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**Technology and economic development:  
the dynamics of local, regional,  
and national change**

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## *Chapter 1*

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### **Economic growth and decline: theories and facts**

Economic growth and development have always been geographically uneven. Early observations were of relatively conspicuous contrasts, such as thriving cities and backward rural areas, advanced European countries and lagging colonies and former colonies. These and other, more subtle, disparities are the outcomes of a capitalist economic system which appears more influential in the 1990s than it has been for several decades. Corporations and entrepreneurs carry out their tasks within this system, and the results of their decisions affect people and places. The capitalist system is a global one, but it both shapes and responds to local circumstances. The growth of part-time work, the rise and decline of industrial areas, and the highly selective growth within the Third World – to mention only a few familiar examples – are impacts of economic change, viewed at a regional (less than global, more than localized) scale.

The 1970s and 1980s presented a time of dramatic change in the structure of economic change at all scales. Growth in international competition has thrust firms and regions which were previously isolated from competition into a new economic environment where interdependence and interaction are the norm. Trade became an immensely prominent consideration for nations and localities alike. Far-flung corporate networks engendered 'global factories' that shifted goods and components from country to country but under the control of corporate management. 'Strategic alliances' and other coalitions of giant firms strengthened both the technological and geographical scope of large enterprises. The theoretical basis for studies of economic growth through the 1960s and 1970s – there was little study of decline – tended to assume that growth and development would inevitably occur, if only the correct policies were chosen, if the proper economic factors were available, and if the population would accept the appropriate social and political changes (Landes 1989; Reynolds 1983).

Some of these changes were under way earlier, but their full impact was not felt until the 1980s. A series of unanticipated events seemed to unfold at the same time, affecting both advanced post-industrial economies and underdeveloped nations simultaneously, if in distinct ways. For the Western countries, the ascent of Japan to economic forerunner, the stagnation of Europe in jobless growth during the 1980s, and the meteoric rise of the newly industrializing countries (NICs) all set existing theories and policies on their heads. What had worked in the 1950s, when the economic pie was growing, did not appear to work in the 1970s and 1980s, when the pie was constant or even shrinking.

The measurement of seemingly simple concepts such as employment became more difficult as full-time jobs and fringe benefits became less assured. Firms in several countries also shifted production from urban locations with unionized workforce to peripheral regions, where industrialization and unionization had little, if any, history and where, consequently, wages, benefits, and work rules were more congenial for employers. More alarmingly, jobs by the thousands disappeared as new plants opened in Asia and elsewhere. Within advanced economies, sharper contrasts emerged between regions. The 'North-South divide' in the UK, the 'bi-coastal economy' and a persistently stagnant rural region in the USA, the booming Tokyo metropolis and lagging peripheral regions in Japan, the Third Italy between the industrial North and the perpetually backward Mezzogiorno all became symptomatic of a general set of problems pervading economic change world-wide (Dicken 1986). At the same time, high technology industry, robotics, and entrepreneurship were hailed as solutions to such problems, although in reality they often seemed merely to reinforce inequality (Bessant and Cole 1985; Castells 1985a; Keeble and Wever 1986).

The plight of underdeveloped countries, with a few notable exceptions, also worsened. Growth became more difficult, and imports rose dramatically while production and living standards fell. Oil, on which machinery and the other trappings of essential industrialization depend, rose in price, making the cost of economic transformation even more difficult. Markets for products became more global – with standards, distribution, and service often being more important than price – again placing peripheral countries without close ties to multinational corporations (MNCs) out of the system by which economic growth occurs. International transfers of new technology – a primary means of technological change, but one carried out largely by private organizations – thus often perpetuate patterns of dependence (Ernst 1980). By any measure, stark disparities in human welfare are present at a global scale (Tata and Schultz 1988).

New forms of production organization, such as flexible specialization, economies of scope, strategic alliances among firms, and widespread subcontracting, have transformed economic activities into forms that are directly challenging theories and policies of all types. Flexible production systems are radically different from the mass-production assembly line, relying mainly on unskilled workers and routine tasks, on which Marxist critiques have focused (Braverman 1974; Sayer 1985; Scott 1988a). Most importantly, technology and product innovation are central elements in these complex new patterns of corporate activity and make any simple explanation less tenable (Hyman and Streeck 1988).

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## Global production

An especially important set of contributions to the understanding of economic activity has been research on multinational corporations, stemming in large part from the work of Hymer (1975). Multidivisional firms operating in many countries at once have a great deal of flexibility with respect to products and markets. However, Hymer's central point was that the division of labour within corporations corresponds to a geographical pattern - what is now called a spatial division of labour - that creates and reinforces uneven development. The hierarchical nature of large firms, reinforced by information technology (Ch. 5), led many researchers to conclude that widespread economic development cannot occur (Fröbel, Heinrichs, and Kreye 1980; Müller 1979). Much of this argument focuses on the technological dependence associated with the concentration of corporate research and development (R&D) in home countries and production in peripheral countries and regions. In addition to the division of labour, restrictive transfers of technology seem to perpetuate technological dependence (Germidis 1977). In truth, the situation of multinationals is very complex, and has eluded simple explanations (Biersteker 1978; Dicken 1986; Dunning 1979).

Multinational firms have evolved through a sequence of three distinct stages. The earliest global firms were those organized to extract from other places natural resources and primary products not available at home. Spices, silk, furs, gold, and silver, among the earliest such items are still in demand today. However, the list has expanded to include tropical fruits and other agricultural crops, petroleum, and other minerals.

The second stage was the expansion into other markets primarily for the sale of manufactured products, although this also took the form of

production as well, beginning in the second half of the nineteenth century (Dicken 1986: 57–9). This market stage occurs among the wealthy countries (as well as the élites of Third World countries) where markets – consumers, industries, and governments – can afford the products. Thus, trade between Europe, Japan, and North America takes place largely among multinational firms in these countries seeking markets for their manufactured products and services. Both the resource and the market objectives of multinationals maintain the traditional international division of labour embodied in Vernon's (1966) influential product cycle thesis. Only advanced economies could produce manufactured goods while they were profitable; underdeveloped countries had little role in the world economy other than as suppliers of primary inputs.

The third stage of multinational activity is very different. It relies on the 'new international division of labour', in which production tasks can be broken down into activities which can be done by unskilled workers in countries where labour costs are very low relative to the advanced countries (Fig. 1.1). Asian workers, outside Japan, earned less than one-fifth the level enjoyed by workers in the USA or Europe. The emergence of manufacturing in Third World countries contrasts greatly with the previous role of those countries in the world economy. Indeed, direct investment in the form of factories and, probably even more important, the surge of subcontracting arrangements with Third World firms has altered the way in which economic development is viewed.

The rise of the NICs to economic powerhouses has been especially remarkable (OECD 1988a). The NICs include a first tier, all located in Asia, also known as the 'four tigers' – Hong Kong, South Korea, Singapore, and Taiwan – and a larger, more diverse group, which includes India, Malaysia, the Philippines, and Thailand in Asia, Brazil and Mexico in Latin America, and, in some lists, Israel and South Africa. (For some issues on defining NICs, see Ingalls and Martin 1988.) Although NIC manufacturing began in unquestionably low-tech products such as textiles, clothing, and shoes, more technology-intensive products, such as electrical and electronic products and transport equipment, are now common (J Henderson 1989; OECD 1988a).

