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Optimum Size of the Informal Credit Market - A Political Economy Perspective

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Abstract

Informality of markets is largely perceived as undesirable. Yet, ample evidence suggests that the informal sector contributes substantially in terms of income and employment in the entire developing world. In this paper, tax evaded income is invested in the informal credit market which in turn determines demand for labor in the informal sector and hence income of informal workers. Political authority cares about lost tax revenue due to evasion but is also concerned with politically adverse consequence of lower income of informal labor due to lack of investment in the informal sector. This trade off determines an optimum size of the informal credit market and the informal economy. The size is sensitive and non-monotonic with respect to changes in the tax rate and size of the labor force, depending on the tax revenue effect of tax policy, labor demand political sensitivity of the govt. towards lower wage in the informal sector.

JEL-Codes: D780, H250, H260, H320, I180, O170, P480.

Keywords: tax evasion, underreporting of income, informal credit market, political economy perspective.

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1. Introduction

Informality of markets is largely perceived as undesirable. Yet, ample evidence suggests that the informal sector contributes substantially in terms of income and employment in the entire developing world. In this paper, tax evaded income is invested in the informal credit market which in turn determines demand for labor in the informal sector and hence income of informal workers. Political authority cares about lost tax revenue due to evasion but is also concerned with politically adverse consequence of lower income of informal labor due to lack of investment in the informal sector. This trade off determines an optimum size of the informal credit market and the informal economy.

Informal economic activities are widely prevalent in the developing world. They contribute substantially to GDP as well as employment. For example, India has close to 50% of its GDP and 90% of its employment being contributed by the informal sector. Similar is the situation in many other countries (Bonnet et al. (ILO Report, 2018)). Informal credit market is also a major institution in these countries and that is one of the main reasons why financial inclusion has been a major policy issue (Dev (2006) and Kanbur (2017)).

The developing countries, don't only have large informal sector, but also have very low degree of financial inclusion. Formal credit markets are not inclusive and do not cater to a large section of borrowers/entrepreneurs in these countries. Therefore, in the developing low income countries, financial inclusion continues to occupy the centre stage of public policy. For instance, in India financial inclusion has been one of the major policy goals for the Government of India since the 1950s.¹ However, as per the Global Financial Inclusion (Global Findex) Database 2017, India is the second largest country (after China) in terms of financial exclusion; about 190 people do not have bank accounts; amongst the people having accounts, almost half the accounts are inoperative, hinting at use of cash for everyday transactions. About 65 million account owners in India use either cash or over-the-counter service for (sending/receiving) domestic remittances while over 90 million account holders work in the private sector and get paid in cash. In the informal sector in India, finance constraints impact the possibility of becoming an entrepreneur (Gang et al. (2020)) and micro-enterprises experience a huge mismatch (difference between loan applied for and received) with respect to formal

¹ Various policy initiatives such as nationalization of the Life Insurance Companies (1956), commercial banks (1969 and 1980) and the general insurance companies (1972) and a host of others in the financial inclusion domain over the years, to the more recent ones such the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the Pradhan Mantri Jan Dhan Yojana (PMJDY), have been undertaken by the Government of India.

borrowings, while the same is lower for the informal borrowings, which hint at the reason why these borrowers prefer to borrow from the informal markets (Final Report (2018), SIDBI).

Informal sector cuts into the ability of the government to collect taxes and allocate revenues for public investment, weakening its fiscal power. Informal credit market is likely to be fuelled by tax evaded income which in turn stimulates informal production, employment and wages. Closing down informal sector can only lead to huge unrest and instability by destroying livelihood of millions. At the same time formal credit is unlikely go to the informal segment with lack of collaterals and officially recorded transactions. Thus, informal credit becomes an indirect saviour of poor workers and hence is kind of a second best institution. No political authority can afford to shut down such a segment. This trade-off and associated policy driven by political economic considerations are highlighted in this paper.

