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# LIVING STANDARDS IN LOWER CANADA, 1831

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**Abstract:** *This paper uses the price and wage data contained in the 1831 census of Lower Canada to provide regional estimates of disparities in living standards within Quebec in 1831. Combining these data with price data for the colony as a whole, we compare living standards in Quebec with those of numerous American and Canadian cities at the same point in time. The results show that Quebec was overall poorer in comparison. However, there are wide variations within the colony—mostly along institutional lines. As a whole, Quebec was significantly poorer than the United States at the same time.*

In 1763, France officially conceded Canada to the British. Little is known about living standards in Canada from that point up until 1870. There is a need to fill that gap along two dimensions: one that follows living standards over time, and another that surveys the regional differences in living standards. This paper attempts the latter type of survey.

We use the census of 1831 (and the 1842 partial census as supportive evidence) to provide the first wide-ranging estimate of living standards in Quebec—then the largest British colony in North America—that is comparable to estimates of those in the United States. Thanks to information from these censuses about wheat prices, daily wages and monthly wages in different areas, we can measure “grain wages” across regions. This paper hopes to provide a first empirical step in the understanding of living standards in Canada. It also aims to shed light on a prolonged agricultural crisis that affected the then-colony in the early decades of the nineteenth century (Ouellet 1966; 1972; 1980). The very existence of this crisis has been debated (Paquet and Wallot 2007; Bédard and Geloso 2014, 2016; Geloso and Kufenko 2015). More importantly, its causes—whether institutional (Phillips 1974), caused by foreign factors (McCallum 1980) or cultural (Ouellet 1966, 1972, 1980)—have also been the object of heated debate.

Thanks to the census data, this is the first time that a wide comparison of living standards has been possible. Most importantly, the census data allow us to distinguish areas according to the land tenure system in place (either French seigneurial tenure or British freehold tenure).

Our paper is arranged as follows. In the first section, we assess the reasons living standards in Lower Canada prior to the mid-nineteenth century are poorly known, namely the exaggerated focus on agricultural production, differences in institutions and the inability to obtain reliable measures for the purposes of comparison. In the second section, we highlight our new dataset and argue that it solves the issues described in section one. In section three, we discuss our results that show that a) within the colony, there were substantial variations in real wages, b) areas under seigneurial land tenure were substantially poorer, in spite of factors that should benefit them and c) real wages were below those observed in the American states to the south.

## **Living Standards across Space and Institutional Regimes**

The assessment of living standards in Canada and Quebec prior to 1870 has always been a problematic issue. Considerable debate exists over the speed of economic growth (and even whether it was positive or negative) from the late 1600s to the mid-nineteenth century. For the era of French rule (from the seventeenth century to 1760), the paucity of information has been problematic, as we do not know what living standards were prior to the conquest of the colony by the British. Numerous historians have given up on assessing the importance of the changes caused by the Conquest of Canada. This has led some to bemoan the fact of “basic empirical research that has largely gone by the wayside, as few scholars have been interested in revisiting the historiography or even the archives” (Fyson 2012:192). To be fair, the quantitative sources prior to 1760 are challenging to use. In a 1986 essay, Louise Dechêne described the state of the statistical sources as poor in the post-Conquest era (p.19). She partially blames the ongoing stalemate in the literature on the poverty of the data available. In 1974, French historian Jacques Le Goff reviewed the debate on the agricultural crisis of 1802 that pitted Fernand Ouellet (1966, 1972) against Jean-Pierre Wallot and Gilles Paquet. Ouellet argued that performance was dismal, an opinion that has received significant support from many economists and historians. In the minority, Paquet and Wallot (2007)<sup>1</sup> argued that the economy was more buoyant and growth was robust—a view that has garnered some traction (McInnis 1982, 1992). Scathingly, Le Goff argued that neither side could muster sufficiently convincing evidence to make its case. In the end, he faulted both sides and claimed that, although he believed it to be impossible, the only way to break the deadlock would be to create a national accounting model of the colonial economy.

In Le Goff’s eyes, as long as there was no large and broad statistical portrait of the economy, the issue could not be resolved. The first dimension of this challenge—a time horizon—has been partially answered thanks to continuous estimates of real wages drawn from rural areas from 1688 to 1760 (Geloso 2016). An extension of this series to the nineteenth century would provide an idea of the evolution of living standards. However, we still know very little about differences over space. In terms of cross-sectional estimates, what little does exist is quite problematic in itself for three reasons: a) the relative importance of net agricultural income

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<sup>1</sup> Compendium containing their articles

in total income; b) institutional boundary delimitations; and c) poor comparability with other societies.

Numerous regional studies of farming show large differences in living standards (Harris 2012 provides a discussion of these differences by surveying the literature) by using different farming regions. Because these regional studies measure living standards at various locations in different manners at discrete points in time, uncertainty about living standards remain. Harris (2012: 243-247) makes it clear that there are no metrics that allow for comparison over space and time. The only point of wide agreement in the literature is that Lower Canada was poorer than the neighbouring colony of Upper Canada (modern-day Ontario) and poorer than the neighboring American states in the northeast. The extent of that gap in living standards is unknown and while there are some estimates (notably McInnis 1992 who found a 34% gap for net farm income between Lower Canadian farmers and Upper Canadian farmers using the census of 1851), their potency is limited. This is because most of these studies are concerned solely with agricultural production. While net agricultural income does vary considerably across the colony (see Lewis and McInnis 1984), agriculture is not the sole source of income. Obviously, farming tied workers to their farms to some extent, but farming alone could not sustain very high living standards. In the neighbouring economy of Upper Canada, it was estimated for the early nineteenth century that in “the absence of a second source of farm income, workers would not have chosen to migrate [to farming] even if, in the long run, farm income would have been more than three times the nonfarm alternative.” However, when a second source of income became available, farming became a viable alternative when the “nonfarm income was as high as one half of long-run farm income” (Davis and Engerman 1999:14). Peasants thus complemented their income by working elsewhere. The reliance on non-farm income could vary considerably across regions, depending on local opportunities, transportation and trade networks. For example, newly settled regions tended to have considerable wood-related production. As land-clearing took place, the felled trees could be brought to urban markets, local saw mills or potash factories (Marr and Paterson 1980: 65). Such output was more limited in longer-settled regions. Furthermore, there was an important increase in the urban population as measured by the population of villages and towns. According to Courville (1990: 95) the proportion of the population living in towns and

villages increased from 17% to 24% between 1815 and 1851. Consequently, there might be risks in relying solely on agricultural income for analysis.<sup>2</sup>

The second reason concerns the role of institutional dualism in the colony, which may have caused divergence in living standards *within* the colony. While Canada was under French rule, the seigneurial system of land tenure was imported into the country and adapted to the conditions of the colony. After the conquest of Quebec, the British maintained the institution. By 1791, the British government had frozen the boundaries of seigneurial estates. All lands settled after 1791 were settled under British freehold tenure, resulting in the emergence of institutional dualism.

Under seigneurial tenure<sup>3</sup>, a landlord (*seigneur*) had to grant land to peasants (*censitaires*), who farmed the land in exchange for payment of fixed duties (*cens et rentes*). These rates were established in relation to land held rather than the amount of land actually farmed, which could be legally construed as taxes on assets rather than output. However, a key point to remember is that *censitaires* could not simply abandon their land. Once settled, peasants could only leave the estate if they sold their farm, subject to the *lods et ventes* tax, as we outline later. This was a considerable restriction on mobility. In return, the *seigneur* was obligated to provide grist mills to the peasants, and he was only allowed (by royal edict) to charge one fourteenth of the grains brought to the mill to be turned into flour. Peasants were not allowed to use grist mills in neighbouring seigneuries, even if those were physically more accessible to them. Other obligations would be associated, such as the *corvée*, whereby peasants had to do work for the *seigneur* on certain days (generally three days a week, or sixty *sols* per day if they chose not to work). The *censitaire* was also subjected to the *lods et ventes*, which required payment of an 8.5% tax to the seigneur upon selling his land. The seigneur himself was obligated to pay the *quint*, also a tax upon selling the estate, but payable to the crown. There were other minor obligations, but they are not of relevance to the story we are telling here. Finally, the *seigneur* had monopoly rights over the establishment of mills and access to waterways.

