Final report

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The Macroeconomic Benefits of Tax Enforcement in Pakistan*

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Abstract

We study the benefits of improved tax enforcement in Pakistan through simulations of a model of the Pakistani economy. We begin by documenting that the effective tax rate facing firms is increasing in firm size, with firms in the modern sector facing tax rates nearly ten percentage points higher than in the traditional sector. In addition, larger firms face substantially higher tax rates than small firms. Effective tax rates range from 5% for smaller firms to 10% for middle-sized firms and 15% for the largest firms. We then build a two-sector (modern and traditional) model of the Pakistani economy. Simulations of the model show that improvements in tax enforcement could increase revenues (by 8% in our middle scenario) but also reduce informality (by 3.3 percentage points) and increase GDP (by nearly 2%). We contrast this with a one percentage point increase in the tax rate, which increases tax revenues, but reduces GDP and increases the rate of informality.

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1 Introduction

Despite being one of the world's largest and fastest growing economies, Pakistan faces numerous challenges if it is to sustain its current growth rates. Infrastructure needs are enormous, including demands for roads, improvements to the electricity grid, improved health facilities, and continued support for other social programs. The extent to which the government of Pakistan makes these growth-enhancing expenditures is surely of key importance for the nation's growth and development in coming years.

At the same time, Pakistan faces serious challenges in raising revenues to pay for these valuable expenditures. Currently, tax revenues are only around 10 percent of Gross Domestic Product (GDP). This is low relative to more advanced economies, such as the United Kingdom (39 percent), or other rapidly emerging economies (India at 18 percent and China at 28 percent). Without increasing revenue sources, it will be hard to keep up with the expenditure needs of this growing nation of 185 million people. This may in turn put a damper on economic growth.

At the heart of Pakistan's revenue challenges is its large informal sector. According to a recent report by the Government of Pakistan, just 36 percent of manufacturing employment in Pakistan is employed in the formal sector. This means that two out of three Pakistani manufacturing workers works at an establishment that pays no taxes or few taxes. The rest of the economy is quite similar, with crippling rates of informality in agriculture, retail trade, and services more generally. This large informal sector deprives the Pakistani government of badly needed revenues, which in turn limits spending on needed infrastructure.

Given this large informal sector, one broad policy to increase tax revenues would be to increase the budget used for tax enforcement. This would allow the Federal Board of Revenue to crack down on firms that operate informally, and to induce more forms to comply with their tax obligations. Such a policy would certainly raise revenues. Unlike other revenue measures-such as increasing tax rates-it might also lead directly to higher economic growth. This is in addition to the beneficial effects of the use of these revenues, such as infrastructure spending. The reason, in short, is that many firms forgo productivity-enhancing investments in order to stay small and informal. Therefore, inducing them

to become formal might induce them to make investments, increase employment and to grow.

In this paper we simulate the effects of increases in tax enforcement on Pakistan's revenue and level of GDP per capita. We begin by documenting how the effective tax rate varies with firm size. Using data from Pakistan's Census of Industries, we document that the effective tax rate that firms face strongly increases with size. The smallest firms pay virtually no taxes, whereas mid-sized firms pay the majority of their taxes and the largest firms pay the highest effective rates. These empirical findings confirm the importance of the informal sector in keeping overall tax collections low in Pakistan.[1]

We then build a simple model of the Pakistan's economy, and use the model to simulate the effects of increased tax enforcement on GDP and revenues. The model is stylized, and captures the main features of the economy needed to simulate the policy changes, while abstracting from much else.

In the model, heterogeneous entrepreneurs operate firms in either the traditional sector or the modern sector. Firms in the traditional sector face lower effective tax rates, but are limited in their ability to innovate and grow. Firms in the modern sector may innovate and operate at any size, but face the full statutory tax rate. For simplicity, labor is the only input in production. (In this sense our estimates are a lower bound on the cost of informality as we abstract from capital investment that is an additional channel of firm growth and thus economic growth.) In addition, operating in the modern sector requires an investment in productivity, making the firm better able to produce output from a given input of labor. In equilibrium, firms that innovate operate in the modern sector with a larger scale, greater output and higher productivity on average. Those that stay in the traditional sector, and make no investments and end up with lower productivity.

We calibrate the model to match several key features of the Pakistani data. First, just 36 percent of manufacturing employment is in the formal sector. We choose parameter values for the model to match this feature in equilibrium. Second, we match the share of intermediate goods in production, which is around one third. This is important as value added taxes, such as the General Sales Tax of Pakistan, are only made on sales net of

[1] They may also reflect legal exemptions provided to smaller firms.

purchased intermediaries. Finally, we match the average markup of around 25 percent, which is a standard value in the economics literature. While markups are not easy to observe directly, several studies have imputed markups in this range across a wide set of goods.

