Recession in the Skilled Sector and Implications for Informal Wage

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Abstract: Global recession is likely to hit the skilled sector or the so-called white goods, white collared sector in a typical developing economy. In this paper we try to analyze the impact of such an event on informal wage as the vast majority of the workforce in the developing world is employed in the unorganized or informal sector. In particular, we demonstrate the analytical possibility that a recession in the skilled sector will actually increase real informal wage.

Keywords: Recession, skill, capital-labor ratio, informal wage, general equilibrium

JEL Classification: E31, J21, J31

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1.   Introduction

A large body of literature has been devoted to the analysis of the informal/ unorganized sectors in developing and transition economies all around the globe. Issues pertaining to absolute and relative informal wage, employment, output and productivity growth in unorganized enterprises, the formal-informal interactions in product and factor markets have generated huge amount of research in recent years. Interested readers may have a look at Funkhouser (1997a,b), Fields (1990), Goldberg and Pavcnik (2007), Kar and Marjit (2009), Maiti and Marjit (2008), Marjit and Kar (2009a, b, 2008, 2007), Marjit and Maiti (2007), Webster and Fidler (1996), etc., for country level empirical studies for South America, Asia, Africa and a few transition countries in Europe.

One query at a theoretical level has been to explore whether market oriented reform process yields benefits for poor informal workers. Studies by Kar and Marjit (2009), Marjit (2003), Marjit and Beladi (2008), Marjit, Kar and Acharyaa (2007), Marjit and Kar (2009, 2004, etc), deal with this and related topics. Marjit (2003), Chaudhuri and Banerjee (2007), Marjit, Kar and Beladi (2007) and Marjit and Kar (2009)[1] have used functional general equilibrium structures where unskilled workers, if deprived of a job in the formal sector at a relatively high administered or negotiated wage, fall back on the informal sector where wage is market determined. These papers use the labor market framework developed by Carruth and Oswald (1981) and Agenor and Montiel (1996). It is observed in most country studies that the informal sector is the largest employer of relatively unskilled workers when skill-biased technological changes in production of manufactured commodities and services have always facilitated income and employment growth for the highly skilled. In fact, the increased requirement of technical expertise in

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[1] Also see, Chaudhuri (2003), Chaudhuri and Mukherjee (2002), etc.

the work place has not only created an entry barrier for those who are not equipped with the same, but have also excluded many senior level workers previously considered productive at the firm level.[2] In addition, the rising skilled wage has been responsible for a lower aggregate demand for skill, with many more workers settling for contractual and irregular job market profiles generally in the domain of unorganized sector. The impact of such palpable changes is undoubtedly felt on the informal sector comprising largely of non-traded goods. Using such structures where labor mobility between the formal and the informal sector is substantial, several policy questions have been discussed in the above-mentioned papers.

In this paper we follow a similar framework to analyze the consequences of a drop in demand for a product manufactured with skilled labour and capital on the *informal real wage*. This tries to answer the question whether recession in the skilled good sector is harmful for the unorganized or informal workers. The paper has quite a few features consistent with the stylized features of a developing country.

First, keeping in mind that large portion of the informal sector produces non-traded goods we argue that a recession in the skilled good sector has both supply and demand side impacts on the informal non-traded sector. It is possible that capital relocation from the skilled sector due to recession actually increases production in the formal unskilled sector pulling labor away from the informal sector. At the same time, demand squeeze has a negative impact on the informal sector. We identify the key parameters, which will dictate the resulting movements in informal wage. Such a recession may in fact raise the informal wage, improving the real income of unskilled workers in both the formal and the informal sectors. In a subsequent exercise, we show that if the output of the informal

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[2] See Card and DiNardo (2002) for example.

sector is also tradable in the international market, our conjecture on informal wage would still hold owing to a supply side shock alone. Contraction in the skilled sector in the extended framework is corresponded by growth in the unskilled sector and wage increments in the informal sector, although the latter two sectors do not undergo any price or productivity shocks. In a wider context, this would imply that countries with considerably large share of medium skilled and unskilled or informal sectors might not suffer too much from high-end global crisis of the nature described above.

Section 2 describes the first model, section 3 offers the extension and results and section 4 concludes.

