

Tax reforms and incentives to evade in the presence of informality—evidence from Mexico

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Tax design and informality

Issues with Mexican tax system:

1. Low non-oil revenue generation (among the worst performers in Latin America; similar to Pakistan)
2. Split tax bases; gaps and exemptions for special interests: differential incentives to cheat
3. Informality converts good intentions into bad outcomes
4. Plugging gaps requires information flows through both administrative strengthening and policy reforms

Tax reforms could have negative effects on households and on states:

- Address disincentives generated through a redesign of interpersonal and intergovernmental transfers, while minimizing impact on the poor (Ahmad and Stern 1991)
- Need coordinated actions within a consistent medium-term strategy to strengthen competitiveness

Antecedents

- Project with IADB on policy design in the face of informality
 - Antón, Hernández, Levy (2012) focus on informality arising from payroll financing of formal sector benefits
 - Key role of payroll taxation (nomina)
 - fully/partially replaced by general revenues (reformed VAT) and
 - basic benefit for greater efficiency, equity and growth
- Current LSE work with SHCP/World Bank and follow-up (IGC support) focuses largely on tax distortions
 - Particularly, holes in the VAT, Income Taxes and interactions between the two
 - Drawing lessons for other countries with informality and cheating in sample, particularly Pakistan
- Careful to avoid “Good intentions and bad outcomes”: incentives and political economy considerations
- Need for joint determination of the tax and social policy agenda indicated
 - Clear evidence from Mexican 2007 reform involving IETU (minimum tax on firms creditable against the CIT)
 - Focus on households and states with different instruments (part of follow-up agenda)

Focus of paper

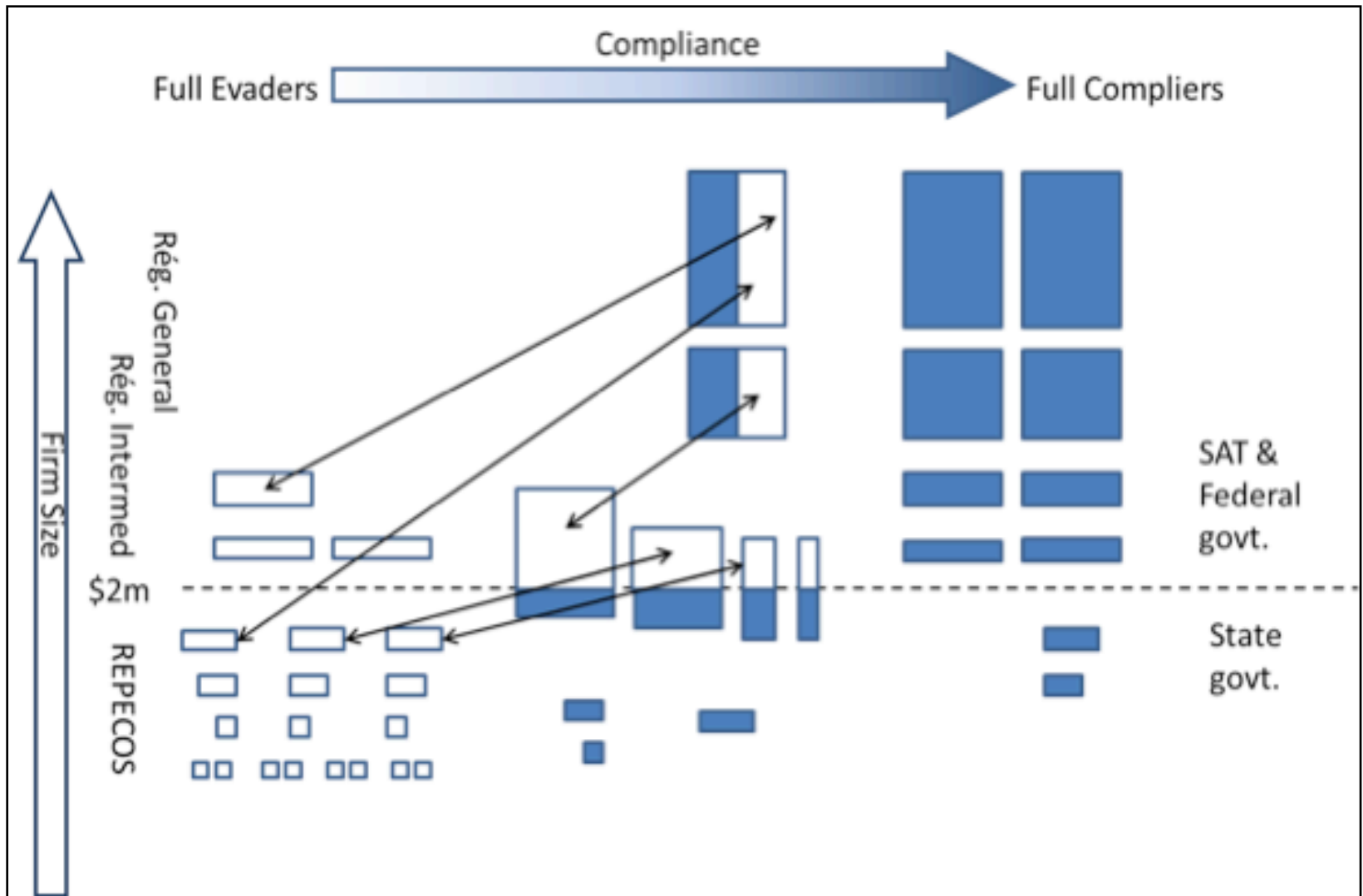
- Address the weaknesses in the tax system
 - Particularly VAT (C-efficiency of .26 in Mexico close to Pakistan-- among the lowest in the world); largely due to
 - Special regimes: border regions, small taxpayers; maquiladoras
 - Exemptions and zero-rating for social purposes
 - But also income taxes—the gaps in the VAT potential exceed those for the income taxes, in relation to Latin American standards
- Tax on tax interactions important; as are the interactions with social policy and compensatory measures:
 - Can poor losers be compensated?
 - How far can one go in protecting the poorest from the tax reforms?
- How does this fit in with an overall strategy of tax reforms for Mexico?
 - Part of on-going analytical, evidence based research
 - Identify key areas that are needed for follow-up and additional work