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<sup>2</sup> In addition, it should be pointed out that numerous individuals have grown skeptical of the estimates of net farm income provided by Lewis and McInnis. Notably, Altman (1998) recomputed the estimates using different assumptions and found larger variations across regions. The most contentious point in his computation regarded the role of dairy production and its calculation. Armstrong (1984) also criticized the assumption of uniform prices across the colony to measure the value of output while there were considerable regional variations in prices (Ouellet et al. 1982).

<sup>3</sup> Information regarding the seigneurial system was largely derived from the work of Benoît Grenier (2007, 2012).

Moreover, the *seigneur* had the right to tax everyone on his estate, which acted as a tax on such activities. Thus a saw mill not operated by a seigneur would be subjected to the *cens et rentes*, the *lods et ventes* and all other duties the seigneur could legally impose. However, if that sawmill was operated by the seigneur, none of these obligations would exist. Thus the system was akin to a special tax treatment for seigneur-led enterprises. Generally, *seigneurs* were active in numerous forms of investments, from the flour mill to the saw mill.

Areas settled under freehold tenure after 1791 were not subject to such exactions and regulations. The absence of such duties and monopolies substantially impacted living standards across institutional boundaries. The burden imposed by seigneurial tenure was considerable: Richard Harris (1966 [1984]) estimated seigneurial dues somewhere between 5% and 10% of the average farm household's income, and Louise Dechêne (1974) put that figure at 14%. Morris Altman (1983) used census data to estimate that seigneurial dues absorbed between 37% and 47% of net output per household (measured in wheat minus consumption needs and seed requirements) in the 1688–1714 period. By 1726–1739, they had declined to a share ranging between 26% and 37%. In 1987, Altman reduced those estimates by roughly half, thanks to new data on seed requirements, but the cost to farm households was still considerable. Alan Greer (1985:136) used the same approach to estimate a proportion of 44% in St-Ours (on the south shore of Montreal) in 1765. According to Altman, the transfer from peasants to seigneurs reduced disposable income. Lower incomes for the peasant population meant lower aggregate demand for domestically produced goods and, thus, slower growth. Altman also argues that exactions made by *seigneuries* were purely extractive and not meant to finance the production of public goods that would enhance overall welfare. Additionally, all of these effects do not include the role that the monopoly rights of *seigneurs* could have played. Indeed, *seigneurs* were free to establish mills, plants, foundries and factories in their estates without being submitted to the *cens et rentes* and the *lods et ventes*. Any competitor to the *seigneur* did have to pay these duties, which were essentially taxes on capital stock and capital transfers.

Taken together and in the face of economic theory, it is hard to see how the contribution of seigneurial tenure could have been positive. Most scholars attribute some negative impacts, but a generally well-shared consensus is that the negative effects were small and could not explain the (supposedly) relatively low living standards of the French-Canadians (Percy and



Szostak 1992; Grenier 2012; Courville 2008; Altman 1998; Russell 2012).<sup>4</sup> However, a minority view has emerged to argue that seigneurial tenure had a large impact. Arsenault Morin, Geloso and Kufenko (2015) used institutional differences to explain regional variations in infant mortality rates, which they took to be a proxy of poverty levels. They found that, everything else being equal, seigneurial estates had infant mortality rates twice those observed in non-seigneurial areas. These differences were also well recognized by contemporary observers, who noticed that wages in Lower Canada tended to be below those in Upper Canada “except in the Eastern Townships [settled under freehold tenure]” (Martin 1838: 335). Others like Harris (2012: 275) also observed that industrial activity—in spite of being far removed from the port cities of Montreal and Quebec—was more intense than in seigneurial areas. Consequently, there is a need to evaluate living standards across institutional boundaries in order to ask the question of whether or not seigneurial tenure could have mattered. We must emphasize that we are not attempting to explain which of the institution’s features had an impact but whether or not the institution could have created differences. The study of each individual feature should be left to separate papers as seigneurial tenure is a wide and complex subject.

Finally, the scarcity of available data prevents comparisons with other societies, such as the neighboring United States. There are Canada-wide estimates provided notably in the work of Maddison-Project. However, these are problematic inasmuch as the data prior to 1850 are based on linking Canada to the United States. Indeed, the initial dataset derived by Angus Maddison (2003:453) assumed that, for the 1820–1850 timeframe, the per-capita product of non-indigenous populations grew at the same rate as that of the United States. Thus, while it is instructive to use Maddison data to compare levels, there are obvious limitations for the pre-confederation era.

In this paper, we assert that the census of 1831 offers important information that circumvents the problem of relying exclusively on agricultural production, while at the same time providing a sufficiently large cross-section of areas in which to assess differences along institutional lines. We also use the incomplete census of 1842 to provide supporting evidence to assess the robustness of our results based on the 1831 census.

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<sup>4</sup> Russell probably summarized this viewpoint best. In responding to the categorization of seigneurial tenure as creating unfree labor markets, Russell (2012, 83) argued that “peasants would have laughed at the notion that they were unfree labor.” Russell added that the “contention that ‘an abundance of cheap and free land relative to labor encourages unfree (...) labor institutions’ is itself laughable” (Russell 2012, 83).

## Wages and Prices in the 1831 and 1842 Censuses

The census of 1831 for Lower Canada is the object of scorn from historians. It is often piled in with the other censuses (1765, 1784 and 1827) as being part of the statistical dark age of Quebec (Dechêne 1986; 190). It is plagued with metrological problems caused by different land units and volume units used by French and English farmers. In addition, before the census of 1851, there are no breakdowns of land acreage by crop that would allow for a reliable computation of net grain output. This limits the ability to generate estimates of net farm output prior to 1851. However, the scorn directed at the census of 1831 has been mitigated in recent years. Geographer Serge Courville (1987, 1990), who did not resort to the use of econometric testing, managed to use the 1831 census to distinguish between *rural* and *agricultural* populations, pointing out that they were very different in size. Noting that there were many more urban centers in rural areas than previously believed, Courville argued that there was much more to the hinterland of Quebec than agriculture. In doing so, he rehabilitated the 1831 census and went on to publish numerous important quantitative and cartographic papers on early Canadian history (Courville, Robert and Séguin 1991; Courville, Robert and Séguin 1995; Courville 2008).

The recognition of the upsides to the 1831 census must be extended to the rarely observed fact that it reported wages and prices for wheat in the vast majority of sub-counties.<sup>5</sup> Enumerators were asked to report the going wage rate for a day's work, the monthly wage rate for purely agricultural workers (with board), and the price for wheat.<sup>6</sup> All prices were reported in shillings. Market exchanges were always an open option for farmers of Lower Canada. Even if they chose not to trade their labor on the market, they could always do so at the prevailing price—which was reflective of the marginal product of labor. As factually described above, farmers needed to work for the non-farm sector in order to complement their income. Thus, we assume that the wage rate should be seen as the marginal productivity of labor and representative of average earnings (Allen, Bassino, Ma, Moll-Murata and Van Zanden 2011: 29). As a result,

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<sup>5</sup> Lower Canada was divided in four administrative districts: Gaspé, Québec, Trois-Rivières and Montréal. Each district was composed of different counties and each county was composed of sub-counties (either parishes when they were under seigneurial tenure or townships when under free and common socage).

<sup>6</sup> In the original census rolls the headings of concern to us are labelled as such: *a)* average price of wheat in each such place since the last harvest; *b)* average wages paid in each such place to servants employed in agriculture, and who are boarded by their employers—per month; and *c)* average wages paid in each such place to day labourers—per day.

we create an approximate measure of real wages across the colony by dividing the nominal wage rate by the price of a unit of wheat—an approach frequently used by economic historians (see Van Zanden 1999; Pommeranz 2000). This provides a first measure of living standards. Grain wages have come under criticism, such as that advanced by Stephen Broadberry and Bishnupriya Gupta (2006), who argued that there was a gap between silver wages and grain wages. For the eighteenth century, Broadberry and Gupta showed a larger gap between Northwest Europe and Asia than Pommeranz did. This is based on the recognized tendency for wages and prices to be higher in developed economies thanks to the productivity of the traded goods sector. While grain wages remained stable across space, silver wages fluctuated along with productivity. Areas with higher silver wages were able to consume more non-food goods and total consumption was greater. In the case of Lower Canada, grain wages acted as a conservative measure of living standard differences between seigneurial and freehold areas, while nominal wages acted as a more liberal measure.

We also use both measures of wages (the monthly and daily series). This is because the headings of the census make it clear whether monthly workers are employed in agriculture, but do not do this for daily workers. Thus, we may be capturing work of different natures. We do not believe this to be an issue given that farm work was an unskilled field of work and the alternatives did not require different skill levels. We prefer the daily wages since they exclude room and board while we do not know the variation in the value of room and board across the colony. In addition, daily wages are more comparable with other regions.

