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Goyal, Ashima

Indira Gandhi Institute of Development Research

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*Ashima Goyal**
Professor

Indira Gandhi Institute of Development Research
Gen. Vaidya Marg, Santosh Nagar,
Goregaon (E), Mumbai-400 065
ashima @ igidr.ac.in
Tel.: +91-22-2841 6512; Fax: +91-22-2840 2752

Abstract

Labour institutions influence the outcome of macro policies. We postulate that, for India, nominal wages rise with average labour productivity and with the price of food, and discuss the macroeconomic consequences. As inflation is caused by sectoral supply constraints and productivity mismatches, a cut in demand need not work, and even if it does, it imposes a large cost. Stimulatory macro policies can actually lower the rate of inflation, and raise real wages, even in the face of a supply shock if they are designed so as not to hurt the productivity increase that is a part of development. A rise in agricultural productivity turns out to be the best way to lower inflation, and allow target real wages and growth in industrial output to be achieved. Greater openness offers a way to follow such policies even in the short-term by using imports to enhance food availability following an agricultural shock. Stylised facts and simulations with a macrodynamic model provide evidence in support of such wage behaviour. A preliminary examination of Indian labour market institutions also supports the latter and suggests that better ways to improve labour's position are better education and training facilities, and infrastructure.

JEL codes: E37, E17, O11

Key words: Labour institutions, food prices and wages, macrodynamic simulations

Labour Market Institutions, Real Wages and Macroeconomic Outcomes

Ashima Goyal

1. Introduction

From the viewpoint of labour economists we follow a reverse research strategy in this paper. We start by postulating the behaviour of real wages in the Indian economy that is consistent both with the scanty evidence available, and with certain well-known macroeconomic time series. Next we explore its macroeconomic outcomes, as structural change occurs and the economy becomes more open. We then go to the labour market institutions that are capable of delivering such a behaviour of real wages in the Indian context. We end with an appeal for empirical investigation. Do such institutions exist in India? If so, there are clear implications for macroeconomic policy. The paper draws upon earlier work presented in Goyal 1998a, b and 1999.

Labour institutions influence the outcome of macro policies. Bruno and Sachs (1985) report that in Germany real wages are rigid since the average contract length is only one year. Therefore, in the face of an adverse supply shock a tight monetary policy is necessary to prevent inflation. This explains the conservative policies of the Bundesbank. The average nominal wage contract is for three years in the US. Stimulatory monetary policy by raising prices can therefore lower real wages and maintain employment. Jeanne (1998) points out that using real wage rigidity is essential, in calibrated general equilibrium models, to generate realistic macroeconomic time series. Among developing countries the ratio of imported consumer goods is high in Latin America. Devaluation therefore directly causes inflation as strong income conflict works as a propagation mechanism, converting a supply shock into an accelerating inflation. No group is willing to take a fall in its income share in response to a terms of trade shock. But in India the average per capita income level is about one fourth that in Latin America and this affects the range of feasible choices. One implication is the absence of sharp income conflict. In countries with high equality and median per capita incomes such as the South-east Asian tigers and China, nutritional minimums are now widely attained, so the exchange rate can safely be depreciated to maintain competitiveness. A reduction in real wages, even if the

depreciation cannot be absorbed by a rise in labor productivity, is not a political catastrophe. But in countries which have median inequality and very low per capita incomes, such as India , only a nominal exchange rate that is compatible with efficiency wages would be sustainable. Only then would devaluation result in a real depreciation because wages and prices would not rise.

We postulate that, for India, nominal wages rise with average labour productivity and with the price of food, examine the evidence for this, and discuss its macroeconomic consequences. As sectoral supply constraints and productivity mismatches cause inflation, a cut in demand need not work, and even if it does, it imposes a large cost. Stimulatory macro policies can actually lower the rate of inflation, and raise real wages, if they are designed so as not to hurt the productivity increase that is a part of development. A rise in agricultural productivity turns out to be the best way to lower inflation, and allow target real wages and growth in industrial output to be achieved. Greater openness offers a way to follow such policies even in the short-term by using imports to enhance food availability following an agricultural shock. A preliminary examination of Indian labour market institutions also supports our hypothesis on wage behavior and suggests that the best ways to improve labour's position are those that increase its productivity and exit options.

The structure of the paper is as follows: In section two the macroeconomic outcomes of this real wage behaviour are examined, first in a closed and then in an open economy. Section 3 presents evidence for this wage behaviour, first in the shape of relevant stylised facts and second by simulations that satisfy certain consistency relations imposed in a dynamic general equilibrium macroeconomic model. Section 4 explores the labour market institutions that would result in efficiency wages, and addresses questions about Indian labour market institutions. Are they of this kind? What is the desirable direction of change? Section 5 outlines the consequences of the analysis, based on the current and changing structure of Indian markets and institutions, for policy. Section 6 concludes.