Distortions and incentives to evade

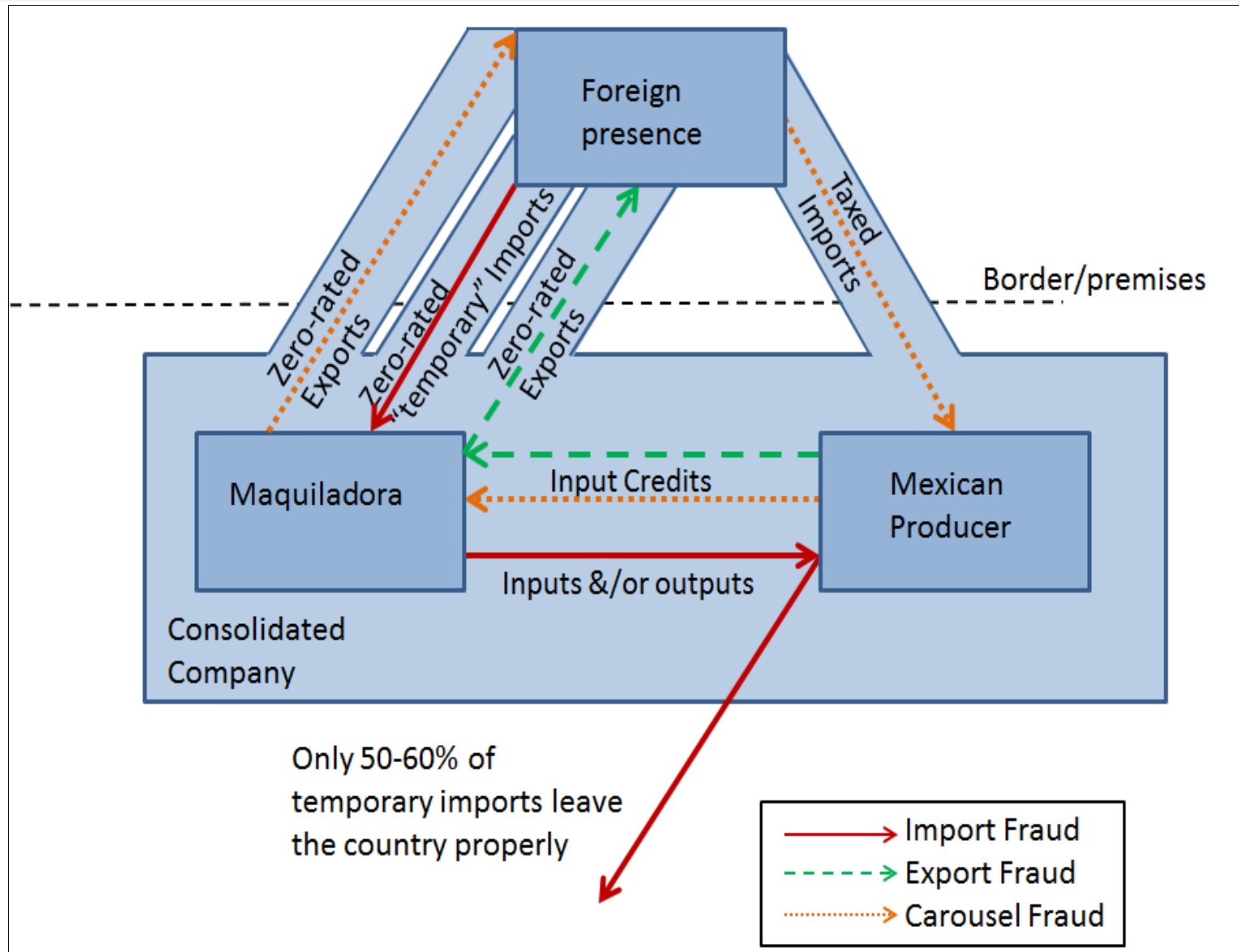
Swiss cheese effects and issues for analysis

