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**GLOBALISATION,
DEVELOPMENTS AND TRENDS IN
THE NEW INTERNATIONAL
DIVISION OF LABOUR**

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GLOBALIZATION, DEVELOPMENTS AND TRENDS IN THE CHANGING NEW INTERNATIONAL DIVISION OF LABOUR*

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Abstract

The purpose of this paper is to analyse the major changes in the patterns of the New International Division of Labour that have occurred during the past two decades.

The paper takes as its starting point the seminal study of Frobel (1980) and his colleagues.

The paper identifies three categories of changes to the NIDL: the changing spatial patterns of the division of labour over the past two decades, changes to the nature of the production patterns of Transnational Corporations and changes to the location and nature of NIDL labour processes. The paper examines how the concepts of 'core' and 'periphery' can also be applied within specific global industries. The paper seeks to identify some of the effects of these changing patterns upon the working lives of 'workers in an integrating world' (World Bank, 1995).

The paper finds both that Frobel's work is deficient in certain respects, and that aspects of the work are still relevant today.

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I. Introduction

I.1. Context of paper

The International Division of Labour (IDL) forms one of the four dimensions in Giddens' model of globalization. All four dimensions of globalization in the model are facilitated by 'global networks of information exchange'. The elements of the IDL in Giddens' model are industry, production, jobs and skills, and technology, and these constantly interact with the other dimensions of globalization: the world capitalist economy, the nation state system and the world military order. (Giddens, 1990). Thus, the IDL is both a condition and a process, and the above analysis provides an apt overview of the subject of this paper.

The International Division of Labour is the one dynamic of the complex process of globalization that is most deeply affecting the employment relationship. There is no doubt that with globalization comes what Campbell et al call 'the rising phenomenon of labour market interdependence' (Campbell, 1997, p. 10). Labour, carried along in a world of diminishing barriers to trade and capital flows, is increasingly being transformed from a local into a global resource. The most significant attempt in the past two decades to analyse what is happening to the labour force in the face of this transformation has been the research of Frobel *et al* (1980), whose thesis renames the phenomenon of the IDL in a globalizing economy the *New International Division of Labour* (NIDL). Amongst the debates around the impact of the NIDL, two categories seem of major importance: they concern issues of social consequences and issues of business strategy.

(a) *Social Consequences*: The debates centring on social issues have an underlying moral basis, concerning social inequalities between the developed and the developing nations in terms of employment opportunities for labour, the number and type of jobs, wages, and the whole range of worker rights to levels of security and conditions (Allen and Hamnett, 1995). That we live now in a world where trade-offs occur between the employment situations of one country and another is also beyond dispute. But what is the nature and extent of these trade-offs? Campbell (1997) claims: 'Employment loss and employment gain must increasingly be understood in a framework of cross-national interdependence'; the problem is to ascertain whose is the loss, and whose is the gain.

(b) *Business Strategy*: The debates also centre on issues of strategic motivation. While research indicates that the motivation of Transnational Corporations (TNCs) for utilising the global labour market is to achieve dual strategic aims: both expansion into new markets as well as low labour costs (Radice, 1995, Viatsos, 1989, Henderson, 1997, Campbell, 1997), the balance between these aims is not so clear.

The context of the NIDL is taken as the global capitalist economic system. Labour processes are embedded in the dynamics of global capitalist trade and manufacturing:

'The New International Division of Labour is structurally incorporated into the global capitalist system ... NIDL theory

addresses ...the nature, distribution and interrelationship of labour processes across the globe'
(Henderson, 1986, p. 86)

I.2. Aims of Paper

The purpose of this paper is to examine the current state of the changing NIDL, within the context above.

After first revisiting Frobel's concept of the NIDL, I identify four categories of change in the pattern of the NIDL that have taken place over the past two decades. The relevance of Frobel's (1980) research is assessed at each stage.

- I) *Changes to the spatial dimensions of the NIDL*
Shifts in the nature and extent of the 'core' and the 'periphery' in the NIDL.
- II) *Changes to production networks and the emergence of commodity chains affecting the NIDL*
Alterations to the NIDL by multinational producers and buyers driving new production networks and commodity production chains
- III) *Changes to the nature of the labour processes* (a) in the type of divided labour processes and b) in the nature of the work and organizational processes
- IV) *Changes caused by the actions of Nation States affecting the NIDL*

The importance of Nation States in transforming the conditions and status of labour in the former periphery

II. Frobel's Concept of the NIDL

Ten years before Giddens refined his model of Globalization and the role of the IDL within it, Frobel and his colleagues (Frobel, Folker, Heinrichs, Jurgen, and Kreye, Otto, 1980) published their research study into changes in the use of labour in the manufacturing process. This seminal work is an attempt to identify the changes being wrought upon the IDL as globalisation of production increases. Frobel's thesis is in two parts. The first part states that as the division of labour becomes global it divides the labour force into core and periphery .The second part states that as manufacturing centres are located in the periphery, so jobs are lost in the core.

II.1. Part One

Frobel argues that the driving force of the division of labour into two economic zones of 'core' and 'periphery' is global capitalism, as enacted through the strategies of some of the main actors in the globalization process, Transnational (or Multinational, as they were generally termed in the 1970s) corporations. The 'core' is situated in the first zone of the advanced industrial states. The 'periphery' is situated in the second zone of the developing countries. Transnational companies whose headquarters are based in the core states are utilising increasingly accessible labour

from the peripheral states as part of the growing phenomenon of sourcing labour from a global base. The reason this is happening is that globalisation provides an opportunity for international capitalists, through their Transnational Corporations (TNCs), to maximise profits through the use of low cost, low- skilled labour. Frobel argues that an increasing polarisation of the core and the periphery results from this use of labour. In detailed studies of the Federal German Textile and Garment industries, the researchers show how skilled and technologically advanced processes are being retained in the core economies, while deskilled and labour intensive processes are being located in the periphery. TNCs are engaged in an organisational and spatial separation of labour processes across the globe, aided by the provision of incentives from International Agencies (UNIDO, The World Bank), and Nation States from the ‘periphery’ eager to attract investment. The researchers provide much evidence of this latter phenomenon in their examination of the operation of Export Processing Zones (‘Free Production Zones’: Frobel, 1980, pp. 295-392; note 2, Section V.2. of this paper).

The second part of Frobel’s thesis is a consequence of the first.

II.2. Part Two

The results of this core/periphery division of labour are the reduction of manual employment opportunities and rising unemployment in the ‘core’ areas, with depressed working conditions and further deskilling in the ‘periphery’.

The paper addresses the first part of Frobel's thesis. It focuses on the changing patterns of the NIDL itself, rather than the consequences for employment in the core states of the 'developed' world.

III. Changes to the Spatial Dimension of the NIDL: New Pattern Spatial Divisions of Labour

Frobel *et al* identify three preconditions for their NIDL model, all of which stem from what we would now term the globalisation process. (Frobel, 1980, p.13)

Firstly, they point to the 'practically inexhaustible reservoir of (cheap) disposable labour...in the developing countries'. Secondly, they point to the advanced division and subdivision of the production process, which forms tasks so fragmented that they can be easily learnt and performed with minimal levels of skill and training. Thirdly, they point to the facilitation of the NIDL by developments in transport and communication systems. These 'space shrinking' and technologically advanced systems facilitate the increasing independence of manufacturing sites from their geographically distant origins. (Mittleman, 1995) Global space is important to Frobel's concept of the NIDL and in Frobel's analysis, the three preconditions lead to a NIDL taking place in a globe divided in two: the developed and the developing nations. This allows Frobel to expand on his thesis that the social relations of global production hinge upon exploitation. Massey points out that 'different regions have allotted to them, in different spatial structures, particular bundles of functions within

the overall relations of production...and this in turn means that the geography of dominance and subordination can take many forms.’ (Massey and Jess, 1995, Massey, 1995, p. 96). In Froebel’s thesis, dominance is seen in the developed nations, subordination in the developing nations. The dominance is perpetuated through a compound of the ‘global factory’ and the ‘wage costs’ hypotheses. ‘The NIDL tendency is a deskilling strategy whereby productivity is enhanced by annexing workers to a single operation; labour control is maintained by fragmenting workers’ skills; and wage costs are reduced by replacing skilled with simple labour’ (Child Hill, 1987, p. 23).