Political economic reasons for sustaining informal segment have not been discussed extensively in the literature. Papers by Marcoullier and Young (1995), Marjit (2003), Choi and Thum (2005), Marjit, Mukherjee and Kolmar (2006) , Marjit and Kar (2011) etc. have discussed the interaction between government policies and shadow economy in terms of corruption, using public space for informal income and employment etc. but not about the political economy of public policy regarding the size of the informal credit market.²

Straub (2005) has identified credit rationing as a problem for the tax paying firms operating in the formal sector and more flexible credit supply to the non-tax paying firms in the informal sector. Auroba (2020) discusses optimal tax evasion and inflation with given set of institutions. Marjit, Ghosh and Biswas (2007) deal with reformatory policies in open economies in presence of an informal labor market. Recently Marjit, Mishra and Mitra (2021) have analysed the issue of false litigations and deferred tax payment allured by the presence of higher return on investment in the informal credit market. But none of these papers brings up the question of informal credit market fed by tax evaded income and the broader political economic considerations behind designing regulations to control tax evasion or the size of the informal credit market. We focus on an endogenous governance system or an institutional system which tends to be lenient to the informal credit market.

² Many papers (Bento et al., 2018; Cano-Urbina, 2015; Dobson and Ramlogan-Dobson, 2012; Nguimkeu, 2014; Ordóñez, 2014; and Porta and Schleifer, 2014), of late, have analyzed and highlighted various aspect of the informal sector. However, none has focused on the political economic perspective(s) of policy making, with respect to sustenance and/ or size of the informal sector.

It is a well-known argument that higher tax rate leads to more evasion and hence may lead to a decline in tax revenue. Government internalizes such a cost due to evasion and maybe added problems of bribery and harassment (Marjit, Mukherjee and Mukherjee (2000)). All of these would lead to an optimum rate of taxation. But evaded amount would not lie idle. It would be invested to fetch risk adjusted highest possible return in the informal credit market. That would be good for society that cannot accommodate substantial number of unskilled workers. Thus the social cost of evasion might diminish to some extent and accordingly the political economic incentive of a government to choose an optimal tax would also be affected.

Tax evasion or illegal investment are distortions which can be easily eradicated if the implementation cost of such a policy is negligible. Greater resources in the hands of the government or invested in the formal sector may not readily flow to all who need those for employment and livelihood because of several kinds of imperfections. Huge policy emphasis on microfinance organizations, financial inclusion and collateral free loans speak volumes about strategies in the face of such imperfections. Institutional reforms take time and are unlikely to happen overnight. Electoral politics has to make room for majority of citizens. Thus political economic compromise looks for a non-zero size of informal or shadow economy. If one interprets the informal sector as an added distortion, we are basically in a second best world where things might get better with more distortions than less.

If tax revenue is the only concern of the government for providing public goods, one would expect stringent policies against tax evasion. But in a situation when the evaded amount actually flows into the economy and helps productive employment, for political reasons the government would be less stringent towards evasion and such a society would be characterized by a larger size of the informal sector or informal credit market. In this context we provide results which are quite intuitive.

Higher tax rate may not increase total tax revenue depending on the extent of evasion. In case it does increase tax revenue, the marginal benefit from raising tax revenue will decline and hence the government might be willing to channelize more resources on the margin to the informal credit market to pop up informal wage. In that case higher tax rate will go hand in hand with less stringent measures to contain informal flow of funds. But if tax revenue actually goes down due to evasion, the strategy would be to choke off additional funds.

Comparing two identical economies but one with a greater work force that looks for job beyond formal sector, the incentive to pamper informal credit market will be greater. This

is again a case where along with tax revenue which is a formal source of funding socially productive projects by the government, there is a shadow economy which provides livelihood to many. Hence, government might actively strategize its choice in favour of the informal source of funds.