The census of 1842 for Canada East (the name of the colony legally changed in 1840) is much more problematic. We do not use it to derive implications about living standards throughout the colony. We do, however, use it to check whether our results are robust. Normally, the similarity of questions between the two censuses would have allowed for observational continuity of variables from 1831 on. However, the 1842 census was widely considered a “failure” (Curtis 2002: 55). Numerous rural municipalities had failed to appoint enumerators and the colonial legislature failed to allocate sufficient funds for this operation (Curtis 2002: 55-56). It had to be taken again in 1844; the rolls of that census were lost, and no total tabulations of the incomplete 1842 census exist. The information for numerous counties has been lost, which leaves researchers with a limited number of areas: only 23 counties, compared with nearly twice as many in 1831. Yet, some researchers have resorted to using it in “highly controlled exercises”

(Olson and Thornton 2001: 339). We believe that we are able generate such a highly controlled exercise. We avoid the problems associated with enumeration of individuals or associated with the measurement of land area and agricultural output. We merely take the information provided with regard to wages for “agricultural labor per day throughout the year” and “the average price of wheat in every such place since last harvest” to see how grain wages and wages increased over time between 1831 and 1842 and to see whether the patterns seen for 1831 are also present in 1842, which would provide us with some reassurance about our results.

With regard to the 1831 census, the data were collected from the sub-counties totals contained in the *Appendix to the Journal of the House of Assembly of 1831–32* and from the rolls containing the manuscripts of the census. These manuscripts can be downloaded online from [www.familysearch.org](http://www.familysearch.org) (retrieved may 1<sup>st</sup> 2015). They are problematic, and using them alone would cause us to lose important counties, as complete data for the counties of Montreal, Chambly, Stanstead and Ottawa are not available. However, the manuscripts were useful in numerous instances for obtaining additional pieces of information and completing some missing observations. One such major limitation was that the county of Rimouski, in eastern Quebec, had not been compiled in the 1831 census recapitulations in the *Appendix*, but its rolls are available in full at familysearch.org. Overall, we first proceeded to collect all the wages we could from the census manuscripts and averaged the different observations we found in all areas when there were many. Then, we completed our coverage by using the *Appendix* recapitulations to find missing areas. The notes associated with each county allow us to understand the quality of the wage information. This is important, as many details about the indications given to enumerators in 1831 are unknown. Some enumerators did not provide exhaustive details about the county they were assigned. However, many did provide a wealth of details. For example, the enumerator for the rich county of Chambly (south of Montreal) reported that the “rates of wages, as marked in the preceding columns, are to be considered as the general average during the year, but in harvest time as high as 12 dollars a month is given for laborers, or 3 shillings 9 pence per day” (Appendix O.o to House of Assembly of Lower Canada 1832; unpaginated). Remarks provided for the counties of Bellechasse, L’Islet, Lachenaie and L’Assomption confirm that this was the understanding of the wages reported in the census. With regard to the volume units for wheat, it is ostensibly clear that the unit used is in *minot* (1 minot = 1.107 bushels) in most areas. However, the English-speaking areas, as can be seen in numerous rolls by individual sub-county,

reported quantities in bushels. We corrected the price of wheat to adjust for these differences in quantities. We eliminated the counties related to the Gaspé district. This district, which lies on the eastern-most peninsula of Quebec, was sparsely populated (it only had two counties, that of Gaspé and Bonaventure) and bore more economic similarity to the neighboring colony of New Brunswick than to Quebec. That left us with observations for daily wages in 224 sub-counties. We also have 222 observations for monthly wages and 217 for prices. These observations cover close to 75% of the population of Lower Canada in 1831. There were 51 sub-counties under freehold tenure, the remaining areas being under seigneurial tenure. For the 1842 census, the data were consulted directly online at [www.familysearch.org](http://www.familysearch.org) (retrieved May 1<sup>st</sup> 2015). There is little information about the areas surveyed in the 1842 census. However, the enumerators were more diligent in reporting the type of volume unit in which grain was reported. When the volume unit was unreported, we assumed the French areas reported the price in *minots* and the English areas in *bushels*, as in the 1831 census. Overall, we collected prices and wages for 92 sub-counties (out of 139 available). However, we were only able to form pairs of prices and wages, in order to derive grain wages, in 47 areas, as no more than 48 wage observations and 86 price observations were available. Of those, we were able to match 34 areas that are present in both the 1831 and 1842 censuses. Very few observations about monthly wages were available. Readers will be able to find the resulting data available on request from the authors with the population of each area (which are needed in order to derive population-adjusted wages for the entire colony).

The mapping of the proper areas was made possible through the maps of Bouchette (1831a and 1831b), which have been extensively used by economic historians since. The most notable of these maps can be found in Courville, Robert and Séguin (1995: 43), Courville (1990: 193) and Courville (2008:126). This mapping is also crucial with respect to our question regarding the relevance of seigneurial tenure. While cross-sectional data might provide a first indication, there is considerable noise to be cut through that may hide the “true variations”. The areas predominantly settled under freehold tenure tended to be far removed from urban centers and located on poor soils ill-suited for agriculture. This could reduce the actual differences between areas, even though natural endowments have nothing to do with institutions. One of the key areas of English settlement was located in the modern region of Estrie (southeastern Quebec), and it illustrates our point very well. Its soils are quite acidic, void of limestone and phosphor, and considered to be of “mediocre fertility” (Kesteman, Southam and St-Pierre, 1998:

49-51). In addition, the region is far removed from the natural transportation network provided by the St-Lawrence seaway. The low flow of the rivers riddling the region made water transport relatively prohibitive (ibid.: 101). Given the ruggedness of the area, roads were hard to build, and the colonial administration had been inefficient at investing in such infrastructure (ibid.: 101-106). By comparison, seigneurial areas tended to have better farming conditions. They also benefitted, by virtue of having been settled for a long period of time, from greater access to the road network and other transport infrastructure. In fact, the predominant feature of seigneurial areas that is not shared with freehold areas is the access to the waterway. Most townships are deep inland and have little access to the St-Lawrence seaway—the main trade route within the colony. English areas, by virtue of being settled late, were virtually precluded from existing alongside the St-Lawrence seaway, and were left with “second-rate” landlocked areas. Thus, there is a need for environmental controls. For the purposes of this paper, we use land quality, length of growing season, distance from urban centres and recency of settlement. All of these variables are detailed in Appendix 1 to this paper.

Finally, to enable comparisons with the United States at the same time, we decided to rely on the approach devised by Robert Allen (2001 and Allen, Murphy and Schneider 2012), which consists of creating welfare ratios. Welfare ratios are found by multiplying daily wage rates by a certain number of days, and then dividing this “income” by the cost of a comparable basket of goods. The issue of using exchange rates between different denominations through the creation of purchasing power parities (PPPs) can thus be circumvented. This approach also solidifies comparisons, and it has been widely used in the field of economic history (see notably Lindert and Williamson 2015). The wage data collected in this paper are useful in finding the numerator of the welfare ratios. The denominator (prices for the basket) is in itself another issue. To solve that issue, we chose to use the exact definition of the basket calculated by Allen, Murphy and Schneider (2012) for the United States (see Appendix 2 for the basket), and we relied on the account books of the Séminaire de Québec and the Ursulines de Québec, both of which were religious congregations. This is the same source as the one used by Geloso (2016) in the creation of welfare ratios for Canada under French rule between 1688 and 1760 (also discussed in Appendix 2). The greatest advantage of these sources is that, although the headquarters of these entities were located within the walls of Quebec City, they also owned major agricultural estates throughout the colony. Religious congregations earned an appreciable

share of their income from the seigneurial estates they owned and operated. Overall, the Church owned over 25% of all conceded lands under seigneurial tenure, and 34% of the colony's population lived on Church estates by the end of French rule (Jaenen 1976:71). In fact, the Church still held significant assets during the nineteenth century (Young 1986; Baillargeon 1977; Barthe 2015). The second great advantage is that the data found within these account books are quite exhaustive and allowed us to replicate the exact same basket for Lower Canada as the one that Allen, Murphy and Schneider (2012) used. This saved us having to recalculate the basket for the regions of the United States that they considered. The only change we made is that we used oats instead of maize since oats were the subsistence crops in Lower Canada even if wheat tended to be greatly consumed (Lavertue 1984).<sup>7</sup> The details of the basket can be found in Appendix 2 where we discuss the source material in greater detail.