‘World market orientated industrialisation, as a process of dependent development, intensifies the structural dependence of economic reproduction as a whole...’ (Froebel, 1980, p. 383)

‘What is produced and how it is to be produced are decisions which are subordinated to the profit maximising calculus and strategies of foreign companies...’

(Ibid, p. 383)

However, subsequent research has modified Froebel’s simplistic spatial categories: ‘How poorly the NIDL thesis captures the complexities of transnational collaborations and rivalry in a world of competing States’ (Child Hill, 1987)

New spatial global divisions of labour are emerging, driven by changing markets and the transfer of technology. I shall term these new formations *new pattern spatial divisions of labour*.

The new pattern spatial divisions include macro-regions larger than individual Nation States, which constitute new loose spatial units. The EU, NAFTA, and the Asia Pacific are three examples of these macro regions, each containing a Division of Labour with its own new 'core' and 'periphery' areas. (Mittleman, 1994, p. 430; Child Hill, 1987, p. 25; Mody, 1989; Applebaum and Henderson, 1982; Henderson and Castells, 1987, Henderson, 1986, 1989, 1997; Campbell *et al* 1997)

The research reveals four key perspectives on new spatial pattern divisions of the NIDL; (i) a broad categorisation of the spatial divisions of the NIDL into three axes; (ii) Changes to the spatial dimension through the creation of production chains; (iii) Changes fuelled by particular industries (iv) Changes specific to the ESEA region of the globe.

III.1. The Three Axes of the NIDL

Mittleman (1994) differentiates what he calls *three axes* where the NIDL is occurring simultaneously and in different ways across the globe.

They are:

- a) The Asia -Pacific Axis
- b) Europe and the ex-Socialist Countries
- c) North America and Mexico and the Caribbean

These spatial divisions are 'tethered ... to global structures'. At one and the same time the new structures 'form patterns of inner globalization and outer globalization' (p. 280). The three regions form 'mega Markets'.

They generate 77 percent of world exports and produce 62 percent of world manufacturing output.

Europe and the ex-Socialist Countries

The transition from a Soviet-type socialism to a capitalist, free market economy in the States of Eastern Europe and the former Soviet Union has transformed the spatial pattern of the NIDL within this geographical region. As these States struggle with the economic hardships and unemployment brought on by the transition from centrally planned economies to free market, TNCs, encouraged by former communist states desperate for foreign investment, are availing themselves of both unskilled and skilled labour in a mirror image of the NIDL patterns between the advanced industrial states and the developing world. Although the extent of FDI is difficult to measure, there is no doubt that use of manufacturing labour as well as services is growing substantially

Africa and the New NIDL

Africa is notably absent from Mittleman's three axes, but he makes reference to Africa as 'marginalized and poverty doubling' (p. 441) In a study of Africa's position within the NIDL, Shaw (1990) finds the continent operating on the outer margins of the core/periphery axes: 'In most factors identified as central to the new division of labour, Africa, in terms of debt, industry, services, technology etc., tends to be the least ... involved continent'. Foreign capital flows to Africa have declined, from an already low base. Recent developments within the NIDL - dealt with later

in this paper - have acted to reduce demands for African minerals and markets, and MNCs have withdrawn or changed the pattern of their investments. The OECD does not categorise any African countries amongst the Newly Industrialising Countries (NICs). Those States categorised as such include certain European States, the diversifying Latin American economies and the export-led South-East Asian economies - Brazil, Greece, Hong Kong, Mexico, Portugal, Singapore, South Korea, Spain, and Taiwan. Africa's place within the NIDL is in the outer periphery: the 'Fourth World' (Shaw, 1990). Changes within the NIDL under globalization are largely the product of 'a new tripartite collaboration amongst international financial capital, multinational corporations and the State in the South', and Africa has been excluded from integration into 'this emerging network of production relations' that has caused rapid growth in Third World States. Along with developing countries on the outer periphery, Africa remains largely dependent on agriculture, with a relatively stagnant growth rate. 'Africa ... performs its traditional (neo-colonial) role as a supplier of primary goods and as a market for industrial products' (Shaw, 1990). Labour has thus remained primarily agricultural, albeit at a turning point and open to a number of development prospects.

III.2. Production Chains and Spatial Distribution of the NIDL

The impact of globalized production incorporating buyer- led and producer- led production chains upon the division of labour is, according to Gereffi, to create distinct new pattern spatial divisions of labour,

differentiated by varying levels of development amongst the countries (Gereffi, 1994b).

Gereffi's analysis of radically altered patterns of world trade and manufacture affecting the NIDL will be dealt with in more detail in section IV of this paper. However, it is important to note here his findings concerning the changing spatial dimensions of developing industrial patterns of third World countries relative to core nations. As core economies shift predominantly towards services, vigorous industrialization has become the hallmark of the periphery. More manufacturing is being done in the periphery than the core, 'By 1990, the industrial sector in East and South East Asia averaged 45 percent of their GDP, and manufacturing averaged 34 percent'. Between 1965 and 1990, manufacturing increased its share of GDP in East and South East Asia by 10 percentage points, compared to net sectoral growth rates of 4 percent in sub Saharan Africa and 2 percent in South Asia and Latin America (World Bank, 1992:222-3, quoted in Gereffi, 1994b, p. 212).

III.3. Industry Specific Research and Spatial Distribution

The development of the electronics industry in East Asia illustrates the way particular industries can themselves modify the NIDL from a simple core/periphery model into a more complex spatial distribution (Henderson, 1986, 1989, 1997, Castells and Henderson, 1987). Henderson's research has uncovered 'a number of related divisions of labour'. He groups seventeen national economies heavily involved in the electronics industry into six 'economic and spatial concentrations of electronics production'.

- (a) Group One: the technological and productive giants - The USA and Japan;
- (b) Group Two: the European Industrial economies - Germany, France, Britain, Italy, Netherlands, and Switzerland
- (c) Group Three: The East Asian newly industrializing economies (NIEs): Korea, Taiwan, Singapore and Hong Kong
- (d) Group Four: The Southeast Asian near-NIEs
- (e) Group Five: The Latin American NIEs - principally Brazil; and
- (f) Group Six: China. (Henderson, 1997, p.95)

Although the global electronics industry involves seventeen national economies, ‘within these economic and spatial concentrations of electronics production there exist substantial variations’.

Further examples of examinations of industry specific effects on the NIDL are the automobile industry (Section V.3 of this paper) and the garment industry (Sections IV and V.2. of this paper).

III.4. The Three Tiers of East and South East Asia

Campbell *et al* (1997) group the ESEA (East and South East Asia) new pattern spatial configuration together into three tiers, reflecting a process of ‘considerable industrial dynamism during the past two decades’. Tier one includes Japan; the four Asian Newly Industrialising Economies (NIEs) (Hong Kong, Republic of Korea, Singapore and Taiwan); Tier Two: the ASEAN-4 (Indonesia, Malaysia, the Philippines and Thailand);

Tier Three: mainland China and Tier Four: the newly emerging 'layer' of countries such as Vietnam, Laos and Cambodia.

Together, they comprise a new spatial area of rapidly growing intra-regional trade, with its own relationships in the NIDL (Campbell, 1997). The importance of mainland China as a new 'periphery' in the NIDL is illustrated by Wu's (1999) study of Special Economic Zones (SEZs) in mainland China (Section V.2. of this paper). The new pattern spatial division of labour within the ESEA area was created partly by the expansion of Japanese multinationals locating production facilities for semi-conductors and other components in East Asian States such as Taiwan, Korea, Singapore, Malaysia and Thailand. As Korean industries have developed, they too have altered the division between core and periphery. For example, Samsung and Goldstar manufacture in Thailand, Indonesia, the Philippines, China and Mexico (Mody, 1987, Henderson, 1997, quoting Bloom, 1992). Employment in electronics manufacturing industries in Hong Kong has seen a substantial fall, with 1985 figures of 135,000 jobs falling to 85,000 in 1990. As home labour costs have risen, Hong Kong's manufacturers have relocated 3,000 jobs to Guandong Province in mainland China (Henderson, 1997).

