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Financial development and the underground economy

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ABSTRACT

We provide a theoretical and empirical study of the relation between financial development and the size of the underground economy. In our theoretical framework agents allocate investment between a low-return technology which can be operated with internal funds, and a high-return technology which requires external finance. Firms can reduce the cost of funding by disclosing part or all of their assets and pledging them as collateral. The disclosure decision, however, also involves higher tax payments and reduces tax evasion. We show that financial development (a reduction in the cost of external finance) can reduce tax evasion and the size of the underground economy. We test the main implications of the model using Italian microeconomic data that allow us to construct a micro-based index of the underground economy. In line with the model's predictions, we find that local financial development is associated with a smaller size of the underground economy, controlling for the potential endogeneity of financial development and other determinants of the underground economy.

1. Introduction

Recent estimates indicate that the underground economy represents 10–15% of GDP in developed countries and 30–40% in developing countries. In some countries, such as Panama and Bolivia, almost 70% of GDP is hidden (Schneider, 2007). Apart from ethical and political concerns, a large share of underground economy is a serious issue for governments and policy makers since it distorts investments, exacerbates income inequality, and hampers growth.[1]

Many factors explain the emergence and size of informal activities. A high level of taxation, a cumbersome legislation, high payroll taxes and labor costs are only some of the many factors which may push firms into informality. Among these factors, the availability of credit and its cost have received little attention. In this paper we study how the choice to operate underground (and to what extent) interacts with financial development. As in Ellul et al. (2012), the starting point of our analysis is that the ability to reveal and signal revenues reduces information frictions and the cost of credit. When firms or individuals operate underground their ability to signal revenues and assets is lower, and the cost of credit higher. As financial markets develop, more efficient intermediaries enter the market and the cost of credit falls, increasing the opportunity cost of continuing to operate underground. In short, financial market development is negatively correlated with the size of the underground economy.

To clarify our arguments, we propose a simple theoretical model in which agents choose between a low-return technology and a more advanced and rewarding technology. Investing in the low-return technology does not require a loan, while the high-return technology requires external funding. We posit that firms can reduce the cost of credit by pledging more collateral, as in Jappelli et al. (2005). Since contracts are not completely enforceable, part of the pledged resources can be lost in the case of a dispute, for example because of judicial costs and inefficiencies. Pledging more collateral, however, is costly because firms must disclose their revenues and assets to financial intermediaries and also to tax officials. Hence, agents choose how much to invest in the two technologies by trading off the reduced financial cost of supplying more collateral against the benefit of hiding revenues and operating with the low-return technology. The choice between the two technologies therefore is also a choice between the underground and the official economy. Financial development reduces the cost of credit and the incentives to operate underground, while making it more profitable to reveal the revenues from high-tech projects.

Our model adds two important insights to existing works. First, we take explicit account of the technological choice that is involved when entrepreneurs choose to operate underground. There is compelling evidence that the underground economy thrives in mature and non-competitive sectors, and that underground firms do not innovate, operate on a small scale, and implement low-return technologies.[2] In our model the choice to operate in the underground

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[1] The underground economy encompasses many activities. Many are legal, many others are criminal and illegal. The extent and variety of these activities is vast. In this paper we refer only to activities that per se are legal, but which are hidden to official statistics and authorities. We use the terms underground, informal, unofficial more or less synonymously.

[2] See Loayza (1996), Batra et al. (2003) and Farrel (2004).

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economy is driven by technological reasons, and the model implies that high-tech firms operate mainly in the formal economy, while low-tech firms operate mainly underground. Second, in our model agents can operate simultaneously in both sectors, because they choose the optimal levels of income and assets to disclose to the tax authorities. This is in line with empirical evidence showing that firms and individuals are seldom completely underground or completely transparent (Johnson et al., 2000).

In the second part of the paper we challenge the model's predictions with empirical evidence, exploiting the variability in local financial development across Italian regions. The data are drawn from the Bank of Italy's Survey of Households Income and Wealth (SHIW) to build an index of the underground economy based on individual-level data. The index measures the level of work irregularity among Italian workers from 1989 to 2006, and ranges from 0 (activity is only in the formal sector) to 1 (activity is completely hidden). We regress this index on an indicator of financial development and other individual and regional variables. The results show that the underground economy is strongly negatively correlated with financial development. We find also that more competitive and innovative sectors display lower levels of underground activity. Most importantly, in our empirical approach we control for the endogeneity of financial development using the indicator proposed by Guiso et al. (2004).

The paper is organized as follows. Section 2 reviews recent literature on the underground economy. Section 3 presents the theoretical model. Section 4 describes our indicator of job irregularity. Descriptive analysis and empirical estimates are presented in Sections 5 and 6, respectively. Section 7 concludes.

