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CSE Working Paper

#30

Income Distribution and Effective Demand in the Indian Economy

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August 2020

Centre for Sustainable Employment

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Abstract: Does there exist a trade-off between labour's income share and output growth rate? Or does a reduction in wage share in itself reduces the output growth rate? These questions have returned to the centre stage in the midst of India's present crisis as the government sought the dilution and suspension of labour laws as a counter-cyclical policy instrument. In the absence of any other stimulus or countervailing factors, the impact of such a policy would hinge on the relationship between income distribution and effective demand. This paper attempts to lay bare this relationship for the Indian economy through an empirical analysis of India's macro data and a theoretical model on the basis of regression results.

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The author is grateful to Rohit Azad, Anamitra Roychowdhury and Arjun Jayadev for their comments. The usual disclaimers apply.

1. Introduction

Does there exist a trade-off between labour's income share and output growth rate? Or does a reduction in wage share in itself reduces the output growth rate? These questions have returned to the centre stage in the midst of India's present crisis as the government sought dilution and suspension of labour laws as a counter-cyclical policy instrument. Though such policies have been advocated for stimulating growth by recent Economic Surveys and initiated in many states in the pre-Covid period, the process gained momentum particularly in the midst of the present crisis.

Despite variation across states, there are at least three broad features of such changes in labour laws which can be argued to bring about a decline in the share of wages in output. These are (a) dilution of the notion of minimum wage rate, (b) extension of the working hours and (c) increase in flexibility to hire-and-fire (Roychowdhury, 2020; Sood and Nath, 2020). If wage share is defined as the ratio between real wage rate per worker and output per worker, where output per worker is the product of output per work hour and number of work hours per worker, then such modifications in labour law would aim to the reduce wage share either by reducing real wage rate or increasing the work hours per worker.

Unlike a period of boom when labour's income growth rate may get pulled up despite a fall in its income share due to presence of exogenous stimuli, during the period of depressed demand such as the present one, the impact of state-induced reduction in wage share on labour's income growth rate would depend on the relation between wage share and growth rate. In the absence of an inverse relationship between wage share and growth rate, reduction in labour's income share would be associated with further fall in labour income growth rate in the midst of what has already been an unprecedented crisis. But does such an inverse relationship exist in the Indian economy? Or can reduction in wage share itself reduce growth? This paper attempts to address these questions. The rest of the paper is organized as follows:

Section 2 provides a critical overview of competing theoretical frameworks under which the relationship between wage share and growth rate have been analysed. The central empirical question is posed in the backdrop of this theoretical debate. Section 3 highlights some stylized facts of the Indian economy. Section 4-6 estimates the relationship between wage share and various components of aggregate demand. Based on the estimated values of the regression analyses, section 7 provides an exposition of the nature of relationship between wage share and growth rate in Indian economy through a theoretical model.

2. The Theoretical Framework and the Empirical Question

In a world where nominal wage rate is set through a bargaining process and determined independent of existing technological conditions, a phenomenon which otherwise characterizes the real world, the impact of changes in income distribution can be analysed in *two* alternative ways. The logical structure of these alternative frameworks are fundamentally different from each other and the empirical strategy of estimating the impact of change in wage share is dependent on the precise choice of theoretical framework.

The first theoretical framework comprises of the supply-side models, the common feature of which is the existence of an automatic adjustment mechanism that ensures exante savings necessarily generates an equivalent level of investments. Once real wage rate is perceived to be exogenously set above the market clearing level, an assumption which all proponents of labour market flexibility adhere to, then implementation of labour market reforms and consequent reduction in real wage rate within this framework can be argued to simultaneously change income distribution and increase the steady state growth rate. Depending on the specificity of the model and the nature of closure, such rise in growth rate can be argued to be brought about either through an increase in technological output-capital ratio (neoclassical models) or increasing the savings propensity of the economy (Ricardian models). In the Indian context, the implicit theoretical root of the entire spectrum of empirical literature advocating labour market flexibility can be located within this supply-side framework. There are at least two fundamental drawbacks of such analyses.

The first limitation is empirical in nature and pertains to the lack of robustness of the regression estimates that have been used to advocate labour market flexibility (Bhaltora, 1998 and Bhattacharjea, 2007). Further, Roychowdhury (2018) showed that as compared to the sectors where labour laws did not apply, the sectors where labour laws applied were also the ones where the employment growth rate was greater. The second limitation, however, goes much deeper and is methodological in nature. The supply-side theoretical framework is based on the unrealistic assumption that investment necessarily adjusts to changes in exante savings. The moment one drops this rigid assumption and includes an investment function, the entire theoretical basis of labour market flexibility breaks down as rise in output-capital ratio as well as higher savings propensity may be shown to be associated with lower steady state growth rate (Sen, 1970 and Dutt, 1990). Relaxing the rigid assumption of supply-side framework related to investment behaviour leads one to explore the alternative framework.

The alternative or the second theoretical framework pertains to the demand-side theories where exante investment decisions are analytically distinct from savings decisions and it is the exante investments which generates an equivalent level of savings. The impact of income redistribution on growth rate has been primarily analysed within this framework through Kaleckian models, where consumption propensity of the workers is assumed to be greater than that of the capitalists. Any reduction in wage share is argued to push the economy into two opposite directions: while it can reduce growth rate by reducing the consumption propensity of the economy, it is argued to open up the possibility of pushing up growth rate by increasing the investment rate (Bhaduri and Marglin, 1990) or the net exports (Blecker, 2001). The net impact on growth rate is argued to depend on the relative strength of these opposite forces. Depending on which effect dominates, the growth regime is either termed as wage-led (if the negative impact of lower wage share dominates), or exhilarationist (if the positive impact of lower wage share dominates).