The transfer of technology to the peripheries is uneven and limited, and they continue to receive investment for assembly operations, so the ESEA States now exhibit two distinct spatial forms of the NIDL. Alongside the development of their own technologically advanced indigenous industries, companies in Hong Kong, Korea and Taiwan still operate as sub-contracted manufacturers and final assemblers for foreign-owned TNCs, particularly Japanese, US or European firms in the buyer-led commodity

chain pattern. The growth triangle promoted by Singapore gives local firms access to cheap labour in Malaysia and Indonesia: 'The export of capital to cheap labour sites is seen by the government as preferable to importing non-Chinese labour into Singapore' (Henderson, 1997, p. 110). Henderson (1997, p. 106) cites 1989 figures of 43 percent of Taiwanese production being for buyers such as IBM., Philips, NEC, EPSON, Hewlett Packard and NCR. Similar examples can be found for Korean and Hong Kong firms. The peripheral economies in East Asia have become the production end of the buyer- driven commodity chains fronted by Japanese TNCs and receive 'massive in-flows of investment by Japanese semiconductor and consumer electronics companies', as well as 70 percent of Japanese production facilities for semiconductors and other components (Henderson, 1997, p. 99). It is possible to argue that just-in-time (JIT) and lean, total quality production systems have contributed to the need for this development (Section V.3 of this paper).

IV. Changes to Market Networks and Commodity Chains Affecting the NIDL

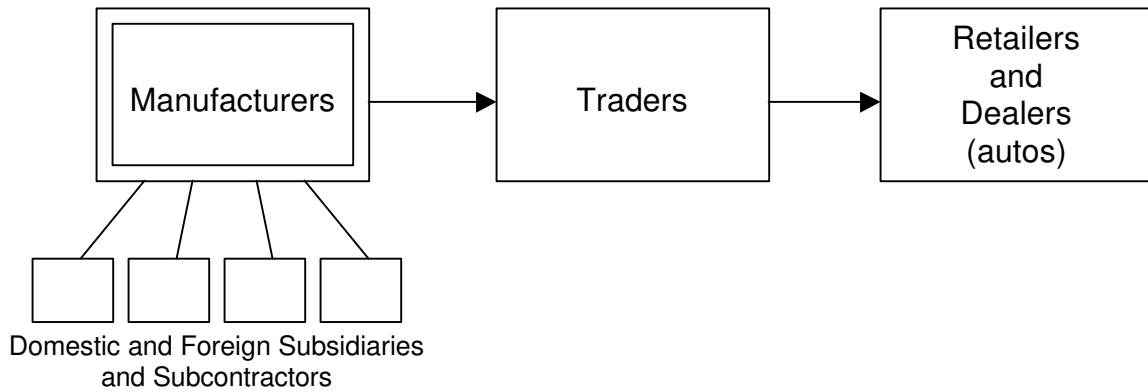
IV.1. Global Commodity Chains

Research into global commodity chains provides a new framework for the analysis of the changing spatial distributions of the NIDL (Gereffi and Korzeniewicz, 1994, Gereffi,1994 a,b,.1997, Korzeniewicz and Martin,1994, Hopkins and Wallerstein,1994, Henderson,1997, Mitter,1994)

Figure 1 The Organisation of Producer-Driven and Buyer-Driven Global Commodity Chains

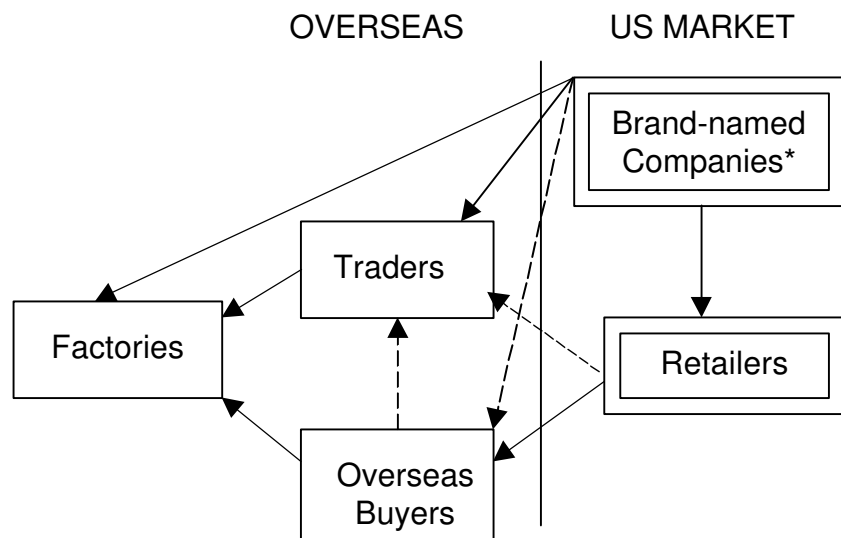
1. Producer-Driven Commodity Chains

(Industries such as automobiles, computers, aircraft and electrical machinery)



2. Buyer-Driven Commodity Chains

(Industries such as garments, footwear, toys and housewares)



* These design-orientated, national brand companies, such as Nike, Reebok, Liz Clairborne and Mattel Toys, typically own no factories. Some, like The Gap and The Limited, have their own retail outlets that only sell private label products.

Note: Solid arrows are primary relationships; dashed arrows are secondary relationships.

Source: Gereffi, 1994, b.

Workers who are not nominally integral employees of TNCs become, by default, part of the empire of these companies, and part of the NIDL. Employees of small or medium sized enterprises which were, two decades or so previously, independent operators within their own nation states, can now be located on the periphery of TNCs, and their labour forces become peripheral labour forces.

'Some Small and Medium sized enterprises (SMEs) are incorporated into either producer-driven global networks, in which large SMEs centrally organize production by subcontracting components manufacture across the globe (as in automobiles) or buyer-driven global networks (as with Nike, Benetton)' which lock SMEs into global production networks, establishing co-operative ventures and market niches, with cross-border networking between the SMEs themselves'

(Held *et al*, 1999: quoting Gereffi, 1994, p. 97; Castells, 1996, p. 160; O'Doherty, 1995).

Held *et al* note that some researchers hold these commodity chains to be a new mode of capitalist production (Castells, 1996 and Gray, 1998) whilst others argue *plus ca change* (Lash and Urry, 1994).

Gereffi's work puts an original light upon the division of labour under globalization. He identifies three specific trends in the global manufacturing system, globally organized by 'core corporations that represent both industrial and commercial capital': (Gereffi, 1997, p. 43),

- (a) 'the spread of diversified industrialization to large segments of the Third World
- (b) the shift toward export-orientated development strategies in peripheral nations , with an emphasis on manufactured exports
- (c) high levels of product specialization in the export profiles of most Third World countries, along with continual upgrading by established exporters among the newly industrialized countries (NICs).'

The global sourcing system of networking with sub-contractors at the end of buyer-led commodity chains has led to a hidden and increasing 'peripheral' flexible labour force of unskilled men and women. They are a new aspect of the NIDL connected with changing work practices by the TNCs, who provide the markets, materials and know-how, but rely on sub-contractors to employ labour to process their orders.

Each of these trends takes place within the world economy, which Gereffi characterises as a 'global factory', in which the production of a single good commonly spans several countries, with each nation performing tasks in which it has a cost advantage.

In Europe, the former Communist States provide a new source for low cost labour and the location of subsidiaries to service firms' global production and marketing networks. Wages are a fraction of those in Western Europe. Clothing and footwear, consumer durables, furniture and electronics assembly are part of both buyer-driven and producer-driven commodity chains, with both TNC owned subsidiary factories and 'extensive continuing forms of contract production' (Radice, 1995).