2. Macroeconomic Outcomes

Consider a simple economy with two sectors, agriculture and industry. Industrial output is demand determined, while the agricultural price, P_A, equates demand to a given supply of food, in any one period[1]. If there is a level $\bar{w}$, of the real product wage in terms of agricultural goods, that maximises efficiency, and W is nominal wages, then:

$$\bar{w} = W/P_A$$

If the real wage target grows at β, or:

$$d\,\bar{w} / \bar{w} = \beta$$

Nominal wages must grow at:

$$dW/W = \pi_A + \beta$$

If industrial prices, P_I, are set as a mark-up[2] on wage costs, where m is the profit share, a is the labour required to produce one unit of industrial output, and β the trend rise in labour productivity in industry, or fall in a. Then:

$$P_I = [(a\,(1-\beta))/(1-m)]W$$

Substituting out W from the two equations gives the terms of trade that satisfies the target real wage. β can be dropped from the equation if we substitute $\bar{w}_t = \bar{w}_{t-1}(1+\beta)$. Although time subscripts are dropped for simplicity, other variables refer to period t.

$$P_I / P_A = [a\,\bar{w}_{t-1}/(1-m)]$$

Writing in terms of $\rho = P_A / P_I$, we get:

$$\bar{\rho} = [(1-m)/ a\,\bar{w}_{t-1}] \qquad (1)$$

Demand for the product of each sector is a function of income and relative prices. Equations 1 and the sectoral market clearing relations are graphed in Figure 1. The *AA* (II) curve graphs the combination of ρ and Q_I that yield equilibrium in the agricultural (industrial) market. Equation 1 is graphed as the horizontal line at the level of ρ that satisfies the efficiency wage target; ρ will tend to fall above this line. Below the *AA* curve

[1] The model is based on Cardoso (1981). See also Goyal 1998a,b.

[2] This is a simplification but can be derived optimally from industry structure arguments. A simplistic reading of the model can be that firms raise nominal wages and then raise prices. The correct reading is that when food prices rise firms need to offer higher wages to induce the required effort, and as output falls the optimal mark-up is constant or rising, so that prices must rise. If the mark-up is optimally derived, trying to change it through policy will only induce distortions on the supply-side. In Goyal (1999) the mark-up is derived by the profit maximisation of risk-averse firms in a more general dynamic model. Simulations in section 3.2 are based on this model.

excess demand for agriculture (ED_A) is positive and ρ will rise. Above the *II* curve excess demand for industry (ED_I) is positive and Q_I will rise.

If the economy is in the triangle BCD, inflation will occur. This can be controlled by a cut in money supply or demand for industry only by inflicting a loss in industrial output equal to BC. But a rise in agricultural productivity, by causing the OA curve to pass through point C can remove inflation without any loss of industrial output. This will also raise real wages as the agricultural terms of trade that give the product wage target are realised.

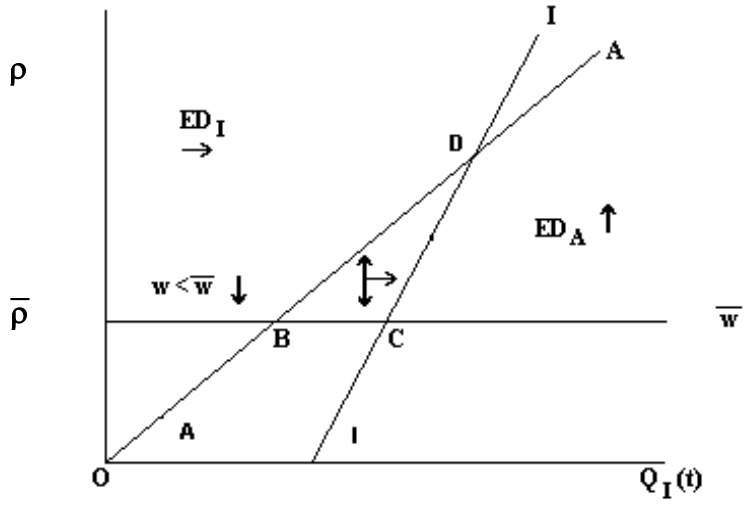

Figure 1: Three equilibrium conditions in a closed economy

What happens under liberalisation, as agriculture gradually becomes a traded good? If a more diversified consumption basket were consumed nominal wages would now be raised in line with the consumer price index, *P*, to maintain a real wage target. *P* is a weighted average of traded (eP_T^*) and nontraded (P_{NT}) goods prices. The weights are given by respective consumption shares, such that, $0 < \delta < 1$.