Though there can be a broad agreement about the theoretical possibility of exhilarationist growth regimes through the trade channel, the central point of debate even within Kaleckian theories has centred around the exhilerationist investment function. While the investment rate in any other Kaleckian model would be a function of capacity utilization rate or the profit rate (or both), the specificity of the exhilarationist model is that investment function is perceived to be a positive function of the capacity utilization rate and the profit share. The scepticism around such investment function is on following grounds:

The *first* issue pertains to the use of profit share as a separate argument in the investment function instead of the profit rate. The exhilarationist investment function is based on the assumption that *at any given capacity utilization rate and investment rate*, higher profit share positively affects the actual and expected profit rate of firms. However, though higher profit share of a firm can be argued to notionally increase profit rate of a micro firm *at a given capacity utilization rate*, nonetheless, such a rise in profit share at the macro level would reduce the actual capacity utilization rate itself by increasing the savings propensity of the economy and thereby, keep the actual profit rate of the economy unchanged. If investment rate is perceived to be a function of expected profit rate, whereas expected profit is argued to be dependent on the actual profit rate, then there appears no theoretical reason why investment rate would respond positively to higher profit share. In other words, there exists a paradox between micro motive and macro behaviour which exhilarationist investment function appears to ignore.

The *second* issue pertains to the manner in which the relation between savings propensity and investment is perceived, which is distinct both from the Ricardian models as well as other Kaleckian models. Assuming workers do not save, the savings propensity of an economy would be the product of the savings propensity of the capitalists and the profit share. In supply-side Ricardian models, investment rate would respond positively to both these components of savings propensity. The cornerstone of under-consumptionist Kaleckian models has been the fact that investment rate responds negatively to both the components of savings propensity. However, in contrast to both these theories, the distinct feature of exhilarationist model is the fact that exante investments respond positively to one component of savings propensity (the profit share), but negatively to another component (savings propensity of capitalists). What appears to be unclear is the basis on which the exhilarationist models distinguish between different components of savings propensity in terms of their different effects on investment decisions.

Though one confronts significant challenge in conceptualizing exhilarationist growth regimes through the investment channel, nonetheless, the exhilarationist models can operate through the trade channel. In the Indian context, there are at least two mechanisms through which changes in wage share can be argued to affect the net exports. They are as follows:

The first route operates through the conventional real exchange rate channel. Since domestic prices are perceived to be set by mark-up over unit prime cost within Kaleckian models, reduction (increase) in wage share is argued to bring about a depreciation (appreciation) of real exchange rate by reducing domestic prices at any given foreign prices and nominal exchange rate. Such depreciation (appreciation) of the real exchange rate in turn opens up the possibility of increasing (decreasing) exports at a given level of foreign demand and reducing (increasing) imports at a given level of domestic demand.

The second route is specific to a developing country like India where changes in income distribution affects the import propensity by changing the consumption basket of the economy at any given real exchange rate (Dasgupta and Chowdhury, 2015). This is because of the fact that while the consumption baskets differ across decile classes, the direct and indirect import-demand associated with the consumption basket of the upper decile is higher than that of the lower decile (ibid). Thus by bringing about an increase in the consumption share of the upper decile classes through income redistribution, reduction in wage share can bring about an increase in the import demand per unit output at a given real exchange rate.

In a nutshell, changes in wage share can be argued to push different components of aggregate demand into opposite directions and the net impact on growth rate would depend on the relative strength of its impact on consumption propensity, exports and imports. Which of these forces are dominant in the Indian economy? The following section outlines some stylized of the Indian economy and the subsequent three sections adopt a single-equation approach to estimate the consumption function, the export function and the import function separately.

3. Some Stylised Facts

There are at least four distinct features of the Indian economy which can be noted in the present context:

Firstly, as well known by now, the share of wages in gross value added of the registered factory sector registered a sharp decline since the decade of 80s, albeit with marginal recovery in the very recent period (see figure 1a). Such a trend has been associated with the overall decline in the income share of bottom 99% during the same period, as indicated by the strong correlation between the two indicators in the scatter plot of figure 1b.

Figure 1: Wage Share in Registered Factory Sector and Income Share of Bottom 99%, 1973-74 to 2016-17

Figure 1a: Share of Wages in Gross Value Added

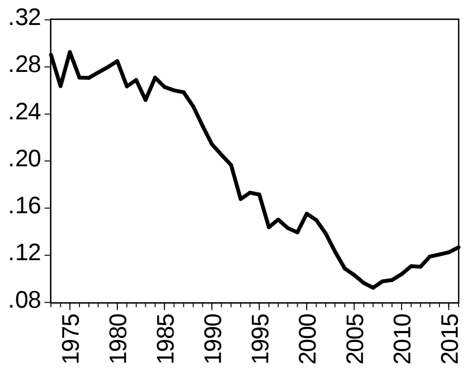
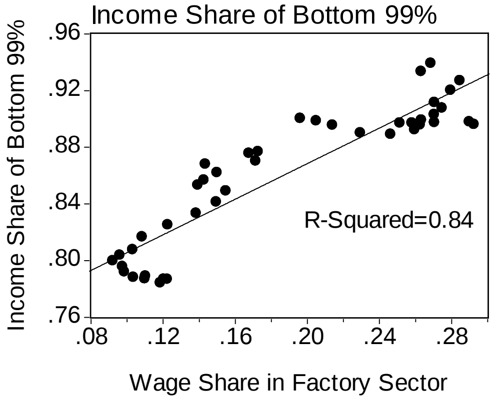


