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THE IMPACT OF SALES TAX REFORM ON ONTARIO CONSUMERS: A First Look at the Evidence

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ABSTRACT

Ontario's new Harmonized Sales Tax applies to a broader base of consumer purchases than before, but it also removes some of the "hidden" taxes on business inputs. This paper offers a first look at how the change has affected consumer prices and the welfare of Ontario families. While consumer prices initially rose 0.9% due to the reform, the price impact has since fallen, reflecting the way that input tax credits are being passed on to consumers, or the new taxes are otherwise being absorbed by sellers. With the compensating income tax changes also enacted by the Ontario government, the net impact of the reform for most families by the end of 2010 was a gain or very small loss in after-tax real incomes. Since input tax credits are likely passed on as lower prices or higher wages only gradually over time, the effect of the policy on after-tax real incomes will likely continue to improve over time.

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SUMMARY

In July 2010, Ontario replaced its Retail Sales Tax (RST) with a new tax harmonized with the federal Goods and Services Tax (GST). Ontario's new Harmonized Sales Tax (HST) is a fundamental reform, albeit one poorly understood by many Ontarians. In brief:

- Like the GST, the new tax is a value-added tax, meaning taxable businesses receive credits for HST paid on business inputs. In contrast, a high proportion of revenues under Ontario's old RST were "hidden" taxes paid by businesses.
- The new tax applies to a broader base of consumer purchases than the old RST, chiefly through the inclusion of some services and excisable goods in the tax base.
- Income tax measures were introduced to offset the impact of sales tax reform on consumers.

The reform's impact on consumers has been much debated. Past economic research has found that input tax credits paid to business reduce production costs and, in most industries, are passed on to consumers through lower prices. However, no study has looked at the actual experience in Ontario since the reform. This paper offers a first look at actual experience by examining changes in consumer prices in Ontario since July 2010 that can reasonably be attributed to the effects of tax reform.

On the basis of the consumer price data, I find:

- The effect of harmonization was to raise consumer prices in Ontario by an estimated 0.9 percent in July 2010.
- By December, the effect of harmonization had fallen to an estimated 0.6 percent, as sellers increasingly adjusted prices to absorb some of the consumer tax increase.
- The gradual decline in price impact over time reflects how input tax credits are passed on to consumers by businesses, or how the new taxes are otherwise being absorbed by sellers. These estimates suggest that about two-thirds of new input tax credits are already reflected in lower consumer prices.
- Incorporating the compensating income tax changes also enacted by the Ontario government, the reform's net effect at the end of 2010 was extremely small for the average family. Incorporating all the changes, the after-tax real cost of living is estimated to have risen \$121, or 0.24 percent of household consumption, for the average family based on December prices.
- Most families of below-average income experienced a net gain as a result of the reform, as compensation through the income tax changes more than offset higher taxes on consumption expenditures.

In other words, the net impact of the reform for most families by the end of 2010 was a gain or very small loss in after-tax real incomes. Since input tax credits are likely passed on as lower prices or higher wages only gradually, the long-term positive effect of the policy on the after-tax real incomes of Ontario families is understated by this very short-run estimate of its impacts.

INTRODUCTION

In July 2010, Ontario introduced a significant reform of its sales tax system, abolishing the Retail Sales Tax (RST) and introducing a new, broader-based value-added tax (VAT) harmonized with the federal Goods and Services Tax (GST).² Ontario's new Harmonized Sales Tax (OHST) has since engendered considerable controversy among the media, politicians and the public.

The OHST reform is simultaneously complex and comparatively small:

- The reform is complex because it involves a basic change in the way Ontario taxes consumption. The old RST was a traditional final sales tax, levied on most goods purchased through retail establishments – whether by businesses or final consumers – as well as on a small number of services. In contrast, the new OHST is an “invoice-and-credit” VAT under which taxable purchasers (businesses) receive a credit for OHST paid on business inputs, so that a greater part of the legal burden of taxation now falls on final consumers.
- The reform is small because the provincial tax rate remains unchanged. While the OHST tax base has been broadened to include some services and goods previously exempt from RST, most consumer purchases subject to OHST were taxed at the same eight percent rate under the old RST. Thus, while the reform has eliminated most of the hidden tax on business inputs, some highly visible taxes on consumer purchases are increasing.
- Certain measures were introduced through the income tax system to offset the impact of sales tax reform on consumers. In particular, income tax rates were reduced, tax credits targeted to low-income families were increased and “transitional” payments were made.

The effect of these changes on consumers has been a matter of debate. In the period leading up to the reform, several studies attempted to predict the impact using information on patterns of consumer purchases and projections of how taxes and prices would change with the reform.³ However, no study has looked at the actual experience since the reform. This paper offers a first look at actual experience by examining changes in consumer prices in Ontario since July that can reasonably be attributed to the tax reform. On the basis of the consumer price data, I estimate the overall effect of OHST so far on the cost of living in Ontario, and on the distribution of after-tax real income of Ontario families.

DETAILS OF THE HARMONIZATION IN ONTARIO

The reform's centrepiece is the harmonization of the base for Ontario's sales tax with the five percent federal GST, with the two taxes levied together at a combined 13 percent rate, collected by the federal Canada Revenue Agency, with the provincial portion of revenues remitted from the federal to the provincial government. As discussed in the Introduction, the OHST reform has two parts: a decrease in taxes levied on business purchases through the introduction of input tax credits (ITCs) for taxable purchasers, and an increase in taxes levied on final consumer transactions through base broadening.

² Six of ten provinces have now adopted a value-added tax similar to the federal GST, albeit with some differences in the tax base.

³ See for example TD Bank (2009), Ontario Ministry of Finance (2010), and Lightman and Mitchell (2009).

Tax Treatment of Businesses

Ontario's former RST was levied on most goods purchased through retail establishments – whether by businesses or final consumers – as well as on a small number of services. Certain exemptions were available to business purchasers but these were largely limited to goods purchased for resale and some machinery and equipment expenditures of manufacturing industries. It has been estimated that as much as 40 percent of RST tax revenues were paid by business purchasers rather than final consumers.⁴

One problem with the RST was therefore that tax was levied at various stages of the production process. Such a tax cascades through the production chain as tax paid on inputs and is embedded in the selling price of intermediate goods, which may be subject to tax again as goods are further resold and reprocessed for final sale to consumers. Tax cascading has the potential to change production decisions in undesirable ways, resulting in an uneven pattern of taxation of final consumption goods in a way that lacks good policy justification.

