Global commodity chains and the development of employment nodes and corridors in western Melbourne

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Abstract
Cites in advanced economies have been transformed by the substitution of locally produced for imported goods supported by knowledge intensive logistics services. Using the framework largely provided by the Global Commodity Chain paradigm, this paper examines the formation of employment nodes in manufacturing and transport sectors in the Western Region of Melbourne and by analysing journey to work data of travel between the nodes, it seeks to measure the extent to which employment corridors have been formed to link these nodes. While the dynamics of the nodes provides evidence of the substitution of a buyer driven transport commodity chain for a producer driven manufacturing commodity chain, the analysis suggests that an employment corridor making use of the Western Ring Road has yet to form. In doing so it contributes to the definition of the concept of an employment corridor.

Keywords – regional economics, employment corridors, global commodity chains

Paper type – Academic Research Paper

1 Introduction
This paper examines the development of employment nodes in the manufacturing and transport sectors in the Western Region of Melbourne and the extent to which employment corridors have been formed to link these nodes. It uses the journey to work data to examine the origin and destination of travel between the nodes. Transport hubs have formed at the intersection of major freeway links and adjacent to the principal metropolitan air and sea port substituting for some of the activities performed by the manufacturing sector at these locations. In doing so it documents the manner in which a large region within a major Australian city has been transformed by the substitution of locally based manufacturing by globally produced imported products which form part of a global supply chain supported by knowledge intensive logistics services.

By a relatively small and narrowing margin, Melbourne is Australia’s second largest city behind Sydney. Although the similarities between the two cities are greater than their differences, historically Melbourne has been Australia’s major manufacturing centre. It is also situated at the head of a rich agricultural hinterland and together these factors help explain why the Port Melbourne is Australia’s largest container port with 38% of the
traffic and the Melbourne Airport handles 30% of Australia’s air freight. While both these key transport facilities lie just outside the boundaries of the Western Region of Melbourne, as they are usually drawn, their proximity has a major bearing on economic activities within the region. The Western Region has traditionally been Melbourne’s principal manufacturing region so the movement of goods to and from the ports has always been an important regional activity. However the historical radial road and rail transport network has been overlaid with a cross connecting freeway system that provides rapid circular access through the Region at a distance of about 15 kilometres from the CBD, linking the two ports by a fast urban freeway. As a consequence the region has become a favoured location for distribution centres operated by the major consumer product chains as well as the major transport companies.

A number of employment nodes in or directly contiguous with the Western Region have become established. There are three with concentrations of transport and storage jobs – the Port of Melbourne, Melbourne Airport, both just outside the Region, and a wholesale and distribution centre straddling the junction of the Princes Freeway and the Western Ring Road. This latter area is also the centre of a high concentration of manufacturing jobs, as is an area in Hume to the north and immediately adjacent to the Western Region. The freeway system links the various manufacturing and transport nodes described above. This paper discusses the extent to which a spatial labour market is being created in the form of an employment corridor associated with access to the employment nodes via the freeway system.

These nodes and their interconnections form a small part of a much larger global network of trade and information flows. Globalisation has impacted on the two sectors, manufacturing and transport differentially. Manufacturing in the region has been adversely affected by the integration of Australian production centres in the global pattern of manufacturing now dominated by China and other Asian countries. On the other hand employment in the transport sector has been the beneficiary, both of the substitution of domestically produced goods for imported and locally assembled final products, and the application of information technology to the control and monitoring of the movement of goods. These technical advances in logistics have encouraged the development of large-scale centralised distribution centres. This transformation then forms part of the rise of Melbourne as a knowledge city and its decline as Australia’s major manufacturing centre.

These trends are informed by two apparently competing paradigms seeking to analyse transnational spatial relations, global commodity chains global (GCCs) and the World City Network (WCN) (Derudder and Witlox 2010). The GCC (Gereffi and Korzeniewicz 1994) literature and related concepts of global value chains (GVCs) (Gereffi et al 2005) and Global Production Networks (GPNs) (Coe et al 2004) which analyse the production, distribution and consumption of material goods has the greatest application to this analysis of employment nodes and corridors. The distinction between production and buyer-driven commodity chains (Gereffi1994) is of particular importance. However the insights provided by the WCN (Taylor 2004) literature on advanced corporate services appear to be less relevant.

