Impact of HST on Ontario and British Columbia Households by Income Quintiles

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Executive Summary

This paper measures the impact of the new HST tax, implemented on July 1, 2010, by the Ontario and British Columbia governments, on households. The paper focuses on the effects of the tax regime change, from the retail sales tax (RST) to the HST, on the five income quintiles as defined by Statistics Canada. I use consumer spending data from Statistics Canada's 2008 Family Expenditure Survey and Statistics Canada's housing investment data (and the 2006 Census) for tax changes in new single-unit, owner-occupied housing. I assume that 60 percent of input tax savings, to firms and non-private agencies, are passed on to consumers. Finally, I use published information from provincial government studies and budgets to measure personal income tax reductions – to calculate net tax changes.

My results are as follows.

• for both Ontario and British Columbia, the switch to the HST tax (and the accompanying personal income tax relief measures) represent, on average in the longer-run, a net tax increase for households. For British Columbia, the net tax is estimated at around $320; for Ontario the change is around $290 (all dollar amounts are $2008 – the benchmark year used for all data and calculations in this paper) ;

• in the first year – before the Ontario transition payments expire and before larger savings from input-cost reductions kick in – the net tax disparity between Ontario and British Columbia is quite large. In Ontario the average family sees a gain of about $145 in tax relief; for British Columbia the average family can be expected to pay an extra $480 in taxes;

• the tax rise from the tax regime change is much higher than that suggested in the Government of Ontario's technical paper, "Ontario's Tax Plan for Jobs and Growth". This is because (1) the Government of Ontario amortizes the HST tax increase (for new housing) over many years, reducing the tax increase for "year 3" in their study, and (2) the Government of Ontario assumes a high 90 percent pass-through rate for cost savings by businesses, from input-tax write-offs;

• the net per-family tax increase in British Columbia is higher than that for Ontario, given that the Government on British Columbia has granted much less in the way of personal income tax relief. This is true, even though the pure HST tax increase in British Columbia is considerably lower than that for Ontario;

• for both provinces, the pure HST tax increase is regressive: it impacts low-income households far greater than that for higher-income households. But the accompanying personal-income tax cuts are very progressive, such that on balance the net impact is modestly progressive – from the poorest households to upper-middle class families. There is no further progressivity from the upper-middle class to the rich households.

• the change towards an HST tax on consumer services is highly regressive, but the imposition of the HST to tax new construction (new homes over a certain price limit; renovations and additions) is modestly progressive.

I. Introduction

This past July 1, 2010, the governments of Ontario and British Columbia have undertaken a sales-tax regime change, moving from provincial-specific retail sales tax (RST) bases to a harmonized sales tax (HST) base. The change supports the stated federal government tax-harmonization objective[1] – of encouraging provincial governments to, in general, harmonize taxes with that of the federal government, and in particular, to harmonize various provincial retail sales taxes to that of the federal Goods and Service Tax (the GST).

This paper gives a rough measure of the impact of the change, onto Ontario and British Columbia households, from the RST to the GST, in 2008 dollars. In this paper I quantify the impact for each of the five income family quintiles, as well as for all families. I use Statistics Canada Family Expenditure Survey data to measure the effect for household consumption. I also use Statistics Canada investment and housing numbers to measure the effect of the new HST on spending on owner-occupied single-unit purchases of housing over the decreed housing cost limits[2] . Note, that, using this approach, I do not use the official National Accounts definition of residential expenditures – an approach that relegates new housing expenditures to the business sector. I discuss this point more fully below.

Note that this paper takes no position as to the merits or demerits of the harmonized HST tax. There is a considerable body of literature, by economists favouring the tax – and a considerable body of political statements, from provincial opposition parties and grassroots groups, opposing the tax. To keep this paper brief, I omit discussing this literature, and move directly to measuring the effects. I compare my results to other studies (see below).

Section II below discusses the methodology in calculating the effects of the new HST on households. Section III reports my results, and Section IV compares the results to other studies. Section V concludes. Note that there is an appendix containing tables describing consumer commodities affected by the new tax.

[1] See Department of Finance Canada, "Proposed Changes to the Application of the Harmonized Sales Tax to Financial Institutions" (2010),http://www.fin.gc.ca/n10/10-050- http://www.fin.gc.ca/n10/10-050-eng.asp .

[2] For Ontario, the HST applies on new single-unit houses valued at $400,000 or more. For British Columbia, the HST is applied to housing valued at over $550,000.

II. Measuring the Impact of the Provincial HST tax on Households, by Income-Quintile Groups

This section explains how the HST tax changes are computed. There three tasks to be undertaken, corresponding to the three sub-sections in Section II. Section 2.1 calculates *gross* tax changes to *consumer* spending (before savings from reduced costs, from material inputs, are taken into account). Section 2.2 computes gross tax changes to spending on new housing (an *investment* good), and Section 2.3 calculates the net change in taxes paid, adding the gross HST tax increases to gross personal income tax reductions and savings from reduced input costs, given that firms and non-commercial enterprises save on provincial sales taxes on material and some service inputs.

Before the discussion, a word is in order about assumptions made about the definition of "family" or "households" used in this paper. Household expenditures in this paper differ from household spending in the national accounts sense. When I measure changes to provincial sales taxes – in Ontario and British Columbia – I measure the changes as a yearly, cash flow to provincial governments. Clearly, taxation from consumer spending flows to provincial governments on a yearly basis. But provincial sales taxes from new housing flow to governments in the year the housing spending takes place. Spending on "new housing" in a national accounts sense technically is undertaken by commercial businesses – whereby consumers borrow money and pay back the money through amortized payments, and consume housing services in future years. In this paper, we add consumer and housing spending together, in the year sales taxes are paid – and ascribe all spending to households. Therefore, higher mortgage payments in future years – resulting from the imposition of the HST on new housing – is not taken into account in this paper, since the tax increase is assumed to take place on a once-and-for-all basis.

