Regional development models

Michael Dunford
School of Social Sciences and Cultural Studies
University of Sussex, Falmer, Brighton BN1 9QN
Tel : (44) (0)1273 606755
Email : M.F.Dunford@sussex.ac.uk

Synopsis
This entry emphasises the fact that, considered as a whole, models of regional development afford analyses of a range of centripetal and centrifugal forces, and that relative development depends on the relative weight of these two sets of forces. It also emphasises the fact that regional development is dialectical/cumulative in character as consequences are causes and causes are consequences: what happens at one point in time is in part a consequence of what happened earlier. In the light of these observations it provides a historical survey of the often competing models put forward. After an account of neoclassical models of regional convergence and related models of modernization and stages of development, attention is paid to models of uneven development including theories of circular and cumulative causation, dependency and unequal exchange and to related concerns with the relative merits of exogenous and endogenous development. A number of these ideas were taken up in more recent models of endogenous growth which are also considered along with some of the core ideas developed in the new economic geography whose goal is to explain the geographical concentration of people and economic activities and the forces that shape the geography of resource endowments.

Key words
neoclassical convergence models, circular and cumulative causation, modernization theories, dependency theories, unequal exchange, endogenous growth, new economic geography

Glossary entries
region: The word region is most often used to refer to a delimited part of the surface of the earth. In geography regions are identified either on the grounds that the area as a whole shares certain common characteristics, or is in certain respects functionally interdependent or is an area over which economic, political or administrative dominion or authority is exercised. Often considered as referring to a part of a nation, the word can also denote supranational territorial entities.

development: Development is often measured simply by calculating how much new wealth (Gross Domestic Product) is created in a particular area in a particular year or how much income accrues to an area's inhabitants (Gross National Income). The creation of wealth is a means to an end (reduced poverty, inequality, and unemployment, and an increase in human capabilities defined as the freedom to achieve valuable beings and doings (themselves called
functionings) which include good health, adequate nourishment, access to educational services, happiness, self-respect and security.

circular and cumulative causation: according to models of circular and cumulative causation development and under-development are self-reinforcing, while comparative development depends on the relative weight of unequalising centripetal forces of attraction and suction and equalising centrifugal forces of diffusion.

the flying geese model: this model was developed to represent the role of a dominant growth centre (Japan) at the head of a hierarchical group of East Asian economies that experienced rapid catch-up in the years after 1950. The idea was that the emerging economies in East Asia pursued one after another a sequence of industrial evolutions. The first involved a product cycle sequence (the import of modern manufactures, domestic production, export and finally re-imports). The second involved an industrial sequence involving a movement from lower to higher value added activities and a succession of industries (textiles, chemicals, iron and steel, motor vehicles and electronic products). The third sequence was inter-national rather than intra-national and involved the transfer of products and industries from counties that were more advanced to countries occupying lower positions in the hierarchy.

unequal exchange: models of unequal exchange involve the claim that, as wages are relatively low in economically under-developed countries, and rates of profit do not differ, the merchandise produced in under-developed areas is sold at relatively low prices: a worker in a rich area can therefore purchase for a few hours of his/her work the product of an entire day's work of a worker in an under-developed area.

### Introduction

The word region is most often used to refer to a delimited part of the surface of the earth. In geography regions are identified either on the grounds that the area as a whole shares certain common characteristics, or is in certain respects functionally interdependent or is an area over which economic, political or administrative dominion or authority is exercised. Often considered as referring to a part of a nation, the word can also denote supranational territorial entities. As for the word model, it can refer either to a particular historical or geographical pattern of development or to an abstract or simplified conceptual representation of the characteristics and determinants of real world situations. In the second case the aim is to replicate or explain these workings and to identify underlying causal mechanisms. In the former the aim is to identify the variety of forms that development can assume.

Generally speaking the word development refers to the act of making the area more useful or more productive of useful things (development of or in an area) or to development of or for the people who reside in an area (human development) and is often associated with the idea that places and their inhabitants can pass from lower to higher stages of organization. Development is therefore a process in which people are at one and the same time the actors and the
Development is often measured simply by calculating how much new wealth (Gross Domestic Product) is created in a particular area in a particular year or how much income accrues to an area's inhabitants (Gross National Income). Most models of regional development are concerned either with explaining such increases in output and income or with explaining the actions and improvements that bring about these outcomes. Although the aim of this entry is to outline these models, it is important to note that wealth creation is essentially a means to an end rather than an end in itself. According to Seers, the purpose of development is to reduce poverty, inequality, and unemployment. More recently, Sen has argued that development involves expanding the real freedoms that people enjoy: development should increase capabilities defined as the freedom to achieve valuable beings and doings (themselves called functionings) which include good health, adequate nourishment, access to educational services, happiness, self-respect and security. An important implication is that models of regional development should address questions of distribution as well as of growth. As we shall see, few do.

