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Article

Investment-led growth, employment, and income distribution: Conceptualizing a post-Keynesian employment Phillips curve dynamics in India

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Abstract:
The present study aims at studying productivity growth, employment, and income distribution in a Young-Kaldor investment dynamics in which productivity growth and a higher markup sustaining investment are endogenous to growth and support better employment and wage outcomes. Investment-led growth requires equality of investment and profit. However, it also involves increases in wages as compensation for the increased incidence of specialized employment, which adds force to the investment-led dynamics. It is contended that empirical support for this investment-led transitional dynamics can point towards an employment Phillips curve: a positive correlation between wages and employment at given prices. A lack of dynamic evolution can indicate wage-price correlation, but without necessarily having spiral connotations, and provides alternative understandings to the price Phillips curve on which the literature focuses.

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The current paper strives to illustrate an intermediate goods specialization-led higher pace of investment and the resultant employment and income distribution outcomes that permit a possible post-Keynesian employment Phillips curve (PC). In the mainstream literature, the focus is typically on a price PC, in which higher employment growth phases put pressure on wages, resulting in a wage-price correlation. The latter, having higher labor-cost-based inflationary connotations, suggests that there are limits to employment expansion. The current discussion on an employment PC, however, proposes that, if higher employment growth is modelled to be generated mainly by a higher pace of investment-led technological progress, the above limits to its growth can be absent. The employment growth would invariably be associated with increases

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in wages. However, the indicated wage-employment relationship in the growth comes with constant product prices[1] or an absence of wage-price correlation. Moreover, since investment-led growth demands increases in (profit) margins, increases in wages should also be associated with increases in margins without putting pressure on prices.

In this focus, the distinction between a price PC and an employment PC crucially depends on how the income distribution outcomes are visualized in growth. If the focus is on achieving good economic outcomes, including satisfactory productivity growth and favorable employment and income distribution outcomes (Landmann, 2004), there can be different perspectives. The mainstream neoclassical exogenous productivity growth, tracing full employment outcomes, shows that changes in the relative prices of labor and capital define the capital intensity of production, associated with marginal-productivity-based income distribution outcomes. The assumption is that, as long as prices (or wages) are flexible, the full employment outcome is a natural outcome in growth. This perspective, therefore, mainly focuses on a price PC, which occurs when wages are not flexible or exhibit short-run rigidities at a higher level, accompanied by a wage-price correlation, and indicates a constraint on employment growth outcomes.

However, it is crucial to consider alternative perspectives that can achieve these good economic outcomes. A post-Keynesian perspective, for instance, challenges the basic neoclassical production-function-specific outcomes. This perspective emphasizes the need for technological improvements as the driving force behind most changes in the factor proportions in production, particularly those related to a higher rate of investment. It sheds new light on how income distribution outcomes play a central role in sustaining the association between investment and productivity growth (see Kaldor, 1961, 1972; Sylos Labini, 1995).

This alternative paradigm encompasses distinct stages of development for specific lines of argument that bear on the current focus on the employment PC. To elaborate, a focus can be on more realistic investment-led productivity growth, in which the observed higher capital intensity in production is mainly driven by technological progress. The involvement of higher fixed investment also implies that firms concerned maintain the setup by adopting a pricing rule, which is a markup on some aspects of costs, thereby defining the profits to support the fixed investments. Therefore, there is a particular distribution of income or wage and profit configurations specific to the fixed investments in a period defining a Leontief-type fixed coefficient production function (see the related contributions by Kalecki, 1965; Kaldor, 1961; Sylos Labini, 1956, 1979).[2]

Considering a fixed coefficient production function in any given period, the higher productivity-based output realization also depends on exogenous demand conditions (Sylos Labini, 1956; Kaldor, 1961, [1983] 1989). If so, a demand-led growth perspective also comes out, whereby changes in demand (or output growth expectations) will bring about further technological-progress-driven changes in the coefficients of the function.[3]

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[1] That some growth phases witness employment outcomes with negligible inflation rates have been highlighted in Marglin (2021, chapter 19).

[2] Roncaglia (2014) highlights the Sylos Labini-Modigliani debate and Sylos Labini's main criticism of the neoclassical hypothesis. If the coefficients of a production function are altered by technological progress and maintained by the income distribution outcomes, this holds even in the long run. The neoclassical, well-behaved, production-based wage-flexibility-based changes in factor intensity will not be operative even in the long run.

[3] See Corsi and D'Ippoliti (2014), on Sylos Labini's (1984) productivity function and Blecker and Setterfield (2020). Although the present focus is on demand-led technological progress, as in Corsi and D'Ippoliti (2014), elaborating on Sylos Labini's (1984) note, the conception of technological progress leading to changes in the coefficients is much broader in scope, including how factor-scarcity-led changes in relative prices of factors also induce technological progress. This understanding also challenges the neoclassical production functions, which assume that changes in relative prices lead to changes in factor proportions, provided that aggregate output remains constant.

The current focus is on a Young-Kaldor perspective, which provides an alternative elaboration of growth-specific outcomes. The starting point is Kaldor's (1961) demand-led technological progress perspective, which underpins a technical progress function. This perspective is of particular interest, as it suggests that demand-led increases in the pace of investment can indicate increases in capital intensity and productivity associations. One contribution of the paper is to demonstrate that, even if the function aims to explain how investment-led growth defines transitional dynamics that converge to steady-state growth, in later writings, Kaldor (1972) provided a Keynesian elaboration of Young's (1928) perspective, in which investment-led dynamics possess a cumulative causation property. Tendencies towards any steady-state growth induce further departures from it, and so on. Importantly, the focus is on the nature of productivity growth embedded in the growth of intermediate goods specializations, which supports the cumulative causation growth.

In reinforcing the Young-Kaldor perspective, the paper makes a significant contribution by underscoring that investment dynamics support higher growth in specialized employment, which is accompanied by higher wages as compensation for the specialized labor.[4] Furthermore, the increases in markups are also endogenous to this growth, which sustains the investment-led dynamics, and can be consistent with increases in wages without inducing higher prices. Specifically, even if wages move in line with productivity growth, the internal economies associated with intermediate goods specialization can permit increases in margins in growth that come with stable prices. Income distribution outcomes, endogenous to growth, sustain the investment dynamics that can also support an employment PC outcome.

In other words, wage increases in growth that are associated with employment growth do not necessarily pinpoint a price PC. Since investment dynamics also demand increases in markups during growth, a sharp distinction between the price and the employment PC perspectives would emerge if it could be shown that the changes in markups are traced not to price and labor cost relationships but to another, more dominant factor: the prospects for reducing intermediate goods costs in growth. This paper argues that, if intermediate goods costs are managed in an investment-led growth model, it can lead to a higher employment outcome with stable prices.

A post-Keynesian price PC emerges if there is a lack of cost reduction associated with the absence of investment dynamics, which can lead to higher labor costs. If so, the very conceptualization of employment PC also provides an alternative understanding of a price PC compared to the mainstream discussion of a price PC. If the latter exclusively focuses on a wage-price correlation, thereby indicating higher labor-cost-based inflationary prospects facing employment growth, the current focus offers an alternative perspective on the wage-price nexus in economic growth. Whether the causation runs from higher price-based markup to higher wages or vice versa, these interactions do not necessarily lead to a wage-price spiral.

Accordingly, the empirical issues that this conceptualization raises are: one, what exactly is the relationship between prices, wages, intermediate goods, and prices? Do intermediate goods cost reductions allow for higher markups in growth with higher investment, resulting in stable prices, especially if wages are also expected to increase during growth? Are intermediate goods specialization and such investment-led productivity growth central to higher employment outcomes? Does a lower employment outcome indicate the absence of the demand-led revival of investment options and, in that case, what are the implications for wage price behavior?

[4] A higher wage and growth association has its emphases in post-Keynesian literature, starting with the demand-side roles of higher wages, say in the absence of higher profit-led growth (for a review, see Blecker, 2016; Marglin, 2021), and its further elaboration to take into account higher wage-based supply dynamics (Lavoie and Stockhammer, 2012).

To discuss these issues, section 1 focuses on the Young-Kaldor perspective on investment dynamics, which emphasizes the relationship between specialization and income distribution, leading to an employment PC. Section 2 examines the empirical challenges associated with the employment PC, particularly highlighting the differences between the specific wage-price interactions found in an employment PC and those in traditional price PC models. Section 3 covers the methodology and results, along with discussions of their policy implications, and section 4 concludes with a note on potential directions for future research.