I also ascribe all taxes spent to people doing the spending within the province – using the Statistics Canada consumer and housing expenditure surveys – assuming that the spending by provincial residents represents "spending" within the province. For example, I use expenditure statistics on "hotel and motels" from the Family Expenditure Survey – a survey of provincial residents. An Ontario family could be spending money in an out-of-province hotel (or a hotel outside of the country, for that matter), but I treat all the spending as if it is within the province[3]. Furthermore, some gasoline spending, and spending on tourist amusements – as reported in Statistics Canada's Family Expenditure Survey – is undertaken outside of the respective provinces – with some such spending by non-province residents taking place within the two provinces.

Consequently when I speak of a provincial "family" in this paper, it is a "family" spending an "average" amount on new housing, all in one year. The "family" also incorporates non-resident families spending money in the two provinces – as if they acted like in-province families. These simplifying assumptions do not alter the basic results of the paper.

[3] Statistics Canada, in measuring national accounts consumption, adjusts for domestic households spending outside of the country, and foreigners spending within our borders, by surveying such spending, and constructing a consumption component called "net expenditures abroad". See Statistics Canada (1975 , p. 154) for a detailed explanation of how this line is computed. Total national accounts consumption, consequently, reflects true spending by Canadians.

2.1 The Increase in Sales Taxes: Consumer Spending

First, I used published provincial government sources[4] to itemize which *new* consumer commodities (goods and services) the HST – as of July 1, 2010 – will apply for the first time. From this list, I then made a sub-set of commodities common to both Ontario and British Columbia (see Table A1 in the Appendix). From the original list I then made a list of new-HST taxable commodities unique to British Columbia (Table A2) and Ontario (Table A4). Note that conversion to the HST yields some modest sales tax reductions in both provinces (e.g. hotels and motels in British Columbia; movie tickets in Ontario), and the list of these items is seen in tables A3 and A5 respectively.

To compute the change in sales taxes paid by households, through consumption, I gathered 2008 data from Statistics Canada's the Survey of Household Expenditures. The agency surveyed 1356 households in Ontario and 1138 in British Columbia. All statistics are reported in *per-family* terms. For the commodities listed in the Appendix, data was published for the vast majority of cases, and in particular, the commodities with relatively high spending amount.

In a number of cases, Statistics Canada uses the "F" symbol instead of a number. This symbol represents the fact that too few households in the survey reported positive spending to make the number accurate. In these cases, I used different methods to estimate the spending. In some cases, it was possible to estimate the data as a "residual" – subtracting all other sub-components (with reported numbers) from a sub-total. For example, "veterinarian services" is now HST-taxable in both provinces. To find the amount spent by the first-quartile income group, one can subtract "pet food" and "purchase of pets" from "total pet expenses". In other cases, the residual estimation method cannot be used. In these cases, I assume that for each income class the amount spent equals the provincial average. For example, "household moving expenses" is now HST-taxable in both provinces. For British Columbia, I use "total shelter" expenses" for all households ($15,201) and "household moving expenses" ($96) as allocators, and use the proportion (96/15201) to allocate the available "total shelter" expenses for each income quartile. The technique was used for typically small items, such as moving expenses.

In other cases, for specialized commodities, for commodities where spending data are not available, and for commodities where households supply some services, I estimated shares of reported consumption spending to obtain an estimate of HST-taxable spending. For example, spending on "vitamins" is not reported by Statistics Canada. "Vitamins" is defined as being part of "other non-prescription medicines" (a consumption class where data is available for all families and for each quintile-class). I estimated that 25 percent of such spending was for vitamins. To cite another example, "magazines and periodical" subscriptions are now HST - taxable – but magazines bought from newsstands are not – and Statistics Canada only reports total magazine consumer purchases. Here I assume that 90 percent of spending is subscription spending. The tables in the Appendix list other examples. An important case is "spending on home repairs". Here I assume that two-thirds of such spending is contracted to companies which

[4] See Government of Ontario (2010b), "What is Taxable Under the HST and What is Not": http://www.rev.gov.on.ca/en/taxchange/pdf/taxable.pdf and Government of British Columbia (2010d), "What is Taxable Under the HST and What's Not": http://hst.blog.gov.bc.ca/wp-content/uploads/2010/05/GST_PST_HST_List_v04.pdf .

will charge the HST on both the goods and services portion of the bill[5]. Specially-prepared foods purchased from stores is now HST-taxable, in both provinces – and here I used data from a 2002 Statistics Canada survey[6] to estimate the amount now taxable – using numbers form this 2002 survey to prorate "total food purchased from stores" from the 2008 survey.

All per-family spending data are tabulated as in the tables in the Appendix – for "all families" plus for each of the five quintiles. I then sum all new HST-taxable commodities, for each province, for new-taxable commodities common to both provinces and new-taxable commodities unique to each province. I then compute HST-tax increases for both Ontario and British Columbia, multiplying the consumption totals by 8 percent and 7 percent respectively for each province. Note that these results represent "gross" tax increases, before pass-through input and capital cost savings are introduced (see below). Finally, I multiply those consumption components where irregular tax rate changes take place. For example, in British Columbia, households save .4 percent on electricity and heating spending; in Ontario hotels and motels the tax rate rises by 3 percent. Finally, the tax increases and changes for all components are summed to arrive at a total HST tax increase.