$$\overline{w} = \frac{W_t}{P_t} \tag{2}$$

$$P_t = (eP_{Tt}^*)^{\delta} P_{NTt}^{(1-\delta)} \tag{3}$$

Perfect trade arbitrage ensures that traded goods prices are given by world prices multiplied by the nominal exchange rate, e. An asterisk denotes a world price. The prices of nontraded goods continue to be set as a markup on wages after correcting for labour productivity. Substituting out W and P in the target wage equation and solving for the value of the real exchange rate ($z = eP_T^*/P_{NT}$), we get:

$$z_w = \left[\left(\frac{a}{1-m} \right) \overline{w}_{t-1} \right]^{-\frac{1}{\delta}} \tag{4}$$

We call it z_w, or the target level of the real exchange rate because it satisfies the real wage target Eq. 2. Inflation will be positive as long as $z > z_w$. Eq. 4 is analogous to Eq. 1 for the closed economy. It is easy to see that if in the closed economy, industrial goods also enter the consumption basket and their price influences the wage target, and the budget share of agricultural goods is δ, then the lowest value of $\bar{\rho}$ occurs when $\delta = 1$. As more and more industrial goods are consumed, a higher ρ will also satisfy the real wage target.

Conversely, under agricultural liberalisation, the share, δ, of traded goods in the consumption basket will rise steeply, since food is the largest constituent of the consumption basket in a low per capita income country. But because of freer food imports, it will be possible to follow a more efficient set of policies to control inflation--namely, those that shift OA through C. But now the goods market clearing relation replaces the II curve and the equality of the current to the capital account replaces the AA curve (Figure 2). The conditions for the z' =0 curve to pass through B are (i) that investment, i, financed by a capital account deficit exceeds savings, s, by a sufficient amount, and (ii) when staple food items are traded, the nominal exchange rate is determined by the gap between domestic and foreign productivity in the production of these items. The gap should be high enough to provide price incentives to exporters and farmers by a sufficiently depreciated nominal exchange rate, yet low enough to allow z_w to be reached. If this is not so, the most successful policies will be those that use investment to improve this productivity.

Therefore a precondition for successful agricultural liberalisation is that agricultural productivity be high enough at such a nominal exchange rate. India's agricultural productivity had increased with the green revolution, but is still sufficiently below world productivity levels to give a highly depreciated exchange rate at the level that equates domestic to world food prices. But since the steep devaluation of the early nineties pushed India into the inflationary triangle, without sufficiently stimulating exports, a further rise in agricultural productivity is required. If the productivity of industrial (or non-traded) goods rises more than real target wages, the target terms of trade (or real exchange rate) line will also shift up and further reduce the triangle. Otherwise a rise in agricultural (or traded goods) productivity will be required.

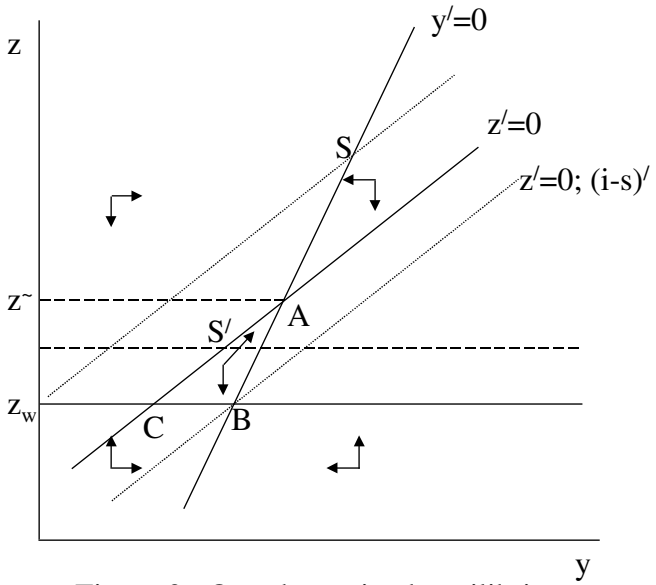

Figure 2 : Overdetermined equilibria

Again, as policies that raise domestic interest rates or cut demand will shift the z' =0 curve to the left, they will raise inflation, and lower output and investment. The basic longer-term reason for inflation is the inconsistency of the real wage target with sectoral productivity growth, and the shorter - term, the supply constraints on agricultural output or foreign exchange that require a rise in relative prices to satisfy demand. If relative

prices lie in the triangle and are influenced by both the wage target and the market clearing equilibrium, successful macro policies will be those that respect and work with these relations.

3. What is the Evidence?

In searching for evidence to support the postulated behaviour of real wages, we look first at available stylised facts on Indian labour market structure and wages, and then on outcomes from simulations with a theoretical model. The first bring out the influence of food prices on nominal wages at low per capita income levels. The second the response of nominal wages to rising labour productivity.

3.1 The Stylised Facts

Per capita incomes[3] are low in India, and income indexation is not widespread. About 40 percent of the population are still below the poverty line. Seventy percent of the population is employed in the rural sector. Almost two-thirds of the average budget is spent on food. The trade share is low, agriculture is still not completely liberalised, and restrictions continue on consumer goods imports.

