

Structural change and employment growth in India: reinterpreting “Manufacturing as an Engine of Growth”

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Abstract

Purpose – The present paper aims to highlight how manufacturing expansions under conditions of increasing returns, which involve the growth of intermediate goods specializations, support advanced service employment. In addition, the increasing use of manufacturing products in services highlights additional, new service sector employment opportunities.

Design/methodology/approach – This paper investigates (1) the manufacturing and service interactions and (2) the investment behaviour in manufacturing using Auto-Regressive Distributed lags (ARDL) and Vector Autoregressive (VAR) models. The models allow for different specifications to study whether investment behaviour in manufacturing supports dynamic manufacturing and service interactions.

Findings – The results underpin how Kaldorian manufacturing as an engine of growth is still relevant in Indian growth and is key to achieving higher advanced employment, export-orientation and services and manufacturing nexus outcomes. What matters, though, is that manufacturing investments are to be guided mainly by intermediate goods specializations. The slowdown of these specializations, explaining the slowdown of manufacturing investment, is therefore, a concern.

Originality/value – A reinterpretation of manufacturing as an engine of growth in which primacy is given to investment behaviour in technical progress functions that can support the growth of specializations in manufacturing and such specialized service employment.

Keywords Structural change, Intermediate goods specialization, Keynesian macro increasing returns, Reinterpretation of Kaldor’s technical progress function

Paper type Research paper

1. Introduction

There is a large and growing body of literature on India’s post-1980 revival period, which was marked by a significant “structural shift” in favour of the service sector and is also associated with periods of higher growth (Mazumdar, 2010; Cortuk & Singh, 2011, 2015; Verma, 2012; Krishna, Erumban, Das, Agarwal, & Das, 2015; Mallick, 2017; Agarwal, 2018; Erumban, Das, Agarwal, & Das, 2019; Ghose, 2021; Basole, 2022). However, the literature expresses concern about a lack of matching good employment opportunities in advanced services during this period of growth (Bhadury, Narayanan, & Pratap, 2021). This could be attributed to a lack of dynamic labour reallocation in response to productivity growth, as well as the absence of strong manufacturing and service interactions, both of which are necessary for creating good job opportunities (Verma, 2012; Krishna *et al.*, 2015; Erumban *et al.*, 2019; Agarwal, 2018; Ghose, 2021).

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It is critical to investigate the link between structural change and growth. This can shed light on the underlying processes that can result in structural change dynamics with positive employment outcomes.

According to the standard neoclassical analysis, the overall growth driven by exogenous technological progress (or the growth of effective labour) can be sector- or industry-specific, and the resulting income growth via Engels Law (or Bell's Law) elasticity can be linked to a distinct structural change. Engel's law states that as income increases, the share of income spent on agricultural products decreases. Bell's law argues that at the early stages of increases in income, the structure of demand will shift towards manufacturers but at a later stage of development, there will be a shift of demand from manufacturers to services. However, supply shocks also matter. Therefore, (1) there is no specific prediction of the specificity of structural change and (2) despite the fact that structural change sustains growth, growth induces a structural change that has no further growth implications (Chenery & Srinivasan, 1998, vol. I, part 2). Further, it assumes full employment as a natural outcome, and if the employment outcome in response to productivity growth is not guaranteed, as in the case of India (as previously discussed), it is ascribed to wage or price rigidities or to Keynesian types of unemployment outcomes unique to oligopolistic market structures (Solow, 1998, 2003).

An alternative Keynesian demand-led perspective discusses a causality that runs from structural change to overall growth, which can be traced back to Kaldor's manufacturing as a growth engine thesis, which has direct employment implications. The thesis relies on the Verdoorn coefficient, a causation running from output growth to productivity growth. If the focus is on manufacturing-driven growth, and if manufacturing growth significantly determines overall productivity growth, the model also incorporates structural change dynamics in which manufacturing growth would be associated with a shift of labour force from other sectors towards manufacturing (Kaldor, 1966; for continuing relevance in developed countries, see McCausland & Theodossiou, 2012; Blecker & Setterfield, 2019).

The demand-led perspective can be important in the Indian context, emphasizing the dynamic interlinkages between manufacturing and services that guide growth. The current emphasis, however, is not on manufacturing as an engine that traces full employment outcomes and remains silent on the demand and supply dynamics of investments. A more pertinent focus would be on highlighting the role of investment, which would underpin important variables and processes that help the economy transit to a developed status, with implications for faster employment growth.

The contribution of this paper is to illustrate Keynesian investment-led transitional dynamics involving manufacturing-led growth processes that can highlight employment and productivity growth relationships. The objective is to include Kaldor (1972)'s later writings on the subject, which are based on Young (1928)'s investment behaviour. Manufacturing investments that result in a growth of specializations would be embedded in dynamic manufacturing and service inter-linkages with higher, more specialized employment outcomes. The aim is also to enrich the existing Indian literature on Keynesian perspectives on demand-led growth (Nayyar, 1978, 1997; Kalirajan, 2004; Kathuria & Natarajan, 2013).

To elaborate, Cortuk and Singh's (2011, 2015) analyses confirm a robust Indian growth-specific causal relationship that runs from structural change to overall growth, which is linked to divergence trends (also see Sanyal & Singh, 2021). According to them, the Indian growth, therefore, indicates expansions under conditions of increasing returns and reinforces the classical traditions elaborated by Young and Kaldor.

This emphasis on demand-led increasing returns, however, begs the fundamental question of why increasing returns have not translated into a greater expansion of good job opportunities in India. In Young and Kaldor perspective, micro-increasing returns (or profits) is a function of increasing returns in production possibility. Productive expansion in one line

of production is accompanied by such expansions elsewhere. This emphasis on macro expansions is all about creating new employment opportunities in growth, either towards an economic maturity stage (full employment) or mobility from low-productivity jobs to higher productive jobs (Kaldor, 1966).

According to this paper, if growing employment opportunities, particularly in services, are absent, the emphasis on increasing returns expansions underpinning structural change is misconstrued.

In fact, following the Kaldorian framework, Nayyar (1978, 1997) provides a rich understanding of how demand support in a developing economy to achieve this advanced endogenous growth is neglected in India. Kalirajan (2004) and Kathuria and Natarajan (2013) argue that this broader participation-based dynamic scale economy is missing in India. These understandings can highlight the missing links that explain why Indian growth is associated with lower employment outcomes.

But Young-Kaldor provides an alternative perspective in which the focus is not on scale-based productivity growth, but on a dynamism that supports an advanced form of industrial differentiation that is characterized by the constant emergence of new specializations and new specialized subtasks, which induces sophisticated interlinkages between manufacturing and services. Keynesian independent investment behaviour is central to transitional dynamics that mark constant departures from any tendency towards full employment. It facilitates manufacturing expansions that indicate increased specialization in intermediate goods. This supports the constant emergence of specialized firms performing narrowly specialized tasks, which would be relevant to specialized employment opportunities in both manufacturing and services, thereby supporting a proper structural shift towards the service sector.