In contrast, the HST is an “invoice-and-credit” VAT. While all taxable supplies are subject to tax, regardless of the identity of the purchaser, taxable businesses may claim a credit for input taxes paid while remitting HST on their taxable sales. The result is that only value added at each stage of the production process is subject to tax and, in principle, the VAT is equivalent to a tax on sales to final consumers alone.⁵ A significant benefit of VAT, and the primary motivation for the Ontario reform, is therefore the removal of embedded input taxes from production costs.⁶

Analysis of Statistics Canada's input-output data for Ontario suggests that harmonization has reduced input taxes on material inputs in many industries, most notably in the residential and non-residential construction sectors. Additionally, a substantial fraction of input taxes were on capital goods. Mintz (2009) calculates that the sales tax harmonization, together with the corporate income tax reductions announced in Ontario's 2009 Budget and other capital and corporate tax changes, will reduce effective tax rates on investment from 33.6 percent in 2009 to 18.5 percent on average by 2018.⁷

⁴ The pattern of taxes on businesses and consumers under RST and VAT is compared in Smart and Bird (2009b).

⁵ In practice, some commodities are exempt from taxation under GST and OHST, which means that while no tax is payable on their sale, input taxes incurred in their production are not credited either. In such cases, tax does remain embedded in business costs, just as with the RST.

⁶ Since ITCs are not available to suppliers that are tax-exempt under HST, harmonization can only reduce input costs in taxable sectors. Indeed, embedded taxes likely have increased slightly for financial and health-care services, which are HST-exempt.

⁷ The figures are for investment by non-CCPC (large) businesses.

Base Broadening

Due to harmonization, OHST applies to certain commodities – especially services – that were previously exempt from RST. Notable examples of commodities exempt from RST but taxable under OHST are:

- **Personal services**, including hair stylists, dry cleaning and laundry services, massage therapy and others. While some home-repair services were previously subject to RST, more of the sector is now taxable. Certain recreational activities including sports club memberships, some live entertainment productions and magazine subscriptions are also newly subject to provincial tax.
- **Professional services**, including legal and accountants' fees, real estate commissions, and fee-based financial and investment services. Most financial services are exempt from OHST.
- **Utilities**, including electricity, natural gas, home heating oil and home internet services. (Telephone and cablevision services were previously subject to RST.)
- **Public transportation**, including domestic air, rail and bus travel originating in Ontario, taxi fares, travel agent commissions and travel tour fees.
- **Gasoline and tobacco products** were previously subject to specific provincial excise taxes but were exempt from RST. Their full price, including excises, is now subject to OHST.

As this suggests, the share of services newly subject to tax is fairly small. Indeed, despite its name, the federal Goods and Services Tax exempts a high proportion of services and the same is true of OHST. The list of services exempt from both taxes includes most financial services, residential rents, most health care, education, child care and most services delivered by government and quasi-governmental organizations. As well, most food and agricultural products are untaxed under both GST and OHST. In the language of VAT, food and agricultural outputs are “zero-rated” rather than exempt, meaning that while no tax is charged on sales, producers are eligible for full credits for VAT paid on inputs to production. The result is that there is neither direct nor embedded tax on these commodities.

The key examples of newly taxed goods are presented in Table 1, organized into the broad categories of consumer price indices used in the empirical analysis below. To give an initial sense of the magnitude of the changes, the table also reports the share of the overall Consumer Price Index (CPI) basket that is in each affected category. It is important to note that these weights are for the full CPI category, which in some cases is much larger than just the newly taxed commodities. For example, household furnishings includes certain newly taxed repair services but the bulk of the category is goods whose tax treatment has not changed with the reform.

In addition, HST changed tax rates slightly on some items previous subject to Ontario tax:

- **Hotel rooms** are now subject to eight percent OHST, in place of a previous five percent provincial tax.
- **Alcoholic beverages**, previously subject to taxes of 12 percent if sold in stores and ten percent in bars and restaurants, are now subject only to the eight percent OHST. Since most prices are set directly by the provincial liquor agency, the government has adjusted pre-tax markups on alcohol to keep after-tax prices constant, preserve revenue and “maintain social responsibility,” according to budget documents.

TABLE 1: Consumer Price Index Categories Affected by OHST

CPI code	Category	Examples of newly taxed items	Share in CPI basket
11	Food Purchased From Stores	none	10.8
12	Food Purchased From Restaurants	none	4.9
21	Rented Accommodation	none	5.3
22	Owned Accommodation	real estate commissions; home maintenance services	17.3
23	Water Fuel And Electricity	electricity; home heating	4.8
31	Household Operations	internet services; domestic services	7.1
32	Household Furnishings	repair services	4.2
41	Clothing	none	3.7
42	Footwear	footwear under \$30	0.9
43	Clothing Accessories And Jewellery	none	0.7
44	Clothing Material Notions And Services	dry cleaning	0.4
51	Private Transportation	gasoline; taxis	17.9
52	Public Transportation	domestic inter-city travel originating in Ontario; travel agent commissions	2.1
61	Health Care	none	2.2
62	Personal Care	hair stylists; massage therapy; etc.	2.3
71	Recreation	some live entertainment; sports clubs	9.3
72	Education And Reading	magazine subscriptions	3.8
81	Alcoholic Beverages	uncertain	1.4
82	Tobacco Products And Smokers' Supplies	cigarettes	1.1

OHST: Not Quite Harmonized

The OHST tax base departs from GST in certain ways. Most of the differences are measures intended to preserve tax preferences that existed for certain commodities under RST, or which seek to preserve existing higher rates of tax on other commodities. In particular:

- **Children's clothing, books, newspapers and feminine hygiene products**, all of which were previously RST-exempt, are accorded "point-of-sale rebates" of OHST. Since these goods bear only the five percent federal rate at all stages of the production chain, but full ITCs are available to traders, the provincial portion of HST is effectively zero-rated. This means that the total tax on such goods is actually falling with the reform, because of the elimination of cascading. The affected commodities are, however, a small part of overall consumption.
- **Newly built houses** are subject to tax under HST, but much of the provincial tax component is offset through a rebate equal to the lesser of six percent of the purchase price and \$24,000. This means that the OHST rate on new homes priced up to \$400,000 is 2 percent and the effective rate increases slowly with prices above that level. While a federal new housing rebate also exists under GST, it is much smaller than the Ontario rebate.
- **Certain insurance premiums**, while exempt from federal GST, are subject to an eight percent provincial tax enacted to maintain the same tax level as before the reform.
- **Private sales of used cars**, while exempt from federal GST, are now subject to a 13 percent provincial tax, up from eight percent before the reform.

