

RELATION BETWEEN REAL LABOR PRODUCTIVITY AND WAGE SHARE IN INDIA'S ORGANIZED MANUFACTURING SECTOR

Nancy Yadav

PhD Student, Jawaharlal Nehru University, New Delhi

DOI: 10.46609/IJSSER.2023.v08i11.026 URL: <https://doi.org/10.46609/IJSSER.2023.v08i11.026>

Received: 21 October 2023 / Accepted: 25 November 2023 / Published: 2 December 2023

ABSTRACT

This paper examines the link between wage share in net value added and real labor productivity in India's organized manufacturing sector. The empirical results suggest that increase in real labor productivity almost leads to one for one decline in wage share, which implies that gains of real labor productivity are not accruing to laborers, instead entire gains of labor productivity increase is being captured by profit earners and it is being manifested in continuously rising profit shares. The data from Annual Survey of Industries (1981-82 to 2013-14) suggests that overtime there has been a decline in share of wages in net value added, which is matched by a corresponding increase in profit share, this regressive distribution of income has profound implications for the growth of manufacturing sector itself.

Keywords: India's organized manufacturing sector, wage share, labour productivity

INTRODUCTION

Indian growth trajectory has been peculiar in the sense that fall in share of agriculture in Gross Domestic Product (GDP) has not been accompanied by dynamics of high manufacturing growth, rather the gap has been filled by rise in growth of services. This growth trajectory is not surprising when we analyze the growth process from the entry point of distribution of income¹. The growth process is largely based on rising share of profit income, and the rise in real productivity of labor has not been accompanied by rising share of wage income, which implies that a greater amount of surplus value (which is created by labor) has been appropriated by capital. In the growth process, labor has increasingly been robbed by capital. The outcome is that rising profit income has fuelled the demand for services, but the restricted purchasing power

¹ The link between distribution of income and Indian growth trajectory is explained in greater detail in literature review section.

(owing to fall in share of wages) in the hands of masses constricted the market for manufactured products.

This paper particularly analyses the distribution of income in organized manufacturing sector and the relation between growth of real labor productivity and the growth in share of wages. The rest of the paper is divided in four sections. Section-1 presents the data analysis, Literature review is done in section-2, section-3 presents data source and methodology, section-4 presents the interpretation of results and conclusion follows in section-4.

SECTION-1

It is discernible from table 1 that share of wages in net value added has witnessed a steep fall over the three decades, it was 30% during 1981-82, it fell drastically to 10% during 2007-08 and then recovered a little to rise to 14% during 2013-14. The share of profit was 23% during 1981-82, and it plummeted to 61% during 2007-08, and then declined to 49% during 2013-14. At the same time share of interest payments have declined overtime from 22% during 1981-82 to around 10% during 2007-08. The fall in share of interest payments have led to cheapening of capital and the consequent rise in capital intensity, which is one of the reasons for slow employment growth in manufacturing sector. So, overtime we see a clear steep rise in profit share, and the corresponding fall in wage share and interest payments.

It is clear from the figure 1 that share of profits has risen above the share of wages only during the neo-liberal regime (particularly from 1993-94), the rise in profit share was particularly sharp during 2000-2005.

