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ABSTRACT

In this paper we examine incentives to cheat in the Mexican tax system and argue that these are affected by interactions between taxes. We use variation in tax status between Mexican firms and variation in the tax rate between different regions within Mexico to investigate the interaction effects between different taxes that firms face. Firms' reported profits for one tax, the corporate income tax (CIT), depend on the tax status for its inputs and outputs of another tax, the Value-Added Tax (VAT). In other words, VAT exemptions do not only lead to evasion of VAT; they also lead to greater evasion of the CIT, thereby exacerbating the loss of revenues caused by the exemptions. Juxtaposing results from a dataset from Mexico's Tax Administration with Economic Census data shows that misreporting to the tax agency is particularly high when tax exemptions are present. We place the results within the broader framework of the tax reform agenda in Mexico that involves decisions affecting states and households in different circumstances as well as investment decisions. These results have implications for other developing countries that have growing informality and tax evasion, as in Pakistan. Short-term fixes, such as amnesties, do not begin to address the underlying incentive difficulties and only serve to make matters worse and should be avoided.

1. INTRODUCTION

A major tax reform was undertaken in Mexico in the early 1980s, with the introduction of a Value Added Tax (VAT), together with a rationalization of federal and state level taxes and the establishment of a world-class tax administration, the *Servicio Administrativo Tributário* (SAT). The VAT was introduced as a federally administered tax with shared revenues, allowing the removal of many distortive taxes at the state level (Gil Diaz, 1987). This had many desirable features, in that an "efficient" tax was designed to be implemented by a single federal agency, avoiding the complexity and distortions faced in Brazil with the origin based state level VATs. It also avoided the split bases for the GST between goods and services, as in India and Pakistan. It is interesting that Mexico was included as part of a World Bank project in the 1980s on tax reforms in developing countries,[1] given the very significant reforms that had already taken place and could be a model for countries like India and Pakistan (for other countries in the study at that time, see Ahmad and Stern, 1991).

Yet, with the creeping introduction of special provisions and exemptions in both the income taxes and the VAT, Mexican non-oil tax revenue collections have fallen to around 10% of GDP, well below both the OECD and Latin American averages (OECD, 2010). Thus, the Mexican tax system has more in common with one of the worst performing tax systems in the world—ironically Pakistan—than with its neighbours in Latin America.

It is striking that the Mexican non-oil tax collection, which was around the Latin American average in 1990-92—albeit well below the large federations, Brazil and Argentina (see Table 1.1)—had fallen to the lowest place by 2008-9 and is the only country represented in Table 1.1 where revenues as a share of GDP have actually *fallen*. By then, Mexico at 10.7% was far below the Latin American average of 18.5% of GDP, and even further behind Brazil at 34.4% of GDP. The increasing tax breaks, exemptions and preferences that had crept in for many "well-meaning purposes", largely provide opportunities to cheat and evade taxes—but have otherwise become redundant.

Among the well-meaning purposes were the encouragement of trade and investment, which was stifled by the existence of high tariffs and other barriers to investment in Mexico. This led in the 1980s to the maquiladoras regime allowing manufacture for re-export to circumvent many of these onerous barriers. However, with the reforms to the Mexican trade and investment regime (particularly rationalization of tariffs), the maquiladoras regime is now best described as a convenient vehicle for the avoidance and/or evasion of income taxes and the VAT.

A second well-meaning purpose was protection of the poor. In the absence of any effective means of redistributing income, and in particular any means of reaching the poorest, policymakers turned to the tax system and built several distributional measures into the design of the VAT and granted exemptions to sources of income believed to be concentrated among the poor in the income taxes. Currently, while

[1] This was directed by Ehtisham Ahmad together with Nicholas Stern and Jesús Seade, initially at the University of Warwick in the mid-1980s.

personal income tax revenues remain paltry, the scope for redistribution through the income tax as it currently stands is concomitantly limited (Bird and Zolt, 2005).

Table 1.1 Tax collections in selected Latin American countries (% of GDP)

	1990-92	2008-09
Brazil	23.7	34.4
Argentina	18.5	31.2
Uruguay	22.5	24.6
Mexico	12.7	10.7
Guatemala	8.8	11.1
Dominican Republic	8.6	14.1
Average Latin America	14.0	18.5

Source: CAF, 2011.

The adverse distributional consequences of reforms that increase the efficiency of the main taxes could be effectively offset through expansion and reform of direct transfer programs rather than through distortionary measures in the tax code, raising overall efficiency (Atkinson and Stiglitz, 1976; and Saez, 2004) and hence the ability to increase revenues without adversely affecting the poor. This involves a careful description of gainers and losers as a result of the tax reforms, While direct social assistance programs, such as Oportunidades, have been effective in reaching the poor, and have been replicated elsewhere, including Brazil and Pakistan, adding yet more weight to Oportunidades may not be the best way to compensate those affected by the tax reforms in Mexico—we expand on this point in Section IV.

The disappointing revenue performance is largely due to the poor performance of the VAT. A C-efficiency[2] of around 0.25 for the VAT puts Mexico in roughly the same league as Pakistan (which also has a low tax/GDP ratio of under 10%). Turkey is a developing country, also in the OECD and with roughly the same characteristics as Mexico—in terms of the importance of agriculture, a growing industrial sector on the border of the EU, large population as well as informality. However, the Turkish VAT had a C-efficiency of .47 around 2005, similar to that of Sri Lanka (which could be deemed to have comparable levels of efficiency and insurgency as in Pakistan).

On the Corporate Income Tax (see Table 1.2), the Mexican performance is at the OECD average, but well below Latin American standards. At around 3% of GDP, Mexican CIT collection is significantly lower than in Chile, and also Brazil. However, the personal income tax appears to be around the Latin American average—but this is well below the levels that have become standard in the OECD.

While international comparisons are important in showing how Mexico fares vis-á-vis its comparators in the region, or in the OECD, they are a poor guide as to how the gaps can be filled and how quickly. It is therefore advisable to keep the Latin American and

[2] The C-efficiency is the ratio of VAT revenue to aggregate consumption, divided by the standard VAT rate (see Ebrill et al., 2001).

OECD standards as indicators of broad potential, but relate the short-term possibilities in relation to what is feasible in Mexico, given its institutional and policy constraints.

Table 1.2 Income Taxes in selected Latin American countries (% of GDP)

	CIT	PIT
Argentina	3.6	1.6
Brazil	5.1	2.6
Chile	7.3	1.2
Mexico	2.4	2.2
Latin American average	3.6	1.4

Source: CAF, 2011.

Antón, Hernández and Levy (2012) argue that one of the causes of the poor performance of Mexican public finances is the structure of incentives that reflects disincentives associated with inappropriately designed formal benefit systems, financed through distorting payroll taxes that fall largely on the formal sector. Thus, there are major incentives for informality with the concomitant implications for efficiency, investment and growth. The solution proposed by Antón, Hernández and Levy (2012) is to shift largely to a reformed social protection mechanism, financed by general revenues relying largely on a reformed VAT.

