LEGALISATION COSTS, CONTRACT ENFORCEMENT AND THE INFORMAL SECTOR*

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1. INTRODUCTION

It is known that the informal sector size depends on the development level of a country. Table 1 presents estimates for the dimension of the informal sector of selected countries. In the United States, estimates suggest that the informal sector represents around 10 percent of the official Gross Domestic Product. In Peru, for example, the informal sector is 60 percent of the official GDP, which means that more than a third of this country's total output (including the formal and informal sectors) is not accounted for in official figures.

There is a set of countries, however, that seem to escape this rule. These are developed countries that have an informal sector size comparable to that of less developed countries. Examples include Spain, Greece, Italy and Portugal. In Portugal, for instance, it is estimated that almost a fifth of total national output is produced outside the realm of official accounts.

A first question that one might ask is – how can we measure the informal sector weight in total economy? The literature describes several methods for tackling this issue. For example, Schneider and Enste (2000) describe an approach used in areas with strong industrial activity, which consists of measuring the energy consumed in that area. If one knows the technologies used by the industrial units of the area, based on actual energy consumption in that area it is possible to estimate the expected output. By comparing this figure with the output accounted for in official figures, one is able to estimate the

Table 1

	Informal sector (% of official income per capita)	Official income per capita (in 1999 USD)	Total income per capita (in 1999 USD)
Denmark	9.4	32030	35041
Canada	14.8	19320	22179
Germany	13.2	25350	28696
France	13.8	23480	26720
United States	10.0	30600	33660
Belgium	15.3	24510	28260
Portugal	22.1	10600	12942
Spain	22.4	14000	17136
Italy	26.0	19710	24834
Argentina	21.8	7600	9257
Brazil	35.0	4420	5967
Peru	60.0	2390	3824
Nigeria	76.0	310	546

DATA ON THE INFORMAL SECTOR AND INCOME FOR SELECTED COUNTRIES

Source: Antunes and Cavalcanti (2006).

unofficial output. As should be expected, the methods vary with the activity sector that one is interested in.

The second important question, and the one that we shall address in this study, is – which factors determine the size of the informal sector and the performance of the economy? Authors such as De Soto (1989, 2000) have argued that barriers to activity in the formal sector create the conditions for a large informal sector. Among these barriers, De Soto emphasizes the administrative fees and bribes paid to bureaucrats. Other important factors include the tax burden imposed on firms, the absence or insufficient quality of public services, and the cultural environment.

From an economic viewpoint, the existence of an informal sector might not be deleterious for the efficiency of the economy. After all, if people and firms are willing to operate outside the legal and institutional protection inherent to the formal sector, that is because, operating unofficially, they expect to have larger gains than what they would get if they operated in the formal sector. If the aggregate benefit that all these people and firms get in informal activity exceeds the net benefit that their inclusion in the formal sector would entail, then the economy as a whole will be better off.[1] However, the informal sector distorts the economy in several different dimensions, and this may lead to attempts at reducing it.

One of the distortions is that, by operating in the informal sector, it is difficult for an entrepreneur to use his wealth as collateral for credit. By operating in the formal sector, any entrepreneur will have to pay taxes and bear the cost of entry in the formal sector. However, he will have the great advantage of being able to borrow under legally binding contracts, and presenting his wealth as collateral for credit. Legal protection means that, in the case he wants to renege on his bank debt, he will lose a fraction of his profits as an entrepreneur; this punishment will be larger the larger the level of contract enforcement in the economy. The possibility of borrowing and using collateral increases the potential scale of the entrepreneur's firm and improves the efficiency of the economy.

If, on the contrary, the entrepreneur decides to operate informally, he will not pay taxes or the costs of operating formally. However, his access to credit will be severely limited. In some cases, he might have to resort exclusively to his personal wealth in order to become entrepreneur. This balance between the costs of formal operation and the benefit of easy access to credit will determine the sector the entrepreneur will operate in, as well as the scale of his project.