In the formal sector, the average wage contract is negotiated after three years. Only four percent of the labour force is unionised and minimum wage laws are not strictly enforced. COLA or automatic cost of living adjustments, which are widespread in Latin America, are quite rare in India. In spite of trade unions and restrictions on exit, real wages can adjust through changes in composition. For example, by increasing the tasks contracted out to the informal sector. Many margins of adjustment are available. Wages were rising in the organised sector, in the eighties, but there was a contraction even in the absolute numbers employed.

Therefore if wages respond in a particular way to food price shocks or productivity changes it must be because it is in the employer's interests to do so.

[3] India's per capita income was $ 320 in 1994. If the US per capita income is taken to be 100 India's is 4.9, while Brazil's is 20.9.

Williamson (1991) in collating the lessons of history on the interactions of growth with poverty and inequality, remarks that more than inequality, it is shocks to food prices that have had the largest impact on poverty. Technological progress in America during the industrial revolution favored essentials, therefore poverty remained lower than in Europe at a comparative period.

The increase in poverty in India immediately after the devaluations of the early nineties coincided with the steep rise in food support prices to match the new border prices. Figures to support this come from the regular surveys of per capita consumption expenditure (PCCE) conducted by the National Sample Survey Organization of India.

Since 1972-73 (when the surveys were started) PCCE has been increasing for the rural population in both the state where it is highest (Punjab) and lowest (Bihar). But between 1992 and 1994, years of high agricultural price inflation real PCCE fell by -0.37 and -1.87 per annum respectively in Punjab and Bihar.

Therefore employers would want to link nominal wages to food prices, in the medium-term, because of the debilitating effects of a long-term fall in nutrition on labour productivity. Recent evidence for this comes from a paper by Ravallion (1998) in the context of the debate that a rise in food prices led to an increase in poverty in the early years of the reform. He argues that it is not a rise in food prices, but the accompanying fall in agricultural output that raises poverty. He finds evidence that the impact of relative food prices on real agricultural wages disappears in the medium-run. Pressure by trade unions will have some effect in this direction, especially on wages in the public sector and government administration.

But there are also political pressures in a democracy, because of the extreme sensitivity to inflation. Since inflation precipitates social discontent; the Government often imposes monetary tightening to lower inflation. India has normally had a low (for a developing country) and stable rate of inflation. The latter has only rarely reached double digits. But if inflation is instigated by an agricultural shock and sustained by the wage-price nexus

outlined above, a monetary tightening is a costly way to lower inflation; better ways are available. When the Congress government used tight money to control inflation in the mid-nineties, the economy slipped into a recession[4] and it was voted out of power.

Although nominal wages are linked to agricultural prices, they themselves rise with labour productivity. So does the target real wage. Our model focuses on wages in the nonagricultural (or non-traded) goods sector, since these determine prices in this sector, relative prices and the rate of inflation. A large part of manufacturing and services in India is unorganised.

Reliable information on the average level of nominal and real wages in the unorganised sector is hard to obtain. Wage data published by the CSO pertain to the factory sector covered by the ASI, which accounts for a paltry eight percent of total employment. Estimates made by some scholars[5] are available for the unorganised sector, but they are based on non-uniform sample surveys. Vaidyanathan (1994) finds evidence of a rise in wages in the eighties in the informal sector also. His estimates suggest that nominal wages in non-agriculture rose by 77 percent over 1977-78 to 1983-84 and 75 percent over the next three years.

Although food continues to remain a major share of the consumption budget, other items are added with development. Employers are willing to pass on the rise in productivity even in labour surplus developing countries, because rising productivity is not possible without the rise in wages. That is, efficiency depends on wages. One of Kaldor's famous growth facts is that the trend share of capital has remained constant while that of labour has risen, in the majority of countries. If the rise in wages were correlated with productivity it would not impact on inflation. Although real wages are pro-cyclical, the net rise would be positive over the cycle reflecting not only cyclical factors, but also the rise in productivity as development takes place.

[4] Benabou (1996) surveys recent analysis of the ways poverty and inequality harm growth. Optimising overlapping generations models are used with a non-representative consumers, to capture the effects of inequality. Our point is that some of these harmful effects are carried through incorrect or inappropriate policies.

3.2 Model Simulations

Information on changes in aggregate real and nominal wages in the nonagricultural sector, during the nineties, is not available, but the wholesale price index and output series for nonagriculture are available. Simulations with the wage-price module of a dynamic general equilibrium model allow us to estimate wage behaviour that is consistent with the simulated mark-up and trend rate of decrease in labour per unit output, *a*, and that generates the historical price and output series. It should also be in line with the measured rise in per capita income, of above three percent, for the decade of the eighties[6].