## Results

### *Variations within the colony*

Our results show wide variations in wages within Lower Canada. The lowest wage rate observed is slightly above one shilling per day (in the parish of St-Hyacinthe), while the highest is 3.33 shillings per day (in Bolton), with a weighed colonial average of 1.79 shillings per day. The lowest monthly wages range from the Isle-aux-Coudres parish (county of Saguenay) at 10 shillings per month while the highest stands at 60 shillings per month (in eight sub-counties of the county of Sherbrooke). The parish of Isle-aux-Coudres has the lowest grain-wage per month (2.013 bushels) while the sub-counties in Sherbrooke county stand at 9.6 bushels per month. The weighed colonial average stands at 26.22 shillings per month and 4.62 bushels per month. In terms of daily grain wages, the lowest estimate found is in the St-Hyacinthe parish and stood at 0.204 bushels per day. The highest estimate is found in the parish of Ste-Famille (located on Orléans Isle east of Québec City), at 0.60 bushels per day. The colonial average stands at 0.32

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<sup>7</sup> Readers unfamiliar with welfare ratios may shun the idea of using oats instead of wheat especially if the latter was the largest crop in the colony. However, it needs to be pointed out that welfare ratios are the equivalent of creating measures of real wages adjusted for purchasing power parity. Basically, a ratio of two means that a worker could buy two “poverty line” baskets. Thus, the basket needs to be a poverty line. While there exist other measures like the “respectable basket” (Allen 2009; Geloso 2016) with more calories from different grains and meats, and the account books for Lower Canada are sufficiently rich to allow such a basket to be measured, the data are scarcer for the United States *circa* 1830 which prevents us—at present—from computing such a measure.

bushels per day. Table 1 shows the distribution of those wages according to quintile (arranged by size of population in each area). The distribution by quintile reveals the differences across the colony from the poorest to richest areas.

**Table 1:** Wages per day and month and grain wages

	Monthly wages (shillings)	Daily wages (shillings)	Monthly wages (bushels of wheat)	Daily wages (bushels of wheat)
Quintile 1	17.71	1.38	2.90	0.24
Quintile 2	22.39	1.66	3.78	0.28
Quintile 3	27.51	1.92	4.57	0.31
Quintile 4	31.32	2.17	5.70	0.38
Quintile 5	46.88	2.61	7.93	0.46
Entire colony (non-weighted)	28.21	1.88	4.97	0.33
Entire colony (weighted)	26.22	1.79	4.62	0.32
Quebec District	23.56	1.84	4.11	0.32
Trois-Rivières District	35.35	1.93	5.91	0.33
Montreal District	30.21	1.88	5.49	0.34

Maps 1 and 2 allow us to better see the regional variations in both wage rates and grain wages. The regional pattern shows that poorer areas tend to be located within poor agricultural regions of eastern Quebec, something that was also observed with the net agricultural income computations of Lewis and McInnis (1984) and Altman (1998). The variation in the colony conform with the commonly made assertion that Montreal was the richest area. Indeed, by all metrics, sub-counties in the agriculturally rich areas of Montreal were doing better. It also conforms with the general belief that in the plains around Montreal farmers had access to more land that they could clear for farming. In the 1831 census, 46% of conceded lands in Montreal district were cleared for farming. This compared with 36% and 34% in the Quebec and Trois-Rivières District. More importantly, the land was also of greater quality in the Montreal area. Using variables for land quality (see Appendix 2) that compute the types of land most suited for crops, we can see this most clearly.<sup>8</sup> In the Montreal district, 57% of the land area is categorized as well-suited for crop-growing compared with 33% and 26% in the Quebec and Trois-Rivières districts. In terms of growing season, the Montreal district had the longest average growing season (208 days compared with 187 days in the Quebec district). Our finding is tangentially linked with those of Greer and Robichaud (1989). They were concerned about the rebellions in Canada in 1837-1838 and aimed to see if they could be related to the agricultural crisis. They

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<sup>8</sup> This variable is described in Appendix 2 and it is the same as the one used by Lewis and McInnis (1984)

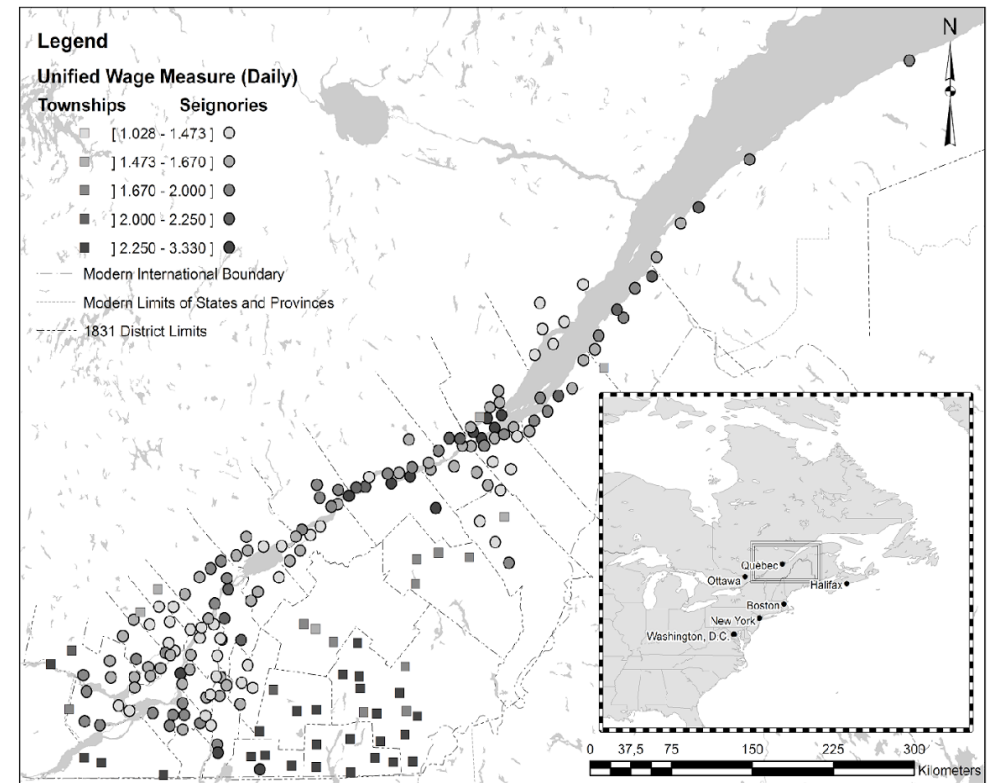
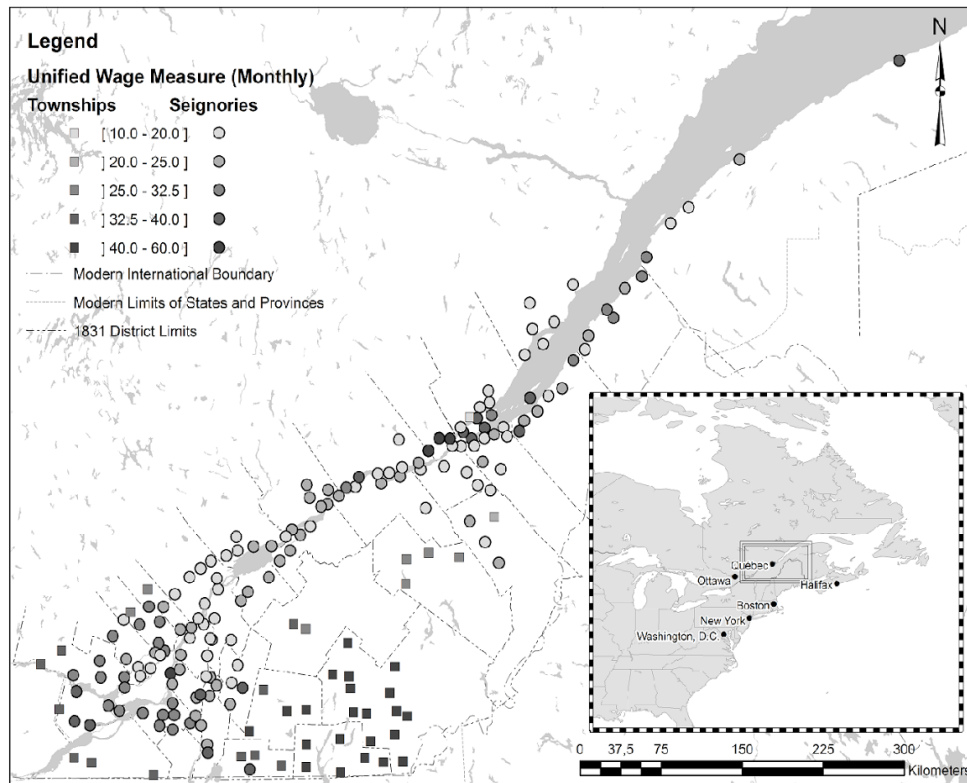