- **Input tax credits** payable to businesses with revenues over \$10 million are to be restricted for purchases of energy, telecommunications services, passenger vehicles, work-related meals and entertainment.⁸ Modeled on a similar restriction in the Quebec Sales Tax, this is a transitional measure to increase revenues, due to be eliminated by 2018.

Income Tax Measures

Coincident with the announcement of OHST, the government introduced a number of changes in income taxes. While these are discussed in more detail later in the paper, it is worth noting that income tax measures have a fairly large revenue cost; they insulate many Ontario families from any reduction in economic welfare through the new sales taxes and they represent a small but significant shift away from income taxation towards consumption taxation. Since there are substantial economic advantages to (progressive) consumption taxation in place of income taxation, this change is to be lauded. I return to these issues below.

Revenue Impacts

In the 2010 Fall Update, the Ontario government projected that the fully phased-in reform would increase net sales tax revenues by \$2.3 billion in 2012-13, plus an additional \$1 billion in revenues due to the temporary restrictions on input tax credits paid to large businesses. The projected total revenue increase of \$3.3 billion is approximately 0.8 percent of aggregate personal consumption expenditures in Ontario. In contrast, Smart and Bird (2009b) estimated, based on 2002 input-output data, that RST's conversion to an eight percent tax on the federal GST base would be nearly revenue-neutral in Ontario. The difference is mostly explained by Ontario's departures from the GST base, including additional taxes on insurance, alcohol and used cars, and partial ITCs for large businesses, minus the effect of the larger rebate for new housing and the new point-of-sale rebates.

While the sales tax reform increases revenue for Ontario, taken together with the income tax changes, the reform is approximately revenue-neutral. The 2010 Update estimates the cost of personal income tax changes, including the rate cut and the sales and property tax credits at \$2.8 billion in 2012-13, which offsets virtually all of the sales tax revenue increase, even before full phase-in of ITCs for large businesses in 2018.

WHO BEARS THE TAX BURDEN? THE ECONOMIC PERSPECTIVE ON TAX INCIDENCE

The combination of new ITCs for business inputs and base broadening for consumer purchases has led some commentators to characterize the reform as a shift in tax burdens from businesses to individuals. The economic perspective on tax incidence is somewhat different. Ultimately, all taxes are paid by people, not businesses – whether in the form of higher prices paid for commodities or lower wages, rents and profits received for labour, land and capital used in production. The operative question is therefore how consumer prices are changing with the reform, and to what extent input tax credits under OHST are shifted to consumers in the form of lower pre-tax prices of goods and services produced in Ontario, offsetting the effects of base broadening.

⁸ The restriction applies to all financial institutions, regardless of revenues, although financial institutions are largely exempt from HST and so receive almost no ITCs.

That taxes on sales and production costs are generally shifted forward to final consumers is a central, if largely untested, precept of public finance economics. The notion of full forward shifting makes sense in industries where unit production costs are invariant to the scale of output and competitive pressures keep prices in line with costs. But in some cases, it is more reasonable to expect that consumer prices adjust by less – or more – than the associated tax change. In particular:

- The embedded input taxes of the old RST could not easily be passed onto consumers by firms in tradable sectors that compete against close substitutes in export markets or in the domestic market against imported goods. In tradable sectors, price competition is with foreign producers who did not pay the Ontario RST on inputs. Since the RST in such cases was therefore likely not embedded in sale prices before the reform, introduction of ITCs is unlikely to reduce prices now. Instead, the effects of harmonization will be manifested in increased domestic production, increased productivity and, in the longer run, higher wages for Ontario workers.
- In concentrated industries where firms have market power, prices may generally exceed minimum unit costs, and changes in embedded taxes might not be passed on to prices dollar-for-dollar. In some cases, embedded taxes may be undershifted to consumers, so that introduction of ITCs leads to less than commensurate reductions in prices. But the opposite may be true as well. If embedded RSTs were overshifted, then ITCs should result in greater than dollar-for-dollar reductions in consumer prices despite limited market competition. The simplest example of such behaviour is a firm that sets prices equal to a constant markup over all costs, including embedded taxes.
- In supply-constrained industries, consumers' willingness to pay may be a more important determinant of selling prices than producers' tax-inclusive cost of production. A key example is residential housing, where developers face significant supply constraints due to planning restrictions and limitations on available land in many communities. In such cases, part of the tax may be absorbed into profit margins rather than passed on fully to consumer prices.
- In regulated industries, the extent to which embedded taxes and ITCs are shifted to consumers may depend on regulators' choices about pricing and the ease with which new firms may enter the market. Key examples in Ontario include electricity and natural gas for home heating.

Similar considerations apply to analyzing the economic incidence of the new taxes on consumer purchases through base broadening. While it may seem self-evident that businesses will pass on such taxes to consumers, the same considerations of overshifting and undershifting in non-competitive markets apply to taxes on final sales, as well as to the embedded taxes on production inputs discussed above. Previous economic research has found that ad valorem (percentage) taxes like OHST are more likely to be undershifted in non-competitive industries, whereas specific excises (levied in dollars per unit sold) may be overshifted. I return to this distinction below.

While these issues arise in some industries, it is important to emphasize that previous research finds that tax changes are fully passed on to consumers in most cases. For example, Bird and Smart (2009a) examined consumer price changes in three Atlantic provinces after a similar tax harmonization in 1997. While those provinces decreased their statutory tax rates as part of the reform, effective tax rates still rose in some sectors because of base broadening. We found that, whether taxes went up or down, in most sectors the tax changes were fully passed on to consumers in the form of price changes.

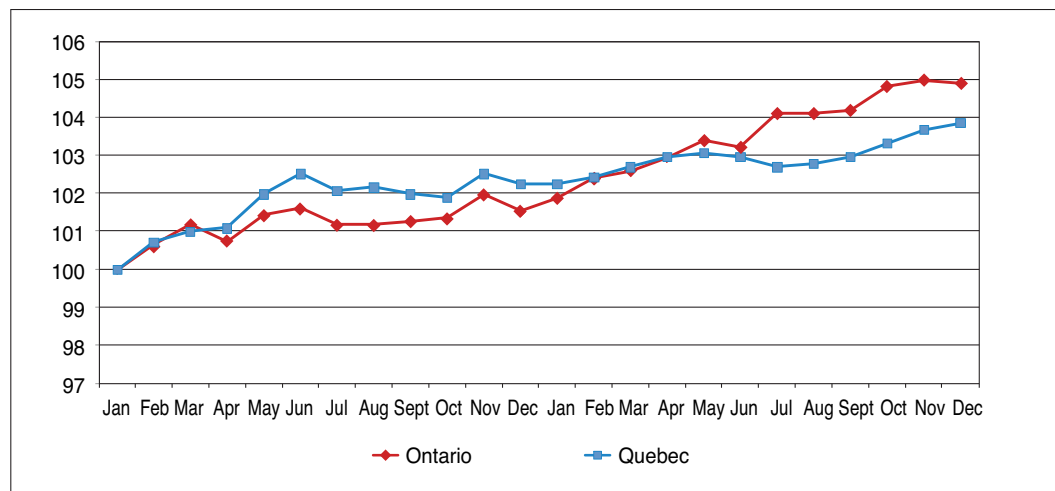
HOW HAS HARMONIZATION AFFECTED CONSUMER PRICES IN ONTARIO?