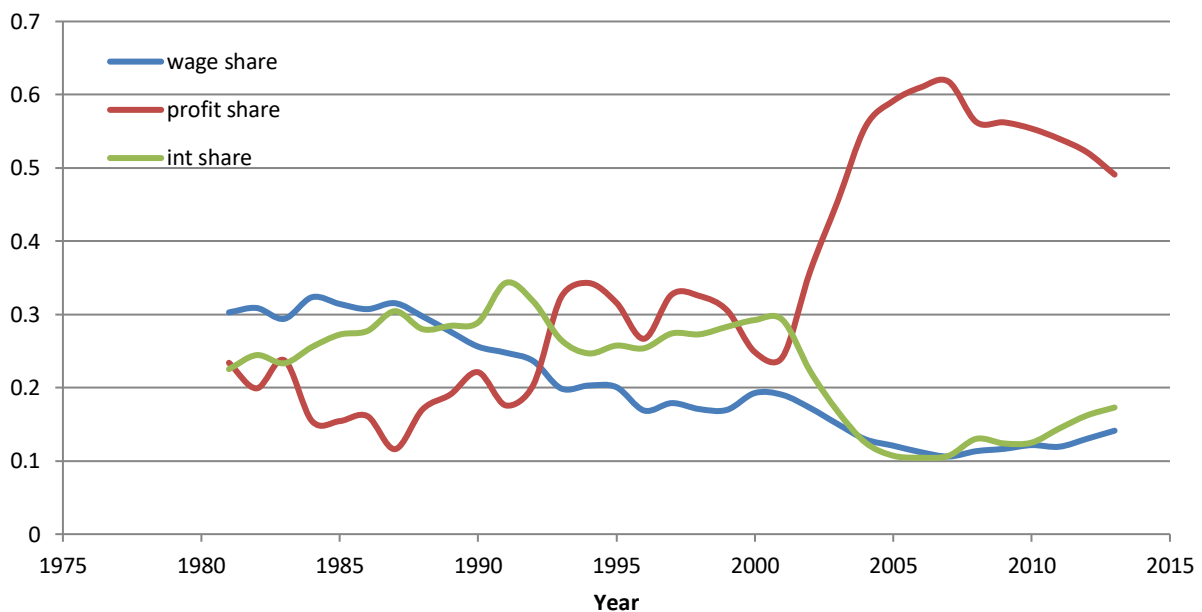
As can be seen from table 2, growth rate of real labor productivity is not matched by corresponding growth of real wage and growth of wage share. In almost all periods except 2010-11 to 2013-14, growth in real labor productivity was substantially higher than real wage growth, and growth in wage share was negative in most of the periods, it became positive from 2009-10 onwards. This trend indicates that gains of increasing real labor productivity was not accruing to labor in the form of higher real wages or high share of wages in net value added, rather it got expressed in higher profit incomes. This actually is robbery of labor by capital. The increasing gains in output were produced by labor but its benefits were robbed by profit earners. Figure 3 also shows that overtime the gap between real wages and real labor productivity has been continuously increasing.

Table 1: Share of Wages, Profits, Interest Payments in Net Value Added (in%)

Year	Wage share	Profit share	Interest share
1981-82	30	23	22
1990-91	25	22	28
1994-95	20	34	24
2004-05	12	55	12
2007-08	10	61	10
2010-11	12	55	12
2013-14	14	49	17

Source: Author’s Calculation using Annual Survey of Industries data, various years.

Figure 1: Share of Wages, Profit and Interest Payments in Net Value Added (%)



Source: Author’s Calculation using Annual Survey of Industries data, various years.

Table 2: Average Annual Growth Rates of Selected Variables²

Time Period	Real Wage ³	Real Labor Productivity	Wage Share
1981-82 to 1991-92	2.3%	6%	-1%
1990-91 to 1995-96	0.4%	7.4%	-5%
1995-96 to 2000-01	-3%	1%	-0.6%