We use the model to simulate the effects of increases in tax enforcement. We simulate cost reductions of operation in the formal sector (relative to informality) of 5 percent, 10 percent, and 20 percent. These three simulations correspond to plausible outcomes arising from a policy shift to substantially greater enforcement capacity in a developing country like Pakistan. What find that GDP per capita would increase by 0.8 percent, 1.8 percent, and 4.5 percent respectively as a result of these policies. Enforcement leads to higher GDP because it shifts production and employment from the less productive informal sector to the formal sector and allows previously-informal firms to invest in modern technologies. In our simulations, employment in the informal sector declines by 1.6 percentage points, 3.3 percentage points, and 4.5 percentage points, respectively.

Greater enforcement also has two positive effects on tax revenues. First, the Federal Board of Revenue now collects revenues from firms that have shifted to the formal sector. Second, those firms now operate at a larger scale and thus have higher revenues and profits as part of the tax base. Together, these forces increase tax revenues by 3.8, 7.9, and 16.9 percent, in our three scenarios. These revenues could additionally raise productivity by allowing for growth-enhancing investments in infrastructure or other public investments. We emphasize that these additional growth effects are not in our study, nor are the costs of increasing the budget of the Federal Board of Revenue in Pakistan. Measuring these additional effects are beyond the scope of this analysis.

As a frame of reference, we compare these policy changes to an alternative that increases the tax rate by one percentage point. The higher tax rate increases revenues by 9.2 percent, comparable to our middle tax-enforcement scenario. However, increases in tax rates come at the expense of lower GDP growth. We calculate that this higher tax rate induces 1 percent of firms to shift from the formal to the informal sector, which lowers GDP per capita by 0.5 percent (due to the investments forgone by these firms). This compares with an *increase* of nearly two percent in our middle scenario above. The point of this ex-

ercise is to highlight how investments in tax capacity may be a more effective way to raise revenues than increases in tax rates, given the large share of informal employment in Pakistan. Both policies raise revenues, but greater enforcement has the positive side effects of lowering informality, increasing innovation, and higher GDP growth, while increases in tax rates have the exact opposite economic effects.[2]

We conclude that increases in tax enforcement capacity may have substantial growth impacts in the medium run. Increasing enforcement will induce some currently small firms to make productivity-increasing investments and join the modern sector. This will raise GDP per capita directly. Increasing enforcement will also raise revenues, which will likely indirectly increase GDP several years hence. Of course, improving tax enforcement is not costless, and it is beyond the scope of this study to provide a complete cost-benefit analysis. We note that there is evidence that that investments in tax collection capacity more than pay for themselves and in fact have an enormous return on investment (FBR Pakistan, Biannual Review 2015-16). Given this, there is a strong case that the government of Pakistan should further consider increasing tax enforcement capacity as a way to increase growth.

2 Effective Tax Rates Firm Size in Pakistan

2.1 Data

Our data on effective tax rates is calculated from the Census of Manufacturing Industries (CMI). The CMI is a large-scale survey of manufacturing establishments in Pakistan. We use data from the most recent wave of the survey, covering the period 2005-6. The dataset includes a sample of nearly 6,500 manufacturing establishments, with 10 or more employees. This reflects value added of more than 1.2 trillion Rs. Approximately 30% of surveyed firms were in the textile manufacturing industry, 15% in food and beverages, and 13% in the chemical industry.

Establishments were asked for detailed information about their income statements,

[2]For completeness, we also compute the effects of the opposite policy, namely a one percentage point decrease in the tax rate. This reduces informality by 0.9 percentage points and increases output by 0.5 percent, but loses 9.1 percent of revenues.

including revenues, profits, and taxes remitted. The data also includes information about number of employees and fixed assets. The data was collected through mailed surveys, with follow-up visits by Provincial Directorates of Industries.

While CMI data is of relatively high quality, the dataset has a number of drawbacks for our purposes. First, as with any survey, non-response may bias the sample. The CMI response rate was approximately 67%, which is well within the range of survey response rates in industrialized countries. Second, as with any survey, data are self-reported and subject to error. Third, and most pertinent for our study, is the fact that the CMI focuses on large scale manufacturing industries that are officially registered and have employment exceeding 10 employees. By construction, the survey therefore doesn't cover firms in the informal sector or small scale manufacturing, where a substantial share of tax avoidance occurs.

2.2 Effective Tax Rates and Firm Size

For each firm in our sample, we calculate the effective value added tax (VAT) rate as the ratio of total tax remitted by the firm, net of subsidies received, to the firm's value added, as follows:

$$\text{Effective VAT} = \frac{\text{Total Taxes Paid}}{\text{Value Added}}$$

Our focus is on corporate taxation in general, not on the VAT in specific. We note in this regard that this tax rate does not correspond *administratively* to the VAT, but rather encompasses the entire tax burden facing firms. Hence this corresponds to the *economic* concept of value added taxation. By scaling total taxes remitted by the firm by firm profits, we are summarizing the overall incentives for firm growth, regardless of the source of these taxes in tax law.

The Total Taxes Paid term is calculated as the sum of sales taxes, the Federal excise duty, import duties minus export subsidies, taxes paid on inputs, and other taxes. We do not include provincial and district taxes due, as our focus is on the Federal level. Including taxes at lower levels of government doesn't alter our results. Our results are also nearly

identical when excluding subsidies from the calculation (i.e. gross taxes rather than taxes net of subsidies).