Advanced, knowledge-based services are, in turn, central to continuing competitiveness and further expansions of manufacturing. Manufacturing would continue to play this important role in these interactions.

Therefore, this paper would provide a reinterpretation of Kaldor's technical progress function that incorporates the empirical specification of the role of investment in Young-Kaldor increasing returns-based cumulative causation. This paper is organized as follows to address these concerns: Section 2 would look at the issue of how advanced manufacturing underpinning higher incidences of intermediate goods specializations supports a structural transformation towards an advanced service sector with good employment outcomes. Section 3 discusses the theoretical perspective to highlight the importance of advanced manufacturing, which is followed by Section 4, which elaborates on the theoretical and empirical issues pertaining to advanced manufacturing that come with a higher incidence of intermediate goods specializations and explains why the focus has to zero in on Young-Kaldor increasing returns. Sections 5, 6, and 7 concern data, econometric specification and analysis and findings, respectively. The conclusion would be in Section 8.

2. Advanced manufacturing and manufacturing and services nexus

The hypothesis is that advanced manufacturing growth that would typify the growth of specializations would highlight dynamic manufacturing and service inter-linkages that also support the growth of specialized employment both in services and manufacturing. Young (1928; also see, Stigler, 1951) observed, advanced division of labour-based manufacturing, at initial stages, manifested itself in within-firm specializations in sub-tasks like manufacturing, production of equipment, looking after trading and marketing, finance, raw material procurements, etc. Manufacturing production is just one of many specializations. According to Young, specializations become economical and add to profits when firms target larger production, and the search for greater markets forms the basis of such modern production processes. However, as the specialization-based growth process gathers momentum, within-

firm specializations give way to the formation of specialized firms looking after narrow specializations, and many of the hitherto within-firm sub-tasks are now classified as part of the service sector.

[Sturgeon and Memedovic \(2010\)](#) note how there is a growing body of literature that traces Young's development of modern production based on intermediate goods specializations: when production becomes increasingly fragmented, or "roundabout", the increased demand for specialized intermediate goods and services draws a broader range of establishments, firms, workers and countries into increasingly complex and dynamic divisions of labour. This supports intricate, sophisticated coordination between the goods and services industries.

One implication is a major part of the advanced service sector employment in the advanced countries could be nothing but reclassified "advanced manufacturing-based" employment opportunities (see, [Rowthorn & Coutts, 2013](#)). In the USA, managing businesses account for around 35% to 40% of total employment, accounting for growing and dominant employment in the services sector ([Goodwin *et al.*, 2013](#)).

It can then be hypothesized that the greater the employment opportunities supported by a manufacturing-led division of labour, the greater the scope of the service sector. The experience of developed countries suggests manufacturing still plays an important role in their service sector-dominated growth. Manufacturing exports from these countries dominate international trade, and within it the intermediate goods share dominates, making it clear why the incidences of research and development expenditures (R&D) and labour productivity are more specific to the manufacturing sector. This coming up of advanced services, primarily dominated by business services, would add force to this competitive advantage and dominance of manufacturing.

It can be argued the advanced status of the service sector in many instances is unrelated to business services per se. However, the advancements in other traditional services, the greater sophistication of such services and the good employment opportunities in them are mainly derived from the higher incidences of sophistication in the manufacturing products that they use. For instance, the advanced status of health services cannot be attributed merely to the services provided by doctors and nursing staff, etc. It is the inclusion of greater varieties of sophisticated medical equipment and laboratories that lend the advanced status to health services, which come with greater varieties of specializations and many narrow specializations and can explain much of the new and growing employment opportunities in these services.

Then, a dynamic manufacturing sector is germane to the new employment opportunities in services and can explain possible service sector-led growth and higher employment opportunities in services that, in turn, would capture important inter-linkages between services and manufacturing.

3. Manufacturing specializations: growth and employment

Suppose one starts with [Stigler \(1951\)](#) that the modern growth in advanced countries typifies the existence of a vast array of specialists in very detailed, narrow specializations, new neo-classical endogenous growth perspectives provide a particular explanation of the processes involved. These theories (for example, [Romer, 1986](#); for a review, see, [Solow, 2000](#)) discuss how investment and concurrent adoption by all allow external economies to support further investment-led expansions and so on, with structural change-specific causal significance. The emphasis is also on newness – the coming up of new specialized tasks to produce new varieties of goods, supported by R&D and learning – that creates all-important externalities. However, according to [Solow \(2000\)](#), the role of externalities and endogenous growth—for example, a faster rate of investment with some stability in the capital-to-output ratio—cannot

be consistent with a well-functioning savings-led production function (for different perspectives, see, [Mankiw *et al.*, 1992](#); [Padhi, 2019](#)). Increased savings and investments must be based on a substitution principle that guides changes in the capital-output ratio.

Therefore, recent conceptualizations of the role of investment in explaining development processes embedded in intermediate goods specialized and such employment opportunities to produce varieties of goods have increasingly relied on constant elasticity of substitution production function that comes with an elasticity of substitution parameter greater than one ([Aghion & Howitt, 2009](#)). The implication is that, allowing for the fact that the elasticity parameter is specific to the generalized use of specialists and specialized intermediate goods ([Hicks, 1936](#); [Piketty, 2014](#)), additional use of such specialization, and the resultant increases in capital intensity translate into a higher share of the specializations with higher returns to the specializations. Specifically, [Krugman \(1991\)](#) shows how the very existence of specializations through pecuniary external economies also induces a reallocation of foreign savings that explains higher internal economies of scale (and returns) for a new specialist firm.

In these conceptualizations, if there is a one-to-one correspondence between the use of a specialization (or such a firm) for the production of a specific variety of goods (that the specialization permits), growth induces the growth of specialized firms. Therefore, even if there is an increase in capital intensity in each firm's greater specializations, the growth permits growth of specializations (and their higher share in output) and such employment outcomes.

However, it is perhaps true that this new neo-classical perspective might not provide insights into how to achieve a developed growth status in developing country contexts. The elasticity parameters vary from country to country, depending also on accumulated investments (and past output growth), and they could be less than one in a developing country. Similarly, Krugman's theory also remains silent on the growth of additional firms, and the role of investments in a closed economy framework.

Accordingly, the current focus is on an alternative Keynesian perspective ([Kaldor, 1961, 1966, 1972](#); also see, [Padhi, 2019](#)) that sheds light on demand-led supply dynamics, especially resulting in a growth of specializations in intermediate goods. Initially, demand-led perspectives highlight how the growth of demand (and output) via the Kaldor growth laws permits advanced manufacturing with higher productivity growth (for the developed country experience, see [McCausland & Theodossiou, 2012](#); for Indian studies see, [Kalirajan, 2004](#); [Kathuria & Natarajan, 2013](#)). However, manufacturing as an engine of growth tracing out a steady state of full employment outcome remains silent on the role of investment to achieve the developed status and employment outcome.