The rest of the paper is structured as follows. Section 2 presents the model while the next section analyses the informal sector. Section 4 analyses the political economy perspective of policy making while the last one has the concluding remarks.

2. Model

(a). Firms

Consider a firm which has sold goods and earned income of x and is liable to pay tx as tax to the government; we assume proportional taxation (throughout the paper). The firm claims that it has earned $\tilde{x} < x$. Thus, the firm evades tax on $(x - \tilde{x})$ and invests the same in the informal sector at a higher (than formal sector) rate of return, R ; the formal sector offers a return of r . Thus, $R > r$. Stringency of the audit is represented by ρ ; $\rho \in (0, 1)$. If the evasion is detected, then the evader pays a penalty, F , which is a function of the unreported income, i.e., $(x - \tilde{x})$. The aggregate fine function is convex in its argument. Hence, with probability ρ , the firm pays the penalty $F = F\{(x - \tilde{x})\}$; $F' > 0$ and $F'' > 0$.

The maximization problem faced by the tax paying firm is given by,

$$V(\tilde{x}) = \tilde{x}(1 - t)(1 + r) + (x - \tilde{x})(1 + R) - \rho F \quad (1)$$

The FOC with respect to \tilde{x} is the following,

$$\rho F' = (R - r) + t(1 + r) \quad (2)$$

The LHS in equation (2) is an increasing function of $(x - \tilde{x})$ as F is convex in $(x - \tilde{x})$ while the RHS a flat line. F' can be written as $Z = Z((x - \tilde{x}))$; $Z' > 0$ as $F'' > 0$. Thus, equation (2) can be rewritten as,

$$\rho Z = (R - r) + t(1 + r) \quad (3)$$

As shown above, equation (3) determines the optimal underreporting, i.e., $(x - \tilde{x})^*$. The same is depicted below (figure 1).

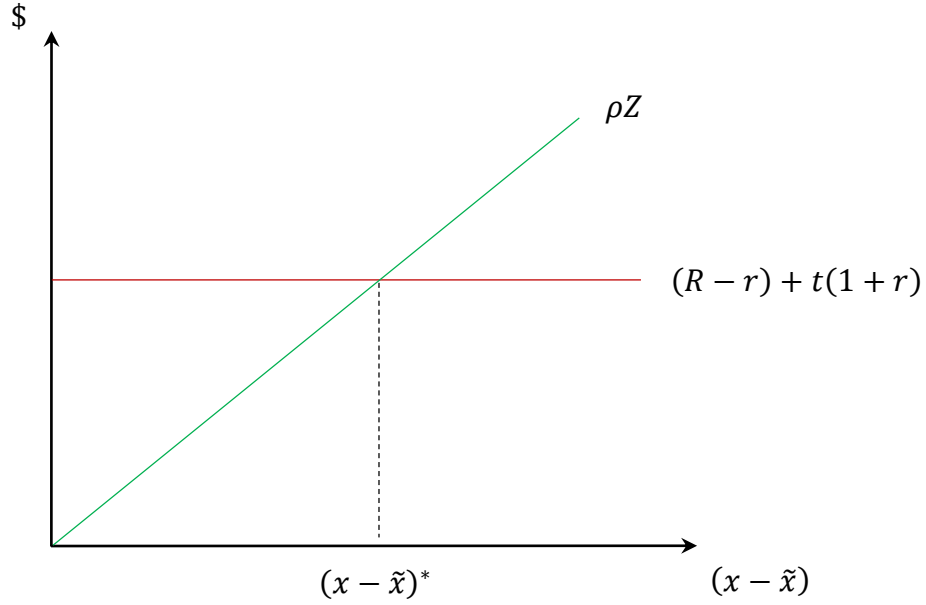


Figure 1: Optimal underreporting of income, i.e., $(x - \tilde{x})^*$

Differentiating equation (3) with respect to ρ gives,

$$\begin{aligned}
 -\rho Z'((x - \tilde{x})) \frac{\partial \tilde{x}}{\partial \rho} + Z((x - \tilde{x})) &= 0 \\
 \Rightarrow \frac{\partial \tilde{x}}{\partial \rho} &= \frac{Z((x - \tilde{x}))}{\rho Z'((x - \tilde{x}))} > 0
 \end{aligned} \tag{4}$$