We calculate Value Added as total receipts minus the cost of inputs. Total receipts include sales but also other receipts, such as rents, commission work, and transport services rendered to others.

Based on this calculation, a small number of firms face an effective VAT exceeding 100%, with taxes occasionally multiples of total profits. Other firms have negative tax rates. Given the way the variable is constructed, negative tax rates and those exceeding 100% are theoretically possible. We nevertheless exclude observations with tax rates exceeding 100% and those below -20% from our calculations so as to avoid our results being driven by outliers of this sort. In addition, a portion of these observations may reflect measurement error.

Figure 1 divides firms into deciles by size (based on value added).[3] The average firm faced an effective tax rate of 8.8%, similar to total tax revenues as a share of GDP in the tax system of Pakistan as a whole. However, firms face very different tax rates, depending on their size. Firms in the lowest three deciles pay rates below 5% on average, firms in the middle five deciles pay rates just below 10% on average, while the top 10% of firms face tax rates exceeding 15% on average.

[3]Results are very similar when dividing firms by sales or number of employees.

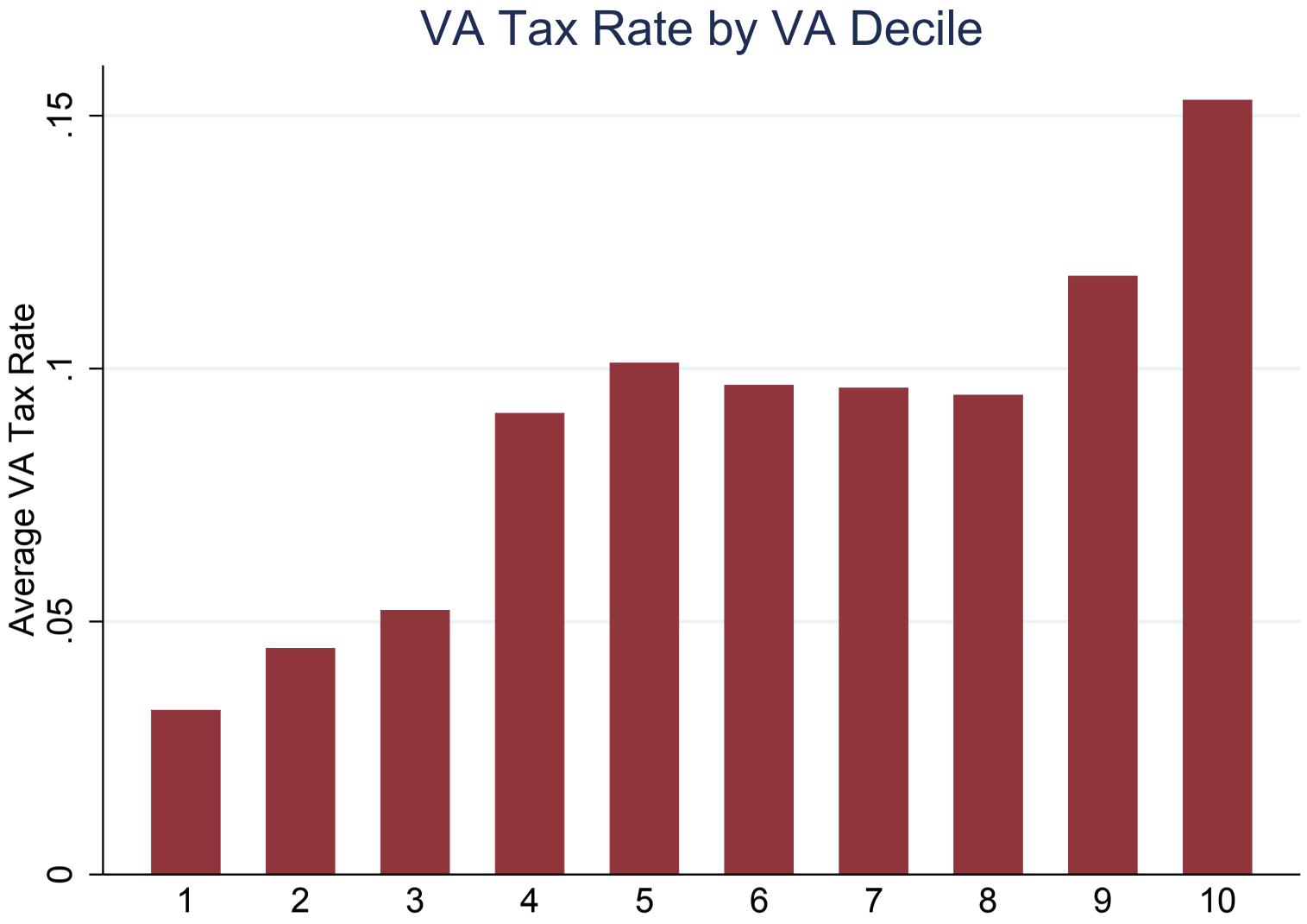

Figure 1: Effective Value Added Tax Rate by Deciles of Firm Size (Value Added)

Note: The figure shows the effective Value Added Tax rate facing the average firm in each decile of the firm size distribution. Firm size is measured by value added.