An alternative, however, is the formulation of the technical progress function ([Kaldor, 1961](#)), in which high demand-led investments translate into higher capital intensity, but the increases in capital intensity can be assisted by more than proportionate increases in labour productivity growth, indicating the contributions of increases in capital productivity.

However, this transition, in a given state of technical dynamism, permits steady-state growth, and if so, the function is indistinguishable from that of the productivity growth specific to a well-behaved production function ([Bairam, 1995](#)).

Therefore, Kaldor, in later writings ([Kaldor, 1972](#)) relied on [Young \(1928\)](#). Young provides a different meaning of capital productivity. It is not higher scale economies per se but a larger scale of production that induces division of labour and such specializations. The larger output and the higher capital productivity confirm the Adam Smithian dictum that larger output leads to the economical use of specializations. For Young, therefore, the division of labour-led specializations does not only refer to manufacturing ones but necessarily involves specializations relating to the greater search for markets, among others.

Young also argues that once greater market access permits the economical uses of specializations, and the resultant scope of higher profits, it creates external economies and leads to the generalized use of the specializations. The resultant greater market for specializations with higher resultant profits and learning by doing supports growth propensities and the constant emerge of new sub-tasks, new specializations, new processes, new products and new industries. As earlier discussed in [Section 2](#), there ensues an increasing tendency towards complex and dynamic divisions of labour with sophisticated coordination between goods and services industries that propagate in a cumulative way.

There are two important aspects of investment behaviour in Young. The focus cannot be on savings-led investment in response to supply shocks, which merely targets reallocation in which more productive expansion in one line of production would be associated with resource and finance diversion from other less productive lines of production (or firms). Young's focus is rather on increasing returns in production possibilities in response to the introduction of new specializations by a firm. This introduction in any one line of production induces such expansions elsewhere and permits a generalized adoption of specializations-based expansions. This generalized adoption in turn induces the growth of specializations. Such Keynesian types of macro expansions and growth have to be supported by finance-led new investment opportunities independent of prior savings. This type of investment supports increasing returns in production possibility, in which the introduction of intermediate goods specialization by one induces such introductions and expansions elsewhere.

Second, Young's thesis (as in [Kaldor, 1966, 1972](#)) hints at how the introduction of intermediate goods specialization also permits dynamic learning by doing. Unlike Arrowian static learning by doing, where experience supports the best adaptation to supply shocks, Young-Kaldor would argue that the new introduction can face technical and economic problems and induce scientific investigations to correct or improve them, which in turn permit the growth of formal science (also see, [Schmookler, 1966](#)). This symbiotic relationship between advanced production and the growth of formal science contributes to the constant coming up of new specializations ([Young, 1928; Padhi, 2019](#)).

If so, employment opportunities embedded in macro expansions would be the source of the dynamic learning by doing, and the employment dynamic is also important for new investment opportunities ([Padhi, 2015, 2018](#)).

4. Young-Kaldor investment behaviour and cumulative causation

4.1 Theoretical issues

Kaldor's later (1970s onward) writings emphasized how advanced growth is export-driven and exports are the fundamental autonomous demand force that drives such advanced demand-driven growth. ([Palumbo, 2009; Blecker & Setterfield, 2019](#)). Accordingly, his Keynesian reinterpretation of Young's thesis on how a greater search of markets drives cumulative causation growth embedded in the division of labour-led sophisticated industrial differentiation is an elaboration of how exports enlarge the size of the market and induce the division of labour-led cumulative causation (see, [Setterfield, 2011; Blecker & Setterfield, 2019](#)).

It is true that as a steady state long-run outcome, export-led growth has to recognize the role of import demand and incorporate a balance-of-payments equilibrium condition. However, if the focus, true of the current focus, is on a transition to advanced growth with an emphasis on increasing both the growth of exports and the share of exports in aggregate demand, the focus has to be on the Youngian-Kaldorian cumulative causation export-led growth dynamics. The cumulative causation growth would emphasize both a causation running from domestic initiative to greater productivity growth to export success to further demand-driven productivity growth and so on, and a causation running from initial export

success or exposure that can induce investments that add to domestic productivity growth to further export reach and so on.

Following [Blecker \(2013\)](#) and [Blecker and Setterfield \(2019\)](#), and taking lower case variables denoting an instantaneous rate of change, growth of exports x depends on

$$x = \varepsilon_x (e + p^* - p) + \eta_x y^* \quad (1)$$

ε_x is the price elasticity of export demand, e is the nominal currency depreciation, p^* and p are the rate of change of foreign and domestic prices, η_x is the income elasticity of export demand, and y^* is the rate of change in foreign income. In the present analysis, to simplify the analysis, it is assumed that a country starting with a little experience in export-led growth and with a simple, traditional production base but striving for a transition towards an advanced export-led growth status would take foreign price as a parameter (so, $p^* = 0$), but is sensitive to domestic prices in the face of a depreciating currency, especially when it can be import-dependent and a depreciating domestic currency also puts pressure on import-based prices. Domestic price sensitiveness translates into the management of

$$p = w - q \quad (2)$$

w is the rate of change in wage rate, and q is the rate of change in labour productivity. Again, for simplicity, assuming unchanged mark-up in a cost-plus price formulation in growth, if the transition has to witness an increase in wages (see the [Section 4.2](#)), the focus has to be on the cumulative causation growth that is driven by labour productivity growth in relation to the wage increases.

A standard closing of the exports-led growth model (see, [Blecker, 2013](#); [Blecker & Setterfield, 2019](#)) is to specify (1) an aggregate demand composed of the weighted average of both domestic and export components, which in a schedule equilibrium sense equals income growth and (2) the Verdoorn law, in which income (and aggregate demand) growth drive labour productivity growth. However, in an important sense, this specification of the model assumes a given investment-to-income ratio as a steady state outcome and remains silent on any significant autonomous role for domestic investment. If exports remain the only autonomous source of demand and investment (and consumption) is endogenous to income outcomes, which assume savings and investment equality in each period and passive adjustment of investment to growth of income (i.e. automatic working of acceleration principle), the model cannot capture realism concerning fundamental demand constraints facing an economy both in “static” and dynamic senses ([Palumbo, 2009](#)).

