

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

L. Abramovsky and D. Phillips

IFS Seminar “Fiscal redistribution in developing countries”, July 10 2015

# Motivation

- Value added taxes (VAT) are an important (and increasing) source of revenue in developed and developing countries

# Motivation

- Value added taxes (VAT) are an important (and increasing) source of revenue in developed and developing countries
- 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]



# Motivation

- VAT structure is of particular relevance in Mexico (introduced in 1980)

# Motivation

- VAT structure is of particular relevance in Mexico (introduced in 1980)
  - Broad VAT exemptions, zero-rating of food and other commodities and significant evasion means a low VAT revenue ratio (circa 30%)

# Motivation

- VAT structure is of particular relevance in Mexico (introduced in 1980)
  - 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

# Motivation

- VAT structure is of particular relevance in Mexico (introduced in 1980)
  - 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%



# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico

# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico
  - 2010:

# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico
  - 2010:
    - Proposed: Introduce a uniform 2% rate to all commodities (CCP) to finance poverty alleviation programmes (including cash transfers such Oportunidades) - considered regressive

# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico
  - 2010:
    - Proposed: Introduce a uniform 2% rate to all commodities (CCP) to finance poverty alleviation programmes (including cash transfers such Oportunidades) - considered regressive
    - Approved: Increase headline rate from 15% to 16%, keep non-uniform structure - considered to make the reform less regressive

# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico
  - 2010:
    - Proposed: Introduce a uniform 2% rate to all commodities (CCP) to finance poverty alleviation programmes (including cash transfers such Oportunidades) - considered regressive
    - Approved: Increase headline rate from 15% to 16%, keep non-uniform structure - considered to make the reform less regressive
  - 2014:

# Motivation

- Recent series of proposed and approved reforms to VAT in Mexico
  - 2010:
    - Proposed: Introduce a uniform 2% rate to all commodities (CCP) to finance poverty alleviation programmes (including cash transfers such 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

# This project

- Quantifies the distributional impact of 2010 reforms and of alternative more targeted instruments
  - Use MEXTAX - a microsimulation model to do this

# This project

- Quantifies the distributional impact of 2010 reforms and of alternative more targeted instruments
  - Use MEXTAX - a microsimulation model to do this
- Looks at efficiency implication of Mexico's VAT non-uniform structure



# This project

- Quantifies the distributional impact of 2010 reforms and of alternative more targeted instruments
  - Use MEXTAX - a microsimulation model to do this
- Looks at efficiency implication of Mexico's VAT non-uniform structure
  - Use a standard QUAIDS demand system built-in in MEXTAX

# This project

- Quantifies the distributional impact of 2010 reforms and of alternative more targeted instruments
  - Use MEXTAX - a microsimulation model to do this
- Looks at efficiency implication of Mexico's VAT non-uniform structure
  - Use a standard QUAIDS demand system built-in in MEXTAX
  - Quantify efficiency gains of introducing a revenue-neutral VAT uniform system

# This project

- Quantifies the distributional impact of 2010 reforms and of alternative more targeted instruments
  - Use MEXTAX - a microsimulation model to do this
- Looks at efficiency implication of Mexico's VAT non-uniform structure
  - 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

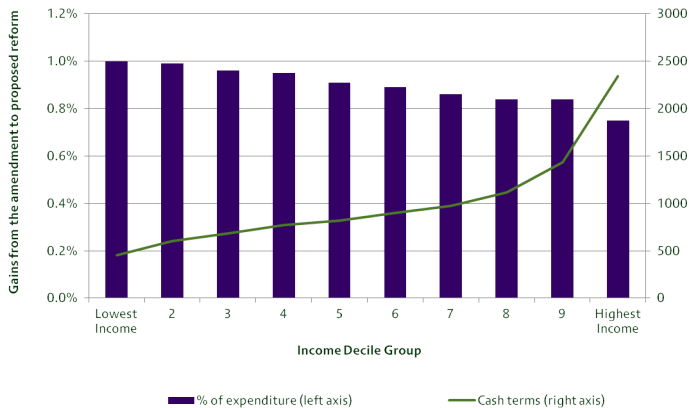
# Assessing the distributional effects of the 2010 reforms

- MEXTAX - static household model
  - Income tax, indirect taxes, soc sec contrib. & cash transfers

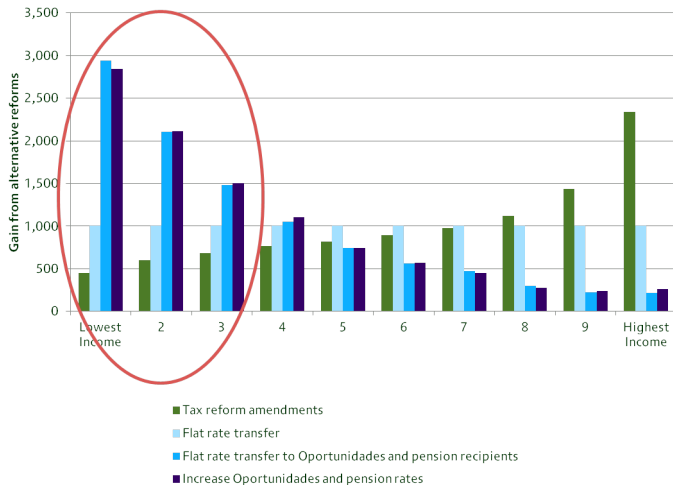
# Assessing the distributional effects of the 2010 reforms