Direct attempts to reform the VAT in both the Fox and the Calderón administrations failed largely due to the vested interests that take refuge behind the argument that the poor and the states might lose as a result of the reforms. However, reforming the VAT remains at the heart of any strategy to significantly improve the Mexican non-oil tax/GDP ratio. However, it has to be part of a broader package of reforms that address the political economy concerns. Indeed, the successful "plugging" of the holes of the corporate income tax by the *Impuesto Empresarial a Tasa Única* (IETU) in 2007 built on the "hold-harmless" criteria that ensured that no state was adversely affected by the reforms.[3]

In this paper we focus on the disincentives in the major taxes that generate cheating, even though Mexico has one of the most modern tax administrations in Latin America. We argue that the generation of information on transaction chains that is made possible by a reformed VAT is critical in closing the gaps and preventing cheating.

[3] See SHCP(2011) and Ahmad et al, 2007 for a discussion of the strategy leading to the IETU. Also see Ahmad, Li and Richardson (2002) and Ahmad (2011) for a discussion of the Chinese case.

2. TAX GAPS AND INCENTIVES TO CHEAT

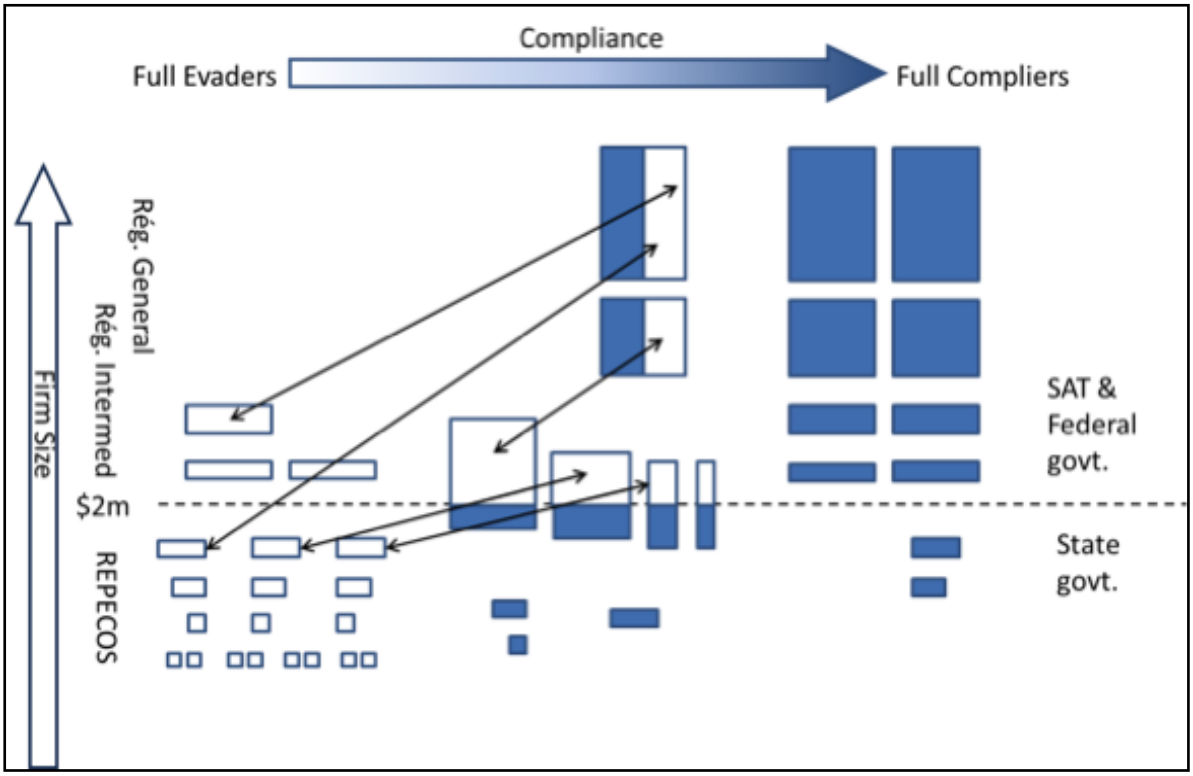
The growing incentives to cheat in the Mexican tax system are associated with exemptions and special provisions that are amplified as gaps in one tax have knock on effects on revenues from other taxes – what we call *tax interaction effects*. In addition to the exemptions and zero-ratings in the VAT, the special lower rate for border regions, which has crept further and further from the Northern and Southern borders into the interior of the country, creates a system of multiple tax rates for the *same good* in a single economy, opening up possibilities for arbitrage. Exemptions and deductions (e.g., cars) also accumulated in the income tax (ISR), creating a Swiss cheese effect on the tax base, and amplifying the incentives to take advantage of the loopholes.

Splitting the bases of the main taxes—VAT and ISR—between the federal and state governments creates a further distortion. The administration and revenues of the small taxpayers (for both the VAT and ISR/IETU), with a turnover of below MX$2m, were assigned to the states under the *Régimen de Pequeños Contribuyentes* (REPECOS). As has been recently estimated, the states have little ability or incentive to administer the REPECOS and evasion is believed to be in excess of 90% (SAT 2010). Worse still, since firms know that paying taxes under REPECOS frees them from the threat of oversight by SAT, and also that the state governments are unwilling and/or unable to enforce REPECOS as long as they pay something, Almunia & Best (2012) show that there is bunching of firms at the lowest end, with over 90% of firms in some states paying the very minimum amount possible.

The overall incentives for businesses to cheat generated by this widespread evasion are summarized in Chart 1. Apart from relatively few large and small firms that are in full compliance (dark shaded boxes to the right), even large-scale firms have an incentive to only partially declare sales, employment or profits. There are likely to be a great many firms masquerading as REPECOS eligible firms in order to take advantage of the extremely low monitoring of REPECOS taxpayers. Much more worryingly, however, as neither the state tax administrations nor the SAT monitor these firms, illegal business-to-business transactions and sales are facilitated. This means that there will be holes in information on the production chain under the VAT, leading to the breakdown of the flow of incentives along value chains. Most importantly, though, REPECOS act as very safe, easy intermediaries for larger firms to sell into the informal sector, hence under-declaring their sales for the purposes of the VAT and the ISR, and consequently reducing their taxable value added/profits.

In the 1980s and previously, Mexico had a restrictive trade regime, high tariffs and an uncompetitive exchange rate. In order to encourage foreign investment for exports, especially to the US, the maquiladora regime was introduced, and has had considerable success in generating both investment and growth in employment. However, with NAFTA, and the 2008-13 trade reforms, tariffs have been reduced and simplified, wages are generally competitive, the exchange rate is market determined, and flexible foreign ownership provisions have been facilitated in most sectors. Furthermore, exports are zero-rated under the VAT, and consequently the border rate has become redundant.

