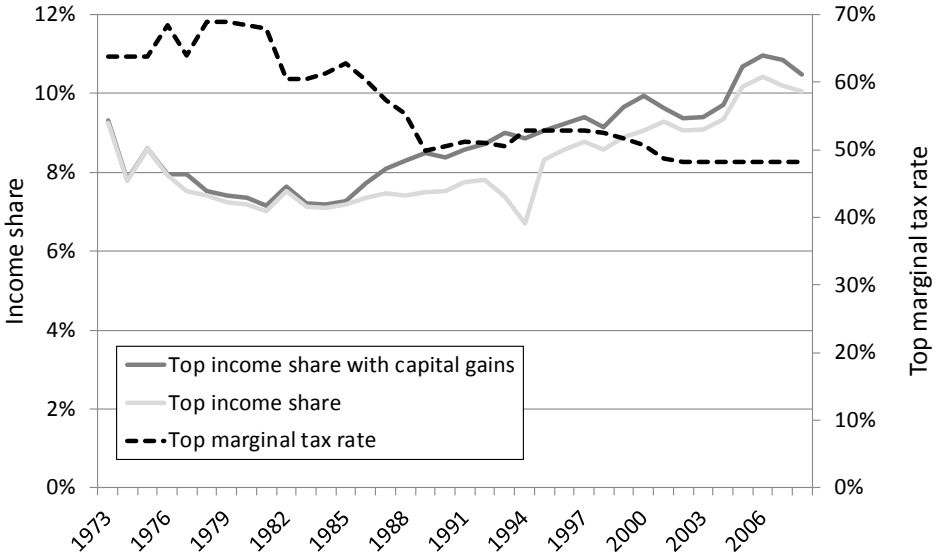


Sources: Ministère des Finances du Québec 1986 to 2008, Statistics Canada 2016a, 2016b; ISQ 2016a. Calculations and compilation from the authors.

To sum up, TMTRs work as a ceiling on the capacity of top income earners to increase their different types of income, affecting growth rates of individual-level taxable income (instead of corporate taxes; more on that later). This means that this institutional factor will impact different types of income in combination with other factors; when this upper bound is lifted, top incomes can grow much more quickly. This also means that we can only indirectly infer its impact, in part because our dataset isn't lengthy enough for solid econometric results.

Contrary to our other factors, we can emphasize that TMTRs can affect all types of taxable income, whereby a decrease in the tax rate will further lift the ceiling on top incomes. In other words, lowering the TMTR makes the increase of different revenue sources likelier and stronger. This may render possible, or accelerate, a dynamic cumulative effect, since the top one percent's higher propensity to save will generate further revenue streams. Combining short-term and long-term effects of TMTRs, Zorn (2017) has estimated that this dynamic effect can explain approximately between one and three-fifths of Québec's rising top income share between 1973 and 2008[7], a result that is similar to Atkinson and Leigh (2010). The counterfactual here is if the TMTR was lowered before different types of income began to rise, which was the case here. The clear negative relationship between TMTR and top incomes share is shown in Figure 8: lower TMTR coincides with a higher share of national income going to the top one percent.

Figure 8
Top one percent's income shares and combined federal and provincial top marginal tax rate, Québec, 1973-2008



Sources: Ministère des Finances du Québec 1973 to 2008; Statistics Canada 2016a, 2016b; Canadian Tax Foundation 1973 to 2008. Calculations and compilation from the authors.

The third factor is the role of corporate tax rates (CTRs) in facilitating increasing non-labor income; we can presume that they will reduce income concentration at the top if they are high enough, since they affect profits, and therefore capital gains and corporate dividends (Atkinson and Piketty 2007, 148). Those revenue sources are disproportionally declared by top income earners: in 2008, 48 percent of all capital gains and 43 percent of all corporate dividends were declared by the top one percent, compared to 37 percent of all business income, and only 7 percent of all labor income. Finally, when CTRs are significantly lower than the TMTR and tax avoidance opportunities exist, high-income earners will have a greater incentive to convert when possible their labor income to corporate income (income shifting), thereby reducing their effective tax rate (Ganghof 2006).

Although it remains very difficult to evaluate corporate tax incidence precisely, Clausing (2012) has shown that previous models of tax incidence overestimate the extent to which corporate taxes fall on labor, while underestimating its impact on capital. Also, Auerbach (2006) argues that corporate taxes represent a tax on economic rents. Thus, we have good reason to believe that CTRs should have a negative effect on top incomes earners' business and dividend income, since these two sources of income are the most likely to be affected by those taxes.