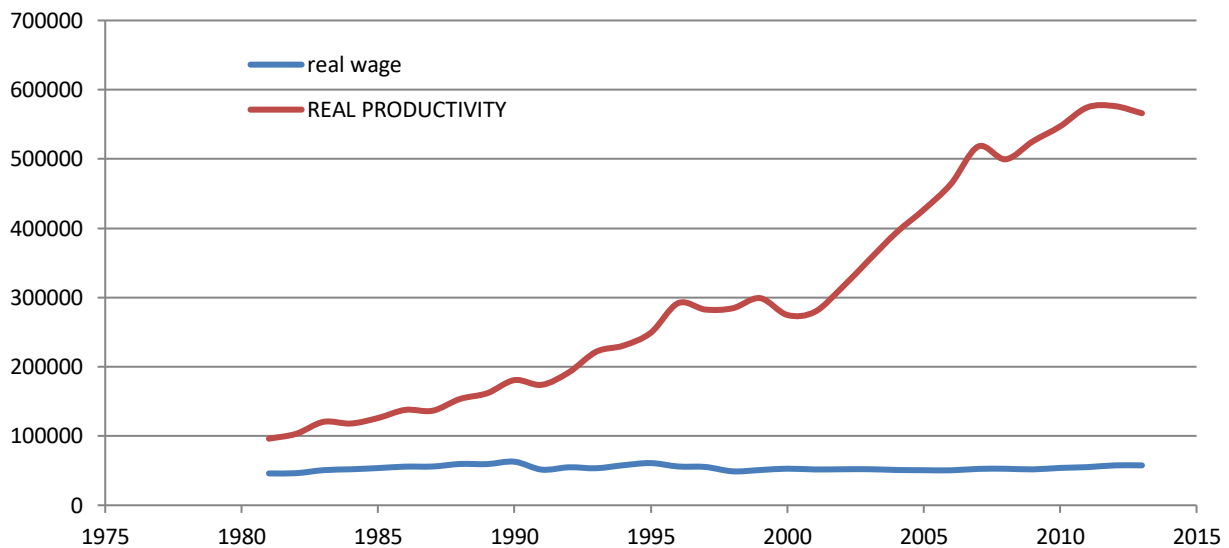
²For calculating average annual growth rates, the log of respective variables was regressed with time trend. The coefficient of time trend is the average annual growth rate.

³ Construction of all variables is explained in section-3.

2000-01 to 2005-06	-0.7%	9%	-10%
2005-06 to 2011-12	1.3%	4.41%	0.7%
2010-11 to 2013-14	2.4%	1%	5.3%

Source: Author’s Calculation using Annual Survey of Industries data, various years.

Figure 2: Widening Gap Between Real Wages and Real Labor Productivity



Source: Author’s Calculation using Annual Survey of Industries data, various years.

SECTION 2

Roy (2016) has contended that addressing the question of slow manufacturing growth in India involves a deeper analysis of distribution of income, which influences the composition of demand and thus over determines the growth trajectory. He has highlighted the role of distribution of income in the higher growth of services. He has argued that high growth of services in India is primarily driven by rising profit incomes. Rising profit shares led to increase in demand for services, which fuelled service sector growth⁴. But at the same time falling wage share turned into lower demand for durable goods which is an important element of manufacturing growth. He brings out the evidence that growth in durable consumption expenditure during 2000-2010 was at a high level of 9.9% but its share in consumption expenditure was only 3.2% owing to restricted purchasing power of masses, so despite high

⁴ Service sector growth is primarily driven by domestic demand. Growth of services exports accounted for only 22% of growth of overall services (Das et al cited in Roy, 2016)

growth of consumption expenditure on durable goods, it didn't contribute to high manufacturing growth because the base of the demand is itself very narrow.

Roy (2015) has asserted that capital -intensity is increasing in India despite cheap labor, and this is expressing itself in slow employment growth. This he mainly attributes to "compression of time and space" in globalization. He attributes rise in capital intensity to process of globalization whereby industries face global competition and are forced to adopt labor displacing technologies which are suited to labor scarce western nations and also rise in capital intensity can also be attributed to peculiar growth trajectory of India which is based on rising profit share which fuels consumption of luxuries and imports that induce labor displacing technology.

Roy (2015) has argued that despite wage cost being a miniscule share of gross value added around 2.17% in 2011-12), a discourse is created that stringent labor laws are responsible for slow growth of manufacturing sector. This he argues is an attempt by capital to destroy whatever little rights exist for labor. He explains that in a globalized world where volatilities of demand are high capital wants "as and when" kind of arrangement, where labor can be easily disposed off like any other inanimate input, without bearing any social burden of providing a living being to a human. The rationale in neo-liberal regime is to dismantle all the institutions which cause "unfreedom" to capital (ibid). This is clearly an assault by capital on labor to destroy institutions which protect their rights.