Another distortion is fiscal. By widening the fiscal base, the average tax burden could be alleviated. Since, as we shall see, the best entrepreneurs operate with higher probability in the formal sector, any reduction in the tax burden would tend to increase the average productivity of the overall economy (including both the formal and the informal sector).

A third distortion is more subtle and has to do with the agents' occupational choice. Before deciding which sector he will operate in, the agent has to decide whether he will be a worker or an entrepreneur.[2] If he thinks that he will have higher income as a worker than as an entrepreneur, given the interest rate, the equilibrium wage rate and the agent's ability as entrepreneur, his choice will be to become a worker. The existence of barriers to become entrepreneur – which give rise to the informal sector – implies that, instead of being entrepreneurs, some agents become workers. This will tend to lower wages (because it increases the labour supply) and the entrepreneurs' costs, thereby increasing inequality in the distribution of income.

This article describes a model economy that incorporates all these factors, namely: i) a formal as well as an informal sector; ii) the possibility that formal firms borrow from credit institutions, unlike informal

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[1] It should be noted that when we think about the informal sector we do not mean the exercise of criminal activities, but rather the exercise of activities that, although outside the realm of legality, could be pursued in the formal sector.

[2] The notion of "entrepreneur" is consistent with self-employed workers, as well as entrepreneurs in the usual sense.

firms; iii) barriers to entry in the formal sector such as administrative costs and payment of bribes to bureaucrats and other agents; iv) endogenous sorting of agents among occupational choices (workers, formal entrepreneurs, informal entrepreneurs) and endogenous determination of the wage rate.

We study how much of the differences in terms of output per capita and informal sector size are explained by differences in terms of barriers to entry in the formal sector and the level of enforcement of legally binding contracts, between the reference economy (the United States) and other economies under study (Southern Europe and Latin America). Our quantitative conclusions allow us to estimate how much the economies under study would gain if their barriers to entry and the level of contract enforcement were changed to the United States level.

We conclude that: i) barriers to entry do a better job than the level of contract enforcement at explaining the observed differences between the United States and Southern Europe in terms of the informal sector size; ii) for developing countries (such as Peru), however, the two factors have comparable importance; iii) the two factors do not explain a large fraction of the observed variation of output per capita across the economies under study.

These conclusions have important policy consequences. One is that, for instance in the Portuguese economy, a large informal sector suggests the existence of large barriers to formal sector operation, which might be explicit (taxes or fees on the creation of new firms) or implicit (delays in project approval, a long lapse of time between legal registration and formal operation of firms, insufficient advantages of formal activity, corruption, etc.). A way to increase efficiency would be to reduce these costs. In a favourable scenario and in the very long run, that would mean the reduction of the informal sector size to 10 or 15 percent, and a reduction between half and a third in the difference between the Portuguese official output per capita and its United States level (which corresponds to a reduction of about a fifth in the difference between the two economies if we consider both sectors). This process would consist, essentially, of a shift of firm activity from the informal to the formal sector.[3]

2. DESCRIPTION OF THE MODEL ECONOMY

Let us consider a small open economy with a large number of agents. Each agent represents a household which perpetuates itself across generations. After living for a given period of time, each agent leaves a successor.

At the beginning of his life, the agent is endowed with a given ability level as an entrepreneur, x, and a personal level of wealth left as bequest by the previous generation, b. The agent's inheritance is determined by his predecessor's decisions, but his level of entrepreneurial ability is random and does not depend on his predecessor's. The link between generations is determined only through inheritance b. In each generation, agents are all born simultaneously, and they all have the same lifespan. Each agent has a utility function given by

$$U(c, b') = c^\gamma (b')^{1+\gamma}$$

where c is lifetime consumption, b' is the bequest left to the next generation, and γ is a parameter between 0 and 1 that defines how much of the agent's lifetime income is consumed or left to the next generation.