Ideally, we would present data on the effective corporate or capital tax rate, but

it is unavailable for Québec. However, top statutory corporate tax rates, especially when using combined federal and sub-national rates (in the case Québec), are useful proxies of taxes on corporations[8]. In Québec, combined federal-provincial top corporate income tax was around 50 percent in 1986, before decreasing from 1988 to 1991 to 43 percent, as shown in Figure 9. They remained approximately at that level, until they were significantly lowered between 2003 and 2008, reaching 30 percent at the end of this period.

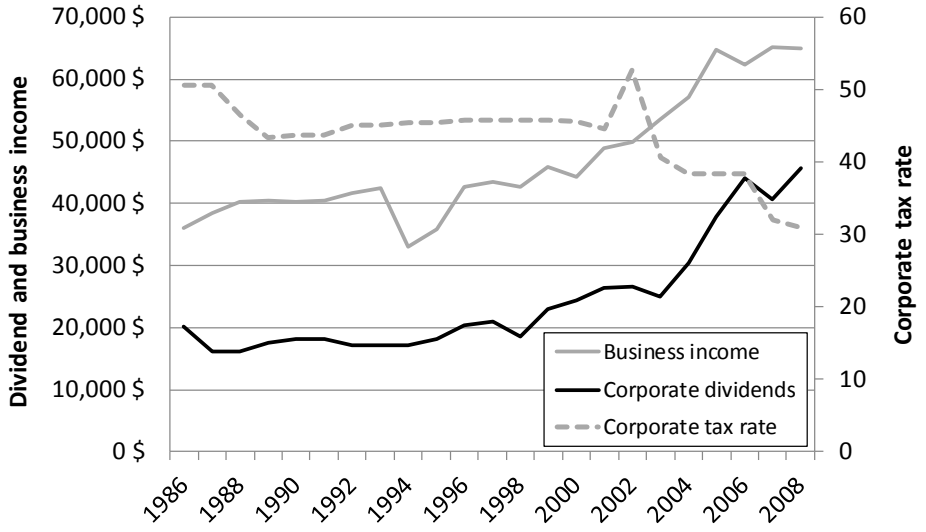
It seems that CTRs could have had a certain impact on top income on business and dividend income. Figure 9 shows that these three variables are moving in similar directions, and the most important increases of those two types of income occurred mostly after the tax reductions were enacted. Nevertheless, CTRs do not show enough variation over time to be strongly correlated with the steady increase of top earners' total income, which suggests a more modest impact at the aggregated level than on business income and dividends.

Our last institutional theory is union strength. Unions are seen as an institutional barrier to inequality in general (Jaumotte and Buitron 2015), and to top income growth in particular (Flaherty 2015, Huber et al. 2017). Of all the variables influencing top income shares in Huber et al. (2017), union density is the variable with the strongest impact. Unions should impact top incomes through two distinct channels. First, strong unions influence the structure of markets and affect pre-distribution by strengthening the bargaining position of wage earners. This would clearly benefit the bottom 99 percent, at the expense of firm profitability and wage disparities, both of which should disproportionally benefit the top one percent. Also, unions within firms can put pressure on managers to limit the increase of business executives' pay schemes (Levy and Temin 2010).

Second, strong unions can put pressure on politicians to implement policies like labor protection and the minimum wage, but also public services and progressive taxation. Those policies will increase the income of people in the bottom 99 percent and strong unions can counteract powerful business interests that favor less equalizing institutions. In this sense, unions can act as pro-labor interest groups, representing a crucial component of labor's power resources (Huber et al. 2017; Volscho and Kelly 2012).

Québec has the most unionized members per capita in North America, and unions are mainly present in its large public sector. Since the 1980s, union density has not declined as significantly in Québec as in other jurisdictions, but there was a decrease of more than five percentage points from 1993 to 1999, as shown in Figure 10. In fact, union density in the public sector stayed relatively constant (around 82 percent), but it declined slightly in the private sector, from 28.4 percent in 1997 to 26 percent in 2008 (ISQ 2016). Unfortunately, data on private sector's union density is unavailable before 1997. However, since the public sector's union density and the share of total employment in the public sector are relatively stable in

Figure 9
Top one percent's average corporate dividends, business income and combined federal and provincial top corporate income tax, Québec, 1986-2008