Next, I calculate effective tax rate changes. To do this, I first compute per-family "disposable" income. From Statistics Canada's Survey of Family Expenditures, I use "total household income" – and subtract from taxes deducted from source, Canada Pension Plan contributions and Employment Insurance contributions to obtain per-family disposable income. This is done for the "all families" average and each of the five income quintiles. I then divide the increases in HST taxes by disposable income, times 100, to get the resulting tax rate changes.

2.2 The Increase in Sales Taxes: New Housing Construction

As stressed above, in this paper we compute HST housing costs, to households, as they accrue as tax flows to the provincial government. If a given household purchases a $700,000 house in Ontario, that household pays – given the $400,000 threshold on taxable housing – $300,000 times 8 percent in the HST and that $24,000 flows immediately to the government. In this paper, we calculate the direct HST tax flow, and average it over all households, and by income quintile. Using this approach (and not amortizing the tax liability over many years) allows us to calculate a true tax burden per household.

Much of the discussion about HST taxation of new housing construction focuses on new single homes, and the $400,000-per-home limit (in Ontario) and the $550,000-per-home limit (in British Columbia). But new housing encompasses more than newly constructed housing units. According to the National Accounts – see Statistics Canada CANSIM table 026-0013[7] – new housing investment also includes "renovations", "total acquisition costs", "cottages" and "mobile homes". "Renovations" is a particularly important component. In Ontario, in 2008 for example, renovations totalled some $15.2-billion – slightly more than all new housing-unit investment ($14.45-billion). And all of homeowner-purchased renovations are subject to the HST tax.

[5] For the reaming one-third, I assume that this portion is home-owner supplied services (done for free) plus materials purchased for the repair work. Note that this latter component already had the PST applied to it – so it must be subtracted from the total "maintenance and repair" consumption total.

[6] See Statistics Canada (2003), "Food Consumption in Canada: 2002".

[7] Statistics Canada, "Residential Values, by Type of Investment, Quarterly", CANSIM Table 026-0013.

Furthermore, Statistics Canada includes another key component: "total acquisition costs". These costs include sales taxes, land development fees and supplementary costs. Staying with Ontario for comparison purposes, total acquisition costs totalled $1.992-billion. Most of this component is subject to the HST tax.

To calculate the gross HST tax liability (again, pass-through cost savings are estimated below), I first compute HST paid – for Ontario and British Columbia – on new single-unit housing. To do this, I first assume that all new single-unit housing is purchased by households, and all multi-unit housing is purchased by corporations[8]. The latter spending, thus, lies outside this analysis. I then use unpublished statistics – again from the 2008 Survey of Family Spending – to gauge the proportion of new housing valued over $400,000 in Ontario and $550,000 in British Columbia. For both provinces, I then assumed the following spending shares for housing over the tax-free limit: quintile-1, 0 percent; quintile-2, 5 percent; quintile 3, 20 percent; quintile 4, 40 percent; quintile 5, 35 percent. Statistics Canada did provide breakdowns on per-family spending, by housing price, but the sample numbers making purchases were too few to use with confidence. But the numbers, summed across houses of different values, suggested that families in the highest income bracket did not make the most purchases – thus the slightly lower percentage for this group *vis-a-vis* quintile #4.[9]

Given unpublished housing price information provided by Statistics Canada, I estimate that 13.5 percent of new housing in Ontario is priced over $400,000 and 49 percent of new housing in British Columbia is priced over $550,000. Both provinces only start applying the HST at those limits – and I assume the HST applies to about 90 of total housing value, priced at those benchmark limits.

As stated above, I assume that all other forms of new dwelling construction – other than single-unit housing – are assumed to be purchased outside of the household sector, and therefore are ignored in this paper. Similarly, another component of total housing expenditures, "conversions", is assumed to be undertaken solely by non-household agents. Not that "conversions" make up less than 1 percent of total housing spending.

"Renovations" make up a significant part of "total housing expenditures", about 40–45 of total housing expenditures. As is well-known, renovations are defined as improvements and additions to current residential housing stock – over an above repair and maintenance outlays[10] . Here, Statistics Canada's Survey of Family Expenditures (fortunately) includes renovations in the survey. I simply use these numbers directly from the 2008 survey – available for "all families" and each quintile-class. As discussed above, I treat all spending as it takes pace in the single

[8] Note that a small part of new single-unit hosing could be purchased by firms for rentals. Similarly, a small part of new duplex construction could be bought by households, where the household lives in one unit and rents the other unit. Here I ignore these possibilities.

[9] Perhaps this is due to the fact that many families in the highest income group are older, and through normal life-cycles have already purchased their homes. This raises the issue of how to assign tax burdens, if one ascribes tax burdens for only a single year (in our case: 2008). Here, thus, we say that the HST tax on higher-priced housing falls mostly on the middle class.

[10] National accounts methodology states that repair and maintenance spending is properly part of consumption spending, and that renovations is part of investment spending. From the last line of the paragraph in the text, the Survey of Household Spending calls renovations "improvements in the home: improvements and alterations", and places these numbers as the last line in the survey – signifying that this line is not technically consumption, but still part of family spending.

2008 year, such that HST taxes paid accrue to provincial government all in that year. As is with the cases of "new single-unit housing", I do not amortize "renovations" spending.