The separation between the material transfer of goods and the location of advanced producer services is addressed in the seminal paper by O’Connor (1989) which demonstrated that while Melbourne was the larger port, Sydney had the greater share of port and trade related advanced services. While this paper is now dated, according to Taylor et al (2009) Sydney is ranked in the top 6 ‘world cities’ indicating that Sydney has grown to be a significant world centre for advanced producer services while Melbourne is not ranked. Jacobs et al (2010) also rank Sydney highly as a centre of port related
advanced producer services, while Melbourne is unranked. In general, Jacobs et al (2010) finds that there is at best a weak relationship between the location of port related services and commodity flow patterns in ports. This suggests that technological developments in information transfer and logistics has further reduced the importance of co-location of port related services and physical port throughput.

A key question then is whether the growth and development of employment nodes in this region are essentially at the discretion of command and control decisions made by the advanced producer service (APS) organisations located in alpha cities as ranked by the World City Network or more a product of the physical characteristics and pricing of land and key infrastructure facilities. If the trends detected by the WCN (Taylor 2010) of the rising influence of Sydney a ‘world city’ and declining role of Melbourne, then the WCN analysis may be highly germane to the outcomes for the regional employment nodes and corridors examined in this paper, particularly if the operations of the firms managing the processes within the nodes fall increasingly under the direction of APS firms.

However such an analysis appears to be rather simplistic. The control of processes undertaken by enterprises within the nodes is highly complex. Controlling enterprises range from large TNCs headquartered in foreign countries, to local logistics and retail firms. For this analysis the GCC framework has valuable explanatory power. The GCC approach permits a focus on system wide, spatially separated networks of labour and production processes (Brown et al 2010) and the manner in which such processes are governed (Smith 2002).

2 Production nodes and commodity chains

Commodity chains are networks of labour and production processes that result in a finished product. These inter-organisational networks focus on global flows between nodes in a particular commodity (Smith et al. 2002). Commodity chains may be divided into those which are production and buyer driven, depending on their governance structures (Gereffi 1994). Production commodity chains tend to be controlled by global enterprises that make investment and production decisions based on such factors as labour and other production costs, local incentives and transport costs. A decision made to include or exclude a particular production plant from a global supply chain is likely to have major implications for the economic activities in a particular node. Motor vehicle manufacturers are a good example of such producer driven commodity chains. Decisions by headquarters to source a car or car components from a particular plant can have major implications, not only for that plant, but potentially, for the prospects of a range of suppliers forming part of the node.

Buyer-driven commodity chains are controlled by large retailers, brand-named merchandisers and trading companies. Such chains are part of commodity chains involved in the production and distribution of consumer goods, such as clothing and electronics. Buyer-driven commodity chains reflect the primacy of large retailers in driving down the cost of their purchased products by taking advantage of low cost contract manufacturing and/or substituting imported for domestically-produced goods. With the decline of domestic manufacturing in many Western countries, including Australia, as manufacturing has moved offshore to low wage countries, especially China, the rise of buyer driven commodity chains and the decline of production commodity chains is highly related. Goods which were previously domestically produced are now imported from low cost sources overseas through commodity chains governed by domestic retailers.

On a global scale, all of the city of Melbourne represents a single node in the global cities network or commodity chains. In fact of course it is a complex urban form with a
patchwork of industry sector specialisations. Some of its subregions have been the beneficiaries of globalisation and the adoption of new productivity raising technologies and others more the victim of a global economic transformation which has concentrated large scale manufacturing activity in rapidly expanding Asian economies, such as China, leading to a decline in the more marginal traditional manufacturing centres, such as Melbourne. While it is beyond the scope of this paper to discuss the development of Melbourne as a knowledge city in detail (see Yigitcanlar et al 2008), at the risk of some oversimplification, the subregion to the east of the CBD, with concentrations of high growth services, such professional, technical and scientific services, has benefited from globalisation, while the old manufacturing subregion to the west has suffered significant job losses, even while it has experienced rapid population growth.