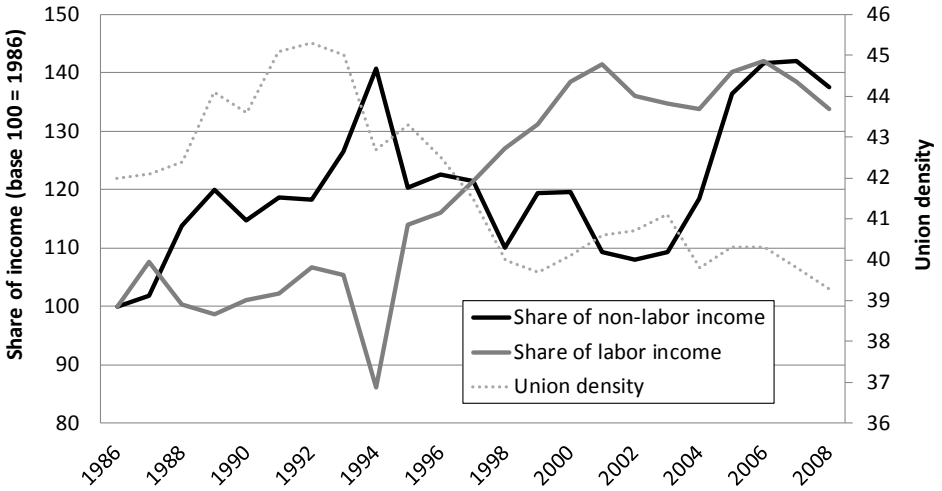
Sources: Ministère des Finances du Québec 1986 to 2008; Statistics Canada 2016a, 2016b; Canadian Tax Foundation 1994 ans 2012. Calculations and compilation from the authors.

the period under consideration (ISQ 2015, calculated by Desrochers and Schepper), we can assume that changes in total union density are mostly due to changes in the private sector.

Figure 10 shows that the decline of union density during the mid-1990s coincides with the rise in the top earner's labor income. Collective bargaining coverage rates, which limits wage disparities, have also declined significantly from 1990 (47.5 percent) to 1998 (40 percent), and have remained steady since then (ISQ 2014). As union density stagnated at its lower bound in the 2000s, we could assume that labor's bargaining power and strength was weakened enough to at least facilitate the increase of non-labor income and of the share of the total income allocated to the one percent (not shown in graph). However, Figure 10 suggests that the evolution of top earner's non-labor income does not seem to be as affected by union density as their labor income.

Although we have neither the space nor the data to convincingly test the causal mechanisms involved, the presence of stronger unions certainly can account for the more moderate increase of Québec's top one percent, compared to his North-American neighbours (see Zorn 2017, chapter 4). However, Figure 10 hints that their relative decline may have favored top earner's labor incomes.

Figure 10
Top one percent's share of labor and non-labor income to national income (base 100 = 1986), and union density, Québec, 1986-2008



Sources: Ministère des Finances du Québec 1986 to 2008; Statistics Canada 2016a, 2016b; ISQ 2016b (for union density data beginning in 1997); Haddow 2015 (for union density data before 1998). Note: Haddow's calculations are used to avoid a break in the time series. Calculations and compilation from the authors.

6. Conclusion

Disaggregating top income data offers promising opportunities to deepen and nuance our understanding of the growing economic disparities that define our epoch. We have seen that under the slow but somewhat constant rise of Québec's top income share lies a variety of sharp increases of different income sources. We have shown the risks of fallacy of composition effects and the importance of timing counterfactuals. Of all the theories we examined, our general conclusion would have been different and rather limited if we had only relied on aggregated top income data.

Reviewing the usual suspects for top income growth, we have shown that market-based theories like technological change and globalization failed to preserve their explanatory power at the disaggregated level we investigated, even if it is possible that those factors could matter in more unequal societies. As for institution-based theories like financialization, fiscal policy and union strength, they actually hold up fairly well to the evidence and data we analyzed, especially when analyzing disaggregated data.

These results show how public policies can have a big impact on the evolution of top incomes. This can give hope to those who believe that societies are powerless when it comes to income disparity at the top. It also shows the importance of studying institutions, warranting political scientists to reclaim and contribute to a

subject widely dominated by economics. Beyond the theories we surveyed, we wished to show the great potential of expanding and disaggregating top income datasets. The recent changes brought to the World Wealth and Income Database (Alvaredo et al. 2016) show encouraging progress.