[Padhi \(2015a, 2020\)](#) suggests that in the balance-of-payments-constrained growth as a steady state outcome, foreign income growth, which is the basic source of demand-led exports, is taken as a parameter for each country, and, therefore, the demand side role of investment is not important. However, if foreign growth is not assured but is determined by the addition of new countries, which is also an emphasis in Kaldor’s writings, these countries in their transition phases would experience the investment-based dynamism underlying Young-Kaldor. [Blecker \(2013\)](#) and [Blecker and Setterfield \(2019\)](#) also argue that Young-Kaldor cumulative causation and such export-led growth can only lead to higher short-to medium-term transitional dynamics, which can be sustained if the long-term export-led growth conforms to the balance-of payment constrained growth. In this respect, short-term cumulative causation and transitional dynamism should also highlight the role of investment [1]. This focus is important since export-led growth or greater search of markets in the Youngian cumulative causation is initiated by domestic new investment opportunities that bring innovation in terms of the division of labour. Kaldor in his reinterpretations of Young, also mentions how the advanced transition cannot be captured by savings-led investments in response to innovations but has to incorporate Keynes’s insight into macrofinance-led

investment that can sustain a higher pace of investment than pre-existing savings (and such pre-existing income status) in each period in the transition phases.

A possible modification to the export-led cumulative causation in the spirit of Blecker and Setterfield is to incorporate the role of domestic investments, which can now be viewed as the basic force shaping aggregate demand:

$$i = an + bx + cd \quad (3)$$

where a stands for response of investment to, n , national characteristics, like the status of infrastructure, education, housing, etc. and b and c are the coefficients to capture how important export (x) and domestic demand management (d) are in shaping the pace of investment.

The productivity growth function can be [Kaldor \(1961\)](#); also see, [Bairam, 1995](#)'s linear technical progress function to indicate transitional dynamics:

$$q = \alpha i \quad (4)$$

The coefficient α captures a demand-driven higher pace of investment and such growth of capital intensity that results in higher labour productivity, which outpaces the growth of capital intensity and therefore indicates a growth of capital productivity in the transitional dynamics. This growth of capital productivity would capture how a higher pace of investment also induces greater Youngian intermediation goods specializations that also target a larger and larger volume of output in growth. In other words, the coefficient in the present empirical focus would indicate investment and specialization associations (see [Section 4](#)).

[Equations \(1, 2 and 4\)](#) can be combined (again ignoring markup and foreign price changes) to yield

$$i = A + b \mathcal{E}_x q \quad (5)$$

where $A = an + b(\mathcal{E}_x(e-w) + \eta_{xy}^*)$

and the combination of [equations \(3 and 5\)](#) gives the demand and supply dynamics-based "equilibrium" pace of investment:

$$i = A / \{1 - (b \mathcal{E}_x) \alpha\} \quad (6)$$

The model shows that A sets the broader parameters of demand-driven growth, which indicates the growth is strongly path-dependent ([Blecker & Setterfield, 2019](#)). It incorporates the variable a which captures national characteristics like availability of public infrastructure, housing, past accumulated experience in inventiveness, etc. These in Keynes's sense would define a particular long-term expectation and investment opportunities. This is also akin to [Kaldor \(1961\)](#)'s specification of a particular state of technological dynamism in an economy. Similarly, the coefficient b in the term A also captures domestic demand management policies that would indicate both the assurance of proper utilization of capacities (and the realization of profit expectations that would guide investment prospects in growth ([Dutt, 2013](#)).

However, as [Blecker \(2013, p. 398\)](#) and [Blecker and Setterfield \(2019, p. 393\)](#) note, the modelling strategy demands that all the above influences, along with foreign income growth, be assumed as growing at a constant rate. The basic focus is then on the rate of change in productivity, which drives export-led or advanced cumulative causation.

If so, since in [equation \(6\)](#) above all the coefficients or elasticity parameters are unambiguously positive, the growth of investment in cumulative causation responds primarily to the rate of change in productivity, which in the present discussion refers to a growing intermediate goods specialization.

4.1.1 *Importance of employment, wage rate and intermediate goods specialization.* Blecker (2013) and Blecker and Setterfield (2019) rightly note that the parameter A in equation A assumes importance in showing how a fear of appreciation or a wage increase can constrain export-led dynamism. The latter's impact would be more so when their model (Blecker & Setterfield, 2019, pp. 378–80) and as discussed earlier in the introduction (and Section 2) a manufacturing as an engine of growth thesis, relying on the Verdoorn coefficient, implies a manufacturing-dominated structural change associated with higher employment growth. This can put pressure on wages.

The present paper holds that the current reliance instead on the Kaldorian technical progress function, especially embedded in the Youngian division of labour dynamics, shows an increase in wage can be consistent with cumulative causation growth. To elaborate, first, equation (4) higher pace of investment also has higher employment implications. That is, equation (4) has to be paced by the growth in capital productivity and the resultant growth of output that outpaces the growth of labour productivity (attributed solely to the growth of capital intensity). This would imply a higher macro demand for labour that paces the growth of employment. This should also explain increases in real wages. Such a technical progress function (Kaldor, 1961) would indicate higher growth of demand for labour and employment.

The increases in capital productivity in Young-Kaldor indicate the growth of varieties of intermediate goods specializations, and if so, the employment growth resulting from it would refer to the growth of more specializations, new employment opportunities embedded in the specializations, and higher money (and real) wages. Therefore, taking l and w as denoting employment and wage rate, respectively, we have,

$$l(w) = f(i) \quad (7)$$

$$w = g(i) \quad (8)$$

An advantage of this specification of employment outcomes is that wage increases are less of a concern. Employment (and wage) outcomes are not seen as passive outcome variables. They can also play an important, active role in growth. To elaborate, investment-led growth marks a transition to the coming up of specialized firms for specialized tasks (the incidence of industrial differentiation). This typifies the growth of varieties of capital stock in various specialized sub-tasks. Then, the employment outcome in each period represents the utilization of capacities that embody new varieties of capital stock. The newness, the economic and technical problems facing the utilization of the newness, is the source of learning by doing, which would be inalienable to the labour force. This learning by doing is the basis for further innovations and newness (Schmookler, 1966). Padhi (2015, 2018a) also highlights how an increase in employment even in the basic Kaldor-Verdoorn specification, enlarges the size of the market and can induce further advanced investments. Then, we have

$$\mathbf{i}_t = \mathbf{f}(\mathbf{l}_{t-1}) \quad (9)$$

If so, the implication is that if investments in cumulative causation are guided mainly by the rate of change in productivity (equation (5)), the latter is indicated by the rates of changes in both intermediate goods specializations and employment.

Then, we have

$$\mathbf{i} = \mathbf{A} + \mathbf{b}\boldsymbol{\varepsilon}_x \mathbf{q} + \boldsymbol{\varepsilon}\mathbf{1} \dots \dots \quad (10)$$

The current focus also highlights how investment can be the key to exports and be guided by them in turn. However, instead of a focus on simultaneous determination, following Keynes's sequential reasoning, the basic association between investment and intermediate goods specialization (conditioned by employment) would shape how sensitive investment is to export orientation.