- Holes in the direct tax system:
 - CIT: special provisions and deductions, above those normally associated with taxing pure profits over a project life-cycle; and extensive special regimes
 - IETU worked to plug holes, but less than anticipated—also subject to base erosion
 - Collections fall short of Brazilian and Chilean performance, but average for OECD
 - PIT: much lower than OECD, but above average for Latin America
- Exemptions and special provisions for VAT
 - Multiple taxes/prices for same good
 - Considerable potential for arbitrage
 - Exemptions and split base—breaks in the information chain—problems with small tax regime (REPECOS) and maquiladoras
- Importance of tax on tax interactions
- Does this amplify the effects through the nomina?
- Information flows critical in closing gaps
 - Revamped role for SAT, including for audit of smaller taxpayer, and nomina?

Incentives to cheat



Maquiladora sink-holes



Additional constraints and opportunities

- Distortions also coming through payroll taxes; and design of formal social benefits: Levy (2008); Antón, Hernández and Levy (2012)
 - Role of basic benefit as a compensatory tool for the tax reforms, and also part of a revamp of the Social Protection System?
 - How to use Oportunidades or categorical targeting more effectively?
- Gainers and losers among states:
 - Compensation through intergovernmental transfers
 - More important to evaluate handles that affect subnational accountability
- Agenda for:
 - Revamping revenue assignments and intergovernmental transfers?
 - Compensatory measures—universal basic benefit?
 - Role of more targeted measures?

Why Tax on Tax Interactions Matter?

Tax interactions: Why do they matter?

- Firm's treatment in the VAT system will impact its incentives regarding its CIT liability
 - To reduce VAT → understate sales, overstate purchases
 - To reduce CIT → understate revenues, overstate inputs
→ Underreporting VAT will also reduce CIT liability
- 2 sets of incentives affect cheating:
 - Temptation effect: VAT and CIT reduce firms' profits
Higher tax rate → greater incentive to cheat
 - Information effect (Lack of): With poor information, probability of detection is reduced
More exemptions → less information → greater incentive to cheat

