
Are Consumption Taxes Regressive in Quebec?

Luc Godbout and Suzie St-Cerny*

PRÉCIS

Cette étude remet en question la présomption voulant que les taxes à la consommation — au Québec, la taxe sur les produits et services du gouvernement fédéral (TPS) et la taxe de vente du Québec (TVQ) — soient régressives. À l'aide de l'Enquête sur les dépenses des ménages de Statistique Canada, les auteurs analysent le panier de produits taxables et non taxables des ménages québécois pour chaque quintile de revenu. Leurs résultats montrent que sans les crédits pour TPS/TVQ, les taxes à la consommation sont pratiquement proportionnelles au revenu des ménages; toutefois, avec les crédits, le taux de taxe effectif augmente avec le revenu. Ainsi, les crédits de taxes constituent un outil plus efficace pour améliorer la progressivité des taxes à la consommation que la détaxation des produits alimentaires de base. Finalement, les résultats indiquent aussi que, à l'image de la réduction récente du taux de TPS, une augmentation du taux de TVQ, jumelée à des changements au crédit de TVQ remboursable, profite même aux ménages des quintiles de revenu les plus bas.

ABSTRACT

This study questions the presumption that consumption taxes—in Quebec, the federal goods and services tax (GST) and the Quebec sales tax (QST)—are regressive. Using Statistics Canada's Survey of Household Spending, the authors identify the basket of taxable and non-taxable consumption of Quebec households for each income quintile. Their results show that without GST-QST credits, consumption taxes are almost proportional to household income; however, with these credits, the effective tax rate rises with income. By this measure, the tax credits are a more effective tool for improving the progressivity of consumption taxes than the zero-rating of basic groceries. Finally, the

* Of Université de Sherbrooke, Quebec (e-mail: luc.godbout@usherbrooke.ca; suzie.st-cerny@usherbrooke.ca). We wish to thank François Drouin, of Université de Sherbrooke, who agreed to explore (as part of his research toward a master's degree in taxation) the potential for analysis regarding the breakdown of consumption taxes using data from Statistics Canada's Survey of Household Spending, and focusing in particular on effective tax rates. His work has confirmed the relevance of further analysis of the regressive nature of consumption taxes. The views and conclusions presented in this article remain, of course, entirely our responsibility.

results also indicate that, like the recent reduction in the GST rate, increases in the QST rate, combined with changes to the refundable QST credit, benefit even households in the lowest income quintiles.

KEYWORDS: CONSUMPTION TAX ■ GST ■ QST ■ PROGRESSIVE TAXES ■ SALES TAXES ■ REGRESSIVE

CONTENTS

Background	464
Consumption Taxes and Their Impact on Households	465
Consumption Taxes: The Current Situation	465
The Fiscal Impact of Taxes	466
The Regressive Aspect of Consumption Taxes	468
Tools for Reducing or Eliminating the Regressive Effect of Consumption Taxes	471
Multiple Rates	471
Exclusions	471
Tax Credits or Allowances	472
Measures of Progressivity	474
The Methodological Approach for Distributing the Weight of Consumption Taxes	476
Survey of Household Spending	476
Household Type	477
Measure of Household Income	477
Breakdown of Households by Income	477
Breakdown of Taxable Spending by Quintile	478
Government Revenues Derived from the QST	480
The Survey of Labour and Income Dynamics	481
Consumption Taxation of Households in 2008	482
Breakdown of Consumption Taxes	482
Are Consumption Taxes in Quebec Truly Regressive?	483
Tax Concentration Curve	484
Index of the Share of Taxes as a Proportion of the Share of Income	484
Measurement of the Effective Consumption Tax Rate	486
Factors of Progressivity of Consumption Taxes in Quebec	486
Impact of Changes to GST and QST Rates	488
The Reductions in the GST Rate in 2006 and 2008	489
The Increases in the QST Rate in 2011 and 2012	489
Changes in the Combined GST-QST Rate, 2005-2012	490
Conclusion	491

BACKGROUND

In Quebec, the federal goods and services tax (GST) and the Quebec sales tax (QST) apply to most goods and services consumed.

Despite existing offsetting measures, such as the zero-rating or exemption of certain products and services and refundable GST-QST credits, there is an abiding negative impression in Quebec, as in Canada generally, regarding the use of consumption taxes. Although few studies have dealt specifically with this subject since the implementation of the GST and the QST, there is a strongly held public presumption

regarding the unfair nature of consumption taxes. This study addresses a series of questions:

- Are these two consumption taxes a regressive form of taxation?
- Do the offsetting measures eliminate the inherent regressivity of consumption taxes?
- Will the situation be exacerbated by the recent and expected changes to the GST and the QST?

The recent and expected changes to the QST provide a timely opportunity to undertake a rigorous study of the repercussions of consumption taxes, in order to determine whether or not the negative perception is justified.

CONSUMPTION TAXES AND THEIR IMPACT ON HOUSEHOLDS

An essential exercise in developing fiscal policy consists of assessing the impact of consumption taxes on households according to income. This type of study attempts to answer a variety of questions. For instance, what would be the result of a change in the relative weight of taxes on income distribution?¹ Put more simply, who pays consumption taxes?

Consumption Taxes: The Current Situation

The GST became effective on January 1, 1991, replacing the federal manufacturers' sales tax.² Since then, six provinces have harmonized with it. Quebec was the first to follow the federal lead: on July 1, 1992, it replaced its retail sales tax, dating from 1940, with the Quebec sales tax (QST).³ Since 1997, the federal government has collected a harmonized sales tax (HST) in New Brunswick, Nova Scotia, and Newfoundland, in place of the GST and the provincial sales tax. Ontario and British Columbia have also adopted the HST, effective July 1, 2010.⁴

1 See, for example, Gérard Forgeot and Christophe Starzec, "L'impact redistributif des impôts indirects en France" (2003) 13 *Public Economics* 3-43.

2 The initial GST rate was 7 percent; it has since been reduced, as described below. Since July 1, 1992, Revenu Québec has administered the GST throughout Quebec on behalf of the federal government.

3 The initial QST rates were 4 percent on services and 8 percent on goods. In May 1994, a single rate, 6.5 percent, was applied, which was subsequently raised to 7.5 percent, on January 1, 1998, and to 8.5 percent, on January 1, 2011. Further increases are planned, as described below.

4 The HST is different in each province. The current HST rates differ in some provinces (12 percent in British Columbia; 13 percent in Ontario, New Brunswick, and Newfoundland; and 15 percent in Nova Scotia). The zero-rated or exempt goods and services are also different in some cases; for example, children's car seats and car booster seats are exempt from the provincial portion of the HST in Ontario and British Columbia, but not in Nova Scotia.

In 2011, the GST rate is 5 percent and the QST rate, 8.5 percent. However, the QST applies to the total of the sales price and the GST, resulting in a combined sales tax rate of 13.93 percent rather than 13.5 percent.⁵ Since the GST and the QST are value-added taxes, companies that collect the taxes can recover GST and QST that they paid on their inputs.

In 2007, consumers in Quebec paid \$7 billion in GST and \$8.8 billion in QST on their purchases of goods and services. For the Quebec government, the QST is the second-largest source of revenue after personal income tax, accounting for 22 percent of all its tax revenue. For the federal government, the GST generated 15 percent of its tax revenue, with roughly one-fifth being collected in Quebec.⁶

The GST rate remained unchanged at 7 percent for 15 years. The federal government reduced the rate from 7 percent to 6 percent on July 1, 2006, and then to 5 percent on January 1, 2008. Despite the lower rate, the parameters of the refundable GST credit for individuals were not changed, meaning that neither the amount nor the reduction threshold of the GST credit has been revised downward.

In Quebec, the government has announced a series of changes to the QST. In the March 2009 plan to return to a balanced budget, the government announced that the QST rate (then 7.5 percent) would rise by 1 percentage point on January 1, 2011.⁷ Then, in the 2010-2011 budget, the new plan to return to a balanced budget announced another increase in the QST rate, from 8.5 percent to 9.5 percent, to take effect on January 1, 2012.⁸ Along with each of these rate hikes, the government stipulated an increase in the refundable QST credit. It was announced in the 2010-2011 budget that the refundable credit for the QST would be combined with two other refundable tax credits to form the new refundable solidarity tax credit. The budget stated that, essentially, this new tax credit will provide more assistance to households to mitigate QST-related costs. Since it has (so far) been possible to extract the QST credit component from the solidarity tax credit, we can see that the QST credit will be increased in 2011 and 2012 to reflect the increases in the QST rate.

The Fiscal Impact of Taxes

Studies examining the breakdown of taxes focus on the fiscal impact of taxation; in particular, they measure the distribution of all taxes within the population.⁹

5 For example, for a product with a retail price of \$100, the 5 percent GST is \$5, and the QST is calculated on a value of \$105 at a rate of 8.5 percent, so that the QST payable is \$8.93. The total of the taxes is thus \$5 + \$8.93 = \$13.93.