The evidence shown here indicates very progressive effective VAT rates that themselves may affect firms' incentives to grow. However, the largest tax wedge is between the firms in this sample and those excluded by construction-small firms and firms in the informal sector. A simple extrapolation from Figure 1 would indicate that small firms pay essentially zero tax rates. Firms in the informal sector also pay zero tax rates. There is thus a wedge of close to 10 percentage points on average between the tax rates facing larger firms in the formal sector and smaller and informal firms.

In summary, data from the CMI confirm that there are strong tax disincentives to firm growth. A firm transitioning from the informal to the formal sector will increase its effective tax rate by 10 percentage points on average over the firm lifecycle. Within the formal sector, there are further disincentives to firm growth. Growing from the third to the fourth decile of earnings, firms can expect to see a 5 percentage point increase in their effective tax rate. Growing from the 75th percentile to the 90th percentile, firms can expect a further effective tax hike of 5 additional percentage points. In the following section we outline a simple model that quantifies the economic costs of this tax gradient in the firm size distribution. For simplicity, we will focus on the main wedge between formal and informal firms, but given the evidence shown here this likely understates the full disincentives facing firms that wish to grow.

3 Estimating the Economic Value of Tax Enforcement

In this section, we estimate the economic and fiscal gains from improving tax enforcement in Pakistan. We first briefly outline the model we have developed for this purpose. (Full details and derivations are available from the authors on request.) We then describe how we calibrate the model to features of the Pakistani economy. Readers uninterested in the technical details of the model can skip to the following section, where we report the results.

3.1 The Model

As is common in the macroeconomic literature, we assume that consumers face a basket of consumer goods, with good i denoted by y_i. For simplicity, we assume that consumers only value consumption, but results would be similar if they had broader preferences (that incorporated the value of time, e.g.). Let the elasticity of substitution between individual consumer goods be $\theta > 1$, so that the value to consumers of the entire basket Y is given by

$$Y = \left(\int_0^1 y_i^{\frac{\theta-1}{\theta}} di \right)^{\frac{\theta}{\theta-1}}.$$

Goods are produced by set of firms (of measure 1) indexed by $i \in [0, 1]$. Each firm produces a single variety of consumer good, using labor and intermediate goods as inputs. They combine these inputs using a standard Cobb-Douglas production technology:

$$y_i = z_i \left(x_i^{\alpha} l_i^{1-\alpha} \right), \tag{1}$$

where x_i and l_i are firm i's demand for intermediate goods and for labor. z_i is the TFP of firm i.

Before producing, each firm decides whether to operate in the traditional sector or the modern sector. Operating in the traditional sector is costless, but firms operating in the modern sector must pay a fixed cost c. The parameter c will be central in our analysis, as this cost is net of any penalty firms in the traditional sector face due to tax evasion that is detected. Thus an increase in cost of evasion due to tax enforcement is equivalent to a *decrease* in the cost c of operating in the modern sector.

We assume that firms know their potential productivity in the modern sector before entering into the modern sector, and their productivity in the traditional sector if they operate there. For simplicity, we assume that all firms in the traditional sector have the same productivity and normalize this value to one: $z_i = 1$. Firms' productivity in the modern sector z^i_{mod} is distributed according to a Pareto distribution, which has been shown elsewhere to be a good characterization of the firm size distribution. The Pareto distribution has a CDF F, PDF f, tail parameter γ, and lower bound parameter $M = 1$. Hence entering

the modern sector is akin to an investment in a modern technology (with no uncertainty). The cost of investment is c and the return of the investment is the upgrade in productivity from $z_i = 1$ to $z_i = z^i_{\text{mod}} > 1$.

A sales tax of τ is levied on all firms operating in the modern sector.[4] This tax is then rebated to households as a lump-sum transfer. Let τ_i be the tax rate for firm i; its value is zero in the traditional sector and τ in the modern sector.

Finally, workers work a fixed number of hours, which we normalize to one.

Solving the Model Rather than describing the algebraic detail of the model (available on request), we describe here the general methodology. First, we denote the (consumer) price of good i as P_i. Facing these prices, we allow consumers to choose their basket of goods optimally. This leads to a standard demand function, where consumers' demand for any individual good is decreasing in the price of the good.[5] In addition, once we know the proportions in which different goods are consumed, a CPI index P can be constructed.[6]

Next, firms operate so as to maximize profits. Firms face a two-step decision process. First, they decide whether to operate in the modern or in the traditional sector. Second, they choose the quantity of inputs (labor and intermediate goods) they would like to use, which gives the quantity of production, and choose a price, taking into account the demand function arising from consumer optimization. Note that firms can choose both prices and quantities, as they have some market power, due to the imperfect substitutability of consumer goods.

Beginning from the production decision, this is a standard profit maximization problem. As usual in a model of "monopolistic competition", firms optimally set the (pro-

[4] Results would be similar under a VAT, but model derivations are slightly more involved.