1. Conceptualizing investment dynamics and employment PC

1.1. Investment dynamics and employment growth

In the literature, the growth driven by exogenous productivity growth can permit increases in wages (and profits), which is well acknowledged. However, the possibility of higher wages, which can be consistent with higher investment dynamics and provide a solution to the unemployment situation, remains a neglected subject. The present focus is on wage and employment outcomes by incorporating investment-led transitional dynamics into a variant of the demand-led growth perspective (see Padhi, 2024a). Demand-led growth perspectives generally focus on the Kaldor-Verdoorn law, which supports dynamic economies of scale and the adjustment of investment to them, via the acceleration principle. This understanding offers an alternative Keynesian steady-state growth model characterized by a fixed-investment-output ratio and specific income distribution outcomes (see Gomes, 2020; Blecker and Setterfield, 2019). However, the current focus is on incorporating an investment dynamics perspective that permits a discussion of the endogenous evolution of income distribution outcomes and its interactions with the changing pace of investment, which is crucial to the employment PC prospect.

The specific focus is on Young's economic progress (1928), in which transitional dynamics are initiated by the division of labor by a firm, resulting in specialized subtasks – manifested in manufacturing and non-manufacturing, like trading, transport, marketing, design, etc. – resulting in an array of intermediate goods specializations (also see Stigler, 1951). Young closely follows the Adam Smithian and Karl Marxian classical perspectives, in which the division of labor, being the primary basis of economic dynamics, depends crucially on the extent of the market. A firm initiating the division of labor must target a larger volume of output (or seek larger markets) that makes possible the economical use of the specialized machinery required for various tasks that the division of labor demands.

Given the importance of the role of "size of the market", Young's contribution is to highlight the specificity of a mechanism by which division-of-labor-led dynamics have a cumulative causation property (also see Padhi, 2019). First, the initiation of division of labor is seen as an innovation that induces technological external economies, leading to the generalized adoption of such innovation in an economy. Second, the realization of the latter and the resultant growing market for specialized subtasks, in turn, induce the scope for further division of labor in terms of the emergence of specialized firms in specialized tasks. The demand-led processes show that, once the division of labor is initiated, the emergence of further division of labor and, later, a tendency towards increasing industrial differentiation, which accompanies increases in the share of intermediate goods specialization, gathers momentum cumulatively. Though not directly mentioned by Young, these scopes of the further division of labor, or the process of industrial differentiation, also indicate the role of a Schmookler (1966) type of dynamic learning by doing.

If the initial specializations informally take place and face technical and economic problems, scientific inquiries into them to correct and improve them can also be a source of the scopes of the further division of labor.[5]

Kaldor's (1972) contribution is to show that the Youngian innovation does not indicate an elasticity of substitution-based reallocation but instead leads to a generalized adoption of the innovation, indicating macro-expansion prospects, i.e., an expansion in one line is accompanied by expansions elsewhere. Such advanced Youngian transitional dynamics must incorporate Keynes's insight into how macro expansions depend crucially on periodic higher finance-led investment that outpaces pre-existing savings. If so, Young's cumulative causation growth process highlights the Keynesian growth of new investments in which initial investment embodying the division of labor induces further investments in the further division of labor, and so on. That is, the Keynesian investment dynamics and macroeconomic expansions support each firm's greater search for markets, which makes possible the economic use of intermediate goods specializations.

To formalize this investment-based transition dynamics, the current focus is on a reinterpretation of Kaldor's (1961) nonlinear transitional-dynamics-based technical progress function. In formulating the function, Kaldor (1961, pp. 265-267) argues that, given a specific dynamism of a society, a faster rate of investment is accompanied by a faster rate of technical improvements and an increased pace of productivity. Accordingly, there is a relationship between increases in capital intensity and increases in labor productivity, which suggests that, given the dynamism, initially, productivity will increase more rapidly than does capital intensity. However, over time, the rate of increase in productivity slows down, and the relationship converges to a steady-state outcome.

The Young-Kaldor Keynesian thesis, however, reveals the function's nonlinear phase, i.e., increases in labor productivity that outpace the increases in capital intensity possess a cumulative causation growth property. A higher pace of investment, resulting in the growth of intermediate goods specializations and the increased use of specialized machinery for various subtasks, indicates an increase in capital intensity. However, since the latter must be supported by firms targeting an increasingly larger volume of output, making possible the economical use and viability of specializations, it is also associated with increases in capital productivity. The latter signifies that, in cumulative causation growth, increases in labor productivity outpace the increases in capital intensity.

However, if the focus is on Young-Kaldor transitional dynamics, which give importance to the pace of investments embodying intermediate goods specializations, a reformulation of the technical progress function is that, instead of posing a relationship between increases in capital intensity and increases in labor productivity, the focus is on the relationship between labor productivity growth l and the growth of investment i. Taking the lower case for the instantaneous rate of change and α as the technical progress coefficient, we have:

$$l = \alpha(i), \quad 0 < \alpha > 1 \tag{1}$$

Equation 1 assumes that the employment growth outcome is proportionate to the pace of investment. If a higher pace of Youngian investments is supported by higher output growth, permitting the economical use of intermediate goods specialization, and therefore is associated with increases in capital productivity, it has implications for good employment growth. To

[5] Corsi and D'Ippoliti (2014) highlight how Sylos Labini's (1984) productivity function underlies the scope of interactive learning by doing, which is relevant in the present focus, where the Youngian division of labor-based varieties of specialization in subtasks can grow through interactive learning.

illustrate this, a change in capital intensity in a static setting, where aggregate output and employment remain constant, also leads to an increase in labor productivity, which is solely attributed to the change in capital intensity. However, in Youngian cumulative causation growth, the changes in capital intensity are attributed to a higher pace of investment targeting a larger volume of output. Increases in capital productivity accompany them. In that case, it implies that the increases in labor productivity in the Youngian investment dynamics are greater than the static elasticity of substitution-based labor productivity growth arising solely from the introduction of capital intensity. Therefore, if the indicated higher growth of output outpaces the latter static increases in labor productivity, it translates into an increase in macro demand for labor, leading to higher employment growth.

We have, then, employment growth e as a positive function of Youngian investments:

$$e = a(l), \quad a > 0 \tag{2}$$

1.2. Pace of investment

In the current reinterpretation of Kaldor's technical progress function, if the growth of investment paces l, the latter is specific to demand management policies targeting an exogenous growth of demand, and we have:

$$i = by - cp \tag{3}$$

The rate of change in investment adjusts to the rate of change in demand (y) and the rate of change in prices (p). The latter is in response to changes in the prime costs w and m (material costs) and labor productivity. That is, without explicitly mentioning a markup and its growth, price via margin pressure is higher when w and m are higher and is lower when labor productivity is higher,[6] and we have:

$$p = (w + m) - l \tag{4}$$

Combining equations 3 and 4, the demand side of the evolution of investment is:

$$i = by - c(w + m) + cl \tag{5}$$

An equilibrium pace of investment is when the demand condition (equation 5) is matched by productivity growth (equation 2) and, combining equations 2 and 5, we have:

$$i = \{by - c(w + m)\}/(1 - \alpha c) \tag{6}$$

As Blecker and Setterfield (2019, chapter 8) noted, equation 6 assumes that y, w, m, and such variables grow at a constant rate (but see below), so that the primary focus is on the two endogenous variables: investment and the productivity parameter α, which drive advanced growth.

[6] The empirical issues discussed below in section 2 should necessarily abandon this assumption.

If α witnesses increases in Young-Kaldor growth, it implies higher employment growth, as shown in equation 2. Therefore, if employment growth e is a function of l and the latter evolves through interactions between i and α (equation 6), we have:

$$e = f(i;\ \alpha) \tag{7}$$

1.3. Pace of investment and role of income distribution in growth

The problem with the above specifications is that, if higher employment in specialized tasks demands higher wages, it can reduce investment (equation 5), which otherwise is central to employment generation. The issue is: do the endogenous evolutions of both investment and productivity growth support higher margins in line with increases in investment, and would it come with increases in wages without price increases? Although increases in wages can indeed permit higher profits if they are associated with productivity growth, the current focus suggests that investment dynamics support endogenous increases in margins, even if wages keep pace with productivity growth.

To discuss this interaction between the pace of investment and the income distribution outcomes that should support it, initially, the focus can be on a Kaleckian generalization of the modern industrial sector in which prices are a markup over prime costs, and the incidence of higher fixed-costs-based factories is such that the costs remain constant over the relevant range up to full employment; supply then is perfectly elastic up to the full employment level, and then it becomes inelastic. Given the supply conditions, a markup is specific to a particular fixed investment in the short run.