This has prompted the state planning authority (DPCD 2008) to seek a better understanding of the location and development of employment in the region. The most recent metropolitan planning document for Melbourne, A Planning Update, Melbourne @ 5 million (DPCD 2008) advocated the formation of ‘employment corridors’ between nodes of economic activity. The remainder of this paper seeks to examine the formation of employment nodes and their interaction with spatial labour markets to better understand journey to work flows within this subregion of Melbourne to test whether employment corridors are being formed.

### 3 Employment nodes

In some industries jobs are clustered around particular nodes, reflecting the need for proximity of complementary firms, infrastructure or to benefit from other so-called Marshallian agglomeration economies. Particular labour markets cluster around these nodes (Amin and Thrift 1992).

The location of employment nodes for the transport and manufacturing sectors was estimated from ABS business establishment data available at a post code level. This used data about establishment by employment size to estimate the number of employees in each industry sector for each postcode in the Western Region and the Hume LGA immediately adjacent to the north of the Western Region.¹ The post code districts allowed finer grain analysis than ABS Statistical Local Area (SLAs)

Figures 1 and 2 shows respectively the distribution of manufacturing and transport jobs in the region. In manufacturing there are four concentrations – in the south converging on Laverton and Altona, to North around the Melbourne Airport and two areas to the east, Broadmeadows (north) and Coburg (south). The first three of these are linked by the Western Ring Road and are the focus of the subsequent analysis.

In Figure 2 two significant nodes are identifiable, each coinciding with two of the manufacturing nodes. One centred on Laverton in the south and the other coincident with the Melbourne Airport in the north.

The subsequent analysis is based on journey to work data which at its finest level of detail is available at the SLA level rather than post code district. The above analysis was used to select the relevant SLAs to form the boundaries of two nodes – one in the north, the other in the south.

¹ The Western Region of Melbourne is sub region defined by the local government areas of Moonee Valley, Maribyrnong, Hobsons Bay, Brimbank, Wyndham and Melton.
The 2006 Census journey to work (JTW) origin-destination pair permits the identification of the number of jobs by location and the residential origin of these workers. The following sections examine employment in the two sectors, Manufacturing and Transport & Storage.
and Transport and Storage. As discussed, these two sectors are illuminating because the first represents the employment structure of the West in its historical role of manufacturing hub, while the second describes the new, globally connected service jobs that have proliferated since the trade-exposed Australian economy shifted to importation of consumer goods.

These industries are clustered in locations that reflect the West’s industrial development. For the Transport sector, development at the northern end of the corridor centres on the Craigieburn SLA, which includes both the Melbourne Airport and the Hume Highway gateway to regional Victoria, and is host to 8000 jobs (see Table 1). In the southern node, over 9000 transport and storage jobs are found in the SLAs of Wyndham–North, Sunshine and Altona. The Port of Melbourne represents a further transport node linked somewhat indirectly to the southern node via the West Gate Freeway and more directly to the northern node via City Link. Unfortunately for analytical purposes, the Port sits in the ‘Melbourne–Remainder’ SLA, so transport jobs in the SLA are not only at the Port and adjacent Dynon Road Rail Terminal, but also scattered about the inner city. Nevertheless, the large majority would be Port related. The total number of transport and storage jobs in this SLA in 2006 was 5413.

<table>
<thead>
<tr>
<th>Table 1. Composition of transport nodes, 2006</th>
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<tbody>
<tr>
<td>LGA /SLAs</td>
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<tr>
<td>Sunshine–Altona–Wyndham North</td>
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As indicated in the analysis of post code districts, the manufacturing nodes are more dispersed. The northern cluster spans Craigieburn and Broadmeadows to provide 18,200 jobs, while the southern cluster adds Maribyrnong to three transport SLAs to provide almost 24,000 jobs as shown in Table 2.