IV.2. Buyer-Driven Commodity Chains

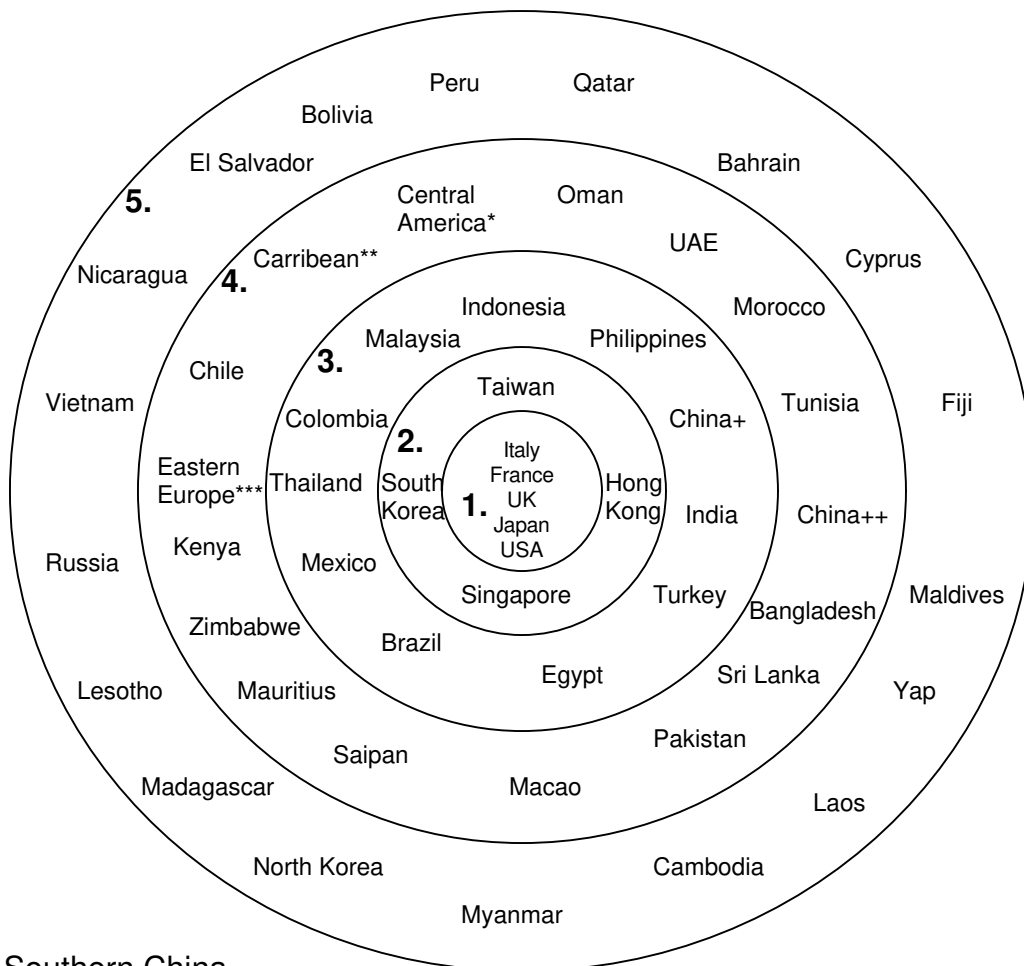
In the case of *buyer-driven commodity chains*, the buyer firm is a hollow company which ‘often has no ‘in-house’ manufacturing capability’, and relies solely on overseas factories that are contractually tied to the parent TNC, manufacturing goods to their exact specification. Buyer driven commodity chains ‘characterise many light consumer goods industries, such as garments, footwear, and toys’, and tend to be labour intensive at the manufacturing end of the chain (Gereffi, 1994b). Independent Third World factories make finished goods to the exact specification of the buyers and branded companies that design the goods, such as Nike, Reebok, L.A. Gear, The Limited, and Gap. According to Gereffi, the bulk of contract manufacturing factories acting for US retailers are East Asian, and locally owned - from huge plants in South Korea to small family firms in Taiwan and Hong Kong.

At the other, consumer face end, huge sums of money are invested in design, advertising and marketing. In the middle of the chain, trading companies, branded merchandisers, retail chains, or their agents, distribute the output of the factories from local firms abroad. ‘This is the major export niche filled by East Asian NICs in the world economy’ (Gereffi, 1994b). At the production end, the labour force provides the goods as cheaply and efficiently as possible.

Buyer-driven commodity chains extend under OEM arrangements from Japanese, US and EU TNCs to Korea, Taiwan, and Hong Kong and to the further peripheral labour forces of China and Vietnam (Henderson, 1997).

Gereffi has extensively mapped garment industry Global commodity chains, (see Figure 2). In Figure 2, the concentric circles reflect the new spatial divisions of the NIDL, with core states nearer to the centre, and increasingly peripheral states towards the outer circumference.

**Figure 2 The New Industrial Division of Labour:
Core and Periphery States in the Global Garment Industry**



- + Southern China
- ++ Interior Provinces of China
- * Guatemala, Honduras, Costa Rica
- ** Dominican Republic, Jamaica, Haiti
- *** Poland, Hungary, Czechoslovakia, Bulgaria

Source: Gereffi, 1994,b.

In the 1970s, when Froebel *et al* conducted their research, the trend was for TNCs to locate labour intensive aspects of production in ‘electronics, footwear and garment production in low-wage countries that had a virtually inexhaustible supply of cheap female labour’ (Mitter, 1994, p. 20). The mode of setting up branches or subsidiaries in the developing world changed ‘perceptibly’ in the 1980s. As TNCs increasingly began to employ a global model of ‘the flexible firm’ to source labour for their production operations, the outer tiers of flexible workers were no longer the employees of the TNC subsidiary itself, but became the employees of sub-contractors located in the peripheral and ‘new core’ states in the globe who supplied specialised work when demand was high.

Mitter’s research into the garment industry in Mexico and India where the subprocesses of garment manufacture are handed out to smaller subcontractors or outworkers shows the burgeoning of mini ‘cores’ and peripheries’ at the level of the industry and the level of the firm. In India, the garment industry operates with a tiered system of labour. The limited number of ‘core’ workers employed in sub-contracted local firms are mainly male skilled tailors and cutters, but the majority of workers supplying the elements of garments for assembly to these core workers are unskilled women and men machinists who stitch parts of garments at home (Mitter, p. 19, Elson, 1994, p. 205). Homeworkers provide the bulk of labour inputs into the clothing, footwear and shrimp-processing industries in Mexico and India. These casual workers are at the end of a series of buyer-driven commodity chains, joint ventures set up by foreign companies with local businessmen. The process of separating workers at the lower end of the commodity chain from the employment and

responsibility of the TNC which uses their labour has the effect of shifting demand management costs to subcontractors (Ozawa, 1991, Section V.3 of this paper).

IV.3. Producer Driven Commodity Chains

Producer driven commodity chains, on the other hand, are largely controlled and owned by the TNCs themselves, with only components being sub-contracted. Because they constitute capital and technology intensive industries such as automobiles, computers, aircraft, and electrical machinery, the TNC itself needs to carefully control the production system and quality of the outputs. Thus it is in these industries that we see the skill enhancement of the labour force having a major impact on the NIDL. This process takes place either through the parent TNC organizing and financing training, or through the State investing in educating and training a potential high tech labour force to attract inward investment, as in the case of Singapore (Section VI of this paper).

Henderson (1997) has found that within the electronics industry in the Southeast Asian subregion of the NIDL, networks of TNC subcontractors cluster around Taiwan, Hong Kong and Singapore, with a selection of US (such as Harris Semiconductor) and Japanese owned electronics companies sourcing a wide variety of machinery, components and cables from locally-owned Malaysian companies.

Gereffi conceives a hierarchy of labour through the commodity chains - with those states supplying mainly buyer-driven commodity chain labour

still in the various spatial peripheries of the globe, and those states at the heart of producer-driven commodity chains enhancing their wealth and opportunities for their labour force in the global order. He concludes states have, and will move up in the global order of the NIDL as they design their economies to foster and attract skilled labour processes: 'Manufacturers making advanced products like aircraft, automobile and computer systems are the key economic agents...not only in terms of their earnings, but also in their ability to exert control over backward linkages with raw material and component suppliers, as well as forward linkages into retailing' (Gereffi, 1994b, p. 219). Technologically advanced states house workers who are the new aristocrats of labour within the global NIDL.

In the European/former communist states axis of the NIDL, TNCs are using subsidiaries for low cost manufacturing as 'a natural extension of their global production and marketing networks' (Radice, 1995).

V. Changes to the Nature of the Labour Processes Depicted in Frobel's Model

The framework of commodity chains not only increases understanding of changing spatial patterns in the NIDL, but also indicates how the activities of TNCs employing different patterns in the global sourcing of their labour are increasing the complexity of labour processes within the NIDL. I now propose to examine these changing labour processes in greater detail.