Figure 1b: Scatter Plot Between Wage Share and Income Share of Bottom 99%



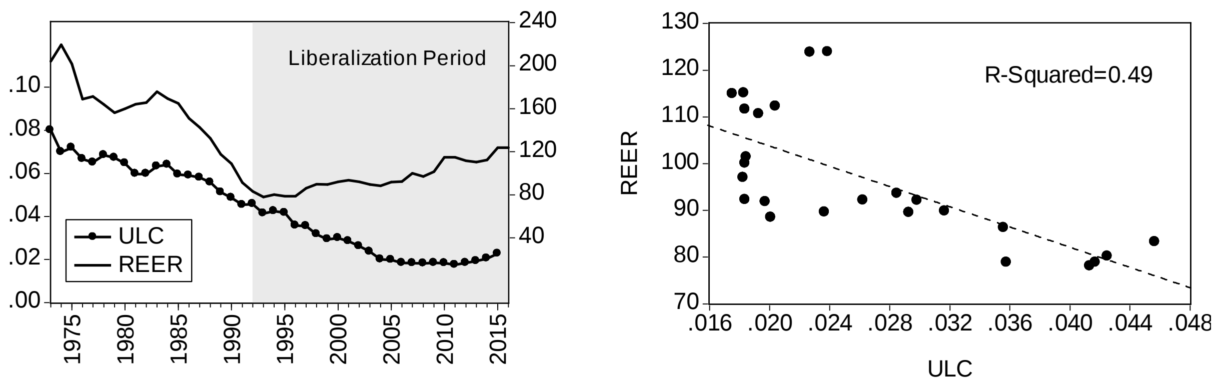
Source: Annual Survey of Industries and World Inequality Database

Secondly, despite a sharp decline in the wages per unit of output or the unit labour cost (ULC), the Indian economy witnessed an appreciation in the real effective exchange rate (REER) during the post-liberalization period (1992 onwards). This is reflected in figure 2a, where rise in the index of REER indicates appreciation. While a fall in ULC, *ceteris paribus*, is expected to be associated with depreciation in REER due to reduction in output prices, a trend which was *actually* observed during the pre-liberalization period, the trend showed a sharp reversal since the 90s when the ULC and index of REER started moving in opposite directions. The latter phenomenon indicates the presence of countervailing factors and that reduction in unit labour cost had hardly any *expost* impact of reducing domestic output prices at a given nominal exchange rate and foreign prices. This divergent trend between ULC and REER is reflected by the scatter plot and a negative linear trend line in figure 2b.

Figure 2: Unit Labour Cost (ULC) and Real Effective Exchange Rate (REER)

Figure 2a: ULC and REER, 1973-74 to 2016-17

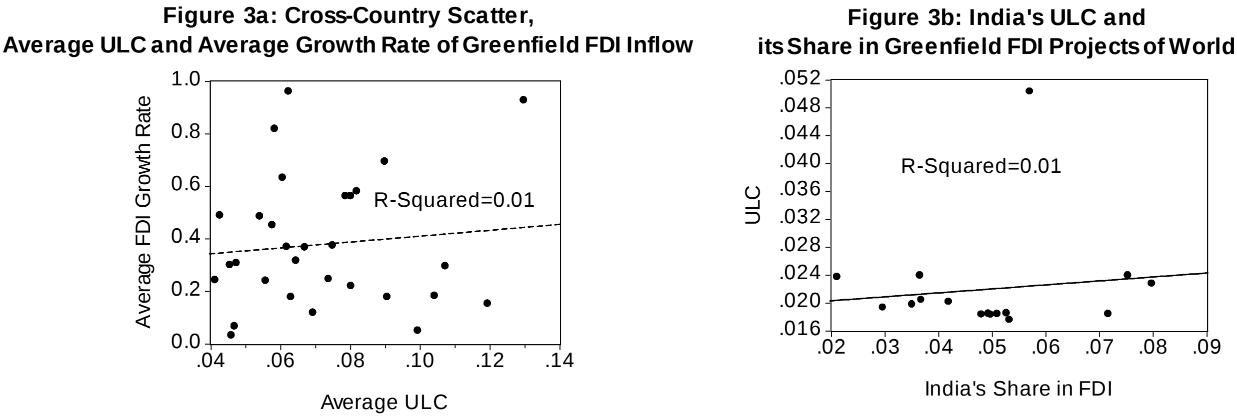
Figure 2b: Scatter ULC and REER, 1992-93 to 2016-17



Source: Annual Survey of Industries and Bruegel Database

Thirdly, the destination of greenfield foreign direct investment (FDI) projects, which otherwise played an instrumental role in enhancing exports in many developing countries, has been typically determined by factors which are independent of country's unit labour cost. Figure 3a reflects this phenomenon for 30 developing countries through a scatter plot between their average growth rate of greenfield FDI projects and their average ULC during the period 2003 to 2018. Figure 3b reflects the same phenomenon for the Indian economy through a scatter plot between India's share in the value of world greenfield FDI projects and its unit labour cost during the period 2003 to 2018. The trend lines for both the scatter plots are horizontal (with R-squared=0.01), indicating absence of any significant relationship between ULC and greenfield FDI projects.

Figure 3: Scatter Plots between ULC and Greenfield FDI Projects (value)

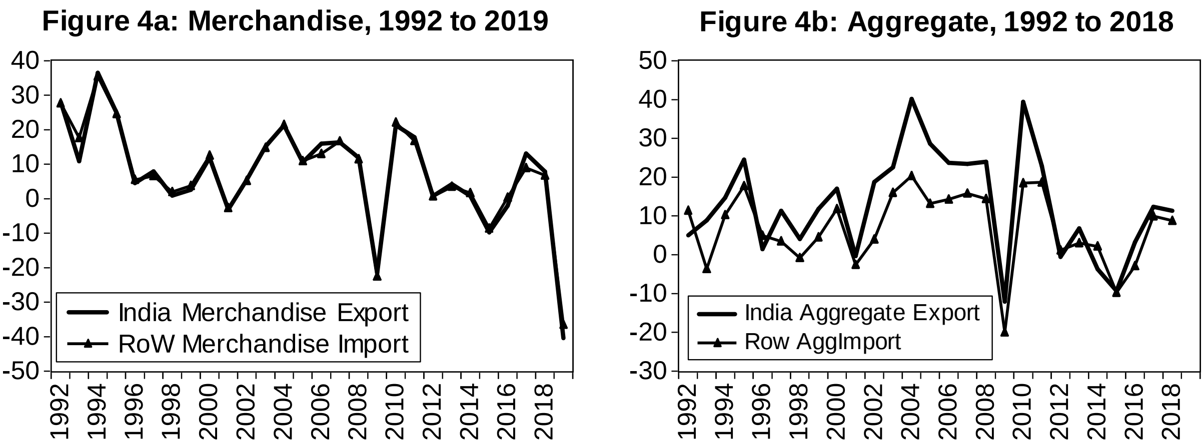


Source: World Investment Report, UNCTAD and INDSTAT2, UNIDO Database

Note: For the sake of comparability, ULC data for all countries including that of India is calculated from UNIDO database. The ULC is calculated as the ratio between wages and salaries and the value of output.