The new spatial division of labour which has grown out of global corporate activity has produced regional economies of three broad types (Hamilton and Linge 1983: 24):

1. Those with a highly technological environment;
2. Those with a significant proportion of skilled personnel but lacking in a diversified and modern industrial structure; and

Hourly Labour Costs, 1981 (US=100)

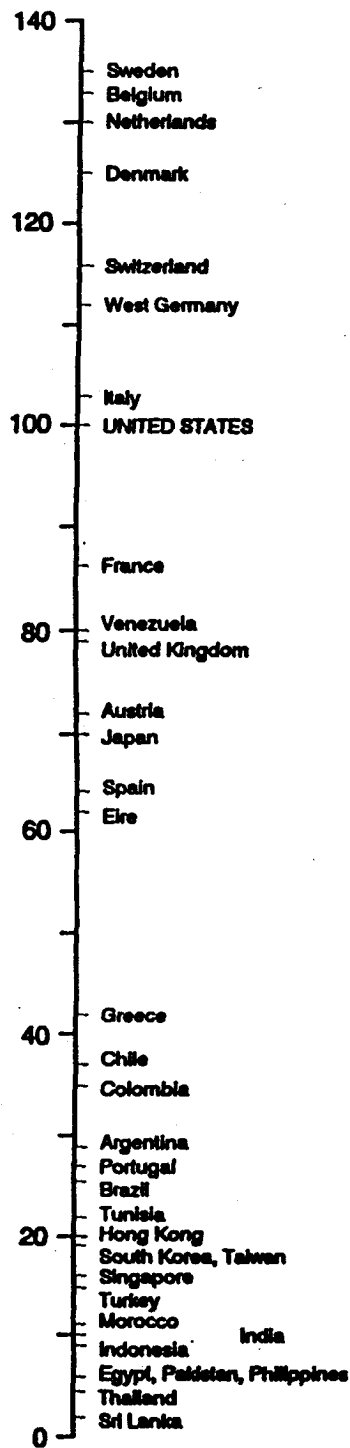


Figure 1.1 Hourly labour costs in selected counties, 1981. *Source:* Dicken (1986: 240 (fig. 7.8))

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3. Those with reserves of unskilled labour which is either surplus to farming and rural occupations or redundant to declining industries.

The great surge in international production and the creation of the 'global factory' in the 1950s and 1960s was a result of several 'permissive' or 'enabling technologies' which effectively compressed space and allowed large firms to become truly global. Technology has been an enabling element for the international division of labour, taking place from three main sets of changes:

1. Developments in the technology and organization of production that subdivided and standardized complex production processes into simple units requiring minimal training or skills, thus allowing workers in virtually any location to perform required tasks;
2. Improvements in telecommunications and transportation since the Second World War permit people, goods, and information to travel efficiently and cheaply to any location on the globe, rendering industrial location and the management of production largely independent of geographical location;
3. The development of a world-wide reservoir of potential labour, not penetrated by unions, and therefore having little power to demand wages and fringe benefits (Bluestone and Harrison 1982: 115-18; Dicken 1986: 106-16; Fröbel, Heinrichs, and Kreye 1980: 37-44).

These developments have allowed firms, particularly those firms which were already large, to develop a global strategy and control of product development, production, and marketing.

These 'permissive technologies' permitted managers to shift capital (as well as products) across long distances, and to operate far-reaching networks of production facilities. The 'de-skilling' suggested in (1) above is a scientific and deliberate way to alleviate dependence on certain sets of skilled workers, but it has also allowed some segments of production requiring low levels of skill to be moved 'off shore' while others remain near needed pools of specialized labour. The global semiconductor industry exemplifies this tendency (J Henderson 1989; Molina 1989; Scott 1987; Scott and Angel 1988; E Schoenberger 1986).

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## **Technology, regions, and economic development**

The dynamics of technological change provide the focus of this book. Technology is central to regional change, positive and negative, and to

economic change, job-creating and job-destroying. It is the most obvious cause and effect of the cumulative wealth of rich nations. Technology also promises, more than any other phenomenon, to bring poor nations out of poverty. As a 'chronic disturber' of comparative advantage, it has provided the principal source of change for firms, regions, and nations alike (Chesnais 1986). The concept of technology behind the book is a broad one that encompasses knowledge in all its forms, from simple and routine procedures of everyday life, to the methods of organization and management in enterprises large and small, from the machines that produce in enormous quantities what formerly required many workers, to the complex scientific investigations that create ever newer inventions and products. Capitalist firms profit from new products as much, if not more than, from new, labour-saving processes, although far more attention has been paid to the latter (Sayer 1985).

This chapter introduces the concept of *regional development* as a combination of qualitative and quantitative features of a region's economy, of which the qualitative or structural are the most meaningful. The perspective of regional development will not be familiar to all readers, but it has played an important bridging role for social scientists attempting to explain disparities in economic structure and well-being. Economists, geographers, planners, political scientists, and sociologists all contribute to regional development as a field of study (Malecki 1983).

Growth and decline, as quantitative changes in economic activity, gauge the impact on a region, in jobs and incomes, of decisions both from within and from external sources. The qualitative attributes include the *types* of jobs – not only their number – and long-term and structural characteristics, such as the ability to bring about new economic activity and the capacity to maximize the benefit which remains within the region. The standard theory of economic growth and development has concentrated on quantitative changes, despite an increasing awareness that regional growth depends, often critically, on aspects that are understood only in comparison with other regions or nations. The facts of regional development suggest that it is not enough to rely on concepts of growth without an equivalent concern for the forces which permit growth to take place or prevent it from occurring. These are the concerns of regional development, whether examined at the national, subnational, or local scale.

Conventional theories and policies regarding regional development focus in one way or another on the capital-labour 'production function' and responses by the state via various policies. Early policies derived almost directly from the neoclassical model, which 'is an ideology, a

religion' on which virtually all post-war economic policies have been grounded (Vining 1987). Labour is especially problematic, since it is seen by firms as an input to production and by governments as an outcome of regional growth. Labour skills and wages vary tremendously and these greatly influence location decisions of firms and the ultimate spatial division of labour. The interplay between capital, labour, and the state (or public sector) is fundamental to the dynamics of economic development (Storper and Walker 1989). For large enterprises, many other factors in addition to labour enter into their decision-making, and support the view of complexity in economic change (Clarke 1986).

Competition is keen for technological competence and superiority, both on a local level and internationally (Botkin, Dimancescu, and Stata 1982; Miller and Coté 1987; Office of Technology Assessment 1984). This is the latest arena where state intervention has interacted with private interests to generate policies that perceive and address the competitiveness of firms and of regions. The supply-side approach, which emphasizes the creation of firms, jobs, and wealth based on internal resources, is a part – albeit an important part – of the development process (Sweeney 1987). However, new firms, and high technology, involve critical steps, barriers, and synergies which determine the pattern of growth and development (Stöhr 1982, 1986a).

### Regions: the arena of economic change

What do we mean by 'regional'? Regions can be subnational spaces, especially of large countries, or aggregates of several nations. For example, Europe after 1992 will be more a single region than it has ever been. The flexibility of definition is not imprecision; rather, it reflects the various geographic scales at which economic change occurs.

Traditionally in regional economic analysis, regions were defined in three ways (Boudeville 1966; Meyer 1963). First, regions may be homogeneous with respect to some physical, social, or economic characteristic. In the USA, the corn belt and the manufacturing belt represent two such regional designations that fail to hold up to long-term scrutiny (Smith and Dennis 1987). Second, nodality or polarization around a central urban place has the advantage of focusing attention on economic attributes of cities and their dominance over surrounding space, especially as labour markets (Berry 1973). Finally, policy-oriented regions adhere to administrative boundaries that correlate with political or state institutions and their well-defined spheres of influence.