Causal mechanisms can be, and probably are, different in other provinces and countries. Therefore, disaggregating top income data at sub-national levels also shows considerable potential, by combining additional case studies with the already large and growing number of comparative studies on top incomes. This would, among other things, allow us to investigate the relations between the evolution and characteristics of the economic structure with those of top incomes, or even with political and social changes.

Of course, we cannot generalize our results without a sufficient number of similar case studies in other countries, in addition to proper econometric modelling and statistical enquiries. With the data at our disposition, our empirical investigation was basically limited to making informed observations and cross-checking the data and trends. Nevertheless, we consider that our demonstration has accomplished its goal, and our paper actually showed only a fraction of the disaggregated data we uncovered, which include amounts and number of declarants, as well as a disaggregated picture of different business incomes.

Future work should do appropriate tests of the main theories about the rise of top incomes by using disaggregated data. Ideally, researchers should build similar datasets with taxpayer data from other Canadian provinces to increase the number of cases. There is sufficient variation in the main variables of interest between Canadian provinces to perform proper statistical tests, while naturally controlling for unobserved characteristics often present at the country level. For example, with additional data from other provinces, we could verify whether the size of the financial sector is correlated with top earners dividend income and whether corporate tax rates are associated with business income and corporate dividends of top earners. We could also test the causal mechanism of union density on top incomes by verifying if union density co-varies with top earners' labour income. Finally, to test theories about skilled biased technical change, we should see a clear association between top earners labour income and demand for high-skilled labour. We believe that disaggregated data on top incomes is an empirical treasure-trove just waiting to be unearthed and we encourage other researchers to build datasets containing disaggregated data by types of income in order to improve the empirical verification of top incomes theories.

7. References

1Stock1. 2016. "TSX stock index annual average." Accessed 12 may 2016. http://www.1stock1.com/1stock1_139.htm.

Aaberge, R., and A. B. Atkinson. 2010. "Top Incomes in Norway." in Top Incomes: A Global Perspective. edited by A. B. Atkinson and T. Piketty, 448-481. Oxford et New York : Oxford University Press.

Acemoglu, D. 2002. "Technical Change, Inequality and the Labor Market." *Journal of Economic Literature* 40: 7-72.

Alvaredo, F., T. Atkinson, T. Piketty, E. Saez, and G. Zucman. 2016. "World Wealth and Income Database." Accessed 30 June 2016. http://www.wid.world/

Atkinson, A. B., and A. Leigh. 2010. "The Distribution of Top Incomes in Five Anglo-Saxon Countries over the Twentieth Century." Discussion Paper No 4937, Bonn: Institute for the Study of Labor.

Atkinson, A. B., and T. Piketty., eds. 2007. *Top Incomes over the Twentieth Century. A Contrast between Continental European and English-Speaking Countries*. Oxford: Oxford University Press.

Atkinson, A. B., T. Piketty, and E. Saez. 2010. "Top Incomes in the Long Run of History." In *Top Incomes: A Global Perspective*, edited by A. B. Atkinson, and T. Piketty, 664-759. Oxford : Oxford University Press

Auerbach, A. J. 2006. "Who Bears the Corporate Tax? A Review of What We Know." *Tax Policy and the Economy* 20 (1): 1-40.

Bank of Canada. 2016. "Exchange rate for United States Dollar, annual average. " compiled by Statistics Canada, Table 176-0064. Accessed 7 May 2016.

http://www5.statcan.gc.ca/cansim/a26?lang=fra&retrLang=fra&id=
1760064&&pattern=&stByVal=1&p1=1&p2=37&tabMode=dataTable&csid=.

Bell, B & J. Van Reenen. 2014. "Bankers and their Bonuses" The Economic Journal. 24 (574): F1-F21

Bennett, A. & J.T. Checkel (eds.). 2015. *Process Tracing.* Cambridge: Cambridge University Press.

Bourque, G. L. 2013. "La financiarisation de l'économie nuit-elle aux entreprises?" Note de Recherche de l'IRÉC. Institut de Recherche en Économie Contemporaine.

Canadian Tax Foundation. 2012 *Finances of the Nation*. Toronto: Canadian Tax Foundation.

Canadian Tax Foundation. 1994. *National Finances*. Toronto: Canadian Tax Foundation.

Clausing, K. A. 2012. "In Search of Corporate Tax Incidence." *Tax Literature Review* 65: 433-472.

Davies, J., & A. Shorrocks. 2000 "The Distribution of Wealth." *in* Handbook of Income Distribution, Vol. 1. edited by A. Atkinson and F. Bourguignon, 605-675. New York: Elsevier.