<table>
<thead>
<tr>
<th>Table 2. Composition of manufacturing nodes, 2006</th>
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</thead>
<tbody>
<tr>
<td>LGA /SLAs</td>
</tr>
<tr>
<td>Sunshine, Altona, Wyndham and Maribyrnong (C)</td>
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</table>


The manufacturing node includes transport (car manufacturing), textiles clothing and footwear (TCF), food and chemicals. TCF jobs which are concentrated in Maribyrnong, for instance, more than halved in the period 2001 to 2006 with the continuing impact of tariff reductions. On the other hand, the more diversified manufacturing activities located in Sunshine, which include food, metals, plastics and chemicals, managed to hold employment levels relatively steady over the period 1996 to 2006. Nonetheless employment levels in the manufacturing node fell from 24,759 in 2001 to 23,468 in 2006. In contrast, employment in the transport and storage node grew by almost 60 per cent from 7516 in 2001 to 11,940 in 2006. To a large degree, the goods flowing through the buyer-driven commodity chains have displaced those previously produced domestically. There has been substitution of imported goods for a range of previously manufactured goods, particularly in the TCF sector (ABS 2007c).

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The significance of the employment nodes is the value added activity undertaken at each node. While there are no regional accounts available at the ‘node’ level, the trends in employment numbers is compounded by the trends in output per worker. While reliable data for regional productivity are not available, Figure 3 shows the trends in total factor productivity for manufacturing and transport for Australia. The productivity data, shown in Chart 4.1, indicates that while traditionally, transport jobs had low productivity compared with manufacturing jobs, this has changed with the progressive introduction of more sophisticated logistics technology. Transport companies, such as Linfox and Toll Holdings, both located in the region, have transformed themselves into full service logistics and distribution companies which include warehousing and inventory management as well as transport services. Accordingly, while the value of manufacturing conducted in the Western Region appears to be in long-term decline, not only are jobs in transport and storage increasing, but the industry is also experiencing above average productivity growth.

![Figure 3. Trends in labour productivity: manufacturing and transport and storage, Australia](source: ABS (2007c).

Labour productivity for transport and storage has increased at an annual average rate of 2.3 per cent per annum compared with manufacturing which has grown at 1.9 per cent per annum. Reflecting this trend, wages and salaries per employee for transport and storage ($54,900) has recently (2007/08) overtaken that for manufacturing ($53,300). Value added per employee however remains lower in transport and storage than manufacturing, $94,000 compared with $101,000.

If these national figures are reflected in activities undertaken in the employment nodes, then the decline in manufacturing is being largely offset in value added terms by the rise of the transport sector. However some of the increased productivity in the transport sector may be being captured by the logistics companies located in the cities with concentrations of APS discussed earlier rather those working in the physical distribution centres.
4 Evidence for the development of employment corridors

This section which provides a review of evidence of the spatial distribution of employment in Western Melbourne and its relationship to the Western Ring Road, aims to contribute to the definition of an employment corridor in Western Melbourne.

Melbourne’s urban planning framework Melbourne @ 5 Million defined an employment corridor as ‘A corridor that contains and links a number of large employment precincts’ in a way that ‘improve(s) accessibility to jobs and services and reduce(s) congestion on the transport network’ DPCD (2008).

In this vision, the corridor acts as a ‘connector’ linking workers’ homes to business sites with a view to reducing the time and costs of journey to work. Better transport links will increase the range of jobs available to residents of outer Western suburbs, presumably by extending the distance they are able to travel per unit of travel time. Corridors make labour markets larger and alter the ‘shape’ of labour markets. For example, the Western Ring Road greatly increases the distance a worker can travel in 30 minutes at peak hour. Importantly, the corridors will improve circumferential public and private transport networks, which will contribute to Melbourne @ 5 Million’s intended shift from a mono-centric to a poly-centric urban form.

However, Melbourne @ 5 Million expands from the idea of connection, to later view corridors as: producing agglomeration and generating employment; and that they will ‘provide for substantial increases in employment, housing, education and other opportunities along each corridor and better link them through improved transport connectivity’ DPCD (2008). This assumes that the existence of the transport link will precipitate a spurt in public and private investment along its route, and accordingly a shift in land use. By bringing more jobs closer to where people live, corridor-based development will improve access to employment, with clear social and environmental benefits. In essence, the idea of transport corridors aims to stimulate a range of employment opportunities along the corridor.

4.1 Transport and storage

For transport and storage, the southern node had more than one third of its jobs filled by residents (3199) and 25.6 per cent (2336) from other parts of the Western Region (see Table 3). However, the northern node, largely the Melbourne Airport, had a residential workforce of only 612 (7.6 per cent). Its links with the Western Region are extremely important, with about 28 per cent of its jobs (2240) being filled by Western Region residents. The Port’s links with the West are also important with 37 per cent of jobs (2005) filled by workers living in the Western Region. Most significantly, of these, 1351 came from Laverton, Keilor, Sunshine, Altona (four top SLAs) and Melton. Each of these SLAs has ready access to the Western Ring Road/Princes Freeway.