Between 1970 and 1990, the share of manufactures in developing countries' exports tripled, from 20 percent to 60 percent (World Bank, 1995). Frobel's 1980 research showed that the bulk of manufactures from the assembly factories of the Third World and the textile and garment industry consisted of the products of low or unskilled labour. However, it is possible to identify three types of change that have altered this pattern in the past two decades. These are:

- i. 'Brain Labour' has been added to the NIDL
- ii. Changes have taken place in the nature and extent of low-cost, low-skilled labour within the NIDL
- iii. New organisational structures and working practices are emerging-characterised by the terms 'flexibility', or change from Fordist to post-Fordist production

V.1. 'Brain Labour': Research and Development Workers; Scientists, Engineers, Research Technologists

That there is a move by TNCs to resource skilled labour from the developing countries is now beyond dispute. The World Bank, reviewing the developing countries' share of the skilled work force between 1970 and 1992 found that while the low- and middle- income countries' total share of the workforce only rose from 79 percent to 83 percent, their share of the world's skilled workforce jumped from a third to nearly a half (World Bank, 1995).

This trend has been linked to the realisation by companies in global competition that the knowledge base in most dynamic industries sets the competitive edge of corporations (Mytelka, 1987).

The emergence of technological advances within the service sector has led to the incorporation of hardware use in telecommunications, banking, transportation, and health services (Viatsos, 1989). Simultaneously, global telecommunications make it possible to source labour to operate these advances from across the globe. (Henderson, 1986, 1989, 1997, Child Hill, 1987; Gereffi 1994 a, b; Viatos, 1989) Skilled labour is resourced from Eastern Europe, staffing ventures in banking, insurance, advertising, retailing and air transport (Radice, 1995).

The pace of rapid technological change means that firms now need to keep up with changing consumer tastes and be in a position to shape future markets. Thus firms need strategies 'to cope with the rising costs, risks, and uncertainties of knowledge production' (Mytelka, 1987, p 68). The strategies they have developed impinge directly on the pattern of the NIDL in two ways: first by firms setting up knowledge units overseas, exporting Research and Development (R & D) processes to labour in peripheral countries, and second, by forming joint ventures and mergers, acquisitions and alliances (Mody, 1989).

a) *Research and Development:*

In the first strategy, firms have relocated knowledge production to autonomous development units within the firm - 'to the firm's overseas research laboratories or through the use of world product mandates to selected foreign subsidiaries' (Mytelka, 1987, Henderson, 1989, 1997, Viatsos, 1989, Mody, 1989). TNCs spread the costs and risks of response and R & D to host governments 'through grants, subsidies and state procurement policies Third World countries with a strong scientific and

engineering base (e.g. Brazil, Argentina, India, Korea, Singapore and Taiwan) are excellent candidates for the decentralization and internationalization of knowledge production by large multinational firms'. Countries such as these 'are forming the core of a global oligopoly in these industries' (Mytelka, 1987). It is possible to interpret these changes through the 'wage cost' part of Frobel's NIDL thesis, but only by adding a new dimension to it. Low cost, low skilled workers in the 'global factory' are being joined by an elite globally sourced band of knowledge workers providing TNCs with a 'global brain factory'.

Gereffi argues that the complexity of products exported is an indicator of the sophistication of a country's economy (Gereffi, 1994b, p. 213). It is also an indicator of the level of skilled labour at work in that country's economy. East Asian NICs Singapore and South Korea, utilising capital and skill intensive technology, increased their overseas sales of machinery and transport equipment from 1965 to 1990 by 38 percent and 34 percent respectively, as a share of total merchandise exports.

Taiwan's exports in this category from 1965 to 1990 increased by 21 percent and Hong Kong's by 16 percent. In the same time period, in Southeast Asia, the skill intensive technology exports increased in Malaysia by 25 percent and in Thailand by 26 percent. In Latin America, exports rose in Mexico at 24 percent and Brazil at 16 percent. (Gereffi, 1994b, pp. 213, 214, quoting World Bank 1992: 248-9)

b) Joint Ventures:

In the second strategy, TNCs form joint ventures in design and development, cutting costs by reshaping and restructuring the market to enable them to utilise labour from the global pool (Mytelka, 1987, Mody, 1989). Mytelka uses the example of the development of a global telecommunications oligopoly, 'structured through a set of technologically based collaborative agreements among firms' to illustrate this strategy (Mytelka, 1987, p. 69).

These strategies by MNCs and TNCs reshape the NIDL, while using the process of rapid globalization to maintain competitive advantage in the markets. This process fits Giddens' original model of the globalization process where the interaction of TNCs with States and with the IDL is facilitated by the increasing development of technology (Giddens, 1990).

Most important are the changing attitudes by TNCs towards the supply of labour, in the light of changing conditions of international competitiveness. Stopford (1996) argues that a nation is no longer at an advantage if it possesses a large pool of low-cost labour in industries such as electronics where direct labour costs are a relatively minor part of the total costs of production (Stopford cites figures of 3 percent). Evidence suggests that, both in developing countries, and within Europe, inward investors are preferring locations where they can have access to a pool of highly trained labour, even if the short-term costs may be higher. 'The argument is that the ability of the workforce to upgrade itself to satisfy the demands of next-generation products will determine by how much total long-term costs can be lowered to enhance the durability of the firm's competitiveness'

(Stopford, 1996, p. 269). This is certainly true in the case of firms on the cutting edge of new technologies, such as automobiles . Indeed, Stopford provides the telling example of how TNCs will train up a local labour force to be in possession of skills - as when General Motors and Ford trained up the Mexican labour force as ‘part of their successful transfer of advanced engine manufacturing to Mexico’.

Henderson’s industry specific research into electronics reveals how it stimulates demands for engineers and electricians*. From the late seventies onwards, TNCs sought to source ‘significant supplies’ of skilled labour at a relatively low cost with high productivity and high quality, for certain types of technology production’. (Henderson, 1997) The US, Japanese and European MNCs had begun to use skilled, knowledgeable labour in Hong Kong and Singapore for technologically advanced processes such as computer controlled testing and circuit design.

At the present time, of seventeen national economies significantly engaged in global electronics production and exports, Japan, USA, the European industrial economies, Korea, Taiwan, and Singapore provide skilled labour to the global pool, performing knowledge intensive parts of the production system. Japanese consumer electronics industries operate from a position of global dominance, whereas in semiconductors, Japan and the US exercise ‘twin domination’. Skilled workers producing microcomputers in Taiwan and semiconductors and consumer electronics in Korea are changing the position of these States within the NIDL. The new cores

* See this paper, section VI

especially Korea, Taiwan and Singapore are forging technological alliances and OEM arrangements with leading TNCs. Henderson finds, for example, in Korea, Samsung has 61 'technology transfer' agreements with North American, Japanese and European producers¹ (Henderson, 1997).

However, foreign owned TNCs own the majority of the technologically advanced industries in Singapore, as in up-coming Malaysia and Thailand. The transition economies of Central and Eastern Europe provide a rich source of skilled and technologically advanced workers, at a fraction of the wage costs of their Western European neighbours. Hence, Volkswagen's investment in Skoda cars, General Electric's in Tungram and the famous case of Asea Brown Boveri's (ABB) 'rapid acquisition of a regional network of power engineering firms' (Radice, 1995, p. 120). The strong tradition of engineering skills in the Czech Republic and Poland, for example, have led ABB to establish operating subsidiaries, some of them in joint ventures (FT, 19 DEC 1994).

These type of investments are the largest of all Western European investments into the East. Even Suzuki of Japan and Daewoo of South Korea have seized the opportunity to invest in the car industry in Eastern Europe. Skilled and educated labour is being resourced by TNCs in the infrastructure and material sector - including telecommunications equipment, steel, power engineering , glass, chemicals and commercial vehicles. Labour costs stand at 10 percent of West European levels (Radice, 1995).

¹In addition, 'Goldstar has 79, Hyundai 33, and Daewoo 20' (Henderson, 1997, p. 114).

Thus, a new development in the pattern of the NIDL that could not possibly have been foreseen by Frobel *et al* has opened up in the former communist States of Central and Eastern Europe.