Policies, whether at a national or a subnational level, generally ignore urban nodes in favour of a smaller set of broad regions, and data collection is typically done only for such administrative areas (Tiebout 1962). At the international scale, data are typically available only for a nation as a whole, and perhaps for a few large cities or urban areas. Subnational data are frequently very difficult to come by. In advanced economies, regional data for administrative units are often better, but problems of detail and frequency still persist when compared to the national scale. In the end, 'we have to make do with the regions we have' (Brown and Burrows 1977: 16).

Regions are decidedly not well defined by political boundaries, and Smith and Dennis (1987) show that the American 'manufacturing belt' evolved from a number of smaller regions, each specializing in the production of different products (Meyer 1983). A corresponding 'new manufacturing belt' has not emerged in the US sunbelt despite high levels of manufacturing employment; its relative industrial diversity distinguishes it from the North as it evolved (Smith and Dennis 1987). In the UK, South Wales has evolved from a coal-mining region into a manufacturing region for new technology that coalesces into the M4 corridor eastward towards London (Hall *et al.* 1987; Sayer and Morgan 1986). The transformations of South Wales in the UK and of the New England region in the USA have attracted a great deal of attention in places where labour has largely defined and moulded the regions and regional change (Cooke 1985a; Harrison 1984; Morgan and Sayer 1986; Sayer and Morgan 1986). Indeed, the local nuances of economic change have led to a surge of 'locality studies' which examine even smaller areas than traditional regions (Cooke 1986; McArthur 1989).

In place of these definitions, Markusen (1987: 16-17) proposes an alternative definition: 'A region is an historically evolved, contiguous territorial society that possesses a physical environment, socioeconomic, political, and cultural milieu, and a spatial structure distinct from other regions and from the other major territorial units of a city and nation.' Regions are differentiated by distinct class structures which are unevenly distributed, by the separation of finance and ownership from production, and the economic and sectoral specialization that often endures over long periods (Markusen 1987; Massey 1984).

Gilbert (1988) summarizes recent thinking on regions by outlining three definitions of region. In the first, the region is the spatial organization of the social processes associated with the mode of production. The social division of labour, the process of capital accumulation, the reproduction of the labour force, and political

ideological processes of domination used to maintain the social relations of production all define the region as 'the concrete articulation of *relations of production* in a given time and place' (Gilbert 1988: 209). A second view of region uses *local culture* as a means by which people and groups are linked through specific communication processes which enhance their collective way of thinking about places and space. The third perspective sees the region as the setting for *social interaction* of all types, but particularly those which create or enforce domination and dependence.

Region formation, which involves elements of the first and third approaches above, occurs through regional social interaction while being both the condition and the outcome of the social relations between individuals, groups, and institutions in regional space (Gilbert 1988: 216–17). The role of the individual in this setting is problematic, but the dominant view at present is to posit individuals as actors (human agents) who are constrained by social structures (Gilbert 1988: 218; Storper 1988). The interactions between the capitalist system and localities and regions define the process of development.

It is clear that regions are not static, but are 'as mutable and malleable as the economic and social relations that comprise them and that they comprise' (Smith and Dennis 1987: 169). In their example of the northern core region of the USA, Smith and Dennis maintain that the decline of that region began in the 1920s with the flight of the textile industry. Similar movements took place in other sectors in response to massive technological changes, such as dramatically lower transportation costs, standardization of production, and increased minimum efficient scale of plants. The result, however, also had an important spatial dimension: regions became not simply subsets of national space or markets, but units of international space. Comparisons of costs, wages, and work conditions shifted from being made merely on a local basis or intraregionally to international in scope. This internationalization, although recognized somewhat in terms of the global arena of finance and production investment, has markedly changed 'the scale at which regions are constituted as coherent and integrated economic units' (Smith and Dennis 1987: 171; see also Graham *et al.* 1988). Douglass (1988) documents a similar transformation of urban areas in Japan since 1970 as a consequence of that country's transnational corporations.

## Regional disparity: cores and peripheries

Regions and nations undergo similar processes at work in all spatial scales (Smith 1984). The division of labour within and among large firms, and dominance and dependence relationships among firms and among places are common mechanisms that affect regions of all sizes. In particular, peripheral areas at different spatial scales – national, regional and local – exhibit similar structural and qualitative impacts and side-effects of traditional economic development mechanisms (Stöhr 1982). Comparisons of differences in economic activity across nations are often dubious, given the vast differences in population, land area, resources, and history (Walsh 1987), but the commonalities within the global economy or world system suggest that much more is similar than different (Drucker 1989; Taylor 1985).

In the world-system view, three basic elements comprise the 'world economy': (1) a single world market, (2) a multiple state system, and (3) a three-tier structure (Wallerstein 1979). Wallerstein's view of a tripartite international division of labour imposes a rather strict *core – semi-periphery – periphery* structure on to the 'capitalist world system' that may well be too strict in practice (Knox and Agnew 1989; Lipietz 1986). However, through the process of capitalist development including colonialism, regions of the world have become defined within an international division of labour. For Wallerstein, the core is characterized by free labour engaged in skilled tasks. In the periphery characteristically involved in a single cash crop or mining production are the countries in which coerced labour, under colonial state power, is found. Between the core and the periphery is what Wallerstein calls the *semi-periphery*, composed of countries that have regressed from core status through undergoing a process of deindustrialization and those heading for core status as they experience rapid industrial development (Cooke 1982: 153; Wallerstein 1979). Southern Europe is a frequent illustration of semi-periphery, resting uneasily between the core economies of northern Europe and the periphery of the Third World (Arrighi 1985; Hudson and Lewis 1985; Seers, Schaffer, and Kiljunen 1979).

Such a core–periphery structure is not static, as the rapid rise of Japan suggests. The world-system view also maintains that 'core' and 'periphery' are not areas, regions, or states, but spaces where core or peripheral processes dominate. In simplest terms, core processes consist of relations that incorporate *relatively* high wages, advanced technology and a diversified production mix whereas periphery processes involv

low wages, more rudimentary technology and a simple production mix' (Taylor 1985: 17). The semi-periphery is the dynamic category within the world economy. The restructuring of spaces involves regions rising and sinking through the semi-periphery (Taylor 1985: 17–18). Shifts in the relative status of nations in international competition are frequent observations from many perspectives (Cohen and Zysman 1987; Kennedy 1987; Pavitt 1980; Porter 1990; Prestowitz 1988).

Regional units within nations pose a more difficult problem, in part because the boundaries are less precise but also, more importantly, because a region is more 'open' than a nation; that is, a larger proportion of its economy will depend on flows of imports from and exports to other regions. These flows are notoriously more difficult to measure, because the usual restrictions on commerce via customs barriers, immigration control, exchange controls, and trade quotas do not exist, and thus even the most rudimentary information on flows is either unavailable or superficial (Richardson 1973).

Regional economic problems – that apply equally across nations and to regions within nations – include inequality of income, unemployment, and migration losses (Brown and Burrows 1977). Growth rates, of income or of jobs, are customary indicators of regional economic differences. The fact that regions do not grow at equal rates, do not provide equal numbers of jobs or jobs sufficient for those seeking employment, is a complex issue. Consider employment first. Jobs can be provided either from local or indigenous firms, or they can be brought into a region from outside, to produce products or services for markets elsewhere. Some jobs will be concerned with the provision of goods and services to organizations and consumers in the local region, others to distant, even foreign, customers. The variety of possible markets complicates the conventional export base approach to regional development. Even if unemployment is slight, not all jobs are equal, either in pay, in security, or in upward mobility. Likewise, what is produced in a place is perhaps less important than who is producing it, and at what stage in the production process (Clark, Gertler, and Whiteman 1986: 20–38).