4.2 Empirical issues

The present paper concerns the development of intermediate goods specializations in the Indian context to study their possible importance in structural change dynamics and employment outcomes. Though a focus is also on tracing out Indian service sector-led structural change to specifically study the interactions of manufacturing and services, the primary focus is on the behaviour of intermediate goods specializations in manufacturing, which not only should be central to manufacturing services interactions but also should result in a higher pace of investment associated with greater, more specialized employment outcomes.

In this focal point, the current study takes cognizance of how market reform processes in India starting in 1991 have seen firms importing intermediate and capital goods that have resulted in the production of more varieties of goods and services (Goldberg, Khandelwal, Pavnick, & Topalova, 2010). One implication can be a reallocation of resources and finance towards the firms concerned, allowing for savings-led expansions that can indicate a lower employment outcome. On the other hand, there are studies that show that exposure to globalization and imports also induces domestic firms to adjust by bringing in complementary specializations or undertaking innovative activities (Tece, Pissano, & Shuen, 1997; Ketels & Memedovic, 2008). A possibility therefore is also the prospect of a Youngian-Kaldorian Keynesian macro expansion that can indicate greater, more specialized employment outcomes.

Accordingly, the present focus is on two aspects of employment outcomes in structural change-specific growth:

4.2.1 Structural change dynamics. The first empirical focus is on the specificity of structural change to study whether it reveals significant dynamic, symbiotic interactions between manufacturing and services. Chandra and Sandilands (2006, 2021) show how in advanced countries services also play the role of engine of growth and international competitiveness of manufacturing; however, assuming the advanced services specialization is an outgrowth of past advanced manufacturing, Indian, an emerging country study, should focus both on the pivotal role of manufacturing and on causation running from manufacturing to services. That is, Young-Kaldor development processes also underpin Kaldor's growth law, in which manufacturing growth that outpaces overall growth should induce manufacturing-based advanced services.

Thereby, the related issue to analyse is whether the Indian structural change-specific growth highlights the role of intermediate goods specializations that in turn support the causation running from manufacturing to services and their interactions.

4.2.2 Employment outcomes. In explaining the above hypothesized dynamic manufacturing and services interactions, primacy is given to the Young-Kaldor role of investment behaviour embedded in intermediate goods specializations that should also support a higher employment outcome. This needs elaboration. Sturgeon and Memedovic (2010, pp. 2–3) note how intermediate goods specializations underlying Young (1928) and the complex interconnections between manufacturing and services, have led to higher productivity gains, learning and industrial upgradation in developing countries, especially China and India. This also has implications for boosting specialized employment opportunities.

However, they also note (p. 4) how Youngian greater division of labour also translates into the development of global supply chains with outsourcing possibilities. The experience of different countries/industries suggests it has led to the loss of manufacturing jobs, and industrial upgradation can come without any guarantee of larger employment outcomes in specific individual countries/industries.

India's post-market reform growth also typifies how imported intermediate and capital goods have had an impact on the technological upgradation of industries, which comes with a

higher incidence of varieties of sophisticated goods and services (Goldberg *et al.*, 2010). However, as already discussed in the introduction, if the focus is on the new, more dynamic services, or on general sectors and industries that account for higher productivity levels and growth outcomes, a favourable outcome on the employment front is conspicuously missing (Verma, 2012; Krishna *et al.*, 2015). There is some discussion that traces the low employment outcome, or jobless growth, to a higher capital intensity that accompanied the growth (Raveendran & Kannan, 2009; Mazumdar, 2010; Tejani, 2016). This has also led to growth that lies below some threshold level that otherwise could come with higher growth in employment (Abubaker & Nurudeen, 2019). This could explain why weakened structural change-specific interlinkages or the absence of the dominant position of manufacturing in the service sector-led growth (Agarwal, 2018; Krishna *et al.*, 2015).

However, the paper argues that there is a need to distinguish between the impact of specialized firms in a static setting and the growth of specializations and increasing returns to them in a dynamic Youngian setting.

It is true that when within-firm specializations are undertaken by specialized firms, each catering to many firms in turn, this outsourcing will negatively impact employment. Or, equivalently, this is seen as an increase in capital intensity that reduces employment in individual industries.

Second, Kaldor (1972) cautioned that if the focus is on savings-led expansions, only a few firms participate in knowledge-based expansions (which can have higher capital intensity). The substitution principle can lead to higher returns for those firms. In a given state of aggregate demand, this would imply that others have less market access. This explains why productivity growth-led structural change only results in a static reallocation of labour force towards more dynamic firms/industries, while the broader, more dynamic effects of productivity growth—higher aggregate employment growth—are missing (Verma, 2012; Erumban *et al.*, 2019). Third, when discussing employment growth outcomes in the context of growth and structural change, the emphasis should not be on larger-scale economies. The scale economies result in an oligopolistic market structure that relies on greater market power to compensate for higher fixed costs. The market structure would include entry barriers and strategic behaviour by dominant firms, preventing broader participation.

Young's focus was more dynamic. Taking the example of the modern printing industry, he explains how greater roundabout production, or division of labour-based industrial differentiation has led to modern printing, which comes with the growth of specialized firms in specialized tasks such as typesetting, wood pulp, various kinds of paper, inks and their different ingredients, the group of industries focusing on technical parts of the production of illustrations, machinery, etc. If these developments in one line of production, also, via learning by doing and the resultant growth of formal science, support such expansions elsewhere, the induced macro expansions acquire growth connotations with the constant coming up of new products, new processes, new sub-tasks, etc. that propagate themselves in a cumulative way.

Supposing the imports of technology indicate investment that defines Keynesian macro expansions under increasing returns conditions, the resultant growth of industries, manifested in the constant emergence of new industries, products, processes, etc., can provide higher overall employment. These can increase the employment base and its growth, even when the growth is usually associated with increased capital intensity in individual industries.

Then, the focus has to be on investment behaviour that can be responsible for the growth of intermediate goods specializations.

5. Data

Indian literature (see Mazumdar, 2010) notes how service-sector-led growth in India could be discernible from the early 1980s. However, Indian experience also suggests that in the initial

periods up to the market reform, the service sector was dominated by the public sector; and the market reform processes initiated in 1991 saw a shift of emphasis towards a private sector-led service sector growth. The post-reform period also saw an increasing reliance on imports of intermediate and capital goods that added to the advanced production of greater varieties of sophisticated products and services in the economy (Goldberg *et al.*, 2010). The current empirical emphasis on the role of intermediate goods specialization both in shaping manufacturing and service interactions and in the prospects of a higher pace of manufacturing investments, therefore, concern the post-reform period starting in 1991. The end period of the analysis is 2019. The current focus on Young-Kaldor manufacturing investments concerns a high growth phase that signifies a transition towards an advanced state. The post-reform growth phase includes a high growth phase from 2003–2004 to 2010–2011. It should be noted that 2008 saw a period of global financial crisis, and though the momentum of Indian growth continued somewhat till 2011, the post-2011 period marked an initial slowdown to be followed by some revival of growth. The end period of the study is 2019 and post-2019, which saw pandemic-related disruptions, management of growth in such an era would be beyond the scope of the present study.