2. Non-Traded Informal Commodity

Let there be three sectors in the economy: *X* produced with skilled workers (*S, return* w_S) and capital (K_1, return *r*) specific to the formal sector; *Y* produced with unskilled labor (*L,* return $\overline{w}$) and K_1; and *Z* produced with *L* (return *w*) and capital of a different (informal) variety (K_2, return *R*). Apparently, sectors *X* and *Y* enjoy benefits receivable in formal labor markets and or wage protection from organized labor unions. As it is observed in the technologically advanced sectors in any country, the highly skilled workers receive a market-determined wage usually set at very high levels. Production functions face diminishing returns to factor inputs and the sectors exist in competitive market conditions. Equations (1-3) represent competitive market conditions, where per unit cost is equal to per unit price of the commodity in question; a_{ij} 's are input-output coefficients and P_j 's (*j=X, Y*) are world commodity prices that the small

country in question takes as given. Equations (5-7) are full-employment conditions for factor inputs and equation (8) offers the equality between demand and supply of non-traded good in equilibrium, where P_Z, price of the non-traded good is endogenously determined.

$$w_S a_{SX} + r a_{K_1 X} = P_X \qquad (1)$$

$$\overline{w} a_{LY} + r a_{K_1 Y} = P_Y \qquad (2)$$

$$w a_{LZ} + R a_{K_2 Z} = P_Z \qquad (3)$$

$$a_{SX} X = S \qquad (4)$$

$$a_{K_1 X} X + a_{K_1 Y} Y = K_1 \qquad (5)$$

$$a_{K_2 Z} Z = K_2 \qquad (6)$$

$$a_{LY} Y + a_{LZ} Z = L \qquad (7)$$

It is assumed that the consumers spend $0 < \alpha < 1$ share of their income on commodities and services supplied by the informal sector. Thus, equality in the non-traded goods sector implies:

$$\alpha(P_X X + P_Y Y) = (1 - \alpha) P_Z Z \qquad (8)$$

We therefore have eight equations to solve for eight variables: w_S, r, w, R, P_Z, X, Y and Z;

Basic Comparative Static

A recession in sector X implies that there is a drop in the aggregate demand for the commodity with a resulting negative change in its price. In algebraic terms, it implies

$\hat{P}_X < 0$, where, '^' indicates a proportional change ($\hat{p} = \dfrac{dp}{p}$). Sector Y that uses

unskilled labor but exists under the umbrella of labor unions and therefore enjoys a wage

premium above the market-clearing wage earned by equally skilled workers in sector Z,

however, does not experience any direct fall in the price level. Thus, $\hat{P}_Y = 0$, and we are

interested in observing as to what happens to $\hat{w}$.

Using (1) and (4)

$$\hat{X} = \frac{\theta_{K_1X}\sigma_X}{\theta_{SX}} \hat{P}_X = \delta_X \hat{P}_X < 0 \tag{9}$$

Then using (5) and (6)

$$\hat{Y} = -\frac{\lambda_{K_1X}\sigma_X}{\lambda_{K_1Y}\theta_{SX}} \hat{P}_X = -\delta_Y . \hat{P}_X > 0 \tag{10}$$

Finally, using (7)

$$\hat{w} - \hat{R} = (-\frac{\lambda_{LY}\delta_Y}{\lambda_{LZ}\sigma_Z} \hat{P}_X) > 0 \tag{11}$$

Substituting for $\hat{X}, \hat{Y}$ from above and $\hat{Z} = -\hat{a}_{K_2Z} = -\hat{w}\theta_{LZ}\sigma_Z$ from (6) on to the non-

traded commodity market equilibrium in equation (8) subjected to proportional change,

and then using (11), we get

$$\hat{P}_Z > 0, \; iff \left[\mu_Y + \left(1 - \mu_Z\right)\frac{\theta_{LZ}\lambda_{LY}}{1 - \lambda_{LY}} \right]\delta_Y > \mu_X \left(1 + \delta_X\right) \tag{12}$$

where, $\mu_X = \dfrac{\alpha P_X X}{P_Z Z}$, $\delta_X = \dfrac{\theta_{KX}\sigma_X}{\theta_{SX}}$ and $\delta_Y = \dfrac{\lambda_{KX}\sigma_X}{\lambda_{KY}\theta_{SX}}$.

Note that for δ_Y very high or μ_X very low, $\hat{P}_X > 0$.

Next we use equations (3) and (11), of which we know from (11) that, if $\hat{P}_x < 0$, $\dfrac{w}{R}$ must

go up. At the same time, following (12), if P_Z goes up, then $\hat{w} > \hat{P}_Z > 0 = \hat{P}_Y > \hat{P}_X$, and

the real informal wage goes up in consequence.

Therefore, one might argue that condition (12) is quite revealing. As X contracts

and capital leaves X to go Y, Z must also contract. However, only a part of that

contraction is a result of contraction in its own demand. Hence, there is a net loss in the

supply of Z, accentuating a fall in P_Z. If $\mu_z = 1$, i.e. the informal workers do not

consume X and Y, such a positive effect will vanish from the LHS of (12).