[5] The resultant demand function is standard for the case of constant elasticity of substitution preferences:

$$\frac{P_i}{P} = \left(\frac{y_i}{Y}\right)^{-\frac{1}{\theta}},$$

where P is the consumer price index.

[6] The CPI is given by

$$P = \left(\int_0^1 P_i^{1-\theta} di\right)^{\frac{1}{1-\theta}}.$$

ducer) price as a constant markup over their unit cost of production.[7] To simplify notation, we can normalize the price of goods in the traditional sector to $P_i = 1$. In this case, the price of a good i is given by

$$P_i = \frac{1+\tau_i}{z_i}.$$

Naturally, consumer prices are increasing in the sales tax. In addition, prices decrease in a firm's productivity, as higher productivity allows production at a lower cost. Conversely, it can be shown that profits are increasing in productivity and decreasing in the sales tax rate.[8]

Turning now to the decision of whether to operate in the modern sector, the firm's decision is as follows. The benefit to entering the modern sector is the difference between the profits the firm obtains in the two sectors. The increase in profits may be positive (because of the higher productivity) or negative (because of the higher tax rate). The cost of entering the modern sector is given by c. So a firm enters the modern sector if the increase in profits exceeds the entry cost.[9] Given that firms' profits in the modern sector are increasing in productivity, there is a cutoff productivity level $\bar{z} > 1$, such that all firms with higher potential productivity in the modern sector enter the modern sector and all those with lower productivity remain in the traditional sector.[10] Once we know the cutoff

[7] This is given by

$$P_i = \psi\left(1+\tau_i\right)\xi_i,$$

where ξ_i is the unit cost of firm i given by

$$\xi_i = \frac{1}{z_i}\left[w\left(\frac{\alpha}{1-\alpha}\frac{w}{P}\right)^{-\alpha} + P\left(\frac{\alpha}{1-\alpha}\frac{w}{P}\right)^{1-\alpha}\right].$$

and

$$\psi \equiv \frac{\theta}{\theta-1}$$

is the markup.

[8] Formally, profits are given by

$$\pi\left(z_i,\tau_i\right) = z_i^{\theta-1}\Upsilon\frac{\psi-1}{\psi}\left(\frac{P}{1+\tau_i}\right)^{\theta}.$$

[9] Formally, a firm enters the modern sector if $\pi\left(z_i,\tau\right) - c > \pi\left(1,0\right)$.

[10] Formally, $\bar{z}$ is the solution to the following equation:

$$\pi\left(\bar{z},\tau\right) - c = \pi\left(1,0\right).$$

productivity $\bar{z}$, it is straightforward to calculate the number of firms operating in each sector.[11]

Results and Intuition A first important, but intuitive, result is that the cutoff productivity $\bar{z}$ is increasing in the tax rate τ, so that the number of firms in the modern sector is decreasing in the tax rate in that sector. This is intuitive, because a higher tax rate erodes the benefits of entering the modern sector. Hence informality is increasing in the tax rate. Naturally, informality is also increasing in the cost of operating in the modern sector c.

Given the simple structure of model, with no physical capital in production and with workers working a fixed number of hours, GDP is determined fully by the productivity of firms in the economy. Individual firms' potential productivity in either sector is predetermined, so that overall productivity is determined solely by the number of firms who invest in the modern technology. Hence GDP is decreasing in both the tax rate and the cost to entering the modern sector.

Finally, for a given tax rate, a lower entry cost c increases tax revenues. The lower entry cost induces entry into the formal sector. This increases the tax base by increasing the number of firms in the tax base and increasing firm's investment in the modern technology. On the other hand, an increase in the tax rate has ambiguous implications for tax revenues. While the tax rate increases, the tax base declines. Using a realistic parameterization, corporate taxes in Pakistan are well below the peak of the of the Laffer curve, so that increases in the tax rate increase tax revenues.

These were the main theoretical predictions of the model. In order to give a sense of the magnitude of these effects, we must choose values for several parameters, to which we now turn.

[11] The measure of firms in the modern sector is given by

$$\mu = \left(\frac{1}{\bar{z}}\right)^{\gamma}.$$

3.2 Model Calibration

Table 1 summarizes the model's calibration. A number of parameters were set to standard values in the literature. Specifically, the share of intermediate goods in production is taken as $\alpha = \frac{1}{3}$, as is often assumed in the macroeconomics literature. This allows models to match the labor share in national income in a large number of countries. In addition, we set the elasticity of substitution across goods varieties to $\theta = 5$, so as to match a markup of 25%, which is in the range of estimates of markups in the existing literature.

Parameter Values	Moments	Model	Data
$\alpha = 0.33$	Intermediate Share %	33	33
$\theta = 5$	Markup %	25	25
$M = 1$			
$\gamma = 1.05$			
$\tau = 0.10$	Effective Sales Tax Rate %	10	10
$c = 0.37$	Formal Employment Share %	36	36

Table 1: Calibration of Parameter Values

Two parameters determine the distribution of firm productivity and firm size. We set $M = 1$ due to the assumption that firms in the modern sector are more productive than those in the traditional sector. The parameter determining the width of the tail of the Pareto distribution is taken from the existing literature (Toda, 2017) as $\gamma = 1.05$.