The study adopts two measures, IS-I and IS-II, to indicate the behaviour of intermediate goods specializations. One is the index of intermediate goods provided by the use-based classification of the index of industrial production provided by the Central Statistical Organization (source: rbi.org.in). The present paper will focus mainly on the share of intermediate goods as a percentage of the index of durable goods (IS-I); a higher share would indicate a greater incidence of specializations in the production of more sophisticated goods. Second, Sturgeon and Memedovic (2010) highlight how the role of intermediate goods specialization can be indicated by the share of specific final product industries, such as electronics, automobiles and motorcycles, apparel and footwear that dominate global value chains. The present paper follows a similar logic but concentrates on how, if imports of intermediate goods dominate Indian growth, it impacts manufacturing exports. Indian manufacturing exports have also seen a structural change in favour of certain new industries, such as engineering goods, chemical, metal products, etc. and the share of medium to high technology-intensive exports in manufacturing exports has seen an increase (Nayak, Aggarwal, & Mann, 2013). A higher share of manufacturing exports to imports can therefore indicate a structural shift towards exports that are less price sensitive and driven by a higher income elasticity of demand and can capture a possible higher incidence of intermediate goods specialization-based exports. Therefore, an increase in the manufacturing exports to imports ratio (IS-II) should indicate the contribution of intermediate goods specialization.

National Accounts statistics are used for manufacturing, services and GDP in the structural change analysis. Since the focus is not on the utilization of capital stock but on investment as financial flow data that attend either to reallocations or macro expansions, it is at its current prices. Annual Survey of Industries data (source: epwrf) is used for manufacturing investment and employment, which refer to additions to fixed capital formation and workers, respectively.

6. Econometric specification

The current paper uses time series data to test the significance of the association between the variables specific to the hypotheses developed in the present paper. It has been stressed that time series data generally move together even when they are unrelated, which can lead to spurious associations. In general, for a study of non-spurious associations, the Johansen cointegration method has been followed. However, the method requires a large sample (more than 30 observations), is sensitive to lag length selections and demands that the stationarity property of the variables be integrated into the same order (whether I (1) or I (1)).

The autoregressive distributed lag (ARDL) method provides some advantages since the present study, apart from a longer period for structural change analysis, also studies the role of intermediate goods specialization in structural change and in manufacturing investment behaviour with a small sample covering the period 1991–2011. The method provides a Bound test (Pesaran *et al.*, 2001), a test of cointegration, that identifies a single non-spurious long-run relationship between the underlying variables, and the determination of such long-run relationship in a small sample size, less than or equal to 30 observations, is robust (Haug, 2002; Narayan, 2005). This is when the method considers how growth effects – the lag effects of both independent and dependent variables – allow for a non-spurious association. Narayan (2005) though citing studies that use around 20 observations, also considers a longer period up to 65 observations since a longer period also captures dynamic changes. The requirements of bound tests can be lower when used in small samples. Further, the bound test in ARDL can also be applied even when some variables are stationary at levels and others are stationary in their first differences.

Another advantage of ARDL is that the Indian post-1991 period has seen many incremental policy changes that indicate the sources of dynamism. Since the ARDL associations, the bound test, also take into the dynamic impacts of lags of both independent and dependent variables, it explicitly studies periodical departures of the growth impacts and whether the long-run association to a stable outcome (Error Correction Method [ECM] coefficient is negative and significant).

$$I_t = 0 + 1I_{t-1} + \dots + kI_t - p + 0E_t + 1E_{t-1} + 2E_{t-2} + \dots + qE_t - q + U_t$$

The above is the specification of the ARDL model supposing, for instance, the focus is on how investment relates both to its lagged values and the lagged value of employment E . Where U_t is a random “disturbance” term that we’ll assume is “well-behaved” in the conventional sense. It will be serially independent, in particular.

The current analysis would discuss ARDL results only when the Bound tests are significant, denoting the long-run relationship and the ECM term is negative and significant, denoting that the long-run relationship is stable. These test results are not reported but can be provided on request.

7. Analysis and findings

7.1 Specificity of structural change

Table 1 displays the basic information that should shed light on the “growth opportunities” that would accompany a structural change. The period from 1966 to 1980 is divided into two sub-periods, with the latter showing a decrease in overall growth but a significant deceleration in manufacturing (and industrial) growth rates. However, growth rates since

Growth phases	Agriculture	Manufacturing	Services	GDP
1951–66	2.27	6.67	5.00	3.84
1967–80	2.43	4.75	4.08	3.59
1951–80	2.18	5.34	4.63	3.59
1991–2000	3.33	7.03	7.16	6.13
2000–11	2.56	8.53	8.05	6.85
2011–2019	3.39	7.47	7.66	6.72
1991–2019	2.97	7.21	7.68	6.45

Source(s): National Accounts; CSO (India); rbi.org.in; author’s calculations. 1051–1990 data is with the 2003–2004 base period and 1991–2019 data in 2011–2012 base period

Table 1.
Growth of different
sectors in different
growth phases

1980 show a resurgence. The overall growth rate from 1981 to 2011 was 6.09% per year, which was significantly higher than the growth rate prior to 1980. During the revival period, it can be seen that the growth rates of services and industry (in that order) outpace overall growth and, thus, provide new growth opportunities.

(From 1981 to 1996, government services dominated service sector growth; however, after 1996, private sector services began to predominate (see Mazumdar, 2010). Again, the table notes a sub-period, 2004–2011, that marks the so-called “high growth phase” in the post-1996 period of revival.)

Taking the current focus on the period 1991–2019, the table shows that in the entire period and for sub-periods, service sector growth outpaces manufacturing growth. The only exception is the high growth phase period 2000–2011 in which manufacturing growth takes the lead in growth performance. As a result, even in this cursory data analysis, the service sector emerges as the dominant sector during the Indian revival period, but manufacturing comes out to be a leading sector in high growth phases.

7.2 Dynamics of structural change

Quite contrary to what is to be expected in service sector-dominated growth, Table 2 Vector Autoregressive (VAR) (unrestricted) Granger causality (Wald tests) shows that it is the manufacturing that Granger causes overall growth.

However, the ARDL regression would also take into account dynamic changes, captured by the lags of both dependent and independent variables, to capture possible dynamism and long-run associations. Kaldor’s growth laws posit a dynamism where it is the manufacturing growth that should outpace the overall growth and in turn induce higher overall growth; the coefficient of manufacturing in explaining overall growth should be significant but less than one and the constant should be positive.