Fourthly, India’s export growth rate has been primarily driven by exogenous changes in the level and structure of global demand during the post-liberalization period. Figure 4a shows the trend in India’s merchandise export growth rate which broadly followed the trend in that of the import growth rate of rest of the world. Figure 4b shows the same trend for the aggregate category including the service sector.

Figure 4: Nominal Growth Rate of India’s Export and Import of Rest of the World (RoW)



Source: WITS COMTRADE Database and UNCTAD STAT

In short, while reduction in labour's income share has been a general feature of the Indian economy in the recent period, its role in stimulating exports has been limited as reflected by the fact that export growth rate increased only during the period of global booms. It is in this backdrop that we now estimate the consumption, export and import functions.

4. Estimation of Consumption Function

The consumption expenditure of any economy can be classified into 2 components-(i) an autonomous component (A) which remains unaffected by the level of income (Y) and (ii) the induced component which can be perceived to be the product of income and a given macroeconomic consumption propensity (b). Since the consumption-GDP ratio would be the sum of the share of autonomous component in GDP and the consumption propensity, as shown in equation (1), its trend would be affected by changes in any of these components.

$$\frac{C}{Y}=\frac{A}{Y}+b\quad(1)$$

The specificity of the Kaleckian proposition, however, lies in its emphasis on the second term of RHS, namely, the consumption propensity 'b'. If the total income of the economy is divided between workers and profit earners, then the macroeconomic consumption propensity 'b' would be equal to the weighted average of the consumption propensity of the workers and the profit earners, with the weights being the wage share and the profit share respectively. Accordingly, the earlier equation (1) can be re-written as equation (2), where 'h', 'c_w' and 'c_e' are the wage share, the consumption propensity of the workers and that of the profit earners respectively. With the consumption propensity of the workers being assumed to be higher than that of the profit earners, lower wage share is supposed to reduce the consumption-ratio at a *given* share of the autonomous component in output.

$$\frac{C}{Y}=\frac{A}{y}+c_e+(c_w-c_e)h\quad(2)$$

In the case of an expost macroeconomic data, however, the share of autonomous consumption component in output is itself subject to change as other autonomous demand components change. For example, any rise in investment or export, ceteris paribus, would bring about a rise in output and thereby lead to a decline in the share of autonomous consumption component in output. Taking the consumption-ratio as the dependent variable and the wage share as the independent variable, the objective of the present empirical exercise is to test the relationship between the two after controlling for the changes in its intercept term. A time-series regression is conducted for this exercise.

Data: The consumption-GDP ratio is calculated as a ratio between the current price estimates of private final consumption expenditure and the GDP. The 2011-12 series for current prices estimates are taken from EPWRF. The indicator for wage share is calculated as a ratio between wages and the gross value added of the organized factory sector. The data for wages and gross value added is taken from Annual Survey of Industries (ASI). The consumption-GDP ratio is taken as the dependent variable, whereas the wage share is taken as the independent variable. Since continuous time-series data for the wage share can be constructed since 1973-74, the sample period of the analysis is selected as 1973-74 to 2016-17.

Estimation Method: We adopt a 'partial' structural break model with 'm' number of potential break dates ($T_1,\ldots,T_m$) producing m+1 regimes, where the intercept term is allowed to change across break dates, but the coefficient for income share is estimated for the entire sample period. We take the sample period from 1973-74 to 2016-17, where the number of break points (m) and the break dates ($T_1,\ldots,T_m$) are treated as unknown and estimated from the data. For the observations $t=T_{j-1}+1, T_j+1\ldots,T_j$ in regime $j=1,2,\ldots m+1$, the regression model can be described by equation 3, where c_t and h_t respectively denote consumption-GDP ratio and the wage share at time t. In terms of equation (3), the intercept term 'a_j' would be different for different endogenously determined regimes. If there exist a positive relationship between the wage share of the workers and propensity to consume as argued by Kalecki, then the value of β would be positive for the entire period even after allowing for different values of the intercept term in different regimes.

$$c_t = \alpha_j + \beta h_t + \varepsilon_t \quad (3)$$

Following Bai and Perron (2003), the breakdates are estimated as global minimizers of the sum of squared residuals from the OLS regression (3) using a dynamic programming algorithm. Accordingly, for the set of m break points ($T_1,\ldots,T_m$), the parameters α and β are estimated by minimizing the sum of squared residuals $\sum_{j=1}^{m+1} \sum_{T_{j-1}+1}^{T_j} \left(c_t - a_j - \beta \pi_t\right)^2$. The Schwarz Information Criterion (SIC) is used to determine the optimal number of structural breaks, as we select that number of breaks for which the SIC is minimum. The optimal number of breaks is found to be 2 where SIC is minimum (-5.57) and the break dates are estimated to be 1985-86 and 2004-05. Thus, we estimate α for three periods, namely, i) 1973-74 to 1984-85, ii) 1985-86 to 2003-04 and iii)2004-05 to 2016-17, whereas β is estimated for the entire sample period.

The Ramsey RESET test was conducted to check for specification error. It could not reject the null hypothesis of correct functional form even at 10% significance level. The White test for heteroskedasticity could not reject the null hypothesis of homoskedasticity even at 10% significance level. The Breusch-Godfrey Serial Correlation LM test could not reject the null hypothesis of no serial correlation at 10% significance level. In order to test for the existence of unit root in the residuals, we conduct the standard Augmented Dickey-Fuller (ADF) Test. The null hypothesis of existence of unit root in the residuals is rejected at 1% significance level.