Desrochers, François and Bertrand Schepper. 2015. "Le secteur public et l'économie régionale au Québec." Institut de Recherche et d'Information Socio-Économiques.

Dynan, K., J. Skinner and S. Zeldes. 2004. "Do the rich save more?" *Journal of Political Economy*, 112 (2): 397-444.

Epstein, G. E. 2005. "Introduction: Financialization and the World Economy." In *Financialization and the World Economy*, edited by G. E. Epstein, 3-16. Cheltenham: Edward Elgard.

Flaherty, E. 2015. "Top Incomes Under Finance-Driven Capitalism, 1990–2010: Power Resources and Regulatory Orders." *Socio-Economic Review* Special Issue Paper: 1-31.

Fortin, N., D. A. Green, T. Lemieux and K. Milligan. 2012. "Canadian Inequality: Recent Developments and Policy Options." Canadian Public Policy, 38(2) : 121–145.

Ganghof, S. 2006. *The Politics of Income Taxation: A Comparative Analysis*. Colchester: ECPR Press.

Godbout, L. P. Fortin, and S. St-Cerny. 2006. "La défiscalisation des entreprises au Québec est un mythe. " Document de travail. Chaire de recherche en fiscalité. Université de Sherbrooke.

Haddow, R. 2015. *Comparing Quebec and Ontario*. Toronto: University of Toronto Press.

Hall, P. 2003. "Aligning ontology and methodology in comparative politics." in J. Mahoney and D. Rueschemeyer (eds.) *Comparative Historical Analysis in the Social Sciences*. Cambridge: Cambridge University Press.

Huber, E. J. Huo and J. D. Stephens. 2017. "Power, Policy and Top Income Shares." *Socio-Economic Review*. Advanced Access.

ILO. 2013. *Global Wage Report 2012/13: Wages and equitable growth*. Geneva: International Labour Office.

ISQ. 2014. *Regard statistique sur la couverture syndicale au Québec, ailleurs au Canada et dans les pays de l'OCDE*. Québec: Gouvernement du Québec.

ISQ. 2016a. "Taux de présence syndicale, résultats selon le sexe pour diverses caractéristiques de la main-d'œuvre et de l'emploi, Québec, Ontario et Canada." Accessed 30 June 2016: http://www.stat.gouv.qc.ca/docs-hmi/statistiques/travail-remuneration/presence-syndicale/index.html.

ISQ. 2016b. "PIB et indice de concentration géographique de l'industrie finance et assurances, Canada et provinces." Québec: Gouvernement du Québec. Accessed 7 May 2016. ISQ: http://www.stat.gouv.qc.ca/statistiques/secteur-financier/principaux-indicateurs/pib/pib-concentration-geographique.html.

Jaumotte, F., and C. O. Buitron. 2015. "Inequality and Labor Market Institutions." IMF Staff Discussion Note, SDN/15/14.

Kopczuk, W, and E. Saez. 2004. "Top Wealth Shares in the United States, 1916-2000: Evidence from Estate Tax Returns." *National Tax Journal* 57 (2): 445-488.

Krippner, G. R. 2011. *Capitalizing on crisis*. Cambridge: Harvard University

Press.

Kristal, T. 2010. "Good Times, Bad Times Postwar Labor's Share of National Income in Capitalist Democracies." *American Sociological Review* 75 (5): 729-763.

Lemieux, T., and W. C. Riddell. 2015. "Who are Canada's Top 1 percent?" In *Income Inequality. The Canadian Story*, edited by A. Green. W. C. Riddell, and F. St-Hilaire, 103-156. Montréal: Institute of Research on Public Policy.

Levy, F., and P. Temin. 2010. "Institutions and Wages in Post-World war II America." In *Labor in the Era of Globalization*, edited by C. Brown, B. Eichengreen, and M. Reich, 15-49. New York: Cambridge University Press.

Markusen, J. R. 2004. *Multinational Firms and the Theory of International Trade.* Cambridge, MA: MIT Press Books.

Ministère des Finances du Québec. 1973 to 2008. *Statistiques fiscales des particuliers*, Analyse des déclarations des revenus (TP4). Québec: Gouvernement du Québec.

Milligan, K., and M. Smart. 2015. "Taxation and Top Incomes in Canada." *Canadian Journal of Economics*, 48 (2): 655-681.

Nau, M. 2013. "Economic Elites, Investments, and Income Inequality." *Social Forces* 92: 437-461.