Importantly, the cost parameter c is set so the model matches the share of formal employment in Pakistan (36%, taken from ILO, 2007), when the tax rate is $\tau = 10\%$, the relevant rate from the data in the previous section.

4 Results

As noted in the introduction, Pakistan's revenues are low as a percent of GDP, when compared with high income countries and other rapidly growing emerging economies. Increased public revenues could be used to finance investments in infrastructure and other public investments. We conduct two sets of simulations corresponding to two policies aimed at increasing tax revenues. First, we investigate the effect of an increase in tax enforcement. Second, we study the effects of an increase in statutory tax rates. Importantly, our study looks not only on the revenue implications of these policies, but also their broader macroeconomic implications.

Figures 2 and 3 report the model's results. Figure 2 begins with the effects of an improvement in tax enforcement. The return on tax enforcement–the degree to which improved tax enforcement creates disincentives for firms to operate informally–is beyond the scope of this study. Instead, we investigate the impact of decreases in the overall cost of entry into the modern sector. The cost c in our model is a summary of this cost and is the cost of entry into the modern sector net of the costs of operating in the informal sector, including tax evasion that is detected. Hence in our model an improvement in tax enforcement is equivalent to a *reduction* in the cost of operating in the modern sector.

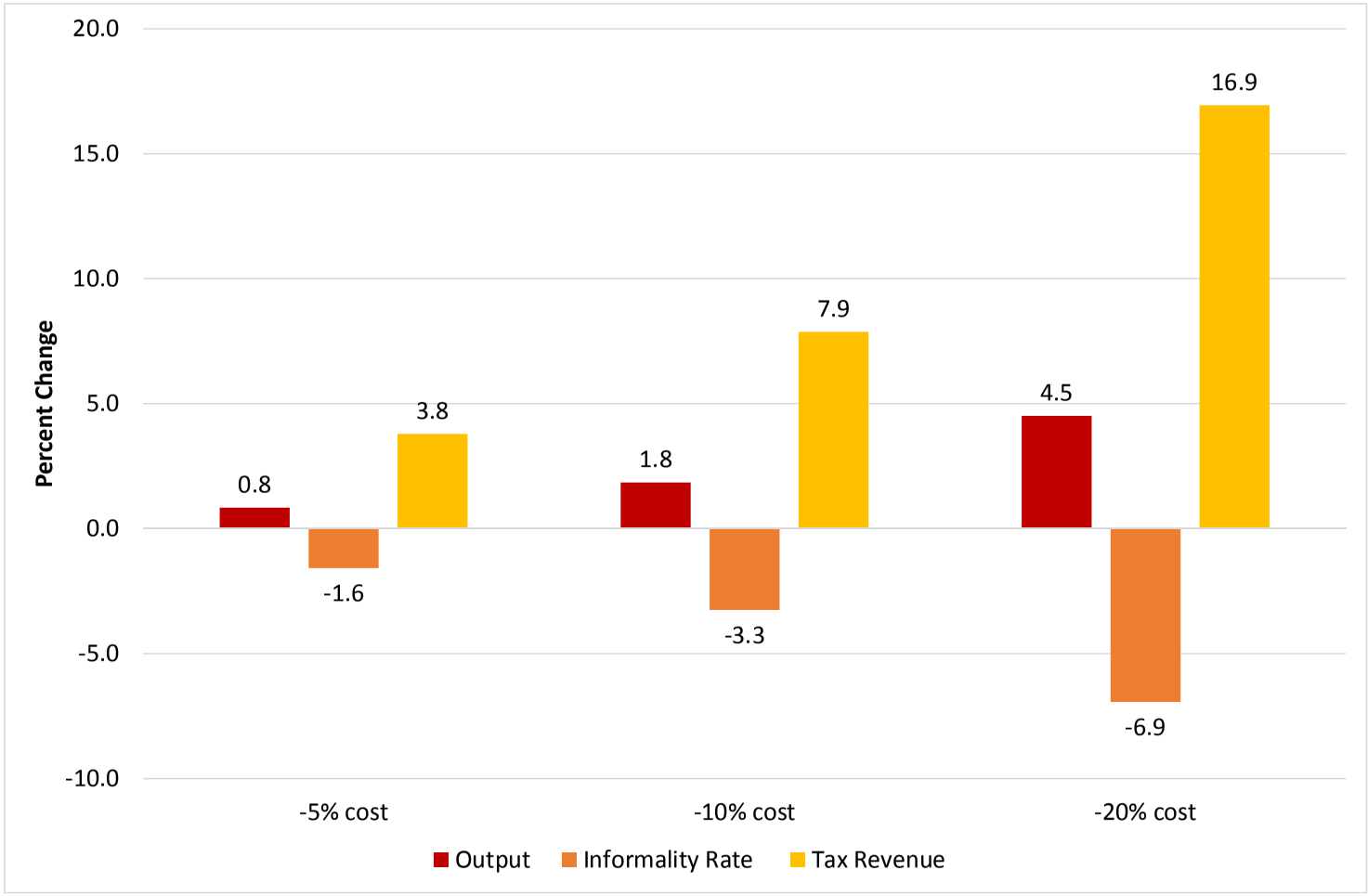

Figure 2: The Effects of Improved Tax Enforcement

Note: The figure shows the effects of an improvement of tax enforcement leading to a reduction in the cost of operating in the modern sector of 5%, 10%, and 20%. The bars for each simulation correspond to the effects on GDP (percent change), rate of informality (change in percentage points), and tax revenues (percent change).

