Tax collection, the informal sector, and productivity

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ABSTRACT

An important determinant of informality in a country is its tax enforcement capacity, which some authors argue further distorts the decisions of firms and creates inefficiency. In this paper, I assess the quantitative effect of incomplete tax enforcement on aggregate output and productivity using a dynamic general equilibrium framework. I calibrate the model using data for Mexico, where the informal sector is large. I then investigate the effects of improving enforcement. I find that under complete enforcement, Mexico's labor productivity and output would be 19% higher under perfect competition and 34% higher under monopolistic competition. The source of this gain is the removal of the distortions induced by incomplete enforcement of taxes. These distortions affect the economy in three ways: by reducing the capital–labor ratios of informal establishments; by allowing low-productive entrepreneurs to enter; and by misallocating resources towards low-productive establishments. As a result, TFP and capital accumulation are reduced, and hence output. I decompose the gains following the guidelines of five leading papers in the literature of resource misallocation across plants. I isolate the effects of pure factor misallocation, distorted occupational choices, capital accumulation, and complementarities. I also study marginal improvements in enforcement and find that there is an inverted-U relationship between the size of the informal sector and output. This reflects the fact that improving enforcement entails a tradeoff: more taxes vs. fewer distortions.

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1. Introduction

Is the informal sector good or bad for an economy? Some authors have argued that firms operating in the informal sector are less regulated and less taxed than firms in the formal sector, which allows them to operate more efficiently. This represents a positive force in the economy (see Schneider and Enste, 2002). In contrast, other authors have highlighted distortions that might arise in the presence of a large informal sector and, specifically, of incomplete enforcement of taxes. For example, Lewis (2004) argues that informality distorts the "natural" competitive process, as informal firms enjoy an "unfair" cost advantage through tax avoidance; and Farrell (2004) reports that informal firms reduce their scale of operation in order to remain undetected by the government, which makes them less efficient.[2]

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[2] Similarly, Levy (2008) argues that informality constitutes an implicit subsidy for low-productive activities; and Bigio and Zilberman (2011) show that when screening of observable inputs occurs, the optimal monitoring strategy of the tax enforcement authority induces firms to distort their input demands.

In this paper, I am interested in quantifying the extent to which distortions associated with the way firms avoid taxes affect output and productivity. To do this, I start with a general equilibrium model of occupational choice and capital accumulation that includes a taxation policy with limited enforcement. In this framework, incomplete tax enforcement is the source of plant-idiosyncratic distortions similar to those studied by Restuccia and Rogerson (2008) and Hsieh and Klenow (2007), among others. Individuals have heterogeneous entrepreneurial abilities (as in Lucas, 1978) and each faces a discrete occupational choice: whether to be a formal entrepreneur, an informal entrepreneur or an employee (as in Rauch, 1991). If formal, the entrepreneur pays taxes; if informal, the entrepreneur faces a probability of being detected that depends positively on the amount of capital hired. Therefore, only small firms are able to evade taxes, because it is more difficult for the government to detect them.

The novelty in this paper is that it connects informal-sector data for a typical developing country with a general equilibrium model in which the consequences of incomplete enforcement of taxes can be studied. I calibrate the model using data for Mexico, an economy where 45% of the employees work in informal establishments. I then investigate the effects of improving enforcement. My main finding is that under complete enforcement, Mexico's labor productivity and output would be 19% higher in the baseline model and 34% higher in a model with monopolistic competition. These gains come, to an important extent, from a novel mechanism through which better enforcement, and therefore higher taxes, increases capital, as the benefits of staying small fall.

A second contribution in the paper is that the gains from full enforcement are analyzed in the context of five leading papers in the literature on resource misallocation across plants. I classify these papers into three groups: (a) Restuccia and Rogerson (2008), which assumes free entry to determine the mass of firms in equilibrium; (b) Gollin (1995) and Guner et al. (2008), which emphasize occupational choices; and (c) Hsieh and Klenow (2007) and Jones (2011), which focus on linkages and complementarities using models with monopolistic competition. The relevance of this particular exercise is twofold: first, it provides a way to decompose the gains from full enforcement; second, it clarifies the differences among the papers above by comparing the results that alternative models provide for the same change in policy. Finally, the paper also makes contributions on the empirical side, which I detail below.

In Section 3, I present the baseline model. Two features of the equilibrium are key to understanding the distortionary aspects of incomplete enforcement. The first is that entrepreneurs with low productivity choose informality, while the more productive ones choose to operate in the formal sector. This occurs because any firm below a certain threshold can avoid detection and thereby operate informally and increase profits by avoiding taxes, at no additional cost. This feature induces two types of distortions: a misallocation of resources to establishments with low productivity and an increase in the number of unproductive entrepreneurs in the economy (i.e., a distortion of occupational choices). The second feature of the equilibrium is that informal establishments optimally reduce their scale to remain undetected by the government. This brings about a distortion in the capital of informal establishments, because the probability of being detected rises with the amount of capital hired. When full enforcement is introduced, these distortions disappear. However, since all entrepreneurs become formal, the tax burden increases for a group of previously untaxed entrepreneurs. At a basic level, improving enforcement involves a tradeoff between fewer distortions and more taxes.

My results suggest that when full enforcement is introduced, the gain of fewer distortions is greater than the cost of more taxes; however, when there are only partial improvements in enforcement, this is not necessarily the case. In particular, the effect of marginal changes in enforcement relies crucially on the size of the informal sector. If informality is very high, marginal improvements in enforcement reduce output because taxes increase for a high-productive set of marginal firms, while the gain from reducing distortions is relatively small. The opposite logic follows when informality is low. Thus, returning to the fundamental question of whether the informal sector is good or bad, the answer is: it depends. When I compute the equilibrium for a range of enforcement levels, I find that there is an inverted-U relationship between output and enforcement. Mexico is at the bottom of this curve where the positive and the negative effects roughly offset each other. If Mexico improves enforcement only marginally, output barely changes; but if Mexico goes all the way to full enforcement, the gains are sizable.

In Section 7, I decompose the gains from full enforcement. I start by obtaining the "pure misallocation effect". To do this, I use a simplified version of the model: a static endowment economy. In this simple economy, the only source of changes in aggregate output is the reallocation of existing resources across firms. When I introduce full enforcement, marginal products are equalized and the allocation of resources improves, which increases output by 2% relative to the benchmark.

Once marginal products are equalized, output can be expressed as a function of four factors: the capital stock, the supply of employees, the mass of firms, and the average entrepreneurial ability. The only way through which aggregate output can now be modified is by changing the levels of these factors. I investigate the effects of full enforcement on the levels of each factor following the guidelines of the five leading papers mentioned previously.

I first bring the model closer to Restuccia and Rogerson (2008) (group "a" above) by shutting down the occupational choice channel and replacing it with a free-entry condition. This exercise teaches us about the importance of the effects of full enforcement on the mass of firms, while keeping the remaining three factors fixed. I find that output and productivity fall to a level that is 92.5% of the benchmark. This occurs due to higher taxes.

Next, I bring the model closer to Gollin (1995) and Guner et al. (2008) (group "b"), which teach us about the importance of occupational choices, while abstracting from changes in capital stock. When full enforcement is introduced, marginal entrepreneurs no longer find it attractive to remain in operation because they are forced to pay taxes and so become employees. Thus, the mass of entrepreneurs falls (which reduces output); however, average entrepreneurial ability and the