6 Statistics Canada, CANSIM database, tables 284-0004 and 384-0007; Institut de la statistique du Québec, *Comptes économiques des revenus et dépenses du Québec*, 2009 ed. (Quebec City: Institut de la statistique du Québec, 2010); and Finances Québec, 2010-2011 Budget, Budget Plan, March 30, 2010, at I.4.

7 Finances Québec, 2009-2010 Budget, Budget Plan, March 19, 2009, at A.44-45.

8 Finances Québec, 2010-2011 Budget, Additional Information on the Budgetary Measures, at A.9.

9 For Canada in particular, see G.C. Ruggeri, D. Van Wart, and R. Howard, "The Redistributive Impact of Taxation in Canada" (1994) 42:2 *Canadian Tax Journal* 417-51; Frank Vermaeten,

Fiscal impact studies generally make use of microdata, and the results are presented by income group according to household category. In some cases, households are converted into adult equivalents using equivalence scales. However, households remain a common unit of observation in studies of fiscal impact.¹⁰

While most studies use annual data, some attempt to estimate consumption and income over the life cycle in order to avoid distortion of the results. (Typically, in the first and last years of adult life, consumption is proportionally higher in relation to annual income than in the middle of the life cycle.) Those who favour the life cycle approach maintain that annual income is highly variable from one year to the next, while consumption is more uniform over the years. They argue that the level of consumption is a better indicator of well-being, and thus that using income over a lifetime is preferable to using annual income for the purposes of assessing fiscal policies. They also refer to permanent income theories and indicate that using annual income exaggerates measurements of regressivity and progressivity of many taxes. On the other hand, the main arguments of those who favour using annual income are, first, that simulating an income series over a lifetime is very uncertain, given all the assumptions that must be made; second, that both taxpayers and political decision makers are more interested in the tax profile over a short period; and third, that frequent changes in fiscal policy provide another reason for the use of annual income.

The results of fiscal impact studies are very often shown as the ratio between taxes paid and income for each income group, called the average effective tax rate. However, the choice of income used also has an effect on the results obtained. Should only market income (wages and other sources of income) be used, excluding government transfers? Or should the notion of total income be used, which includes transfers and thus considers the share of income directly under the control of households that the government collects in taxes? Is it preferable to apply the notion of disposable income, which reduces total income by taxes paid? Lastly, should the definition of income be expanded to include a value imputed to government spending on goods and services, given the large number of assumptions concerning the distribution of the value of such goods and services?

The main studies on the fiscal impact of taxes in Canada have analyzed the effect of all taxes of all orders of government.¹¹ They have also presented the results according to government and by type of tax. The methodology used in these studies is

W. Irwin Gillespie, and Arndt Vermaeten, "Tax Incidence in Canada" (1994) 42:2 *Canadian Tax Journal* 348-416; and Marc Lee, *Eroding Tax Fairness: Tax Incidence in Canada, 1990-2005* (Toronto: Canadian Centre for Policy Alternatives, 2007).

10 See, for example, Jonathan R. Kesselman and Ron Cheung, "Tax Incidence, Progressivity, and Inequality in Canada" (2004) 52:3 *Canadian Tax Journal* 709-89.

11 Ruggeri et al., *supra* note 9; Vermaeten et al., *supra* note 9; Lee, *supra* note 9; and Arndt Vermaeten, W. Irwin Gillespie, and Frank Vermaeten, "Who Paid the Taxes in Canada, 1951-1988?" (1995) 21:3 *Canadian Public Policy* 317-43.

similar even though the choices made regarding the type of income and tax imputation assumptions vary. Despite these differences, the results support one another, to varying degrees, and can be summarized as follows:

- Overall, Canada's tax system is progressive and results in substantial income redistribution in favour of low-income groups.
- The federal tax structure is more progressive than the tax structure of the provinces as a whole, the latter being, according to the studies, more proportional or mildly progressive.
- The personal income tax is the only truly progressive tax.
- Local taxes are somewhat proportional or slightly regressive.
- Taxes on consumer goods (sales taxes and other taxes) are regressive.
- Overall, using income after government intervention (taxes and transfers) would improve the results obtained in terms of progressivity (more progressive or less regressive).

Using 1981 data, Payette and Vaillancourt¹² examined the impact by income class of government revenue and expenditure (federal, provincial, and local) for Quebec. They provided a detailed description of their method of imputation of government taxes and expenditure. Their results showed that in 1981, three types of taxes had a regressive impact: the tax on corporate profits (according to the imputation assumptions, this tax can also be neutral); the property tax; and taxes on goods (indirect taxes, customs duties, excise taxes and duties, registration and licence fees, etc.). On the other hand, income tax and social security taxes were progressive. Turning to the impact of public spending, transfers had, not surprisingly, a clearly progressive impact. And, when population was chosen as the allocator of spending among quintiles for many spending categories, the other spending categories were also progressive, with the exception of the debt and other spending category. Overall, Payette and Vaillancourt showed that in 1981, in Quebec, taxation was mildly regressive and government spending was progressive.

The Regressive Aspect of Consumption Taxes

Unlike income tax, which has a progressive tax scale (the rate rises as income increases), consumption taxes have a single non-zero rate. Two taxpayers, one low-income and the other high-income, will pay the same amount of GST-QST on the purchase of an identical product.

In addition, the research on fiscal impact discussed above is consistent with one of the main criticisms often levelled at consumption taxes, namely, that they are regressive—that is, lower-income families spend a larger share of their income in taxes than higher-income families.

12 Micheline Payette and François Vaillancourt, "L'incidence des recettes et dépenses gouvernementales au Québec en 1981" (1986) 62:3 *L'Actualité économique* 409-41.

Some authors have written on this aspect of consumption taxation. An overview of this literature tends to confirm, in some respects, the regressive nature of consumption taxes specifically or of indirect taxation in general.

In a study of the redistributive impact of indirect taxes in France, Forgeot and Starzec¹³ conclude that indirect taxation has an anti-redistributive effect that contributes to the heightening of inequalities. Ruiz and Trannoy¹⁴ present a microsimulation model of the redistributive impacts of indirect taxation. The model confirms and quantifies the regressive impact of various indirect taxes—in particular, excise duties on tobacco, alcohol, and petroleum products. Ruiz and Trannoy conclude that indirect taxes make but a marginal contribution to redistributive objectives. In their view, indirect taxation should be considered as a “budget reservoir” from which governments can draw to fund reforms of direct taxes with a real redistributive impact.

Using a microsimulation model, Decoster et al.¹⁵ simulate a shift from direct taxation to greater use of indirect taxation in five European countries, keeping government revenues constant. The study shows that the regressive aspect depends on the denominator used. If the amount of indirect taxes paid is compared as a proportion of income, these taxes are regressive, but they are proportional or even progressive as a percentage of total consumption spending. However, they are still less progressive than other forms of taxation, such as taxation of individual or family income.

As indicated above in the section on fiscal impact, many authors argue that the progressive or regressive nature of indirect taxes should be measured, not on the basis of annual income, but rather using life cycle income. Caspersen and Metcalf,¹⁶ Metcalf,¹⁷ and Athreya and Reilly¹⁸ have all shown that consumption taxes are regressive on the basis of annual income, but become proportional or even progressive when the calculation is based on life cycle. On the other hand, Chernick and Reschovsky¹⁹ contradict the foregoing studies and affirm that consumption taxes are always regressive, regardless of the time horizon considered.

13 Supra note 1.

14 Nicolas Ruiz and Alain Trannoy, “Le caractère régressif des taxes indirectes : les enseignements d’un modèle de microsimulation” (2008) 413 *Économie et statistique* 21-46.

15 André Decoster, Jason Loughrey, Cathal O’Donoghue, and Dirk Verwerf, “How Regressive Are Indirect Taxes? A Microsimulation Analysis for Five European Countries” (2010) 29:2 *Journal of Policy Analysis and Management* 326-50.

16 Erik Caspersen and Gilbert Metcalf, “Is a Value Added Tax Progressive? Annual Versus Lifetime Incidence Measures” (1994) 47:4 *National Tax Journal* 731-46.

17 Gilbert E. Metcalf, *The National Sales Tax: Who Bears the Burden?* Cato Institute Policy Analysis no. 289 (Washington, DC: Cato Institute, 1997).

18 Kartik B. Athreya and Devin Reilly, “Consumption Smoothing and the Measured Regressivity of Consumption Taxes” (2009) 95:1 *Economic Quarterly* 75-100.

19 Howard Chernick and Andrew Reschovsky, “Yes! Consumption Taxes Are Regressive” (2000) 43:5 *Challenge Magazine* 60-91.

Turning to Canada, in a 1978 study, Ruggeri²⁰ maintained that the different empirical results found for Canada in various studies on consumption taxes could be explained in part by differences in the definition of income (before or after government intervention by taxes and transfers) and in the method of allocation of payments of taxes for the various income groups. Using income after taxes and transfers (after government intervention) and breaking down household spending according to Statistics Canada's 1969 survey of family expenditures,²¹ he concluded that provincial sales taxes were proportional.