"Total acquisition costs", as an aggregate component, comprise roughly 8-9 percent of total residential investment. Acquisition costs include sales taxes, land development and service charges, and record-keeping charges for mortgages, etc.[11] Statistics Canada was able to send me a break down, for Ontario and British Columbia, of sales taxes for single-unit housing, which I netted out. The agency also supplied me with data on "other supplementary costs", for the two provinces, for new single homes purchased. I allocated this number to each income-quintile, using "real estate fees" paid by quintile[12] . Statistics Canada also provided me with "land developer fees" – the remaining component – but this was for all housing. I first reduced this figure to that for single housing, using the ratio of single-housing-to-total-housing as an allocator. I then allocate it among the income-quintiles using "real estate fees" as an allocator. I then sum up the parts to get a reduced "total acquisition costs" – for "all families" and for each income-quintile group. I report each component in the accompanying tables for this paper – and calculate a total effective tax rate by dividing total spending on single housing by disposable income, analogous to the effective rate computed for taxable consumption outlays.

2.3 Per-family Personal Income Tax Cuts/Input Cost Pass-Through Assumptions.

To consider the final tax-reform effect on households, one has to compute personal income tax cuts, and input-cost pass through assumptions, and subtract these from the HST tax increases calculated above. I adopt the approach from the Government of Ontario (2010a), and consider "year 1" and "year 3" as comparative benchmarks. For "year 3" – in computing HST increases above, I simply carry the exact same HST numbers from year 1 to year 3, assuming zero-economic and population growth, and assuming zero behavioural changes. The "year 3" numbers, thus, only incorporate changes to personal income tax/transfer and cost-pass through assumptions[13].

Both provincial governments announced personal income tax cuts (and cash transfers in the case of the Government of Ontario), to make the HST more acceptable to the electorate, and to introduce tax-progressivity into the overall tax-regime change. Ontario announced a reduction in the lowest personal income tax rate, an increase of the provincial sales tax credit to lower income groups, and a sales-tax transition benefit (a transfer) for the first year the HST tax is put in place. I took the data from Government of Ontario (2010a, Table 1, page 6), and converted in into per-family numbers. I then allocated these benefits across income-quintiles – as shown in Table 2, page 6 of the Ontario study. I excluded the "Ontario Energy and Property Tax credit Enhancement", given that the benefits lie outside the realm of sales tax reform. For British Columbia, this province announced fewer and smaller personal income tax cuts. It announced a $1,627 increase in the basic personal income tax credit (which given the lowest tax rate of .0520 amounts to an $82.70 per-tax-filer tax reduction). I then adjust this number by the number of tax-

[11] E-mail sent to the author from Matthew Hoffarth, Statistics Canada, July 12, 2010.

[12] Note that "real estate fees" are part of consumer spending, and the fees are for only used housing. But this statistic was deemed to be the best allocator available.

[13] In British Columbia, families will enjoy a special tax credit which will technically reduce the effective tax rate by .4 percent, which I computed above. But in theory the electricity and heating sector could pass through cost saving. But I argue above that they will not.

filers for each income-quintile. I also add in the newly-announced HST tax credit, a credit which benefits the two lower-income quintiles.

The last line item to be estimated is the pass-through cost-savings to consumers, given firms will reduce prices given that under the HST they will now write off provincial sales taxes on inputs and capital acquisitions. The major study done by the Government of Ontario [(2010: pp. 16-24)] assumes a 20 percent pass-through in year 1 and 90 percent in year 3. In my study, I assume a pass through of 20 percent in year 1 and 60 percent in year 3. The reason for my dissent, here, has to do with the nature of industry organization. The HST is now to be applied to "electricity and heating" in both provinces – a big spending item. However the vast majority of spending for this component passes through regulated monopolies – where cost reductions are rarely granted. Taxi services – now subject to the HST in both provinces, is by-and-large another price-regulated sector. True, the majority of other new-HST taxable commodities are purchased through competitive markets – the majority of these are organized into oligopoly or monopolistically-competitive markets. Basic economic theory suggests that cost reductions, in these markets, cost reductions result in a less-than dollar-for-dollar price reduction. Even in the (rare) case of perfect-competition, cost reductions result in a less-than dollar-for-dollar price reduction, in the usual case of increasing costs[14] . Having said this, my 60 percent pass-through assumption plays a major role in the comparative results of this paper.

[14] i.e., upward sloping supply curves. In the case of constant costs, reduction in input costs would result in a 100 percent pass through. But a constant cost, perfectly competitive industry is rather rare. One sector where this would apply is that of real estate agents, and some home services (in a large city: electric and appliance repair, barber shops and beauty parlours, etc.).

III. The Results of the Paper

I summarize the results as follows. Note that all results are presented in $2008 dollars, since nearly all data used were from 2008. I made no effort to scale up the results to 2010 or into the future.

1. For both provinces, in the long run, in "year 3" after significant input-cost savings take place, and after the Ontario transition cash payments stop, the switch to the HST tax (and the accompanying personal income tax relief measures) represent, on average in the longer-run, a net tax increase for households (see Tables 7 and 8 below). For British Columbia, the additional net tax is estimated at about $320; for Ontario the change is about $290. As such, the tax reform measures in both provinces should be viewed as net tax increases;

2. In the first year – before the Ontario cash payments expire and before larger savings from input-cost reductions kick in – the net tax disparity between Ontario and British Columbia is even more striking (see Table 6). In Ontario the average family will sees a tax *reduction* of about $145 in tax relief; for British Columbia the average family can be expected to pay an *extra* $480 in taxes. The major reason for this large difference is that the Government of Ontario has undertaken HST-transition cash payments, whereas Government of British Columbia has not done so.

3. Although the net per-family tax increase in British Columbia is higher than that for Ontario, the gross[15] HST tax increase is smaller in British Columbia relative to Ontario. For British Columbia, the total gross HST tax increase is slightly less than $800 per-family ($795); for Ontario the tax increase is somewhat over $1000 per-household ($1042). (See Table 5).