We conducted three rounds of simulations, corresponding to a 5%, 10%, and 20% reduction in the value of c, the cost of operating in the modern sector. Improving enforcement makes operating in the modern sector more attractive, and indeed there is reduction of 1.6 to 6.9 percentage points in the rate of informality in our simulations. This is a substantial change and would raise the number of firms operating in the modern sector by as much as 20%. Entering the modern sector allows firms to invest in modern technologies and operate on a larger scale. Thus firms in the modern sector are more productive and this increases GDP by 0.8% to 4.5% in the simulations. The positive economic effects expand the tax base both by reducing informality and increasing output. Hence, with no change in the tax code, revenues from corporate taxation would increase by 3.8% to 16.9% in our simulations.

These economic and fiscal gains are substantial. But we note that this doesn't capture the full effect. Not only does better tax enforcement increase revenues, but it also increases the revenue efficiency of taxes. That is, if the Pakistani government wished at a later point to increase statutory tax rates, more revenues would be gained from a given tax increase.

Compare these results with those of an increase in the tax rate, without improvements in tax enforcement, reported in Figure 3. We consider a one percentage point increase in the effective sales tax rate. The revenue gains are substantial, with revenues increasing by 9.1%. Note that the current effective sales tax rate is 10%, so this experiment represents a 10% increase in tax rates. Revenue gains are slightly smaller because of the inefficiency loses due to higher tax rates. These losses can be also be seen in Figure 3. The tax hike applies only to firms in the modern sector and reduces the benefit of operating in the modern sector. Accordingly, the rate of informality increases by 0.9 percentage points, causing 2.5% of firms in the modern sector to exit to the informal sector over time. Given that firms in the traditional sector operate on a smaller scale and with less modern technologies, GDP declines by half a percent.