For all these reasons, it is interesting to examine how consumer prices have changed since the OHST reform in July 2010. To do so, I obtained detailed price data from Statistics Canada's CPI for the period up to December 2010, the most recent month available at the time of writing.

The challenge in using actual price data to estimate the impact of the reform is the counterfactual question: What would prices in Ontario have been in late 2010 had the reform not occurred? Since prices for various goods change over time due to a variety of economic factors unrelated to tax reform, examining month-to-month changes in Ontario's CPI in isolation is potentially deceptive. To provide a rough measure of the counterfactual, I compare month-to-month price changes since June 2010 to the contemporaneous price changes in Quebec. If other economic factors affect Quebec and Ontario prices in the same way, then the difference in the two provinces' month-over-month inflation rates since June can be more reasonably attributed to the effects of Ontario's tax reform. Quebec offers the most natural comparison for other factors affecting Ontario prices since markets in the two provinces are closely integrated and the provinces' CPI baskets are similar.

Figure 1 presents the CPI for All Items in Ontario and Quebec since January 2009. It illustrates the method and provides a preliminary estimate of the effect of the reform – to make the figure more readable, the series have been rescaled so that both price indices equal 100 in January 2009. The figure shows that, while prices were generally trending upward in Ontario in the first half of 2010, there was a fairly sharp increase in CPI beginning in July. Since there was no such jump in Quebec's CPI at the same time, it seems reasonable to attribute the increase, at least partly, to the effects of tax reform. In particular, the month-over-month increase in Ontario's CPI was 0.9 percent in July, compared to a CPI decrease of 0.3 percent in Quebec. Under the assumption that Ontario's prices would have evolved in the same way as Quebec's in the absence of reform, we therefore estimate that tax harmonization caused a 1.2 percent increase in Ontario's prices in July.

FIGURE 1: CPI for All Items, Ontario and Quebec; 2009-2010



In the following five months, price levels in Ontario and Quebec increased in a largely parallel fashion, but Ontario's rate of inflation fell below Quebec's in November and December. The cumulative increase in Ontario's CPI between June and December was 1.6 percent, compared

to 0.9 percent for Quebec, suggesting that the impact of tax harmonization after six months was to increase Ontario's overall price level by just 0.7 percent.⁹

Ontario's inflation rate in late 2010 could have diverged from Quebec's for a variety of reasons unrelated to tax reform. Most importantly, the divergence in price levels might have come from price changes in markets not closely integrated between the two provinces, such as the relatively volatile fresh food components of CPI. As well, the divergence could reflect price changes that are common to both provinces but which are weighted differently in the two provinces' CPI baskets.¹⁰ To establish the true impact of harmonization in Ontario, the more detailed analysis in the next section of the paper examines price changes only for those subcomponents of the CPI basket for which tax rates are known to have changed, as listed in Table 1. The focus on affected commodity groups should remove the greatest source of spurious price changes from our estimates of the effects of the reform.¹¹

While the analysis of Figure 1 illustrates the general method used to estimate the effect of harmonization, it also demonstrates its limitations. Prices in Ontario and Quebec might have diverged in late 2010 because of factors other than sales tax reform, including different patterns of seasonality in prices between the provinces, different trend rates of inflation or simply the inherent volatility of prices within each province. In the appendix to this paper, I explore two alternative control strategies that attempt to deal with these possibilities. The estimated effects of harmonization reported in the Appendix are, however, broadly similar to the base case discussed in the main text.

IMPACTS ON INDIVIDUAL COMMODITIES

I turn next to a detailed analysis of price changes in the individual components of CPI that were directly affected by tax changes occurring through the OHST reform. Table 2 reports price changes for 16 subcategories of CPI for which provincial data are available, which together comprise all of the OHST tax changes listed above.¹² Analogous to the information presented graphically in Figure 1, the rightmost six columns of the table report the cumulative change in average prices in Ontario from June to each month following the reform, minus the corresponding price change in Quebec. Thus the reported change for July represents an estimate of the initial impact of the reform on after-tax prices, while the remaining columns show how prices have evolved subsequently.

⁹ This report was prepared before Statistics Canada released CPI data for January 2011. Subsequent examination shows that Ontario's CPI for All Items was essentially unchanged in January. Quebec's CPI rose 0.5 percent relative to December 2010, but this largely reflects the increase in Quebec's own sales tax rate on January 1.

¹⁰ In other words, the relative change in All Items' CPI for the two provinces is not a true price index for the tax change, because provinces' CPI baskets are weighted differently. In contrast, the aggregate impact on affected commodities, reported in the next section, is a true index for the tax change, weighted by Ontario's 2005 CPI basket weights.

¹¹ In some of the unaffected sectors, harmonization could be causing prices to fall as new ITCs lower business costs and are passed forward to consumers. Because the effect of ITCs on costs is of a similar magnitude in most taxable sectors of the economy (other than construction), it is difficult to distinguish the effect of ITCs from other, unobserved factors that may have affected Ontario's general rate of inflation over the last five months of 2010. In other words, the overall effect of ITCs on prices simply cannot be measured accurately with the CPI data. Excluding the unaffected sectors is therefore a way of focusing on the reform impacts that can be measured most accurately. This may exclude some of the price-reducing effects of harmonization.

¹² The one possible exception is the replacement cost of owned accommodation which, because of conceptual problems, is excluded from Table 2. The effect of HST on new houses is discussed in detail below.