and

$$\frac{\partial^2 \tilde{x}}{\partial \rho^2} = \frac{Z'((x - \tilde{x})) \frac{\partial \tilde{x}}{\partial \rho} \rho Z'((x - \tilde{x})) - \left\{ \left(-Z''((x - \tilde{x})) \frac{\partial \tilde{x}}{\partial \rho} + Z'((x - \tilde{x})) \right) Z((x - \tilde{x})) \right\}}{\left(\rho Z'((x - \tilde{x})) \right)^2}$$

We assume $Z''((x - \tilde{x})) = 0$. Thus, $\frac{\partial^2 \tilde{x}}{\partial \rho^2} < 0$ and $\tilde{x} = \tilde{x}(\rho)$ is concave.

However, $Z''((x - \tilde{x})) = 0 \Rightarrow F''' = 0$, is not necessary but is sufficient for the concavity of \tilde{x} . As long as Z'' is not strong enough, it will hold.

(b). Government

Clearly, to the extent the firms succeed in tax evasion, the government loses revenue. We assume that the government would want to maximise tax revenue by affecting the

stringency of the audit, ρ . However, the government faces a monitoring cost $M = M(\rho)$; M is assumed to be convex.³ Thus, the government's objective function is,

$$V_g = t\tilde{x}(\rho) - M(\rho) \quad (5)$$

The government, chooses the unique optimum stringency of audit, i.e., ρ^* by equating its marginal benefit and marginal cost, i.e., $t\tilde{x}'(\rho) = M'(\rho)$.

3. The Informal Sector

The underreporting of income and investment of the same in the informal sector by the formal sector firms hampers the government's tax revenue and enhances the informal activity. This far the main objective of the government is assumed to be maximizing tax revenues and curbing the engagement of the formal sector firms in the informal sector by choosing a particular ρ^* . We now proceed to a more general objective function of the government, based on political economic considerations.

The informal sector comprises of the poorer firms which can not avail funds from the formal credit markets due to lack of collateral and hence they represent the demand side in the informal credit market. The unreported earnings of the formal sector richer firms, i.e., $(x - \tilde{x})$, makes up the supply of credit in the informal credit market. As stated above (in section 2), $(x - \tilde{x}) = (x - \tilde{x})(R)$ and $(x - \tilde{x})' > 0$.

Let us assume that the informal sector firms need credit for production of some good (assumed to be the numeraire) and uses labor, L as the only input facing w as the wage rate. Let the production function of the informal firm be given by, $q = q(L)$; hence $q(L)$ is concave.

The firm's (profit maximizing) objective function is as follows,

$$\pi = q(L) - w(1 + R)L \quad (6)$$

We assume full employment in the labor market, i.e., inelastic labor supply, given as \bar{L} , while the supply of credit be given by $\bar{S} + S(R, \rho)$; where \bar{S} is the supply of credit from other sources apart from the richer formal sector firms, and $S'(R) > 0$ where $S = (x - \tilde{x})$. The

³ Monitoring has elements of fixed as well as variable cost. We assume that the fine received by the government covers/cancels out the fixed cost of monitoring, thus we do not include it in the revenue of the government and only consider the variable monitoring cost.

informal sector is credit constrained. Thus, the hiring decision of the firms will depend upon the wage rate and the availability of credit. The total wage bill must equal the credit supply,

$$wL^d(w(1 + R)) = \bar{S} + S(R, \rho) \quad (7)$$

Therefore, the firms' demand for labor will be,

$$L^d(w(1 + R)) = \frac{\bar{S} + S(R, \rho)}{w} \quad (8)$$

In the informal sector, usually, there is very little open unemployment as the workers hold on to any job they can get for survival. However, the wage rate can be pretty low due to the pressure of the labor supply (Marjit (2003) and Marjit and Kar (2011)).