Roychowdhury (2014) argues against two claims, first being that labor laws are responsible for employment debacle in organized sector and second is that labor laws by protecting one section of labor force creates a labor aristocracy amidst low paid informal workers. He argues that these arguments are completely flawed and they gloss over the actual underpinnings. He argues that the chapter 5 b of industrial disputes act 1948 is often held responsible for employment debacle in the organized sector which requires an undertaking (engaged in manufacturing, mine and plantation activity) employing 100 or more permanent workers to take prior permission from government before retrenching even one worker. However, the flaws in this argument are brought to the center stage when it is realized that it is applicable to only organized manufacturing sector(which employs less than 30% of the whole organized sector workforce) and not to the organized sector as a whole. And also, data reveals that for the period 1980-2008 employment growth has been higher in the organized sector at 1.31%(where the labor laws apply) as compared to employment growth in the whole organized sector(0.59%) and in organized sectors excluding organized manufacturing(0.34%). Thus, the argument of labor laws responsible for slow employment growth is completely bogus. And even the second argument of labor aristocracy is rejected because the wage share in gross value added has been falling in organized sector and has reached to less than 10%, and also informal employment within organized manufacturing sector has been rising, therefore the claim of labor aristocracy amidst

rising informal employment is completely flawed. The argument of labor aristocracy is employed by capital to create a divide within the working class(ibid)

SECTION 3

This section explains details of data source and construction of key variables used in the analysis. The main data for analysis is the Annual Survey of Industries (ASI) time series data on principal characteristics of organized manufacturing sector. It was downloaded from the website of Ministry of Statistics and programme implementation, Government of India. It provided data for the time period 1981-82 to 2013-14.

ASI data was supplemented by annual time series of relevant price indices. The data for consumer price index for industrial workers (CPI-IW) and the wholesale price index for manufactured products (WPI-MF) was collected from the handbook statistics on Indian economy, 2014, published by RBI. The price indices were converted to base year of 2004-05. In order to convert to prices, both the price indices were divided by hundred.

Calculation of variables

Real Wage	=	Wages to Workers/ (Number of Workers* CPI-IW)
Real Labor Productivity	=	Net Value Added/ (Number of Workers*WPI-MF)
Profit Share	=	Profits/Net Value Added
Wage Share	=	Wages to Workers/Net Value Added
Share of Interest Payments	=	Interest Payments/Net Value Added

The model that is intended to be used is a log-log model, it will enable us to estimate what impact does 1% increase in real labor productivity has on wage share.

For OLS estimates to be reliable, following assumptions of asymptotic OLS analysis need to be satisfied:

- 1) **Linearity and weak dependence:** $\{(X_t, Y_t): t=0, 1, 2 \dots n\}$ follow a linear model and is stationary and weakly dependent.
- 2) **No perfect collinearity:** It implies that no independent variable is constant, nor a perfect linear combination of the other
- 3) **Zero conditional mean:** The explanatory variables are contemporaneously exogenous i.e. $E[U_t|X_t] = 0$, where $X_t = (X_{t1}, X_{t2} \dots X_{tk})$ are the explanatory variables. It means that the error term and the explanatory variable are uncorrelated i.e. $cov(X_{ij}, U_t) = 0$

- 4) **Homoscedastic:** The errors are contemporaneously homoscedastic i.e. Variance ($U_t|X_t$) $=\sigma^2$ i.e. variance of unobservable error at time t conditional on explanatory variable at time t is constant.
- 5) **No serial correlation:** The errors in two different time periods are uncorrelated i.e. $E(U_t U_s|X_t, X_s)=0$ for all $t \neq s$ (Wooldridge, 2006)

We check one by one that these assumptions are satisfied. First of all, we should make sure that the series to be used is stationary i.e. there are no unit roots

