Ramsey taxation and the (non?)optimality of uniform commodity taxation

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Introduction (I/II)

In this presentation we consider the classic Ramsey taxation problem of maximising social welfare subject to a revenue requirement and derive three key results:

1. **The Ramsey Rule** - The marginal DWL per dollar of collected revenue must be the same for all tax instruments

2. **The Inverse Elasticity Rule** – Tax goods inversely to their own-price elasticity of demand

3. **The Uniform Commodity Taxation Theorem** – Tax all consumption goods at a common level
We also ask whether the optimal commodity taxation policy is uniformity across all goods?

- A vast literature has emerged since the seminal work of Ramsey (1927) that has argued for differentiated tax levels on different commodities in order to minimise excess burden.

- However, under certain assumptions on preferences there is also another body of literature that has emerged since the theorems of Atkinson and Stiglitz (1976) and Deaton (1979) that argues for exactly the opposite.

- We find that the theoretical underpinnings of the uniform taxation theorems are unlikely to be true in reality meaning that a degree of differentiation in commodity tax rates is optimal. In particular, taxing leisure substitutes at a lower level than leisure complements.

- However, implementing tax differentiation (a’la Ramsey) has a high informational cost and for this reason policy makers have tended to be in favour of more uniform commodity tax regime.
The Ramsey Model – how do we tax commodities?

Due to market failure there are a number of reasons why we may want to introduce taxes:

- To satisfy a revenue requirement for financing public goods (market failure of provision)
- To redistribute from rich to poor (equity argument)
- To correct for externalities and internalities (non-internalised impacts due to individual decisions)

- With perfect information an optimal policy would be to tax all consumption goods and leisure uniformly – effectively a flat tax on income which does not change decisions “at the margin”. Problem – government cannot observe the value of leisure and tax it, so recovering any revenue necessarily requires distortion

- Ramsey (1927) and subsequent work has how we minimise excess burden (maximise social welfare) by introducing taxes on commodities subject to a revenue requirement constraint.
Is it plausible that uniform commodity taxes are optimal?

• Both the Ramsey Rule and Inverse Elasticity Rule suggest we should differentiate commodity tax rates, with Ramsey commenting that:

“The obvious solution that there should be no differentiation [in commodity taxation] is erroneous” (Ramsey, 1927)

• However, the uniform commodity taxation theorem (Deaton 1979 here) says precisely the opposite:

“The intuition for this result is clear: when all commodities are equally substitutable for leisure, there is no second-best efficiency case for distorting the choice between them in order to offset the labour-leisure distortion”. (Sørensen, 2007)
The implausibility of the assumptions of the uniform taxation theorem

Homotheticity:

• Strict homotheticity may be a problem over the whole class of goods as this implies common income elasticities of demand of 1 – in reality we have luxuries, necessities and inferior goods, and even though Deaton (1979) extends his result and shows that if “subgroups” of goods display such behaviour should be taxed uniformly at the optimum it is unlikely that such goods would account for the majority in an economy.

Equal complementarity to leisure:

• Analysis conducted Crawford et al as part of the Mirrlees Review (2011) noted that it is unlikely that ALL consumption goods are equally complementary to leisure (for example, consumption of certain goods goes hand-in-hand with working, such as child care) and other services are actually complete substitutes for leisure (such as cleaning, car repair etc). Given this there is a case for certain commodities to be taxed at differential levels.

• These together suggest a commodity tax regime with a degree of differentiation is likely to be optimal.
The advantages of differentiated taxation

• In addition to taking account of the different levels of complementarity/substitutability between different goods and leisure, differentiated tax rates provide a useful policy instrument for government for other means:

• **Equity** – a uniform commodity tax rate is regressive and will have a greater proportional impact on poorer consumers than the rich. This provides a rationale for differentiated tax rates, with “necessities” being taxed less – something we see is common with most commodity tax system (e.g. in the UK exempts certain categories of food are exempt from VAT)

• **Ex(in)ternalities** – as we have discussed previously there are compelling arguments to tax some goods at a higher rate to deter/promote their consumption (paternalism), although it is questionable whether this results in desired behaviour
So why do we see almost uniform tax rates across the majority of countries Mankiw et al (2009)?

• **The optimal taxation literature has often been criticised for being practical inoperable**

• To execute an optimal differentiated tax regime by one of the rules we derived above we would need perfect information on economic fundamentals such as the price elasticity of demand for each good, or failing that the degree of substitutability/complementarity between it and leisure. However in practise, governments do not have the information needed to determine the optimal tax rates on specific goods and services.

• Therefore, most practitioners argue in favour of an almost uniform level of commodity tax, supplemented by a range of Pigovian taxes to correct for obvious ex(in)ternalities

• More recent work such as Kleven (2004) and Sørensen (2007) suggests that alternative models including household production and time investment to consumer goods yield commodity optimal tax formulae based on more readily available metrics such as production factor shares.
References


Any questions?