The labor market equilibrium is given by the following equation,

$$w = \frac{\bar{S} + S(R, \rho)}{\bar{L}} \quad (9)$$

Equation (9) determines $R^*(\rho)$. As the supply of credit decreases with ρ , R increases with ρ , i.e., $\frac{\partial S}{\partial \rho} < 0 \Rightarrow \frac{\partial R}{\partial \rho} > 0$.

As R goes up the demand for labor shifts down due to the higher effective cost of employing workers. The demand for labor, as shown below (figure 2), contains the effects of both the credit market (equation (8)) and the labor market (equation (9)).

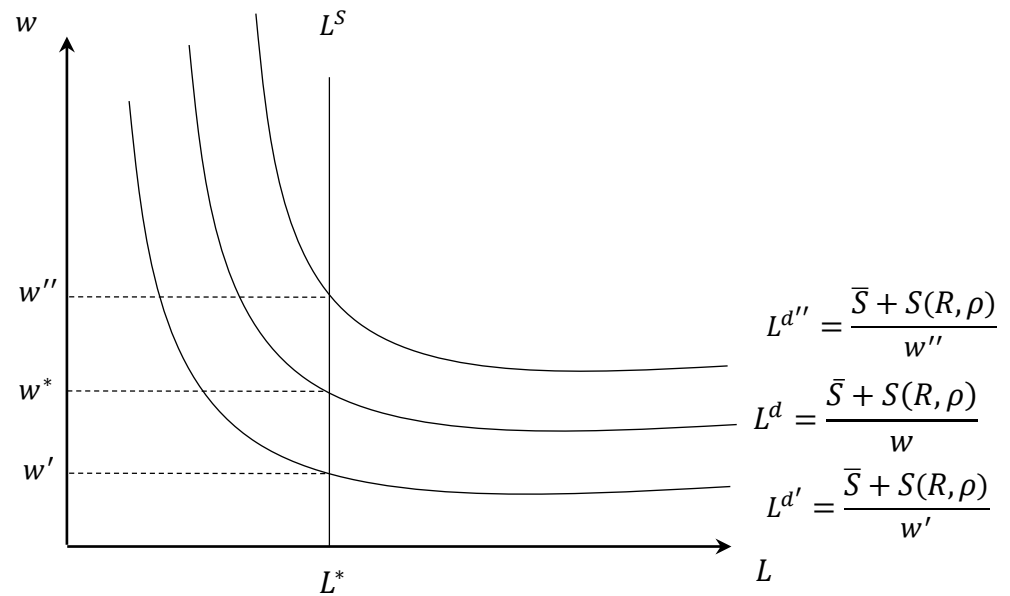


Figure 2: Informal labor market equilibrium

We have shown above that the government can control the flow of illegal funds to the informal sector through the stringency of audit, i.e., ρ . However, ρ also influences the real wages in the informal sector, i.e., w . From equation (9) we have,

$$\Rightarrow \frac{dw}{d\rho} = -\frac{d\tilde{x}}{d\rho} \frac{1}{\bar{L}} < 0 \quad (10)$$

4. Political Economy of Policy Making

We now consider a more general objective function of the government, where it is concerned about the real wages in the informal sector. The Political Economic Welfare (PEW) function of the government is,

$$PEW = U(t\tilde{x}(\rho), w(\rho)) \quad (11)$$

Optimizing the above welfare function with respect to ρ we have,

$$\frac{dPEW}{d\rho} = \frac{\partial U}{\partial t\tilde{x}(\rho)} t \frac{d\tilde{x}}{d\rho} + \frac{\partial U}{\partial w(\rho)} \frac{dw}{d\rho} = 0 \quad (12)$$