   The difference in the average increase in gross HST paid stems from the difference in the increase in HST paid arising from consumer commodities, and not new construction. For both provinces, the average household can be expected to pay slightly over $300 in gross HST arising from new residential construction outlays (see Tables 3 and 4). But British Columbians can be expected to pay considerably less in additional gross HST levied on consumer commodities (under $500 per family in British Columbia), whereas Ontario families are seen to pay an additional $740 per household (see Tables 1 and 2).

4. The reason why Ontario residents pay more in additional gross HST taxes on consumer items are two-fold. First, Ontario residents pay the HST at a higher tax rate (8 percent) than that for British Columbia (7 percent). This can be seen, by studying the first two lines in Tables 1 and 2. Ontario families pay an extra $320 gross HST tax on new-HST commodities taxed in common with British Columbia; for British Columbia, this increase is slightly under $260. Second, Ontario households pay an additional $400 in gross HST on new taxable items specific to Ontario only. For British Columbia families, they pay slightly under $260 for HST items specific to their province. The reason this is so is that British Columbians do pay an additional HST on one big consumer item (restaurant meals). But Ontario families pay extra HST on two large components: gasoline, and electricity and home heating (compare Tables A2 and A4 in the Appendix).

[15] I.e., before input pass-through cost reductions are taken into account.

5. As stated, the total expected gross HST tax increase on new housing is roughly equal for both provinces – slightly over $300 per household (Tables 3 and 4). Note, in comparing the first data columns in Tables 1 and 2, that Ontario residents spend less on HST-taxable housing – but that the tax is higher. The two effects counter-balance each other, such that average new HST tax paid is roughly equal in the two provinces.

   As seen from these tables, the bulk of new HST paid in this area will arise from renovations and additions – and not new residential houses. This stems from the minimum housing price limits, before HST taxation sets in, decreed by both provincial governments.

6. For both provinces, the gross HST tax increase is regressive: it impacts low-income households far greater than that for higher-income households. (See Table 5, which summarizes the average per-family HST tax increase for both consumer and new housing spending). Looking at Ontario first (row 3 in Table 5), the gross HST-rate increase declines from 1.96 for the lowest-income quintile to slightly over 1.4 percent for the richest family quintile. For British Columbia, in contrast (row 6, Table 5), the gross HST-rate increase declines more sharply, from slightly over 1.9 percent for the poorest quintile to about 1.25 for the richest quintile.

   It is difficult to explain the differing tax-progressivity between the two provinces. Comparing the decline in gross HST tax increases – from the first quintile to the fifth quintile – we first see that the decline in tax rate rises among consumption HST is roughly equal (see the bottom rows, Tables 1 and 2). But looking at the HST rate increase in new housing investment (bottom row, tables 3 and 4), we see that the rate in increase in tax rates – from the first to the fifth quintiles – is larger for Ontario (the tax is more progressive). The "renovation" component drives this tax increase – and Statistics Canada survey data suggest that lower-income families in British Columbia are renovating – and bear proportionately more of HST-imposition from this spending area, than is the case for lower-income families in Ontario.

7. Finally, the personal income tax cuts scheduled by Ontario are larger than those for British Columbia (slightly under $500 on average for Ontario families versus $270 for British Columbia families). This accounts in large part as to why the net tax increase (HST plus the personal income tax cuts) is significantly lower in Ontario. Having said that, the personal income tax cuts in British Columbia are more progressive. This is because Ontario lowered the lowest income tax rate by one percentage point[16] – and this tax break is shared by all income classes. In contrast, middle- and upper-income groups in British Columbia only receive a small increase through their basic personal income tax credit. The upshot of this – and given the standard tax regressivity from the HST – is that the net tax changes are considerably more progressive in British Columbia than in Ontario. But the net tax changes are progressive in both.

To summarize, in my view none of the results in this paper seem all that surprising – once one goes through all of the rather complex calculations. The two provinces did not lower their respective sales tax rates, and broadened their respective sales tax base. As a consequence one sees a tax increase – a regressive tax increase – stemming from the conversion to the HST

[16] i.e., the basic (first) tax rate was reduced by 6.05 percent to 5.05 percent for 2010 and thereafter [Government of Ontario (2009), p. 9].

tax system. The bulk of public finance research suggests that sales taxes as regressive[17] . Similarly, the announced personal income tax reductions are progressive: they favour poorer families. This results from sales tax rebate enhancements (geared to poorer families) and equal-dollars-per-family tax credits (which also favour poorer groups). And totalling up all changes, we see that on balance the change is progressive – and this is true especially for poorer families up to middle-class families. Moving from the upper-middle-class to the rich families, there is no more tax progressivity. I also emphasize, however, that on balance the average household, in both provinces, faces a net tax hike.

[17] See Figure 15.13 in Rosen *et. al.* (2003, p. 311). This graph shows average sales tax rates declining with rising family income. The study quoted in the textbook used an empirical general equilibrium model for this result.

IV. Comparing the Results to Previous Work

Here I compare my results to previous work and policy statements. I divide this section into three parts: statements by the Government of Ontario, the Government of British Columbia, and studies by other academics and think-tanks. See Table 9 below for a summary of these results.

4.1. The Government of Ontario's Study

In June 2010, the Government of Ontario issued its main research study: "Ontario's Tax Plan for Jobs and Growth" [Government of Ontario (2010)]. The difference in my findings can be best seen by comparing their Table 1 (page 6 of their study) to my Table 6 below. Here I simply compare the "year 3" results – since the "year 1" results are irrelevant since they include transitory payments and ignore longer-run cost savings effects. Note that these two tables show aggregate – and not per-family – results, and are all in millions of dollars.