Production is done using work and capital. Given the agent's capacity as an entrepreneur, x, his production function will be given by

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[3] For a detailed description of the economic model and the results obtained, see Antunes and Cavalcanti (2006).

$$y(k,n) = xk^\alpha n^\beta,$$

where k is the amount of capital used in production and n is the number of workers hired in the labour market. Parameters α and β lie between 0 and 1 and define the weight of each input in production. In order to have positive profits, restriction $\alpha + \beta < 1$ must hold. The good produced using this technology may be consumed, used as capital, or left to the next generation.

The capital market is organised as follows. First, we admit that financial intermediaries (which we can define as banks) lend money exclusively to entrepreneurs in the formal sector so as to finance their projects. To make things simpler, we shall assume that banks have access to external financial markets at the fixed and exogenous interest rate r, and the intermediation margin is zero. Given that each agent acts in his own best interest, contracts will be designed in a way that entrepreneurs prefer to honour them rather than defaulting. To model such environment, we need to know the agent's income in case of default, as well as when the entrepreneur repays the loan. In the first case, the agent does not pay interest but looses all capital presented as collateral; moreover, he suffers a punishment proportional to the output of his firm net of labour costs. The punishment will be larger the larger the level of contract enforcement imposed by official institutions. In the second case, the agent repays the interest, keeps his capital and is not punished.

We admit perfect mobility of labour across sectors, implying that the wage rate in the formal and informal sectors is the same. Let us designate it by w. The profit net of labour costs of an entrepreneur with ability x investing k is

$$\pi(k,x,w) = \max_n y(k,n) - (1+\tau)wn,$$

where τ is the tax rate paid by the entrepreneur by each hired worker. We assume that the fiscal revenue is used to maintain the infrastructure of the economy.

Each formal sector entrepreneur's income, expressed in end-of-period units of the final good, is equal to

$$\pi(a+l,x,w) - (1+r)(a+l+\varsigma),$$

where r is the interest rate over the entire period, a is the self-financed part of capital using his bequest, l is the loan amount, and ς is the cost of entry in the formal sector, under the form of taxes and legal fees, as well as bribes and other costs incurred in order to operate in the formal sector.

The restriction that it is in the entrepreneur's best interest to repay his loan must ensure that the entrepreneur never chooses to default, meaning that his lifetime income his higher if he repays the loan. Let us call ϕ the fraction of $\pi(k,x,w)$ that the agent looses in case of default – his punishment. This parameter reflects the capacity of authorities to enforce contracts, since the higher its value, the larger the fraction of the entrepreneur's profit that authorities are able to seize. Each agent will have a credit limit given by expression

$$\pi(a+l,x,w) - (1+r)(a+l+\varsigma) \geq (1-\phi)\pi(a+l,x,w) - (1+r)a.$$

The left-hand member of this inequality is the entrepreneur's income if he operates in the formal sector and honours his debt, as we saw. The right-hand member is the income that the agent gets in case he defaults: the first term, $(1-\phi)\pi(a+l,x,w)$, is the portion of profit net of labour costs that authorities are not able to seize after default, and the second, $-(1+r)a$, is the loss of capital given as collateral. Absent from the right-hand member of the inequality are l, since the agent does not repay the loan, and ς, because he switches to the informal sector and does not have to pay the costs of operating in the formal sector. The optimization problem of the entrepreneur, therefore, is to find a non-negative value for

a and *l* so as to maximize is income subject to the restriction of non-default that we have just seen, and to the constraint that self-finance must not exceed inheritance, $a \leq b$. Let us define $V_f(b, x, w)$ as the maximum income of a formal sector entrepreneur with inheritance *b* and entrepreneurial ability *x*, given that the equilibrium wage rate is *w*. Since contracts are self-enforcing, in equilibrium there are no defaults.