The core model is reduced to two dynamic equations giving the change in normalized output *u*, and profit share or mark-up, *m*. The two equations are:

$$u' = e + (i_1 + g_1 s(1-f) - s)m + j)u$$

$$m' = w_1 u - w_2 m^2 + w_3$$

The parameters of the first equation refer to investment and savings behaviour and of the second to pricing behaviour. Our initial values are the output-capital ratio *u*, the mark-up or profit share *m,* and capital stock of the year 1984-85. We use time series for output, investment, savings, capital inflows, and price wholesale index numbers with base[1] 1981-82.

The model was calibrated over 1975/76 to 1984/85. The calibrated parameter set was:

$s = 0.479$, $i_1 = 0.32$,

$g_1 = 0.7$, $w_3 = 0.3524$

$j = 0.002$, $f = 0.5$

$\Omega = (i_1 + g_1 s(1\text{-}f)\text{-}s)m + j = 0.00865\ m + j$

The following variations were estimated:

(i) 1985-86 to 1989-90

$s = 0.44$, $i_1 = 0.315$,

[5] Some of these estimates are reported in the data appendix in Goyal 1999.

$g_1 = 0.7, \quad w_1 = 0.34,$

$\Omega = 0.029\ m + j$

(ii) 1990-91 to 1993-94

$s = 0.44, \quad i_1 = 0.276,$

$g_1 = 0.6, \quad w_1 = 0.39,$

$\Omega = -0.032m + j$

(iii) 1994-95

$s = 0.555, \quad i_1 = 0.515,$

$g_1 = 0.67, \quad w_1 = 0.37,$

$\Omega = 0.145925m + j$

(iv) Three simulated scenarios from 1996-97 to 2001-02 were:

Scenario 1: $i_1 = 0.515$, rate of growth of y_m: 14.1 percent

Scenario 2: $i_1 = 0.4$, rate of growth of y_m: 8.19 percent

Scenario 3: $i_1 = 0.32$, rate of growth of y_m: 4.24 percent

But in this paper we use the model and the calibrated parameter set over 1984-1996, to understand the behaviour of wages. The price of a unit of value added in non-agriculture is simply distributed over wage and profit share. All kinds of shocks that influence prices and the substitution responses they evoke are all subsumed in changes in either *a*, *m* or W. Therefore core inflation is determined by the combination of these variables. Future expected inflation influences the expected and the actual nominal wages. In so far as the model does uncover structural features of the economy that underlie seeming chaos, the very simplicity of the model helps in putting order on complexity. There is the discipline coming from the fact that all the parameters together have to reproduce the behaviour of the economy.

[6] The World Bank has estimated projections of a three to six percent rise in productivity over the period 1995-2010.

Rise in agricultural prices influenced by monetary, supply side or administered price shocks, would in turn impinge on W. The shocks are stochastic, but with varying coefficients of correlation across time and with each other. Shocks to raw material, intermediate and imported goods could affect desired mark-ups if the elasticity of substitution between inputs is very different from unity.

In our simulations, we start with the initial value 5918.69 of nominal wages, W, for 1984-85. This is taken from the calibrating simulations for the earlier period. The rates of growth of nominal wages suggested by the Vaidyanathan study, are applied and then extrapolated beyond 1987-88, giving the W(H) series reported in Table 1, column 2. However, the manufacturing price index calculated using this W(H) initially overestimates the price rise (column 4), although it comes close to the historical wholesale price index (1981-82 = 100), WPI(H), by 1989-90. Indeed, W^e obtained by using WPI(H) in the simulations, is at first lower than W(H), but almost reaches its level by 1989-90. This suggests either that Vaidyanathan's estimates of nominal wages for the mid-eighties are too high, or that there was a dip in short-run mark-up or a peak in labour productivity in the mid eighties.

Table 1 presents results for the estimated nominal and real wages, using the WPI(H) reported in the final column, for the years 1990-91 to 1995-96. The simulations were performed first with a(H) and then holding a constant at the 1989-90 level, to capture the impact of possible adverse shocks to productivity arising from structural adjustment. If a is constant it means that there is no rise in productivity over that period. In each case, w_3 was first continued at 0.39 and second reduced to 0.34 in 1994-95 (Table 2). A fall in w_3 implies a fall in mark-ups.

If the price level is constant, W can rise if productivity rises (that is, a falls), or m falls. Conversely, if W is constant, the price level can fall if a or m falls. Indeed, *ceteris paribus*, there is perfect symmetry in changes in W or Pm. If real wages are to reflect the full consequences of any adverse shock to a or m, a fall in W or a rise in Pm must occur. This is intuitively obvious, but simple calculations using our simulations, help to illustrate the relationships across the variables.