However, to allow for changes in investment that necessitate adjustments in the markup, a focus can be on Young's discussion (in Sandilands, 1990) of the changes in markups that should be endogenous to the investment plans of growth-oriented firms. To elaborate further, Young (in Sandilands, 1990), like in his 1928 paper, discusses a reciprocal demand hypothesis (Blitch, 1983), in which, if the demand facing any firm is the reciprocal of the supply responses elsewhere, and if its own "better" supply response induces such responses, any increase in such supply by any firm would be associated with a shift of the demand curve facing it, which defines the growth-oriented firms (in Sandilands, 1990,pp. 45-46). However, as discussed above, Kaldor (1972) rightly points out that such a macro conception of the reciprocal demand hypothesis has overtones of Say's Law and faces aggregate demand constraints. The focus has to be on Kaldor's Keynesian interpretation of a reciprocal demand model. Suppose a firm initiates investment in the division of labor, and there is a subsequent possibility of the generalized adoption of the division of labor. Its demand curve, which is the reciprocal of the induced investments by others, shifts to the right. This process identifies growth-oriented firms with investment plans to capitalize on the induced growth in market size.

According to Young, the expansion prospects do not reflect adjustments in a given production structure or they are specific to a particular long-period supply curve. For instance, as Blitch (1983) records, Young, in his correspondence with Knight, notes that the static analyses' focus on a tendency towards normal profits misses important elements of economic progress, signifying how firms, in response to favorable demand conditions, do not come with the same optimal size but define newer and more efficient capacities, and this has a further feedback effect on demand, and so on. If these adjustments require higher investment plans, according to Young, even in the

short run, the firm would set a price that recoups such 'supplementary costs' (in Sandilands, 1990, p. 49).

As Young notes (in Sandilands, 1990, pp. 48-50), this can explain why businesspersons routinely depart from a marginalist pricing rule. According to him, it may signify underproduction (as the static theory of the firm would suggest) but is primarily a feature of growth: "It shows progress rather than depression and is, in the long run, productive and economical" (in Sandilands, 1990, p. 48). As Young concludes, "[…] the discipline of modern costing makes businessmen think not in terms of (marginal) prime costs, but of their aggregate costs".

1.4. Evolution of markup, and wages: The role of internal economies in Youngian growth

The current paper weaves together Young's understanding of a higher markup in growth with his 1928 cumulative causation thesis, in which higher profits are based on cost reductions arising from the evolution of division-of-labor-specific efficient capacities. The efficient capacities do not refer to advantages related to higher scale economies of production but to firm-specific varieties of subtasks that define a specific stage of the division of labor. Each task comes with specialized machinery, indicating such intermediate goods specializations. Even if it is true that, in the initial stages, a firm-specific division of labor involves in-house production of all intermediate inputs, in the later stages, the focus has to be on firm-specific capacity; this refers to the use of a definite set of specialized intermediate goods that are produced by other specialized firms, each specializing in production of a specific intermediate good. Generalizing, the division of labor-specific capacity refers to the use of a set of intermediate goods. The primary focus remains on the fact that, if such firm-specific capacities are to target a larger volume of output, it permits reductions in the costs of intermediate goods, which is central to the augmentation of profits or margins (Young, 1928, p. 537). This understanding (again) brings in the importance of increases in capital productivity in the investment-led transitional dynamics. When division of labor targets a larger market to produce a larger volume of output, which makes possible the economical use of machinery and intermediate goods involved in the division of labor, the resultant increases in capital productivity indicate the internal economies and intermediate cost reductions that drive growth. Higher incidences of capital productivity in growth indicate higher such cost advantages.

To incorporate this Youngian insight into the internal economies of growth in the Kaleckian markup pricing, we start with a generalized Kaleckian markup pricing formula whereby prices are a markup over wage costs (Kalecki, 1965, pp. 47 and 61), or, taking k as the markup, we have:

$$k = Y/W \tag{8}$$

where Y is the nominal income, which is output minus the intermediate goods cost, and W is the wage bill. Therefore, the share of wages in income is:

$$W\ /\ Y = {}^{1}/_{k}$$

Both Kaldor and Kalecki discuss price formation corresponding to steady-state growth with a specific investment ratio, in which the inverse relation between the share of wages and k can be true. However, to turn to Young's thesis on transitional dynamics, in which a higher pace of investment can be associated with a cost reduction of intermediate goods, one can rewrite the

Kaleckian markup equation 8 by dividing C, the firm-specific Youngian capacity defining a specific stage of division of labor, throughout, to get:

$$k \,/\, C = \{(Y/C) \,/\, (W/C)\} \,/\, C \tag{9}$$

Supposing Youngian capacities in a period target a particular nominal output O in a given period, O can replace C in equation 9. Laborers' contribution is mainly towards the production of a larger output (O). Suppose higher wages (W) in a period match a higher output expansion (O) in the same period, coming with a constant W/O ratio. However, if value added (Y) increases more than the output, a higher Y/O can permit a higher markup k/O.

The important point is that, if increases in profits should guide the pace of investment in growth, a focus should be on the contribution of investment to generating higher value-added as output expands. The specification of an increase in Y/O is important. To elaborate, growth can be seen as a sequence of Keynesian short runs. In any given short run, a favourable aggregate demand environment plays a demand-side role in the realisation of the macro division of labor and the resultant reduction in intermediate costs. However, investments representing new investment opportunities, which embody the further division of labor, define the advanced capital stock of subsequent periods, allowing for further reductions in intermediate costs, and so on.

Therefore, a historical sequence of short runs can witness the evolution of Y/O (Padhi, 2014), which is the evolution of $(1 - M/O)$, where M stands for nominal intermediate costs. We also have $M = Pm(M)$, $O = Pw(O)$, and $Y = Py(Y)$, where M stands for intermediate goods, Pm stands for price of intermediate inputs, Pw stands for price of the product (output), Py stands for the price of value added (arrived at by the double-deflation-method-based value added), and variables in italics denote value measures at their constant prices. Allowing for a constant M/O, the evolution of Y/O is:

$$Y/O \;\; \Delta(Py/Pw) \;=\; 1 - \;(M/O)\,\Delta(Pm/\,Pw) \tag{10}$$

In the above equation, if there is a decrease in the price of intermediate goods (Pm) reflecting an increase in efficiency in the production of intermediate inputs, and if this is associated with the sticky price of the product (Huang et al., 2004), it can support an increase in Py/Pw. That is, a reduction in the price of higher intermediate goods specialization-led intermediate goods permits a higher Y/O. Alternatively, taking a single deflation-method-based measure of real value added, the higher Y/O is indicative of a higher real value added per unit of nominal output.

The implication is that, over time, even if there are increases in W/O, if the increase in Y/O exceeds the increase in W/O, it can, in turn, support a higher k. The increases in k can be consistent with the increases in the pace of investment in growth.[7] It should be noted that the value of k in any given period is specific to a particular state of division of labor that comes with a particular level of labor productivity (and intermediate cost reduction) and the corresponding money wages. In subsequent periods, realizations of expected increases in both wages and k (and profits) are conditional upon a higher pace of investment that comes with more efficient capacities, indicating Youngian investment dynamics. If the latter is absent, mere increases in investments must be supported by a higher price-led Y/O. However, such increases in markups confirm Kaleckian logic, which suggests a decrease in wage share.

[7] Therefore, in transitional dynamics, if a country experiences a higher wage share, it can be consistent with profit-led investment dynamics. This understanding is rooted in Rowthorn's (1981) argument, which posits that wage-led dynamics can accompany investment-led dynamics.

1.5. Final model: evolution of investment, employment, and income distribution

To incorporate the evolution of income distribution in investment dynamics, and denoting o as the rate of change of output, equation 6 can be rewritten as:

$$i = \{b(y / o) - c(w / o + m / o)\}o / (1 - \alpha c) \quad (11)$$

A higher rate of change of output (o) via increases in the technical progress coefficient α, indicates a lowering of the rate of change of M/O (m/o), even if wages and output move in tandem. It supports a higher y/o (and margins) at a given price, maintaining a higher pace of investment (i).

Wage and price formation in growth follows the logic of Keynes's short-run employment determination. As is sometimes maintained,[8] it is not about how a rise in prices leads to a reduction in real wages, which brings about expansion. It is investment-led expansions that lead to an equilibrium output, which defines any particular price formation and plays no role in the expansion. Even if the money wage in the short run is held constant, this wage rigidity is not central to any particular employment outcome. Much depends on the investment climate, which, if favorable, can permit full employment even if wages (and prices) are taken as the parameters. If wages in the short run are constant due to a bargaining process, the money wage W takes into account the expected full-employment price Pe when a transition from low capacity utilization with a lower price to Pe occurs. A consistent price formation analysis occurs when W, the money wage rate in the short run, is set with an expected income, Ye, in mind, which in turn defines the expected price Pe. Any changes in W in growth, therefore, are related to changes in Ye, and prices Pe would adjust accordingly. In growth, dynamizing, or taking lower-case variables for the instantaneous rate of change, we have:

$$w = x(ye) \quad (12)$$

The coefficient x captures the sensitiveness of w to changes in expected income, allowing for the fact that $dPe/Pe = f(dYe/Ye)$.