## Dominance and dependence

Development is fundamentally 'a dominance/dependence relationship that is expressed in a great many ways' (Brookfield 1975: 1). Because of its varied expression, it is not a neutral or scientific concept on which

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there is any clear agreement (Toye 1987; Arndt 1987). Peattie (1981: 11–12) provides an example:

The subject of economic development is inherently complicated and difficult to treat from a single perspective. . . . The transformation of political and social institutions, the confrontations both within and between nations of the haves and the have-nots, and the struggle over scarce resources have made more and more difficult to deal with the subject in any tidy framework, like that provided by economics. Once a subject is seen to involve worldwide and interrelated processes of economic and social transformation, and to be a way of designating the interaction of the human species with the natural environment, it becomes a topic so broad and complex that it is difficult to generalize.

Within underdeveloped countries, some problems persist that are fundamentally geographic. *Dualism*, the severe contrast between traditional and modern sectors, is nowhere so evident as in the giant cities that characterize underdeveloped nations (Armstrong and McGee 1985; Santos 1979). In fact, it is the highly structured dualism found in the Third World that demonstrates how poorly integrated multinational corporations are with the nations in which they operate. The 'core-periphery' dichotomy identified by Friedmann (1966) stands as one of the "dominant metaphors" of our time' (Strassoldo 1981). Its further realization in the broad phenomenon of dualism is well captured by Santos (1979) and Brookfield (1975).

Bivand (1981) characterizes the asymmetry between 'pure' periphery and 'pure' centre or core across a number of dimensions (Table 1.1). The distinction between periphery and core geographically concerns levels of linkage and access. Economically, the core is a set of regions where complexity, technology, and control are the norm. Culturally and politically, as well, core regions are dominant and peripheral regions are dependent.

In fact, the situation in Third World settings is considerably more complex than the dualistic or core-periphery model is able to capture. Lo, Salih, and Douglass (1981) have proposed a 'macro-spatial development framework' which consists of five components:

1. A *world market* largely composed of developed countries buying primary products from the Third World countries and exporting manufactured goods, particularly modern technology embodied capital goods, to them;

Table 1.1 Characteristics of 'pure' core and 'pure' periphery

Periphery	Core
<p><b>Geographical:</b>            Coupled to few means of transport. High absolute and relative contact costs. Poor position on the transport network. Difficult access to other peripheral areas</p>	<p>Coupled to all means of transport. Low absolute and relative contact cost. Strong position on the transport network</p>
<p><b>Economic:</b>            Raw material production. Simple processes, one-sided, vulnerable production. Export of labour. Import of finished wares</p>	<p>Finished wares and services produced. Expansion, agglomeration economies. Complex control processes. Import of labour. Adaptable business community. Control over capital. Contact with other economic agents</p>
<p><b>Cultural:</b>            Accepts others' language. Forced to take the consequences of others' models of society. Consumes symbols created elsewhere</p>	<p>Produces and spreads the symbol system. Represents expertise. Control of information media. Rejects symbols from the periphery as irrelevant or unimportant</p>
<p><b>Political:</b>            No strategic resources. Absence of élites, or only agents of centre in administration. Poorly represented in the centre. High costs incurred in assembling and putting forward views. Few initiatives</p>	<p>Control of strategic resources. Concentration of élites. Over-represented in formal administrative organs. Low costs incurred in assembling and putting forward views. Many initiatives</p>

Source: Bivand (1981: 221 (table 2)).

2. An *urban formal sector* dominated by enclave foreign and domestically financed modern manufacturing and business of the corporate type;
3. An *urban informal sector* consisting of a wide range of traditional activities, small in scale and characterized by such occupations as hawkers, vendors, daily labourers, and services which are distinct from the enclave sector and its related professional and white collar occupations (Armstrong and McGee 1985; Portes, Castells and Benton 1989; Santos 1979);
4. A *rural export sector* generated in many cases from the plantation economy developed during colonial rule together with post-independence natural resource exploitation such as mineral extraction, oil, and timber;
5. A *rural peasant economy* historically isolated from the national and world market and dominated by peasants and landlords engaged mostly in food-crop production.

This framework still simplifies the reality and variety of Third World countries, but it captures effectively the interrelationships among different groups in an economy (Fig. 1.2). In particular, Fig. 1.2 illustrates the contrast between the formal sector, linked to the world economy through trade and commerce, and the informal sector, to which modern technology scarcely belongs, whether in cities or in rural areas.

The actual result in Third World cities has been described by Stretton (1978: 104):

Governments build grand quarters for themselves in their cities. They encourage private investments in central city offices, hotels, hospitals, affluent residential quarters with western standards of space and service, national and international airlines and airports and fast motorways from the airports to the city centres. This sort of development is sometimes defended as creating conditions which will attract foreign businessmen and therefore further their investment – though any further investment it attracts is quite likely to be of the same unequalizing kind.

The core-periphery paradigm is manifested in the global urban system as well. One city may become a 'world city' while the rest of the nation – and entire countries – remain largely outside the world economy (Friedmann 1986a; Friedmann and Wolff 1982). Friedmann (1986a) presents seven interrelated theses:

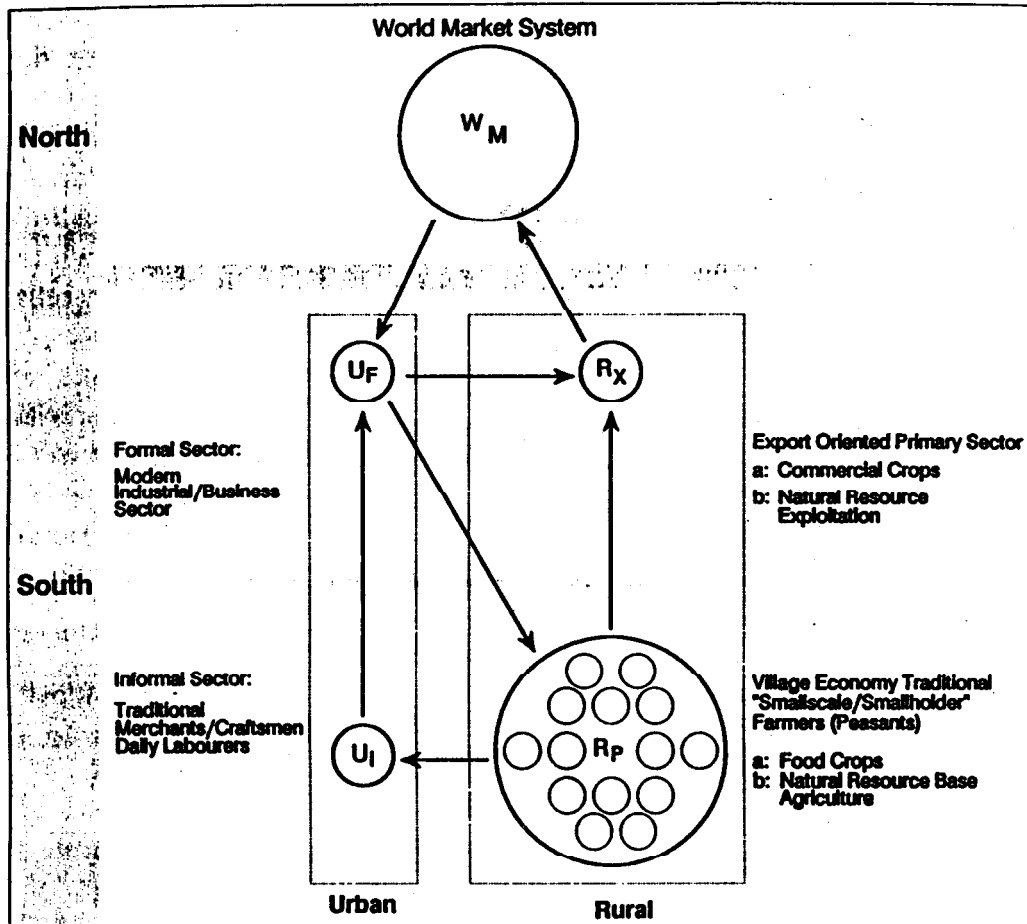


Figure 1.2 Dualism between formal and informal, urban and rural sectors.  
 Source: Lo, Salih, and Douglass (1981:20 (fig. 2.6))

1. The form and extent of a city's integration with the world economy, and the functions assigned to the city in the new spatial division of labour, will be decisive for any structural changes occurring within it.
2. Key cities throughout the world are used by global capital as 'basing points' in the spatial organization and articulation of production and markets. The resulting linkages make it possible to arrange world cities into a complex spatial hierarchy.
3. The global control functions of world cities are directly reflected in the structure and dynamics of their production sectors and employment.
4. World cities are major sites for the concentration and accumulation of international capital.
5. World cities are points of destination for large numbers of both domestic and/or international migrants.

6. World city formation brings into focus the major contradictions of industrial capitalism – among them spatial and class polarization.
7. World city growth generates social costs at rates that tend to exceed the fiscal capacity of the state.

The spatial arrangement of Friedmann's tentative hierarchy of world cities is somewhat linear along an East–West axis, with three distinct sub-systems: an Asian subsystem centred on the Tokyo–Singapore axis, with Singapore playing a subsidiary role as regional metropolis in South-east Asia; an American subsystem based on the three primary core cities of New York, Chicago, and Los Angeles, linked to Toronto and to Mexico City and Caracas, thus bringing Canada, Central America, and the Caribbean into the American sphere of influence; and a West European subsystem focused on London, Paris, and the Rhine Valley axis from Randstad to Zurich. The southern hemisphere is linked into the European subsystem via Johannesburg and São Paulo (Table 1.2).

**Table 1.2** Friedmann's world city hierarchy

Core countries		Semi-peripheral countries	
Primary	Secondary	Primary	Secondary
London	Brussels		
Paris	Milan		
Rotterdam	Vienna		
Frankfurt	Madrid		
Zurich			Johannesburg
New York	Toronto	São Paulo	Buenos Aires
Chicago	Miami		Rio de Janeiro
Los Angeles	Houston		Caracas
	San Francisco		Mexico City
Tokyo	Sydney	Singapore	Hong Kong
			Taipei
			Manila
			Bangkok
			Seoul

*Source:* Friedmann (1986a: 72 (table 1)).

Dualism also is present in advanced economies, as illustrated by contrasts in growth, especially in new sectors such as services (Cooke 1987; Green 1988; McKee 1974), and the presence of informal,

irregular work (Sharpe 1988). It is not a new situation, but the regional differences found in developed countries can be summed up in the observation: 'Prosperity is tied more to where you live' (Clark 1988). The disparities continue to hit rural areas the hardest, as they have historically (Averitt 1979; McKee 1974). New industries and good jobs gravitate towards cities. However, the mosaic of inequality has become more fine-grained, and the economic prospects vary more from place to place. The decline of large cities, from Newcastle to New Orleans, since the 1960s, and the rise in many countries of sunbelt regions, are evidence of patterns which are not easy to explain.

As an example, the state development strategy in Venezuela has been described as

a strategy that produced steel but few jobs; that organized the city for the advantage of foreign corporations, but made it difficult for local business people to get established; that concentrated power in the hands of a national elite and left local leaders and community members ignorant of what was being planned; that made some people rich, while appearing likely to leave many . . . to pick up the 'trickle down' of growth as an unskilled, intermittently employed subproletariat (Peattie 1981: 6).

A historical perspective is helpful in shedding light on the concept of development. Economic development as a term denoting a process which societies undergo was hardly used before the Second World War. 'Material progress' or economic growth was the more common policy objective, and development economics as a field of research and policy mirrored the Western preoccupation with employment, income, and other economic indicators (Arndt 1981, 1987: 1-2).

Through the evolution of social as well as economic thought, an intellectual framework emerged for thinking about development as a world-wide process of modernization, involving the spread of rationality and individualism, powered by the transformation of the technical order, and submerging other, 'less aggressive' cultures (Dube 1988; Headrick 1988; Peattie 1981: 35-6). This trend peaked in the early 1940s, when a series of studies on backward or underdeveloped countries presaged the formation of a single international body of thought on economic growth and development (Mandelbaum 1945). International comparisons of national and per capita income figures became the prime objective of development theory and policy (Arndt 1987: 43-54). Even where other goals were acknowledged, such as a shift from agriculture to other sectors or distribution of income, 'these tended to be qualifications. . . . The touchstone, if not the essence, of economic development was taken

to be growth in output and income per head in the less developed countries' (Arndt 1987: 53).

## The legacy of colonialism

Colonialism presented a different set of problems, which we now know as underdevelopment. Colonies were 'made by and for the mother country', and the economic concern of the colonials was primarily the development of the natural resources of the colonies for Western countries' benefit (Arndt 1987: 24-9). From the beginnings of the 'capitalist world system' that spread first through such colonial ventures and later through the seemingly less malevolent endeavours of multinational corporations, the underdeveloped nations have been dominated by outside entities and dependent upon an economic system over which they have no control (Amin 1974; Clark 1975; Moudon 1989; Villamil 1979). The destruction of precolonial economies through the import of products against which local producers could not compete and the construction of a highly concentrated infrastructure in effect created the disparities which later policies sought to reduce (Moudon 1989: 103-33).

The structure of colonialism was technological as well as political and cultural. Headrick (1988) lists five ways in which technology was involved in the imperialism of Europeans in Asia and Africa between 1850 and 1940. The first was a small set of important inventions which allowed Europeans to conquer inland sections previously impenetrable: steamships, railways, firearms, and telegraph permitted control to be imposed over large territories. The second was indirect. The 'imperialism of free trade' was that 'the industrialization of the Western nation stimulated a growing demand for the products of the tropics' (Headrick 1988: 6). Falling transport costs permitted the shipment of bulk commodities such as cotton and indigo for cloth, palm oil to lubricate machinery, copper and gutta-percha for electric and telegraph lines, and for canned goods, and rubber for clothing and automobiles. An affluent population also demanded increasing amounts of coffee, tea, sugar, cocoa, and other tropical goods.

Third, Western colonialists transferred technology to Asia and Africa in efforts to increase production and lower production costs by applying Western industrial and scientific methods to commodity production. Fourth, an increase in demand for Western manufactured products was prompted by their introduction into Asia and Africa. 'Motor vehicle

television, and modern weapons have become irresistible but barely affordable temptations for people of poor countries' (Headrick 1988: 7).