The percentage rise in W^e and *w* as w_3 falls is 6.62 in 1994-95 and 9.45 in 1995-96. This is true for simulations with *a*(H) and constant *a*. If in 1993-94, W^e is fixed at Rs. 16670.4 (its value when $w_3 = 0.39$) and *m* as 0.462032 (the latter's value in the simulation when w_3 falls to 0.34), the estimated price index is 250.4. This is 6.62 percent below the historical price index, which is 267. A similar experiment performed for 1995-96 gives a fall of 9.45 percent in the wholesale price index over its historical value. If in 1993-94 the WPI is kept constant at 243 implying zero inflation for that year, W^e falls by 9.87 percent across all the simulations. The percentage is equivalent to the actual rise in WPI in that year. Similarly, zero inflation in 1994-95 would have required a fall in W^e of 7.87 percent, which is close to the observed price inflation in that year.

Table 1
Historical W(H) and simulated nominal wages (W^e) and prices (Pm)

Years	W(H)	W^e	Pm^e with W(H)	Pm(H)
1984-85	5918.69	6367		
1985-86	7278	6738.82	134	124
1986-87	8369	7463.56	145	129
1987-88	9625	8486.38	158	139
1988-89	11069	9756.00	172	152
1989-90	11512	11384.58	171	169

Some of these features are due to the simple structure of the model. The simulations we have undertaken establish extreme bounds for variations in W or WPI in the nineties. The third column in Table1 gives the maximum nominal value of W, and the fourth column the minimum. In the former, the fall in *a* has cumulated over the nineties, and *m* also falls after 1993-94. Needless to say, if W had been fixed this would have shown up in a fall in the WPI. Columns 7 and 8 in Table 2 show similar bounds for the real wages. Only in the case with *a* fixed at its 1989-90 level do real wages fall through the nineties, rising only marginally by 1995-96. In this simulation the variations in real wages reflect the impact of

pure changes in mark-ups, while those in nominal wages reflect both in mark-ups and the WPI(H).

Table 2
Historical prices and simulated nominal (W^e) and real wages (w^e)

Years	W^e				w^e				Pm(H)
	a(H)		a		a(H)		a		
	$w_3 = 0.39$	$w_3 = .34$ after 1994-95	$w_3 = 0.39$	$w_3 = .34$ after 1994-95	$w_3 = 0.39$	$w_3 = .34$ after 1994-95	$w_3 = 0.39$	$w_3 = .34$ after 1994-95	
1	2	3	4	5	6	7	8	9	10
1990-91	12101.29	12101.29	12101.29	12101.29	6612.73	6612.73	6612.73	6612.73	183
1991-92	13582.29	13582.29	13034.51	13034.51	6690.78	6690.78	6420.94	6420.94	203
1992-93	15504.02	15504.02	14288.99	14288.99	6860.19	6860.19	6322.56	6322.56	226
1993-94	17209.46	17209.46	15221.94	15221.94	7082.08	7082.08	6264.17	6264.17	243
1994-95	19630.23	20929.38	16670.40	17773.67	7352.15	7838.72	6243.60	6656.81	267
1995-96	22093.16	24181.61	18012.71	19715.43	7671.24	8396.39	6254.41	6854.64	288

The contribution of the trend rise in productivity to that in W^e is approximately 4 percent per year. The percentage excess of Column 2 over Column 4 (in Table 2) varies from 4.2 percent in 1991-92, to 22.65 percent by 1995-96. Column 2 reports the simulation with a(H) and Column 4 that with a held constant. The variation in real wages in Columns 8 and 9 arises only due to changes in m. From Column 9 it can be calculated that this is 6.3 percent in 1994-95 and 2.84 percent in 1995-96. Indeed the corresponding rise of 15.54 percent in nominal wages in 1995-96 from Column 3, can be neatly attributed as follows: approximately eight percent as compensation for the rise in WPI(H), 4 percent to the rise in productivity (fall in a) and the balance three percent to the fall in m.

Why these particular extreme bounds? While it is true that productivity may have fallen in the early years of structural adjustment, the whole rationale of the reforms was to raise it. And if the adjustment has been successful, the trend rate of growth may exceed the earlier four percent. So that the contribution of productivity shocks to real wages may have been zero in the early years of reforms, but will be rising now. Therefore, the range of possible

variation in real wages lies between that given by zero and a constant unfaltering productivity growth in the nineties.

Our simulations indicate that productivity growth has been passed on as a rise in the share of wages, justifying our assumption of a trend rise in product real wages. Even though changes in productivity and the mark-up may have had almost equivalent impact on the cost of production in the past, if labour productivity rises to world levels, the influence of changes in *a* will dominate in the future. The mid-eighties mark a period of structural change on the supply side. For the first time the m' = 0 curve shifts, as competitiveness increases and re-structuring lowers costs.

