VAT policy and the case for uniformity: empirical evidence from Mexico

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Motivation

- Value added taxes (VAT) are an important (and increasing) source of revenue in developed and developing countries.
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- Lively academic and policy debate about the appropriate VAT rate structure, for equity, efficiency and administrative reasons.
  - One efficiency reason not discussed much is the differential opportunities for tax evasion and home production across commodities.
  - Developing countries context (limited tax capacity) changes key results in optimal tax theory [Best et al 2014, Gadenne 2014]
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  - Broad VAT exemptions, zero-rating of food and other commodities and significant evasion means a low VAT revenue ratio (circa 30%)
  - Need to increase tax take further: non-oil tax revenues ~10%, among lowest in OECD
  - VAT only accounts for 20% of revenues - although all commodity taxes account for 55%
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  - 2010:
    - Proposed: Introduce a uniform 2% rate to all commodities (CCP) to finance poverty alleviation programmes (including cash transfers such as Oportunidades) - considered regressive
    - Approved: Increase headline rate from 15% to 16%, keep non-uniform structure - considered to make the reform less regressive
  - 2014:
    - Approved: Increase VAT base by removing some few exemptions/zero-rates to certain commodities (chewing gum, international transport services, pet food); remove border rate differentiation
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  - Use a standard QUAIDS demand system built-in in MEXTAX
  - Quantify efficiency gains of introducing a revenue-neutral VAT uniform system
  - Discuss qualitatively assumptions underlying standard QUAIDS model: in particular, formal/Informal consumption in certain sectors could affect the optimal VAT structure
Assessing the distributional effects of the 2010 reforms

- MEXTAX - static household model
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- Data
  - ENIGH 2008 (household income and expenditure)
  - Informal/underground transactions: observe over 10 types of vendors
    - Informal if: 1 Street market; 2 Mobile Stall; 3 Hawker
  - Assume incidence of tax is on purchases from formal vendors
    - Does not capture tax evasion by formal vendors, underestimates tax evasion
Gains from the replacement of the CCP (2% uniform tax on all commodities) with a increase in VAT rate

Income Decile Group

- Lowest Income
- Income Decile 2
- Income Decile 3
- Income Decile 4
- Income Decile 5
- Income Decile 6
- Income Decile 7
- Income Decile 8
- Income Decile 9
- Highest Income

Gains from the amendment to proposed reform

- % of expenditure (left axis)
- Cash terms (right axis)
Absolute cash gains from alternative ways of spending the revenue foregone due to the 2010 amendments
Efficiency implications of Mexico’s VAT structure

- Two broad arguments for the efficiency of broader/more uniform rates of VAT

- Administrative and enforcement efficiency

- Economic efficiency - under a set of assumptions, a uniform rate of VAT minimizes efficiency of revenue raising

- Weak separability of leisure and consumption

- [Corlett and Hague 1953, Atkinson and Stiglitz 1976]

- Equal substitutability with non-taxed forms of procurement such as home production and informal transactions across commodities


- Tastes being uncorrelated with underlying earnings capabilities

- [Saez 2002]

- Unlikely to completely hold, but the idea that non-uniform VAT rates are distortionary is well established

- Informal policy proposals in developed [Mirrlees et al 2011] and developing [Ebrill et al 2001] countries
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  - 12 categories - comprises all commodities and grouped according to functionality and tax treatment.
  - Behavioural response comes from substitution between these categories
  - Assume no within-category substitution if relative prices within the category change - consistent with how prices changes are modelled in static (non-behavioural) version of MEXTAX
Price variation and elasticities

- Use geographic and time variation in prices at the city/region-month level (Bank of Mexico)
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- Elasticities of substitution and income elasticities make sense:
  - Food on which VAT is not levied (e.g. tortilla) is most inelastic and a necessity
  - Food & drinks & meals out on which VAT is levied (coke can) is more elastic and a luxury
Effect of VAT rate structure on expenditure patterns