Table 3. Composition of transport nodes, 2006

<table>
<thead>
<tr>
<th>LGA/SLAs</th>
<th>Southern Node</th>
<th>Northern Node</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sunshine–Altona–Wyndham North</td>
<td>Craigieburn</td>
<td>Melbourne–Remainder</td>
</tr>
<tr>
<td>Jobs in node</td>
<td>9134</td>
<td>8005</td>
<td>5413</td>
</tr>
<tr>
<td>Workers from:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within node</td>
<td>3199 (35.0%)</td>
<td>612 (7.6%)</td>
<td>122 (2.3%)</td>
</tr>
<tr>
<td>Other WMR</td>
<td>2336 (25.6%)</td>
<td>2240 (28.0%)</td>
<td>2005 (37.0%)</td>
</tr>
<tr>
<td>Other places</td>
<td>3599 (39.4%)</td>
<td>5153 (64.4%)</td>
<td>3286 (60.7%)</td>
</tr>
</tbody>
</table>

As indicated in Figure 4, those working in the northern node from the Western Region come from nearby Moonee Valley (888), Keilor (557) and Melton (458). A small number (337) however originate in the Southern node. The northern node also relies on the surrounding areas of Sunbury (604), Whittlesea (390), Broadmeadows (452), Preston (160) and Moreland North (226) to provide 1832 (23 per cent) of its employees. For the southern node, residents from each of Moonee Valley (259), Maribyrnong (285), Melton (994) and Keilor (602) fill significant numbers of jobs with the Western Ring Road providing particularly good access.

![Figure 4. Transport 'employment corridor']

### 4.2 Manufacturing

As shown in Table 4, the southern node draws its workforce primarily from within its own boundaries (42 per cent) and other parts of the Western region (29 per cent). In contrast, the northern node draws only 23.9 per cent (4354) of its workers from within the node and a further 22 per cent (4080) of its workers from the Western Region, with Keilor providing 1036 and the southern node 1290.

<table>
<thead>
<tr>
<th></th>
<th>Southern Node</th>
<th>Northern Node</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LGA /SLAs</strong></td>
<td>Sunshine, Altona, Wyndham</td>
<td>Craigieburn and</td>
</tr>
<tr>
<td></td>
<td>North s and Maribyrnong (C)</td>
<td>Broadmeadows</td>
</tr>
<tr>
<td><strong>Jobs in node</strong></td>
<td>23,907</td>
<td>18,200</td>
</tr>
<tr>
<td><strong>Workers from:</strong></td>
<td><strong>Within node</strong> 10,060 (42.1%)</td>
<td>4354 (23.9%)</td>
</tr>
<tr>
<td></td>
<td>Other WMR 7016 (29.3%)</td>
<td>4080 (22.4%)</td>
</tr>
<tr>
<td></td>
<td>Other places 6831 (28.6%)</td>
<td>9766 (53.7%)</td>
</tr>
</tbody>
</table>

As shown in Figure 5, the northern node also draws workers from the surrounding areas, particularly Whittlesea (2622), but also Moreland (1409), Preston (752) and Sunbury (482). The southern node attracts workers from nearby areas in the Western Region, Melton with 2021 and Keilor 2336, providing the largest number of workers. Very few workers come from the Hume LGA (800), mostly from Craigieburn/Broadmeadows.

Figure 5. Manufacturing ‘employment corridor’

4.3 The Western Ring Road: an access link or employment corridor?

The evidence provided by the JTW data suggests that there are two very substantial nodes providing manufacturing and transport employment, and there is a significant amount of traffic between the two nodes. Both southern nodes draw a high proportion of their workers from within the node boundaries while both Northern nodes are more dependent on workers from nearby suburbs including a significant proportion from the Western Region. Around a quarter of the jobs in the two nodes are supplied by workers from areas for which the Ring Road provides particularly good access. There is no doubt that the spatial labour markets of the two nodes have been extended and travel times cut by the construction of the Ring Road. However, its development as an employment corridor requires more jobs to be created in the areas between the nodes to complement those already established at the nodes.