The income of an informal sector entrepreneur is given by

$$\pi(a, x, w) - (1+r)a.$$

If the entrepreneur operates in the informal sector, he will not pay taxes or the costs of operating formally. He will not be able to borrow, so the incentive restriction for not defaulting does not apply. Given that the agent must rely solely on his inheritance to start up an informal sector firm, his only restriction is $a \leq b$. Let use designate the maximum income of an informal sector entrepreneur with inheritance *b* and entrepreneurial ability *x*, given that the equilibrium wage rate is *w*, by $V_i(b, x, w)$.

The agent's total wealth will be the value of his inheritance plus his lifetime income, either as an entrepreneur or as a worker. The agent's total wealth, in end-of-period units of the consumption good, will be given by

$$Y = \max\{w, V_F(b, x, w), V_i(b, x, w)\} + (1+r)b.$$

The agent's utility function implies that he will consume fraction γ of *Y* and will leave $b' = (1-\gamma)Y$ to the next generation.

The agent's occupational choice will depend on his pair (b, x) and the equilibrium wage rate *w*. Figure 1 depicts occupational choice in the (b, x) space for a given level of the wage rate. For values of *x* below a certain threshold, $x^*(w)$, the agent will choose to become worker, since his ability is low. Above that value, the agent might work because he has insufficient bequest in order to start a business and obtain a sufficiently high credit limit. The agents with higher ability operate in the formal sector (since they are able to borrow large amounts of resources, thereby exploring all their ability as entrepreneurs). For intermediate levels of ability and moderate or high inheritance, agents might prefer to operate in the informal sector.

3. EQUILIBRIUM

The shape of the distribution of the entrepreneurial ability *x* is an important driver of the final results. In this study we normalise *x* to interval [0, 1] and assume that the cumulative distribution function is $\Gamma(x) = x^{\frac{1}{\varepsilon}}$, where ε is a positive parameter. When the value of is a lot larger than 1, inequality in the distribution of *x* is large, with few agents with very low *x*; when its value is much smaller than 1, inequality is large, with few very good entrepreneurs; when its value is 1, *x* is uniformly distributed. This functional form for the distribution of *x* has been used in the literature because it is simple and has good adherence to data on earnings and wealth.

Given the cumulative distribution of bequests at the beginning of the period, $\Upsilon(b)$, the equilibrium of the economy is defined as a pair $\left(w, \Upsilon'(b)\right)$ of a wage rate and a bequest distribution for the next generation such that:

- All agents do their occupational choices and investment decisions (for those that become entrepreneurs) optimally, according to the rules that we saw.

Figure 1

OCCUPATIONAL CHOICE OF AGENTS
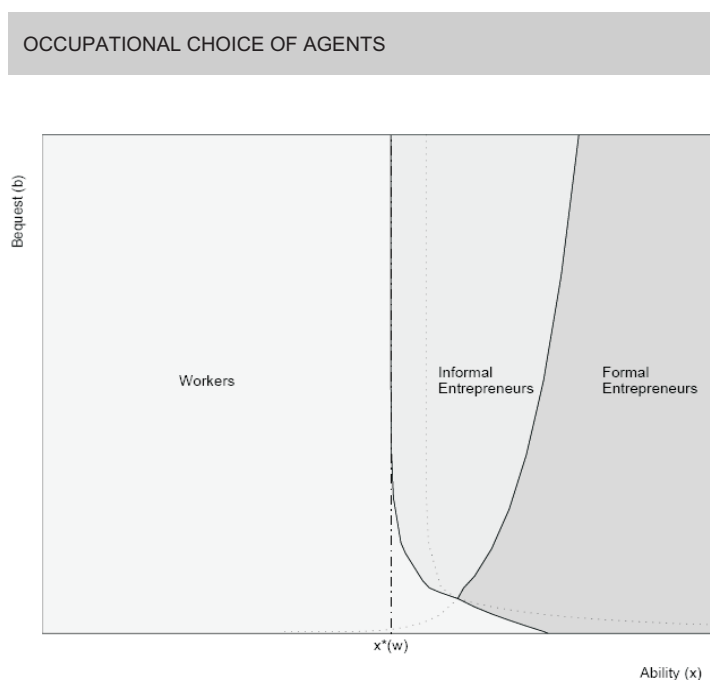
- The wage rate is such that the labour demand (in the formal and the informal sector) equals supply. In mathematical terms, this means that the number of agents in the lightest shaded area of Figure 1 should equal that of the two darkest shaded areas of the figure.