What is the prognosis from this model and the simulations for future inflation and growth? *In the past, the constant trend in a has largely not been reflected in the WPI, although it has raised real wages. Variations in m have, however, clearly shown up in the WPI*. The reason may be that productivity impacts on the nominal wage bargaining process, while prices are set as a mark-up on unit costs. Our model explains the fall in the rate of inflation from about ten percent in 1994-95 to eight percent in 1995-96 and four percent in 1997, by the reduction in *m* as growth revived. As these tendencies work out through lags in expectation and inertia, the rate of inflation will continue to fall by shrinking amounts until it reaches a new equilibrium level. But this is conditional on reasonable growth, the absence of major shocks to costs, and the maintenance of competitive pressures. High public sector investment is required both to maintain favourable demand dynamics and to prevent shortages in infrastructure from developing.

Large gains in productivity may, in the future, allow inflation to decrease independently of changes in the mark-up. So far changes in the latter due to cyclical adjustments, competitive changes and organisational restructuring have influenced the trend reduction in inflation.

4. Labour Market Institutions

What are the labour market institutions that lead to the kind of real wage behaviour postulated? Are such institutions to be found in India? Stiglitz (1974) was an early presentation of the efficiency wage argument. If a worker's output depends upon effort as well as time, profit maximisation equates the average product to the wage rate. In our model a wage-price spiral leads to inflation if the economy-wide average efficiency wage exceeds the average product in agriculture. Blanchard and Katz (1997) argue that the labour demand function is horizontal in the medium-run with changing capital stock, at a reservation wage level linked to technology. Productivity increases are passed on in real wages.

For a developing country poor nutrition adversely affects performance, and tests of the efficiency wage hypothesis in such countries have tried to measure these[7]. Other justifications given for efficiency wages are as a means of preventing shirking. But even in a developing country, productivity depends on more than just a nutritive minimum, once we move beyond causal agricultural labour. Consumption of a more diverse set of commodities, including complex intermediate goods, releases valuable labour time, and improves the productivity of a household. This can explain why employers are willing to pass on productivity increases to workers, even though labour may be available at lower wages.

But employers will only raise wages if it is in their interest to do so. Therefore better education and infrastructure facilities that further improve worker productivity are desirable. Better exit options for workers are a more beneficial way of improving workers prospects.

Papola and Rogers(1992) in surveying the role India's labour market institutions remark that they have not delivered cheap labour, since productivity has been low, and trade

[7] Rosenswieg (1988) in surveying these attempts shows that they do not come to any very clear conclusion.

unions, social forces such as caste, and government policies have had adverse effects. But labour markets do respond to economic incentives even in rural areas. Alternative employment opportunities, agricultural infrastructure investment, and crop innovations increase wages. There is no forced diversification at sub standard wages because, as landlessness increases, labour markets develop and real wages rise.

While lawlessness prevails in the unorganised sector, labour laws in the organised manufacturing sector prevent retrenchment. The laws are framed from the perspective that employers will always exploit unless without strong checks and balances are put in place. But they encourage an unproductive confrontational attitude, while being unable to improve conditions in the much larger unorganised sector. Creating conditions of rising productivity that will give employers an incentive to improve working conditions and workers an incentive to keep learning will benefit both sectors.

It is often remarked in dual economy models[8] following Lewis (1954), that if labour does not consume industrial products, and if rising industrial productivity does not expand employment opportunities, labour will not benefit. But we argue that as the worker's consumption basket diversifies and target real wages rise with industrial productivity, the worker will gain from the latter. But since the share of agriculture in the consumption basket remains high, a rise in agricultural productivity is also essential and can sometimes be more effective.

If productivity gains are passed on to workers improving labour's productivity and exit options will benefit both workers and employers, much more than policies that seek to strengthen labour's position through trade unions or laws that prevent retrenchment.

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[8] Eswaran and Kotwal (JDE, 1993) is an example of a two-sector general equilibrium model where preferences between food and textiles are heirarchical and reflect Engel elasticities. Workers do not gain from a rise in productivity in textiles, since workers do not consume textiles and employment in textiles does not rise. Allocation of labour to the textile sector increases with exports of textiles, and so do real wages. They also rise with productivity in the food sector.

5. Implications for Macro Policy

We have examined the macroeconomic outcomes of institutional labour market features in a developing economy in Section 2, and then found supporting evidence for this in the next 3 sections. Clear implications follow for macro policy in an economy caught in the inflationary triangle.

The traditional policies that emphasize fiscal and monetary discipline have their roots in a concern about inflation. Is a tight monetary policy essential for control of inflation? It would be so only if a unique market clearing equilibrium existed. But a labour surplus developing economy is likely to have over-determined equilibria in the inflationary triangle. Even so, these institutional features of the labour market can give additional leeway in the design of policies. The correct set of policies are those that encourage the development process. Macro policy can be stimulatory as long as steps are taken to ensure low prices of food and an adequate infrastructure. Agricultural prices function as a nominal standard because a large proportion of the population is paid subsistence real wages. If productivity rises sufficiently this will no longer be true. Indeed the definition of development is that the average real wage rises above subsistence. Yet even if real food wages are rigid monetary policy does not have to be tight -- because of the possibility of raising the efficiency and level of utilisation of resources, in the context of mobility of international capital.