V.2. Low-cost, Unskilled Labour: Changes to the Nature and Extent of the Use of this Labour

Lower-skilled assembly line work, identified by Frobel *et al* as the essence of work resourced by labour from the developing nations, still remains a major aspect of the NIDL. Even in the electronics industries, in electronics producing economies close to half the work force, and approaching two thirds in Hong Kong and Singapore, tends to be women - overwhelmingly employed in lower skilled assembly jobs.

'In terms of wage rates, hours of work, compulsory overtime, supervisory control, health hazards, sexual harassment, limited paid holidays, dismissal without redundancy payments and hostility to trade unions, the record has often been one of unremitting exploitation'

(Henderson, 1997, p. 115)

Japanese plants have also emerged in Latin America, particularly Brazil and Mexico.

In Europe, the former Communist States provide a new source for low cost unskilled and semi-skilled labour and for the location of subsidiaries to service firms' global production and marketing networks. Wages are a fraction of those in Western Europe. Clothing and footwear, consumer durables, furniture and electronics assembly are part of both buyer -driven and producer driven commodity chains, with both TNC owned subsidiary factories and 'extensive continuing forms of contract production'. Overall, as with skilled labour, labour costs currently stand at 10 percent of West European levels (Radice, 1995).

Gereffi's work on buyer-driven commodity chains provides a very useful way to differentiate between the continuing existence of large pools of low-cost labour, utilised by TNCs in their globalizing resource-seeking competitive strategy and the newer search by TNCs for 'brain labour'. Although the buyer-driven commodity chains researched by Gereffi involve the same industries as were researched by Frobel *et al*, namely, light consumer goods, garments, footwear, toys, household goods, and consumer electronics, the sub-contracting ties of the producer to the TNC in the commodity chain mean that the producer is under even more pressure to maintain quality while keeping labour costs to a minimum. In these sub-contracting units 'many operate in the unorganised sector where wages are low and benefits are nil' (Mitter, p. 19), working in 'very competitive and globally decentralized factories' (Gereffi, 1994b).

*Export Processing Zones*²

Frobel's research into Export Processing Zones (EPZs) as part of the NIDL concluded that the primary function of EPZs was the use of cheap labour, rather than the tax and tariff privileges that come as part of the contract between the MNC and the State where the EPZ is set up. EPZ production sites are characterised by Frobel as 'World market factories' where the labour carries out simple assembly operations, at a very low cost.

““Cheap labour” is a term borrowed from the language of the business press, but is one which precisely characterises the conditions on the labour markets of the developing countries’
(Frobel, 1980, p. 322)

This statement is amply backed up with complex information from the mid-seventies when the researchers gathered their material and covers the 'seventy-nine free production zones in thirty-nine countries and many sites outside the zones, employing in all 725,000 workers'. How much has the nature and extent of the NIDL altered in EPZs since Frobel's 1975 research? Export Processing Zones (Free Trade Zones) are not only still in existence and displaying similar labour patterns to those identified by Frobel, they have become of even greater significance in the NIDL than

² Frobel notes the range of terms for these zones: 'the new production zones go under a variety of designations: the most frequent are 'free export zone', 'export processing zone' and 'export industrial zone' (Frobel, 1980, p. 302). In China, such regions operate under much the same economic freedoms, and are usually designated 'Special Economic Zones' or SEZs.

they were in the mid-seventies (ICFTU, 1999). EPZ employment overall has increased rapidly. It grew by 9 percent annually between 1975 and 1986, and by more than 14 percent between 1986 and 1990. This compares to an annual growth rate of manufacturing employment in the developing market economies of only 2.9 percent for the period 1975 - 1986 (Parisotto, 1993). The World Bank reports that 45 percent of total employment by Multinationals in developing countries takes place in EPZs.

The World Bank sees these jobs largely as a positive asset to developing countries, and an essential phase in their economic development strategy: 'low-skill jobs must be seen as just one step in the growth dynamic'. (World Bank, 1995). The World Bank (1995) acknowledges the criticism that the jobs of these workers, whose skills are low, and whose labour is therefore, in theory at least, substitutable, are transient and insecure. To counteract such criticisms the report gives examples of several States - Mauritius, the Philippines, and the Republic of Korea - who have moved forward to higher skilled work at higher wages from low-wage employment. EPZs in East Asia have been declining since the mid-seventies in response to spiralling labour costs and the strategies by Nation States to upgrade the skills of their labour force and move towards technologically superior production (Gereffi, 1997, p. 58).

The report states that TNCs in low -skill industries such as garments and footwear then move on to 'a new generation of EPZs with cheaper labour'. The shift in location of EPZs follows the changing spatial divisions of labour. Low-wage areas in neighbouring China, Southeast Asia, for

example, Indonesia, and South Asia have become the new locations for EPZs. Other world areas which represent the lower levels in the world hierarchy of labour costs, such as Latin America, India, and Pakistan attract investment in search of low skilled, low cost labour such as the clothing industry. (Gereffi, 1994; World Bank, 1995). In other words, ‘textiles and clothing actually represent the leading edge of economic globalization for Third World nations that seek to be incorporated into the world economy as manufactured goods exporters’ (Gereffi, 1994b, p. 214). The table illustrates the cost advantages they offer.

Table 1. Comparative Labour Costs in US Dollars per Hour in the Apparel Industry, 1991

Indonesia, Honduras, China, Pakistan, Philippines	Taiwan	USA
Under \$0.50 per hour	\$3.74 per hour	\$6.77 per hour

Source: Gereffi, 1997, O’Rourke, 1992, 116-18

Composition of the labour force in EPZs

The labour force in EPZs is changing, but is still largely composed of young mainly rural, unmarried women, engaged in the assembly-line and piecework production typical of EPZ factories (Parisotto, 1993, ICFTU, 1999). However, male and older female factory labour is being introduced in the emerging Newly Industrialising Economies (NIEs), or the new ‘core’ countries, where the cost of industrial labour is rising, and the labour market in these jobs is tight. Gereffi cites the incidence of 25

percent male labour in Hong Kong's garment industry (Gereffi, 1997, p. 59). None of the changes already identified, however, negate the conclusions of Frobel's analysis of work in the EPZs. Evidence suggests that the criteria for selection of workers are still those who work for the lowest wages, are the most productive and are unskilled or semi-skilled (Frobel, 1980). The characteristics of this type of work: exploitatively low wages, long hours, built-in overtime, demanding shifts, and often poor working conditions endured without representation, remain the same. The price paid for unionisation and demands for worker rights is still either the threat of, or the actual, relocation of capital elsewhere (ICFTU, 1999).

The role of China's labour force in carrying out the labour processes of the periphery has been described by Wu (1999). China first designated four Special Economic Zones.³

(SEZs) - in essence their EPZs - close to Hong Kong, Macao and Taiwan in 1979. In Wu's detailed study of the largest zone, Shenzan, the top ten manufacturing industries ranked cumulatively over a period from 1979-1990 were garments and textiles, rubber and plastics, metal products, machinery, footwear and headwear, electronics, electrical machinery, and consumer electronics (Wu, 1999). Labour in these industries reflects the general pattern of the NIDL in all EPZs: 'a large reserve of inexpensive rural surplus labour' producing labour intensive goods for export'.

³ A special feature of China's SEZs is that they also place an emphasis on agriculture, tourism, commerce and services, science and education as well as industry (Wu, 1999).

The zones have attracted most foreign investment from Hong Kong. As Wu notes: ‘Hong Kong investment dominated not only in Shenzhen, but also in Guangdong Province and in the nation as a whole’ (Wu, 1999). However, the investment has been ‘largely low-tech’. Wu remarks that labour in Shenzhen and in China as a whole was attractive to new industrial location because of its low wage costs, low social costs, and its non-militancy or lack of organised power connected to the Communist limitations on worker representation (Wu, 1999, p. 66). He cites a survey of 10,000 Japanese companies in 1990, which revealed that the top reason for investing in China was the low cost of labour: ‘abundant, cheap, and relatively good in quality’. Up to 1994, there was no comprehensive labour law in China, and up to the late eighties, child labour and unregulated working hours were permitted, and rights to labour protection were unknown in the SEZs.