In Quebec, Vaillancourt and Berthiaume²² examined Quebec's retail sales tax compared with Ontario's tax in 1970 for economic families according to 12 income groups. They concluded that the sales tax was clearly regressive for all income groups in Ontario, but that in Quebec, it was roughly proportional in the first 10 groups, representing 85 percent of families. Vaillancourt and Poulaert²³ then repeated the exercise, but for all the provinces and for two years, namely, 1978 and 1982. In this case, their results measured for a Canadian weighted average showed that retail sales taxes were somewhat progressive in 1978 and regressive in 1982. This result also held for Quebec, though when the last income group was excluded in 1982, a degree of proportionality was apparent, or at least regressivity was fairly low.

However, it should be mentioned that there is no study dealing specifically with the GST or the QST. In the studies mentioned earlier on the Canadian tax system as a whole, the effect of consumption taxes on income has been measured, but in every case, either value-added taxes (GST, QST) had not been implemented, or they were included in the entire set of indirect taxes. Nonetheless, it is important to point out that Vermaeten et al.²⁴ indicate that the regressive aspect of indirect taxes remains despite the existence of tax credits, while Lee²⁵ specifies that his calculations concerning indirect taxes do not take the tax credit into account, because he considers it to be a transfer and thus includes it in income. However, he adds that this credit offsets the regressive aspect of the GST.

One might ask: If a specific analysis of consumption taxes, even taking into account existing tax credits, shows that they are regressive, is that cause for concern so long as the tax system as a whole remains progressive? As Chernick and Reschovsky

20 G.C. Ruggeri, "On the Regressivity of Provincial Sales Taxation in Canada" (1978) 4:3 *Canadian Public Policy* 364-72.

21 Statistics Canada, *Family Expenditures in Canada*, catalogue no. 62-535 (Ottawa: Statistics Canada, 1969).

22 François Vaillancourt and Jacques Berthiaume, "A Comparative Analysis of the Incidence of Retail Sales Tax in Ontario and Quebec, 1970" (1978) 26:5 *Canadian Tax Journal* 596-604.

23 François Vaillancourt and Marie-France Poulaert, "The Incidence of Provincial Sales Taxes in Canada, 1978 and 1982" (1985) 33:3 *Canadian Tax Journal* 490-510.

24 Vermaeten et al., *supra* note 9.

25 Lee, *supra* note 9.

observe,²⁶ the essential thing is to ensure that the less well off do not become more disadvantaged when a change in fiscal policy is implemented.

Tools for Reducing or Eliminating the Regressive Effect of Consumption Taxes

While consumption taxes tend to be regressive by nature, government can intervene to reduce or completely offset their regressive effect.²⁷ The three most common ways to reduce regressivity for low-income households are multiple rates, exclusions, and tax credits or allowances.²⁸

Multiple Rates

Implementing multiple rates, with lower rates applied to everyday goods and services and higher rates applied to “luxury” goods and services, obviously reduces the regressive nature of consumption taxes. Of the 27 member states of the European Community, Denmark is the only one to use a single value-added tax rate. France, for example, applies rates of 2.1 percent, 5.5 percent, and 19.6 percent.²⁹

In this regard, Bickley³⁰ indicates that economists oppose multiple rates because of the administrative costs they generate and their effects on the neutrality of the tax.

Neither Quebec nor Canada has adopted this approach, and both apply a single consumption tax rate.

Exclusions

The regressive nature of consumption taxes obviously depends on the tax base. Once certain goods or services are exempt from tax, it is possible to reduce or eliminate regressivity by excluding goods whose consumption represents a relatively larger share of expenditures by lower-income households. This can be done by excluding essential goods (food and shelter, in particular).

26 Chernick and Reschovsky, *supra* note 19.

27 Many authors speak of the possibility of reducing or cancelling the regressive aspect. See, in particular, Jeffrey M. Schaefer, “Sales Tax Regressivity Under Alternative Tax Bases and Income Concepts” (1969) 22:4 *National Tax Journal* 516-27; Metcalf, *supra* note 17; and Kent Osburn Zirlott, “Analyzing Sales Tax Regressivity Using Consumer Expenditure Data: A Three Scenario Analysis for Alabama,” PhD dissertation (University of Alabama, 2007).

28 James M. Bickley, *Value Added Tax: Concepts, Policy Issues, and OECD Experiences* (Hauppauge, NY: Novinka, 2003).

29 European Commission, Taxation and Customs Union, *VAT Rates Applied in the Member States of the European Union* (Brussels: European Commission, 2011).

30 *Supra* note 28.

For the same reasons mentioned for the use of multiple rates, Bickley points out that economists criticize the use of exclusions. However, Schaefer³¹ and Davies³² have shown that excluding food purchased for home consumption (basic groceries) from the tax base can reduce regressivity or increase progressivity, depending on the measure used.

Quebec and Canada use the exclusion approach. Many goods and services are either exempt or zero-rated (for the QST, the GST, or both).³³ From the consumer's standpoint, "exempt" and "zero-rated" mean the same thing—namely, application of a zero rate to a given product or service—but for a business, the impact depends on which form of exclusion applies.³⁴ There is a multitude of exempt or zero-rated goods and services, including prescription drugs, certain transportation services, most health services, education services, and child-care services, as well as certain specific goods (such as diapers and books) in the QST system.

Obviously, shelter and basic groceries must be added to that list. Regarding shelter, the government acknowledges that it is an essential need and a major component of household consumption. As for groceries, the government acknowledges the general view among taxpayers that basic groceries should not be taxed. In both cases, these measures were included in recognition of the negative consequences of a tax on rental accommodation and basic groceries for low-income taxpayers.³⁵

Tax Credits or Allowances

The third approach designed to attenuate the effects of consumption taxes for low-income households is the introduction of transfer measures directed to this group of taxpayers. This type of allowance can consist of a tax credit claimed when filing an annual tax return, or a periodic benefit. A variant of this approach is to allocate a defined portion of consumption tax revenues to transfers to low-income households.

By simulating the implementation of a sales tax with a tax credit or universal rebate, Zirlott³⁶ (for Alabama) and Burton and Mastromarco³⁷ (for the United

31 Schaefer, *supra* note 27.

32 David G. Davies, "Clothing Exemptions and Sales Tax Regressivity: Note" (1971) 61:1 *The American Economic Review* 187-89.

33 For example, as discussed below, 53 percent of households' current expenditure in the lowest income quintile has not been taxed. The proportion decreases as income increases, reaching 33 percent for the highest income quintile.

34 The difference is important for companies that may or may not claim input tax rebates or credits depending on whether the supply is zero-rated or exempt.

35 Finances Québec, *Tax Expenditures: 2010 Edition* (Quebec City: Finances Québec, 2011), at B.227-30.

36 Zirlott, *supra* note 27.

37 David R. Burton and Dan R. Mastromarco, *Emancipating America from the Income Tax: How a National Sales Tax Would Work*, Cato Institute Policy Analysis no. 272 (Washington, DC: Cato Institute, 1997).

States) have shown that consumption taxes can become progressive for low-income earners.

Unlike European countries, which do not use this approach, Quebec and Canada have offered the tax credit since the introduction of the GST and the QST.³⁸ The federal and Quebec governments allow individuals a refundable sales tax credit, depending on their economic and family situation. In 1989, Canada's minister of finance, Michael H. Wilson, wrote:

Canada is in a unique position: our extensive experience with refundable tax credits delivered through the income tax system ensures that we will be able to offset the regressivity that is inherent in taxing consumption.³⁹

Table 1 shows the parameters of the GST and QST refundable tax credits for 2008, while figure 1 illustrates the amounts received for a couple with children. It can be seen that the amount obtained varies widely depending on family situation and income. However, only the value of the federal credit depends on the number of children.

If a consumption tax that is applied uniformly (at the same rate on all products and services, regardless of household situation) imposes a heavier burden on households that are less well off, three tools can be used to reduce or reverse the regressive impact of the tax. Quebec and Canada make use of two of these tools—the exclusion of certain basic goods and services from the tax base, and the provision of tax credits for households that are less well off—both of which clearly affect the distribution of the consumption tax burden among households. That said, implementation of these measures must be offset financially by applying a higher general sales tax rate if the government is to maintain the revenues it needs from the imposition of a consumption tax.

A document published in 1987 by the federal Department of Finance, before the implementation of the GST, showed that a sales tax without a refundable tax credit would be regressive, but a sales tax with a refundable credit and some exemptions would be progressive.⁴⁰

It may be worthwhile not only to examine whether consumption taxes are regressive or not, and thus how taxes are collected, but also to study how governments use tax revenues for public spending. As discussed above, refundable sales tax credits

38 In New Zealand, there is a sales tax credit, but it is restricted to families with dependent children. See Ian Dickinson and David White, *Tax Design Insights from the New Zealand Goods and Services Tax (GST) Model* (Wellington, NZ: Victoria University, Centre for Accounting, Governance and Taxation Research School of Accounting and Commercial Law, 2008), at 11.

