Consumption Taxation
Tax Incidence

• Two different issues.

• Commodity Taxation
  • and Deadweight Loss
  • Why we cannot use lump-sum taxes
  • Comparison: income tax vs. consumption tax
  • BC Carbon Tax: Tax and Rebate Scheme
  • HST

• Tax Incidence
Introduction: Consumption taxes

• In Canada, the income tax is not the only form of taxation
  – An income tax is a tax on potential consumption
  – A consumption tax is a tax on actual consumption
• In Canada there are two basic consumption taxes, the federal Goods and Services Tax, and the provincial Retail Sales Taxes (RST or PST)
• Sales taxes can be per unit taxes (like gas taxes) or *ad valorem* taxes (like GST)
Excise Taxes and Customs Duties

- Customs duties were the original tax in Canada
  - In 1867, accounted for 75% of federal revenue
  - In 1999, accounted for 1.5% of federal revenue
- Excise taxes are a bigger share of federal revenues (~7%)
  - Gas, alcohol, tobacco, lottery profits
  - Often referred to as “sin” taxes
Excise Taxes Underline the Point that a Uniform Tax Rate May not be Optimal

• We’ll discuss the value of a consumption tax vs. an income tax; and (generally) assume a uniform consumption tax rate
  – But if we want to address externalities (pollution, second-hand smoke, violence or drunk-driving associated with alcohol consumption) we may want to tax some commodities at different rates
  – Excise taxes are a way of doing this (see discussion of BC Carbon Tax)

• Another reason a uniform tax rate may not be ideal, is that it’s not likely to be progressive
  – Equity is difficult to address if everyone pays the same GST/PST
Introduction

• Consumption taxes make up about 20% of federal revenues; most of the rest comes from income taxes.
• Consumption taxes make up about 27% of provincial own-source revenues.
• Why use consumption taxes rather than income taxes?
Advantages of a Consumption Tax

• Assume, for now, that by a consumption tax I mean a uniform sales tax (same rate on all goods)

• Ease of monitoring
  – With income-tax system, all income earners need to be monitored
  – With consumption tax system, just need to monitor retail businesses
Advantages of a Consumption Tax

• Consumption tax removes taxation of interest income present under income tax
  – Consumption is taxed same whether it occurs today or tomorrow (as opposed to with income tax)
  – This removes potential distortion of saving behaviour

• Removes need to measure capital gains and depreciation for tax purposes
Disadvantages of a Consumption Tax

• If all goods could be equally taxed, then the consumption tax would not distort relative prices
  – Hence it would cause no DWL
  – However, all goods can’t be taxed
    • Consider leisure. How would we tax leisure?
    • So long as we can’t feasibly tax all goods, then a consumption tax will distort relative prices ==> DWL
Disadvantages of a Consumption Tax

• Politically feasible versions of the tax may lack many of the efficiency gains
  – For example, should food be exempt? Drugs?
    • With exemptions come loopholes for people to exploit
  – To clear the political hurdles to enacting a full consumption tax, it might need to be written to introduce greater progressivity…this may involve efficiency tradeoffs
Evasion and the Consumption Tax

• High consumption taxes in one jurisdiction can lead to smuggling from low-tax jurisdictions
  – Canada tends to have higher cigarette taxes than states in the US, so smuggling from US to Canada occurs
  – Michigan has high cigarette taxes, so smugglers ship from Ohio to Michigan
  – At one point Michigan taxes got so high that smugglers were shipping from Ontario to Michigan (reversing the usual flow)!

• Canadian tourists can take advantage of comparatively low sales taxes in US; technically this is evasion (unless they pay Canadian sales taxes)
Equity and the Consumption Tax

• Is a consumption tax regressive?
  – Looking at it on a year-to-year basis, it looks regressive (people tend to consume less as a fraction of yearly income in high-income years than in low-income years)
  – So in a given year poor would pay a higher fraction of income in taxes than rich
  – But (assuming no bequests) everyone consumes all of their income over their lifetime
    • So from a life-time perspective, a pure consumption tax is proportional (i.e. neither progressive nor regressive)
    • If people have bequests that aren’t taxed, then the consumption tax is regressive
Equity and the Consumption Tax