ARDL results (not reported) however show that there is no long-run association between manufacturing and overall growth (the bound test is insignificant).

Table 3 ARDL results show, expectedly, that allowing for the long-run association between services and overall growth, and the association is stable; the long-run coefficient of services in explaining overall growth is positive and significant and less than one. Table 4 ARDL results also show that the long-run coefficient of the service sector in explaining manufacturing in the period of analysis is positive, significant and less than one. That is, services can be viewed as the engine of growth.

Table 2.
VAR Granger
causality/Block
Exogeneity Wald tests:
variables: GDP (LG);
services (LS) and
manufacturing (LM)

Excluded	Chi-sq	Df	Prob.
<i>Dependent variable: D(LG)</i>			
D(LM)	10.69	2	0.0048
Note(s): Other causality tests are insignificant			
Source(s): Author’s calculation			

Table 3.
Dependent
variable: LG

Variable	Coefficient	Std. Error	t-statistic	Prob.
<i>Dependent variable: D(LG)</i>				
LS	0.86	0.01	79.42	0.0000
C	1.2	0.067	18.50	0.0000
Source(s): Author’s calculation				

A possible interpretation of the result is that even in the service sector-led growth, manufacturing Granger causes overall growth could be dynamic changes in it is important. Keeping in mind that a dynamic change in manufacturing is specific to imports of intermediate goods in the post-market reform era, with the possible generation of new additional service sector-oriented activities, a focus can be on whether the imports are also associated with a revival of domestic specialization with enhanced manufacturing and overall growth (service) interactions.

7.3 Roles of intermediate goods specializations

The current study considers two measures of intermediate goods specializations. Taking the direct measure, Table 5 shows the ratio of the index of intermediate goods to the index of durable goods, IS-I records negative growth over the entire period, and significantly so in the high 2000–2011 growth phase. A similar pattern is also true of the manufacturing exports to imports ratio (IS-II), but the post-2011 slower growth phase saw a marked increase in the ratio (perhaps mostly guided by slower post-2008 crisis-based imports).

7.3.1 Role in structural change dynamics. Table 6 ARDL results provide an explanation of why manufacturing Granger causes overall growth. The long-run association and the coefficient of manufacturing, controlling for IS-I, positively and significantly explain overall growth. This role of services is missing, and the results (not reported) show an insignificant contribution of services to overall growth. However, Table 7 ARDL results show that controlling for IS-I, the service sector significantly and positively explains manufacturing. Intermediate goods specialization highlights such two-way interactions between manufacturing and services that shape overall growth.

Variable	Coefficient	Std. Error	<i>t</i> -statistic	Prob.
<i>Long-run coefficients</i>				
LS	0.92	0.02	37.56	0.0000
C	−0.04	0.16	−0.30	0.7684

Table 4.
Dependent
variable: LM

Period	IS-I share of intermediate goods	IV-II manu.exports to total imports
1991–2000	−1.31	−0.19
2000–2011	−8.47	−6.72
2011–2019	−0.44	2.62
1991–2019	−4.90	−1.84

Table 5.
Growth of intermediate
goods specializations

Variable	Coefficient	Std. Error	<i>t</i> -statistic	Prob.
<i>Long-run coefficients</i>				
LM	0.99	0.024	40.34	0.0000
IS-I	0.07	0.03	2.01	0.1824
C	0.67	0.16	4.19	0.0524

Table 6.
Dependent
variable: LG

ECON

The above evidence shows that manufacturing can be considered an engine of growth (and the long run coefficient is less than one) when one controls for intermediate goods specialization (IS-I). Supporting this are Table 8 VAR Granger Causality (wald tests) show that the manufacturing sector, along with IS-I and overall growth, Granger causes services, and again, controlling for other variables, the causality running from manufacturing to overall growth is significant.

However, this importance of manufacturing controlling for IS-I needs caution because the results pertain to a period of analysis that is also marked by decreases in IS-I. For instance, if Young-Kaldor cumulative causation should also indicate greater export-orientation, the role of IS-II in these interactions (not reported) is insignificant.

7.3.2 *Role in manufacturing pace of investment.* Table 9 (a and b) provides data on some basic parameters that can be used to assess the nature of Indian manufacturing expansion. The data show that, while investment recorded a negative growth rate in the revival period (1991–2000), followed by a turnaround during the high growth phase period (2001–2011), the post-2011 period again saw sharp negative growth. The pace of investment in different phases also saw some matching (though positive) growth patterns in both employment and the nominal wage rate. However, real wage data do not show a significant increase during the high growth phase, and, more importantly, wage shares, both in value-added and output terms, registered negative growth rates throughout the period.

It is reasonable to assume that increases in profit share drive investment, but the value added per unit of output shows only minor increases over the entire period. In fact, the higher growth phase has experienced a slight slowdown. The correlation coefficient between the product price and the value added per unit of output is high (0.83), and thus the real value added per unit of output shows significant negative growth throughout. There is no evidence that intermediate goods specializations drive increases in profit share and investment.

Table 7.
Dependent
variable: LM

Variable	Coefficient	Std. error	t-statistic	Prob
<i>Long-run coefficients</i>				
LS	0.93	0.11	8.09	0.0149
IS-I	-0.05	0.152	-0.33	0.7704
C	-0.12	0.78	-0.16	0.8886

Source(s): Author's calculation

Table 8.
VAR Granger
causality/Block
Exogeneity Wald tests;
variables: GDP (LG),
services (LS),
manufacturing (LM)
and share of
intermediate goods
(IS-I)

Excluded	Chi-sq	Df	Prob.
<i>Dependent variable: D(LG)</i>			
D(LM)	21.463331193	4	0.0003
<i>Dependent variable: D(LS)</i>			
D(LM)	15.30	4	0.0041
D(LG)	17.61	34	0.0015
D(IS-I)	9.98	34	0.0410

Note(s): Other causality tests are insignificant

Source(s): Author's calculation

Growth phases	Investment	Real wage rate	Employment	Wage share (in output)
<i>(a)</i>				
1991–2000	–3.38	1.59	0.67	–12.71
2001–2011	5.50	3.37	5.55	–10.86
2012–2019	–17.350.35	6.56	3.35	–2.82
1991–2019	–1.12	3.73	2.52	–9.94

Growth phases	Nominal value added to output	Price	Real value added to nominal output ratio	Real value added to wages ratio
<i>(b)</i>				
1991–2000	–0.35	6.92	–6.80	–1.69
2001–2011	–0.41	2.89	–3.21	2.08
2012–2019	1.50	1.29	–0.20	–4.48
1991–2019	–1.36	3.54	–4.74	–1.52

Table 9.
Indian manufacturing:
growth rates of some
key variables

Source(s): Author's calculation

Focusing on the role of intermediate goods specialization, the ARDL results (not reported) do not show any significant association of investment with IS-I or IS-II. In [Table 10](#), ARDL results also show investment is positively and significantly explained by employment when the latter is taken to be a standalone variable.