Higher μ_Y relative to μ_X and δ_Y relative to δ_X will both push up P_Z. To see it

cleanly let us suppose $\mu_Z = 1$ and substitute for δ_X, δ_Y in (12). It follows directly then,

$$\hat{P}_Y > 0 \text{ iff } \mu_Y \delta_Y > \mu_X \left(1 + \delta_X\right) \tag{13}$$

or, $\quad \mu_Y \dfrac{\lambda_{KX}\sigma_X}{\lambda_{KY}\theta_{SX}} > \mu_X \left(1 + \dfrac{\theta_{KX}\sigma_X}{\theta_{SX}}\right)$

or, $\quad \mu_Y \dfrac{\lambda_{KX}}{\lambda_{KY}}\sigma_X > \mu_X \left(\theta_{SX} + \theta_{KX}\sigma_X\right)$

$$\mu_Y \dfrac{\lambda_{KX}}{\lambda_{KY}} > \mu_X \left(\dfrac{\theta_{SX}}{\sigma_X} + \theta_{KX}\right) \tag{14}$$

In other words, if elasticity of substitution between labour and capital in the

skilled sector (σ_X) is very high, the contractionary effect in X and expansionary effect in

Y will be quite large strengthening the case for contraction in Z and a rise in P_Z.

3. Tradable Informal Commodity

Let us now consider the case where sector Z produces a traded commodity, *ceteris paribus*. In other words, prices of all three commodities are now given internationally. The production structure remains same as before, except that equation (8) is no longer useful, since there are seven variables, w_S, r, w, R, X, Y and Z to be determined directly from equations (1) – (7).

It is now straightforward to argue that, in the event of a recession in sector X only and a consequent price cut, equation (1) yields

$$\hat{w}_S = (\frac{\hat{P}_X}{\theta_{SX}}) < 0, \quad \text{when } \hat{P}_X < 0 \tag{15}$$

Using (4) and (15), and differentiating equation (5) the following results:

$$\hat{Y} = -(\frac{\lambda_{KX}\sigma_X \hat{P}_X}{\lambda_{KY}\theta_{SX}}) > 0 \text{ when } \hat{P}_X < 0 \tag{16}$$

Now, from (6)

$$\hat{Z} = -\theta_{LZ}\sigma_Z(\hat{w} - \hat{R}) \tag{17}$$

Differentiating (7), using (15) – (17) and simplifying we get,

$$(\hat{w} - \hat{R}) = -(\frac{\lambda_{LY}\lambda_{KX}\sigma_X}{\lambda_{LZ}\sigma_Z\lambda_{KY}\theta_{SX}})\hat{P}_X \tag{18}$$

On the other hand, total differential of equation (3) yields

$$\hat{w}\theta_{LZ} + \hat{R}\theta_{K_2Z} = P_Z \tag{19}$$

Multiplying both sides of (18) by θ_{KZ} and adding it with (19) we obtain

$$\hat{w} = -(\frac{\theta_{KZ}\lambda_{LY}\lambda_{KX}\sigma_X}{\lambda_{LZ}\sigma_Z\lambda_{KY}\theta_{SX}})\hat{P}_X > 0, \quad \text{when } \hat{P}_X < 0. \tag{20}$$

As $\hat{P}_Z = 0$, from (20) it follows that $\hat{w} > 0 = \hat{P}_Z$. So the informal wage, w, rises both in absolute and relative terms following a decrease in the price of the skilled sector commodity.

The intuitive explanations are as follows. A decrease in P_X lowers the skilled wage, w_S, raises a_{SX} and lowers a_{KX}. Sector X contracts, as skilled labour is specific to this sector. It releases capital of type 1 which goes to sector Y causing it to expand. An expansion of sector Y draws unskilled labour from sector Z thereby causing the informal wage, w, to increase.

4. Concluding Remarks

When the global financial markets pass through a long phase of recession, the effects are not contained in that sector alone. Impacts of the downswing are often quickly felt in other markets and in the aggregate the spillovers lead to significant negative growth all over. The much talked about recession in the housing market in the developed countries has now caused meltdown impact in every other sector of the local economies and it is natural to ask how deep the tremors would be felt in the developing world which are connected more than ever through trade and financial linkages. What we find in this paper is somewhat unanticipated in the common wisdom. We argue that since most developing and transition countries are repositories of large unorganized and/or informal sectors that deal largely with non-traded commodities and services and in some cases tradable goods as well, the global recession may not be able to penetrate very far into these economies. In fact, we establish that a fall in the price of those commodities and services that employ white-collared workers may in fact turn out to be favorable for the

purveyors of non-traded goods in general and the informal sector in particular. Thus, as sector Z contracts due to contraction in sector X and despite growth in sector Y, the unit price of that non-traded sector rises. This is the prime source of increase in the nominal and consequently the real wages in the informal sector. In the extended version even if the price of the non-traded sector is frozen from outside, still the expansion of the middle sector draws labor away from the informal producers and the market settles the wage at a higher level compared to the pre-recession period. In brief, therefore, the theoretical possibility that recession in the skilled sector might even raise the wage of the informal workers appears quite robust. As possible extension, in particular, the vertical linkages in production between formal and informal sectors may be explored to lend further insight in similar frameworks. The connections that income poverty of a large number of unskilled workers bear with the informal production and wage therein may also generate testable hypotheses in theory and empirics.

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