Result: Table 1 reports the regression results. The intercept term α is positive and statistically significant at 1% level across all the relevant periods and showed a steady decline throughout the period. But despite such a decline in the intercept term across the periods, the coefficient β is found to be positive (0.70) and statistically significant at 1% level. The R-squared for this regression is found to be 0.97.

Table 1: Regression Result for the Partial Structural Break Model

Periods	**α**	**β**
1973-74 to 1984-85	0.58***	
1985-86 to 2003-04	0.53***	
2004-05 to 2016-17	0.49***	
1973-74 to 2016-17		0.70***
Durbin-Watson=1.58	**Schwarz Criterion= -5.57**	**R-squared=0.97**

Note: ‘***’ indicate statistical significance at 1% level.

The above exercise shows that, *ceteris paribus*, any decline in the wage share would bring about a similar decline in the consumption ratio as would be predicted by the Kaleckian models. With this, we now consider the export function.

5. Estimation of Export Function

The export of an economy within a demand-constrained system can be perceived to be a function of, inter alia, the real exchange rate and the global demand. Since changes in wage share can affect exports only through the real exchange rate channel, here we start by directly testing the relationship between real exchange rate and exports, after controlling for the changes in global demand. The relationship between real exchange rate and wage share would be tested only if there exists a statistically significant relationship between real exchange rate and exports. A panel-data regression is conducted for this exercise.

Data: We consider 22 sub-sectors of manufacturing at the 2-digit level (sectors 15-36) as per the ISIC- Revision 3 nomenclature. The data for India's export, import and world import at the 2-digit level is taken from the WITS COMTRADE database. For each sector, the indicator for global demand is constructed by subtracting India's import from world total import. The sector-specific real exchange rates are constructed in the following manner:

The 36-currency export-weighted real effective exchange rate of an economy can be described as equation (4), where 'e' is the nominal exchange rate of the rupee against the numeraire SDR, 'e_i' is the exchange rate of country 'i' against the SDR, 'p' is the domestic price index measured in terms of WPI, 'p_i' is the CPI of a foreign country 'i', 'w_i' is the share of country 'i' in India's exports and 'n' denotes the total number of countries (here, 36). Accordingly, higher index of real effective exchange rate indicate appreciation whereas decline in real effective exchange rate indicate depreciation.

The list of 36 countries is kept the same as the one used in RBI (2005) for constructing the index of 36-currency export-weighted real effective exchange rate. Since the export share of these countries would be different across the 2-digit sectors, the sector-specific 36-currency export-weighted real exchange rates would also be different from each other. The data for prices and nominal exchange rate of India ('p' and 'e') are taken from the RBI, data for foreign prices and exchange rates ('p_i' and 'e_i') of these 36 countries are taken from IMF Financial Statistics and the respective shares of various countries in India's exports are calculated from COMTRADE database[2].

$$R=\prod_{i=1}^{n}\left[\left(\frac{e}{e_i}\right)\cdot\left(\frac{p}{p_i}\right)\right]^{w_i} \qquad (4)$$

2 It can be noted, that in the recent period indicator for measuring domestic price has been changed from WPI to the new CPI (RBI, 2014). However, in order to make the comparison consistent for the entire period since 1992, we use the WPI of manufacturing products for this exercise.

The three variables-namely, India's exports, import of rest of the word and real effective exchange rate are transformed into growth form to make them I(0) processes. They are respectively termed as $\hat{x}$, $\hat{r}$ and $\hat{z}$. India's export growth rate is taken as the dependent variable, whereas the growth rate of import demand of rest of the world and that of real exchange rate is taken as the independent variable. Since India's export structure has gone through significant changes during the post-liberalization period, the initial year of the analysis is taken to be 1991. Accordingly, the period of analysis is selected as 1991-92 to 2016-17.

Estimation Method: In order to check for the possible existence of unit roots in any of these variables, three kinds of panel unit root tests are conducted: the Fisher test, the Levin-Lin-Chu test and the Im-Pesaran-Shin test. The Akaike Information Criteria (AIC) is used to choose the optimal lag length for the Levin-Lin-Chu and Im-Pesaran-Shin tests. The null hypothesis in all these tests is that panels contain unit roots. The null hypothesis of existence of unit roots are rejected in all these tests at 1% significance level. Thus, the problem of unit roots is not serious for our regression analysis.

Using Hausman test, fixed effect regression model is chosen over a random effect model. Accordingly, the regression equation can be written as equation (5). In terms of this equation, a positive relation between depreciation of real exchange rate and export would be reflected by statistically significant and negative value of θ. Similarly, the coefficient 'γ' would be expected to be positive if there exists a positive relationship between India's exports and global demand.

$$\hat{x}_{it} = A_i + \gamma . \hat{r}_{it} + \theta . \hat{z}_{it} + e_{it} \qquad (5)$$

Where

-- i=1…N and t=1…T

-- x_{it} is the growth rate of export in sector 'i' at period 't'

-- r_{it} is the growth rate of rest of the world imports in sector 'i' at period 't'

-- z_{it} is the real exchange rate in sector 'i' at period 't'

-- A_i is the constant terms for sector 'i'

-- e_{it} is the error term

The Wooldridge test is conducted to check for the presence of autocorrelation, where the null hypothesis states that there exists no first order autocorrelation. In order to check for the presence of heteroskedasticity, we use a modified Wald test where the null hypothesis states that there exists no heteroskedasticity. And lastly, to check for the presence of cross-sectional dependence, the Pesaran's Test is conducted where the null hypothesis states that there exists no cross-sectional dependence. The null hypothesis of each of these tests are rejected at 1% significance level.

Accordingly, the Driscoll and Kraay standard errors are used which are consistent with heteroskedasticity and autocorrelation and are robust to general forms of spatial and temporal dependence. The result of this robust fixed effect regression analysis is reported in table 2.

Result: As evident from the table, that the coefficients for rest of the world import is positive and statistically significant at 5% level. However, though the coefficient for real effective exchange rate shows the expected negative sign, it is statistically insignificant even at 10% level. With 572 observations, 22 groups and 26 periods, the within R-squared value is estimated to be 0.55.