Chart 1. Incentives to Cheat in Mexico

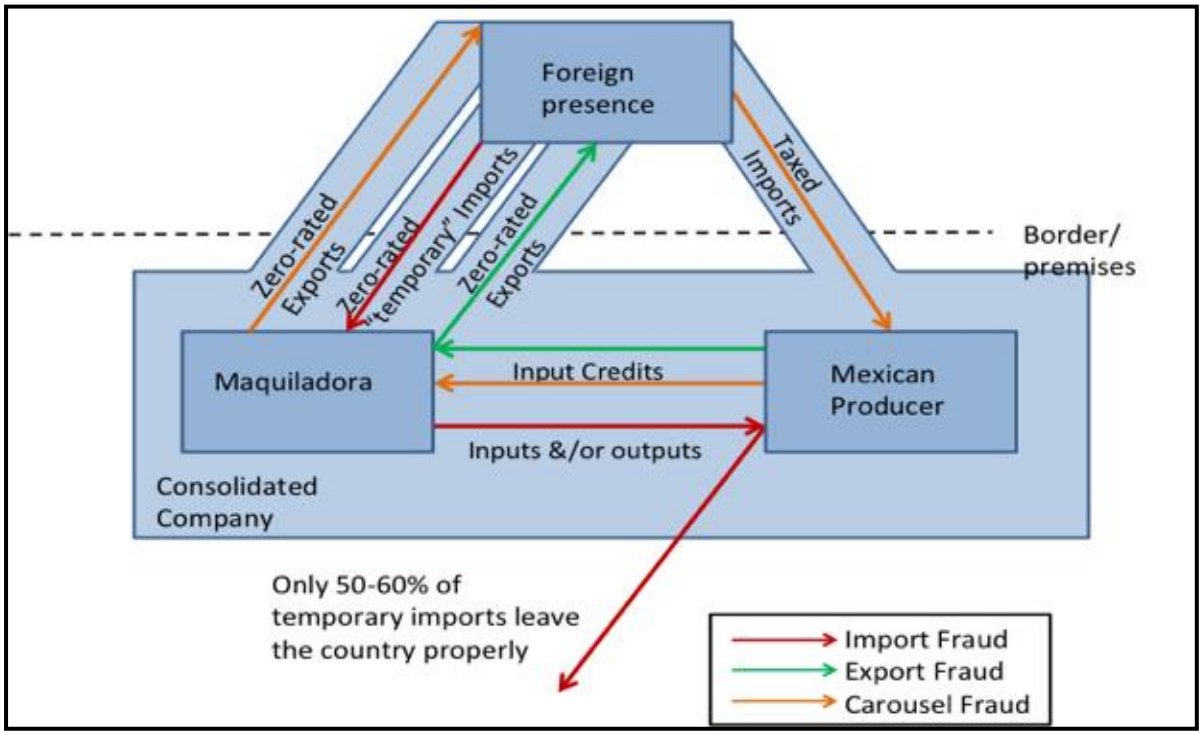


The safe haven provisions were reinforced with the halving of the taxes generated by the maquiladoras in 2002. This sector generates negligible revenues and has become a source of distortions and evasion. Avoidance possibilities abound, including shifting activities and "profits" to maquiladora subsidiaries, and the possibility of carousel fraud. We examine this set of issues in the empirical work in the sections below.

The revenue sink-holes created by the maquiladoras are summarized in Chart 2. It shows the circuits for import and export fraud, as well as carousel fraud. It also shows how Mexican producers might abuse the maquiladora provisions to disguise input credits and show profits as if they were generated by the less taxed maquiladora sector.

The well-meaning special provisions for various sectors and border regions, together with the split bases for the income tax and VAT, are the main reasons for the incentives and dodges that facilitate "cheating" by Mexican taxpayers. The split bases due to REPECOS (for both the VAT and ISR) amplify the absence of incentives for states to follow-up. The situation is made worse by the maquiladoras. These interact with the holes in the tax system to make the incentives to cheat and evade stronger and more rewarding. Under the present conditions, where the policy framework is close to establishing a level playing field, the incentives associated with the maquiladoras are redundant, and their removal will not adversely affect productive investments or employment opportunities.

Chart 2. The maquiladora sink holes



In sum, given the holes in the tax system, the relevant question is not why the tax collections are so low, but how the very efficient SAT manages to collect as much as it does. The Mexican experience also shows that once the special privileges are established, it becomes almost impossible to do away with them directly. The political deals in an opaque budgetary process create a vicious cycle that is amplified by the interactions between the taxes, together with the limitations on the tax administration—especially the poor flow of information, given silos within the same institution, and across government agencies at different levels of administration.

We will examine further the empirical data for corroboration of these effects. However, what is not possible, with the data at hand, is to get a fix on the extent of transactions that take place completely outside the reported circuit (either to SAT or to the state tax administrations). However, the juxtaposition of information reported to SAT and the economic census is used to try and approximate some of the "misreporting" to the former.

3. TAX ON TAX INTERACTIONS AND INCENTIVES TO CHEAT

Exemptions lead to an obvious loss in revenue from contracting the taxable base for a particular tax. In addition, tax interaction effects between different taxes a firm faces may exacerbate the loss in revenues. That is, an exemption with respect to one tax may lead to more evasion with respect to another. We focus here on exemptions in the VAT that generate breaks in the information chain, given the lack of incentive to claim refunds or report to the tax administration. This opens up channels of evasion for the income taxes, as argued in Ahmad & Best (2012).

Firms that seek to evade the corporate income tax would do so by understating their revenues, and/or by overstating their inputs, thus reducing their taxable profits. Analogously, firms seeking to evade the VAT would do so by understating their sales and/or overstating their purchases from other firms. From this the link becomes clear immediately: understating revenues in the corporate income tax can also reduce a firm's VAT liability and over-reporting purchases for VAT purposes also reduces a firm's CIT liability, provided the firm is not completely out of the tax net.

The strength and magnitude of the interaction effect will depend crucially on the incentives that firms face. These incentives are determined by two forces. The first is the rate of tax that applies to a firm's sales and purchases. The higher is the tax rate, the stronger is the incentive of a firm to misstate its activities in order to evade (at least a part of) the tax.

The second aspect of a firm's incentives is the ease with which a firm can misreport and get away with it and consequently the probability that its misstatement will be detected. A key advantage of a uniformly applied VAT is that incentives to report truthfully travel up and down production chains. One firm's sales are a downstream firm's purchases and so a firm trying to underreport its sales would cause the downstream firm to underreport its inputs, thus increasing the downstream firm's tax liability. A uniformly applied VAT therefore creates a strong incentive for the downstream firm to demand that the purchase be declared truthfully.