If investment-dynamics-led intermediate goods specializations permit increases in y/o at stable prices and indicate employment PC, equation 7 can be rewritten as: $e = f(i, y/o)$

$$e = f(i, y/o) \quad (13)$$

then,

$w = f(e)$ at stable prices.

If, however, the investment dynamics are missing, and markup is adjusted by prices for a higher y/o in nominal terms, the specification of a post-Keynesian price PC is:

$$w = f(e, \text{ prices}) \quad (14)$$

[8] It is this interpretation of Keynes that formed the basis of Friedman's criticism of the "post-Keynesian" PC.

2. Empirical issues: the distinction between NKPC and employment PC

The above specification of a possible employment PC raises empirical issues related to wage-price behavior in growth, which is also the primary focus in a price PC framework of analysis. The present perspective holds that, even if wages rise during a higher growth phase that witnesses increases in employment, it would not be associated with price increases if they are traced to investment dynamics associated with intermediate goods specializations.

However, employment PC is also an empirical focus. Does the absence of investment dynamics point towards a price PC and, if so, how does it relate to the mainstream discussion of a price PC? To elaborate, there is a growing body of mainstream literature on price PC, starting with a traditional neoclassical specification relating wage behavior to exogenously given productivity growth in different growth phases (see Ackley, 1987). The recent mainstream focus, however, is on the new Keynesian Phillips curve (NKPC) empirics (see Mankiw, 2016). Briefly, the traditional price PC focus is on how, in a high-growth phase, wages tend to increase more rapidly than productivity growth, resulting in higher prices. Therefore, it underpinned a policy tradeoff between the inflation control objective and the employment objective. That much employment generation can be achieved without higher inflation. The NKPC, however, posits a generalized wage-price correlation, taking wages as the primary source of prime costs that defines the prices, even if the money supply is given for the period. In this scenario, an economy tends towards a natural unemployment rate, corresponding to the point at which both labor and output markets clear. If the policy focus is to raise employment beyond its current level, pressure is exerted on wages (and prices). Higher wages (or margin)-led prices exhibit short-run rigidities, which result from the nonclearance of output and labor markets, and can indicate a higher unemployment outcome. The policy implications, therefore, are different. The focus now shifts to monetary policy rule-based restrictions to control and anchor inflationary expectations around a lower level. While moderating wages and prices, the policy also leads to a higher real money supply, which in turn lowers the interest rate and can increase employment via the Pigou and Patinkin effects. Price stability ensures a better employment outcome.

The current focus, however, argues that, even if the absence of investment dynamics can pinpoint a price PC, there are important differences between the mainstream conceptualizations of the price PC and the current post-Keynesian's PC.

First, like the earlier focus of the price PC, the employment PC conceptualization shows that, if wage increases in higher growth phases exceed their expected increases in growth or are greater than productivity growth, they put pressure on prices. Specifically, if productivity growth is not exogenous but arises from investment dynamics that require the support of higher margins, and if wage demands to maintain a higher wage share exceed the expected evolution of margins based on intermediate goods specialization, price-based margins would be adjusted upward. If this higher price leads to higher margins, it puts further pressure on wages (and therefore on further revisions of margins). Both these unexpected changes in wages and margins have implications for conflict-based inflationary pressures (see Hein, 2023, for a review of the literature on these themes).[9] These possibilities, however, are specific to higher growth phases. If the pace of investment is to be maintained, there is a complete pass-through of higher wages to prices, which in turn leads to higher wage demand, and so on. However, there is an important qualification. As Keynes (1936, chapter 21) highlighted, even if it is more realistic to expect that in higher employment episodes there would be pressure on prices coming from nonfulfillment of

[9] For a more comprehensive analysis of inflationary outcomes, whether stable or conflict-based, see Lavoie (2014), Blecker and Setterfield (2019), Hein (2023), and Skott (2023).

constant returns conditions or higher wages or both, wage adjustments are generally discontinuous and generally would not lead to a generalized wage-price or price-wage-based inflation spiral. In any case, in employment PC conceptualizations, higher wages or margin-based pressure on prices are specific to higher growth episodes and are not symptoms of lower growth and employment outcomes, as suggested in NKPC.

In addition, specific to high-growth phases, a broader Kaleckian markup pricing also shows that in any given period, given the production structure and industrial compositions, there is the possibility that a higher growth phase puts pressure on raw material prices, and such higher costs in turn can put pressure on prices (with lower wage shares). Even if this is true in any given period, with a given supply of raw materials, in the present growth focus, if intermediate goods specializations are endogenous to investment dynamics that also involve the economical use of intermediate goods, it can also mitigate the pressure on costs arising from raw material prices.[10] As per section 1 discussions, much depends on the long-run movements of real value added per unit of output and nominal value added per unit of output, the latter taking into account price adjustments to maintain margins. If the real value-added ratio shows an increase, wage increases in growth can be maintained; a higher ratio in nominal terms implies a lower wage share. That is, a higher price and lower wage share association has to be specific to a lower growth phase.

Second, when transitioning to lower growth or employment phases, the employment PC conceptualization offers alternative insights to NKPC's emphasis on a causal relationship between higher wages and higher price-based rigidities. In the employment PC, the focus is not on how higher wages or margin-based rigidities lead to a lower growth phase, but instead on the possibility that higher prices lead to higher wage demands. Slower growth coincides with the decline in intermediate goods production. If the pace of investment is maintained, it must be supported by higher price-based margins or an increase in Y/O in nominal terms, which implies a lower wage share. It does not necessarily lead to conflict-based inflationary prospects because, if intermediate goods specialization is slowing down, it slows down the employment growth, and the pressure coming from higher wages would lag. Moreover, if the pace of investment also slows down, a higher pressure to maintain higher price-based margins will be absent. If so, even if there is some exogenous higher wage demand, say, trade union pressures, this does not translate into higher prices to maintain higher margins. In both cases, there is an incomplete pass-through of higher prices to wages or of higher wages to prices and, therefore, the absence of any wage-price spiral prospects.

The discussions above on the wage-price nexus, that causation runs either way, and whether it has inflationary connotations, come with many qualifications and closely follow earlier post-Keynesian studies (Sylos Labini, 1979; Hein, 2023) on how there is partial pass-through of wages to prices in low-productivity industries as compared to high-productivity industries. The findings of this present study align with those in the context of growth phases. If higher growth phases indicate unexpected demand for higher wages, there is a complete pass-through of wages to prices. This pass-through would be absent in low-growth phases.

[10] Though the present study depicts a generalized adoption of the division of labor, which is essential for the process to have cumulative causation property, Romaniello and Stirati (2024) argue that, even if productivity growth would have a dampening effect on imported raw material cost-push increases in prices, it is more realistic to take a disaggregated picture in which the size of circulating capital and wage rates differ from industry to industry. Suppose the focus is on higher relative import prices of raw materials, which also affect production costs. In that case, this is particularly true for capital-intensive industries that must increase prices to maintain their margins. If wage demands lag, it can lead to a Kaleckian conclusion, where cost-push prices result in a higher profit share associated with a lower wage share. However, wage demands are more staggered when prevalent wages are high enough. In other cases, wage demands can catch up, potentially leading to conflict-based inflationary outcomes.

Lastly, the issue of exogenous "higher unexpected wages" demands, hinted at above, consistently generates debate. For example, even in textbook versions (Ackley, 1987) it has been stressed that higher wages due to trade union demand are more or less an exaggeration. Trade unions could be working in tandem with businesspersons in the sense that they stick to a particular wage if margins are the expected ones, based on which bargaining for the wages took place; but, if growth and better evolution of intermediate goods specialization permit higher margins, they demand higher wages in line with the changes. As Keynes (1936, chapter 21) observed, businesspersons generally agree to wage increases when the business is doing well.

Therefore, a focus can be on the cost-of-living influences on wages, which earlier price PC deliberations emphasized. That is, inflation assumes an independent importance; for instance, growth phases may exhibit uneven growth, with leading sectors experiencing higher productivity growth, which can be associated with slow growth processes in other sectors, or food inflation remains a concern in higher growth phases. If so, inflation, as reflected in a higher cost of living, as measured by a consumer price index (CPI), can lead to higher wage demands. Again, the causation is not from higher wages to inflation but the other way around. However, the employment PC perspective argues that such higher wages do not necessarily have a further feedback effect as long as, in higher growth phases, a faster pace of intermediate goods specializations permits higher margins.