• In fact, Canada does a couple of things to impose some progressivity on the GST/PST (Canada’s consumption tax)
  – Exemptions for food, medications, children’s clothing (a larger fraction of poor people’s budgets than rich)
  – Preferential treatment for dental services and daycare
  – A refundable GST credit (for low-income people)
    • Check out CRA website to see if you qualify
Personal Consumption Tax and Progressivity

• Rather than taxing consumption at the same rate for everybody as we do in Canada (GST), some have proposed a personal consumption tax
  – Each person reports their personal consumption each year (rather than their income, as with an income tax)
  – Taxes are paid according to each person’s consumption
  – System allows for progressivity
    • People can pay different tax rates according to ability to pay
    • Extraordinary circumstances (high medical bills, etc.) could be taken into account
Personal Consumption Tax

• So it’s possible to have a consumption tax that is progressive

• Note that a system of retirement saving into RRSPs and RSPs (income-tax exempt) is similar to a personal consumption tax system
  – People saving into RRSPs for retirement don’t pay taxes on that money now
  – They pay taxes on it, according to a progressive tax schedule when they withdraw the money in retirement (essentially when they use it for consumption)
Personal Consumption Tax

• Disadvantages
  – This form of consumption tax requires lots of recordkeeping by consumers; potentially involves more costly monitoring
  – Transition costs
  – Questions about treatment of bequests
Conclusions on DWL

– Just because taxes cause DWL doesn’t mean they shouldn’t be used
  • A distortionary tax can be justified if it funds a public good such that the welfare gains from the public good provision outweigh the welfare losses from the tax
  • Policymakers should consider these costs carefully, and try to pick a tax that causes the least harm
– Note that subsidies also distort prices=>SE So subsidies will also cause DWL.
– Finally, our claim that taxes cause distortions that lower social welfare must be qualified.
  • If we take a world with no pre-existing distortions and impose a tax, it will generally reduce welfare (unless it is lump-sum)
  • But in the real world there are lots of pre-existing distortions…so taxes can actually increase welfare in some cases. This is called “Theory of the Second Best.”
GST, PST, and HST

• Will discuss how they work
• Distinction between sales tax (PST) and value-added taxes (GST, HST)
• Invoice-credit method
A Value Added Tax (VAT)

• A VAT is a percentage tax on value added applied at each stage of production
  – Suppose you pay $1000 for inputs (materials, etc.) and use your labour to turn them into $1200 in sales
  – Your value added would be $200
  – With a 10% VAT you would pay $20 in taxes on that production

• The system is useful from an enforcibility perspective: each producer reports what she pays for things, and each reports what she sells things for
  – So can check sales records of one producer against purchase records of another--difficult to lie about sales or purchases!
Example of a VAT

- (from text)

<table>
<thead>
<tr>
<th>Producer</th>
<th>Purchases</th>
<th>Sales</th>
<th>Value Added</th>
<th>VAT at 10 Percent Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer</td>
<td>$0</td>
<td>$400</td>
<td>$400</td>
<td>$40</td>
</tr>
<tr>
<td>Miller</td>
<td>400</td>
<td>700</td>
<td>300</td>
<td>30</td>
</tr>
<tr>
<td>Baker</td>
<td>700</td>
<td>950</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td>Grocer</td>
<td>950</td>
<td>1,000</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>$2,050</td>
<td>$3,050</td>
<td>$1,000</td>
<td>$100</td>
</tr>
</tbody>
</table>
VAT

• The federal GST (Goods and Services Tax) is a VAT (collected at each stage of the production process)
  – The invoice-credit method of collection adds paperwork but reduces opportunities for fraud.
  – Consumers pay the tax at the end; this is then refunded to producers (so it’s only paid once)

• The PST is only collected at the end of the process (upon final sale to consumers)
  – PST leads to inputs being taxed multiple times which doesn’t happen under VAT.
BC’s Harmonized Sales Tax

• In July 2009, Campbell govt announced move to a harmonized sales tax.
  – Instead of separate 5% GST and 7% PST, province will “harmonize” these into a 12% HST
  – Highly controversial, because many items currently exempted under PST would be subject to the HST (the tax base is being broadened)
Arguments for HST

• GST is a VAT
• PST is not
  – Tax “cascading” results from PST
  – Instead of just taxing value added, inputs are taxed in full at each stage of production
  – Recall VAT bread example (~9 slides back)
  – PST of 10% would have net $305 in taxes, as opposed to the $100 raised by VAT
  – Wheat gets taxed 4 times before it’s eaten
  – Bread gets taxed more than flour
Arguments for HST