2. Determinants of the underground economy

Because of the heavy burden on the economy, many studies have examined causes and consequences of underground activities. It is not easy to provide in-depth and exhaustive explanations for why firms and individuals evade taxes or operate irregularly and underground. High levels of taxation, cumbersome legislation and a tight regulatory system, often considered to be the main determinants of underground activities, provide only partial explanations.[3] Other factors play a role in shaping the underground sector, and among them the role of institutions is likely to be the most relevant.[4] Indeed, institutional failure such as poor contract enforcement, judicial inefficiency, complex and arbitrary regulation reduce the incentive for firms and individuals to reveal their revenues. In a recent work Schneider (2010) finds that the underground economy is rooted in a combination of factors such as a large burden of taxation and social security payments, stringent labor market regulation, poor quality of state institutions, and poor tax morale. The institutional setting can significantly affect the choice of informality because the efficiency of public institutions and the quality of public goods provision are important determinants of the opportunity cost to operate underground. For this reason lack of democratic participation, low level of tax morale, institutional distrust are all factors which affect positively the size of underground economy, see Dreher and Schneider (2010), Teobaldelli (2011), Cerqueti and Coppier (2011). These factors play a major role, and improvements in the quality of institutions might work much better in reducing the size of the underground economy than other measures of deterrence, see Feld and Schneider (2010).

Among the many institutions which have been linked to the underground economy, the degree of financial development has received relatively little attention. Yet informality is associated with a higher cost of credit, which is an important component of the overall opportunity cost to operate underground. To the extent that financial development reduces the cost of credit, it increases the opportunity cost of informality. Some papers explore such relation. Straub (2005) develops a model in which firms choose between formality and informality. Being formal involves higher entry costs but lower penalties for defaulting and lower financial costs since hidden incomes cannot be used as collateral. In Antunes and Cavalcanti (2007) entrepreneurs choose between a formal and an informal sector by trading off higher entry costs and tax obligations in the formal sector against higher financial costs in the informal sector. Pant et al. (2009) explore the relationship between employment, informal activities and financial intermediation. The idea is that formal employment can spur financial intermediation since workers with regular jobs tend to use more intensively the banking system as depositors. In Blackburn et al. (2012) entrepreneurs need external resources for investment and can reduce the level of information costs and the financial outlays by supplying more collateral. Supplying more collateral, however, involves a higher tax burden. Given the financial costs, entrepreneurs choose whether or not to evade taxes and to operate underground. Ellul et al. (2012) suggest that when firms choose accounting transparency, they trade off the benefits of access to more abundant and cheaper capital against the cost of a higher tax burden, and study this trade-off in a model with distortionary taxes and endogenous rationing of external finance.

On the empirical front, some papers study the relation between the underground economy and financial constraints. Dabla-Norris et al. (2008) use a survey of registered firms in 41 countries and find that financial constraints tend to induce informality among small firms but not among large ones. Beck et al. (2010) find that access to finance has a stronger impact on tax evasion for small firms, firms located in small cities, and firms in industries that rely more heavily on external finance. La Porta and Shleifer (2008) find that the underground economy is negatively associated with the availability of private credit and individuals' subjective assessment of their access to credit. Using cross-country data, Bose et al. (2012) find that bank development is negatively associated with the size of the underground economy. Ellul et al. (2012) use microeconomic data from Worldscope and from the World Bank Enterprise Survey and find that investment and access to finance are positively correlated with accounting transparency and negatively with tax pressure. They also find that transparency is negatively correlated with tax pressure, particularly in sectors where firms are less dependent on external finance, and that financial development encourages greater transparency by firms that are more dependent on external finance. Existing empirical studies, however, do not address the issue of endogeneity and the potential reverse causality argument that a large underground economy limits the growth of financial intermediaries.[5]

3. The model

We consider an economy with a large number of banks which lend to a continuum of risk neutral entrepreneurs, denoted by i. Banks have a positive and exogenous cost of issuing a unit of loan, $\bar{R}+\delta \equiv \tilde{R}$, which is the sum of the cost of raising funds, $\bar{R}$, and an intermediation cost δ. Each entrepreneur is endowed with an illiquid asset, A_i, which is uniformly distributed in the interval $[0,\bar{A}]$. The asset (or part of it) can be used as loan collateral. We denote the fraction of A_i disclosed to the bank and employed as collateral as γ_i, with $\gamma_i \in [0,1]$. Hence, banks observe $\gamma_i A_i$ but not γ_i or A_i separately. The fraction of the asset that is hidden, $(1-\gamma_i)A_i$, is not observed by any other agent or hence by government.

Each entrepreneur can undertake two types of investment, High-Tech and Low-Tech projects (HT and LT, respectively). HT

[3] See Friedman et al. (2000), Schneider and Enste (2000), Schneider (2005), Dabla-Norris and Feltenstein (2005), Dabla-Norris et al. (2008).

[4] See Loayza (1996), Friedman et al. (2000), Johnson et al. (1998a, 1998b), Dreher et al. (2009).

[5] Gatti and Honorati (2008) use Italian regional data and find that financial development is negatively affected by indicators of the underground economy.