Finally, nearly all the technological changes which affected the relations between the West and the tropics originated in the West or from the work of Western scientists and engineers, for the benefit of Western society. The propensity to find substitutes for goods in short supply was remarkable (e.g. aniline dyes for indigo and other natural colourings, petroleum for palm-oil, synthetic rubber for natural rubber, synthetic fibres for silk). 'In these and other ways, Western scientists and engineers have prevented the demand for tropical products from growing in proportion to the growth in industrial production or in tropical population' (Headrick 1988: 8).

Colonialism also brought about changes in the way native societies worked and produced, but the changes did not originate internally. The extraction of mineral resources, the construction of ports, and the creation of urban centres in these nations changed what had formerly been a diffuse constellation of family plots and small-town centres to urban areas with a minimum of planning (Weitz 1986: 32). This sort of 'development' pattern became part of the lore and methodology for economic development. Taaffe, Morrill, and Gould (1963) proposed a sequence of transportation and urban development that mirrored the sequence common to such colonial ventures (Fig. 1.3). This idealized pattern was very optimistic; urban growth concentrated in far fewer centres in most post-colonial settings where primacy was – and still is – the rule.

For much of the Third World, then, technological underdevelopment has been the rule. Colonialism brought education, medical care, and mechanical equipment to the colonies, but did not pass on essential skills and knowledge to the indigenous populations. When former imperial possessions attained political independence, their people and firms lacked the skills and experience to sustain the infrastructure left by the colonial powers or to build on and develop from this base (Fransman and King 1984; Headrick 1988; Weitz 1986).

Despite these conditions, optimism prevailed in the immediate post-colonial era. No better example exists than that of Walt W. Rostow's *The stages of economic growth* which encapsulated the single focus of economic thinking at the time (Rostow 1960; Heilbroner 1963). Growth and development were considered synonymous, and a simple 'iron law' of economic growth was believed to hold: so long as the amount of savings, coupled with the fruitfulness of those savings, results in an output which is faster than the rise of population, cumulative economic growth will take place (Heilbroner 1963: 86). Rostow

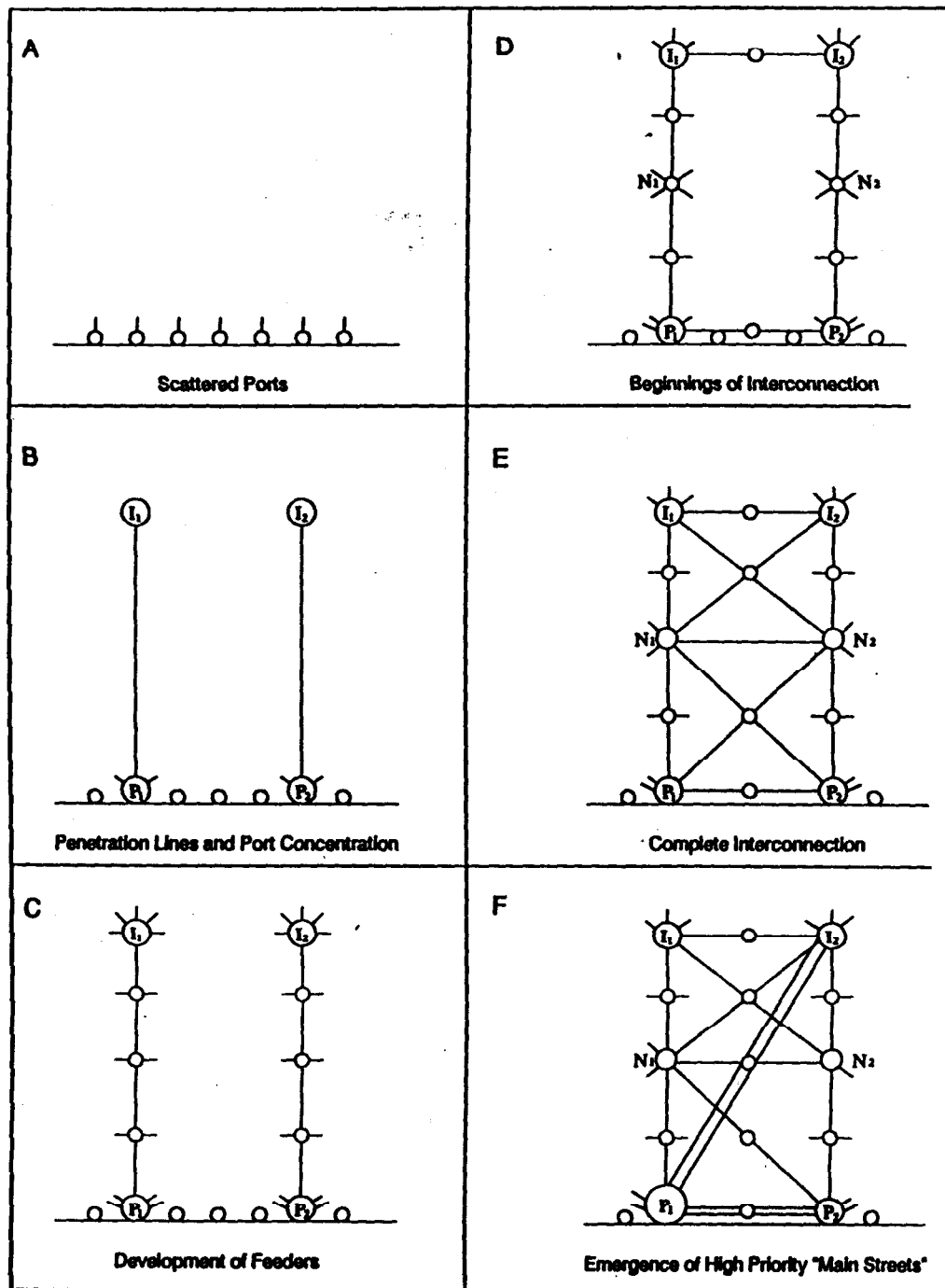


Figure 1.3 Idealized scheme of infrastructure development over time in a developing country. Source: Taaffe, Morrill, and Gould (1963: 504)

suggested that it is possible to identify all societies as lying economically within one of five categories or stages of growth: (1) the traditional society, (2) the preconditions for take-off, (3) the take-off, (4) the drive to maturity, and (5) the age of high mass consumption. For the progression from one stage to another, Rostow in fact had a rather precise formula or recipe: the rate of productive investment rises from about 5 per cent of national income to over 10 per cent; one or more substantial manufacturing sectors emerge to become 'leading sectors' in growth; and the political and social framework is modified to exploit the impulses to expansion in the modern sector (Rostow 1960: 39).

Rostow's stages model was the ultimate attempt on the part of post-war economic planners to devise something like a 'development-vending machine: you put in the money, press the button, and get growth' (Brookfield 1975: 29). The problem, as Brookfield points out, was to find the button, or where to put the money and effort to get growth started. The problem was a circular one. Underdeveloped countries were not underdeveloped because of a lack of scope for investment; they were underdeveloped for want of capital; capital was lacking for want of savings, and savings were lacking for want of development (Brookfield 1975: 34). Suggestions ranged from a 'big push' in a single sector, to 'balanced growth' through investment across a number of sectors, to public investment in 'social overhead capital'.

As Landes (1989: 24) says of the impact of Rostow's optimistic model: 'We have been disappointed since' its publication. Economic development has not responded well to the injections of capital. The reasons for growth in some places and not in others may boil down to an as-yet unknown combination of social and human requisites, including 'obstacles of a managerial and administrative nature' (de Oliveira Campos 1982; Mason 1982). Culture seems to matter more than a colonial past. Thrift and hard work make the simple concepts of capital and labour go further in some places, such as East Asia, than in others, like Africa (Crook 1989; Landes 1989).