The Ontario study shows a total "tax shift in the consumer base" – a euphemism for a tax increase – of about $4.7-billion. I show an increase of about $5.2-billion, and this difference can be explained by my including increased tax payments on new housing[18], in the year the taxes flow to government. As well, my pass through savings estimate comes in at around $1.26-billion, considerably less than their $1.89-billion. Finally, I use the Ontario government's estimate of $2.4-billion in total personal income tax cuts and credits. Consequently, I estimate that the Ontario government will be increasing taxes, on a net basis, by about $1.4-billion, an estimate considerably higher than their $385-million tax increase.

In terms of tax progressivity, I agree with the general results suggested by the Ontario government study, across family-income lines but not in level terms. Their study shows that families with annual income from $4,000-$40,000 would enjoy a net tax reduction of about $200 a year. My results show a smaller $155-per-household saving for the lowest-income group, and only a negligible $35-per-household saving for the second income quintile[19] (see Table 7).

The level differences become even more pronounced for higher income groups. The Ontario study predicts a long-run $25 per-family saving for a middle-income-class family (grossing $60,000 income a year). But I calculate such households will par an extra $250 a year in taxes. The Ontario study predicts upper-middle class families would pay an extra $200 in taxes. My results suggest that this group (the fourth quintile) would pay slightly less than $500 in additional taxes. The Ontario government states that the richest quintile would pay an additional $400 in taxes. My results suggest that this group will pay an extra $920 per-family in taxes.

4.2 Statements Made by the Government of British Columbia

The Government of British Columbia (2010a, 2010b, 2010c) has emphasized the possible overall benefits to the tax regime change (job creation and more investment) and selected benefits to households (lower net taxes for low-income households), without stating any

[18] My calculation of consumer HST tax increases matches up almost exactly with the Ontario study. Compare my second-row-from-the-bottom in Table 1 below, with their second column in Table 3 on page 7.

[19] Note that the average pre-tax income for Ontario's lowest (first) quintile is about $17,700 and is about $40,000 for the second quintile. Note that all tax rate computations in my paper use after-tax income, a better measure since HST tax is paid out of after-tax income.

projected average tax change for the average British Columbia family. On one web page, they list economic studies favouring the HST tax [Government of British Columbia (2010b)].

4.3 Results from Other Academic Work

The Fraser Institute released a study [Veldhuis et. al, 2010)] examining the change to the HST on British Columbia families. This study agrees with my result that the overall tax change is progressive – and that lower-income households benefit in lower taxes paid. But they estimate a far lower increase in net taxes paid by the average British Columbia family. They calculate only an extra $262 in gross HST taxes paid and only a $44 per-family rise in net taxes. The reason for this is that this study ignores HST taxes paid on new housing investment and assumes a high (100 percent) input-tax pass-through to consumers[20] .

The TD Finance Group also did a study, modelling the two provincial economies and predicting the change to each province's total consumer price index. They conclude that the index, in both jurisdictions, will rise by .75 percent in the long run. This translates into a per-family tax increase of $779 in Ontario and $772 in British Columbia. This is a long-run increase that includes input-tax pass through, but excludes consideration of personal income tax relief. In the study the authors make mention of a $75 per-household rise for Ontario – in net taxes (p. 2). This last estimate is considerably lower than my estimate, but only modestly lower than the Government of Ontario's. Note that TD Finance and the Government of Ontario focus only on consumer prices – and ignore longer-run effects of the HST on housing investment. And both agencies assume higher input-tax savings to consumers.

Michael Smart did earlier work on the effects of the HST on the two provincial economies [Smart 2007a, 2007b]. Because his work is early, he did not incorporate any accompanying reductions to the personal income tax. He estimates that households in Ontario and British Columbia would pay an extra gross HST of $1097 and $1372 respectively. Note that these numbers exclude input-tax savings, and treat all new housing (and not housing over a designated limit) as HST-taxable. As Table 9 shows, his estimate for gross additional HST paid is close to my estimate for Ontario, but is considerably higher for that of British Columbia.

[20] E-mails from the Institute to the author.

V. Summary and Conclusions

The key results of this paper are summarized above – and I will not repeat each point here. Briefly, my work shows that the long-run "net" tax changes are considerably higher than that of other work published this year. The reason for this is that I treat all new-housing spending as HST-taxable in the year the spending is made (and as the HST-tax dollars flow to the provincial treasuries), and that I assume a lower input-tax pass through percentage, than that of other work. Note that my results generally agree with other work, as to gross HST tax increases and the general tax progressivity of the overall tax-regime change.

Note that the results of this paper should be best be interpreted looking at overall trends and tax rate changes. Much of the work stems from rough estimates and assumptions. Statistics Canada Survey of Family Expenditures samples a small group, for each province, and individual numbers contain sampling errors. My study did not factor in behavioural changes to the tax-regime change, such as consumers spending less on items with large tax increases, and so forth. I assume a 60 percent savings on input-tax reductions – a contentions point. And various assumptions were made on new housing expenditures, given data paucity.

Are my estimates too high? One investigative approach would be to compare provincial sales tax projections in provincial budgets – between the pre- and post-HST tax announcements – to see if there is any significant rise in the forecasts. (One has to see if this approach is feasible given data availability). I want to consider this for another paper.