Substituting for $\frac{dw}{d\rho}$ from equation (10) and defining $\frac{dPEW}{d\rho}$ as A , the above FOC can be rewritten as,

$$\begin{aligned} A &= \frac{\partial U}{\partial t\tilde{x}(\rho)} t \frac{d\tilde{x}}{d\rho} - \frac{\partial U}{\partial w(\rho)} \frac{d\tilde{x}}{d\rho} \frac{1}{\bar{L}} = 0 \\ &\Rightarrow \frac{U_1(t\tilde{x}(\rho), w(\rho))}{U_2(t\tilde{x}(\rho), w(\rho))} = \frac{1}{t\bar{L}} \end{aligned} \quad (13)$$

where, $U_1 > 0, U_2 > 0, U_{11} < 0, U_{22} < 0$ and $U_{12} = U_{21} = 0$.

$\frac{U_1}{U_2}$ decreases in ρ , i.e., $\frac{d}{d\rho} \left(\frac{U_1}{U_2} \right) < 0$ (as $U_{11} < 0, U_{22} < 0$).

When tax revenue was the only concern of the government (in equation (4)), ρ^* was the optimal stringency of audit. However, when the government is also concerned about the informal wage rate (as in equation (11)), the optimal stringency of audit (ρ_{PE}^*) will be reduced as it has an additional negative impact on the objective function through reduced informal wage rate. At the new optimal ρ , $\frac{d\tilde{x}}{d\rho} > 0$ (equation (4)) while $\frac{dw}{d\rho} < 0$ (equation (10)). Thus, $\rho_{PE}^* < \rho^*$.

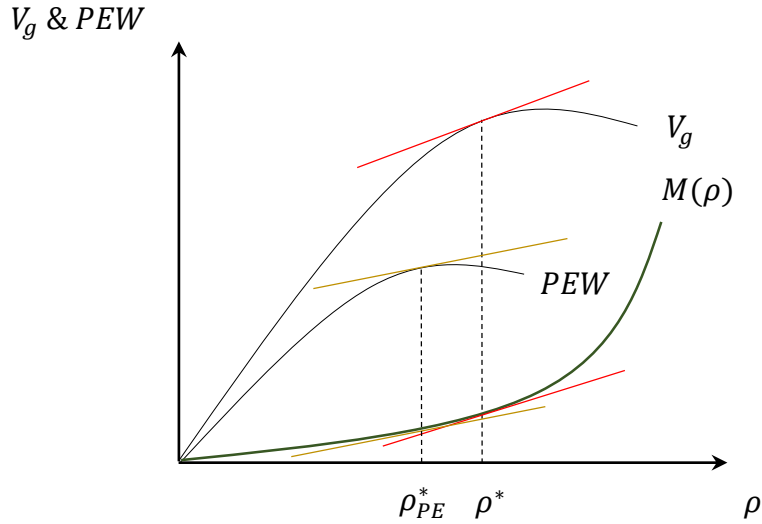


Figure 3: Optimal stringency(ies) of audit, i.e., ρ_{PE}^* and ρ^*

Proposition 1: *In presence of the informal sector, the optimal ρ decreases, i.e., $\rho_{PE}^* < \rho^*$.*

Proof: See the above discussion and figure 3.

We know that at the unique optimum $A = 0$ and $\frac{dA}{d\rho} < 0$ as $\frac{d}{d\rho} \left(\frac{U_1}{U_2} \right) < 0$. Thus, $A(\rho)$ is a negatively sloped graph with respect to ρ cutting the X – axis at ρ_{PE}^* as shown below in figure 4.