We can test stationarity by using following equation

$$Y_t = \alpha Y_{t-1} + e_t \quad (1)$$

Y_t will be stationary iff $\alpha < 1$. If $\alpha = 1$ then Y_t is a unit root process, and is not integrated of order zero therefore it is non-stationary. On the other hand, if $\alpha > 1$ then Y_t is explosive and therefore non-stationary. Dickey-Fuller test is used for checking stationarity, its equation is obtained by subtracting Y_{t-1} from both sides of the equation (1) i.e.

$$Y_t - Y_{t-1} = \alpha y_t - y_{t-1} + e_t$$

$$\Rightarrow \Delta Y_t = Y_{t-1}(\alpha - 1) + e_t$$

The null hypothesis in Dickey-Fuller test is $\alpha - 1 = 0$ i.e. $\alpha = 1$ which means that series is non-stationary.

The alternative hypothesis is $\alpha - 1 < 0$ i.e. $\alpha < 1$, which implies that series is stationary

Since we intend to use log-log model, therefore we should check for stationarity of log(wage share) and log (Real labor productivity).

We find that both log (wage share) and log(real labor productivity) have unit root/s, and are therefore non-stationary. The results of Dickey-Fuller test are given in table 3. We take first difference of both the variables and check for stationarity. We find that at first difference both the variables are integrated of order zero and hence stationary.

Figure 3: Results of Stationarity

Variable	Dickey-Fuller P-value
log (wage share)	0.7547
log (real labor productivity)	0.6238

D Log (wage share)	0.0005
D log (real labor productivity)	0.0000

Source: Author’s Estimation using Annual Survey of Industries data, various years.

Note: D denotes first difference.

After the series has been made stationary, we ran the regression at first difference level of log. The equation obtained is as follows

$$D \text{ Log (wage share)} = 0.0317 - 1.00337 D \text{ log (real labor productivity)}$$

Figure 4: Regression Results

Variables	Coefficients	Standard Error	t-statistics	P-value	R-squared	Adjusted R-squared	F-statistics
Constant	0.0317	0.1280116	2.997	0.0054	0.6719	0.66	61.44
D log (Real Labor Productivity)	-1.00337	0.0105986	-7.838	0.001			

Source: Author’s Estimation using Annual Survey of Industries data, various years.

Before interpreting the results, we should check whether our model satisfies rest of the four properties of asymptotic OLS analysis. We will first check for serial correlation, heteroskedasticity and then endogeneity.

In the presence of heteroskedasticity and serial correlation, the usual OLS standard errors, t-statistics, F-statistics are not suitable to test any hypothesis (Woolridge, 2006). However, before checking for heteroskedasticity we should first ensure that errors u_t should not be serially correlated because any serial correlation will invalidate the test for homoscedasticity (436, Woolridge, 2006).

Serial correlation occurs when the error terms are not independent. We use the following equation for detecting serial correlation

$$U_t = \alpha U_{t-1} + e_t$$

Here we take null hypothesis that there is no serial correlation i.e. $\alpha = 0$ and alternative hypothesis is $\alpha \neq 0$

But we can’t find the actual error terms, therefore we take estimated error terms U_t (hat) and U_{t-1} (hat).

Figure 5: Serial Correlation Results

Variable	Coefficient	t-statistic	p-value	Std. error
$U_{t-1}(\hat{a})$	0.15	0.89	0.37	0.17

Source: Author’s Estimation using Annual Survey of Industries data, various years.

Since t-ratio is insignificant, and P-value is also high enough therefore we fail to reject null hypothesis. Hence there is no serial correlation in the error terms.

Now we test for homoscedasticity. We use Breusch-Pagan test for this purpose. The Breusch-Pagan test is given by the following equation

$$U_t^2 = \alpha_0 + \alpha_1 X_{t1} + \dots + \alpha_k X_{tk} + V_t$$

In this test the implicit assumption is that the errors $\{V_t\}$ are themselves homoscedastic and serially uncorrelated. In Breusch-Pagan test the null hypothesis is that error is homoscedastic i.e. $\alpha_1 = \alpha_2 = \dots = \alpha_k = 0$. And the alternative hypothesis is that at least one from $\alpha_1 \dots \alpha_k$ is non-zero.