TABLE 2: Estimated Price Changes due to OHST Reform; July to December 2010

CPI code	Item	Share in CPI basket - percent -	Jul	Aug	Sept	Oct	Nov	Dec
			- percentage change -					
2205	Homeowners' Maintenance And Repairs	1.8	2.3	1.9	1.4	3.1	2.0	3.2
23	Water Fuel And Electricity	4.8	3.4	3.4	3.9	2.4	0.4	0.2
3101	Communications	3.0	1.4	2.4	2.4	2.4	2.6	2.6
32	Household Furnishings	4.2	-0.6	-0.6	1.8	0.0	1.2	-0.1
42	Footwear	0.9	5.2	3.7	6.6	6.7	3.3	3.8
44	Clothing Material, Notions And Services	0.4	3.6	5.2	4.9	4.9	2.3	2.3
510201	Gasoline	4.2	7.3	5.8	4.2	4.9	4.3	3.9
5202	Inter-City Transportation	1.2	2.4	2.3	2.7	2.7	2.8	2.3
520102	Taxis and Other Local Transportation	0.2	4.2	4.2	4.2	4.2	4.2	4.2
6202	Personal Care Services	1.0	8.3	8.3	8.3	8.3	10.3	10.3
7104	Travel Services	2.4	-2.0	-1.9	0.0	0.0	-1.0	-3.2
7105	Recreational Services	2.4	4.5	4.5	4.8	4.4	4.4	4.4
7202	Reading Material	0.6	0.7	0.7	1.9	0.7	0.7	-1.2
8101	Served Alcoholic Beverages	0.4	2.8	3.1	2.8	2.8	3.0	3.0
8102	Alcoholic Beverages From Stores	1.0	0.5	0.6	0.7	-0.1	0.9	1.3
82	Tobacco Products	1.1	7.3	7.7	8.3	8.2	8.0	7.1
	Weighted Average	29.4	0.9	0.8	1.0	0.9	0.7	0.6

Examining individual price changes in the table, a few patterns emerge:

- For several categories, including **gasoline**, **personal care services**, and **tobacco products**, the estimated price change in July is very close to the statutory OHST rate of eight percent. This is expected, since virtually all expenditures in these categories are newly subject to tax under OHST.
- In other categories, including **homeowners' maintenance**, **communications** (which includes internet provision), **clothing materials and services** (dry cleaning) and others, the estimated price change is positive but smaller than eight percent. This is expected since the categories include a mix of commodities that were both taxable and tax-exempt under RST, so that the expected effect of the reform on prices is less than eight percent.
- Prices for **water, fuel and electricity** increased 3.4 percent in July but by December had risen only 0.2 percent more than in Quebec, despite the fact that virtually all of the category is newly subject to OHST. Examination of individual subcomponents shows that prices for heating oil increased only slightly in Ontario with the reform, while prices for natural gas remained stable in Ontario despite price increases in Quebec. In contrast, average electricity prices increased by more than the full amount of the tax in July, but the tax effect ameliorated somewhat in November and December.¹³ Thus the evidence for this category is consistent with the idea that new taxes were undershifted to consumers in both regulated (natural gas) and unregulated (heating oil) markets.

¹³ The November decline in average electricity prices presumably reflects changes in time-of-use pricing instituted by the Ontario Energy Board on November 1. See "Electricity prices set for small drop," The Toronto Star, October 19, 2010, p. B1.

- The average price of **gasoline** in July rose 7.3 percent more in Ontario than in Quebec, which is slightly less than the new eight percent OHST levied. By December, the cumulative increase in Ontario's average gasoline prices was just 3.9 percent more than in Quebec.¹⁴ Once again, this suggests that gasoline taxes were undershifted to consumers.
- On average, prices for **travel services** declined in Ontario by two percent in July and 3.2 percent in December. This is surprising, given that the category includes short-term rental of hotel rooms, for which the provincial tax rate rose from five percent to eight percent with the reform. However, hotels in several Ontario cities had instituted a voluntary three percent levy on hotel rooms, the proceeds of which were used to finance local tourism promotion activities. Under hoteliers' existing agreements, this levy was automatically eliminated with the three percent increase in the provincial tax rate in July.¹⁵ Thus the price decrease in this category, while still anomalous, reflects in part sellers' conscious decision to absorb the new tax in the form of lower industry funding for tourism promotion.
- Average prices for **alcoholic beverages** served in restaurants and bars increased 2.8 percent in July and remained higher throughout the year. This is also anomalous since the OHST reform reduced the applicable tax rate to eight percent from 10-12 percent, while adjusting pre-tax markups on alcohol to keep wholesale prices (and in-store retail prices) constant. One possible explanation is that restaurateurs held their own markups over wholesale prices constant, resulting in an increase in prices paid by final consumers – a classic example of overshifting of a specific excise tax.

The final row of Table 2 reports the aggregate change in prices for the affected categories, weighted by the shares of the categories in the total CPI basket for Ontario. The estimated total change in the cost of living due to the OHST reform is 0.9 percent in July 2010, declining to 0.6 percent by December. These estimates are similar to – but slightly smaller than – the relative change in CPI for All Items in the two provinces, as reported above. The difference reflects the impact of price changes unrelated to harmonization on All Items' CPI, and the effects of the different weights in provinces' CPI baskets, both of which are removed by looking only at the affected categories. In short, the best estimate is that harmonization caused prices to rise by 0.9 percent in July, falling to 0.6 percent in December.

These estimates are similar to those reported for British Columbia by Kesselman (2011). BC also adopted the HST in July 2010, but there were some differences in the working of the reform, due mainly to differences in the two provinces' pre-existing retail sales tax systems.

¹⁴ In this case, a potentially confounding factor is the September conversion of Shell Canada's Montreal oil refinery into a distribution terminal, which might have affected market conditions and prices differentially in Quebec. But Ontario and Quebec's gasoline markets are closely integrated, so that supply shocks in one province should affect wholesale prices in much the same way in both provinces. Closer examination of retail gasoline prices for individual cities indicates that the reduction in price growth in late 2010 occurred even in most cities in eastern and north-eastern Ontario, where prices presumably reflect supply conditions in Quebec most closely.

¹⁵ In addition, the government of Ontario in the 2009 Budget announced new funding for local tourism promotion programs.

The Evolution of Price Changes and the Shifting of Tax Burdens

Analysis of Figure 1 and Table 2 showed that the estimated effect of OHST was generally smaller after six months than in the first month after the reform. To make this clear, Figure 2 plots the tax-induced price changes in July and December for each category in Table 2; the size of the bubble for each category is proportional to its weight in the overall CPI basket. Observe that the points plotted are almost all clustered along the 45-degree line, indicating that the initial price change was roughly unchanged after six months, or are below the line, indicating that the impact of reform on prices lessened over time.