2.1. Empirical focus: Indian manufacturing

For a study of these empirical issues, the present study focuses on Indian manufacturing. The Indian economy has undergone a transition from a planned economy framework to a market reform era post-1991, and the period of study encompasses the post-reform period from 1991 to 2019. In general, the reforms target fiscal and monetary incentives for achieving greater efficiency, allowing greater freedom for growth-oriented firms, and they therefore have an important bearing on the current focus on the employment PC. The justification for focusing on manufacturing and not the economy is that it is the former that will witness greater incidences of intermediate goods specialization supporting markup pricing and it therefore relates best to the model adopted in the current study.

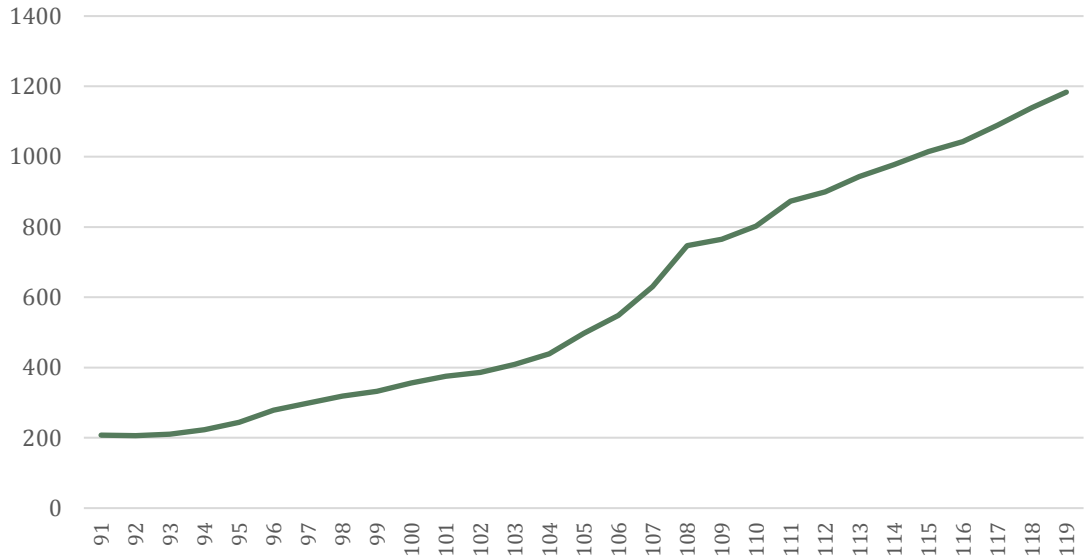
One of the significant impacts of the Indian economic reforms is that the economy witnessed an increase in the incidence of imported varieties of goods and imports of intermediate and capital goods. The pace of domestic investments, which allows for an import surplus economy, can keep pace with domestic savings plus net capital inflows if the objective of price stability dominates monetary policy-making. Otherwise, as in the current focus on Keynesian investment dynamics, the pace of investment periodically outpaces the totality of domestic and foreign savings. In the latter case, capital inflows, insofar as they support the import of intermediate goods, also support higher domestic specializations in intermediate goods, according to the Youngian external economies, which play a key role.

Assuming that domestic specializations face a higher competitive environment, which can support their further improvement, how growth phases adjust to market reform processes becomes an important focus. A higher growth phase can indicate complementarity between imported and domestic specializations, provided monetary policy permits. In this context, Indian manufacturing growth, like overall Indian growth, marks important phases, which also have implications for changes in monetary policy initiatives in India. Post-1991 India experienced higher growth than the pre-reform era, culminating in a high-growth phase that was characterized

by a growth rate of around 8 to 9 percent per annum from 2003-2004 to 2008-2009 (Nagaraj, 2013). The higher growth phase, however, culminated in a higher inflationary situation, which was associated with capital outflows. A low-interest-rate regime has continued, resulting in somewhat higher growth rates up to 2010; however, the Indian monetary policy framework viewed the higher inflation phase as primarily due to an accommodating monetary policy. After 2010, India experienced a tightening of monetary policy, marking a transition towards an inflation-targeting regime. In this regime, the monetary policy objective orientation shifted from achieving growth with price stability to a direct focus on price stability, which would subsequently support growth (Dua, 2020). This period, although it witnessed a lower inflation phase, also saw a continuation of the slow growth phase; this remained true for 2019, the final period of the study.

Figures 1 and 2 capture the above-mentioned changes in growth phases. Figure 1 shows that the index of industrial production (IIP) for manufacturing, a vital component of the overall economy, has a similar trend. An acceleration in the period from 2003 to 2010 was followed by a tapering off of the high-growth phase.

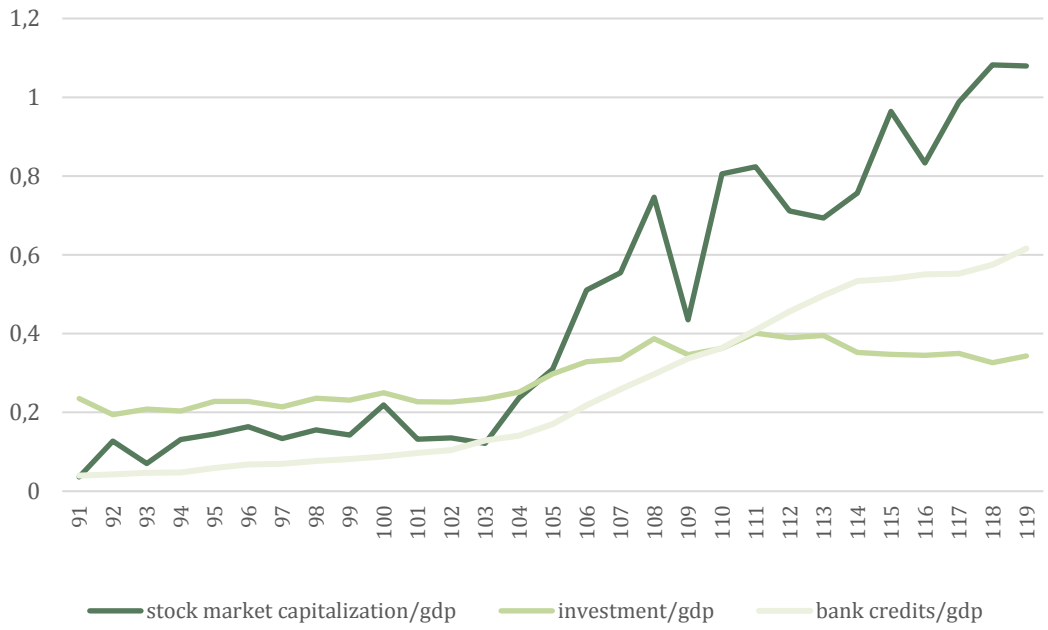
Figure 1 – *IIP (manufacturing), 1991-2019*



Source: https://rbi.org.in; author's calculations.

Similar trends are true of some related key variables, such as the investment ratio, the gross domestic capital formation to GDP ratio, and the stock market capitalization to GDP ratio (figure 2). Figure 2 also shows that, although the bank credits to non-agricultural and non-food sectors as a percentage of GDP continue to increase beyond 2010, but the rate of growth nonetheless slows down.

Figure 2 – *Stock market, investment ratio, and bank credits, 1991-2019*



Source: https://rbi.org.in; author's calculations.

If the economic slowdown after 2010 coincides with a restrictive monetary policy, Nagaraj (2013) proposes an alternative policy focus of implementing Keynesian demand management policies. Specifically, he advocates for increased public investment in infrastructure to ease the supply constraints facing the economy. These policies offer a dual benefit: they both reduce inflation and stimulate economic growth. They are complementary to the current policy focus on reviving domestic investments, especially embedded in intermediate goods specializations.

Although changes in monetary policy orientations are relevant to the present study, which distinguishes a demand-led employment PC paradigm from the price stability-based NKPC (see section 4. Conclusion), there is an additional feature of Indian manufacturing that bears on the distinction between NKPC and the current post-Keynesian PC. India has a sizable informal sector. Suppose, as noted by Padhi (2024b), that the modern sector of a typical economy is relatively small in terms of employment. However, it comes with higher labor productivity, and the rest of the employment is specific to the informal sector, a part of which could provide better employment through various interlinkages with the modern sector. The rest of the informal sector, a larger segment, is characterized by poor employment conditions, with a negligible capital stock and limited productivity improvements.

There can be different segments of the labor market, and each, specific to the size of capital stock, technological parameters, preferences, etc., can indicate that each labor market clears. In this sense, the mainstream NKPC tradition would hold that any aggregate demand management-led employment push can lead to a higher wages-led wage-price spiral.