The main contending theories of inflation are cost-push or demand-pull. In the former, cost components are factor payments, productivity and expectations of nominal wage growth. In the latter, excess demand causes pressure on resources and leads to inflation. Monetary or fiscal expansion stimulates such demand. Our framework can reconcile the two theories if the influence of demand pressures on expected nominal wages is taken into account. Inflation can mechanically be calculated as the weighted sum of the components of price indices, but at a deeper level, core inflation is determined by profit shares, expected nominal wages and shifts in productivity.

It is often argued that devaluation itself causes inflation. This might be true in Latin American countries, but it is not necessarily true in India, with a low trade share and restrictions on the imports of consumer goods. In India it was rather the attempt to reduce the gap between domestic food prices and their border prices after the devaluation of 1991 that lead to inflation. Prices of agricultural products will gradually approach border prices as wages rise together with productivity, but a policy induced sudden jump in nominal prices will not be successful. Exchange rate policy can play a major role in transition if the nominal exchange rate can be set to equate the domestic to the border price of food.

After a supply shock industrial demand can fall if consumers protect their food basket in spite of a fall in real wages. If real wages are maintained then inflation results unless food availability is augmented. There is high political sensitivity to inflation, therefore there has always been a strong policy response to a supply shock and impending inflation. But unfortunately an incorrect set of policies has been followed. Public investment, which accounts for a large part of total investment, is routinely cut, money supply tightened and strong credit restraints enforced. Public investment, especially in infrastructure, crowds in private investment. The latter also slows down. The real interest rate rises. As a result lower investment accompanies higher inflation. The present discounted value of future expected marginal products that determine the investment decisions of a forward-looking firm, fall as inflation rises. Joshi and Little (1994) in a careful year-wise documentation show that macro stabilisation policies have been too draconian in the past, given Indian conditions.

Since the ill effects come from the inflation and induced output contraction resulting from an agricultural shock, our analysis suggests that openness can be used to minimise these shocks. The ways in which it can do so are by allowing food imports in the short-run, setting the nominal exchange rate to stabilise food prices and stimulate exports, bringing real interest rates down to world levels, and encouraging a rise in productivity and competitiveness.

Countries in South-east Asia have had a long tradition of food price stabilization; this was necessary to minimize shocks to the poor. But such policies have been discredited

because of the inefficiencies they bred; with a fall in poverty they are no longer so essential. We argue that in countries where poverty remains high but regimes are now more open, compensating variation in nominal exchange rates can deliver the required protection more efficiently. This yields a rule for setting the nominal exchange rate, so that purchasing power parity is maintained between domestic and foreign basic foodgrains, and domestic food prices stabilised. Once a non-inflationary level of the nominal exchange rate has been discovered, food prices can be stabilised, in a liberalised agriculture, by varying the nominal exchange ate with world food prices, such that domestic food prices remain unchanged, equated to border prices.

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6. Conclusion

In a DC with vast reserves of human resources, utilised at below the production frontier, stimulatory macro policies can actually lower the rate of inflation, and raise real wages, even in the face of a supply shock. This requires that policies be designed so as not to hurt the productivity increase and catching-up process that is a part of development. After the oil shock, middle income countries in South-east Asia sustained such policies by foreign borrowing, and did much better than the West.

We have tried to establish that in a country with a large population at low per capita income levels, target real wages will tend to rise with productivity, and respond to a rise in food prices. A rise in real wages does not harm growth as long as productivity is rising. Indeed it can be a source of demand. The point is worth emphasising because in dualistic models of development growth is most rapid when labour shifts to a productive modern sector at constant real wages. We find that a rise in industrial productivity will raise real wages only if target real wages rise with this productivity--and this does tend to happen. But interestingly a rise in agricultural productivity turns out to be the best way to lower inflation, and allow target real wages and growth in industrial output to be achieved. Greater openness offers a way to follow such policies even in the short-term by using imports to enhance food availability following an agricultural shock.

While Indian labour market institutions are such as to allow the rise in target and actual real wages, inspite of excess supply of labour, labour's position can be improved by certain measures. These include improvements in education and training facilities, and infrastructure. By improving labour's productivity, exit options, and mobility, these measures will make it possible for real wages to rise without hurting profits, investment and output. Such win-win outcomes are certainly better than institutions that seek to strengthen labour's position through trade unions or laws that prevent retrenchment.

Bits of evidence, the simulations, and consistency with macroeconomic outcomes support our hypothesis, but much more research needs to be done on average wage behaviour in India and the underlying labour market institutions. All that this paper aims to do is to bring out the importance of the question for policy and for understanding the economy.

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