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### Growth or development?

Despite the intertwining of growth and development, the two are very dissimilar in the degree to which they are understood. Economic growth in the developed world is 'unambiguous in its meaning', whereas development 'has meant almost all things to all men and women' (Arndt 1987: 6).

Economic development is plainly different from economic growth. Growth – increases in population within a specific area, or increases in the quantity or the value of the goods and services produced in a local economy – does not necessarily lead to qualitative improvements in life. However, it is just such measures which have been conventionally used to gauge regional and national prosperity (Power 1988). In his classic work on urban economies, Thompson (1965: 1) proposed three goals for local economies, but which fit other scales as well: affluence, equity, and stability, for which ‘aggregate growth is more a process than a goal . . . more a strategy than a goal – more a means than an end’ (Thompson 1965: 1–2).

Economic development refers to increases in the quality of life associated with changes, and not necessarily increases, in the size and composition of the population, the quantity and nature of local jobs, and the quantity and prices of goods and services produced locally (Conroy 1975: 1). This distinction, made by Conroy in an urban context, is equally applicable in any regional setting. ‘Economic development is a process of structural change, implying something different if not something more’ (Flammang 1979: 50). Structural change focuses attention on issues of *structure*, a factor that affects not only the quantitative level of the economy of a place, but also its stability (Conroy 1975). Thus Thompson’s (1965) goals of affluence, equity, and stability address growth, distribution and structure simultaneously. Definitions which focus on total or per capita income tell us about increases, but not about change. They measure growth more than development, although structural change may have accompanied the growth or made it possible (Flammang 1979).

An example derives from Rostow’s (1960) stages of economic growth, where growth takes place with some sectors leading, some sectors lagging, and the rate of growth at least partially depending on how fast resources are effectively shifted out of lagging sectors and into the leaders. Flammang (1979: 51) asks:

Is this not the same thing as saying that development (structural change) is necessary to keep overall production increasing? With no structural change, the economy would eventually smack into diminishing returns in a set of given sectors, and growth would have to slow down. But the reverse also applies: it is growth in the older sectors that accelerates the supplies of savings for investment in newer ones. So development supports growth by phasing out the old and bringing in the new, and growth supports development by supplying many (if not most) of the resources the newer sectors

require. Alternating processes? Yes. But both are occurring at the same time, most of the time, and so mask each other to some degree.

Weitz (1986: 20–1) presses the point further: ‘Development is the progressive change in the society’s status quo that takes place as a result of new relationships between different socioeconomic forces.’ Development dynamism is the product of change involving all infrastructures – economic, spatial, institutional, and social – of society, and is a phenomenon that can restructure a nation’s socio-economic base.

The process of economic development is extremely complex, especially in the long run. Development consists of the structural changes which take place in an economy and society – in the technological skills of its population and the technological capability of its firms and institutions that allow them to adapt to competition and change. ‘The very essence of long-run growth is, in fact, the transition – sometimes orderly, sometimes chaotic – of the local economy from one export base to another as the area matures in what it can do, and as rising per capita income and technological progress change what the national economy wants done’ (Thompson 1965: 3).

One type of structural change, the sectoral shifts from agriculture to industry, has long preoccupied development thinkers (Mandelbaum 1945; Brookfield 1975) and continues to do so in a ‘post-industrial’ and ‘information economy’ context (Cohen and Zysman 1987). This issue is pursued further in Chapter 2, where methods and concepts of economic base are discussed in some detail.

Development as qualitative change includes dimensions that go beyond simple number-counting exercises. It involves the changes necessary in social relations and in cultural orientation to stimulate in a cumulative fashion a greater diversity and specialization in the division of labour. This diversity and specialization, in turn, prompts a creative capacity in these regions and urban areas (Perrin 1974: 33; Sweeney 1987). Development also entails ‘modifications in the system of values’ (Weitz 1986: 15). Creativity, as part of the development process itself, demands values that promote, encourage, and reward creativity rather than those that sustain the status quo (Weitz 1986). However, especially in developing countries, regional planning is ‘innately conservative’, serving to perpetuate the bureaucratic structures and processes of the status quo (Gore 1984: 221).

A focus on *structure* poses different problems for understanding economic and social change. It is difficult to put structural change into

the same terms and analytical frameworks as growth, around which a bevy of theories and models have arisen. The concept of structure generally is 'abhorred by economists who view the economy as a homogeneous species within which molecules move about under the action of prices' (Perroux 1983: 25). Social or cultural factors enter mainly as obstacles to development, or as a sphere of social problems created by the strain of development on a traditional order. 'Cultural factors' remain an oft-cited explanation of last resort to account for success and failure in economic development (Landes 1989). Economists typically acknowledge that some non-economic factors are important, but they are ignored in most analyses in favour of more familiar variables such as capital and labour (Doeringer, Terkla, and Topakian 1987; Weitz 1986). This is less true of development studies in the Marxist tradition, which, in 'thinking about "the problem of underdevelopment"' does not 'locate the relevant conditions, and the obstacles to be overcome, within the backward society itself' (Peattie 1981: 45).

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## Regional planning

Within advanced and underdeveloped countries, regional planning strategies tended to concentrate on spatial elements, such as infrastructure, population distribution, and spatial interaction. They failed to be successful when the underlying social and economic interactions and conditions changed (Gore 1984: 211-19). 'Spatial policies cannot achieve their objectives unless they work in concert with sectoral and macro-economic policies' (Gore 1984: 223).

Regional planning in advanced economies dates back at least to the 1920s, both as a means of controlling metropolitan growth and as a decentralized set of programmes intended to cure economic backwardness (Friedmann and Weaver 1979). It faded in importance somewhat during and after the Second World War, when the focus shifted to more scientific economic and regional science models of economic growth applicable to developing nations (Isard 1956, 1960). In this context, 'backward regions' in advanced countries were a separate, and relatively minor, concern (Friedmann and Weaver 1979).

The birth of regional development as a field of study is often dated as 1958, corresponding with the independent publication of Gunnar Myrdal's (1957) *Economic theory and underdeveloped regions* and Albert Hirschman's (1958) *The strategy of economic development*.

Although both books had as their context the underdeveloped world, much of the operational influence into regional planning came from Walter Isard's more general view of 'regional science', contained in his *Location and space-economy* (Isard 1956) and *Methods of regional analysis* (Isard 1960), which were used to train legions of regional planners for the Third World. The apolitical and context-free tool kit of analytical theories and methods gave rise to optimistic policies that should solve problems of regional disparities in any setting. Chapter 2 discusses this traditional tool kit and its shortcomings in the light of new sectors and new realities.

Regional planning is based largely on growth as a means of change. The association of machines and technology with modernization and progress after the Second World War became a more widespread rationale for scientific and technical progress than had been the case prior to that (Adas 1989: 402-18). Growth and, with it, technological progress, as a goal of social policy simply overwhelmed competing objectives (Mishan 1976; Wenk 1986). Regional planning has tended to deal with economic structure only little, primarily because regional growth theory has borrowed directly from national growth models (Richardson 1973).

Regional development in most advanced economies waited until the late 1950s for any central government attention, which was greatly influenced by the notion of growth poles (Higgins and Savoie 1988). Chapter 3 outlines both the growth framework for regional change and the ways in which experience with growth poles provided empirical evidence of the technological and organizational complexity of economic change.