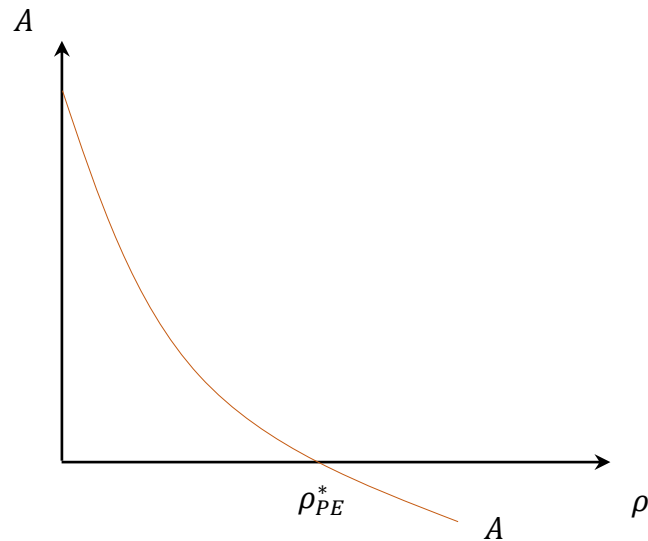


Figure 4: Relationship between A and ρ

As defined above,

$$A = \frac{U_1(t\tilde{x}(\rho), w(\rho))}{U_2(t\tilde{x}(\rho), w(\rho))} - \frac{1}{t\bar{L}}$$

Thus,

$$\frac{\partial A}{\partial t} = \frac{U_{11}\left(t\frac{\partial \tilde{x}}{\partial t} + \tilde{x}\right)}{U_2} + \frac{1}{t^2\bar{L}} \quad (14)$$

Given ρ , $\frac{\partial A}{\partial t} \leq 0$. If $\frac{\partial A}{\partial t} < 0$, given ρ , A will decrease and the curve will shift to the left, thereby reducing the optimal ρ , i.e., ρ_{PE}^* . However, the opposite would happen if $\frac{\partial A}{\partial t} > 0$, given ρ .

If tax revenue does not change when t increases, \tilde{x} must fall given ρ (equation (2)). $\frac{U_1}{U_2}$ does not change but $t\bar{L}$ rises and hence A goes up (equation (13)). A shifts to the right increasing the optimal ρ , i.e., ρ_{PE}^* . When there is no “tax revenue effect,” higher t for the same ρ means that the marginal cost of increasing the ρ is lower. Thus, higher t implies higher ρ . If tax revenue goes up, U_1 will fall and if this fall is substantial, A will fall and resultantly, ρ will fall. Similarly, if tax revenue falls, U_1 will increase, and ρ will increase. The lesson here is about the Laffer Curve. For low tax rates, a rising tax rate will increase tax revenue and there is a chance that with a rise in t , ρ will fall and informal credit market will be encouraged because misreporting is not that bad for revenue, but good for political benefit via expansion of the informal credit market. However, for higher tax rates, a further rise in tax rate will reduce tax revenue and government would be careful not to encourage further credit flow into the informal sector.

Differentiating equation (13) with respect to t gives,

$$\frac{d\rho}{dt} = \frac{-\bar{L}(U_{11}t\tilde{x} + U_1)}{\frac{d\tilde{x}}{d\rho}\left(U_{11}t^2\bar{L} + \frac{U_{22}}{\bar{L}}\right)} \quad (15)$$

$$\frac{d\rho}{dt} \geq 0 \text{ for } U_1 \geq -U_{11}t\tilde{x}.$$

Higher tax rates may not necessarily enhance tax revenue, depending upon the extent of tax evasion. Hence, the government’s response to the flow of funds to the informal credit market would vary. In case the higher tax rate does increase tax revenue, the government may be lesser stringent and channelize resources on the margin to the informal credit market to

increase the informal wage as the marginal benefit from increased tax revenue would decline. Thus, in this case, higher tax rate would be accompanied by lesser stringency to contain the informal flow of funds. However, if the tax revenue decreases due to evasion, the government would choke off the informal flow of funds by choosing to be more stringent.