It is beyond the scope of this paper to establish existing links between the nodes and complementary businesses outside the node, however the number of jobs in transport and manufacturing in the SLAs adjoining the Ring Road provides an indicator of the ‘density’ of jobs in the corridor outside the nodes. These are shown in Table 3 below.

With the possible exception of Keilor, which is in fact a candidate for inclusion in the northern node, the number of jobs in these sectors in the areas between the two nodes is modest compared with the concentration of jobs in the nodes.
Table 5. Number of jobs in 3 western Melbourne LGAs, 2006

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing</th>
<th>Transport and storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moonee Valley</td>
<td>2112</td>
<td>1239</td>
</tr>
<tr>
<td>Melton</td>
<td>1167</td>
<td>1783</td>
</tr>
<tr>
<td>Keilor</td>
<td>3281</td>
<td>1459</td>
</tr>
</tbody>
</table>


4.4 Developing an employment corridor

Developing an employment corridor involves a variety of factors. One is the economic viability of the nodes. As has been discussed, these have formed partly for historical reasons, in the case particularly of the manufacturing nodes, and to take advantage of the transport infrastructure, principally the Port and Melbourne Airport.

Manufacturing developed initially in the West to take advantage of low cost land, proximity to the Port and a skilled labour force. These historical reasons suggest that there is a level of lock in and its future development is path dependant. It is likely to be capable of evolutionary adaptation but not radical change. It has adapted to the withdrawal of industry protection policies. Surviving textile firms have changed their product mix and the motor industry is adopting more fuel efficient technologies with incentives from the Federal government. Given the national decline in manufacturing, employment levels in nodes, while declining, have proved reasonably resilient. However, it is unlikely that manufacturing will be the driver of the future development of an employment corridor unless the economics of world trade changes, such as if the cost of moving goods were to increase substantially in a carbon constrained environment.

The transport and storage nodes have experienced rapid growth, taking advantage of the forces that have adversely affected local manufacturing. With the expansion in traded goods, transport, logistics and distribution firms have benefited from cheap land available close to the key transport infrastructure of the West. The nodes have taken on a metropolitan, wider regional and national role as goods entering and departing the country, through both the airport and seaport, are sourced and distributed nationally. While the volume of trade declined during the GFC, the drivers of global trade in goods are re-emerging. This should mean that transport and distribution jobs in the nodes will continue to increase.

The nature of jobs in the sector is, however, undergoing significant change as logistics services come to dominate simple road and rail transport solutions. Logistics management is:

... part of supply chain management which plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers’ requirements. (Council of Supply Chain Management Professionals)

Thus, those providing these knowledge intensive services are highly skilled, applying ICT to management of supply chains. The development of the transport and distribution nodes is a direct result of the rise of the global knowledge economy.

5 Conclusion

This paper has set out to examine the development of the nodes of two global commodity chains, one in transport and storage and the other in manufacturing. The
manufacturing node is stagnating perhaps declining as manufacturing becomes increasingly centralised elsewhere. It is part of a producer driven commodity chain to the extent that production decisions by TCNs and large local companies to source their products from other nodes in the global commodity chains have a negative impact on those in the Western Region of Melbourne. The decision of local manufacturers and large retail firms to source product for local consumption from overseas has however led to the establishment of large distribution centres at transport nodes. These nodes are part of buyer driven commodity chains and their activity levels reflect logistic decisions made by large consumer goods distributors and freight forwarders. Thus while both sectors are concerned with the supply of goods to market, the knowledge-intensive, logistics-driven transport and storage sector has gained at the expense of manufacturing.

The development of hoped for employment corridors between the nodes of concentrated activity appears not to have occurred, although further research would be required to establish possible links between firms located in the nodes and those along the transport corridor. There is an overall objective of increasing service sector jobs associated with the growth in transport and warehousing activity. That this has been slow to emerge may be explained by the separation between trade related services and the physical movement of goods enabled by the new technologies noted earlier in the paper. Advances in remote goods tracking and similar technologies reduce the requirement for co-location of trade related services with warehousing and distribution.

References


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