<table>
<thead>
<tr>
<th>Expenditure category</th>
<th>Share of good in total expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008 VAT rate structure</td>
</tr>
<tr>
<td>1) Food on which no VAT is levied</td>
<td>26.9%</td>
</tr>
<tr>
<td>2) Food on which VAT is levied and meals out</td>
<td>12.9%</td>
</tr>
<tr>
<td>3) Alcoholic Drinks and Tobacco (VAT and duties levied)</td>
<td>0.6%</td>
</tr>
<tr>
<td>4) Clothing and footwear (VAT levied)</td>
<td>7.2%</td>
</tr>
<tr>
<td>5) Household goods, services and communications (VAT levied, duties sometimes levied)</td>
<td>21.6%</td>
</tr>
<tr>
<td>6) Household goods, services and communications (no VAT levied)</td>
<td>1.6%</td>
</tr>
<tr>
<td>7) Transport and vehicle fuels (VAT levied, duties sometimes levied but not modelled)</td>
<td>7.3%</td>
</tr>
<tr>
<td>8) Public Transport and other transport on which no VAT levied</td>
<td>6.3%</td>
</tr>
<tr>
<td>9) Health and Education goods (no VAT levied)</td>
<td>3.2%</td>
</tr>
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<td>10) Health and personal goods and services (VAT levied)</td>
<td>7.6%</td>
</tr>
<tr>
<td>11) Leisure and hotel services (VAT sometimes levied)</td>
<td>4.1%</td>
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<tr>
<td>12) Other services</td>
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Notes: Reported shares are shares of aggregate household expenditure.
Source: ENIGH 2008 and authors’ calculations using Bank of Mexico price indices and MEXTAX
Gains/losses across the income distribution under a revenue neutral uniform VAT [use compesating variation]
Informality/tax evasion and optimal VAT rate structure

- Assume weak separability between leisure and consumption

- Focus on commodities procured from the informal market on which tax is not paid

- If substitutability between formal and informal varies across commodities (e.g. due to technology)

- Argument to tax less heavily those commodities for which taxable expenditure is more elastic wrt to VAT rate

Relevant for Mexico - there is variation in share of 'informal' expenditure in monetary expenditure across commodities

E.g. higher in food (20%) and clothing (24%)
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- Raise 1bn in VAT revenues, but now 10% on food formal and 20% on telecoms

  - 10% VAT on food formal increases tax base and now 5bn formal and 2.5 informal food
  - effective tax rate on taxable expenditure is smaller at 13%
Summary of results...

• Distributional results

  • Amendments to 2010 reforms made reforms more progressive as share of income or expenditure; but not in absolute terms (cash terms).
  • Amendments weakly targeted to poorer households: simpler universal cash transfers or expanding existing instruments would have been more progressive than amendments

• Efficiency results

  • Under standard assumptions: deviation from uniformity have a notable effect on spending patterns but very small effect on aggregate welfare (0.1% of total expenditure)
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Conclusions

- Turning arguments for VAT rate structure on their head

Zero-rates to foods is often supported on distributional grounds in the case of Mexico raise more revenue from VAT by broadening tax base and redistribute using better instruments. Though lower rates to food may be supported by efficiency considerations (higher relative substitution between formal/informal), judgements of the case for uniformity will be country-specific. Proper evaluation requires considering assumptions underlying theory: reflect economic structure and tax instruments availability, empirical analysis of household behaviour and tax reform, and how policy is formed and taxation administered.
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- Model evasion and revisit efficiency implications of VAT rate structure
  - Adapt model by Kleven et al (2000) to include formal/informal procurement
  - Estimate elasticity of substitution between the formal and informal goods
    - need variation in formal/informal prices exogenous
    - if this not possible, then improve assumptions of incidence of change in taxes on informal prices, assuming pass-through to informal sector is between \([0; 1]\)