

# Commodity taxation and the case for uniformity: empirical evidence from Mexico

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PEUK Conference, 3/4 September 2015

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  - But many countries operate reduced and zero rates for basic goods as form of redistribution (e.g. Mexico, UK)
  - And economic theory provides a number of efficiency reasons for differentiated VAT rates
  - One that has attracted relatively little attention is VAT evasion (e.g. informal economy) which differs across commodities
    - Of particular relevance in developing countries

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  - Need to increase tax take further: Non-oil revenues 14% of GDP, among lowest in OECD
  - VAT only accounts for 20% of revenues, low by regional standards - base broaden, or raise rate?
    - 2010 proposed (base broaden, *CCP*) and approved reforms (raise rate, 15% to 16%, maintain structure)

# This Presentation

- Analyses the merits of using VAT rate differentiation for redistribution in contexts such as Mexico
  - Compare an increase in VAT standard non-uniform rate vs. alternative introduction of additional 2% commodity tax on all goods complemented with more targeted cash transfers

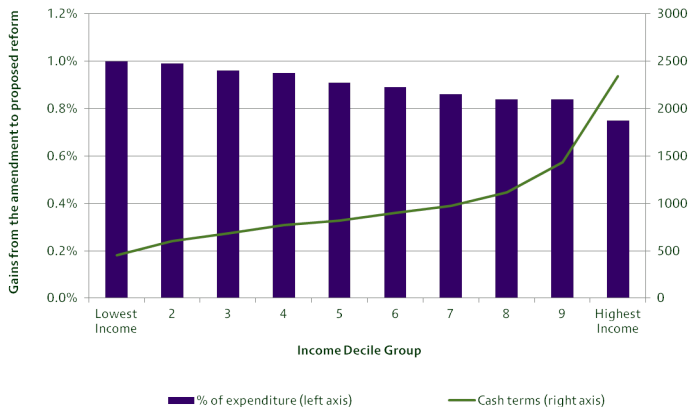
# This Presentation

- Analyses the merits of using VAT rate differentiation for redistribution in contexts such as Mexico
  - Compare an increase in VAT standard non-uniform rate vs. alternative introduction of additional 2% commodity tax on all goods complemented with more targeted cash transfers
- Looks at efficiency implications of VAT non-uniform structure, in the context of informality
  - Using QUAIDs model, estimate efficiency gain from revenue-neutral uniform VAT system
  - Discuss how differential VAT evasion may affect validity of results and optimal VAT rate structure
  - Discuss next steps to model VAT evasion decisions and estimate parameters to inform tax design

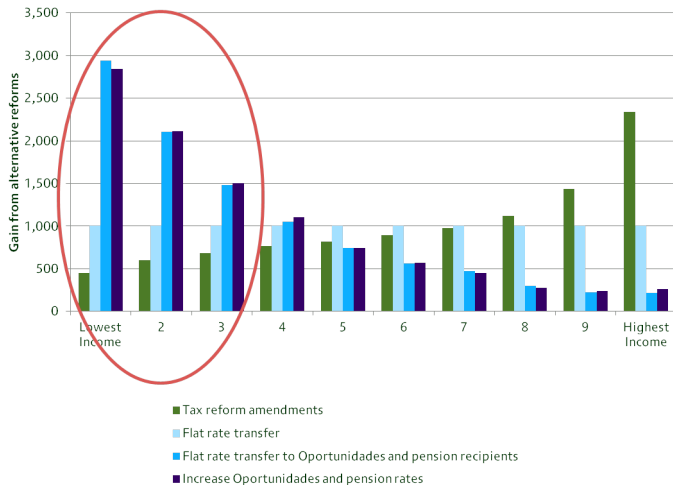
# Merits of using VAT rate differentiation for redistribution?

- MEXTAX - household microsimulation model
  - Simulates distributional, revenue and some behavioural effect of *income tax, indirect taxes, soc. sec. contribs. & cash transfers*
  - Data: ENIGH 2008 (income and expenditure hh survey)
    - Informal expenditure defined using type of vendor (1 Street market; 2 Mobile Stall; 3 Hawker)
  - Assume full incidence of indirect taxes on purchase price of formal sector goods only
    - No tax evasion by formal vendors; no spillover effects on informal prices (segmented markets)

# Gains from replacing the CCP (uniform 2%) with a VAT increase



# Cash gains from alternative ways of spending the revenue foregone from replacing the CCP with a VAT increase



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  - Economically efficient to redistribute via direct tax/transfers - avoids distortions to consumption, provided that:
    - leisure and consumption weakly separable [e.g. Atkinson and Stiglitz 1976]
    - tastes are uncorrelated with underlying earnings capabilities [e.g Saez 2002]
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    - taxed purchases of all commodities equally substitutable with non-taxed procurement [e.g Kleven et al 2000]
- Although unlikely to fully hold in practise, uniformity still recommended [e.g. Mirrlees Review (developed countries), Ebrill et al (2001) (developing countries)]

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    - Do not observe separate prices for formal and informal sector prices
  - Imposes other 'standard' demand assumptions (weak separability, uncorrelated tastes, etc.), which together imply uniformity is economically efficient

# Overview of QUAIDS model

- Integrable quadratic logarithmic expenditure share equation system (goods  $i=1\dots n$ )

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{x}{a(p)}\right) + \frac{\lambda_i}{b(p)} \left(\ln\left(\frac{x}{a(p)}\right)\right)^2$$