39 Canada, Department of Finance, *Goods and Services Tax: An Overview* (Ottawa: Department of Finance, 1989), at 6.

40 Canada, Department of Finance, *Tax Reform 1987: Sales Tax Reform* (Ottawa: Department of Finance, 1987), at 13.

TABLE 1 Parameters of Refundable Tax Credits for the QST and GST, 2008

	Maximum amount	Reduction threshold	Rate of reduction	Cutoff threshold
	<i>dollars</i>		<i>percent</i>	<i>dollars</i>
QST				
Single person	292	29,645	3	40,379
Couple	348	29,645	3	43,245
GST				
Person living alone (including work income supplement) ^a	369	31,524	5	38,904
Single-parent family with one child	611	31,524	5	43,744
Childless couple	484	31,524	5	41,204
Couple with children				
One child	611	31,524	5	43,744
Two children	738	31,524	5	46,284

Notes: The amounts of GST and QST credits are indexed annually. The cutoff threshold for the QST credit is calculated by including the deduction for workers from \$1,000 per person.

^a The maximum amount is \$242, but there is a supplement for a person living alone with a work income supplement. The maximum supplement is \$127 and applies to work income in excess of \$7,851 at a rate of 2 percent. Accordingly, the maximum amount of \$369 is reached at work income of \$14,200.

Sources: Canada Revenue Agency and Revenu Québec.

are in place to reduce the regressive nature of the GST and the QST, and many economists agree that most wealth redistribution occurs on the spending side, and not just in how tax revenues are collected.⁴¹

Measures of Progressivity

There are numerous measures of progressivity, although no indicator is universally recognized.⁴² However, measures of progressivity are generally of two types: targeted or global. A targeted measure of progressivity is calculated for various specified income groups and assists comparison of results from one group to another.

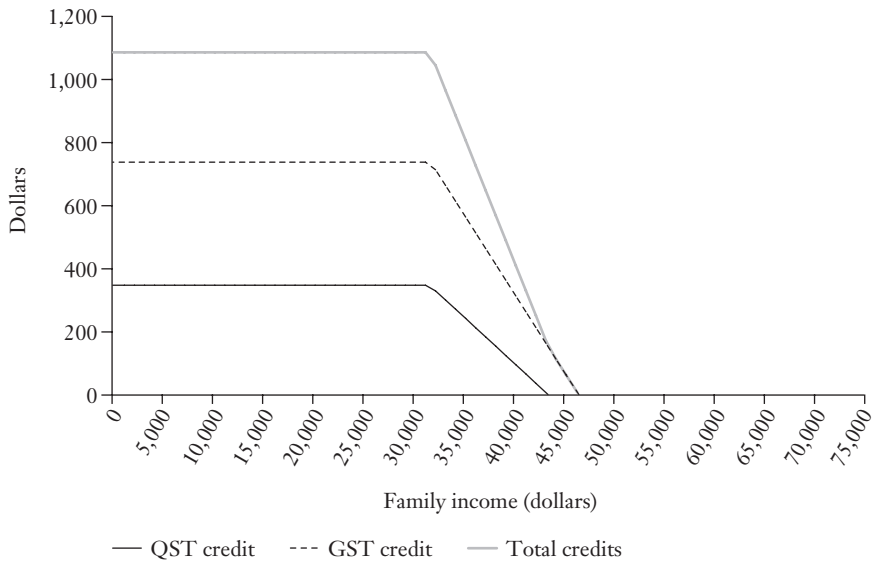
The average effective tax rate is a local measure. In a 1948 study, Musgrave and Thin⁴³ measured the rise in this rate by the change in tax payable compared with the change in income. There is progressivity when the average tax rate is a rising function of income. This type of local measure is extremely useful, even though it makes

41 Bev Dahlby, "Restructuring the Canadian Tax System by Changing the Mix of Direct and Indirect Taxes," in Herbert G. Grubel, *Tax Reform in Canada: Our Path to Greater Prosperity* (Vancouver: Fraser Institute, 2003).

42 John Norregaard, "Progressivité des systèmes d'imposition sur le revenu" (Autumn 1990) *Revue économique de l'OCDE* 91-123.

43 Richard A. Musgrave and Tun Thin, "Income Tax Progression: 1929-1948" (1948) 56 *Journal of Political Economy* 498-514.

FIGURE 1 Annual QST and GST Credits by Family Income for a Couple with Two Children, 2010



Source: Calculations by the authors.

comparisons between jurisdictions, over time, or between two types of taxation more difficult than a global measure. (A global measure analyzes the overall progressivity or regressivity of a tax structure.)

In addition to the average effective tax rate, there are other targeted measures, including a very simple one proposed by Ruggeri.⁴⁴ He analyzed progressivity by comparing the proportion of total taxes paid by households in one quintile with the share of total income of the same quintile. If the tax is distributed proportionally, the index will be equal to 1. More than 1 for the lower quintiles means that the tax is regressive, because the share of tax paid by households in the lower-income quintiles is higher than their share of income. According to Ruggeri's approach, the tax is progressive when the index for the lower quintiles is less than 1 while the index for the upper quintiles is greater than 1.

For a global analysis of progressivity, a Lorenz curve and a tax concentration curve can be drawn side by side. The Lorenz curve shows aggregate population as a function of aggregate income. The tax concentration curve shows aggregate population as a function of aggregate taxes paid. Accordingly, a tax is progressive if at each point of aggregate population (except at both ends) the Lorenz curve is

44 Ruggeri, *supra* note 20.

above the tax concentration curve, implying that the percentage of the population in question is paying less than its share of income.⁴⁵

THE METHODOLOGICAL APPROACH FOR DISTRIBUTING THE WEIGHT OF CONSUMPTION TAXES

The main objective of this analysis is to estimate the distribution of consumption taxes among Quebec households. To do so, the amount of consumption taxes paid by households must first be determined. It will then be possible to determine their weight as a proportion of household income. This section describes the methodological approach used.

Survey of Household Spending

The analysis makes use of Statistics Canada's Survey of Household Spending (SHS) for 2008⁴⁶ to estimate consumption taxes paid in Quebec (QST and GST). The SHS provides detailed information on spending relating to consumption of products and services by households in each province of Canada. Household spending is broken down into more than 260 categories, with many groupings. The survey also gives total income, taxes paid, and the main social contributions paid by these same households. The main groupings of consumption spending in 2008 are as follows:

- Food
- Shelter
- Household operation
- Household furnishings and equipment
- Clothing
- Transportation
- Health care
- Personal care
- Recreation
- Reading materials and other printed matter
- Education
- Tobacco products and alcoholic beverages
- Games of chance (net)
- Miscellaneous expenditures
- Investments in the home: improvements and alterations

45 In particular, Zirlott, supra note 27; Abdelkrim Araar, Sami Bibi, and Jean-Yves Duclos, "Progressivity, Vertical and Horizontal Equity," paper presented at the Workshop on Poverty and Social Impact Analysis in Sub-Saharan Africa, Kampala, Uganda, November 23-29, 2009.

46 Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009).

Household Type

In this analysis, we will use spending by households rather than spending by individuals.⁴⁷ In the SHS, a household is a person or group of persons occupying a dwelling. Accordingly, households consist of couples with or without children, single-parent families, and persons living alone or with other unrelated persons. According to the SHS, there were 3,351,040 households in Quebec in 2008.

Measure of Household Income

Household income can be measured in many ways. For instance, market income includes all sources of household income except government transfers and is calculated before taxes. Total income includes all sources of income, including government transfers. Lastly, after-tax income includes all sources of income, including government transfers, from which income tax is subtracted.

To measure the amount of taxes paid by households as a proportion of their income, the analysis uses the notion of net income, defined as income after personal income taxes and after social contributions. All this information is drawn from the SHS 2008.⁴⁸ Net income is selected for this analysis because it is the income actually available to households for consumption spending.

Breakdown of Households by Income

The SHS presents household spending by income quintile, meaning that the SHS data for the 3,351,040 households are divided into five equal groups. Accordingly, the analysis can take into account the change in consumption according to household family income. The first quintile refers to the group of 670,210 households with the lowest income, while the fifth quintile refers to spending by the group of 670,210 households with the highest income.⁴⁹ In 2008, the population breakdown results in the following total income thresholds for the respective quintiles:

47 It can be argued that household size should be taken into account. For example, the individuals in a family of four earning \$20,000 per year might be poorer than a single individual earning \$15,000. Implementing this approach would involve calculating household income on a per-adult-equivalent basis (using a household equivalence scale to equalize households of different sizes) and then reranking households into five quintiles on this basis. This step is left to further research. Our approach, although not used by all studies, is common in the literature; as Kesselman and Cheung, *supra* note 10, at 735, note, “[t]aking the household as the unit of observation without equalizing is also common in FINC [fiscal incidence] studies.”

48 Net income as defined in the SHS 2008 also includes “other money receipts,” which refers to receipts not otherwise included in income, such as cash gifts, inheritance, or life insurance settlements. Winnings from games of chance are also included if they exceed the amount spent on games of chance. For simplicity, we use this net income concept.