The current situation suggests that, while locations may shift, the features of the labour processes that Frobel *et al* found in their research into the original EPZs are likely to persist as capital becomes increasingly globalized.

V.3. New Working Practices and Flexibility

Given the wide and amorphous meanings incorporated in the term ‘flexibility’, in this section I propose to deal with two specific aspects of flexibility which particularly affect the NIDL: ‘flexible’ organisation structures and ‘flexible’ work practices. Three elements of these types of flexibility: breaking down monolithic organisation structures by sub-

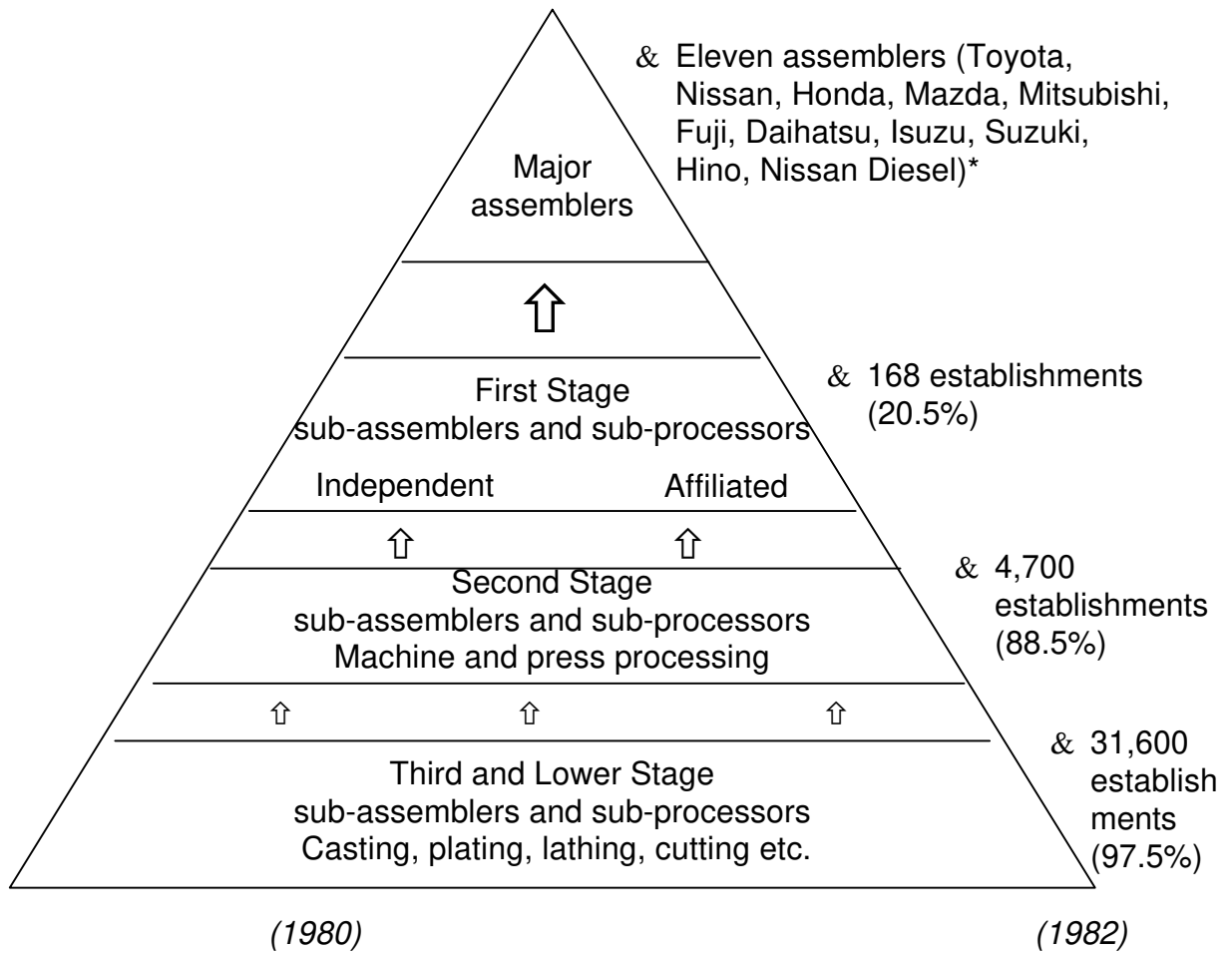
contracting from the parent organisation, introducing flexible production and flexible working practices, can be directly linked to changes in the NIDL. Piore and Sabel (1984), for example, see the concept of 'flexible specialization' as a way forward, a move from the deadening industrial effects of Fordist mass production and the deskilling of workers (Raynolds, 1994). Leaner, delayed organizations, where responsibility is devolved, and small units specializing and innovating, sub-contracted from large firms, and are seen as a potential way to rejuvenate US industry and the economy, with beneficial social consequences. These assumptions about the benefits of flexible specialisation for the *global* labour force are, however, open to question.

The example of the automobile industry is a case in point. JIT or stockless production, enhanced by computer technology, promotes an industry specific division of labour, which is increasingly sourced from the global labour force. Ozawa (1991, p. 147) likens the industrial structure to a pyramid - see Figure 3:

'Eleven core companies ... comprise the major final assemblers at the pinnacle of the industrial pyramid, followed by 168 primary sub-assemblers and sub-processors ... some of which are independent but many are closely affiliated in terms of stock ownership and directorship. The secondary sub-contractors number 4,700 enterprises, and the tertiary group ... 31,600 enterprises. Down the pyramid, the proportion of small and medium sized enterprises to the total in each rung rises'

Figure 3 The ‘Meticulously Segmented Vertical Division of Labour’ in the Japanese Automobile Industry

**Japan’s Pyramidal System of Production:
The Automobile Industry**



Employment Scale	Number of Firms (%)
1 - 9	65.1
10 - 29	19.8
30 - 99	9.1
100 - 299	3.6
300 - 999	1.7
1000 and over	0.7

* Small/medium sized establishments as a proportion of total

**Source: Koichi Shimokawa (1985) *Jidosha (Automobiles)* Tokyo: Nibon Keizai Shimbunsha p. 23.
Ozawa, 1991, p. 148**

Cost savings are achieved in two ways. First, the wages and conditions of the sub-contracted labour force are considerably cheaper as the tiers of the pyramid descend. Second, all the workers in the pyramid are bound by an integrated system of production and set of working practices controlled from the top designed to improve quality standards and efficiency. Systems of 'just-in-time and total quality control...encompass all of the vertical layers, continuous technological improvements (kaizen) are pursued vigorously' (Ozawa, 1991, p. 148).

The peripheral workers in this industrial structure are those in the descending tiers of the pyramid. Their firms are the ones required to 'rationalise' and shed labour if the controlling firms need cost reductions. Similarly, work intensification is demanded from sub-contractors as well as workers in the 'core' to achieve productivity improvements. Japanese MNCs are making use of the existing 'core ' and periphery' divisions already existing within the European Union and other new spatial pattern areas (Mittleman, 1995, Child Hill, 1987) to locate their core assembly plants and their peripheral suppliers. For example, Portuguese workers, with their relatively low wage rates, supply spare parts for Nissan UK and Yazaki Corporation (Ozawa, 1991).

All the changes to the NIDL outlined so far in this paper- the spatial shifts in the location of the NIDL, the TNC driven commodity chains with their impact upon labour usage, and the changes to the nature of the labour processes within the NIDL, have been facilitated by co-operative Nation State policies and practices.

VI. Changes caused by the actions of Nation States affecting the NIDL

States as prime actors in the globalization process have, over the past two decades adopted policies which have influenced the patterns of the NIDL within their borders. States and Governments have produced differing policies that have shaped the NIDL, often determining whether the State remains in a core or a periphery category. This is true particularly in the Asia-Pacific axis, where the considered educational strategies of former peripheral States have resulted in the formation of new 'cores'.

'East Asia is widely known as home to economies that have successfully upgraded their participation in international markets through a determined focus on education and training' (Campbell *et al*, 1997, p. 8).

The interaction between States and Industries has also had a strong impact where particular State policies on certain industries such as automobiles have changed the character of the industry and the way labour is used. 'It is competition and collaboration among companies and governments in Japan and the US that is shaping the international division of labour in the world auto industry today' (Child Hill, 1987).