- Demographics enter as taste-shifters as part of  $\alpha_i$  so that

$$\alpha_i = \alpha_0 + \sum_{k=1}^K \alpha_{ik} z_k$$

$$\ln a(p) = \alpha_0 + \sum_i \left\{ \alpha_i + \sum_{k=1}^K \alpha_{ik} z_k \right\} \ln(p_i) + \frac{1}{2} \sum_i \sum_j \gamma_{ij} \ln(p_i) \ln(p_j)$$

$$b(p) = \prod_{i=1}^n p_i^{\beta_i}$$

$$\ln \lambda(p) = \sum_{i=1}^n \lambda_i \ln(p_i)$$

- Adding-up, homogeneity, symmetry are imposed, non-negativity is tested

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- Use a 2-step procedure, where first  $a(p)$  and  $b(p)$  are approximated, then it iterates 12 times.
- Price and income elasticities make sense:
  - Food on which VAT is not levied (most foodstuffs) is most inelastic and a necessity
  - Food & drinks on which VAT is levied (e.g. soda, luxury foods) & meals out are more elastic and luxuries

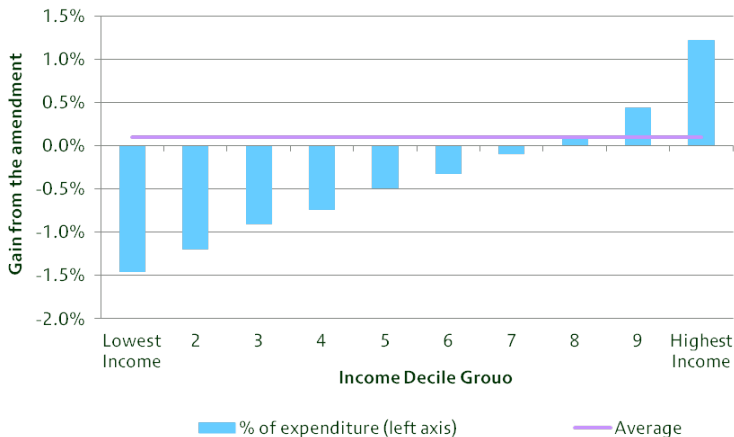
# Quantify efficiency gain from moving to a uniform revenue-neutral VAT

Expenditure category	Share of good in total expenditure	
	2008 VAT rate structure	Uniform 7.86% VAT rate
1) Food on which no VAT is levied	26.9%	28.3%
2) Food on which VAT is levied and meals out	12.9%	12.7%
3) Alcoholic Drinks and Tobacco (VAT and duties levied)	0.6%	0.5%
4) Clothing and footwear (VAT levied)	7.2%	7.0%
5) Household goods, services and communications (VAT levied, duties sometimes levied)	21.6%	21.4%
6) Household goods, services and communications (no VAT levied)	1.6%	1.6%
7) Transport and vehicle fuels (VAT levied, duties sometimes levied but not modelled)	7.3%	7.1%
8) Public Transport and other transport on which no VAT levied	6.3%	6.2%
9) Health and Education goods (no VAT levied)	3.2%	3.2%
10) Health and personal goods and services (VAT levied)	7.6%	7.4%
11) Leisure and hotel services (VAT sometimes levied)	4.1%	4.0%
12) Other services	0.6%	0.6%

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 rev neutral uniform VAT



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- Focus on the implications of the ability to purchase from informal markets and evade taxes (work in progress)
  - Substitutability between formal and informal markets may vary across goods
  - If so, tax more (less) substitutable at lower (higher) rates, as distorts taxable spending less, allowing lower average tax rate

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  - If so, tax more (less) substitutable at lower (higher) rates, as distorts taxable spending less, allowing lower average tax rate
- Significant variation in share of informal monetary expenditure across goods in Mexico
  - E.g. food (20%) and clothing (24%) much higher than other goods



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- Revenue requirement: £1bn, which is raised at a uniform 20% rate on all formal expenditure
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  - £4bn formal food, £2bn formal telecoms, with £4bn informal food untaxed
- Suppose now reduce rate to 10% on food, and raise it to 25% on telecoms
  - Substitution means now purchase £6.6bn formal food, £2 bn telecoms, £1.4 bn informal food
  - Raises £1bn, at an average tax rate of ~13.2% on **taxed goods**

# Summary of results

- Distributional results
  - Amendments to 2010 reforms were relatively progressive (% of expenditure); but not absolutely (cash terms).
  - Poorly targeted at poorer households: universal cash transfers or expanding existing instruments much more progressive

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- Distributional results
  - Amendments to 2010 reforms were relatively progressive (% of expenditure); but not absolutely (cash terms).
  - Poorly targeted at poorer households: universal cash transfers or expanding existing instruments much more progressive
- Efficiency results
  - Under standard assumptions: deviation from uniformity only a very small effect on aggregate welfare (0.1% of total expenditure)
  - Differential propensity to tax evasion over goods would mean uniformity not optimal

# Conclusions

- Zero-rates for food difficult to support from a distributional perspective in Mexico
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  - Revenue raised from a broader VAT could be used, in part, for better targeted redistribution
- However, applying lower rates to food may be supported by efficiency considerations if more prone to informality/VAT evasion
  - Levels of informality suggest this may be the case
- Turns usual policy arguments (IMF, World Bank) on their head



# Next steps

- Model evasion as a consumer choice over 'formal' and 'informal' goods
  - Simulate impact using assumed elasticities of substitution
  - Estimate impact by estimating elasticity of substitution between the formal and informal goods for different commodities

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  - Two main empirical challenges:
    - Exogenous variation in formal/informal prices
    - Defining informal expenditure - only a rough proxy in data

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  - Coca-cola: -0.38
  - Tortilla: 0.003
- Variation in unit values can reflect quality as well as price
  - Approaches to deal with this (Deaton (1990), Crawford et al (2003)) are restrictive
  - Assume income-quality link, and quality-price link constant across localities

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- Estimate model in other countries where more plausible variation due to tax variation
  - e.g. Brazil or India