49 For methodological questions, the total of the households of the sample is 10 less than the addition of the number of households of each quintile. For more information, see Statistics Canada, *User Guide for the Survey of Household Spending, 2008*, catalogue no. 62FOO26M, at 21.

1. First (lowest) quintile: \$22,354 or less
2. Second quintile: \$23,355-\$39,143
3. Third quintile: \$39,144-\$61,389
4. Fourth quintile: \$61,390-\$94,700
5. Fifth (highest) quintile: \$94,701 or more

Breakdown of Taxable Spending by Quintile

To measure the QST and GST paid by households, each of the 260 spending categories of the SHS 2008 was analyzed to determine whether or not it consisted of taxable goods and services.⁵⁰ Table 2 shows the breakdown of taxable and non-taxable spending by Quebec households in each quintile in 2008, for each of the main consumption groupings listed above.

The level of detail in the SHS 2008, while still too coarse, is nonetheless adequate for estimating taxable household consumption. To clarify how the taxable items were determined, the text that follows provides an explanation of some of the major spending items, especially those that required a larger number of manipulations.

SPENDING ON FOOD

The size of household income certainly has an influence on the proportion of the family budget allocated to basic necessities, such as food. In 2008, for households in the lowest quintile, almost 19 percent of total spending was on food, compared with 9.5 percent for households in the highest quintile—hence, the importance in this study of estimating the taxable portion of such spending. The two main components of the SHS in the food category are food bought in a store and food bought in a restaurant. Of course, taxes are paid on food bought in a restaurant. However, for food bought in a store, the taxable and non-taxable portions must be estimated.

Quebec's tax expenditures report indicates that in 2008, zero-rating of basic groceries cost \$1.2 billion in forgone QST revenue,⁵¹ which implies total household spending on non-taxable products estimated at \$15.5 billion. The method we use to calculate the taxable and non-taxable portions of food products bought in a store is shown below. Adding up the data from the SHS 2008 for all quintiles, total household spending on food bought in a store amounted to \$20 billion. Using this figure, it is possible to estimate the non-taxable portion of spending on food bought in a store in 2008 at 77.2 percent. To simplify matters, and because nothing allows us to estimate variations between households in spending on food, whether taxable or not, this proportion is applied evenly to households in each quintile, to arrive at the figures shown for "Food" in table 2.

50 For more details about the breakdown of taxable and non-taxable spending in this article, e-mail either of the authors or contact the Canadian Tax Foundation library (www.ctf.ca).

51 Finances Québec, *Tax Expenditures: 2010 Edition* (Quebec City: Finances Québec, 2011), at A.59.

TABLE 2 Taxable and Non-Taxable Household Spending, by Income Quintile and Spending Category, Quebec, 2008

	Lowest quintile		Second quintile		Third quintile		Fourth quintile		Highest quintile	
	Taxable	Non-taxable	Taxable	Non-taxable	Taxable	Non-taxable	Taxable	Non-taxable	Taxable	Non-taxable
Food.....	1,191	2,456	1,992	3,608	2,575	4,403	3,305	5,615	4,644	7,193
Shelter.....	979	5,608	1,699	6,442	2,330	7,877	3,702	8,838	6,810	11,560
Household operation.....	1,219	5	1,865	133	2,072	204	2,729	324	3,996	717
Household furnishings and equipment.....	532	nil	1,048	nil	1,468	nil	1,796	nil	3,046	nil
Clothing.....	866	nil	1,343	nil	1,936	nil	2,755	nil	4,938	nil
Transportation.....	1,547	397	4,226	754	6,854	838	9,225	1,055	13,645	1,444
Health care.....	198	833	146	1,359	228	2,108	298	2,258	307	2,686
Personal care.....	497	nil	788	nil	1,006	nil	1,279	nil	1,819	nil
Recreation.....	737	nil	1,708	nil	2,616	42	4,111	118	6,996	192
Reading materials and other printed matter.....	90	nil	173	nil	189	nil	271	nil	430	nil
Education.....	68	252	73	269	69	217	163	486	366	1,227
Tobacco products and alcoholic beverages.....	674	nil	1,061	nil	1,292	nil	1,700	nil	2,353	nil
Games of chance (net).....	nil	102	nil	274	nil	270	nil	213	nil	284
Miscellaneous expenditures.....	74	137	260	319	320	583	274	822	556	1,482
Investments in the home: improvements and alterations.....	100	nil	793	nil	1,924	nil	2,698	nil	5,106	nil
Total.....	8,772	9,790	17,175	13,158	24,879	16,542	34,306	19,729	55,012	26,785

dollars

Note: A portion of taxable spending includes spending subject only to GST. It consists of diapers, books, and tobacco in the personal care; reading materials and other printed matter; education; and tobacco products and alcoholic beverages categories in the Survey of Household Spending. It has been included in our calculation of taxes paid.

Source: Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and calculations by the authors.

Calculation of the non-taxable portion of spending on food bought in a store, Quebec, 2008

Household spending,			
food purchased from stores	\$5,983 ^a × 3,351,040 ^b	= \$20,049.3 million	(A)
Tax expenditures, basic groceries	\$1,161 million/7.5% ^c	= \$15,480 million	(B)
Spending on non-taxed products			
as a percentage of total spending			
on food purchased from stores		77.2%	(B/A)

^a Average per household.

^b Total number of households.

^c Forgone QST revenue ÷ QST rate (2008) = value of non-taxed products.

Sources: Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and calculations by the authors. Finances Québec, *Tax Expenditures: 2010 Edition* (Quebec City: Finances Québec, 2011); and calculations by the authors.

NEW HOME PURCHASES

Concerning spending on shelter, new home purchases are not included in the SHS because they are not considered current spending. For information purposes, we note that it is possible to estimate that only about 1.6 percent of Quebec households purchased a new home in 2008.⁵² Estimates of such purchases can be made from the value of residential building permits.⁵³ Since these permits amounted to \$8.9 billion in Quebec in 2008, taxes paid would represent \$445 million in GST and \$701 million in QST.⁵⁴ However, purchasers of new homes can receive partial rebates of GST and QST, depending on the value of the purchase.⁵⁵ The net amount of taxes paid is obtained by subtracting the estimated tax rebates. This amount is then allocated among the quintiles, using the allocation for mortgage payments shown in the SHS 2008.

Government Revenues Derived from the QST

To judge the accuracy of the estimate of taxes collected using the SHS 2008, the QST revenue collected by the Quebec government in 2008 was reconciled with the results obtained from the methodological approach. Table 3 shows the consistency of the exercise by reconstituting total QST receipts. It also indicates that the estimates shown in table 2 for the various SHS spending categories together account for about 70 percent of the QST collected by the Quebec government.

52 Our calculations, using Statistics Canada, CANSIM database tables 026-0001 and 027-0009, and the SHS 2008.

53 Using the value of residential building permits means that we assume that all building permits issued in 2008 led to a sale in 2008. We know that is incorrect (some sales in 2008 were for 2007 permits, and some 2008 permits will result in sales in 2009), but we use it as a proxy.

54 Institut de la Statistique du Québec, *Principaux indicateurs économiques — Québec: Niveaux annuels* (www.stat.gouv.qc.ca/princ_indic/publications/indicat_ANNU.pdf).

55 *Tax Expenditures: 2010 Edition*, supra note 51, at A.59 and B.232.

TABLE 3 Reconciliation of QST Receipts, 2008

Receipts	Revenue
	<i>\$ millions</i>
Total receipts	<u>9,188</u>
QST paid ^a	6,378
Net QST paid on new residential dwellings ^b	650
Net QST paid by public service organizations ^c	401
Net QST paid by municipalities ^d	470
QST not recovered on exempt goods and services ^e	<u>1,207</u>
Total	<u>9,106</u>
Difference	82
% difference	0.9%

^a This amount is derived from the breakdown of taxable and non-taxable goods and services shown in table 2.

^b Residential building permits in 2008 amounted to \$8.9 billion. Accordingly, the QST paid represented \$702 million, from which QST rebates of \$52 million are subtracted.

^c Public service organizations (charities, schools, hospitals, etc.) pay the QST but obtain tax rebates at very specific rates (50 percent for charities, 47 percent for schools, and 51.5 percent for hospitals). Accordingly, with the help of Quebec tax expenditure data, which shows the amount of rebates paid to public service organizations and the rebate rates, we are able to obtain the net amount of QST paid.

^d This amount is an estimate based on information obtained from the ministère des Affaires municipales.

^e Some goods and services are exempt from tax (rent, for example), but taxable goods and services are consumed as inputs in the delivery of such goods and services. For instance, the owner of an apartment building pays for taxable services but does not charge tax on the rent. To estimate the amount of QST not collected on exempt goods and services, we calculated, again using the *Survey of Household Spending, 2008*, the amount of QST that would have been paid had they not been exempt. We then subtracted the tax expenditure from the amount obtained.

Sources: Calculations by the authors based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009); Finances Québec, *Tax Expenditures: 2010 Edition* (Quebec City: Finances Québec, 2011); and information provided by the ministère des Affaires municipales.