Table 2: Regression Result for the Export Function

	Coefficient	**Driscoll/Kraay Standard Error**
A	-0.21	0.143
$\hat{r}$	3.65**	1.646
$\hat{z}$	-0.02	0.015
Within R-squared=0.554	**Number of Observations=572**	
Number of Groups=22	**Number of Period=26**	

Note: '**' indicates statistical significance at 5% level.

In a nutshell, while India's export growth rate during the liberalization period has been typically affected by the changes in the global demand, its relationship with the real exchange rate during this period has been statistically insignificant. We now consider the import function.

6. Estimation of Import Function

The relationship between import content per unit of output and the real exchange rate function can be described in the linear form as equations (6), where 'z' reflects the real exchange rate, 'm' denotes the import propensity and 'h' is the wage share. The real exchange rate is defined in the same manner as it was in the export function. The second term of the RHS of equation (6) captures the positive (negative) impact of appreciation (depreciation), while the third term captures the negative relationship between wage share and import propensity at a given real exchange rate.. Equation (7) captures the relationship between real exchange rate and wage share in a linear form. Since all the parameters have positive signs, as shown in the reduced form equation (8), the net impact of change in wage share on the import propensity would depend on the values of ‘f’, ‘φ’ and ‘λ’. Reduction in wage share would lead to higher import propensity if λ>fφ, whereas fall in wage share would reduce the import propensity if λ< fφ. In case λ= fφ, changes in wage share would have no effect on import propensity. The objective of this exercise would be to estimate the values of ‘λ’, ‘f’ and ‘φ’.

$$m = c + fz - \lambda h \ldots (6)$$

$$z = \tau + \varphi h \ldots (7)$$

$$m = \kappa + (f\varphi - \lambda) h \ldots (8)$$

where

$$c > 0; f > 0; \lambda > 0; \tau > 0; \varphi > 0$$

$$\kappa = c + f\tau$$

In contrast to the export function, where sectoral wage shares could affect the exports by changing sectoral real exchange rates, here the import propensity would be affected by the wage share of the macro economy. Accordingly, a time-series regression is conducted for the import function.

Data: The import-GDP ratio is calculated as a ratio between the current price estimates of import and the GDP. The 2011-12 series for current prices estimates are taken from EPWRF. As in the case of consumption function, the indicator for wage share is constructed from Annual Survey of Industries (ASI). The index for real effective exchange rate of the economy is taken from Bruegel Database. The base year of the index is 2007-08. Similar to the RBI methodology, higher value of the index would indicate appreciation of the real exchange rate whereas a lower value indicate depreciation. Again, for reason similar to the export function, the sample period is taken to be 1991-92 to 2016-17.

Estimation Method: Similar to the methodology applied in the case of consumption function, we adopt a 'partial' structural break model to estimate equations (6) and (7) separately. The regression equations are written as (6a) and (7a). The intercept term is allowed to change across break dates, but the coefficient for independent variables are estimated for the entire sample period. The Schwarz Information Criterion (SIC) is selected to determine the optimal number of structural breaks. The optimal number of breaks for equation (6a) is 2 and the break dates are 2005-06 and 2014-15. The optimal number of break date for equation (7a) is 3 and the break dates are 1997-98, 2007-08 and 2010-11.

$$m_t = c_j + f z_t + \lambda h_t + \varepsilon_t \quad (6a)$$

$$z_t = \tau_j + \varphi h_t + \xi_t \quad (7a)$$

The Ramsey RESET tests were conducted to check for specification error in both the models. It could not reject the null hypothesis of correct functional form even at 10% significance level. However, the Breusch-Godfrey Serial Correlation LM test rejected the null hypothesis of no serial correlation at 1% significance level for both the equations. Accordingly, the Newey-West covariance matrix is used to make the estimates consistent in the presence of autocorrelation. In order to test for the existence of unit root in the residuals, we conduct the standard Augmented Dickey-Fuller (ADF) Test. The null hypothesis of existence of unit root in the residuals is rejected at 1% significance level.

Result: Table 3 and 4 report the regression results. The coefficients 'f' and 'λ' are found to be statistically significant at 1% level, whereas the coefficient 'φ' is found to be statistically insignificant even at 10% level. The relevant coefficient values are estimated to be f=0.18, λ= -0.80 and φ=0 (since statistically insignificant). The following inferences can be made on this basis:

Table 3: Regression Result for the Import function

Periods	**c**	**f**	**λ**
1991-92 to 2004-05	0.09***		
2005-06 to 2013-14	0.17***		
2014-15 to 2016-17	0.11***		
1991-92 to 2016-17		0.18**	-0.80***
Schwarz Criterion= -4.45	**R-squared=0.93**		

Note: ‘***’ and “**” indicate statistical significance at 1% and 5% levels respectively.

Table 4: Regression Result for the Real Exchange Rate function

Periods	T	Φ
1991-92 to 1996-97	0.67***	
1997-98 to 2006-07	0.79***	
2007-08 to 2009-10	0.91***	
2010-11 to 2016-17	1.07***	
1991-92 to 2016-17		0.81
Schwarz Criterion= -3.22	**R-squared=0.93**	

Firstly, since the coefficient ‘φ’ is statistically insignificant, a positive ‘f’ indicates that the import propensity would respond positively to the changes in real exchange rate at a given wage share. Secondly, since f φ – λ < 0, import propensity would respond negatively to the changes in wage share.