found that the rebels were generally from Montreal, a region that they found to have much larger farms, greater rates of farm ownership and greater levels of wheat output per capita. In their article, Greer and Robichaud also noted that it was in Montreal that the seigneurial rents and duties were high relative to other areas in the colony (1989: 372). This suggests that while natural endowments have an effect, there might be institutional factors at play. In Table 2, we compute the three districts in Table 1 but by distinguishing the different institutional types in each county, we can see that Greer and Robichaud were on to something. The institutional differences are stark. In each district, non-seigneurial estates always perform better. Even more telling is that the natural endowments (land quality) were poorer in non-seigneurial areas in all districts. For example, for non-seigneurial areas in the Montreal district, only 24% of the land was suited for crop-growing compared with 65% for seigneurial areas. These variations suggest that the demarcation lines in living standards identified by many do not necessarily follow lines of natural endowment, but instead follow institutional lines.

**Table 2:** Wages per day and month and grain wages with institutional distinctions

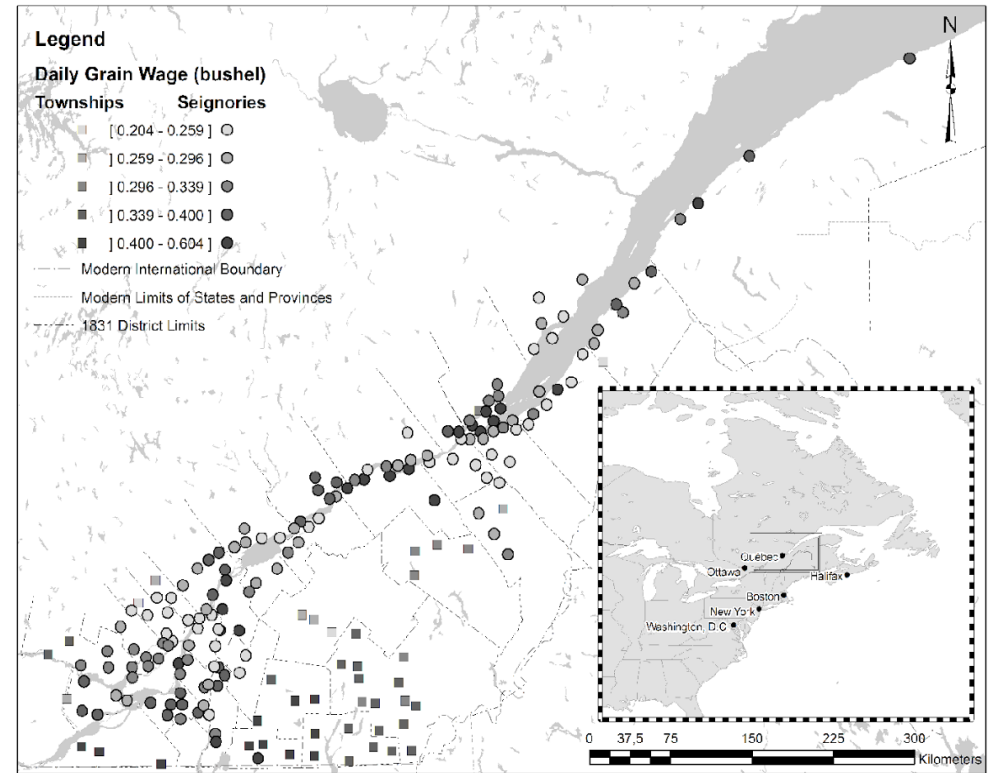
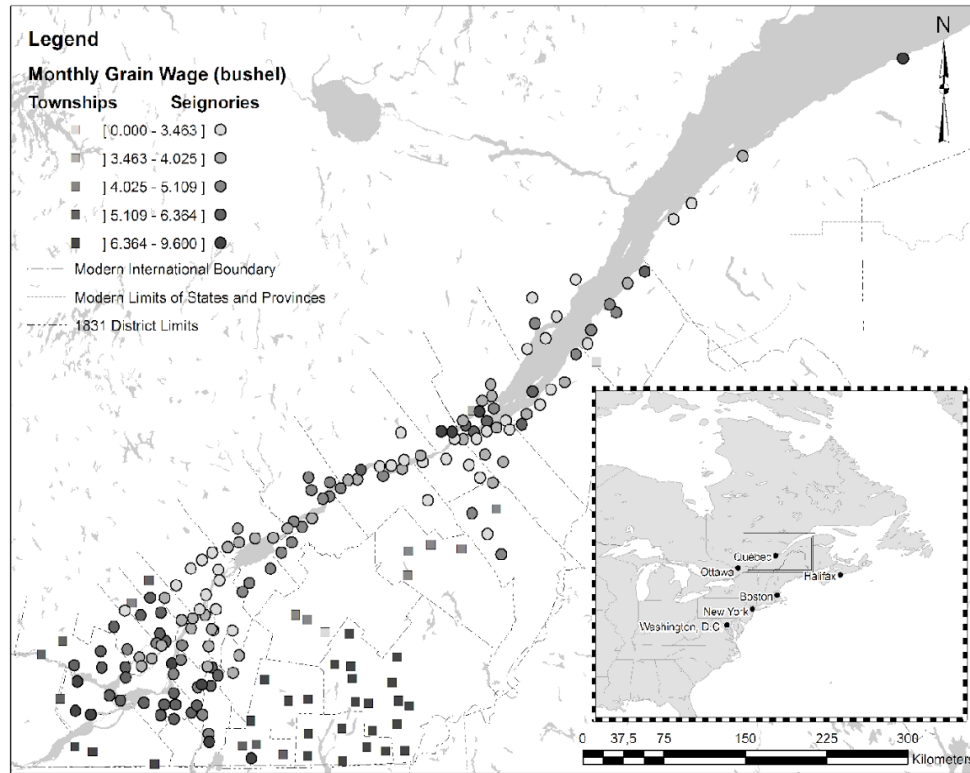
	Monthly wages (shillings)	Daily wages (shillings)	Monthly wages (bushels of wheat)	Daily wages (bushels of wheat)
Seigneurial Montreal	26.21	1.68	4.97	0.32
Non-Seigneurial Montreal	40.9	2.43	6.87	0.41
Seigneurial Trois- Rivières	22.38	1.65	4.07	0.30
Non-Seigneurial Trois-Rivières	51.56	2.27	8.21	0.36
Seigneurial Quebec	23.17	1.84	4.07	0.32
Non-Seigneurial Quebec	29.00	1.93	4.60	0.31

**Map 1: Wages, in shillings, monthly and daily**



Note: Townships (non-seigneurial areas) are represented by squares and seigneuries are represented by circles.

**Map 2: Grain wages (in bushels per day or month) in Lower Canada, 1831**



Note: Townships (non-seigneurial areas) are represented by squares and seignuries are represented by circles

### *Could Seignorial Tenure Have Mattered?*

The regional variations observed bring up the question of whether or not seignorial tenure could have mattered. Table 3 builds on Table 2 and shows that, regardless of the quintile in which a sub-county is ranked, non-seignorial areas do better than seignorial areas. It suggests a role for seignorial tenure. However, such a table may be misleading. In a preindustrial economy that depends highly on the agricultural sector, it is quite normal to expect land quality, distance and access to markets to have a considerable influence on differences in living standards. Morris Altman, using partial productivity estimates, found that for most types of agricultural activities non-seignorial areas were more efficient (1998: 732).