Another hint about a possible HST-tax rise comes from another paper [Dungan et. al. (2009)]. These authors – who support the HST – advocate that the Ontario government should set an HST tax rate of 7.5 percent, and state that at that tax rate the revenue loss to the provincial government "would be small" (p. 6), given the transfers from the provincial government and after the economic benefits from regime change kick in. If this is true, then keeping the HST tax rate at 8 percent implies a net tax rise. Indeed, public support for HST reform would be greater, if the public enjoyed a reduction in the rate. Supporters of the HST should note this, for future tax reform planning

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Tables

Table 1: Sales Tax Increases to Households, by Income Class – Dollar and Effective Tax Rate: Ontario (2008)						
consumption classes		household income quintiles				
	all households	First	second	third	fourth	Fifth
new-HST common* $	321.12	130.00	188.16	277.28	376.64	662.72
tax rate change: %	.50	.79	.53	.53	.50	.47
new-HST Ontario only $	404.40	150.64	284.64	395.12	465.92	653.68
tax rate change: %	.63	.91	.81	.76	.62	.46
non-8% changes: Ont.:$	11.48	1.66	6.43	8.07	12.45	28.77
tax rate change: %	.02	.01	.02	.02	.02	.02
total HST increase: $	737.00	282.30	479.23	680.47	855.01	1345.17
tax rate change: %	1.14	1.71	1.36	1.31	1.13	.95

* Note that all data represent gross increases, before savings from reduced material input costs are taken into account.
** First line shows the gross increases in sales tax paid, for HST-taxable items common to both Ontario and British Columbia.

Table 2: Sales Tax Increases* to Households, by Income Class – Dollar and Effective Tax Rate: British Columbia (2008)

consumption classes		household income quintiles				
	all households	First	second	third	fourth	Fifth
new-HST common** : $	258.09	115.50	177.17	233.59	293.23	472.57
tax rate change: %	.44	.74	.53	.47	.41	.39
new-HST BC only: $	256.62	115.36	189.42	241.15	312.48	425.88
tax rate change: %	.44	.74	.56	.48	.44	.35
non-8% changes: BC.: $	–22.48	–7.13	–12.39	–19.24	–27.63	–47.35
tax rate change: %	– .04	– .05	– .04	– .04	– .04	– .04
total HST increase: $	492.23	223.73	354.20	455.50	578.08	851.10
tax rate change: %	.84	1.43	1.05	.91	.81	.69

* Note that all data represent gross increases, before savings from reduced material input costs are taken into account.
** First line shows the gross increases in sales tax paid, for HST-taxable items common to both Ontario and British Columbia.

Table 3: Per-family Spending on New Housing/Sales Tax Increases, Households by Income Class – Ontario (2008)						
housing class		household income quintiles				
	all households	First	second	third	fourth	Fifth
homes over $400,000 *	373	0	53	213	428	373
total acquisition costs*	167	42	85	206	294	208
renovations*	3253	475	1060	2560	4296	7926
New cottages*	7	1	1	2	6	13
total new housing*	3800	518	1299	3064	5106	8353
total HST increase: $ **	304.00	41.44	95.92	238.48	401.76	681.60
% income HST increase	.47	.25	.27	.46	.53	.48

* Note that these data represent new housing spending, including acquisition costs, renovations and new cottages.
** Last two lines show gross HST tax increases, and as a percent of disposable income, respectively.

Table 4: Per-family Spending on New Housing/Sales Tax Increases, Households by Income Class – British Columbia (2008)						
housing class		household income quintiles				
	all households	First	second	third	fourth	fifth
homes over $550,000 *	668	0	166	666	1332	1165
total acquisition costs*	168	4	110	236	293	202
renovations*	3466	1087	1511	1987	4234	8509
new cottages*	1	0	0	1	1	3
total new housing*	4303	1091	1787	2890	5860	9879
total HST increase: $ **	301.21	76.37	127.09	202.30	410.20	691.53
% income HST increase	.51	.49	.37	.40	.58	.56

* Note that these data represent new housing spending, including acquisition costs, renovations and new cottages.
** Last two lines show gross HST tax increases, and as a percent of disposable income, respectively..

Table 5: Total and Per-family HST Tax Increases, Households by Income Class – Ontario and B. C. (2008)						
		household income quintiles				
	all households	First	second	third	fourth	Fifth
Ontario: total $HST	$5083.2-m	$316.8-m	$569.93-m	$904.04-m	$1233.68-m	$1965.38-m
per-fam $HST	1041.00	324.74	583.15	925.59	1263.46	2013.41
% of disp. income	1.61	1.96	1.65	1.78	1.66	1.42
BC total $HST	$1411.76-m	$107.01-m	$170.74-m	$234.14-m	$351.60-m	$548.62-m
per-fam $HST	794.44	301.10	480.29	658.80	989.28	1543.63
% of disp. income	1.35	1.91	1.43	1.32	1.39	1.26

* Note that these data represent new housing spending, including acquisition costs, renovations and new cottages.
** Last two lines show gross HST tax increases, and as a percent of disposable income, respectively..

Table 6: Net HST and PIT Effects: Ontario and British Columbia (2008), Year 3 Results				
	Ontario		British Columbia	
tax change	Year 1	Year 3	Year 1	Year 3
HST tax increase*	5083	5083	1412	1412
P.I.T cuts, credits, grants*	(5195)	(2410)	(459)	(459)
Pass-through cost savings*	(428)	(1259)	(121)	(363)
total tax effects*	(712)	1409	812	570
# of families (millions)	4.8783		1.77704	
average tax effect per-family**	(146)	289	477	323
* data are in $millions		** data are in $'s per family		
Source: author's own calculations; Government of Ontario (2010); Government of British Columbia (2010).				