7. The Basic Model

In the backdrop of the “stylized facts” of the Indian economy as described earlier, this section attempts to provide an exposition of the relationship between wage share and growth rate of output through a standard medium-run Kaleckian growth model. The government sector is assumed away for simplicity in order to highlight the issue at hand. The estimates of the regression analysis are used to determine the sign of relevant parameters of the model. Following are the building blocks of the model:

Savings function: The positive relation between wage share and consumption propensity of the economy, as estimated in the regression analysis, can be expressed in any form where the consumption propensity of the workers is greater than that of the capitalists. For the sake of simplicity, however, the autonomous component of consumption and consumption propensity of the capitalists are assumed to be zero. Accordingly, the consumption-capital ratio of the economy is expressed as equation (8), where ‘C’ is the consumption expenditure, ‘K is the capital stock, 'c_w' is the consumption propensity of the workers, 'h' is the wage share, 'u' is the capacity utilization rate and 'β' is the technological output-capital ratio.

$$\frac{C}{K}=c_w hu\beta \quad (8)$$

Where

$$u=\frac{Y}{Y^{\square}};\beta=\frac{Y^{\square}}{K}$$

$$0<c_w<1;0<h<1$$

Thus the savings-capital ratio of the economy would turn out to be equation (9), where $(1-hc_w)$ is the savings propensity of the economy. The savings function reflects the standard Kaleckian negative relationship between wage share 'h' and the savings-capital ratio.

$$\frac{S}{K}=(1-hc_w)u\beta \quad (9)$$

<u>Export Function:</u> Taking queue from the regression analysis, the export-capital ratio is assumed to be determined by the exogenously given level and structure of global demand. Since the effect of real exchange rate on the exports was found to be statistically insignificant, export capital ratio is assumed to be insensitive to changes in wage share. The export function is given by equation (10).

$$\frac{X}{K}=\acute{x} \quad (10)$$

Where

$$\acute{x}>0$$

<u>Import Function:</u> The import capital ratio, by definition, can be written as the product of import content per unit of output (m), capacity utilization rate (u) and technological output-capital ratio (β) as shown in equation (11). To capture the Indian specificity, import content per unit of output is written in a linear form as equation (12), where it responds to negatively to changes in wage share. Here, 'e' and 'm_0' are positive parameters.

$$\frac{M}{K}=mu\beta \quad (11)$$

$$m = m_0 - eh \quad (12)$$

$$0 < m < 1; m_0 > 0; e > 0$$

Combining (11) and (13), the import function can be written as equation ().

$$\frac{M}{K} = (m_0 - eh) u\beta \quad (13)$$

Investment Function: Though the nature of investment function has been one of the most widely debated and contested issues even among the authors adhering to the demand-side framework, nonetheless, what is common within all such models and theories is the emphasis of causal relationship from aggregate demand to desired investment rate of capitalists in the medium or long run. Taking cue from Hein (2014), this causal relationship is descried through an investment function as equation (14), where ‘a’ and ‘b’ are positive parameters and investment rate responds positively to changes in capacity utilization rate.

$$\frac{I}{K} = a + bu \quad (14)$$

$$a > 0; b > 0$$

Relation between Output Growth Rate and Investment Rate: By definition, output is the product of capacity utilization rate (u), technological output-capital ratio (β) and capital stock (K). Thus output growth rate (G) at any given period is the sum of growth rate of these three components as shown in equation (15).

$$G = \hat{u} + \hat{\beta} + g \quad (15)$$

7.1 Steady State Equilibrium

The steady-state equilibrium condition in the medium run is given by the equality between investment (g) and the sum of net import and domestic savings (σ) as shown in equation (16).

$$\sigma = g \quad (16)$$

Where

$$\sigma = \frac{S}{K} + \frac{M}{K} - \frac{X}{K}$$

$$g=\frac{I}{K}$$

The macroeconomic (Keynesian) stability condition of the model economy will be fulfilled if the responsiveness of the sum of net import and domestic savings to a unit change in capacity utilization rate is greater than that in the case of investment rate, i.e. $\frac{\partial \sigma}{\partial u}>\frac{\partial g}{\partial u}$

This condition can be written as the following:

$$(\rho - jh)\beta > b \quad (C1)$$

Where

$$\rho = 1 + m_0 ; j = e + c_w$$

From equations (9), (10), (13), (14) and (16), the steady state capacity utilization rate and growth rate turns out to be equations (17) and (18) respectively. Since the Keynesian stability condition (C1) is assumed to hold, the denominators of the two equations are positive and so are the steady state values.

$$u^{*}=\frac{a+\acute{x}}{(\rho - jh)\beta - b} \quad (17)$$

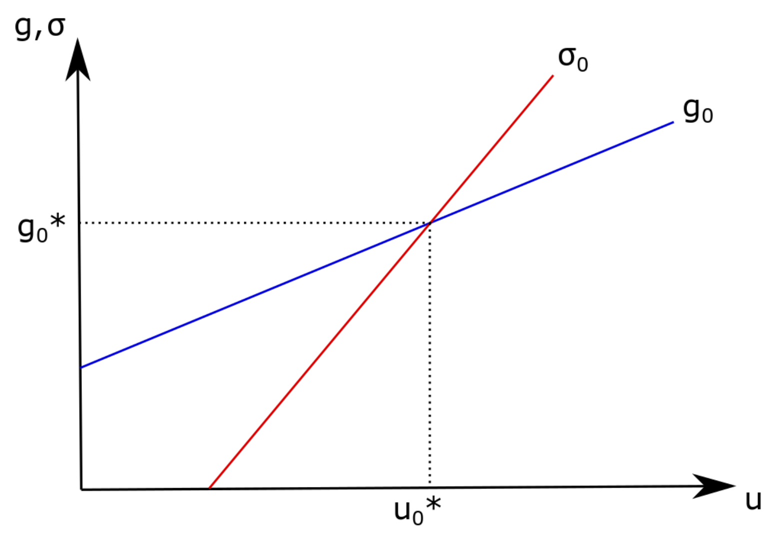
$$g^{*}=\frac{a\beta(\rho - jh)+b\acute{x}}{(\rho - jh)\beta - b} \quad (18)$$

Since the capacity utilization rate and the technological output-capital ratio would be constant at steady state equilibrium, $\hat{u}=\hat{\beta}=0$ at steady state. Thus the output growth rate at the steady-state equilibrium (G*) would be simply determined by the steady-state investment rate as shown in (19).

$$G^{*}=g^{*} \quad (19)$$

Figure 1 provides a diagrammatic exposition of the determination of steady state values. The horizontal axis measures the capacity utilization rate (u), whereas the vertical axis measures investment rate and the sum of net import and domestic savings (g and σ). The slope of the σ-line is steeper than that of the g-line as the Keynesian stability condition is assumed to hold. The steady state values of capacity utilization rate (u_0*) and growth rate (g_0*) are determined through the intersection of the two lines.