However, the basic issue is that, even if all markets, individually speaking, clear and output in each segment is closer to potential output, there can still be the unemployment problem in the sense that a sizable labor force is employed in the informal sector that otherwise can be viewed

as seeking entry into the formal labor market segment. In the background remains the fact that the focus is on a typical developed country, which, in its transition to a developed status, witnessed incidences of productivity growth, typifying the economy with a higher share of intermediate goods and specialists in specialized subtasks. If the services' contribution in these countries is around 70 percent, the services employ around the same percentage of the labor force. Such is the incidence of higher degrees of specialization that those who seek employment and work for a few hours a week can get compensation, which can be higher than one month's regular payment to an employed person in a developing country. If this is absent in India, a sizable portion of informal sector employment, without any specializations and working for a few hours, can be seen as unemployed, seeking jobs in the modern sector at the going wage rate.

Can these entrants be converted into the ranks of employed workers, who should come with higher money and real wages, without any inflationary pressures?

3. Methodology and data analyses

3.1. Methodology

The empirical specifications of wage behavior and employment behavior allow for the possibility that employment and price can influence the wage rate, which in turn can influence price, and the same is true of employment behavior. In this sense, the present study proposes to use ARDL regression representation, in which, if the focus is on the wage rate guided by any variable, say employment, for instance,

$$wt = \beta 0 + \beta 1Et - 1 + \cdots + \beta kEt - p + \delta 0wt - 1 + \cdots + \delta wt - q + \varepsilon t \quad (15)$$

where εt is a random "disturbance" term that is assumed to be "well-behaved" in the usual sense that it will be serially independent.

This specification permits data-generating process-led error correction method (ECM) tests and bound tests, which, if significant, will indicate that the short-run dynamic influences can lead to a stable long-run relationship and that the variables are cointegrated, respectively (the related appendix tables report the test results, along with other diagnostic tests for autocorrelation and stability of the models).

Additionally, the ARDL long-run coefficients are reported after accounting for dummy variables in the data-generating processes, which allows for the consideration of structural breaks. The unit root tests with structural change of the cointegrating relationship point to the break period, which is also reported in the appendix. Short-run VAR Granger causality tests supplement the ARDL results.

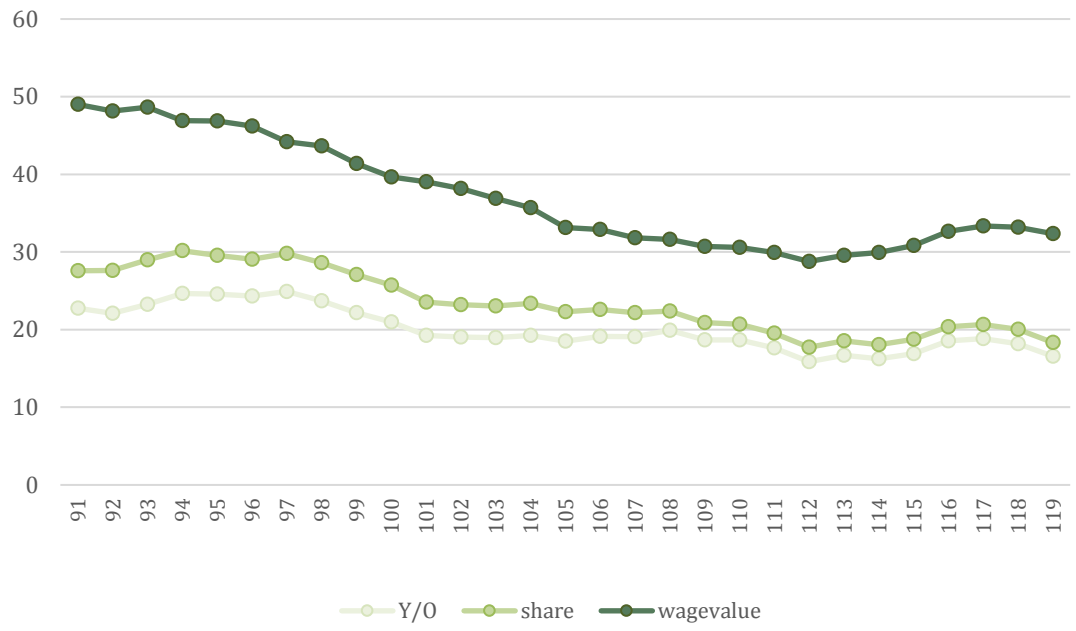
3.2. Data analyses

It should be emphasized that the correlation coefficients between the wage rates and prices, using the price of manufacturing and the CPI, are 0.96 and 0.99, respectively. This finding of almost perfect wage-price correlation, however, needs caution. Appendix table A1 shows that the increases in the growth rates of both nominal and real wages exceed the increases in prices and the CPI. If a scale factor adjusts variables, the correlation among the variables would not be affected. However, the growth rates of each variable would differ (due to changes in the

denominators) when the scale adjustments of different variables vary. In other words, despite the almost perfect correlation between the two, firm-specific adjustment of prices is more than the adjustment of wages. For any increase in wages, if the prices are adjusted at a higher level to maintain the value-added-to-output ratio in nominal terms (Y/O or such markups), it can explain why, despite wage rates recording a higher growth, the wage shares in output and value added witnessed a decrease in the period concerned.

According to the empirical specification of the paper, decreases in wage shares should be specific to slower growth phases, marking the absence of a higher pace of investment-led Young-Kaldor dynamism. Figure 3 illustrates that a decline in the specialization of intermediate goods accompanies the declining trend in wage shares. However, the latter is not associated with any significant increasing trend in Y/O in nominal terms or such price-adjusted markups. The important point is that, if the pace of investment is slower, a lower wage share has not translated into any significant increase in price-adjusted Y/O (or such markups).

Figure 3 – *Relative movement of W/Y, Y/O, and the share of intermediate goods (stacked line graph)*



Source: https://rbi.org.in; author's calculations.

Therefore, as hypothesized in this paper, a wage-price correlation does not always indicate prospects for a wage-price spiral. The hypothesis is that, if investment dynamics are slowing down, with a lowering of the pace of investment and employment, it provides the necessary checks. Since the share of intermediate goods and such specializations witnesses a marked deceleration, the key variables – growth rates of employment and investment, although showing fluctuations in different phases – record slow growth. In fact, over the period, investment growth

is marginally negative (appendix table A1). Then the pressure on a higher price-adjusted Y/O (or such markups) would be muted.

For a formal analysis of associations using the ARDL method, table 1 shows that the logs of investment and workers are I(1), while all other variables are I(0), justifying the use of ARDL bound tests for cointegration.

Table 1 – *Augmented Dickey-Fuller tests for stationarity*

Variable (order of integration)	t-statistics
Log investment I(1)	–9.42***
Log workers I(1)	–5.01***
Log real wage rate I(1)	–5.60***
Log wage rate I(0)	–4.03**
Share of intermediate goods I(1)	–4.33**
Log price: I(0)	–3.37*
Log CPI I(0)	–3.99***
W/O I(1)	–4.47***
Real Y/O I(0)	–7.07***
Nominal Y/O I(1)	–3.72**

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

To start, for a study on whether Indian data suggest employment PC outcomes or not, ARDL regression results (not reported) show that there is no long-run relationship between employment and the wage rate; the bound test is not significant. However, if the focus is on a possible post-Keynesian employment PC, in which wage and employment correlations should be conditioned by investment dynamics, table 2(a) ARDL results indicate that the share of intermediate goods, which conditions investment, have a negative and significant impact on the wage rate. The price-wage correlation and such an indicator of the existence of a price PC, therefore, is specific to the absence of the investment dynamics-led employment PC.

Regarding the price PC specification (equation 14, above), if price is considered an additional independent variable alongside employment, the table 2(b) results show that, taking the wage rate as the dependent variable, both employment and price have a positive and significant influence on the wage rate. In addition, as Indian literature discusses (Behera et al., 2017), table 2(c) shows that the wage rate is positively and significantly sensitive to CPI inflation, indicating a correlation with the standard of living.

Table 2 – *ARDL regression long-run coefficients for log (wage rate)*

Variable	(a) Coefficient (SE)	(b) Coefficient (SE)	(c) Coefficient (SE)
Lworker	0. 30 (0.20)	1.46*** (0.25)	1.51*** (0.18)
Share of intermediate goods	−1.60*** (0.18)		
Linvestment	−0.54*** (0.31)		
Lprice		0.98*** (0.32)	
LCPI			−1.38** (0.45)

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

Both product- and CPI-based price effects on the wage rate, as well as their implications for a feedback effect from wages to prices and a resulting price-wage spiral, require further elaboration. Though ARDL results (not reported due to lack of a significant bound test) do not indicate a long-run causation running from wages to prices, table 3(a), VAR Granger causality Wald tests, shows that both employment and wage rate significantly Granger cause prices. That is, even if the short-run dynamics indicate a periodic adjustment of prices in response to wages, it has no long-run implication for a wage-price spiral.