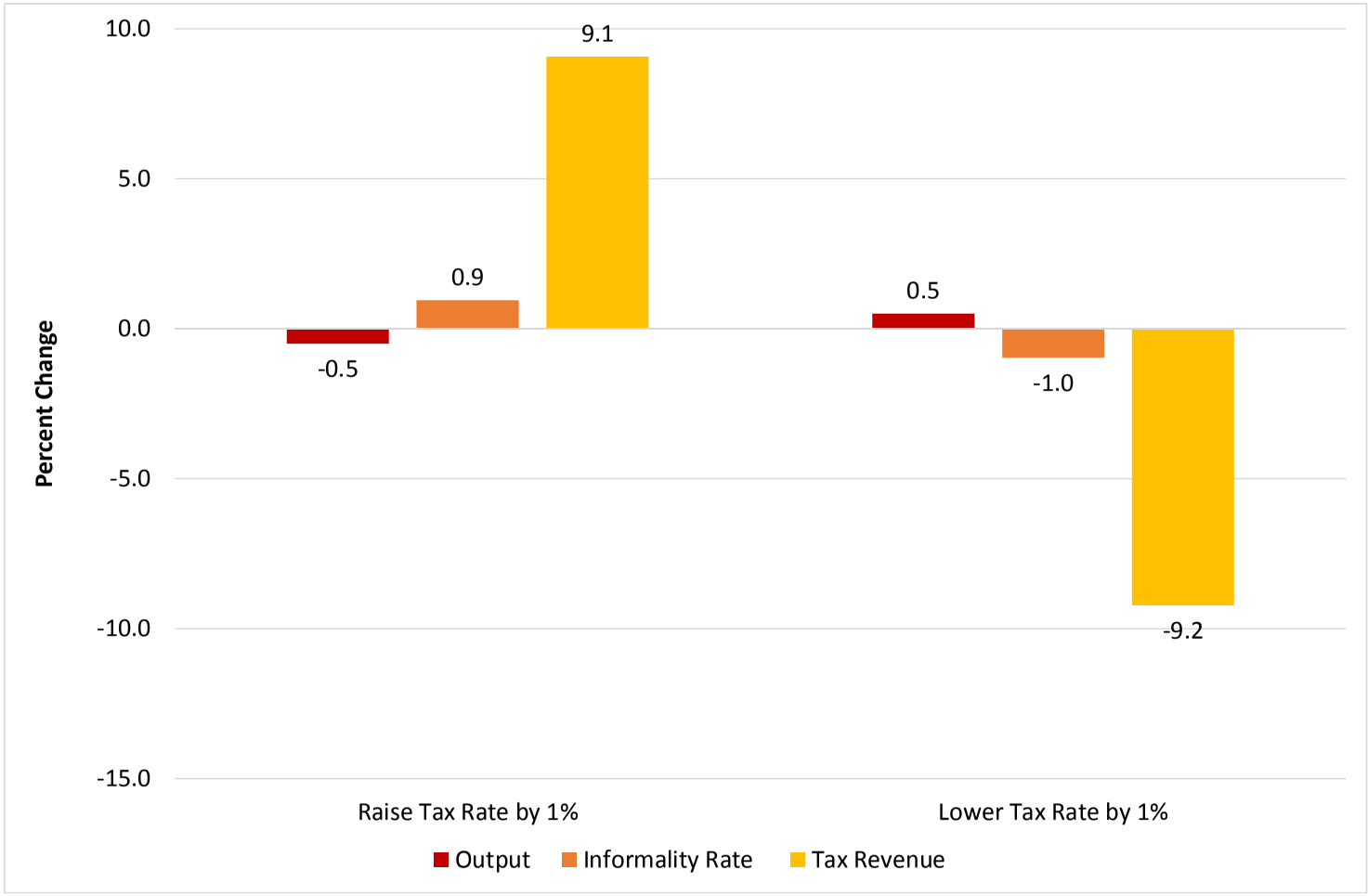

Figure 3: The Effects of Statutory Tax Policy

Note: The figure shows the effects of a 1 percentage point increase and a 1 percentage point decrease in the statutory sales tax rate. The bars for each simulation correspond to the effects on GDP (percent change), rate of informality (change in percentage points), and tax revenues (percent change).

These two experiments have stark differences that highlight the benefits to better tax enforcement. Comparing the middle cost-reduction scenario with the one-percentage-point increase in the tax rate, the two increase revenues by a similar magnitude. But while improved tax enforcement reduces the rate of informality by 3.3 percentage points, the increased tax rate *increases* the rate of informality by 0.9 percentage points. The difference between these two policies represents a 12% reduction in the number of firms entering the modern sector over time. Similarly, while improved tax enforcement leads to a 1.8% increase in GDP, higher tax rates cause a 0.5% decline. The difference between the two policies represents a 2.3% increase in GDP when choosing tax enforcement over statutory tax policy.

Of course, policymakers may choose to cut tax rates rather than increase them. The implications of a one percentage point cut in the sales tax rate are shown in Figure 3. The implications are roughly the opposite of the tax-increase experiment. GDP grows by 0.5% and the rate of informality decreases by one percentage point. But this comes at a cost of a substantial drop in government revenues. These lost revenues would put a strain on Pakistani public finances in a time when investments in infrastructure and other public investments are much needed.

Considering only their fiscal implications, both tax enforcement and increases in statutory tax policy are possible ways to raise revenues. However, the full value of improved tax enforcement becomes glaringly clear when considering the broader macroeconomic implications of these two policies. Tax policy confronts policymakers with a tradeoff: increases in tax rates raise revenues at the expense of other macroeconomic objectives, such as economic growth. In contrast, tax enforcement is a win-win, raising revenues while modernizing the economy and leading to growth.

5 Conclusions

Pakistan has posted impressive growth rates in recent years. In order to continue its high rates of growth, it is imperative that the government of Pakistan continues to fund valuable expenditure projects, such as road and energy infrastructure. At the same time, ex-

penditure projects are limited by tax revenues, and there are clear challenges to raising further tax revenues in Pakistan. First among these is Pakistan's large informal sector, currently estimated at close to two-thirds of overall employment. High rates of informality keep the tax base narrow, and keep revenues low as a fraction of GDP.

In this paper we simulate two broad policy changes that may help Pakistan increase its revenues and raise GDP per capita. The first is to increase expenditures to Pakistan's Federal Board of Revenue and local tax authorities so as to improve tax enforcement. This will raise the cost of operating as a smaller informal business operating outside the tax system. As such, it will encourage firms to make investments that raise productivity and reach their optimal size. We calculate that reducing the relative costs of formal operation by ten percent would raise revenues by around 8 percent, lower informality rates by around 3 percent and raise GDP per capita by around 2 percent. Larger cost reductions would lead to even larger growth in GDP per capita and revenues. We view these as attractive options for policymakers to consider further.

The second broad policy we simulate is an increase in tax rates, without changing the relative costs of informality versus formal operation. A one percentage point increase in tax rates would increase tax revenues by around 9 percent, but at a substantial economic cost. Higher taxes discourage firms from entering the formal sector and undertaking risky but growth-enhancing investments. We estimate that a one percent increase in tax rates lowers GDP by 0.5 percent and increases informality by 1 percent. Cutting taxes would have roughly the opposite effect and spur growth and innovation, but at the cost of lower revenues. Lowering taxes by one percentage point will cut revenues by around 9 percent, which would starve the government from important revenues that could be used for infrastructure and other investments.

We conclude that increased funding for tax enforcement is a far more attractive option than either a tax cut or increase. Greater enforcement serves Pakistan's desire to both raise revenues and GDP per capita in the near future.

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