- MEXTAX - static household model
  - Income tax, indirect taxes, soc sec contrib. & cash transfers
- 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



# 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



# Efficiency implications of Mexico's VAT structure

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

# 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 uniform rate of VAT minimises efficiency of revenue raising

# 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 uniform rate of VAT minimises efficiency of revenue raising
    - weak separability of leisure and consumption [Corlett and Hague 1953, Atkinson and Stiglitz 1976]

# 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 uniform rate of VAT minimises 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 [[Sandmo 1990](#), [Piggott and Whalley 1998](#), [Kleven et al 2000](#)]

# 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 uniform rate of VAT minimises 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 [[Sandmo 1990](#), [Piggott and Whalley 1998](#), [Kleven et al 2000](#)]
    - tastes being uncorrelated with underlying earnings capabilities [[Saez 2002](#)]

# 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 uniform rate of VAT minimises 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 [[Sandmo 1990](#), [Piggott and Whalley 1998](#), [Kleven et al 2000](#)]
    - 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
  - informs policy proposals in developed [[Mirrlees et al 2011](#)] and developing [[Ebrill et al 2001](#)] countries

# Assess quantitatively the efficiency gains of moving towards uniformity

- The MEXTAX QUAIDS model
  - QUAIDS - using standard assumptions (no differential evasion, weak separability, etc.)

# Assess quantitatively the efficiency gains of moving towards uniformity

- The MEXTAX QUAIDS model
  - QUAIDS - using standard assumptions (no differential evasion, weak separability, etc.)
- 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)
  - We don't observe prices for formal and informal commodities - work in progress

# Price variation and elasticities

- Use geographic and time variation in prices at the city/region-month level (Bank of Mexico)
  - We don't observe prices for formal and informal commodities - work in progress
- 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

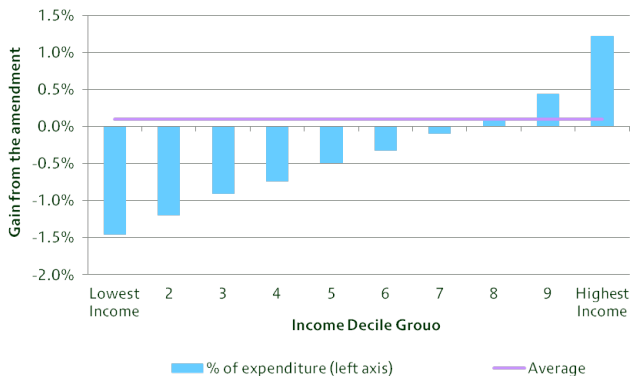
# Effect of VAT rate structure on expenditure patterns

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 revenue neutral uniform VAT [use compensating variation]



# Informality/tax evasion and optimal VAT rate structure

- Assume weak separability between leisure and consumption

# 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

# 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%)

# Intuition: simple example with 3 goods

- Assume there are 3 goods: telecommunications formal, food formal and food informal
  - food formal and informal are substitutes



## Intuition: simple example with 3 goods

- Assume there are 3 goods: telecommunications formal, food formal and food informal
  - food formal and informal are substitutes
- 10bn total expenditure: 3.75 in informal food, 3.75 in formal food and 2.5 telecoms

## Intuition: simple example with 3 goods

- Assume there are 3 goods: telecommunications formal, food formal and food informal
  - food formal and informal are substitutes
- 10bn total expenditure: 3.75 in informal food, 3.75 in formal food and 2.5 telecoms
- Raise 1bn in VAT revenues, 10% of total expenditure or 16% of taxable expenditure (same 16% rate)

## Intuition: simple example with 3 goods

- Assume there are 3 goods: telecommunications formal, food formal and food informal
  - food formal and informal are substitutes
- 10bn total expenditure: 3.75 in informal food, 3.75 in formal food and 2.5 telecoms
- Raise 1bn in VAT revenues, 10% of total expenditure or 16% of taxable expenditure (same 16% rate)
- 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

# 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)
  - Not clear what would happen if assumption equal evasion across commodities is removed

# Conclusions

- Turning arguments for VAT rate structure on their head

# 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

# 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)



# 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 [e.g. Stern 1990]. Proper evaluation requires considering
  - assumptions underlying theory: reflect economic structure and tax instruments availability
  - empirical analysis of household behaviour and tax reform
  - how policy is formed and taxation administered

# Next steps

- Lots of work to do!

## Next steps

- Lots of work to do!
- Investigate more our informal/formal definition:
  - definition of informal in ENIGH is a rough proxy (underestimating evasion)
  - income gradient, changes over time, urban vs rural

## Next steps

- Lots of work to do!
- Investigate more our informal/formal definition:
  - definition of informal in ENIGH is a rough proxy (underestimating evasion)
  - income gradient, changes over time, urban vs rural
- 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  $[0; 1]$