Some scholars, mostly in the 1980s and 1990s, attempted to control for differences in natural endowments. Lewis and McInnis (1980) used a sample of districts from the plains of Montreal in order to limit variations due to climate, although this failed to convince some scholars (see Little 1986). Altman (1998) divided the colony into different regions in a similar attempt, but as McCloskey (1976) highlighted in her work on farming strategies during medieval times, even within very limited regions, there can be wide differences. In a colony like Lower Canada, which is riddled with navigable rivers and wide variations in land quality, this would have been a considerable issue. Moreover, as we underlined above, there were also wide variations in land quality across institutional lines one must control for. Hopefully, with the use of maps produced by Bouchette (1831a, 1831b) and other datasets, we can control for a wide set of environmental and historical variables: land quality, growing season, the length of settlement in the area, the number of recent immigrants unfamiliar with the land, distance from urban markets and communication costs. With such variables, we can run a regression analysis to isolate the effects of natural and historical endowments from the effects of the institutions and from this, we can assess the importance of the differences caused by institutions. In Table 4, there are four panels that represent each of the measures in this paper in log form. With statistical controls, it seems that freehold tenure was compensating important disadvantages in natural endowments since the effect of townships on the log of monthly and daily grain wages suggests differences of 41.9% for the and 38.6%. These are considerable differences that explain sizeable portions of the whole gap between seignorial and non-seignorial areas. Using nominal wages (in shillings), the effect is: 46.5% for the monthly wages and 47.9% for the daily wages. This is an important observation because all the other factors run against freehold estates. As we

indicated above, land quality was greater in seigneurial areas and in all the panels seen in Table 4, it has a significant effect. The same is true with the “recent immigrants” variable. The census of 1831 includes a question that is meant to measure the number of immigrants from the British Isles who arrived in the colony since 1825. When presented as a ratio per 1,000 inhabitants, this should capture the level of unfamiliarity of certain populations with the conditions of Canada. As immigrants generally tend to assume some penalty in the early days of their settlement in a new society, it is not unsurprising that they are adversely affected. This variable also plays against finding higher wages in non-seigneurial areas. Yet, Table 3 indicates an important gap—regardless of the metric used. Thus, the results in Table 4 show that the effect of seigneurial tenure are *hidden* by other variables. These results hold when we exclude outliers and test for heteroscedasticity, which is to a large extent driven by these outliers (see Breusch and Pagan, 1979; and Cook, 1977). In particular, in columns 2–4 and 6–8 the homoscedasticity of the residuals is not rejected. The exclusion of the outliers based on Cook’s distance, improves the fit and corrects the estimate of the effect of tenure status.

**Table 3:** Wages and grain wages in Lower Canada, 1831 by institutional type (not weighted for population)

	Monthly wages (shillings)	Daily wages (shillings)	Monthly wages (bushels of wheat)	Daily wages (bushels of wheat)
Quintile 1 – Non-Seigneurial	29.44	1.65	4.73	0.27
Quintile 2 – Non-Seigneurial	35.25	2.01	6.07	0.33
Quintile 3 – Non-Seigneurial	43.00	2.45	7.40	0.40
Quintile 4 – Non-Seigneurial	49.50	2.50	8.15	0.41
Quintile 5 – Non-Seigneurial	60.00	2.74	9.60	0.47
Quintile 1 – Seigneurial	15.36	1.29	2.80	0.24
Quintile 2 – Seigneurial	19.92	1.51	3.54	0.27
Quintile 3 – Seigneurial	22.82	1.67	4.13	0.30
Quintile 4 – Seigneurial	27.42	1.93	5.17	0.36
Quintile 5 – Seigneurial	35.48	2.36	6.46	0.45
All Non-Seigneurial	43.32	2.30	7.09	0.38
All Seigneurial	24.28	1.75	4.38	0.32

**Table 4:** Regression result (OLS) of the determinants of wage levels

Variables	(1) Monthly wages	(2) Monthly wages (outliers excluded)	(3) Daily wages	(4) Daily wages (outliers excluded)
Non-seigneurial	0.561*** (0.0767)	0.465*** (0.0666)	0.395*** (0.0562)	0.479*** (0.0575)
Distance	-0.000462 (0.000783)	-0.00127 (0.000892)	0.000182 (0.000578)	0.000445 (0.000596)
Land quality	0.169** (0.0781)	0.196*** (0.0667)	0.111* (0.0578)	0.133** (0.0552)
Length of Growing Season	0.00263 (0.00243)	0.00305 (0.00214)	-0.00201 (0.00179)	-0.00331* (0.00175)
Years Since First Settlement	-0.000418 (0.000514)	-0.000830* (0.000452)	0.00118*** (0.000381)	0.00127*** (0.000367)
Recent Immigrants per 1,000	-0.000396* (0.000214)	-0.000391** (0.000181)	-0.000116 (0.000158)	-0.000145 (0.000159)
Postal Zone	0.0912 (0.0581)	0.207*** (0.0571)	0.00369 (0.0429)	-0.0399 (0.0447)
Constant	2.499*** (0.506)	2.341*** (0.443)	0.748** (0.372)	1.021*** (0.367)
Outliers excluded		10		11
Observations	212	202	214	203
R-squared	0.469	0.586	0.277	0.347
Adjusted R-squared	0.451	0.571	0.252	0.324
Breusch-Pagan/Cook-Weisberg test for homoscedasticity	0.0088	0.0852	0.983	0.4676

Standard and robust errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 4:** Regression result (OLS) of the determinants of wage levels (continued)

Variables	(5) Monthly grain wages	(6) Monthly grain wages (outliers excluded)	(7) Daily grain wages	(8) Daily grain wages (outliers excluded)
Non-seigneurial	0.495*** (0.0746)	0.419*** (0.0659)	0.307*** (0.0562)	0.386*** (0.0538)
Distance	0.000297 (0.000770)	-0.000366 (0.000915)	0.000955 (0.000584)	0.00176*** (0.000671)
Land quality	0.188** (0.0755)	0.218*** (0.0668)	0.120** (0.0574)	0.109** (0.0531)
Length of Growing Season	0.00536** (0.00240)	0.00606*** (0.00216)	0.00114 (0.00181)	0.000536 (0.00171)
Years Since First Settlement	-0.000323 (0.000513)	-0.000732 (0.000459)	0.00144*** (0.000390)	0.00139*** (0.000362)
Recent Immigrants per 1,000	-0.000497** (0.000207)	-0.000416** (0.000179)	-0.000159 (0.000157)	-0.000332** (0.000145)
Postal Zone	0.0473 (0.0561)	0.134** (0.0569)	-0.0348 (0.0426)	-0.103** (0.0439)
Constant	4.847*** (0.499)	4.651*** (0.446)	3.003*** (0.377)	3.174*** (0.356)
Outliers excluded		9		9
Observations	206	197	208	197
R-squared	0.452	0.552	0.197	0.289
Adjusted R-squared	0.433	0.536	0.169	0.262
Breusch-Pagan/Cook-Weisberg test for homoscedasticity	0.0074	0.1872	0.5406	0.7626

Standard and robust errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Some individuals could be tempted to dismiss those differences on account of cultural differences between the populations of non-seigneurial areas and seigneurial areas. While we do not seek to deny any influence of cultural conditions, there is evidence that even within these groups, there are demarcations along institutional lines. First of all, as we will see below, the same demarcations are present in the 1842 census—which is reassuring. Secondly, there were six townships that were predominantly Catholic (a proxy for the French population). And they enjoyed higher monthly wages (but not daily) than their counterparts on seigneurial estates. Similarly, there were seven sub-counties operating under seigneurial tenure that were predominantly Non-Catholic. And they fared worse than their counterparts in non-seigneurial estates on three of the four measures we used here. Moreover, our result here is quite in line with those of Arsenault Morin, Geloso and Kufenko (2015) who found that, controlling for the

cultural background of the population, institutional differences did account for a considerable share of the overall differences in infant mortality in the 1851 census (a variable which they took as a proxy for poverty).

*Comparing the 1831 census with the 1842 census*

The comparisons based on the census of 1842 suggest that these results are broadly correct. Although the 1842 census calls for some skepticism and does not provide sufficient evidence by itself, the fact that it points in the same direction as the 1831 census is reassuring. In 1842, the seigneurial areas were poorer than the non-seigneurial areas (as was the case in the 1831 census). With the 34 pairs of areas present in both the 1831 and 1842 census, the ratio of grain wages in seigneurial areas relative to non-seigneurial areas was 85.43% in 1831, and it stood at 91.6% in 1842. Although all areas did experience growth, it seems that growth was slightly faster in seigneurial areas. However, we would not give too much stock to this given the same size of the sample. Nonetheless, the sustained differences over time provide a sense of robustness to the results we obtained with the 1831 census.