Table 3 – *VAR Granger causality/block exogeneity Wald tests*

a. Variables: lwage rate, lworker, lprice
b. Variables: Share of intermediate goods, Linvestment, Lworker

	(a) Dependent variable: D (lprice)	(b) Dependent variable: D (share of intermediate goods)
Excluded	Chi-sq (Df)	Chi-sq (Df)
D(Lworker)	26.35*** (6)	18.10*** (6)
D(Lwage rate)	16.52** (6)	
D (linvestment)		15.08** (6)

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Note: Other causality tests taking (a) and (b) variables are insignificant.
Source: Author's calculations.

To elaborate further, if table 4(a) shows that both employment and prices have positive and significant impacts on the ratio of wages to value added, as an indicator of labor costs, this has not led to any price-adjusted increases in Y/O. For instance, table 4(b) shows that both prices and the share of intermediate goods have a negative and statistically significant impact on Y/O. A higher Y/O and such a markup-based revival of investment are missing. As table 4(c) results show, intermediate goods specialization is key to higher investment prospects. It has a negative and significant impact on investment in the period and, in the absence of investment dynamics, any positive impact of Y/O on investment is not significant.

Table 4 – *ARDL regression long-run coefficients for wages to value added ratio (a), value added to output ratio (b) and investment (c)*

Variable	**(a)** **Coefficient (SE)**	**(b)** **Coefficient (SE)**	**(c)** **Coefficient (SE)**
Lworker	45. 24***		
	(3.90)		
Lprice	–43. 33***	–1.65***	
	(9.71)	(0.28)	
Share of intermediate goods		–0.80***	–0.87**
		(0.17)	(0.40)
Value add to output ratio			0.60
			(1.91)

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

The above results indicate the absence of significant intermediate-goods-specialization-based employment PC. The resultant price PC-based wage-price correlation is also specific to a slower growth phase and has not translated into a wage-price spiral. Specifically, the price-wage correlation has no inflationary connotation, as a lowering of the wage share has not been associated with a higher Y/O. The correlation coefficients between the share of intermediate goods and value added per unit of output and real value added per unit of output are 0.85 and 0.88, respectively. A negative growth in specializations reduces the pace of investment, thereby checking any growth of Y/O (and such inflationary pressures that elevate margins).

3.2.1. Significance of intermediate goods specialization

If the dynamic specification of employment PC is missing and the period witnesses a low pace of investment and employment (see appendix table A1), this can be attributed to declining trends in the specialization of intermediate goods. Though ARDL long-run effects are not significant (and not reported), Table 3(b) VAR Granger causality tests show that, if both employment and investment Granger Cause the share of intermediate goods, the short-run interactions between variables show that employment and investments do not indicate an employment PC.

What exactly is the role of intermediate goods specification, which is the most important element of investment dynamics? Are the developments concerning the price-wage correlation and such a price PC due to the slowdown of intermediate goods specializations?

Considering the existence of a price PC in India, the price formation, as per the current focus, should exhibit a positive influence from labor costs or the wage-to-output ratio and a negative one from greater intermediate goods specialization. Although the ARDL results confirm this, they are not reported because the LM test for autocorrelation is significant at a 7% level of significance, indicating an endogenous bias, albeit mildly so. Examining the direct one-to-one relationship, table 5(a) ARDL results indicate that intermediate goods specializations have a negative and statistically significant impact on prices, as predicted in the employment PC specifications. Moreover, table 5(b) ARDL results show that the positive and significant impact of the wage rate on wage share (W/O) or labor cost is conditional upon a positive and significant impact of the share of intermediate goods. That is, the declining trend of the wage share during the period is due to a decline in the share of intermediate goods during the same period, as depicted in figure 3, above. One implication is that a revival of intermediate goods specializations can facilitate a higher wage-rate-based revival of the wage share and control price increases (table 5(a)). For instance, appendix table A1 shows that, even if the share of intermediate goods shows negative growth in all sub-periods, a slowing down of the negative growth in the period 2012-19 saw a revival of both the wage shares and the value added per unit of output (see figure 3, above); in addition, despite increases in the wage rate in the period, the increase in the price of the product remains moderate as compared to other growth phases.

Table 5 – *ARDL regression long-run coefficients for Lprice (a) and wage to output ratio (b)*

Variable	**(a)** **Coefficient (SE)**	**(b)** **Coefficient (SE)**
Share of intermediate goods	–0.55*** (0.11)	16.31*** (2.70)
Lwage rate		8.84*** (2.30)

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

In this sense, the slower pace of investment in the period covered in the present study highlights the significance of the lack of Young-Kaldor investment dynamics. There is also evidence that a revival of a higher investment-pace-led specialization, coming with a negative impact on prices (table 5(a)), can support employment PC outcomes.

3.3. Discussions and policy implications

All in all, the results have important implications for the related discussions on growth outcomes in the post-Keynesian literature. First, Onaran and Galanis (2012) argue that, even if India remains

a profit-led growth economy, its international trade-specific interactions with other wage-led economies make it vulnerable to a possible slowdown in the wage-led growth of its trading partners. The current focus on investment-led growth in India provides an alternative understanding, in which, even in a profit-led growth scenario, a lowering of the wage share becomes a constraint. It shows that investments are not supported by intermediate goods specializations, leading to a slowdown in growth through a reduction in the pace of investment and employment.

Second, the specification of growth phases has an important bearing on the existence of wage-price correlation prospects. The Indian case demonstrates that this correlation has not led to a generalized wage-price spiral based on competitive or conflict-driven bidding on both sides. Suppose proper growth, based on investment dynamics, permits higher wages without necessarily translating into a wage-price spiral. A lower growth rate, indicative of the absence of a higher pace of investment-led Young-Kaldor dynamism, provides checks and balances on any conflict-based inflation prospects. It is true that, if a higher pace of investment were to be maintained, which, in the absence of specializations, would have to be supported by a higher price-adjusted Y/O or such higher markups, it would lead to a lower wage share. However, if the absence of investment dynamics implies a slowdown in the pace of both employment and investment, the pressure on wage shares and Y/O would be muted. That is, a lower wage share does not necessarily lead to a higher Y/O (or such markups) and subsequently to a further higher wage demand to maintain the wage shares, and so on.

It is because of this lack of such competitive bidding or wage-price spiral in the Indian case that the present paper suggests that the roles of demand-management-led revival of investment dynamism as a solution to higher employment outcomes are relevant.

To elaborate further, as discussed above in subsection 2.2, the Indian economy is moving towards a monetary policy orientation in which price stability is held to be the most important objective (and it will take care of growth). Any evidence of a wage-price correlation would serve as an indicator of job-market tightening, with prospects for a wage-price spiral, and lead to a monetary policy tightening orientation. If the above monetary restrictions are endogenous to a tightening of labor markets and a wage-price correlation, and if such nonlinearity is allowed for, the price PC still exists (see Mishkin et al., 2019). In other words, the policy focus is on checking inflationary expectations that a tightening of the job market, associated with higher wages, carries.

However, the present paper provides an alternative understanding in which, if higher employment growth associated with wage increases is attributed to investment dynamics and the wage increases are expected ones in line with the evolution of the margin at stable prices, the higher employment growth does not lead to any wage-price correlation-led inflationary expectations. A wage-price correlation is a symptom of a slowdown in investment-dynamics-led growth.[11] In a slowdown, moreover, wage increases lag behind price increases (to maintain investment via a higher Y/O) and come with lower labor costs or a lower wage share. Moreover, the latter does not necessarily imply a higher Y/O or such an inflationary outcome. The increases

[11] Though Patra et al. (2021), adopting NKPC methods, strive to show that there is evidence of a forward-looking inflationary-expectations-based price PC, the fact is that the inflation or such expectation has nothing to do with output-gap-based employment outcomes, resulting in either higher markups or higher unit labor costs or their correlation. Most Indian studies, including those by the Reserve Bank of India (RBI), acknowledge that this is due to higher food inflation or other structural causes (see Kundurthi and Kalluru, 2025) and that it can, through interest rate policies, help maintain lower employment outcomes (or output gaps). In a way, Young's thesis underpins how intermediate goods specializations support the emergence of formal science, supporting proper structure-led growth.

in Y/O (and such price-adjusted markups) are moderate when the slowdown in intermediate goods specializations also leads to a lower pace of investment.

Going further, if Nagaraj (2013) suggests that inflation control should be achieved through Keynesian demand management policies targeting better public infrastructure investments, the present paper argues that such demand management policies should involve determining the best way to revive the domestic base of intermediate goods specialization. If monetary tightening were to be replaced by a more accommodating policy permitting a revival of intermediate goods specializations, it, as table 5(a) results show, would have a moderating impact on prices. Price stability should be viewed as an ancillary objective to the overall "proper" growth objective.