Ooghe, E., E. Schokkaert, and J. Flechet. 2003. "The Incidence of Social Security Contributions: An Empirical Analysis." *Empirica* 30 (2): 81-106.

Osberg, L. (2015) *How Much Income Could Canada's Top 1% Pay*? CCPA Report, Canadian Centre for Policy Alternative.

Piketty, T. 2010. "Taxation of Wealth and Wealth Transfers: Commentary by Thomas Piketty." In *Dimensions of Tax Design: the Mirrlees Review*, J. Mirrlees, et al. (eds.), 825-836. Oxford: Oxford University Press.

Piketty, T., and E. Saez. 2003. "Income Inequality in the United States, 1913–1998." *Quarterly Journal of Economics* 118 (1): 1-39.

Piketty, T., E. Saez, and S. Stantcheva. 2014. "Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities." *American Economic Journal: Economic Policy* 6 (1): 230-71.

Piketty, T., E. Saez, and G. Zucman. 2016. "Distributional National Accounts: Methods and Estimates for the United States." NBER Working Paper (22945).

Roberts, A., and R. Kwon. 2017. "Finance, inequality and the varieties of capitalism in post-industrial democracies." *Socio-Economic Review*, Advanced Access.

Roine, J., J. Vlachos, and D. Waldenström. 2009. "The Long-Run Determinants of Inequality: What Can We Learn from Top Income Data?" *Journal of Public Economics* 93(7-8): 974-988.

Saez, E. 2013. "Striking it Richer: The Evolution of Top Incomes in the United States." Accessed 18 June 2015. `http://elsa.berkeley.edu/~saez/saez-UStopincomes-2011.pdf`.

Saez, E., J. Slemrod, and S. H. Giertz. 2012. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." *Journal of Economic Literature* 50 (1): 3-50.

Saez, E., and M. Veall. 2006. "The Evolution of High Incomes in Northern America, Lessons from Canadian Evidence." *American Economic Review* 95 (3): 831–849.

Statistics Canada. 2016a. "Estimates of population by age group, Québec." CANSIM, table 051-0001. Accessed 7 May 2016.

http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=0510001&&pattern=&stByVal=1&p1=1&p2=37&tabMode=dataTable&csid=.

Statistics Canada. 2016b. "Annual Consumer Price Index," CANSIM, table 326-0021. Accessed 7 May 2016. http://www5.statcan.gc.ca/cansim/a26?lang=fra&retrLang=fra &id=3260021&&pattern=&stByVal=1&p1=1&p2=37&tabMode=dataTable&csid=.

Statistics Canada. 2016c. "Gross domestic product (income), provincial and territorial economic accounts," adapted by the Institut de la statistique du Québec. Accessed 6 May 2016. http://www.stat.gouv.qc.ca/docs-hmi/statistiques/economie/comptes-economiques/comptes-revenus-depenses/index.html.

Statistics Canada. 2016d. "Gross domestic product in 2007 dollars, provincial and territorial economic accounts," adapted by the Institut de la statistique du Québec. Accessed 6 May 2016. http://www.stat.gouv.qc.ca/docs-hmi/statistiques/economie/comptes-economiques/comptes-revenus-depenses/index.html.

Statistics Canada. 2017. "High income trends of tax filers in Canada, provinces and census metropolitan areas (CMA), specific geographic area thresholds, annual" CANSIM, Table 204-0002. Accessed 20 January 2017. http://www5.statcan.gc.ca/cansim/a03?lang=eng&pattern=204-0002&p2=31.

Stiglitz, J. 2012. *The Price of Inequality*. London: W. W. Norton.

Tomaskovic-Devey, D., and Lin, K. H. 2011. "Income Dynamics, Economic Rents, and the Financialization of the U.S. Economy." *American Sociological Review*, 76 (4), 538-559.

Van Treeck, T. 2009. "The Political Economy Debate on 'Financialization'– a Macroeconomic Perspective." *Review of International Political Economy*, *16*(5): 907-944.

Volscho, T. W., and N. J. Kelly. 2012. "The Rise of the Super-Rich Power Resources, Taxes, Financial Markets, and the Dynamics of the Top 1 Percent, 1949 to 2008." *American Sociological Review* 77 (5): 679-699.

Zorn, N. 2015. "Un Québec égalitaire ? Évolution du 1 % le plus riche, 1973-2008." *Actualité économique* 89 (4): 27-52.

Zorn, N. 2017. *Le 1% le plus riche : l'exception québécoise.* Montréal: Presses de l'Université de Montréal.