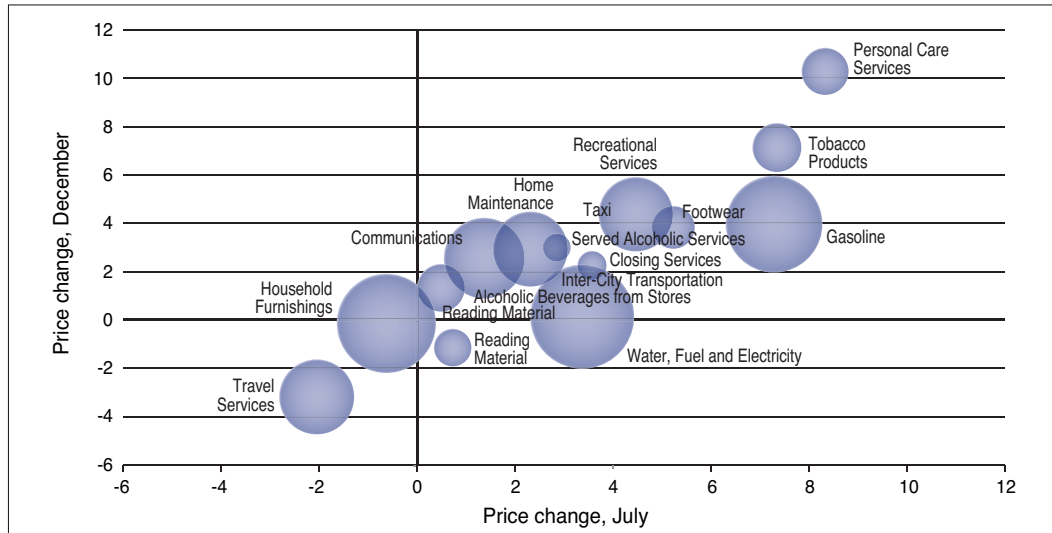
The observed diminution in tax effects over time is consistent with a gradual passthrough of input tax credits to lower consumer prices. However, since the effect of ITCs on costs is of a similar magnitude in most taxable sectors of the economy (other than construction), it is difficult to distinguish the effect of ITCs from other, unobserved factors that may have affected Ontario's general rate of inflation over the last five months of 2010. An alternative, related explanation, is that firms gradually adjusted pre-tax prices downward following the reform, absorbing some of the tax into short-run profit margins as they learned about consumer reactions to the tax increases. Such gradual adjustment in prices is very common, and in this case it implies that sellers absorbed more of the new taxes over time.

It is instructive to compare the observed price decline to the anticipated impact of ITCs on costs. Based on 2005 input-output tables for Ontario publicly available from Statistics Canada, harmonization is estimated to reduce business costs by about \$4.2 billion, or 0.45 percent of the value of non-government production in Ontario. So the observed 0.3 percent consumer price decline in late 2010 represents about two-thirds of the anticipated impact of ITCs on business costs.

As well, this pattern of price changes may reflect the way CPI price data are collected. Statistics Canada does not sample prices of all commodities in all provinces on a monthly basis, due to its limited resources for data collection and because prices for some commodities (especially services) change infrequently. The agency did sample some service prices extraordinarily in July 2010 to capture price changes around the introduction of the OHST, but some reported CPI changes in July may reflect inferences based on how tax rates changed under OHST, as well as actual price observations. As more prices are sampled over subsequent months, reported price indices therefore may fall over time when taxes are undershifted.

In short, the gradual decline in the price impact of harmonization over time reflects the way input tax credits are being passed on to consumers by businesses, as well as other competitive pressures on pricing that caused sellers to bear more of the burden of consumer taxes. Separate estimation of these two effects, and of the impacts of Statistics Canada's methods for collecting consumer price data, will have to wait until the evolution of prices in Ontario can be observed over a longer period of time.

FIGURE 2: Tax Effects Over Time



HST AND NEW HOUSING PRICES

As noted above, OHST follows GST in taxing the sale of newly built houses. The analysis just presented excludes housing replacement costs from the estimated impact of OHST on consumers' cost of living. There are several reasons for doing so, related to both conceptual issues in how housing prices affect consumers and to the way housing costs are measured in the CPI data:

- While most affected commodities first became subject to OHST on July 1, 2010, the tax on new homes was phased in gradually under the OHST transition rules. Some additional tax was payable when agreements to purchase were signed before June 18, 2009, or when construction was partially completed before July 1, 2010; and some RST paid on partially completed houses was rebated, to parallel the effects of the new input tax credits under the HST. Because there was therefore no sharp change in taxes on new homes in July 2010, it is not possible to compare June and July prices to estimate the effect of the tax.
- The new tax was small on average. The OHST housing rebate is equal to the lesser of six percent of the sale price or \$24,000, meaning that the tax rate was just 2.4 percent on new homes selling for \$425,000 (the median sale price for single detached homes in Ontario in fourth quarter 2010), and 3.4 percent for new homes selling at \$525,000 (the median price in the more expensive Toronto market).¹⁶
- The standard assumption that sales taxes are shifted forward to consumers may be less appropriate for housing than other commodities. In most competitive markets, average production costs are largely independent of demand, and profit margins are tight, so that new taxes are passed on to consumers. The supply of new houses is strongly affected by regulatory limits on development while a substantial component of house prices in urban areas is the value of land rather than building costs. For both these reasons, a new tax on housing is apt to reduce consumers' net-of-tax bid prices for new houses, so that the after-tax cost of new housing rises by less than the amount of tax.

¹⁶ The sale price figures are from Canada Mortgage and Housing Corporation (2011).

The implications for consumers of a tax on *new houses only* is in any case conceptually unclear. In a typical year, newly built houses are a small fraction of the total stock of housing, even in the growth areas of southern Ontario. Consequently, OHST actually collected today is a negligible fraction of the total value of Ontario's residential housing stock. But a tax on new houses also causes a rise in market prices for (untaxed) resale homes, as buyers increase their bid prices for comparable resale homes until they equal the tax-inclusive price in the new-house market. It follows that the impact of HST on housing costs is potentially much broader than suggested by the small share of houses that are actually taxed. But this impact represents a transfer from first-time buyers to existing homeowners at the time of the reform, rather than to the provincial treasury. It therefore seems preferable simply to exclude housing replacement cost altogether from the estimated effect of tax reform.¹⁷

In addition to these impacts on replacement cost, the analysis presented here excludes the cost of OHST on real estate and legal fees now associated with buying homes. In the very long run, once all homes have traded and been subject to the tax, the overall impact will be no higher than 0.1 percent of CPI. This calculation assumes that taxes are borne fully by the purchaser, rather than partially absorbed into lower fees for real estate transactions or lower selling prices for homes.