The first consideration implies that firms that face a higher VAT evade more and thus pay less in CIT as well as VAT. We call this the "*temptation effect*". The second consideration implies that firms that find it easier to evade will evade more. In particular, we expect that when the production chain is "broken" by the VAT (because of exemptions, for example), firms will find it easier to misreport their CIT liability. This is because when there is an exemption, the VAT system no longer generates the incentives for truthful reporting. Also, as crucial information about transactions that could be used in an audit is lost, the threat of discovery is reduced. We will call this the (absence of) "*information effect*".

A. DATA AND ESTIMATION STRATEGY

Our empirical strategy tries to quantify how incentives to cheat on the VAT can have spillover effects onto the taxable profits a firm declares for income tax purposes. This constitutes a tax interaction effect. In the Mexican setting, two key features of the VAT system provide an opportunity for us to quantify these effects, as they both create variations in the incentives to cheat on the VAT. The first is that different goods are treated differently by the VAT system. Some goods are *exempted* from their VAT liabilities: firms neither pay VAT on their sales nor do they have the right to claim a tax credit for their purchases, resulting in a very low incentive to report either sales or purchases truthfully to the government. Other goods are *zero-rated*: firms do not pay VAT on their sales. However, they do have the right to claim tax credits for their purchases, generating very little incentive to ensure that sales are truthfully reported, but preserving the incentive to try to over-report purchases. This generates variation across goods both in the rate of VAT that is paid on their sale and in the incentives firms have to report sales and purchases truthfully.

The second feature of the Mexican VAT that we will exploit is the fact that a good faces a different VAT rate, depending on where in the country it is sold. The location specific rate of VAT is 5% lower (10% versus 15% until 2009, and 11% versus 16% since 2010), in border areas. This means that the incentives to cheat on the VAT are stronger in the interior of the country than in the border regions, as there is more to gain from cheating since the rate is higher. What is more, since a reduction in declared value added will also reduce declared taxable profits for income tax purposes, we expect taxable profits to be lower in the interior also through the tax interaction effect.

Taken alone, neither of these features of the Mexican VAT allows us to compellingly identify the effects of the VAT on the income tax. There are all sorts of reasons why reported profits might vary across goods, ranging from differences in barriers to entry to different sectors to differences in the availability of foreign competitors etc., and some of these reasons will be correlated with the taxable status of the goods. Similarly, there are any number of reasons why profit rates may be different in the border regions than in non-border regions, from the quality of local infrastructure and institutions to the climate, and, of course, the proximity to export markets, and most of these will have nothing to do with the VAT rate.

However, taken together, these two features can allow us to identify the tax interaction effects. The size of the incentives to cheat generated by the differences across goods in their tax status will depend on the level of the general VAT rate (10% or 15%). This implies that we should expect all the effects across goods to be stronger in the interior where the applicable rate is higher than in the border regions. To verify this, we employ a difference in differences strategy comparing firms across products and geographic regions. Combining these two sources of variation will allow us to control for any differences across products in declared profits that are constant across regions, and also for any differences between the regions that are constant across products.

In terms of the temptation effect, firms that sell goods that are zero-rated or exempted should be less tempted to underreport their sales than those that sell goods taxed at the

general rate all else equal, since this would not cause their VAT liability to decrease (although underreporting sales may still cause their CIT liability to decrease). This implies that all else equal, reported profits should be lower for firms selling a product taxed at the general rate than for firms selling a zero-rated or exempted product. In addition, firms that sell zero-rated or general rate products have an incentive to overstate their purchases if possible, while exempted firms do not, since they are unable to claim an input tax credit for them. This implies that all else equal, reported profits should be lower for firms selling zero or general rated products than for firms selling exempted products.

In terms of the information effect, firms that are one step down the production chain from the point at which it is broken by an exemption are likely to find it easy to misreport their input purchases. This would also apply in the case of zero-rated products if the probability of receiving refunds is high, and the product becomes effectively exempt—reducing the incentive to report to the tax administration. In both cases, there would be an effective break in the information chain. A firm over-reporting its purchases of exempted or zero-rated products will not increase the VAT liability of the upstream producer, so the upstream producer has no (VAT) incentive to prevent the over-reporting. Of course, this over-reporting of purchases, if mirrored by over-reporting of sales by the upstream producer, would increase the upstream producer's CIT liability, so here the tax interaction effects act to dampen the incentives generated by the differential treatment of the VAT. In such cases, it would be very easy to make reports for their CIT liability that are very different from what is reported for the VAT, given that their VAT declaration generates no tax liability.

It should be noted that this difference in differences strategy only identifies the tax interaction effect if there is no other reason that declared profitability varies across firms that also varies across products and regions in a way that is systematically related to the VAT rate. Such a concern would exist if, for example, the sectors which auditors focused on were different in the border region than in the interior. In particular, there may be stronger audit capabilities along the northern frontier, and this may shift their sectoral focus. Another possibility is if the relative profitability of sectors is different in the different areas in a way that is correlated with the tax rate—given data limitations, we are unable to address this issue at present, and investigating it will have to be taken up in future work.

We aim to test the interaction effects between different taxes a firm faces empirically using two different datasets from Mexico. First, we use data on income tax returns from Mexico's Tax Administration (SAT). These tax returns are extensive, and in particular, contain the variables we will need for our exercise, the firm's profits (sales as well as costs), the product it sells, and the location of the firm.

Then we run the same analysis using data from the 2009 round of the economic census carried out by Mexico's Statistical Agency: *Instituto Nacional de Estadística Geografía e Informática* (National Institute of Statistics and Geography, INEGI). Here, we present estimates using data aggregated to the municipality x product level, and as a result, our estimates are less precise than for the SAT data. However, in ongoing work, we will estimate the same regressions on the INEGI microdata to make the two estimates more comparable.

INEGI goes to great lengths to reassure census respondents that none of the data will be shared with the government, so that businesses are more likely to respond truthfully. To the extent that this is true, we expect that the INEGI data reveals a picture closer to the real activities of the businesses, while the SAT data will contain all the misreporting that firms do as well as any real responses to the tax treatment of their products. We thus expect to find more pronounced and significant results using the SAT data than using the INEGI data.

The dependent variable is a measure of the firms' declared profits which comprise the basis for the two main taxes on corporations, the income tax (*Impuesto Sobre la Renta*, ISR), and the flax tax on business operations, (*Impuesto Empresarial a Tasa Única*, IETU). The taxpayer does not pay the total of both but the higher of the two.

For the SAT data, we construct a measure of the declared profits of each firm, dividing the firm's ISR liability by its declared sales, p. For the INEGI data, we similarly create a measure of the firm's reported profits: sales minus expenses, divided by sales.

We then construct three different dummies for the region a firm is in: $border_r$ is a dummy equal to 1 if a firm is located in an administrative area r that contains municipalities in the border region,[4] $borderN_r$ is a dummy equal to 1 if a firm is located in the border region in the north of the country, and $borderS_r$ is a dummy equal to 1 if a firm is located in the border region in the south of the country. In each case the dummies equal 0 if the firm is located in the interior region.