Proposition 2: *As the tax rate increases, the level of optimal ρ depends upon the tax revenue (depending upon the extent of tax evasion) and the informal wage rate.*

Proof: See the above discussion and figure 5.

However, when \bar{L} is high, it has a significant impact on the political outcomes, thus, the governments usually cannot ignore the informal sector. For high levels of \bar{L} , there is a political need of increasing w , as it is a good political strategy for reelection to office. Therefore, in countries with a substantial labor force looking for a job in the informal sector, the government will usually go for a larger informal credit market as the initial w usually is quite low. However, in our model, \bar{L} affects optimal ρ in an interesting way. With higher \bar{L} , the RHS of equation (13) declines. The numerator of the LHS of equation (13) does not change since $U_{12} = U_{21} = 0$, but the denominator will change since $U_{22} < 0$. Thus, the LHS of equation (13), i.e., $\frac{U_1}{U_2}$ will also fall due to the increase in U_2 . U_2 must rise to match the decline in the RHS of equation (13), since as stated above, $\frac{U_1}{U_2}$ decreases in ρ , i.e., $\frac{d}{d\rho} \left(\frac{U_1}{U_2} \right) < 0$ (as $U_{11} < 0, U_{22} < 0$). Thus, $\frac{U_1}{U_2}$ will rise if ρ falls. Therefore, larger \bar{L} implies lesser stringent policy (lower optimal ρ). However, the ultimate effect of greater \bar{L} on optimal ρ would depend upon the political sensitivity of U_2 . If U_2 is lesser sensitive politically, then it will not rise much. But, $\frac{U_1}{U_2}$ must fall to match the decline in the RHS of equation (13), therefore, ρ will go up.

In the formal sector workers usually get contracted wage rate with fringe benefits as per government regulation, such as the minimum wage etc. The residual labor which does not get employment in the formal sector is employed in the informal sector. This is discussed in detail in Marjit (2003) and Marjit and Kar (2011). More employment in the formal sector will mean that government policies will be much stricter against informal credit market as \bar{L} will be low in our model. Thus, the developed countries, with substantially greater proportion of employment in the formal sector, would exhibit a much smaller sized informal credit market.

Proposition 3: *Higher \bar{L} elicits different political economics re/actions $\left(\frac{d\rho}{d\bar{L}} \gtrless 0\right)$ depending upon how critical sustaining the incomes of the informal workers is in the minds of the politicians.*

Proof: See the above discussion.

Note that, however, if \bar{S} , the exogenous part of credit inflow into the informal sector, is greater, w will be higher given the flow due to tax evasion, i.e., $S = (x - \tilde{x})$. This will increase w and will reduce the need for a high ρ .

Proposition 4: *Greater \bar{S} reduces the need for a high ρ .*

Proof: See the explanation above.

5. Concluding Remarks

Despite generally being perceived as undesirable, the informal sector, in the developing world, is an influential institution and the governments cannot afford to ignore it. Its contribution towards the GDP and employment is very significant. Both the contribution(s) of the informal sector and the electoral politics in the developing world are important factors influencing the political economy of policy making. We bring these together in this paper. We show how the optimal policy of the government is framed in presence of the informal sector. Specifically, with respect to tax revenue and the flow of illegal funds to the informal sector, we show how the government may balance the resources at the margin, compromising perceived desirability of a policy that discourages informal activities. Such a strategy depends critically on the labor income generation is in the informal sector which in turn depends on informal credit market stimulated by tax evaded income from the formal sector. We pinpoint the trade-offs and the factors that influence political decision and hence the optimal size of the informal credit market.

Our work can be extended by bringing in the formal sector credit, wage and employment in the picture and the issue of credit policy of the government. Such a structure would include the credit policy as another dimension of political-economic decision making. That financial sector policies would be influenced by electoral politics, opens up interesting analytical possibilities.

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