- Capital goods are taxed under PST; HST would remove this tax
  - Many argue this would encourage business investment.
  - Raise competitiveness of BC (in terms of attracting business) relative to other provinces.
  - Reduce administrative costs of paying taxes (because only one tax would be paid, as opposed to 2 (different) taxes currently).
Arguments against HST

• Many people see the tax as unfair
  – It raises statutory rate on things that were previously exempt (e.g. houses, helmets, restaurant meals, cable TV)
  – It is seen as a tax cut for business
    • BC estimates it will reduce business costs by $2 billion
    • Note that this doesn’t mean business will pocket $2 billion. Some of those cost savings will be passed onto consumers
Recall Statutory versus Economic Incidence

• A tax on business is (generally) born by both business and consumers
  – Therefore a tax cut for business is (generally) born by both business and consumers.
  – While it’s true some prices will rise (e.g. restaurant meals, contractor services), protestors tend to ignore that others will fall.
Efforts to Ease Transition

• Federal government paying $1.6 billion in transition funds to province
• BC will pass that on to taxpayers; Ontario is adding to the Federal transition funds (so less fervent opposition there)
  – BC offering $230 per family member for HH’s with income<$20,000
  – Ontario is offering bigger rebates and more low-income rebates
HST Exemptions

• Ontario: books, children’s clothing and footwear, diapers, car seats, booster seats, feminine hygiene products, food and beverages sold for a total of under $4 ("Tim Horton tax break")

• BC: same as Ont except last item; motor fuel exempted instead (seems counter to carbon tax policy).
  – New homes up to $525,000 will receive full HST rebate in BC.
CD Howe Study

- Favours shift to HST
- Argues 1997 reforms in Atlantic Canada actually slightly lowered consumer prices
- Argues reform in BC/Ontario will lead to minimal change in consumer prices, but increases in capital stock.
- Most economists think HST is a less distortionary tax.
BC Liberals handled this badly

• Surprise announcement after election-year promises to contrary
• Didn’t made policy revenue neutral (so people perceive it as tax increase)
  – Could have made it revenue neutral
  – Could have made argument that a less distortionary tax that generates same revenue must lead to higher overall welfare.
BC Carbon Tax

- Speaking of “theory of the second best”, the BC Carbon Tax represents an interesting application of this theory.
- Tax consumption of products that produce negative externality
- Use revenues to decrease provincial income tax (a distortionary tax).
- So two sources of inefficiency are taken on simultaneously.
Carbon Tax

- Beginning July 1, 2008, British Columbia began phasing in a carbon tax on all fossil fuels including gasoline, diesel, natural gas, coal, propane and home heating fuel.
- The rate starts at $10 per tonne of carbon-equivalent emissions and rose to $30 per tonne by 2012.
- As of July 2008, there was a 2.41-cent tax per litre in gasoline. By 2012, it was 7.2 cents per litre.
- For diesel and home heating oil, it was 2.2 cents per litre in 2008, rising to 8.27 cents by 2012.
Carbon Tax

- The tax will generate about $1.85-billion over three years.
- Two thirds of the money raised in the first year will come from business.
- The tax is to be revenue neutral and none of the money raised through the carbon tax will go toward program spending.
- Legislation will require a plan to be tabled in the legislature each year showing how the carbon-tax revenue will be returned to businesses and individuals.
Tax Cuts due to Carbon Tax

• Each adult and child in British Columbia will get a $100 rebate — a so-called Climate Action Dividend — in June aimed at helping people adopt greener lifestyles.

• Lower-income British Columbians will be eligible for a $100 payment per adult and a $30 payment per child as part of a Climate Action Credit. The money will be paid quarterly.

• The bottom two personal income tax rates will be reduced for all British Columbians, resulting in a tax cut of 2 per cent in 2008 and 5 per cent in 2009 on the first $70,000 in earnings.
Tax Cuts due to Carbon Tax

• Effective July 1, 2008, the general corporate income tax rate will be reduced to 11 per cent from 12 per cent. By 2011, it will be reduced to 10 per cent.