The Survey of Labour and Income Dynamics

Quebec households pay QST and GST on their purchases, and some of them receive refundable tax credits for the QST and/or the GST. However, the SHS is silent on the allocation of GST and QST credits among households. To estimate the average amount of refundable tax credits obtained by each quintile, simple application of the rules for calculating these credits, as described earlier (see table 1 and figure 1), is not possible. Variations in family situation within each quintile prevent the calculation of average credits per quintile. In addition, it may seem self-evident that households in the upper income quintiles would not receive GST or QST credits; however, some individuals in those households may qualify for credits—for example, an adult student

living with his high-income parents. Chawla⁵⁶ estimated that one-third of families with an annual income of \$100,000 or more received a GST credit in 2003. For this reason, we use Statistics Canada's Survey of Labour and Income Dynamics (SLID) to extract the value of average tax credits per quintile, and thus to calculate net taxes paid per quintile.⁵⁷

CONSUMPTION TAXATION OF HOUSEHOLDS IN 2008

With taxable and non-taxable spending allocated among Quebec households according to income quintile, it is now possible to assess the results obtained against the widespread perception that consumption taxes are regressive.

Breakdown of Consumption Taxes

While table 2 shows the breakdown between taxable and non-taxable spending based on the SHS 2008, table 4 shows the amount of GST and QST paid per household in each income quintile based on average spending. Total consumption taxes paid vary from \$1,012 for a household in the lowest quintile to \$6,880 for a household in the highest quintile. However, these amounts do not take into account sales tax credits received by some households. As discussed earlier,⁵⁸ these credits were implemented by the federal and Quebec governments when the GST and QST were first introduced in order to offset the additional burden for the most disadvantaged.

Net taxes paid are then calculated taking the refundable credits of each quintile into account.⁵⁹ For the lowest quintile, refundable credits represent 60.6 percent of all consumption taxes paid. This percentage falls to 34.3 percent for the second quintile, 9.9 percent for the third, 4.75 percent for the fourth, and lastly, 2.6 percent for the highest quintile.

56 Raj K. Chawla, "The GST Credit" (2006) 7:6 *Perspectives on Labour and Income* 13-21.

57 Statistics Canada, *Survey of Labour and Income Dynamics* (Ottawa: Statistics Canada, 2005, 2006, 2007, and 2008). Of course, it would have been preferable to use one survey to extract all the data used in this study, but the SHS provides no information on tax credits granted to households of each quintile. However, we are assured that the two surveys are compatible. While the matching between them is not perfect, in 2007, from one survey to the other, the differences in the upper limits of the quintiles and the weighted number of households differ on average by only 6 percent. We consider that these differences make it not unreasonable to use the GST and QST credits (information drawn from the SLID) and apply them to the quintiles taken from the SHS.

58 See *supra* note 39 and the related text.

59 The GST credit is separately identified in the SLID. With regard to the QST credit, the SLID includes data for "provincial tax credits," in which the QST credit is dominant, but it also includes other credits. Thus, for all households that had a GST credit, we determine the value of the QST credit using the same weighting as that of the "provincial tax credits" in order to obtain the cost of the QST credit in 2008 (\$505 million). From July 2011, the QST credit is to be combined with two other credits to form the solidarity tax credit. But, for this study, it is possible to isolate the portion "QST credit."

TABLE 4 Consumption Taxes Paid by Households, by Income Quintile, Quebec, 2008

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile
	<i>dollars</i>				
Spending by households (including GST and QST) ^a	9,110	17,938	27,249	37,839	61,307
QST paid ^b	610	1,212	1,864	2,588	4,212
GST paid ^b	402	79	1,190	1,650	2,668
Total taxes paid	1,012	2,002	3,054	4,238	6,880
Refundable GST credit	(353)	(432)	(213)	(131)	(119)
Refundable QST credit	(260)	(255)	(88)	(59)	(58)
Total refundable credits ^c	(614)	(687)	(301)	(190)	(176)
Total net taxes paid ^c	398	1,315	2,752	4,049	6,704

^a Comprises taxable spending from the *Survey of Household Spending, 2008*, plus an amount that we have estimated for the purchase of new homes. As noted in table 3, taxable spending includes items that are not subject to QST (books, diapers, and tobacco). This is reflected in the calculation of taxes paid.

^b Includes the net tax on new homes.

^c Totals may not add because of rounding.

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

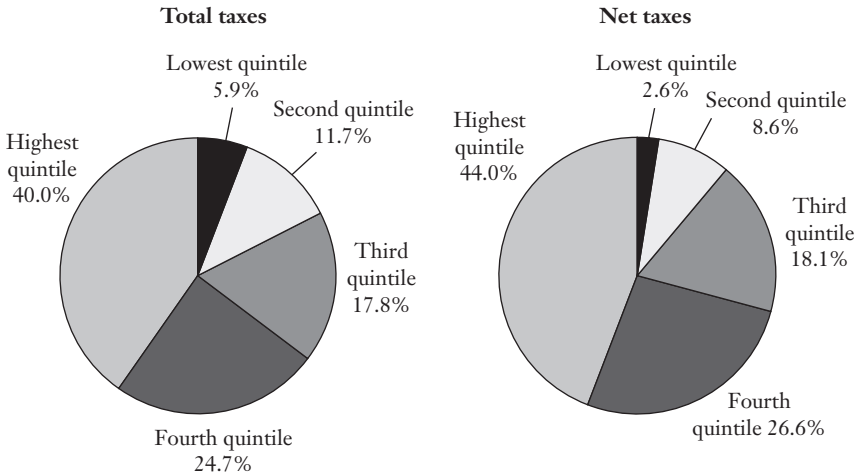
Accordingly, taking tax credits into account, the data show that a household in the lowest quintile paid an average of \$398 in net taxes. This amount rises from quintile to quintile, reaching \$6,704 on average for a household in the highest quintile.

By adding the total taxes and total net taxes paid for all quintiles, we can calculate the share of taxes paid by each quintile. Figure 2 shows that households in the lowest quintile, which account for 20 percent of households, paid roughly 6 percent of total taxes and roughly 3 percent of net taxes paid in 2008. This proportion rises from one quintile to the next, up to 40 percent of total taxes and 44 percent of net taxes for the highest quintile.

While it is still too early, on this simple basis, to rule on the regressive or progressive nature of consumption taxes, table 4 and figure 2 make it possible to state at a minimum that the amount of total and net taxes paid rises appreciably from one quintile to the next, with the result that the first three quintiles pay less than their weight as a proportion of total households, while the situation is the reverse for the two upper quintiles, which together pay over 70 percent of net taxes paid.

Are Consumption Taxes in Quebec Truly Regressive?

Using the data presented above, we can now deal with the question of the progressivity or regressivity of consumption taxes for Quebec households. It will then be

FIGURE 2 Share of Consumption Taxes Paid by Income Quintile, Quebec, 2008

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

possible to invalidate the position that lower-income households allocate a larger share of their income to consumption taxes than high-income households.

Tax Concentration Curve

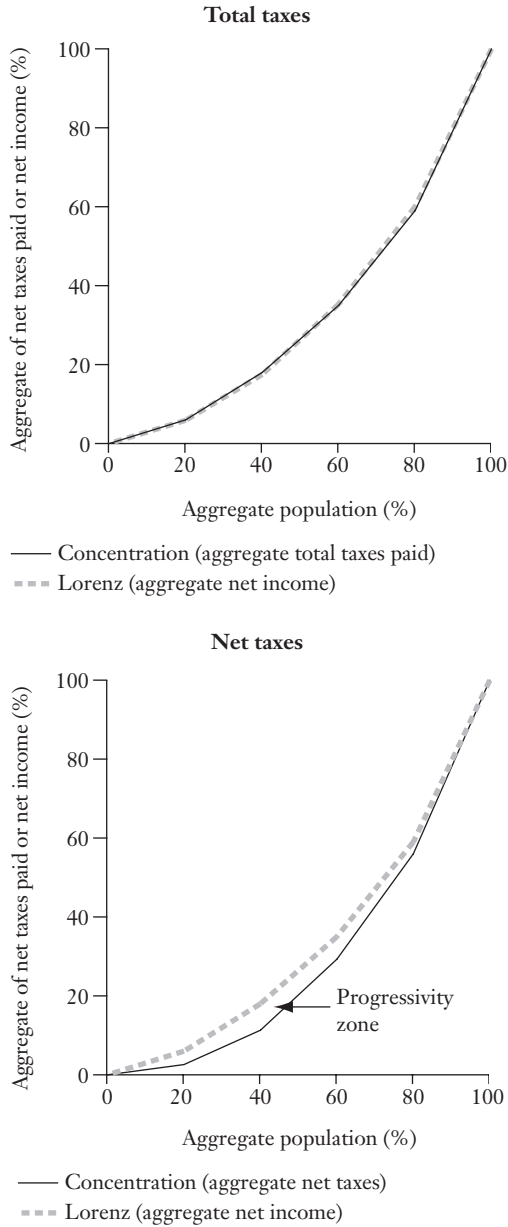
As described earlier, it is possible to measure the progressivity of a form of taxation by drawing a Lorenz curve and a tax concentration curve side by side. This measure indicates that if taxes are better distributed than income, this can only be achieved by what is called a progressive tax. Accordingly, a tax is progressive if at each point of aggregate population, the Lorenz curve is above the tax concentration curve, implying that the percentage of the population in question is paying less tax as a proportion of its share of income.