Figure 6: Heteroskedasticity Results

Variable	Coefficient	t-statistic	p-value	Std. error
D log (Real productivity) \hat{a}	-0.13	-0.03	0.97	3.64

Source: Author’s Estimation using Annual Survey of Industries data, various years.

Since the t-ratio is insignificant (-0.03) and P-value is very high therefore we fail to reject null hypothesis, hence we conclude that there is no problem of heteroskedasticity.

Now we check for endogeneity. For a variable to be endogenous, it should be independent from the error term. We use three equations to test for endogeneity

$$D \log(\text{wageshare})_t = \alpha + \beta D \log(\text{real labor productivity})_t + U_t(I)$$

$$D \log(\text{real labor productivity})_t = \gamma + \lambda D \log(\text{real labor productivity})_{t-1} + V_t(II)$$

$$U_t = \delta + \varepsilon v_t + e_t(III)$$

For explanatory variable to be endogenous ε should be insignificant.

Figure 7: Endogeneity Result

Variable	Coefficient	t-statistic	p-value	Std. error
$V_t(\hat{a})$	-0.016	-0.12	0.89	0.12

Source: Author’s Estimation using Annual Survey of Industries data, various years.

Table 7 presents the results of equation (III). It is discernible from the above results that ϵ is insignificant, therefore we can safely conclude that our explanatory variable is endogenous. Now since all the assumptions have been satisfied⁵; we can interpret the results of our model.

Section-4

The estimated model is

$$D \text{ Log}(\text{wageshare}) = 0.0317 - 1.00337 D \text{ log}(\text{real labor productivity})$$

It can be seen from the table4 that our results are statistically significant at 1% level of significance ($t_{0.99,29} = 2.42$). And the results are economically significant as well, a 1% increase in real labor productivity is expected to reduce share of wages by approximately 1%. It implies that none of the gains of increase in real labor productivity accrue to labour, and all the gains of productivity increase are captured in rising profit share. And R-squared is 0.67, it means that real labor productivity explains 67% of variation in wage share, the rest of the variation in wage share may be due to other factors like bargaining power of labor union, legal laws regarding wages etc. which are not accounted in the present model.

The results we got are in contrast with marginal productivity theory according to which as labor productivity increases, wages also increase in the same proportion as a result wage share will increase if labor productivity increases. However, in an economy where unemployment persists, this phenomenon doesn't really hold. In the presence of huge reserve army of labor, ready supply of labor is available at the same wage and even at lower wage rates even if labor productivity has been increasing. So, as labor productivity increases, the wages remain same, as a result wage share declines (Wage share = Wages/ Net value added, denominator increases but numerator remains same, as a result wage share declines).

Section-5

The results of this paper were limited only to organized manufacturing sector, it was proved that increase in real labor productivity was not matched by a corresponding increase in wage share, contradictory to this, wage share was in fact declining in response to increase in real labor productivity, implying that entire gains were captured by profit earners. The situation is even worse in unorganized sector which employs majority of workforce and where even minimally existing labor laws are not applicable. The wages are even lower in the informal sector. One of the conjectures of this paper was to argue that stagnant manufacturing growth in India is somehow because of demand deficiency caused by low purchasing power (because of low share

⁵ Assumption of no perfect collinearity is trivially satisfied because we only have one explanatory variable and it is not constant overtime.

of wages). This conjecture couldn't be proved here because of limited scope of this paper, it can be taken up as future research prospect.

References

Roychowdhury, Anamitra (2014), "Labor market flexibility argument", Vikalp

Roy, Satyaki (2015), "Labor reforms: A Marxian outlook", Vikalp

Roy, Satyaki (2016), "Faltering manufacturing growth and employment. Is "Making" the answer?", Economics and political weekly, LI (13):35-42

Wooldridge, J. M. (2006), "Introductory econometrics: A modern approach. Mason", OH: Thomson/South-Western.