Antunes and Cavalcanti (2006) show that, after some generations, the equilibrium wage rate and the bequest distribution remain unchanged, that is, $\Upsilon'(b) = \Upsilon(b)$, and w does not change from one generation to the other. This does not mean that the members of the same family have always the same inheritance; it means that they might change occupation and income, but in aggregate terms the distribution remains unchanged. Furthermore, they show that such stationary equilibrium is unique, that is, it does not depend on the initial wealth distribution. All the simulations carried out in what follows correspond to the stationary equilibrium.

4. QUANTITATIVE EXERCISES

As a starting point, we choose the United States economy as the baseline, and for that reason we are going to parameterize the model in such a way that it reproduces some key facts of that economy. The most relevant parameters for our analysis are the cost of formal sector operation (under the form of taxes, legal fees, bribes and other implicit costs), the level of contract enforcement, and the inequality parameter in the entrepreneurial ability distribution (respectively, ς, ϕ, and ε). These three values are determined so as to make the entry costs in the formal sector equal to 0.5 percent of the official Gross Domestic Product per capita (a value obtained by Djankov *et al*., 2002), the informal sector size is around 10 percent of the Gross Domestic Product, and the percentage of entrepreneurs in the active population is around 9 percent.[4]

Table 2 presents some values of interest for the American economy, as well as the results of the model when we change some of the parameters. Beyond the informal sector size and the percentage of en-

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4   In the appendix we present the values of all parameters, as well as a justification for the value used.

Table 2

SOME QUANTITATIVE EXERCISES					
	Informal sector (%)	Total income per capita (EUA=100)	Official income per capita (EUA=100)	% of enterpreneurs	Income Gini (%)
Baseline (US)	**10**	**100**	**100**	**9**	**34**
Part (a)					
Change on the punishment in case of default parameter, ϕ					
From the baseline value to:					
Half $(\phi / 2)$	29	79	67	10.8	33
A quarter $(\phi / 4)$	59	69	40	11.5	30
A eighth $(\phi / 8)$	90	60	19	11.6	25
Part (b)					
Change on the regulation parameter, ς					
From the baseline value to:					
Half (2ς)	10.5	99.6	99.2	9.1	33
A quarter (4ς)	11.1	99	98	9.2	33
Eight time (8ς)	13.5	97.8	95.2	9.3	33

Fonte: Antunes e Cavalcanti (2006).

trepreneurs, the table also shows the income Gini index obtained using the model. This is a measure of inequality in income distribution. A low value of the index corresponds to a more equal distribution; a high value identifies high inequality.[5] In part (a) we see that if we lower the level of contract enforcement (all other things equal), the informal sector size increases, as well as the percentage of entrepreneurs in the active population. Although inequality in income distribution falls, official income per capita falls faster. Total income falls but not as fast. How can we interpret these results? What happens is that the credit limit decreases when the level of enforcement (measured by ϕ) decreases. Many agents that were previously operating in the formal sector are forced to switch to the informal sector; others simply become workers. This in turn increases labour supply, thus reducing wages. The increase in the percentage of entrepreneurs means that there are more entrepreneurs in the economy but on average with lower production – although their ability as entrepreneurs remains the same! Income decreases uniformly for all agents, and in net terms inequality decreases.

The impact of an increase in the costs of formal operation, which we can observe in part (b), leads to an increase in the informal sector size and the percentage of entrepreneurs, and to a reduction in official and total output. The increase of the informal sector is expected: if formal operation becomes more expensive, many entrepreneurs substitute it by informal operation. Some agents become workers, thus reducing wages and making it more attractive to operate informally. The net effect is an increase in the number of entrepreneurs.