Table 7: Longer-run Per-family Net tax Effects, by Income Class – Ontario, 2008 "Year 3"						**$ per family in**
		household income quintiles				
	all households	first	second	third	fourth	Fifth
HST tax increase	1041	324	666	926	1263	2013
PIT cuts and credits	494	405	530	445	460	520
pass-thru cost savings	258	82	171	229	311	573
net tax effects	289	–164	–35	252	492	921
after-tax income	64554	16556	35273	52005	75341	142108
% tax rate change	.45	–.99	– .10	.48	.65	.65
Source: author's own calculations; Government of Ontario (2010).						

Table 8: Longer-run Per-family Net tax Effects, by Income Class – British Columbia, 2008 $ per family in "Year 3"						
		household income quintiles				
	all households	first	second	third	fourth	fifth
HST tax increase	793	300	479	658	988	1543
PIT cuts and credits	270	416	361	149	182	216
pass-thru cost savings	201	78	123	168	252	399
net tax effects	323	–193	–3	344	558	934
after-tax income	58473	15694	33626	49961	71094	122465
% tax rate change	.55	–1.23	–.01	.69	.78	.76
Source: author's own calculations; Government of British Columbia (2010).						

Table 9: Summary of Effects on Households, Ontario and British Columbia, to Policy Literature*				
	Ontario		British Columbia	
study	HST	Net Tax**	HST	Net Tax**
This paper [Murrell(2010)]	$1041	$289	$793	$323
Government of Ontario (2010)	1291	106	_____	_____
Fraser Institute (2010)	_____	_____	262 ***	44
TD Bank	779***	75	772***	_____
Michael Smart (2007)	1097	_____	1372	_____
* all data are dollars per family ** includes personal income tax reductions and input-tax savings *** HST tax includes input-tax savings, and for the other studies they do not				
Source: author's own calculations; Government of Ontario (2010); Government of British Columbia (2010).				

Table A1: List of Consumer Items New HST--Taxable: Common to Both Ontario and British Columbia (2008)*				
number	**commodity #**	**description of consumption component**	**Ontario**	**B.C**
1	calculated	vitamins	50	62
2	29720–297	services related to clothing (laundromats, etc.)	180	128
3	20110	repair and maintenance, owned home (*.67)	243	153
4	20400	repair and maintenance, vacation home (*.67)	260	123
5	20460	electricity and heating, vacation home	48	37
6	26900-27100	repair/maintenance of furniture and equipment *.4	30	26
7	23700	horticultural, snow and grading services	92	95
8	22600	domestic and custodial services (*.5)	60	40
9	20520	other traveller accommodation (e.g., camping)	282	142
10	32100	taxis	80	63
11	32600	household, moving and storage	48	96
12	calculated	other inter-city transportation (*.2)	133	225
13	33220	other health care practitioners (*.1) (e.g. massages)	12	15
14	41500–41700	use of recreational facilities	386	369
15	41900	other recreational services	15	19
16	47100	funeral services	93	49
17	35700-35800	personal care services (e.g., hair styling, etc.)	547	515
18	27200-27300	services related to furniture and equipment	104	50
19	23000	veterinarian and other related services	233	186
20	43100	magazines and periodicals (*.9)	41	43
21	22300	postal services	67	61
22	calculated	maintenance and repair of audio visual equipment	19	18
23	46800	dues and contributions to social clubs, etc.	41	34
24	47300	wholesale/retail memberships	25	25
25	20200	real estate commissions	183	343
26	46200	legal services other than sale of own home	171	66
27	20220	legal services for sale of own home	100	77
28	20260	appraisals, surveying etc. for sale of own home	52	102
28'	45000–45100	tobacco products	529	487
* Source: Statistics Canada: Survey of Consumer Spending				
** Amount spent by the average (all incomes)				

Table A2: List of Consumer Items New HST--Taxable, for British Columbia only (2008)*			
number	**commodity #**	**description of consumption component**	**B.C.**
29	23400	nursery and greenhouse stock (*.5)	$73
30	29000	disposable diapers	32
31	15600	restaurant meals	2032
32	41410	rental of cable vision services (*.33)	139
33	22020	telephone services (*.33)	164
34	30820	parking away from home	78
36	37000	sports and athletic equipment (*.05)	9
37	39000	bicycles (*.90)	83
38	calculated	entertainment services (less cable/satellite TV)	75
39	43000	newspapers	61
40	calculated	education materials (*.50)	22
41	calculated	snack foods	672
* Source and measurements the same as in Table 1.			

Table A3: List of New-HST Consumer Items With a Tax Reduction, British Columbia only (2008)*			
number	**commodity #**	**description of consumption component**	**B.C.**
42	calculated	owned home: electricity/heating (tax rate falls by .4%)	$1764
43	20500	hotel and motels (tax rate falls by 1%)	639
44	30200	vehicle rentals (tax rate falls by 1%)	732
45	calculated	vehicle leases (tax rate falls by 2%)	415
* Source and measurements the same as in Table 1.			

Table A4: List of Consumer Items New HST–Taxable for Ontario Only (2008)*		
number	description of consumption component	$spending**
29	gasoline and other fuels: rented vehicles	$29
30	" " " " : owned vehicles	2269
31	" " " " : recreational vehicles	40
32	water, fuel, electricity: owned homes	2505
33	" " " vacation homes	48
34	internet access services	333
35	on-line services	8
36	live performing arts	123
37	museums and other	44
38	hotels and motels	492
* Sources and definitions are the same as in Table 1.		

Table A5: List of Consumer Items New HST, With Tax Reductions or Increases, Ontario (2008)*			
number	**commodity #**	**description of consumption component**	**Ontario**
38	41000	movie tickets (tax rate falls by 2%)	$107
39	41100	live sports events (tax rate falls by 2%)	57
40	20500–20520	hotels and motels (tax rises be 3%)	492
* Source and measurements the same as in Table 1.			