Next, we construct two different dummies for the taxable status of a firm's output, depending on the taxable status of the goods it predominantly sells: $outputexempt_g$ is a dummy equal to 1 if the firm sells a product that is exempted and $outputzero_g$ is a dummy equal to 1 if firm i sells a good g that is zero-rated. In both cases, the dummies equal 0 if the good falls under the general rate.

Finally, we use the 2008 input-output table for Mexico to calculate two measures of the taxable status of a firm's inputs: the share of the firm's inputs that are exempted from the VAT, $inputexempt_g$, and the share of the firm's inputs that are taxed at the zero rate, $inputzero_g$. The input-output table currently available is at the level of the 3-digit economic sector. There are 79 of these, while the tax status of a good is defined at the 5-digit level. To get around this, we take data from the economic census of 2008 (which the input-output table is based on) to generate the share of each 3-digit sector that goods of the two tax statuses represent.

We then run regressions to test our first hypothesis, that firms which face a higher rate of tax on their sales have stronger incentives to evade. In particular, we estimate equation (1), where $output_g$ is either $outputexempt_g$ or $outputzero_g$, and $border_r$ is either $border_r$, $borderN_r$ or $borderS_r$.

[4] Unlike the INEGI data, the SAT data does not contain the municipality that the firm is located in, but a larger geographic area defined by SAT for taxation purposes. This could cause some imprecision in the estimates as some of the firms that are tagged as being in the border zone are not really in the border zone. The likely direction of this bias is towards zero as we are overstating the number of border firms, and so our "treatment group" of border firms contains some untreated firms.

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

We are interested in the coefficient β_3 on the interaction between the good dummy and the region dummy as our hypothesis predicts that it will be negative. That is, that the difference between firms whose outputs are taxed and firms whose outputs are not is smaller in the border regions where the difference in the tax rate, and hence the incentive to cheat, is smaller.

To test our second hypothesis, that firms just below a break in the production chain find it easier to cheat, we run regressions of the form:

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

where now instead of the taxable status of the sales, we are using the share of a sector's inputs that are untaxed. Again, we are interested in the coefficient β_3 on the interaction term. This time, however, our hypothesis is that it will be positive. That is, firms who find it easier to cheat because more of their inputs are untaxed will cheat less in the border regions where the incentives to cheat are lower because the tax rate is lower.

In order to control more flexibly for the product that the firm makes, rather than using a dummy for the taxable status of the good as a control, we use good fixed effects β_g (at the 5-digit sector level). Thus the analogue of equation (1) is :

$$\beta_{igr} = \beta_g + \beta_1 border_r + \beta_2 (output_g \times border_r) + \varepsilon_{igr} \quad (3)$$

and similarly for equation (2):

$$\beta_{igr} = \beta_g + \beta_1 border_r + \beta_2 (input_g \times border_r) + \varepsilon_{igr} \quad (4)$$

Finally, we combine the temptation effect (our first hypothesis) and the information effect (our second hypothesis) into a single regression to check that one isn't simply picking up the effect of the other and so we run regressions of the form:

$$\beta_{igr} = \beta_g + \beta_1 border_r + \beta_2 (output_g \times border_r) + \beta_3 (input_g \times border_r) + \varepsilon_{igr} \quad (5)$$

We run these regressions for all the permutations between each of the two different measures of the tax status of the goods, and the three different measures of the region of the firm to see where the effects are strongest. Finally, as a further robustness check for the SAT data, we also exclude firms that have zero or negative tax liabilities for both ISR and IETU (i.e., zero or negative profits), as these presumably are not responding to tax incentives (as strongly), and redo the analysis.

B. RESULTS

The results using the SAT data and the INEGI data are first discussed in separate sections below, and then comparisons are drawn between the two. Tables 3.1 to 3.5 below present the results using the SAT data and Tables 3.6 to 3.8 show the results using the INEGI data, estimating equations (3) and (4) above.

SAT DATA

Table 3.1 shows the results of estimating equations (3) and (4) using SAT data with ISR/Sales as the measure of taxable profits. Columns (1) and (4) show results for just the temptation effect, columns (2) and (5) show the information effect and columns (3), and (6) show the results when both are included in the equation at the same time. Columns (1)-(3) and columns (4)-(6) correspond to exempted goods and zero-rated goods, respectively.

Starting with the Temptation Effect, we can see that the coefficients β_3 on $output_g$*$border_r$ are negative as expected. The coefficient in column (1) for exempted goods, for instance, suggest that the difference in declared profits of firms whose products are exempted from the VAT and firms whose products are subject to the general rate is 0. 2% of sales smaller in the border region than in the interior. Comparing this with column (4) for zero-rated goods, this effect seems to be much stronger for zero-rated goods. This may be due to the fact that the input refunds to the zero-rated sector provide an asymmetric incentive to cheat, whereas the general rate firms face the same tax rate on their inputs as on their outputs. The case of the exempt firms is interesting—they would face higher taxes on their inputs in the interior, but no taxes on the outputs, so bear a higher effective tax in the interior than the border region.

Turning to the Information Effect, the coefficient on the interaction term is positive and significant for exempted goods in column (2). This estimate of 0.043 suggests that a firm going from having only taxed inputs to having only untaxed inputs pays 4.3% more of sales in ISR if it is in the border region rather than in the interior. Here looking across columns suggests that in contrast to the temptation effect, the information effect is only present for exempted goods and not for zero-rated goods as shown in column (5). This is consistent with the idea that zero-rated products are still in the tax net, whereas exempted products may have an incentive to slip outside the tax net.

Table 3.2 shows the results of repeating the ISR/Sales regressions using the northern border region and Table 3.3 shows the results from the southern border region. The results show clearly that all the effect comes from the northern border region on the United States border not the southern border region. This may be due to the concentration of economic activity and trade in the North. The results using only firms that pay some tax are also qualitatively similar and so are presented in the annex.

TABLE 3.1 EFFECTS OF EXCLUSION OF SALES FROM VAT ON ISR

	IRS/Sales					
	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	.009***	.005***	.005***	.009***	.008***	.008***
	(.000)	(.001)	(.001)	(.000)	(.001)	(.001)
Output*Border	-.002		-.002	-.007***		-.009***
	(.002)		(.002)	(.001)		(.002)
Input*Border		.043***	.050***		-.003	.009
		(.009)	(.009)		(.004)	(.005)
Constant	.012	.246***	.013*	.035***	.246***	.035***
	(.007)	(.060)	(.007)	(.001)	(.060)	(.001)
Observations	106846	118795	106846	112837	118795	112837
R-squared	.122	.121	.123	.111	.120	.111
F-stat on Sectors	29.6	26.9	29.2	26.1	27.2	26.1
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE 3.2 EFFECTS OF EXCLUSION OF SALES FROM VAT IN THE NORTHERN BORDER REGION