Tax interactions: Estimation Strategy

- Mexican setting allows us to quantify these effects: Mexico's VAT rates are differentiated geographically and across goods:
 - Geographically:
 1. border municipalities (north and south) pay 10% (11% since 2010)
 2. rest pays 15% (16% since 2010)
 - Across goods: 1. general rate, 2. exempted, 3. zero-rated
 - Are there significant differences in behaviour between exempt and zero-rated transactions (problems with refunds may make this effectively exempt)
- Hypotheses:
 1. Firms in interior (higher VAT) → more incentive to cheat → report lower profit (**temptation effect**)
 2. Firms that purchase exempted goods → more incentive to cheat → report lower profit (**information effect**)

→ Combining these two effects allows us to identify interaction effects

Tax interactions: Estimation Strategy

- Difference-in-differences (D-in-D) strategy:
 - Simply comparing reported profit of firms on border vs firms in interior will not identify impact of tax exemptions (many reasons why being in a different region may lead to different reported profit)
 - But in combination it may!
 - We compare difference between reported profit of firms that sell exempted vs. general rated goods in border with the same difference in the interior
 - Difference of reported profits exempted vs. general is expected to be stronger in interior than on border

Tax interactions: Estimation Strategy

- Data
 - **INEGI** (National Institute of Statistics and Geography):
 - “Censo economico 2009”
 - Municipality x product group aggregated data (*forthcoming: firm level microdata)
 - **SAT** (Tax Administration Service)
 - Corporate tax returns at firm level
- Expect that firms have a greater incentive to “lie” to SAT to reduce tax liabilities than to INEGI
 - INEGI assumed closer to the truth

Tax interactions: Estimation Strategy

- We construct 3 different dummies for the region the firms are in, 2 for the taxable status of the good, and 2 for the share of inputs:

Region (high or low VAT rate)		VAT status of firm's sales (outputs)		Share of VAT exempted/ zero-rated goods purchased (inputs)	
border_r	=1 if firm is on border, 0 otherwise	exempt_g	= 1 if exempt, 0 otherwise	Inputexempt_g	= share of inputs that is exempted
borderN_r	= 1 if on northern border, 0 otherwise				
borderS_r	= 1 if on southern border, 0 otherwise	zero_g	= 1 if zero- rated, 0 otherwise	inputzero_g	=share of inputs that is zero-rated

- Note: D-in-D strategy only works if there is no other reason that reported profits should vary across firms that also varies across products and regions in a way that is related to the VAT rate
 - Example 1: if sectors which auditors focused on were different in the border than interior shifting sectoral focus
 - Example 2: relative profitability is different in the two regions in a way that is correlated with the tax rate

Tax interactions: Equation 1

1. Where the VAT rate is higher, are incentives to evade stronger (**temptation effect**)?

$$P_{igr} = \alpha + \beta_1 output_g + \beta_2 border_r + \beta_3(output_g \times border_r) + \varepsilon_{igr} \quad (1)$$

where

P_{igr} = Reported profit (CIT liability divided by sales)
 $output_g$ = 1 if good is exempted/zero-rated, 0 otherwise
 $border_r$ = 1 if on border, 0 otherwise
 β_3 = Coefficient on interaction term
 ε_{igr} = Error term

→ Expect to find a negative coefficient on the interaction term

Tax interactions: Equation 2

2. Do firms that buy exempted goods report lower profits, i.e., cheat more (**information effect**)?

(i.e., firms just below a break in the production chain)

$$P_{igr} = \alpha + \beta_1 input_g + \beta_2 border_r + \beta_3 (input_g \times border_r) + \varepsilon_{igr} \quad (2)$$

where

P_{igr}	=	Profit (profits divided by sales)
$input_g$	=	Share of inputs that are exempted/zero-rated
$border_r$	=	1 if on border, 0 otherwise
β_3	=	Coefficient on interaction term
ε	=	Error term

→ Expect to find a positive coefficient on the interaction term

Tax interactions: Equation 3

3. Combining the **temptation effect** (hypothesis 1) and the **information effect** (hypothesis 2):

$$P_{igr} = \beta_g + \beta_1 border + \beta_2(output_g \times border_r) + \beta_3(input_g \times border_r) + \varepsilon_{igr} \quad (3)$$

where

P_{igr}	=	Profit (profits divided by sales)
β_g	=	Dummy for each product code (good fixed effects)
$output_g$	=	1 if good is exempt/zero-rated
$input_g$	=	Share of inputs that are exempted/zero-rated
$border_r$	=	1 if on border, 0 otherwise
β_2	=	Interaction term (temptation effect)
β_3	=	Interaction term (information effect)
ε	=	Error term