THE BOTTOM LINE(S): OHST IMPACTS AND THE INCOME DISTRIBUTION

Low-income families on average spend a higher proportion of total consumption on some of the newly taxed commodities, including home heating and tobacco products. Thus the OHST reform has the potential to be regressive. To show the impact of the price changes on real income distribution, Table 3 presents the estimated change in average expenditures resulting from the reform for various family types and income levels. The data on expenditure patterns are from the 2008 Survey of Household Spending. To estimate the change in expenditures, I multiply the price change for each affected category in December 2010 from Table 2 by the corresponding expenditure level for each household in the survey data, and then sum across categories. The first column of Table 3 shows the average impact on expenditures for quintiles of the distribution of total household income. The first panel is for the income distribution of all families, and the next two panels perform the same calculations separately for two-adult households and unattached individuals. The estimated change due to sales taxes alone is \$231 annually on average for families in the lowest 20 percent of the income distribution, increasing to \$461 in the middle quintile and \$726 in the richest quintile. As expected, the effect is slightly regressive: new taxes represent about one percent of consumption in the bottom quintile, but only 0.8 percent in the top quintile.¹⁸

¹⁷ Smart (2011) analyzes the interaction of resale and new build housing markets more formally and discusses the implications for the appropriate design of the VAT housing rebate.

¹⁸ These figures are somewhat higher than the estimated change in CPI because the expenditure shares in the data for affected commodities are somewhat higher than the corresponding weights in the CPI basket.

TABLE 3: OHST Reform and the Distribution of Real Income

I. All households					
Estimated average impact of:				Household average:	
Quintiles	Sales tax reform	Income tax measures	Net Impact	Total consumption	Family size
Lowest	231	606	-375	22571	1.6
2nd	367	357	10	36803	2.1
3rd	461	340	121	50105	2.7
4th	590	438	152	67898	3.2
Highest	726	517	208	93011	3.5
II. Two-adult households					
Estimated average impact of:				Household average:	
Quintiles	Sales tax reform	Income tax measures	Net Impact	Total consumption	Family size
Lowest	308	638	-330	33187	2.7
2nd	470	353	117	48406	3.1
3rd	516	457	58	60548	3.0
4th	588	524	64	72003	3.2
Highest	773	533	239	102528	3.5
III. Unattached individuals					
Estimated average impact of:				Household average:	
Quintiles	Sales tax reform	Income tax measures	Net Impact	Total consumption	Family size
Lowest	187	479	-292	15973	1
2nd	225	450	-225	21890	1
3rd	284	203	82	27507	1
4th	323	251	72	34836	1
Highest	445	297	148	47361	1

To judge the overall effects of the reform on income distribution the impact of the price changes should be measured together with that of compensatory income tax changes also introduced by the Ontario government. These are:

- **Refundable Tax Credits:** The previous credit for sales and property taxes has been restructured and enhanced. The new Ontario Sales Tax Credit (OSTC) is worth \$265 per person in 2011, reduced by four percent of family net income over \$25,450.¹⁹ The new Ontario Energy and Property Tax Credit (OEPTC) is up to \$916 per family (more for seniors), reduced by two percent of family net income over the thresholds. Arguably, these credits are part of a broader redistributive reform and not merely compensation for new sales taxes. I therefore count only the OSTC and the \$200 portion of the OEPTC that is earmarked for energy costs as part of the OHST reform.²⁰

¹⁹ The threshold is \$20,360 for single taxpayers.

²⁰ I also exclude the small Northern Ontario Energy Credit, since the SHS data do not allow me to identify eligible households, and the Ontario Clean Energy Benefit, which reduces residential energy bills beginning in January 2011, as well as the Children's Activity Tax Credit announced in 2010. These choices of which compensatory measures to associate with sales tax reform mean that my estimated impacts of the benefits to families are smaller than those reported by the Ontario Ministry of Finance.

- **Income Tax Rate Changes:** As part of the reform, the tax rate was reduced from 6.05 percent to 5.05 percent in the bottom income bracket, which applies generally to the portion of taxable incomes between \$9,104 and \$37,774 in 2011.²¹
- **Ontario Sales Tax Transition Benefit:** Announced as part of the reform were one-time payments totalling \$1,000 for families, reduced by five percent of net income over \$160,000.²² To convert these one-time payments to a stream of payments over time equivalent to the other tax measures, I multiply by a five percent discount rate.

The average value of these measures for each family type and income range is presented in the second column of Table 3. The value of compensation is largest in the lowest quintiles because of the means-testing of the refundable credits, but the value is increasing between the second-lowest to the highest quintiles because greater taxable income and a greater proportion of two-earner families at higher family income levels increase the value of the tax rate reduction.

On balance, the income tax measures offset most of the effects of sales tax reform for most Ontario families.²³ For the poorest 20 percent of households, the value of income tax benefits more than offsets new taxes paid and the net impact reported in the third column of Table 3 is a net gain of \$375 annually on average. In the middle quintile, corresponding to an average household consumption of about \$50,000, the net effect is a loss of \$121 per household (or \$44 per capita, or 0.24 percent of consumption). I emphasize again that this estimate is based on actual price changes in December 2010, and it does not include prospective cost savings from future passthrough of ITCs in the form of lower prices or higher wages in Ontario. While the dollar value of net loss is gradually increasing with income in most cases, the estimated losses due to sales and income tax reforms together are less than one-third of one percent of household consumption for all of the cases reported in the Table; they are generally much smaller than that.

CONCLUDING REMARKS

This paper has presented the first available evidence on the actual impact of the OHST reform on consumer prices and the welfare of families. By any standard, the estimated impacts are small. By comparing the evolution of consumer prices during 2010 in Ontario to those in Quebec, which did not reform its sales tax, I conclude that the impact of the base-broadening component of harmonization was to raise the cost of living about 0.9 percent in July. By December, when the new input tax credits available to Ontario businesses through HST should have exerted some effect on costs, and businesses had had time to adjust prices to absorb some portion of the tax changes, the estimated impact on the cost of living had fallen to 0.6 percent. These estimates are similar to those reported for BC's HST reform by Kesselman (2011). Together with compensatory changes in income taxes, the estimated impact of the reform on after-tax real incomes is extremely small, even before the full effects of input tax credits have been passed on to consumers and workers in Ontario.

²¹ The bottom of the range is twice as high for one-earner couples.