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## Technological capability

Technological change is perhaps the most important source of structural change in an economy, because it alters the mix of products, industries, firms, and jobs which make up an economy. It causes these changes in a subtle manner, creating new jobs and firms, destroying old ones, disturbing the equilibrium (Schumpeter 1934). The post-war economic growth models, in their view of fixed capital, effectively ruled out human capital formation or enhancement of people's creativity, technological skills, technical change, and entrepreneurship (Toye 1987).

Technological capability is not fixed or permanent, since both technology and the abilities of competitors are constantly changing. It

relies on firms, on their activities, and how close they are to the state of the art, or *best practice*, at any point in time. Best-practice technology typically refers to process technology (machinery, equipment, management practices) which ranges from that of the most efficient (best-practice) producers to the most inefficient (worst-practice) (Le Heron 1973). The spectrum from best-practice to worst-practice technology is largely a function of the age (or vintage) of machinery and capital equipment employed. Newer equipment will incorporate or embody newer concepts, techniques, and knowledge which tend to give an advantage to firms – and regions – where this technology is employed. Firms and countries which are not near the current ‘technology frontier’ both in science and in production find it increasingly difficult to keep up with changes in other places (Cohen and Zysman 1987; Katz 1982b; Spence and Hazard 1988). The large quantities of information and the rapid pace of technological change pose serious problems for Third World countries which are late. ‘The new technologies are so esoteric and difficult as to be almost unlearnable’ (Landes 1989: 27). Yet they must be learned, and the rich must help the poor countries, now with technology as in the past with capital (Colombo 1988).

A more accurate perspective on national and regional economic differences, then, is not a focus on differences in resource endowment or differences in the rate of growth of capital or labour. ‘It is the growth and accumulation of useful knowledge, and the transformation of knowledge into final output via technical innovation, upon which the performance of the world capitalist economy ultimately depends’ (Griffin 1978: 14; Stewart 1978: 114–40). Capital transfers have not narrowed the gap among nations in technological activities and assets; instead, it has, if anything, widened. The Third World gets almost all its technology from advanced countries, and it is thereby dependent on the advanced countries where most of the search for new technology takes place. The technology available determines the boundaries of what it is possible for a country to do (Stewart 1978). While a small group of countries, the NICs, have attained surprisingly rapid growth, the bulk of the Third World remains desperately poor (Tata and Schultz 1988; Toye 1987). The success of the Asian countries owes more to technological development than to low wages, although the latter certainly were part of their initial growth (Westphal 1987). Technological capability, then, is at the heart of regional change. As outlined in Chapter 4, it applies at the level of the firm, of regions, and of nations, and relates directly to notions of competitiveness and competition.

Much of the process of technical change is an outgrowth of the way in which technology is produced and exploited by capitalist firms, the

topic of Chapter 5. Technology does not create itself, of course. Rather, it is a direct outcome of the choices and decisions of people and organizations. Often, these choices are misguided, pouring resources into military expansion and trivial improvements of consumer goods. Awareness of technology as a mixed blessing has accompanied technical progress since the beginning. Both the development of new products in research and development laboratories and the transformation of production processes depend on firms' strategies, production relations, and their interrelationships with their competitors. Some of this topic is encompassed within the various 'cycle' models, ranging from product and profit cycles to the 'long waves' which seem to embody global technological change in a long-term manner.

Technological capability also interacts with industrial structure or industrial mix in affecting income levels, job prospects, and potential for future growth. A concentration of low-income industries, for example, effectively predestines that a region will employ workers with few skills and therefore have lower-than-average incomes. The innovation gap among regions is a primary source of regional development disparities, and it depends on not only the sectors, but also on the firms, their organizational structure, and the extent of their markets (Brugger and Stuckey 1987). Flexible forms of manufacturing appear to be supplanting mass production as a means of organizing production. They employ technology in new ways that combine product technology and process technology in a framework of global competition among firms. Chapter 6 deals with the various influences on firms' locations for production and non-production activities. The division of labour provides a succinct framework for the decisions, locally and globally. It is important not to see this tendency as occurring only at the global scale. Firms, small and large alike, seek out locations where unions and labour power are weaker or less well developed as part of the society.

Competition for technological superiority, locally and internationally, has become a major arena for government intervention. The actions and strategies of individual firms and competition among them affect the competitiveness of regions. Transnational firms diminish the likelihood that such policies can accomplish what is intended, at any scale of region, as Chapter 7 demonstrates. The experiences of high tech regions throughout the world are assessed in this chapter, in the context of desired versus actual development outcomes. The transfer of technology is one of the few means available for nations to obtain technological capability which they lack, yet that is not an easy task, since effort and expertise are needed to absorb technology.

Most models and policies, however, ignore perhaps the key type of

economic change: the creation of new goods and services which require new production functions. This view of economic development – often termed Schumpeterian after Schumpeter's (1934) vivid description of 'creative destruction' of capitalism – perhaps explains best the abrupt shifts in structure, the mobility of labour and capital, and the fact that labour is not simply eliminated from capitalist production entirely. The role of new firms and of small firms is dealt with in Chapter 8, where entrepreneurship as a process in regional economic change is examined.

From a long-term perspective, economic structure connotes the endogenous characteristics of a region's economy which make up the capacity for economic growth. The presence of some characteristics such as a relatively new stock of capital equipment, allows high productivity and output for a given level of investment. Similarly, an excellent education system provides a pool of skilled workers who are better able to adapt to new methods of work. Regarding the need to make investments for the long term, Storper (1989: 236–7) notes: 'It is the latter – that is, investments in new products and process development and in worker training and organizational skills – that have long-term payoffs in the form of increasing market shares for firms and generation of high-skill, high-wage employment for the society.' The issue of skills is addressed in Chapter 9.

The introduction of changes in the technological base of society affects every other aspect of society as well (Weitz 1986: 2). Technological change itself encompasses a broad array of dynamic elements of economic life. As a system of information, methods, machinery, and skills, it is among the fundamental or global forces that link regions and nations, and thus make development interdependent (Brookfield 1975; Perroux 1983). Large-scale technological changes have transformed socio-economic structures in profound ways. The first Industrial Revolution allowed the substitution of machinery, usually steam- or water-powered, for human labour. Workers, formerly large impoverished farmers scattered in rural areas, were drawn to the towns where their labour was needed. Their labour was replaced by machines as their mental powers have been more recently replaced by semiconductor conductors in the 'second industrial revolution' (Leontief 1983).

Within short- and long-term transformation, some stability or inertia also holds. As a given level of technology is embodied in machines and in transportation infrastructure, it has a measure of durability (Wegen 1986). Gertler (1988a) notes that the more general problem in understanding regional economic change is the temptation to impute inevitability and irreversibility on observed processes. His list of examples of flawed premisses is excellent (Gertler 1988a: 153):

- urban centres and regions, and will continue to do so.
2. Large firms continue to integrate themselves vertically, if left to their own devices.
  3. Oligopolies or monopolies necessarily grow more extensive over time, and certainly never collapse.
  4. All products pass through the different phases of a common life cycle.
  5. A firm's profits, once high, will remain high.
  6. Production processes become increasingly capital intensive over time.

In fact, each of these 'truisms' is questionable, having some merit in particular cases but little generality. However, they continue to provide the impetus for much research on industrial and economic change.

Industrial transformation in localities, regions, and nations thus becomes the pivotal process to explain. The locally specific ways in which such transformations take place make the global view of this book useful by presenting an array of locally based empirical findings. The next chapter examines economic structural change.