We can use this model as an economic analysis tool. An interesting experiment is the following. Let us think of the American economy as the baseline and ask the question – for example, what would the United States income per capita be if a given parameter were equal to that of economy *X*, all other things unchanged? The answer allows us to have an idea of the extent to which that parameter is able to explain the observed differences between the American economy and economy *X*. Table 3 contains

[5]   The numbers shown are low when compared to those in the American economy, which lie above 40 percent. However, we are only interested in their variation. On this issue, see Antunes and Cavalcanti (2006).

Table 3

	φ	ς / y	Informal sector (% of official income per capita)	Total income per capita (US=100)	Official income per capital (US=100)
SIMULATIONS FOR THE "SOUTHERN EUROPE ECONOMY" AND PERU					
Baseline (US)	**0.25**	**0.005**	**10**	**100**	**100**
Southern Europe (data)	**0.209**	**0.18**	**24**	**62**	**55**
Model predictions:					
Contract enforcement (φ)	0.209	0.005	13.4	94	91
Regulation (ς)	0.25	0.18	25	94	82
Both	0.209	0.18	31	87	72
Peru (data)	**0.13**	**0.2**	**60**	**11**	**8**
Model predictions:					
Contract enforcement (φ)	0.13	0.005	28	81	68
Regulation (ς)	0.25	0.2	27	93	79
Both	0.13	0.2	63	74	41

Fonte: Antunes e Cavalcanti (2006).

the result of this exercise for two types of economy: a "Southern Europe economy", and the Peruvian economy (which epitomises Latin-American economies).[6] The main difference between these two types of economy is the level of income per capita, while Southern Europe is substantially different from the American economy in terms of the informal sector size.

The baseline economy (the United States) displays an informal sector size of 10 percent of the Gross Domestic Product. The fraction of profits taken from the entrepreneur in case of default that is consistent with American data is 25 percent (that is, parameter φ is 0.25), and the cost of entry in the formal sector is 0.5 percent of the official output per capita (that is, ς / y is 0.005, where y is official income per capita[7]).

We estimate that the Southern European economy has an official income per capita of around 55 percent of the American level. (Including the informal sector, this number is 62 percent.) The informal sector attains 24 percent. The fraction profits seized by authorities, φ, is 0.209, while entry costs, ς / y, are 18 percent. In the case of Peru, the official income per capita is 8 percent of the American level. The informal sector is as high as 60 percent. Estimates for φ and ς / y are 0.13 and 20 percent, respectively.[8] Let us look first at Southern Europe. If instead of using the punishment for default, φ, for the United States we feed in the Southern Europe value, we see that the informal sector increases to 13.4 percent, while official output per capita falls 9 percent. If we only increase the operation costs in the formal sector, ς / y, the informal economy climbs to 25 percent and official output falls 18 percent, which are closer to those observed empirically (respectively, 24 percent and 45 percent). The level of regulation for formal operation does a better job at explaining the differences observed between Southern Europe and the United States than the ability to enforce credit contracts. This suggests that bureaucratic inefficiency and barriers to entry in the formal sector is more acute than access to credit in Southern Europe. Changing both parameters, the model underestimates the informal sector size (31 against 24 percent) and overestimates output per capita (72 percent of the American level in the model against 55

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6   The Southern Europe economy is a synthesis of the economies of Italy, Portugal and Spain.

7   Given the normalizations that we performed in terms of x and the production function, the value of ς is 0.0004.

8   The estimates are calculated for the late 1990s. For values of φ and ς / y, see La Porta *et al.* (1998) and Djankov et al. (2002).

percent in the data). This means that other factors should explain the difference in difference – quality of infrastructure, utilization of technology, education, size of the economy, taxes, etc.