Figure 3 shows the two curves for consumption taxes (QST and GST) paid in Quebec in 2008. The left part of the figure shows that without tax credits, QST and GST are proportional taxes. In the right part, the concentration curve of net taxes paid lies in the progressivity zone by being beneath the Lorenz curve at each point.

Index of the Share of Taxes as a Proportion of the Share of Income

As indicated in our earlier discussion of measures of progressivity, if a tax is distributed proportionally, the index of the share of total taxes paid to the share of total income for all households in a quintile will be equal to 1. According to Ruggeri's approach, a tax is progressive when the index for the lower quintiles is less than 1

FIGURE 3 Lorenze Curve and Concentration Curve of Total and Net Consumption Taxes Paid, Quebec, 2008



Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

while the index for the upper quintiles is greater than 1. Figure 4 shows this index for total and net consumption taxes paid by Quebec households. In the left part of the figure, the total taxes paid (QST and GST before tax credits) are proportional. In the right part, for the lowest and the second quintiles, the share of net taxes paid is below the share of income, while the opposite holds for the other three quintiles. So, given the index computed from net taxes, we can conclude that in Quebec consumption taxes are progressive.

Measurement of the Effective Consumption Tax Rate

Lastly, progressivity is present if the effective rate of consumption tax rises between two situations, such that the change in taxes exceeds the change in income. Figure 5 shows the average effective tax rate for each quintile, representing the share of net income that households in that quintile allocate to taxes paid, with and without tax credits. The lowest quintile had an average effective consumption tax rate of 6.4 percent without tax credits and 2.5 percent including tax credits. The average effective rate rises significantly between the lowest and the second quintiles before becoming more proportional, with a slight decline for the highest quintile.

Overall, consumption taxes in Quebec are proportional without tax credits and progressive with tax credits.

For the remainder of this analysis, we will use the effective tax rate to illustrate progressivity in consumption taxes in Quebec.

Table 5 reports the effective GST and QST rates for each income quintile, before and after taking the respective tax credits into account. It shows that before tax credits, both taxes are roughly proportional, while after tax credits, they are progressive.

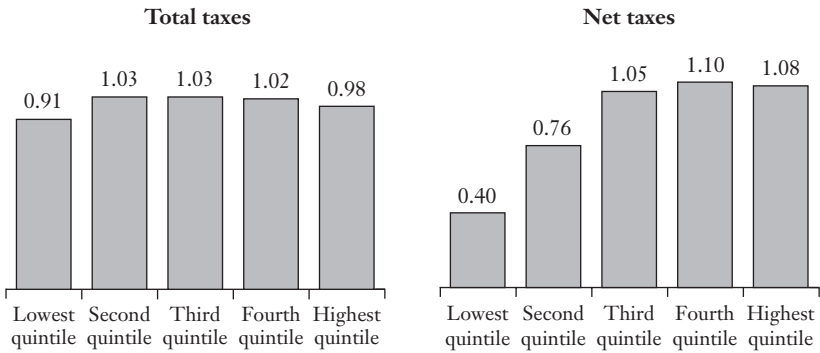
FACTORS OF PROGRESSIVITY OF CONSUMPTION TAXES IN QUEBEC

Now that we have found a degree of progressivity for consumption taxes paid in Quebec, it is useful to attempt to identify its source. For this exercise, we focus in particular on two measures—the zero-rating of basic groceries and the provision of refundable tax credits—and separately calculate their effect on the effective consumption tax rate for each quintile.

Table 6 shows that the zero-rating of basic groceries is of greater benefit to all income quintiles while the tax credits are more focused on households in the lowest quintile. In 2008, the \$1.9 billion allocated to the zero-rating of groceries reduced the effective tax rate of the lowest quintile (before tax credits) by 2 percentage points. On the other hand, the GST-QST credits cost \$1.4 billion, and their effect on the effective rate of the lowest quintile was twice as great—that is, a reduction of 3.9 percentage points. The GST-QST refundable credits thus prove to be crucial. Without them, the effective consumption tax rate of the two highest quintiles decreases, relative to the lower quintiles.

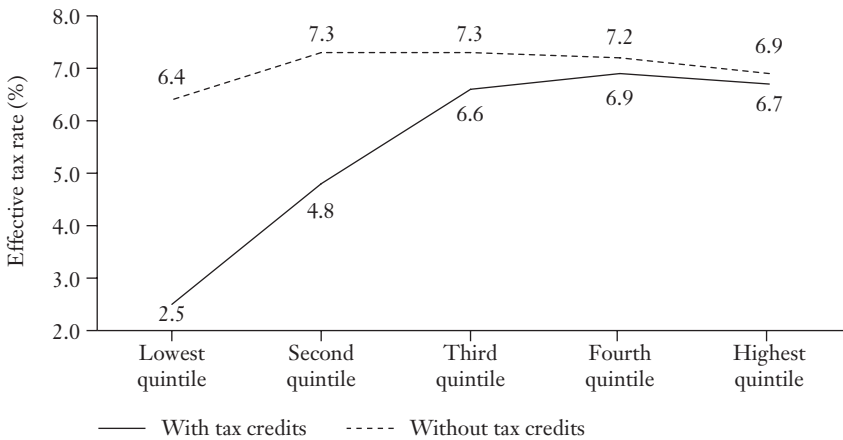
Zero-rating of basic groceries and refundable GST-QST credits give rise to costs for each government. In 2008, zero-rating of basic groceries cost the Quebec government \$1.2 billion, and the portion of the federal cost of this measure attributable

FIGURE 4 Index of the Share of Consumption Taxes Paid as a Proportion of the Share of Income, by Income Quintile, Quebec, 2008



Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

FIGURE 5 Effective Combined Consumption Tax Rates, With and Without Tax Credits, for Each Income Quintile, Quebec, 2008



Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

to Quebec amounted to \$0.8 billion. The GST and QST credits generated revenue shortfalls in 2008 of \$836 million and \$500 million respectively. Table 7 allocates these costs among the quintiles. It comes as no surprise that the largest share of the tax credits (65.8 percent) goes to the two lowest quintiles. However, the benefits from zero-rating basic groceries are enjoyed to a much more substantial degree by the two highest quintiles. Thus, even if governments chose to zero-rate basic groceries

TABLE 5 Effective GST and QST Rates for Each Income Quintile, Quebec, 2008

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile
	<i>percent</i>				
Before tax credits					
GST	2.6	2.9	2.8	2.8	2.7
QST	<u>3.9</u>	<u>4.4</u>	<u>4.5</u>	<u>4.4</u>	<u>4.2</u>
Total	<u>6.5</u>	<u>7.3</u>	<u>7.3</u>	<u>7.2</u>	<u>6.9</u>
After tax credits					
Net GST	0.3	1.3	2.3	2.6	2.6
Net QST	<u>2.2</u>	<u>3.5</u>	<u>4.2</u>	<u>4.3</u>	<u>4.2</u>
Total	<u>2.5</u>	<u>4.8</u>	<u>6.6</u>	<u>6.9</u>	<u>6.7</u>

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

TABLE 6 Sensitivity of Effective Consumption Tax Rates to the Zero-Rating of Basic Groceries and to GST-QST Credits, by Income Quintile, Quebec, 2008

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile
	<i>percent</i>				
Without zero-rating of basic groceries and without credits . . .	8.4	9.0	8.7	8.5	7.8
Without refundable QST and GST credits	6.4	7.3	7.3	7.2	6.9
Real average effective rates.	2.5	4.8	6.6	6.9	6.7

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

in order not to penalize low-income taxpayers, the cost for the two top quintiles is significantly higher, at 55 percent versus 26 percent for the two lowest quintiles.

IMPACT OF CHANGES TO GST AND QST RATES

Considering the recent reductions in the GST rate and recent and forthcoming increases in the QST rate, it is useful to analyze the repercussions of these changes on the effective consumption tax rate for each income quintile. From this analysis, we can observe which quintiles benefit from a reduction in their effective rate and which quintiles experience an increase in their rate in the wake of changes to GST and QST rates. In the calculations that follow, we use the effective tax rates after refundable GST-QST credits.