However, following the present paper's proposed modelling strategy ([Section 4](#) above), in which investment in cumulative causation should be guided by intermediate goods specializations conditioned by such employment opportunities, [Table 10\(a\)](#), ARDL results taking both employment and IS-I together show that both significantly and positively explain investment. Allowing for the fact that investment saw deceleration phases (and negative growth for the entire period), the constant term is negative and significant. However, if one plans for a mean value of zero for investment, [Table 10\(b\)](#), ARDL results (without a constant term) show only employment as the significant independent variable that explains investment.

Variable	Coefficient	Std. Error	<i>t</i> -statistic	Prob.
<i>Long-run coefficients</i>				
Employment	2.90	0.62	4.62	0.0009
C	–6.68	2.48	–2.69	0.0227
<i>(a)</i>				
IS-I	1.31	0.40	2.76	0.0279
Employment	6.54	1.29	5.04	0.0015
C	–21.59	5.29	–4.08	0.0047
<i>(b)</i>				
IS-I	–0.069	0.56	–1.24	0.2328
Employment	1.28	0.05	22.15	0.0000

Table 10.
Dependent variable:
Linvest

Source(s): Author's calculation

VAR Granger causality, taking employment, investment and IS-I (or IS-II), does not show any significant causality. However, if both IS-I and IS-II are taken together with investment, Table 11, results show IS-I significantly explains investment.

Similarly, underpinning the importance of intermediate goods specialization, even though the results for IS-II as an explanatory variable, explaining investment, are not significant, a focus can be on the explanation of IS-II, which can indicate increased export-orientation. In Table 12, ARDL results show that investment conditioning for IS-I positively and significantly influences IS-II. In this, the role of investment is also positive and significant.

Allowing for the importance of intermediate goods specialization both for investment and export-orientation, the results underpin why a slowdown in domestic intermediate goods specialization, which is matched by a slowdown in investment is a cause for concern. To put it another way, if Indian manufacturing investment behaviour does not show advanced domestic increasing returns and explain low employment outcomes, the results also show a policy focus on the revival of intermediate goods specialization can support a higher pace of investment (and export-orientation of domestic manufacturing) with the added advantage of ensuring good employment outcomes.

8. Concluding remarks

The present study highlights how Kaldor's manufacturing as an engine of growth thesis is still relevant if it is embedded in a cumulative causation framework and underpins demand and supply dynamics-led investment behaviour. Results show that (1) manufacturing significantly explains overall growth when conditioned by intermediate goods specialization and (2) there is a significant association between investment and employment when conditioned by intermediate goods specializations. Both would imply that a policy focus on intermediate goods specializations, which also support greater domestic manufacturing export-orientation, can support both a higher pace of investment and employment in manufacturing. Such manufacturing growth can also support and interact with service sector-dominated growth. Both also highlight how a slowdown in domestic intermediate goods specialization, matched by decreases in the pace of manufacturing investments, is germane to low employment outcomes.

To elaborate, it is true that the existing Indian literature (Kalirajan, 2004; Kathuria & Natarajan, 2013) shows that the absence of manufacturing as an engine of growth thesis in the Indian post-reform period should be attributed to the lack of the productivity growth argument. The present paper provides a different interpretation in which productivity growth is an outgrowth of the force of increasing returns in manufacturing that should be

Table 11.
VAR granger causality/Block Exogeneity Wald tests variables: investment (linvest), share of intermediate goods (IS-I) and manufacturing exports to import ratio (IS-II)

Excluded	Chi-sq	df	Prob.
<i>Dependent variable: D(LINVEST)</i>			
D(IS-I)	7.90	3	0.0480
Note(s): Other causality tests are insignificant			
Source(s): Author's calculation			

Table 12.
Dependent variable: IS-II

Variable	Coefficient	Std. Error	t-statistic	Prob.
<i>Long-run coefficients</i>				
IS-I	0.56	0.03	22.43	0.0000
Linvest	-0.22	0.07	-2.87	0.0455
C	1.38	0.37	3.68	0.0212
Source(s): Author's calculation				

paced by a growth in the share of intermediate goods specializations in manufacturing. This provides a greater scope for specialized employment in both manufacturing and services. The lack of employment outcome and manufacturing as an engine of growth should then be traced to decreases in intermediate goods specializations.

This understanding sheds new light on structural change dynamics. Even in service sector-led growth, the results show manufacturing growth, conditioned by intermediate goods specializations, positively and significantly explains overall growth and the coefficient is less than one. The current focus thereby highlights a mechanism in which intermediate goods specializations can support both higher investment and matching employment growth. Intermediate goods specialization also indicates a causality chain in which there is a symbiotic two-way causation between manufacturing and service sectors, and controlling for this, the causation runs from intermediate goods to manufacturing to overall growth, which is significant.

However, this role of manufacturing as an engine of growth needs caution when this is in the context of a decline in domestic specializations. The lack of a higher pace of advanced investments embedded in intermediate goods specializations could be a reason why robust manufacturing as an engine of growth, with manufacturing supporting advanced services, is missing in India. This lack of robust manufacturing or the decrease in domestic intermediate goods specializations can be the reasons for the possible low employment outcome in Indian structural change dynamics.

A policy focus, therefore, emerges that concerns the strengthening of the domestic intermediate goods specializations. The current market reform processes that strengthen public investment, especially with an infrastructure push, along with industrial policy reforms that permit greater freedom for firms to define themselves, expand, innovate, etc. through mergers or reliance on imported technology are important, but the conditions under which these can readily translate into domestic new specializations are important. As discussed earlier in [Section 3](#) above, if these are oriented towards the best adaptation to imports and this adaptation takes place in a static scale-based setting in which investments are savings-led, it can substitute domestic intermediate goods specialization. One implication is that, though the current paper does not explore the underlying mechanism, the imports of intermediate goods have induced new advanced services like marketing, trading, finance, transport, etc. This reinforcing of the service sector, which plays a crucial role in supporting adjustments' to imports of intermediate goods, and the resultant adjustments of employment and investments in manufacturing, however, substitutes related domestic tradable sectors of intermediate goods.

What is important in the current Keynesian focus is that imports and such transitions towards a new technical frontier can also create external economies and new domestic investment opportunities that can outpace savings (as in the Young-Kaldor cumulative causation). If so, the primary focus would be on a proper monetary policy environment that is more permissive towards such a domestic higher pace of investment, which can be crucial for the revival. Keynes's General Theoretic observations that "domestic expansions" can be negated by improper monetary policy still remain relevant.

Note

1. [Blecker and Setterfield \(2019\)](#), p. 414) note how the empirical relevance of this export-led short-run dynamics improves when the rate of change in productivity controls for investment and other variables that have an impact on productivity.

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