**Table 5:** Grain wages in Lower Canada, 1831 to 1842 along institutional lines

	All	Seigneurial	Non-Seigneurial
All areas 1842	0.433 bushels per day	0.39 bushels per day	0.46 bushels per day
Areas in 1842 with observation present for 1831	0.444 bushels per day	0.415 bushels per day	0.45 bushels per day
Growth between 1831 and 1842	+15.60%	+19.43%	+11.39%

*Comparing with the rest of North America*

However, when the comparisons are extended to include the United States, the differences within Lower Canada are trivial. These can be seen in Table 6 and Figure 1. Table 6 shows both the wage rate (in dollars per day) and the grain wages in different regions of North America. It should be noted that we weighed each wage observation for the aggregate estimate by the population in each sub-county. Lower Canada stands very low in comparison to the United States. These observations conform with the data from the Maddison-Project ([www.ggdcc.net/maddison/maddison-project/data.htm](http://www.ggdcc.net/maddison/maddison-project/data.htm), 2013 version), which show that in 1820



and 1840, the United States was 54% and 45% richer, respectively, than Canada as a whole. The fact that Table 6 shows that Upper Canada—the neighboring colony of Quebec, modern-day Ontario—performs better than Lower Canada confirms this as well. At that time, Upper Canada had a smaller population than Lower Canada and, while its living standards would have increased the overall Canadian average, the sheer size of Lower Canada’s population would have dominated the average income per person to the levels observed in the Maddison-Project. This also confirms the broad conclusion reached by McInnis (1992) that Lower Canada was poorer than Upper Canada by a substantial margin when he noticed that net farm income per farm in the former was more than 30% lower than in the latter.

As we mentioned above, another way to see those differences is to use a bare bones basket of goods to create a welfare ratio—an approach exemplified by Allen, Murphy and Schneider (2012). This can be better seen in Figure 1. We used the exact same basket that they did, with the exception that we used oats instead of maize in order to allow for comparability. The details of the basket are discussed in Appendix 2 to this paper and above in Section 2. The welfare ratios show a considerable disadvantage for Lower Canada relative to the American cities of Boston and Philadelphia. Now, the prices we extracted for the purposes of Figure 1 come from a source that historian Fernand Ouellet qualifies as more or less rural (Ouellet et al. 1982: 91). Geloso (2016) used the same source and argued in detail that it represented mostly rural goods. Nonetheless, to reassure potential critics, we also present the cost of the basket we measured with only the wages for Quebec City. Thus, readers have a range of estimates. As a result, we get an estimate for the urban centre of Quebec that we can more easily compare with the data from American cities.<sup>9</sup> Overall, this places Quebec at much lower levels of development than the rest of North America. More importantly, this has to be placed in perspective with the recent research of Geloso (2016). For the years between 1688 and 1760, the bare bones welfare ratio stood at 2.43 throughout the period, compared with 3.34 in Boston. While the data here suggest an increase to a ratio of 3.31 to 4.01, the increase was much steeper in the United States, where it seems to have doubled. Overall, this suggests that, while living standards may have improved in Canada, they improved much faster elsewhere.

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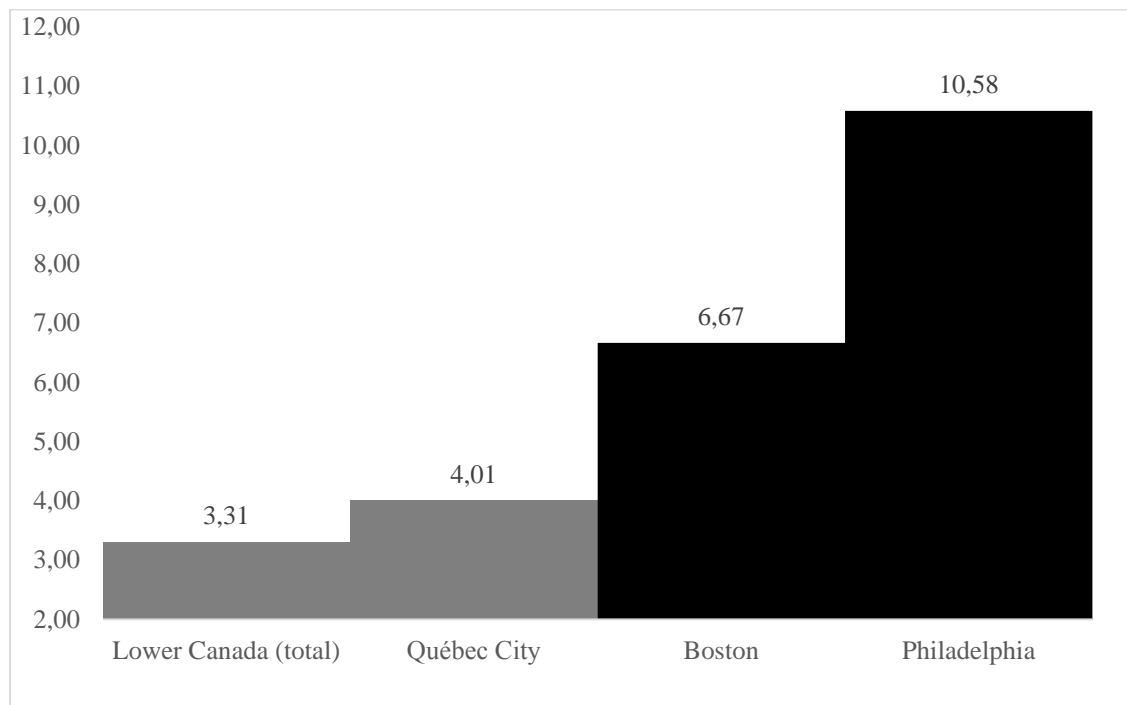
<sup>9</sup> Readers should be aware, as is discussed in the Appendix to this paper, that the prices used are taken from sources with estates outside the main cities. Thus, while prices for imported goods were lower in a port city like Quebec, the prices for food items produced in the hinterland were higher. No estimates of wide urban-rural price differences exist for Quebec during the British era. Historian Fernand Ouellet, alongside Jean Hamelin and Richard Chabot (1982), did however present comparisons of urban-rural prices, albeit only for wheat and lard.

**Table 6:** Grain wages in 1831 in different North American areas

	Bushels per day		Wage rate per day
Lower Canada Seignorial (weighted)	0.306	Lower Canada Seignorial (weighted)	\$0.34
Lower Canada (weighted)	0.317	Lower Canada (weighted)	\$0.36
Lower Canada Non-Seignorial (weighted)	0.401	Maryland <sup>1</sup>	\$0.40
Maryland <sup>1</sup>	0.423	Québec City	\$0.43
Quebec City	0.427	Lower Canada Non-Seignorial (weighted)	\$0.48
Montreal	0.461	West Virginia <sup>1</sup>	\$0.50
Vermont <sup>1</sup>	0.463	Montréal	\$0.50
Upper Canada <sup>4</sup>	0.642	Midwest <sup>3</sup>	\$0.53
Philadelphia <sup>1</sup>	0.862	South Atlantic <sup>3</sup>	\$0.58
West Virginia <sup>1</sup>	0.942	Upper Canada	\$0.61
		Vermont <sup>1</sup>	\$0.62
		Northeast <sup>3</sup>	\$0.65
		Midwest <sup>3</sup>	\$0.65
		Boston <sup>2</sup>	\$0.75
		South Central <sup>3</sup>	\$0.88
		Philadelphia <sup>1</sup>	\$1.00

Source: The wage rate for Canada, quoted in shillings, was converted into dollars on the basis of 5 shillings per dollar (McCullough 1984: 104). 1) The data for Vermont, Maryland, Boston and West Virginia are taken from the Global Price and Income History Group (1 March 2016) available online at <http://gpih.ucdavis.edu>. 2) The data for Boston are drawn from Carroll Wright (1885:102). 3) The data for the Northeast, Midwest, South Central and South Atlantic are drawn from Margo (2000). 4) The data for Upper Canada are drawn from *The Present State of the Canadas* (no author specified 1833) with regard to wages while the prices are drawn from McCalla (1993). All data were downloaded from GPIH on 1 March 2016.

Figure 1: Welfare ratio (bare bones) in Lower Canada compared to the United States (Allen et al. 2012)



## Conclusion

This paper provides the first empirical portrait of living standards in Canada after it was officially ceded to the British Empire in 1760. It relies largely on the census of 1831, which provides a deep analysis of wages across the colony. There are no data sources as promising as the 1831 census to provide such a cross-sectional analysis of living standards. This is a considerable advantage over the sources that would consist of a time series of wages and prices, as these would have to be extracted from account books of religious estates or newspapers that are specific to certain areas. While it offers a time dimension of a selected area in order to capture trends, it may fail capture the full portrait. Our paper does not disregard the potential of a time series approach to measure living standards. In fact, our hope is that this paper will complement any future attempts to produce time series estimates of living standards in Quebec.