	ISR/Sales					
	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	.008***	.003***	.004***	.008***	.008***	.008***
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Output*Border	-.003		-.003	-.010***		-.011***
	(.002)		(.002)	(.002)		(.002)
Input*Border		.055***	.064***		-.009	.008
		(.010)	(.010)		(.005)	(.006)
Constant	.013*	.246***	.013*	.036***	.246***	.036***
	(.007)	(.060)	(.007)	(.001)	(.060)	(.001)
Observations	106846	118795	106846	112837	118795	112837
R-squared	.122	.120	.122	.110	.120	.110
F-stat on Sectors	29.7	27.0	29.3	26.2	27.3	26.2
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE 3.3 EFFECTS OF EXCLUSION OF SALES FROM VAT IN THE SOUTHERN BORDER REGION

ISR/Sales

	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	.007***	.009***	.009***	.007***	.006***	.007***
	(.001)	(.002)	(.002)	(.001)	(.001)	(.001)
Output*Border	.002		.002	.005		.004
	(.004)		(.004)	(.003)		(.003)
Input*Border		-.021	-.023		.015	.009
		(.019)	(.020)		(.009)	(.011)
Constant	.013*	.246***	.013*	.037***	.246***	.037***
	(.007)	(.060)	(.007)	(.001)	(.060)	(.001)
Observations	106846	118795	106846	112837	118795	112837
R-squared	.120	.118	.120	.108	.118	.108
F-stat on Sectors	29.9	27.4	29.8	26.2	27.4	26.2
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

The results show large tax interaction effects between the VAT and the CIT system. In fact, if anything, these are lower bounds on the true effects. The data we are using is from firms who completed and submitted all the required tax declarations (Income tax, VAT, Payroll) and as such should be considered a selected sample of the most compliant firms.

The annex contains tables that show the results excluding firms that pay no tax from the data. The results do not greatly deviate from those discussed in the text.

We would expect the temptation and information effect to be even stronger amongst less compliant firms and so the overall effect is likely to be even larger.

INEGI DATA

Tables 3.4 to 3.6 show the results using the INEGI data. Again, columns (1) and (4) show results for just the temptation effect, columns (2) and (5) show the information effect and columns (3) and (6) show the results for both at the same time, i.e. where one controls for the other, thereby assuring that one is not simply picking up the effects of the other. Once again, columns (1)-(3) and columns (4)-(6) are split into exempted goods and zero-rated goods, respectively.

Table 3.4 compares firms on the border to firms in the interior. Looking at the Temptation Effect, we can see that the coefficient on Output*Border is negative as expected, but unlike in the SAT data, it is not significant. However, it is of a similar magnitude to the coefficient estimated from the SAT data. The coefficient in column (3) suggests that the difference between profits of firms whose sales are exempted from the VAT and firms that are subject to the general rate is 0.7% of sales smaller in the border region than in the interior. Looking across at column (6) for zero-rated goods, the coefficient is slightly smaller.

Turning to the Information Effect, the coefficients on the interaction terms are positive but not significant for exempted goods (columns (2) and (3)), but negative though insignificant for zero-rated goods (columns (5) and (6)). Column (3) suggests that a firm going from having only taxed inputs to having only exempted inputs, while controlling for the temptation effect, makes 5.4% more profit in the border region than in the interior. In contrast, column (6) suggests that a firm going from having only taxed inputs to having only zero-rated inputs, controlling for the temptation effect, makes 0.6% less profit in the border than in the interior. This suggests that in contrast to the temptation effect, the information effect is again more likely to be present for exempted goods and not for zero-rated goods. However, neither is significant.

Tables 3.5 and 3.6 show the results for firms on the northern border and southern border respectively. The results are qualitatively the same apart from some small differences. On the northern border, the information effect is negative for both exempted and zero-rated inputs, though again neither is significant. On the southern border, however, the interaction effect for exempted inputs is positive, very large and significant, possibly suggesting that there is an observable information effect here, while this in not the case for zero-rated inputs.

TABLE 3.4: EFFECTS OF EXCLUSION OF SALES FROM VAT IN THE BORDER REGION

Profits/Sales

	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	-.014***	-.018***	-.017***	-.014***	-.015***	-.014***
	(.002)	(.003)	(.004)	(.002)	(.002)	(.002)
Output*Border	-.008		-.007	-.004		-.003
	(.007)		(.007)	(.006)		(.006)
Input*Border		.049	.054		-.010	-.006
		(.043)	(.049)		(.016)	(.017)
Observations	126503	155491	126503	141551	155491	141551
R-squared	.888	.907	.888	.914	.907	.914
F-stat on Sectors	1927.3	2618.8	1918.0	2899.6	2631.7	2894.6
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE 3.5: EFFECTS OF EXCLUSION OF SALES FROM VAT IN THE NORTHERN BORDER REGION

Profits/Sales

	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	-.019***	-.018***	-.017***	-.019***	-.020***	-.019***
	(.003)	(.004)	(.004)	(.003)	(.003)	(.003)
Output*Border	-.007		-.007	-.009		-.009
	(.008)		(.008)	(.007)		(.008)
Input*Border		-.045	-.036		-.014	-.002
		(.050)	(.056)		(.020)	(.022)
Observations	124402	152954	124402	139267	152954	139267
R-squared	.888	.907	.888	.914	.907	.914
F-stat on Sectors	1917.5	2611.1	1911.5	2885.3.6	2619.3	2882.2
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE 3.6: EFFECTS OF EXCLUSION OF SALES FROM VAT IN THE SOUTHERN BORDER REGION

Profits/Sales

	Exempt			Zero-Rated		
	Outputs	Inputs	Both	Outputs	Inputs	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Border	-.003	-.019**	-.020**	-.003	-.003	-.002
	(.004)	(.006)	(.007)	(.004)	(.004)	(.004)
Output*Border	-.011		-.007	.004		.006
	(.013)		(.013)	(.009)		(.010)
Input*Border		.264***	.278**		-.007	-.015
		(.079)	(.092)		(.027)	(.029)
Observations	121177	149374	121177	136038	149374	136038
R-squared	.888	.908	.889	.914	.908	.914
F-stat on Sectors	1908.5	2606.5	1905.4	2878.9	2610.8	2876.9
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

Tables 3.7 and 3.8 below summarize the results when both the temptation and the information effects are both included in the same equation, placing the SAT data and the INEGI data along-side one another for easier comparison. While Table 3.7 shows outputs and inputs that are exempted from the VAT (as opposed to falling under the general rate), Table 3.8 shows outputs and inputs that are zero-rated.

Comparing the SAT data with the INEGI data shows that the information effects only tend to be significant using the former. This could be indicative of firms misreporting to the tax administration but not to INEGI, meaning that the information effect has only minor consequences for real economic activity, but large consequences for government revenues through evasion.