In this context, conflict-based inflationary prospects should not be assumed away. However, in the present post-Keynesian understanding, as Keynes's (1936, chapter 21) observes, a policy focus on managing conflict-based inflation remains not on restrictive monetary policies but rather on a proper income policy, which, linking wages to investment dynamics (or productivity growth), can moderate the inflationary consequences (see King, 2013).

4. Conclusion

Though the empirical support for an employment PC is missing in India, there is support for the fact that some revival of the specializations (decrease in the negative growth of it as compared to other phases) in the Indian growth phase from 2012 to 2019 shows not only an increase in wage share but also an association with an increase in wage share. However, the general picture is one of slowing specializations during the period, associated with lower employment and investment outcomes.

One of the contributions of the empirical findings is to demonstrate that the conceptualization of the employment PC is important, as it is the lack of investment dynamics that suggests a price PC with a price-wage correlation. If so, the results pinpoint important differences between the current post-Keynesian conceptualization of a price PC and what an NKPC would suggest. Specifically, what needs emphasis is that mainstream price PC conceptualizations highlight how a wage-price correlation translates into increases in labor-costs-led inflationary pressures; therefore, there are limits to policies, including an accommodating monetary policy, that aim at employment expansion. On the contrary, the present study underscores how a wage-price correlation in growth can be attributed to the lack of investment dynamics; proper policies aimed at investment-led employment expansions do not necessarily entail a wage-price correlation. Importantly, even if there is a strong, positive price-wage correlation, the causation is from the slowing down of specialization to higher prices (table 5(a)) and subsequently to higher wages, as well as such price-wage correlation (table 2(a)), which is significantly associated with lower unit labor costs or the share of wages.

Although the present paper's closed economy framework for studying the presence or absence of an employment PC, based on investment dynamics, is relevant, some of the empirical relationships, especially those that allow for the absence of investment dynamics and a slowdown in growth, may exhibit some endogenous bias. Even if the causation running from a lower wage share to a higher Y/O-based investment is insignificant, the higher price-wage correlations, via their effect on wage share and profit margin, still have a feedback effect on investment. Though ARDL-based ECM and LM tests suggest that the bias is somewhat controlled, the ARDL regression method does not eliminate the problem. In this sense, the empirical focus should be broadened to incorporate the impacts of market reforms within an open economy framework and a monetary

policy orientation that is sensitive to capital flows in an import-surplus economy, such as India. This broadened specification would permit the use of more suitable econometric methods to identify and eliminate the source of endogeneity bias. For instance, if the current paper's results show both the lack of intermediate goods specializations and the lower price-led margins (Y/O) contributing to a reduction in the pace of investment, a focus can be on import competition outcompeting domestic specializations and moderating Y/O through price competition. Such competition affects some independent variables, such as the wage rate through low employment outcomes, and dependent variables, like investment via lower price-based markups and declining trends in domestic specializations. Imports also contribute to the availability of new, advanced technology-intensive varieties of goods in the economy, leading to higher standards of living, which in turn affect CPI and, through it, result in increases in wages.

Furthermore, a different picture would emerge if the focus were not on domestic tradable sectors that are open to import competition, but on the export-based tradable goods sectors that, although also facing price competition in foreign markets, can support a revival of domestic specializations.

It is true that the present paper, adopting a closed economy framework, highlights a decrease in intermediate-goods-specialization-led investment dynamics, which should be specific to the market reform processes in India that open up the economy to imports of technologically advanced, newer sets of intermediate goods and products. This outcome indicates that import-led reallocation effects predominate and that the potential overall growth effect of exports is insignificant. The availability of more advanced imported technology and a new knowledge base has not translated into Youngian external-economies-based growth effects or growth of the domestic knowledge base within the economy. However, a more disaggregated framework of analysis, separately analyzing tradable goods industries that face import competition and export-oriented industries, would provide a proper analysis of the crucial variables that define an employment PC or the lack thereof.

Appendix

Data sources

Data from the Reserve Bank of India (https://rbi.org.in/) are used for the index of intermediate goods, compiled by the Central Statistics Office (CSO), India (CSO, 2018). The index accounts for changes in physical quantities of a set of intermediate goods with reference to base year data and the weights attached to construct the index changes with changing composition of industries in different base years. The present study focuses on the index of intermediate goods in relation to the index of durable goods, which is assumed to relate more to intermediate goods uses. In the ratio of the index of intermediate goods to the index of durable goods, the share of intermediate goods is used as an indicator of intermediate goods specializations.

For the data on prices, both for the price of manufacturing and the CPI for industrial workers, the study uses RBI data. For the Indian manufacturing data, the study uses data from the Annual Survey of Industries (ASI), Government of India (available at mopsi.org.in and epwrf.in) for organized manufacturing. The employment data refers to the data on workers with the understanding that the dynamics of changes in production comes with increased incidences of

intermediate processes that would translate into a more specialized set of workers at the production floor level. Accordingly, the data on wages refers to wages of workers. The present study uses ASI data for the time series data on other variables, such as investment, output, and value added. Since the study focuses on the role of Keynesian-finance-led investment and refers to investment as financial data, the data on investment are derived from the gross fixed capital stock at current prices.

Tables

Table A1 – *Growth rate of selected variables*

Growth phases	Log investment	Log workers	Log wage rate	Log real wage rate
1991-2019	–0.13	0.28	4.41	3.74
1991-2000	–0.32	0.08	8.08	1.59
2001-11	0.48	0.61	3.53	3.38
2012-19	–1.94	0.35	3.05	6.57
1991-2011	–0.26	0.01	7.51	1.70

Growth phases	Share of intermediate goods	Log price	Log CPI
1991-2019	–4.90	0.60	1.40
1991-2000	–1.32	1.22	2.15
2001-11	–8.70	0.48	1.12
2012-19	–0.32	0.21	1.08
1991-2011	–1.73	1.13	2.04

Growth phases	Real value added to output	Value added to output	Wage share in output	Wage share in value added
1991-2019	–4.75	–1.37	–3.27	–1.93
1991-2000	–6.80	–0.36	–5.19	–4.86
2001-11	–3.21	–0.41	–5.19	–4.80
2012-19	0.20	1.50	4.91	3.35
1991-2011	–7.10	–1.13	–5.11	–4.03

Source: Author's calculations.

Table A2 – *Bound and other diagnostic tests of the ARDL regressions*

Relationships as per tables in text	Bound test F statistics (level of significance)	Breusch-Godfrey LM test F statistics (p value)	Ramsey reset test F statistics (p value)
Table 2a	4.10*	Prob F (2.4) (0.1257)	0.05 (0.8371)
Table 2b	7.10**	Prob F (2.8) (0.1939)	0.0007 (0.9794)
Table 2c	19.10***	Prob F (2.3) (0.3561)	0.002 (0.9686)
Table 4a	35.63***	Prob. (2.9) (0. 6902)	2. 08 (0.1789)
Table 4b	16.28***	Prob. (2.8) (0. 5109)	3.15 (0.1096)
Table 4c	5.86**	Prob (2.18) (0.8036)	0.39 (0.5401)
Table 5a	8.07***	Prob. (2.13) (0.8804)	0. 42((o. 5243)
Table 5b	11.12***	Prob. (2.12) (0.6876)	1.51 (0.2409)

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

Table A3 – *Unit root with structural breaks of cointegrating relationships (augmented Dicky-Fuller t-statistics)*

Relationships as per tables in text	Break date	t-statistics	Intercept break statistics	Break dummy statistics
Table 2a	2005	–4.93***	–0. 03*	0.17**
Table 2b	2005	–5.76***	–0. 03**	0.11***
Table 2c	2005	–4.06	–0.03**	0.03
Table 4a	2005	–10.47***	–4.48***	3.46***
Table 4b	2013	–2.42	0.02*	–0.02
Table 4c	2013	–3.19	–0.81***	0.01
Table 5a	2013	–3. 30	0.024**	–0.03
Table 5b	2013	–3.63	–0.34**	0.18

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Note: As discussed in the text (section 2.1. Empirical focus), 2005 and 2013 coincide with the high-growth phase from 2004-5 to 2010 and a tightening of monetary policies, respectively. These two period-specific dummy variables are used when structural break periods point to one-year gaps from the respective periods.
Source: Author's calculations.

Table A4 – *ECM with break dummy (only stability test ECT and significance of dummy variable impact)*

Relationship as per tables in text	ECT coefficient (prob.)	Dummy coefficient (prob.)
Table 2a	–0.45***	0.01**
Table 2b	–0.44***	0.04***
Table 2c	–1.62***	0.10***

Table 4a	−0.43***	−3.24***
Table 4b	0. 51***	0. 02***
Table 4c	−1. 94***	−0.66***
Table 5a	−0.72***	0.01**
Table 5a	−0.27***	−0.07

Significance levels: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Source: Author's calculations.

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