Tax interactions (exempted goods)

INEGI vs SAT

	IRS/Sales					
	<u>Border</u>		<u>BorderN</u>		<u>BorderS</u>	
	INEGI (1)	SAT (2)	INEGI (3)	SAT (4)	INEGI (5)	SAT (6)
Border	-.017*** (.004)	.005*** (.001)	-.017*** (.004)	.004*** (.001)	-.020** (.007)	.009*** (.002)
ExemptXborder	-.007 (.007)	-.002*** (.002)	-.007 (.008)	-.003*** (.002)	-.007 (.013)	.002 (.004)
InputexemptXborder	.054 (.049)	.050*** (.009)	-.036 (.056)	.064*** (.010)	.278** (.092)	-.023 (.020)
Constant		.013* (.007)		.013* (.007)		.013* (.007)
Observations	126503	106846	126503	106846	121177	106846
R-squared	.888	.123	.888	.122	.888	.120
F-stat on Sectors	1918.1	29.2	1911.5	29.3	1905.4	29.8
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

* p<0.05, **p<0.01, *** p<0.001

Tax interactions: INEGI vs SAT (zero-rated)

	Reported Profits/Sales					
	<u>border</u>		<u>borderN</u>		<u>borderS</u>	
	INEGI (1)	SAT (2)	INEGI (3)	SAT (4)	INEGI (5)	SAT (6)
Border	-.014*** (.002)	.008*** (.001)	-.019*** (.003)	.008*** (.001)	-.002 (.004)	.007*** (.001)
ZeroXborder	-.003 (.006)	-.009*** (.002)	-.009 (.008)	-.011*** (.002)	.006 (.010)	.004 (.003)
InputzeroXborder	-.006 (.017)	.009 (.005)	-.002 (.022)	.008 (.006)	-.015 (.029)	.009 (.011)
Constant		.035*** (.001)		.036*** (.001)		.037*** (.001)
Observations	141551	112837	139267	112837	136038	112837
R-squared	.914	.111	.914	.110	.914	.108
F-stat on Sectors	2894.6	26.1	2882.2	26.2	2876.9	26.2
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

* p<0.05, **p<0.01, *** p<0.001

Tax interactions: Interpretation of Results

- **SAT vs. INEGI Exempted:**
 - OutputXBorder (Temptation effect)
 - SAT: negative and significant
 - INEGI: negative but not significant
 - Temptation effect is significant only in SAT data
 - InputXBorder (Information effect)
 - SAT: positive and significant
 - INEGI: positive (except borderN) but not significant
 - Information effect is significant only in SAT data
- **SAT vs INEGI Zero-rated:**
 - OutputXBorder (Temptation effect)
 - SAT: negative (except borderS) and significant
 - INEGI: negative (except borderS) but not significant
 - InputXBorder (Information effect)
 - SAT data: positive but not significant
 - INEGI data: negative/near zero, but not significant
 - No significant information effect for zero-rated

Tax interactions: Implications

- Results are similar between the two datasets but temptation and information effects tend to be significant only for SAT data
 - “Real” profits do not show as pronounced cheating as profits reported to the tax administration
 - Greater tendency to hide information from SAT than INEGI
- Information effect more pronounced for exempted goods
 - Exemptions cause more distortions and break in information chain, providing more possibilities to cheat
- On-going work on detailed microdata (using INEGI sample)
 - Note: composition of samples is different in the two datasets
 - Next step: use decomposition methods (Fortin, Lemieux and Firpo, 2011) to take account of differences between the samples

Tax interactions: Implications

- Implications:
 - False reporting to SAT needs to be addressed
 - If exemptions from VAT are reduced, tax revenue will rise from both VAT and income tax
 - Incentives generated by both taxes; and also nomina, should be considered jointly

Cross effects summary

- Main positive revenue impacts provided information effects fully utilized (full chain from VAT, plus audits)
- Negative “temptation” impacts on profits, possible decline in SR revenues (especially with partial VAT reforms)
 - Higher taxes (VAT+CIT) squeeze profits, increasing temptation to evade, plus great ease of doing so
 - Could be substantial for firms excluded from VAT (need further work in this area)
- Once benefits are bestowed—very hard to take away