TABLE 7 Cost of GST-QST Credits and of Zero-Rating of Basic Groceries, Allocated by Income Quintile, Quebec, 2008

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile	All households
	<i>\$ millions</i>					
Refundable tax credit. . . .	414	464	205	130	122	1,336
QST	178	175	62	43	42	500
GST	237	289	143	88	79	836
Zero-rating of basic groceries	206	302	369	470	603	1,950
QST	123	181	221	282	362	1,170
GST	82	121	148	188	241	780

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

The Reductions in the GST Rate in 2006 and 2008

The federal government reduced the GST rate from 7 percent to 6 percent on July 1, 2006 and to 5 percent on January 1, 2008. Since these reductions took effect only 18 months apart, we have assumed that household spending patterns were unchanged for each quintile. Consequently, the analysis uses the SHS 2008 data and the GST rates in force in 2005, 2006, 2007, and 2008. For 2006, since the GST rate was reduced on July 1, a weighted rate of 6.5 percent is used. Concerning the refundable GST credit, since its parameters were not changed despite the rate reductions, its value is not changed in our calculations.

Table 8 shows the change in the effective consumption tax rate for each quintile from 2005 through 2008. While the effective rate of each quintile declined, it is possible to note that in proportional terms, the first quintile benefited most from the GST reduction. This result can be explained by the fact that, whereas the GST rate was reduced, the GST credit was left unchanged.

The Increases in the QST Rate in 2011 and 2012

As discussed earlier, the QST rate increased to 8.5 percent on January 1, 2011, and is to increase again to 9.5 percent on January 1, 2012. Since there are no data projecting household spending, we again assume that household spending patterns remain unchanged. Consequently, the analysis uses the SHS 2008 data and the QST rates in force, or expected to be in force, in 2008 through 2010, 2011, and 2012. Concerning the refundable QST credit, since its parameters will be raised at each increase in the QST rate, the announced increases in the credit are incorporated into the analysis. Table 9 shows that the effective rate of each quintile will rise, but the increase will be smallest for the lowest quintile, thanks to the increase in the solidarity tax credit.⁶⁰

60 As noted earlier, the QST credit will be part of the solidarity tax credit. In the solidarity credit, however, we can isolate the QST credit component. In our calculations, we consider only this component.

TABLE 8 Changes in Effective Consumption Tax Rates, by Income Quintile, Quebec, 2005-2008

Quintile	2005	2006	2007	2008	Percentage change 2008-2005
	(1)	(2)	(3)	(4)	(4-1)/(1)
	<i>percent</i>				
Lowest	3.6	3.3	3.1	2.5	-30
Second	6.0	5.7	5.4	4.8	-20
Third	7.7	7.5	7.2	6.6	-15
Fourth	8.1	7.8	7.5	6.9	-14
Highest	7.8	7.6	7.3	6.7	-14

Note: QST rate: 7.5 percent (all years). GST rate: 2005, 7.0 percent; 2006, 6.5 percent (weighted average); 2007, 6.0 percent; 2008, 5.0 percent.

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

TABLE 9 Changes in Effective Consumption Tax Rates, by Income Quintile, Quebec, 2008-2012

Quintile	2008-2010	2011	2012	Percentage change 2012-2008
	(1)	(2)	(3)	(3-1)/(1)
	<i>percent</i>			
Lowest	2.5	2.6	2.7	7
Second	4.8	5.1	5.5	15
Third	6.6	7.1	7.6	15
Fourth	6.9	7.5	8.0	16
Highest	6.7	7.3	7.8	16

Note: Actual and announced QST rates: 2008-2010, 7.5 percent; 2011, 8.5 percent; 2012, 9.5 percent. GST rate: 5 percent (all years).

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

Changes in the Combined GST-QST Rate, 2005-2012

The combined GST-QST rate will reach 14.98 percent in 2012, almost restoring the rate that applied in 2005 (15.03 percent). However, one cannot simply say that this is a return to square one, and conclude that this is equivalent to a transfer of consumption tax points from the federal government to the Quebec government. Table 10 compares the effective tax rates, by quintile, for consumption taxes in 2005 and 2012 (projected). It shows a large drop in the effective rate for the lowest quintile and a significant drop for the second. For the other three quintiles, in 2012 the situation effectively reverts to what it was in 2005.

TABLE 10 Effective Consumption Tax Rates, by Income Quintile, Quebec, 2005 and 2012

Quintile	2005	2012	Percentage change
	(1)	(2)	2012-2005 (2-1)/(1)
			<i>percent</i>
Lowest	3.6	2.7	-25
Second	6.0	5.5	-8
Third	7.7	7.6	-2
Fourth	8.1	8.0	-1
Highest	7.8	7.8	0

Note: QST rates: 2005, 7.5 percent; 2012, 9.5 percent. GST rates: 2005, 7.0 percent; 2012, 5.0 percent.

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

CONCLUSION

A review of the literature leads to the general conclusion that consumption taxes are regressive. However, it is acknowledged that governments have tools available to mitigate or even reverse this situation. In the wake of the recent reductions in the GST rate and the announcements of increases in the QST rate, we wanted to assess how the GST-QST burden is distributed for Quebec households.

Using data from the SHS 2008, we have classified overall current spending in Quebec on the basis of its taxable or non-taxable status. The subsequent analysis, using well-documented methodologies, shows the breakdown of net consumption taxes paid by households grouped into income quintiles, and determines the effective consumption tax rate for each quintile. Household size is not taken into account in the analysis; this is left to future research.⁶¹

While there is no study dealing specifically with the regressive nature of either the GST or the QST, it is not infrequent in Quebec to hear that consumption taxes are a regressive form of taxation. However, our results contradict this view.

In 2008, households in the lowest quintile paid \$398 in GST-QST, taking into account refundable GST and QST credits, compared with \$6,704 for households in the highest quintile. Allocating total net taxes paid in 2008 among the income quintiles, the share paid by the 20 percent of households with the lowest income is calculated to be 2.6 percent, compared with 44.1 percent for the 20 percent of households with the highest income.

In Quebec, thanks to the exclusion of certain goods and services from the application of the GST-QST, but especially because of the refundable GST-QST credits, it is false to state that lower-income households allocate a larger share of their income

61 See supra note 47.

to taxes than higher-income families. Offsetting measures eliminate the inherent regressivity of consumption taxes.

The rise in the effective tax rate for consumption taxes from one quintile to the next confirms that the application of consumption taxes in Quebec in 2008 was progressive (because the change in net taxes paid is proportionally greater than the change in income). The effective rate rises significantly for the lowest and second quintiles before becoming more proportional.

The analysis also shows the impact of the recent reductions in the GST and the announced increases in the QST. While all households benefited from the recent decreases in the GST rate, this was especially true of households in the lower quintiles. As for the future increases in the QST, they will result in increases in the effective tax rate for all quintiles, but households in the lowest quintile will be affected to a lesser degree. It is significant that, while the federal government did not adjust the GST credit downward when the tax rate was reduced, the Quebec government made a point of enhancing its credit as part of the increases to the QST rate.

Comparing the situation that will exist in 2012 with the one in 2005, the replacement of two points of GST by two points of QST, combined with the changes to the QST credit, will result in a decline in the average effective tax rate of the first two income quintiles, while that of the other three quintiles will drop slightly or remain unchanged.

To conclude, while the analysis reveals that the application of the GST-QST is progressive in nature, it goes without saying that progressivity is more pronounced in the application of income tax in Quebec. The Quebec government continues to rely heavily on the income tax as a source of revenue.⁶² As a proportion of gross domestic product, income taxation is more important in Quebec than in the other provinces and the G7 countries as a whole. Accordingly, the aggregate progressivity of consumption taxes and income taxes is greater than that of the taxes taken separately. Table 11 shows the average total tax load of households in each quintile, taking into account income taxes, social contributions, GST, and QST. Measured as a proportion of total income, the rate rises from 5.9 percent for the lowest quintile to 33.8 percent for the highest, clearly showing that the use of taxes and social contributions is progressive in Quebec.

62 Luc Godbout, Suzie St-Cerny, and Chantal Amiot, *Année d'imposition 2008 : Une charge fiscale nette plus faible et des impôts sur le revenu plus élevés qu'ailleurs, est-ce possible?* Working Paper no. 2010/03 (Sherbrooke, QC: Chaire de recherche en fiscalité et en finances publiques, Université de Sherbrooke, 2010).

TABLE 11 Average Tax Load of Households, by Income Quintile, Quebec, 2008

	Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile
	<i>dollars</i>				
Total income	16,253	30,977	51,239	77,281	140,255
Less personal income tax (1)	349	2,564	7,564	15,589	36,047
After-tax income	15,904	28,413	43,675	61,692	104,208
Less social contributions (2)	204	929	1,880	3,132	4,669
Net income	15,700	27,484	41,795	58,560	99,539
Less QST and GST (3)	398	1,315	2,752	4,049	6,704
Net after-tax income	15,301	26,168	39,043	54,511	92,835
Tax load (1 + 2 + 3)	951	4,808	12,196	22,770	47,420
	<i>percent</i>				
Tax load as a percentage of total income	5.9	15.5	23.8	29.5	33.8

Source: Calculations by the authors, based on Statistics Canada, *Survey of Household Spending, 2008* (Ottawa: Statistics Canada, 2009), and *Survey of Labour and Income Dynamics, 2008* (Ottawa: Statistics Canada, 2010).