Some caveats should be noted in relation to the comparability of the datasets. First, while the SAT data is at the firm level, the INEGI data is aggregated data within a municipality-product group and thus less exact. Second, it is expected that tax compliant firms will be over-represented in the SAT data. These may be more likely to be general-rated VAT firms. In further research, one would want to use a decomposition approach á la Fortim, Lemieux and Firpo (2011) to decompose the comparison between the two datasets into the part that comes from differences in the sample of firms represented in the two datasets and the part coming from differences in reporting to SAT and INEGI.

The results for the temptation effect (using SAT data) suggest that going from the 10% VAT rate at the border to the 15% rate in the interior (in isolation) implies that firms in the interior face a reduced profitability of around 0.7% of sales. Similarly, the estimates of the information effect suggest that declared profitability is affected by 4.3 percentage points. While the INEGI data tends to go in the same direction, the effects tend not to be significant. This can be regarded as evidence of considerable misreporting of profits to the tax administration for CIT purposes compared to “real” profits announced on a confidential basis to the Economic Census.

Unlike with exemptions that open up incentives to cheat with the ISR and reduce the flow of information, the zero-rating regime does not generate the same incentives. Thus the differences in reporting to the SAT and INEGI are negligible. This does not preclude the possibility of fraudulent claims for domestic zero-rating, especially in the case of weaker tax administrations in some regions in Mexico (as would also be the case in countries with weaker tax administrations, such as Pakistan). However, the temptation effect vis a vis the zero-rating regime is likely to be quite high.

TABLE 3.7: COMPARISON OF SAT VS. INEGI DATA (EXEMPTED GOODS)

Profits/Sales

	border		borderN		borderS	
	INEGI	SAT	INEGI	SAT	INEGI	SAT
	(1)	(2)	(3)	(4)	(5)	(6)
Border	-.017***	.005***	-.017***	.004***	-.020**	.009***
	(.004)	(.001)	(.004)	(.001)	(.007)	(.002)
OutputExempt*border	**-.007**	**-.002**	**-.007**	**-.003**	**-.007**	**.002**
	(.007)	(.002)	(.008)	(.002)	(.013)	(.004)
InputExempt*border	**.054**	**.050*** **	**-.036**	**.064*** **	**.278** **	**-.023**
	(.049)	(.009)	(.056)	(.010)	(.092)	(.020)
Constant		.013*		.013*		.013*
		(.007)		(.007)		(.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

TABLE 3.8: COMPARISON OF SAT VS. INEGI DATA (ZERO-RATED GOODS)

Profits/Sales						
	border		borderN		borderS	
	INEGI	SAT	INEGI	SAT	INEGI	SAT
	(1)	(2)	(3)	(4)	(5)	(6)
Border	-.014***	.008***	-.019***	.008***	-.002	.007***
	(.002)	(.001)	(.003)	(.001)	(.004)	(.001)
OutputZero*border	**-.003**	**-.009*** **	**-.009**	**-.011*** **	**.006**	**.004**
	(.006)	(.002)	(.008)	(.002)	(.010)	(.003)
InputZero*border	**-.006**	**.009**	**-.002**	**.008**	**-.015**	**.009**
	(.017)	(.005)	(.022)	(.006)	(.029)	(.011)
Constant		.035***		.036***		.037***
		(.001)		(.001)		(.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

4. TOWARDS A TAX REFORM AGENDA FOR MEXICO AND OTHER COUNTRIES WITH INFORMALITY AND INCENTIVES TO CHEAT

A. MENU OF OPTIONS FOR MEXICO

Mexican tax rates are by and large in line with international practice, and especially in relation with prevailing levels in Latin American countries. The poor revenue performance is instead predominantly due to the "holes" in the tax system that also provide ample opportunities to cheat and evade taxation. The most pernicious holes are ostensibly due to "good intentions"—providing relief to the poor, encouraging investment, or just simplifying tax administration and genuflexion to the altar of sub-national revenue assignment (with REPECOS). Very few of these special provisions meet their objectives, as the analysis shows, and instead create opportunities to evade and cheat.

While Antón, Hernández and Levy (2012) focus on the formal social security system and the formal payroll taxes as sources of informality, in this paper we focus on the tax breaks, exemptions and splits in tax bases as the cause of much of the incentive to evade. Both sets of analysis focus on introducing a clean VAT to maximise the information effect and choke off opportunities to cheat.

The analysis of the interactions shows that the break in the information chain makes it easier to misrepresent profits for the purposes of the CIT. The results from the SAT data show that, while there are probably some fraudulent refunds with the domestic VAT zero-rating system, by far the largest incentives to cheat come from the VAT exemptions that break the information chain, together with possibilities of arbitrage from the multiple rates for the same class of goods.

The patterns from the SAT data are repeated in the INEGI data, although the coefficients are different. A juxtaposition of the results using SAT and INEGI data suggest that there may be strong incentives to "misrepresent" profits to SAT, whereas the innocuous INEGI information may actually be closer to the truth.

The first conclusion that we draw from the analysis is that any reforms to either VAT or CIT must be coordinated. Partial reforms that do not address the information effects on other taxes may end up losing revenues. As the temptation effect continues to apply, it will do so with greater force since the interactions between taxes lead to reduced reported profits. It would be insufficient to try to offset the temptation effects by, say, eliminating the VAT border rates, without also addressing the exemptions in the VAT chain that are leading to the incomplete information effect.

A clear recommendation is to eliminate the special provisions and exemptions in the VAT in order to maximise the information effect. Something of a "temptation effect" may still

remain, as the interactions with the corporate income tax will squeeze profits as the avenues for "cheating" are choked off. Note that the information effect relates to inputs and outputs that form part of the production chain. Thus, goods like unprocessed foods, which are part of final consumption, and also of importance in the consumption baskets of the poor could be left exempt without affecting the information effect. This would also minimize the need for compensatory measures for the poorest households.

Although it is hard to make a case for reduction in corporate tax rates to minimize the burden on firms that have been cheating and evading taxes, there may well be an argument to examine whether the level of the CIT in relation to the rates in the main trading partners is appropriate, especially China, and other Latin American countries. For trade with China, Mexico may consider a convergence of the CIT towards the new international "normal" of around 25%, largely driven by the reformed corporate tax rates in China and other trading partners. This may be important especially if the reforms envisaged also involve the elimination of the maquiladora regime.

However, it still remains to be determined what the overall tax system should look like, taking into account the effects on the poor—for this we refer to Ahmad and Stern (1991) for an overall framework, focussing on the effects on households in various circumstances as well as firms, given a particular revenue target. Further, the effects of tax reforms on the states and subnational governments could be dealt with as was the case for the IETU, with a hold harmless condition, and using the existing sharing arrangements. Consideration could also be given to introducing an "equalization transfer system" for the general-purpose transfers (see Ahmad, González-Anaya, Revilla, and others, 2007), to offset the disequalizing effect of revenue-sharing.

B. FURTHER DEVELOPING THE POLICY AGENDA IN MEXICO

The main lines of reform to consolidate Mexican public finances are through plugging the holes in the "Swiss cheese" tax system, and blocking incentives to cheat and evade taxes. This is to be determined largely through fixing the VAT, and the concomitant reforms that will be needed to constitute a "sustainable" package—recalling that stand alone attempts to do this by both the Fox and Calderón administrations failed.