Policy implications

- Key element in design is to close off easy avenues for cheating and rent-seeking
- Information flows are critical in enabling SAT to effectively address evasion and underreporting:
 - Uniform VAT across goods and across firms (border rate) to stop information hemorrhaging
 - Plug CIT holes
 - Replace REPECOS
 - Lower VAT threshold in standard regime, income tax limit
 - Introduce local business tax at the third/municipal tier
- Eliminate maquiladora regime—the reformed trade and tax environment is adequate

Implications for Administration (SAT)

- Already one of the best tax administrations in Latin America
 - Functional organization
 - Ability to use information from different sources; advanced IT capabilities
 - Effective audit capability: (39 peso revenue per peso of audit expenditure)
- Better and compulsory use of TIN (RFC)
 - Bank accounts and commercial licenses
 - Facilitate use of third party information (ongoing experiment in Pakistan)
- Simplification of forms, processes and procedures
- Intensify program for cross-checking of info
- Administer nomina
 - revenues could stay with states for short-run
 - Consider rationalization of nomina, along with revenue reassignments
- Most important: **reform policy agenda to enable efficient SAT to function efficiently**

Towards a Fiscal Reform Agenda

Key lesson from this exercise

- Fix the gaps in the VAT, keeping in mind tax on tax interactions
 - Additional tax burdens on firms due to VAT-CIT interactions could be offset by adjustments in CIT rate
 - Bring down to new international standard (25%--helps keep a positive differential with the US
 - Examine interactions between VAT, CIT, nomina
- Partial VAT reforms could lose revenues
 - Inadequate information effect, while the burdens go up, increasing incentives to cheat
- Policy reforms needed, even if there is an efficient tax administration, such as the SAT
 - ***Gimmicks that increase incentives to evade (such as amnesties) should be avoided***, even if there are short-run revenue gains

Short- to medium-term growth enhancing tax agenda

- Has to be a “package” of policy reforms, together with full utilization of the information effects:
 - Broad directions are clear: fix the VAT; rationalize CIT/PIT; growth impact of reducing cheating
 - Introduction of carbon tax, and rationalization of excise system : Efficiency, revenues and growth aspects
 - Further refinement possible to identify deductions that create “moral binding” constraints on revenue and efficiency
 - Deepen “tax diagnostics” agenda (cf. Hausmann-Rodrik, Velasco “growth diagnostics”)
- How can this be implemented, given failure of attempts to reform the VAT since 1998?
 - Address key constituencies—the poor and states and local governments

Gainers & Losers: Protecting the Poor

- Minimize the impact on the poorest by continuing to exempt unprocessed foods (grains)
- Identify gainers and losers from relative price changes
- Compensate the poor losers:
 - Case for a basic benefit?
 - Use of categorical targeting to avoid reducing incentive to work (formally)
 - Much of the impact likely to be in urban areas
- *Oportunidades* associated with largely asset based scorecards, could generate additional labor market constraints
 - Mobility
 - Asset-based eligibility creates disincentives to accumulate wealth
- Effects on households in different circumstances and options for compensation or protection
 - Examine overall effects, and also detailed assessments for polar-cases (e.g., Mexico City and Chiapas)

States and local governments

- Effects of the package of reforms:
 - States may lose REPECOS; and nomina
- Important to have at least one broad-based tax over which states have control (Ambrosiano and Bordignon, 2006)
 - This does not imply decentralized administration
 - Could have piggy-backs on income taxes and VAT administered by SAT; states could choose incremental rates within a range (to avoid race to the bottom)
- Local governments get a local business tax; property taxes (with varying degrees of administration—could be asymmetric)
 - Additional work needed, on effects of options, possibly with SHCP?

Gainers & Losers: States?

- New revenue assignments lead to gains and losses
- Stop-loss provisions (Ahmad et al, SHCP and IMF 2007)
- Equalization transfer framework needs to be developed in conjunction with new revenue assignments
 - Exercise in 2007 was partial
 - Additional work could be initiated with SHCP
- Performance-based transfers to meet central government objectives?