• Effective July 1, 2008, the small business tax rate will be reduced to 3.5 per cent from 4.5 per cent, with further reductions planned to 2.5 per cent by 2011.
Analyzing a Revenue Neutral Tax and Rebate Scheme

• In order to analyze the distributional impact of BC’s Carbon tax, we’ll look at a benchmark case.
• Assume consumer doesn’t care about CO₂ emissions …otherwise there wouldn’t be the need for the tax.
• Consider two-good model with gas on the x-axis and all other goods on y-axis.
• Assume rebate is in the form of a lump-sum transfer.
• Government revenue from tax on gas is equal to government expenditure on rebates…so tax is revenue neutral.
Is this program leaving consumer as well off as she would be w/o the program?

• Note that this is a different question from what we asked before in which we imposed taxes without making transfer payments at the same time. Using EV will not give us the answer to our question.

• We are interested how big the rebate would have to be in order to make the consumer with the Carbon tax as well off as without the Carbon tax.
Compensating Variation

- Compensating Variation is one way of measuring the change in utility in terms of a change in relative prices.
- It is the change in money income which makes the consumer just as well off after the price change as she was before.
- This means starting with the utility level if consumer only faces Carbon tax but does not receive rebate, you then go back to the original indifference curve using the new prices to find out how big a welfare neutral rebate would have to be.
Finding welfare neutral rebate

Original budget line: red & solid

Budget line with Carbon tax: green and dashed

Assume price of “other goods” is equal to 1.

Utility w/o Carbon tax

Price of gas increases due to Carbon tax
Finding welfare neutral rebate

CV = rebate to keep consumer as well off as before

Need to reach original utility level with new price ratio: parallel shift green dashed line until you reach original utility level
Is CV equal to revenue neutral rebate?

- Revenue neutral rebate is equal to government revenue from Carbon tax.
- Let $g'$ be optimal choice of gas given Carbon tax and revenue neutral rebate.
- Then revenue = rebate is equal to $R = t \cdot g'$
Is CV equal to revenue neutral rebate?

- Consumer’s original budget constraint is equal to $y + p_g g = M$, where $M$ is fixed income.
- Consumer’s new budget constraint with tax and revenue neutral rebate scheme is equal to $y + (p_g + t)g = M + R$, where $R$ is rev. neutral rebate.
- Slope of new budget constraint is steeper than the slope of the original budget constraint: $(p_g + t)$ vs. $p_g$.
- Optimal choice with tax and revenue neutral rebate scheme of $g'$ and $y'$ must be on new budget constraint, so $y' + (p_g + t)g' = M + R$.
- Note that this bundle is also feasible on original budget constraint, because $y' + (p_g + t)g' = M + R$ can be written as $y' + p_g * g' + t * g' = M + t * g'$ which in turn is equivalent to $y' + p_g * g' = M$. 
Is CV equal to revenue neutral rebate?

• This means the new budget constraint with the Carbon tax and the revenue neutral rebate intersects with the original budget constraint and the optimal consumption bundle with the Carbon tax and the revenue neutral rebate is found where the two budget constraints intersect.

• Because the consumer is always utility maximizing, at this point we must also have an indifference curve that is tangent to the new budget constraint.
Optimal Choice with R

Budget constraint with Carbon tax and revenue neutral rebate: solid green line

Utility with Carbon tax and revenue neutral rebate
Revenue neutral rebate is not welfare neutral

Budget constraint with Carbon tax and revenue neutral rebate: solid green line

So the revenue neutral rebate is smaller than the welfare neutral rebate: Consumer is worse off with Carbon tax and revenue neutral rebate than w/o the program

Utility w/o Carbon tax
“DWL” of Tax and Rebate Scheme

- Without considering externality DWL is equal to CV-R.
- But Carbon Tax corrects for externality, we don’t really reduce social welfare by CV-R. Future generations’ external cost is reduced and this benefit needs to be weighed against the welfare loss of current consumers.
- But in terms of distributional impact on our consumer, CV-R gives us a good idea by how much worse off this person will be.
Distributional Impact of BC Carbon Tax

- Current consumers will be worse off, future generations better off.
- Do low-income people suffer more?
- If the rebate is disproportionately targeted towards low-income families, the BC Carbon Tax may have a welfare neutral impact on them, while reducing the welfare of the middle and high-income families.
- Without the rebate, this tax would be regressive, because low-income families spend a higher proportion of their income on gas.
BC Carbon Tax

• In conclusion, the BC Carbon Tax achieves a decrease in CO$_2$ emissions and through disproportionately redistributing tax revenues to low-income families avoids being a regressive tax.