Our results show that a) the colony of Lower Canada exhibited wide variations in living standards across regions; b) there were substantial differences across institutional lines whereby areas living under British land tenure laws exhibited higher living standards and; c) the colonists

of Lower Canada were substantially poorer than the Americans to the south, which implies that Canada was indeed the poorest area in North America.

## APPENDIX 1: CONTROL VARIABLES

### *Length of Growing Season*

The length of the growing season is derived from the *Atlas Agroclimatique du Québec* (2015), produced in collaboration with the agriculture department of the province. It is freely available online at [www.agrometeo.org](http://www.agrometeo.org), and under the heading “saison de croissance,” we can find maps of the average length of the growing season based on the average length observed from 1979 to 2008.

### *Land Quality*

The maps pertaining to the soil capability for agriculture were obtained from the Canada Center for Remote Sensing – Natural Resources Canada, in a digital format. The Canada Land Inventory (1998) (CLI) 1:250 000 data were further processed in the *ArcGIS* software and projected in the NAD 1983 Quebec Lambert conform conical projection after conversion to the *ESRI Shapefile* format. Official municipal boundaries from the Ministère des Ressources naturelles du Québec (Quebec's Natural Resources Ministry) were used both to provide a shoreline limit to the CLI dataset and to enable the use of land quality statistics on a per-municipality basis.

To this end, the *Identity Analysis* tool was used to splice together data from the CLI, which are distributed in small subunits conforming to the National Topographic System of Canada layout, and we then proceeded to associate agricultural land quality attributes to the municipal features using the *Intersect Analysis* tool. The data frame attributes were set to update the geometry attributes of area to hectares and perimeter length to kilometres. Attribute tables resulting from the GIS processing were then imported in spreadsheet software and aggregated using *Pivot tables* based on municipalities, regional county municipalities, and administrative regions.

The CLI contains attributes that describe the proportion, rounded in tenths, of the surface of an agricultural land feature corresponding to a qualitative classification scale, ranging from 1 to 7. The best agricultural areas, with the least limitations, are assigned low numbers (1), with worsening limitations resulting in higher class values (7). Organic soils (i.e. significant peat bogs), non-classified areas for the purpose of agriculture (i.e. built up areas, national parks,

nature preserves) and water are also assigned specific class values. The data attributes provide the three most dominant land quality classes of a feature, their proportion, and the type of limitation encountered. These limitations can be broadly defined as being of a climatic, geological or hydrological nature.

With the total area (in hectares) of any feature, and the proportion of these features corresponding to the soil capability classification in terms of quality and limitations, statistics in terms of both relative and absolute area of potential agricultural land for municipalities are thus available simply by multiplying them and summing them up.

Finally, for the regressions, we computed the land quality as the share of all land of quality 1 to 3 relative to the amount of land already cleared in 1831. This gave us an idea of how much quality land was being farmed and what quality land for farming was left.

#### *Distance from Nearest Urban Centre*

This variable is based on associating a direct line estimate of the distance between a given area and the nearest of three largest cities in the colony at the time: Montreal, Trois-Rivières and Quebec City. The distance is reported in kilometers.

#### *Immigrants per 1,000*

The census of 1831 contains three headings regarding people who immigrated from the British Isles to Canada since 1825 by sea, by land or foreigners who immigrated since 1825 regardless of the manner of entry. The data from the 1831 census report that only 23,426 persons were alive and had arrived in Lower Canada since 1825. The vast majority of them were located in townships.

#### *Years Since First Settlement*

The aggregated data in the *Appendix* to the Journal of the House of Assembly provide the settlement data of some parishes or townships in each district. But not all commissioners reported this information. As a result, we had to turn to the *Dictionnaire des Paroisses, Missions et Municipalités de la Province de Québec*, written by Hormisdas Magnan (1925). This document allowed us to confirm the dates provided in the *Appendix*. However, there are some

issues. Sometimes, the documents cite the point of settlement, the canonical erection and the concession of an estate. In some instances, all three dates are the same. Not always. As a result, we opted for the rule of using the earliest date available in all instances.

### *Postal Zone*

The postal zones were derived based on the schedule of postal rates mentioned in the 1831 Almanac for Montreal (p.37). The rate of 4.5 pence applied to all mail carried within less than 60 miles. The rate of 7 pence applied to mail sent between 60 and 100 miles away. The rate of 9 pence applied to mail sent up to 200 miles away. Each represented a zone and we created a variable capturing this postal zone to measure communication costs.

## **APPENDIX 2: PRICES IN 1831**

The prices used in this paper are drawn from the same sources as those used in Geloso (2016), who concentrated on the period between 1688 and 1760. These sources are the account books of religious congregations (the Séminaire de Québec and the Ursulines), whose headquarters were in Quebec City, but who held farm estates throughout the colony. As a result, they offer price information for rural areas (where their farm estates were located).

The prices were reported in accounting units. In short, these prices are what researchers would call “ideal money.” Colonial economies such as Canada and the United States separated the concepts of media of exchange from the unit of account. In essence, colonists assigned values to foreign coins in terms of the local unit of account. However, the congregations used a mixture of Halifax pound account units and French *livres* units (where one *livre* was worth twenty *sols*, and each *sol* was worth twelve *deniers*). Thankfully, these units are well identified, and the relation between the two accounting systems was fixed from 1760 to 1858 (at twenty-four *livres* for twenty Halifax shillings, thus 24 *sols* per shilling) (McCullough 1990; McCalla 1993). The Halifax Pound system was 10% less than the Sterling Pound (thus, 1.1 Halifax pound per Sterling pound). Normally, there is a conversion to silver in order to compare the baskets, but we do not see the necessity for that here since the goal is to compare welfare ratios and converting

for silver will not improve the quality of the measurement—in fact it changes nothing for our purposes.

The type of cloth used in the United States by Allen, Murphy and Schneider (2012) was linen—which was one of the most commonly used clothing items in Quebec. Geloso (forthcoming) emphasizes the role of the *toile du pays*, *toile de chanvre* or *toile indienne* as the main cloths in use. The *toile de chanvre* was made from hemp and the *toile indienne* tended to be made from wool, the *toile du pays* could be made from either from linen or wool (Ruddell 1983). Fortunately, prices for all these items are generally very similar (a few *sols* difference)—thus we took the average of all the clothing prices found.

With regard to fuel, we created an upper and lower bound of the fuel provided by a cord of firewood. The upper bound was represented by oak and the lower bound by pine—two types of wood that would have been common in Canada (Lower 1973). These yield between 14.8 and 24.2 million BTUs per cord of 128 cubic feet<sup>10</sup> We took the price of a cord of firewood and divided it by the number of BTUs provided by each type of wood and then we averaged them to obtain a mid-estimate. The prices used are indicated below in the same table as the bare bones basket designed by Allen et al. (2012).

**Table A.3.** Bare bones basket and prices used for the estimate of welfare ratio

	Bare bones basket	Prices	Per unit	Monetary unit
Oats	153.96	2.85	kg	Sols
Peas	20	5.26	kg	Sols
Meat (beef)	5	15.55	kg	Sols
Butter	3	38.90	kg	Sols
Soap	1.3	17.36	kg	Sols
Cloth	3	43.90	meter	Sols
Candles	1.3	32.28	kg	Sols
Lamp oil	1.3	29.04	liters	Sols
Fuel	2	28.99	MBTU	Sols

<sup>10</sup> This is for a cord that stands at four feet high, four feet deep and eight feet long (128 cubic feet). According to Gilles Paquet and Jean-Pierre Wallot (1998:311), the common cord of firewood in Quebec was six feet high, four feet deep and two feet long (48 cubic feet). This means that the Quebec cord of firewood was only 37.5% that of the one for this measurement. This paper has adjusted the values accordingly. To make the adjustments, we computed the price of firewood per cubic foot, and adjusted this measurement so that the cord has a volume of 128 cubic feet, and then divided by the BTUs for each type of firewood. The amount of MBTU per type of wood was derived thanks to the computations made available on the website of <https://chimneysweeponline.com/howood.htm> (consulted November 4<sup>th</sup>, 2014).



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