The first issue is to examine more fully the impact on other taxes and provisions—these primarily involve the maquiladoras and REPECOS. As mentioned, the former issue could be handled through an adjustment of corporate tax rates, and the effects on production decisions should be minimal. With respect to REPECOS, the options have to be explored in greater details.

One option is to assign the revenues from small taxpayers to municipal governments, like a fee for service, but linked to the lowering of the VAT threshold (e.g., by 50 percent). With the improvement in overall revenue generation (e.g., if the C-efficiency goes up to 45%, or around Sri Lankan standards), an additional 3% of GDP, with a 50% share for states would give them an additional 1.5% of GDP—as opposed to virtually no revenues generated by

REPECOS. Municipalities would benefit, and with the greater knowledge of local taxpayers, would make the new business tax work effectively. Together with a recalibration of the property tax (although the cadaster/valuation could be contracted to higher levels)—the lowest level of government would be put in a much better position to better provide local services and be held accountable for results.

The main difficulty remains at the state level—even if more shared revenues are generated over time as a result of the reforms. There is a need for own-source revenues at the intermediate level of government, in order to engender greater responsibility. This could be achieved, for example, through a piggy-back on the ISR, with which states could set the marginal tax rate (with a band). An equalization framework would be needed in order to avoid concentration of resources in the well-to-do states.

It would be necessary to carry out a detailed analysis of gainers and losers, and the identification of appropriate compensation mechanisms. This could include categorical transfers that do not affect labour mobility—e.g., for children and nursing women. This may be more useful than relying on conditional cash transfers on the basis of household fixed assets (Oportunidades) which still has a benefit as a general poverty reduction scheme, but is less useful to compensate tax losses as the affected people are not likely to be the same.

The new framework could be introduced using a hold harmless condition for the states, and phased in over time (as was the case with the 1994 Chinese reforms, as well as the IETU introduction in Mexico in 2007)—see Ahmad et al, 2007; and Ahmad 2010. This would address the political economy considerations that would be needed to get any set of policy options through Congress.

Further work is also needed on the underlying incentive structures—using both INEGI firm-level information to supplement the analysis carried out in this paper; and also SAT data using VAT returns.

Lastly, it should be explored whether carbon tax revenues could be used for "green investments" and more efficient industrial restructuring and if carbon tax and restructuring of the petroleum sector could enhance the scope for contracts/production sharing arrangements with the private sector, while keeping PEMEX ownership and control, as specified under the constitution.

C. EXTENSIONS TO OTHER COUNTRIES WITH INFORMALITY AND CHEATING

A key lesson from Mexico is that, even if a country has a first class tax administration with good information systems, there is little that can be done to raise revenues on the administrative tightening aspects if the tax policy framework is full of holes, and taxpayers have the incentive and ability to evade, or legally engage in tax avoidance. As in some countries in Asia, such as Pakistan, the use of third party information to identify the groups who are cheating is a useful device for blocking cheating. However, if this is not

accompanied by tax policy reforms to establish a level playing field, it is unlikely to be sufficient to raise substantial sums of revenues. Indeed, partial reforms as seen in the context of Mexico, that do not begin to address the information effects, could increase the temptation effects and lose revenues.

In the final analysis, third party information could be useful as a cross-check and an attractive handle to address the issue of effective audit within a strengthening of a regular functional tax administration. But without policy reforms, or if combined with an amnesty, additional revenues are far from guaranteed (Ahmad and Malik, forthcoming).

The situation would be even worse in cases where the authorities in desperation begin to use amnesties (see Baer and Le Bourgne 2008), often without the benefit of tightening the policy framework. This just increases the temptation effects without addressing the information circuits. Also, the prospect of future amnesties creates a further distortion against honest taxpayers, should there be any, and ensures that there would be an increased incentive and opportunity to evade.

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ANNEX: REGRESSIONS USING SAT DATA

EXCLUDING FIRMS WHO PAY NO TAX

ISR/SALES

TABLE A1: ISR REGRESSIONS POOLING BOTH BORDER REGIONS

	Exempt			Zero-Rated		
	Outputs (1)	Inputs (2)	Both (3)	Outputs (4)	Inputs (5)	Both (6)
Border	.008***	.004***	.004***	.008***	.008***	.008***
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Outputs Out*Border	-.002		-.002	-.007***		-.008***
	(.002)		(.002)	(.002)		(.002)
Inputs Out*Border		.054***	.062***		-.005	.007
		(.011)	(.011)		(.005)	(.006)
Constant	.020*	.246***	.021*	.047***	.246***	.047***
	(.009)	(.065)	(.009)	(.001)	(.065)	(.001)
Observations	81131	90562	81131	85987	90562	85987
R-squared	.133	.131	.133	.120	.131	.120
F-stat on Sectors	25.6	23.6	25.3	22.6	23.8	22.6
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE A2: ISR REGRESSIONS IN THE NORTHERN BORDER REGION

	Exempt			Zero-Rated		
	Outputs (1)	Inputs (2)	Both (3)	Outputs (4)	Inputs (5)	Both (6)
BorderN	.008***	.002	.002*	.008***	.007***	.007***
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Outputs Out*BorderN	-.003		-.003	.010***		.011***
	(.003)		(.003)	(.002)		(.002)
Inputs Out*BorderN		.069***	.078***		-.011	.005
		(.011)	(.012)		(.006)	(.007)
Constant	.020*	.246***	.021*	.047***	.246***	.047***
	(.009)	(.065)	(.009)	(.001)	(.065)	(.001)
Observations	81131	90562	81131	85987	90562	85987
R-squared	.132	.131	.133	.120	.130	.120
F-stat on Sectors	25.7	23.6	25.4	22.8	23.8	22.8
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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

TABLE A3: ISR REGRESSIONS IN THE SOUTHERN BORDER REGION

	Exempt			Zero-Rated		
	Outputs (1)	Inputs (2)	Both (3)	Outputs (4)	Inputs (5)	Both (6)
BorderS	.007***	.009***	.009***	.007***	.006***	.007***
	(.001)	(.002)	(.002)	(.001)	(.001)	(.001)
Outputs Out*BorderS	.002		.002	.006		.004
	(.005)		(.005)	(.004)		(.004)
Inputs Out*BorderS		-.022	-.022		.018	.010
		(.023)	(.024)		(.011)	(.013)
Constant	.021*	.246***	.021*	.049***	.246***	.049***
	(.009)	(.065)	(.009)	(.001)	(.065)	(.001)
Observations	81131	90562	81131	85987	90562	85987
R-squared	.131	.130	.131	.119	.130	.119
F-stat on Sectors	25.8	23.8	25.8	22.7	23.8	22.7
(P-value)	.000	.000	.000	.000	.000	.000

Standard errors in parentheses

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