Drawing on examples from East Asia, Henderson (1997) shows that government intervention has in many cases tempered the detrimental aspects of TNC formed divisions of labour to ones which feature, amongst other things, skilled labour and rising wages. The location of capital intensive, knowledge-intensive electronics industries in developing

countries highlights the need for qualified engineers and technicians, and pressure is thus exerted on governments ‘to upgrade their education system’*.

Henderson (1997) also points out that the strategy of the Singapore government to force up labour costs encouraged MNEs to locate technologically sophisticated labour operations rather than labour intensive ones in Singapore, concomitantly locating labour intensive operations elsewhere in the East Asian division of labour.

The dominant role of TNCs in the globalizing economy forces States and Governments to adopt policies that will attract inward investment. ‘Given that investment is one of the keys to economic growth, Governments are motivated to seek as many sources of new investment as possible’ (Stopford, 1996). Stopford remarks on the contests between nations to attract ‘mobile wealth creating capital’. Thirty-five developing countries introduced eighty policy changes reducing restrictions on foreign investors in 1991. During the 1980s, 199 bilateral investment treaties for the promotion and protection of FDI were signed, and a further 64 during the early 1990s. What is clear here is that although nation states are dependent on TNCs for inward investment, in many cases they are able to mould and direct that investment.

There is considerable evidence to show how States and Governments can themselves push TNCs to invest or change the nature of the way they utilise and divide up global labour sources through far reaching State

* See Section V.1. of this paper

strategies affecting the development of industries and the national labour force (Castells, 1992, Mody, 1989, Henderson, 1997). Singapore's drive to 'squeeze out companies looking for unskilled labour' in 1979, a combination of social welfare policies, investment in education and a substantial increase in labour costs eventually transformed the NIDL in Singapore, with TNCs by the late 1980s sourcing highly skilled labour from Singapore in finance, advanced services, high technology manufacturing and R and D.(Castells, 1992, pp. 36-7). South Korea virtually created its own internal NIDL, with the State promoted formation of the *chaebol*. Further government measures during the 70s and 80s ensured a highly educated labour force that was, however, brutally repressed - although it is arguable this played a part in ensuring the type of foreign investment that the government favoured- from companies that could facilitate technology transfer. The State created and staffed specialized R & D Institutes and linked them to industry under a major Civil Service department, the Ministry of Science and Technology. Castells emphasises the key role of the Korean State in rising to a position of a 'core' country, with its own multinationals driving their own division of labour within the country itself. He sees it as the result of 'the nationalist project of a developmental state that deliberately orchestrated the creation of major Korean multinational companies able to become influential in the world economy on the basis of foreign lending, American military support, and ruthless exploitation of Korean labour' (Castells, 1992, p. 41).

The labour force in Korea, through State policies, has been upgraded to one that is highly educated, skilled and technologically literate - high up

‘the technology ladder’ in the NIDL. Apart from the technologically advanced exports of the Korean MNCs, Korea’s engineering exports grew between 1970 and 1986 at 19 percentage points higher than Japan’s, at an average annual rate of 39 percent (Castells, 1992).

The intervention of the Taiwanese State has directed its industrial structure, and the networks between the State, firms and the world market have been instrumental in shaping the NIDL patterns within Taiwan. Castells shows how the Taiwanese State became during the 80s a new ‘core’ in itself, with the largest Taiwanese companies using mainland China and other East and Southeast Asian countries for ‘offshoring production’. He gives the example that an estimated 40 percent of Taiwanese shoe production actually takes place in China (Castells, 1992). As with Korea, the State has embarked in the 1970s and 80s on a programme of education and State action to upgrade and modernize industry, with a high technology park connected to the major government research institute in electronics and two leading technological universities (Castells, 1992). State Research and Development institutes in Taiwan ‘have acquired foreign technologies, adapted them and encouraged their absorption by Taiwanese companies’ (Henderson, 1997, p. 109). At the same time, the Taiwanese State has encouraged the setting up of plants by foreign MNCs, by making accessible to them a productive low-wage, unskilled labour force composed largely of young women. The small businesses of Hong Kong have also raised their productivity and technological expertise through State policies creating means to train and inform the labour force.

Castells concludes that the classic NIDL model is no longer appropriate for these four Asian States since their industrial expansion is not a by product of TNCs from the former 'core' nations industrializing the 'periphery'. Rather, especially in the cases of Taiwan, South Korea and Hong Kong the States themselves have created their own divisions of labour as a direct result of influencing and trying to control their own industrialization (Castells, 1992, p. 50).

The role of certain States in changing the NIDL as Frobel depicted it, by creating a pool of educated labour within former 'peripheral' regions, 'able to reskill itself during the process of industrial upgrading', is not a dimension explored by Frobel (Castells, 1992, p. 53). However, the role of labour within these States remains true to Frobel's model: highly productive 'at a level of wages very low for international standards'. In addition, whilst providing the strategies to enhance its status, Governments and industry within these States have been prepared to keep labour tightly and often repressively under control, 'in terms of work discipline and labour demands', (Castells, 1992).

VII. Conclusion

The NIDL has developed over the past two decades into a phenomenon of great complexity.

On a global scale, multiple cores and peripheries within the NIDL are occurring. The new cores and the peripheries are formed of divided labour forces from within States, new spatial dimensions including clusters of

States, identifiable geographical areas and specific industries. The ways in which labour is divided are both shaped by new strategies of the major actors within the NIDL, and generated from spin-offs of the strategies employed in the old NIDL. Sections of low cost labour may now take a different form, but where its global location is in the developing countries it is still resourced from these countries because it is cheaper (Appelbaum and Henderson, 1992).

The principal actors shaping and changing the NIDL remain TNCs and States. TNCs appear as the major orchestrators of the old and the new NIDL, with their massive powers of capital investment and their search for cost reductions in the new global labour market. The evidence suggests that TNCs are forcing the pace of the NIDL as much as they did when Frobel's study first appeared in 1980 (UNCTAD, 1997; 1999b). But States and Governments have interacted with TNCs in the past two decades to temper and alter the 'drive of the logic of international capitalism' which is the theme of Frobel's NIDL (Child Hill, 1987). State strategies have changed the nature of workers within the NIDL, and created a new hierarchy within the core/periphery divide. Many former peripheral States now have their own TNCs. States vie with each other to attract FDI. They are prepared, with the encouragement of International Agencies such as the World Bank and UNIDO to provide the most amenable labour force to ensure they will get it.

The role of organised labour and Trade Unions, while constrained by the powers exercised by these two global forces, is also significant, but is outside the scope of the present paper.

The evidence shows that Technology transfer has and is taking place through the changing spatial location of technologically skilled labour, and this has undoubtedly contributed to raising the status of former peripheral nations to that of a new set of core nations. Indeed, some commentators go so far as to say that technology transfer has led to ‘a more complex and dynamic pattern to the NIDL than the dependency of the economies in the lower tiers on foreign capital, technology and sourcing’ (Campbell, 1997).

The location of highly-skilled labour also has to do with the drive for access to new markets. ‘First, and principally in terms of objectives, the international division of labour pursued by the technology leaders requires an active presence in third markets’ (Viatsos, 1989).

The myth that post-Fordist production systems, replacing Fordist or mass production systems, have somehow eradicated the worst features of the old NIDL (Kaplinsky, 1989), is not backed up by the evidence. Firstly, however ‘organic’, multi-skilled and demand-driven flexible labour processes such as those in Japanese automobile and electronic industries may seem to be, the evidence shows they rest on an all-encompassing Division of Labour based on similar principles to the ‘old NIDL’ (Ozawa, 1991, Kaplinsky, 1989). Secondly, many of the features of Frobel’s NIDL such as the existence of a periphery of low-cost, low-skilled labour engaged in true Tayloristic mass production are shown to persist. Indeed, the examples of Japanese JIT systems have been shown to generate a particular form of inequality between core and periphery that is only masked by the spotlight that has been put on the new working practices of the few ‘core’ workers.

The paper has demonstrated how the NIDL can, at one and the same time, source both a low-cost, low-skilled labour force and a high-skilled, technologically advanced labour force from a changing pattern of core and peripheral areas across the globe.

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