²² For singles, the transition benefit is \$300 and the threshold is \$80,000. Payments are being made in three installments during 2010 and 2011.

²³ At the same time, means-testing of the new credits has raised the marginal tax rate on earned income by five percentage points, net of the bottom bracket rate reduction, over a fairly broad range of incomes below the median.

It is sometimes surprising for economists conversant with the benefits of value-added taxation that such small changes in tax burdens attract so much attention and controversy among the news media and the public. One likely reason is that HST is in most cases added to bills at the cash register, rather than included in quoted prices. This makes even low rates of sales taxation highly politically salient, even compared to much higher rates of income taxation, since income tax is usually withheld at source and tax returns are filed only annually. Canada appears to be the only Organization for Economic Cooperation and Development (OECD) country with a value-added tax where the tax is usually added at the cash register rather than included in quoted prices (Millar, 2009). It is probably not a coincidence that Canada also had the lowest VAT rate among those countries prior to harmonization in Ontario and BC.²⁴ The extraordinary visibility of HST may have effects on tax incidence as well. In a recent study, Chetty, Looney and Kroft (2009) found that adding taxes at the cash register leads to “mistakes” by consumers that make them less sensitive to taxes in purchase decisions, which may in turn increase the extent to which taxes are shifted forward to consumers rather than borne by producers. Regardless of how it affects pricing, there is little question that many Canadians regard the separate calculation of HST on each transaction every day as an irritant. The estimates in this study may give a better sense of how small that irritant actually is.

²⁴ Japan’s rate is lower, but its VAT uses the subtraction method, making it a business tax rather than a transactional tax. Even after the 2010 harmonization, Canada has the second lowest rate among OECD countries with a VAT.

APPENDIX: ALTERNATIVE CONTROL STRATEGIES

In this paper, I have estimated the effect of sales tax harmonization on consumer prices by calculating the cumulative monthly change in average prices from June 2010 onward in the affected categories of CPI, minus the corresponding price changes in Quebec. Under the assumption that prices evolve in parallel fashion over time in the two provinces, this approach allows us to distinguish the effects of the reform from the factors that would have caused prices to change even if the reform had not occurred. But if the parallel trends assumption does not hold on average for Ontario and Quebec then, as noted earlier, these estimates may be biased. In this appendix, I briefly explore two alternative control strategies that produce slightly different estimates of the effects of the reform.

One potential concern relates to the month-to-month variation in prices due to seasonality in pricing of some commodities and to possibly divergent trends in general price inflation in the two provinces in 2010 due to macroeconomic conditions. Seasonal effects are especially strong for energy products, and for fresh foods, the latter of which is excluded from the analysis since its tax treatment did not change. If normal seasonal price variation in each category is the same in Ontario and Quebec, then the base case control strategy used in this paper successfully purges its effects from our estimates of the impact of the reform. But seasonal pricing patterns may differ between the two provinces in some cases. An alternative approach for dealing with seasonality is to compare the evolution of year-over-year inflation rates in the two provinces after the reform, instead of month-over-month inflation. This approach is equivalent to assuming that month-to-month inflation in 2009 represents normal effects of seasonality, while any divergence in the monthly pattern in late 2010 represents the effects of sales tax reform. In this case, maintaining such an assumption is difficult because inflation patterns in Ontario seemed to change for some categories beginning in November 2009, relative to Quebec – see Figure 1. Differencing out the effects of monthly patterns in 2009 would include those 2009 changes as part of the effect of the reform, whereas they more likely reflect differing patterns of post-recession economic recovery in the two provinces.

With that caveat, it is nevertheless interesting to examine the estimated effects based on changes in year-over-year inflation in place of monthly price variation. Table 4 presents these estimates in the middle two columns, together with the base case estimates of Table 2, which are reproduced in the leftmost columns for ease of comparison. The year-over-year estimates are slightly higher than the base case in aggregate: the effect of harmonization is 1.1 percent in the first month, and one percent in the sixth month. Closer examination shows that the most important differences are in the CPI categories for water, fuel and electricity and personal care services. By construction, these differences tell us that late 2009 inflation rates in these categories were higher in Quebec than Ontario, compared to what was observed in 2010.

Another concern is with the choice of June prices as the base from which subsequent inflation rates are measured. The general price level in both provinces dipped slightly in June 2010, but slightly more in Ontario than Quebec. Some of the subsequent price changes in the provinces might therefore reflect the reversion of prices to trend, rather than reform effects, and trend reversion might occur differently in the two provinces. To explore this possibility, the rightmost two columns of Table 4 report estimates that are based on cumulative inflation relative to the average price level in second quarter 2010, rather than to June alone. As Figure 1 indicates, Ontario's inflation rate in the second quarter was slightly higher overall

than Quebec's, so that differencing from the second quarter base necessarily increases the estimated effect of the reform, but the difference is small. The estimated aggregate impact in the first month is essentially unchanged at 0.9 percent, while in the sixth month, it is slightly higher at 0.7 percent.

TABLE 4: Sensitivity Analysis

Item	Base Case		Year-over-year Inflation		April-June Base Prices	
	Estimated Impact of Tax Reform in:					
	Jul	Dec	Jul	Dec	Jul	Dec
Home Maintenance	2.3	3.2	1.3	2.6	2.7	3.5
Water Fuel And Electricity	3.4	0.2	7.1	7.6	4.8	1.6
Communications	1.4	2.6	1.5	3.6	1.5	2.7
Household Furnishings	-0.6	-0.1	0.5	-1.2	-3.2	-2.7
Footwear	5.2	3.8	6.2	4.1	4.8	3.4
Clothing Services	3.6	2.3	3.7	3.2	3.9	2.5
Gasoline	7.3	3.9	8.0	3.3	7.1	3.8
Inter-City Transportation	2.4	2.3	2.4	3.3	2.7	2.6
Taxi	4.2	4.2	3.9	3.9	4.2	4.2
Personal Care Services	8.3	10.3	8.4	13.5	8.2	10.1
Travel Services	-2.0	-3.2	-1.6	-1.5	-2.9	-4.0
Recreational Services	4.5	4.4	4.7	4.5	4.6	4.5
Reading Material	0.7	-1.2	2.0	-5.4	0.4	-1.5
Served Alcoholic Beverages	2.8	3.0	2.7	3.4	2.6	2.8
Alcoholic Beverages From Stores	0.5	1.3	0.8	0.5	0.6	1.5
Tobacco Products	7.3	7.1	7.6	7.3	7.5	7.2
Weighted Average	0.9	0.6	1.1	1.0	0.9	0.7

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