Figure 1: Determination of Steady State Growth Rate and Capacity Utilization Rate



7.2 Comparative Statics

The impact of decline in wage share on steady state capacity utilization rate and growth rate is calculated by taking a partial derivative of equations (17) and (18) and shown as equations (20) and (21) respectively.

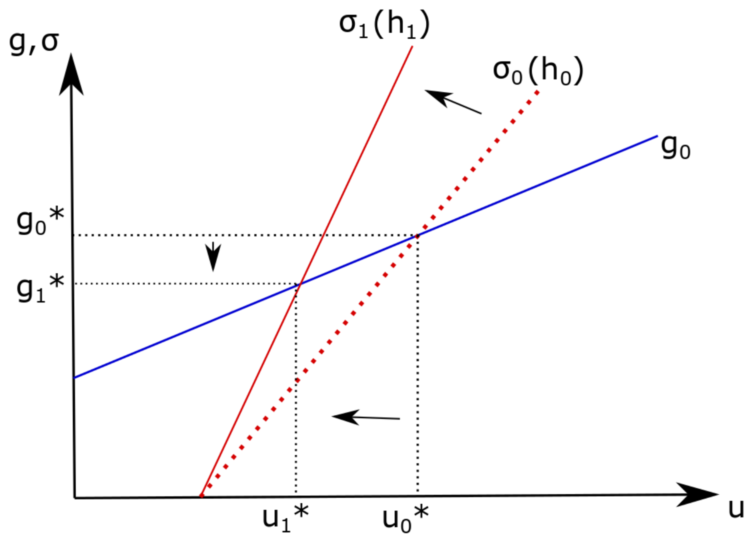
$$\frac{\partial u^{\square}}{\partial h} = \frac{j\beta(a+\acute{x})}{[(\rho - jh)\beta - b]^2} > 0 (20)$$

$$\frac{\partial g^{\square}}{\partial h} = \frac{j\beta b(a+\acute{x})}{[(\rho - jh)\beta - b]^2} > 0 (21)$$

The positive sign of the partial derivatives reflects the under consumptionist thesis of positive relationship between wage share and growth rate. With exports being insensitive to real exchange rate, here the under-consumptionist model operates through the consumption channel and the import channel.

In terms of the diagram, the impact of lower wage share is shown in figure 2 through a leftward rotation of the σ-line from σ_0 to σ_1 as its slope become steeper on account of a fall in wage share from h_0 to h_1. Accordingly, the steady state growth rate and capacity utilization rate falls to g_1* and u_1* respectively.

Figure 2: Impact of Lower Wage Share on Steady State Growth Rate and Capacity Utilization Rate



8. Concluding Remarks

The net impact of lower wage share or income share of labour appears to be negative in the Indian economy reflecting its adverse impact on consumption and import propensity. Since investment decisions depends on the existing demand conditions, *ceteris paribus*, reduction in wage share can be expected to bring about a decline in steady state investment rate and growth rate by reducing effective demand.

By implication, suspension and dilution of labour laws which aims to reduce the wage share, is expected to reduce growth rate compared to the level that would have otherwise existed in the absence of such policies. Thus in the absence of any countervailing factors, such policy-induced reduction in the income share of labour in itself would be expected to reduce the income growth rate of labour due to lower output growth rate.

One alternative policy instrument for recovery would be higher government expenditure through fiscal expansion. However, increasing expenditures to any necessary extent may itself require imposing capital control, going beyond the rules set by international finance and fundamentally changing the macroeconomic structure that hitherto existed in the post-liberalization period. The policy choice between reducing income share of labour and changing the existing growth regime essentially involves a political question of choosing the class that bears the primary burden of adjustment in the aftermath of crisis.

References

Bai, Jushan and Perron, Pierre (2003): "Computation and analysis of multiple structural change models", Journal of Applied Econometrics , vol 18, no.1, pp1-22.

Bhaduri, Amit and Marglin, Stephen (1990): "Unemployment and the real wage: The economic basis for contesting political ideologies" Oxford: Cambridge journal of Economics , 375-393

Bhaltora, S. (1998): “The Puzzle of Jobless Growth in Indian Manufacturing”, Oxford Bulleting of Economics and Statistics, 60, pp 5-32.

Bhattacharjea, A. (2007): “Labour Market Regulation and Industrial Performance in India: A Critical Review of the Empirical Evidence” The Indian Journal of Labour Economics, 49(2), pp 211-32.

Blecker, Robert Allen (2001). Kaleckian macro models for open economies. In J. Deprez, & J. T. Harvey, Foundations of International Economics: Post Keynesian perspectives (pp. Chapter 5, pp 116-150). London and New York: Routledge.

Dasgupta, Zico and Chowdhury, Subhanil (2015): "Growth, Import and Inequality: Explaining the Persistently High Trade Deficit in India", Economic and Political Weekly, Vol 50, No 48, pp 65-74

Hein, Eckhard (2014). Distribution and Growth After Keynes: A Post-Keynesian Guide. Cheltenham, UK and Northamption, MA, USA: Edward Elgar.

RBI (2005): "Revision of Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) Indices", RBI Monthly Bulletin

Roychowdhury, Anamitra (2018): Labour Law Reforms in India: All in the Name of Jobs, New Delhi: Routledge

------ (2020): "Labour Rights are in Free Fall", The Hindu, 18th March, https://www.thehindu.com/opinion/lead/labour-rights-are-in-free-fall/article31609817.ece

Sen, Amartya (1970): Interest, Investment and Growth in Amartya Sen ed. Growth Economics (pp. Chapter 10, pp 220-231). Harmondsworth: Penguin Books.

Sood,Atul and Nath,Paaritosh. (2020): "Labour Law Changes", Economic Political and Weekly, Vol 5, No 2, pp 33-37