From the previous exercise we see that the model is able to account for a little over half the gap between the Southern European economy and the United States: the gap predicted by the model is 28 pp; the actual gap is 45pp. While other differences between the American economy and Southern Europe certainly exist, even in the context of this model,[9] this result shows that the gains in terms of the official output per capita stemming from the elimination of barriers to formal operation (under the form of bureaucratic costs, regulation costs, and other costs, including corruption) and, to a lesser degree, the efficiency in the enforcement of contracts, might be, in the long run, very large. Starting from the situation where both parameters have the Southern European value, and changing the parameters to the baseline level, the model predicts a rise of 19 pp in the level of the official output per capita as a percentage of the baseline level (from 72 percent of the baseline level to 91 percent, a little less than half the observed gap), and to a decrease of the informal sector from 31 to 13.4 percent. This case is interesting in that it suggests that the costs of regulation and entry in the formal sector encourages people operating in the informal sector to switch to the formal sector, as can be seen by the fact that the increase in total output being just 7 pp (from 87 percent of the baseline level to 94 percent). As we lower the regulation costs, more entrepreneurs will find it profitable to operate in the formal sector. With access to credit, they will be able to expand their projects. This, in turn, will increase labour demand and, consequently, the wage rate. Finally, higher wages might encourage some informal entrepreneurs to leave their current occupation and become workers. The informal sector shrinks through these two effects. In this process, some firms might simply disappear for not being competitive in the formal sector. But most remain competitive and operate legally.

For the case of Peru, a typical Latin America economy with low income per capita and a large informal sector, we see that the model explains fairly well the informal sector size, but again does not account for the total difference to the United States level. The simulation suggests that the contribution of the two factors under study is comparable.

As is usual, one must look at these results carefully. First, the calculations are for a time span of at least 35 years. Second, the parameters whose variations we analysed may capture effects different from formal operation costs and the ability to enforce contracts. Specifically, formal operation costs also capture any fiscal component (other than the payroll tax explicitly modelled) affecting production costs. Correlation between parameters may also occur. For instance, a legal system good enough to enforce contracts (a high ϕ) should also be able to punish officials that ask for bribes, thus reducing formalization costs (a low ς). Finally, other factors not included in the model may interact in complicated ways with the model variables and counter the effects that we obtained.

5. CONCLUSIONS

Using a general equilibrium model with occupational choice among workers, entrepreneurs in the formal sector and entrepreneurs in the informal sector, we show that the differences between some economies in terms of the informal sector size may be explained by differences in the costs of operating formally (under the form of administrative fees, including taxes, bureaucratic costs, bribes and corruption costs) and in the ability of authorities at enforcing credit contracts by punishing defaulters effectively. These two factors, however, do not explain the differences in income per capita observed in the

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9   Beyond the differences between ϕ and ς, other potential differences in terms of the parameters pertaining to taxes, the production function and the ability distribution function, may arise. Separate exercises suggest that, for reasonable values of these parameters, our conclusions are still valid. In the case where the weight of capital in the production function is larger (a less probable, albeit possible, scenario), the model tends to attach more importance to the level of contract enforcement.

data. In the Portuguese case, a reduction in the costs of operating formally to the United States level would originate, in the long run, a reduction in the informal sector size to half the current value, and to a reduction between a third and half the gap between the Portuguese output per capita and that of the United States. These figures, of course, should be interpreted as estimates conditional on a set of working hypotheses.

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Annex

CALIBRATION OF THE BASELINE ECONOMY		
Parameter	**Value**	**Comments**
γ	0.8	Estimated by Laitner and Juster (1996)
β	0.55	Weight of labour in production, based on Gollin (2002)
α	0.35	Weight of capital in production, based on Gollin (2002)
r	1	Yearly real interest rate of 2% (for a 35-year period)
τ	0.33	Tax rate on labour, based on Jones, Manuelli and Rossi (1993)
ς	0.0004	Formalisation costs, based on estimates by Djankov et al. (2002)
ϕ	0.25	Informal sector size of 10%, according to Schneider and Enste (2000)
ε	6	9% of total population are entrepreneurs, based on Quadrini (1999)

Fonte: Antunes e Cavalcanti (2006).