Figure 1 summarises the existing literature. It indicates an area's development, wealth and income depend on the interaction of a four sets of factors. The first comprises natural ('first nature') and created ('second nature') resource endowments (natural resources, infrastructures, population, skills, degree of development of technological capabilities and the forces of production, etc.) which influence the activities in which its inhabitants specialise and their role in wider divisions of labour. The second concern the degree to which and the effectiveness with which resources and an area's human potential are mobilised. The extent and effectiveness of resource mobilisation depends not just on the technologies and skills at an area's disposition but also on institutional and social relations, institutional capacities and performance and the extent to which the wider national and international context is conducive to development: in a zero-sum game only the most successful prosper; in a positive sum game the opportunities for all are greater. The third is the extent to which its inhabitants can command and control the resources of others which depends on power relations, the degree of unequal exchange and the extent of transfers of wealth. The fourth involve recognition of the fact that resources are created, conserved and reproduced in and through development. As a result resource endowments are a consequence as well as a cause of development, and development processes are cumulative: development may promote further development through a progressive reinforcement of progress, or development may create obstacles that result in lock-in and limit further progress. One implication of this fourth point is that development is endogenous and path-dependent. Another is that it is cumulative and can involve self-reinforcing virtuous and vicious circles.
natural and created resource endowments --> specialization and the division of labour

degree and effectiveness/efficiency of resource mobilization
technical change
social relations and institutional performance

command and control over the resources of others (unequal exchange, wealth transfers)

resource endowments are also an (endogenous) consequence of development: development processes are therefore cumulative

Figure 1 Development, resources, technologies, social relations and cumulative causation

Models of regional development deal also with the evolution of regional disparities/inequalities and identify the mechanisms and actions that have shaped the past trajectories of regional economies, that explain their current evolutions and that are thought to permit them to arrive at a preferred future states. Existing models can be distinguished according as to whether regional differences GDP or GNI are expected to get smaller (convergence or catch-up) or wider (divergence) over time.

**Neo-classical convergence models**

Neoclassical growth, regional development and trade models rest on the idea that regional development depends on resource endowments. Trade models treat resource endowments as exogenous. Growth models treat population growth and technical progress as exogenous, while capital resources depend on the rate of saving and investment/accumulation of physical capital, although the impact of additional physical capital on growth is itself assumed to dwindle to zero. Neoclassical regional development models explicitly allow for the mobility of capital and labour and their impact on regional resource endowments (increasing human resources in areas of net in-migration, for example). All three groups of models pay no attention to social relations and institutional performance. Instead all assume that market mechanisms will automatically ensure that resources are employed fully and efficiently. To this end these models all rest on (unrealistic) assumptions of constant returns to scale, implying that costs of production do not change as the volume of output changes, the related assumption of perfect competition, with its implication that the economy is made up of small enterprises none of which can have any impact on market prices, and an assumed instantaneous re-employment of resources, implying
that no resources remain unemployed. Externalities, market failure, information asymmetries and co-ordination failures (if one enterprise invests it is profitable for another to do so) which in practice play an important role in shaping regional development trajectories are assumed not to exist and not to matter.

The first of these groups of models includes the Solow growth model, and the growth accounting exercises to which it gave rise. At that stage the dominant national and regional growth model was the Keynesian Harrod-Domar type model. This particular model attributed growth to the savings rate (on which capital investment depended) and the productivity of capital. In addition it suggested that actual growth could fall short of the rate required to ensure full employment and identified instability as a possible feature of capitalist economies. The Solow model was radically different in its implications. The model rested on the idea that regional economic performance depends on (1) growth in the volume of capital and labour inputs, of which an area's resource endowment is made up, and (2) increases in productivity, which depend on technical change. The Solow model predicts that the growth path of a country or region will converge on a steady state. As long as labour is mobile (or regional rates of population growth are identical) and technological knowhow is public, this steady state growth rate is the same for every country or region, while in this steady state per capita variables such as per capita output do not vary. According to these models, the existence of similar conditions in the economies under consideration would result in a convergence in per capita income. The reason why is that economies that are less developed are expected to grow/approach the steady state faster than economies that are more developed, while, in the steady state, per capita variables do not change.

Two factors underpin the expectation of faster growth of less developed economies. The first is the existence of diminishing returns to capital and constant returns to scale. At any given level of technological development, these conditions imply that: (1) increases in per capita output get smaller as the amount of capital per worker increases; (2) increases in productivity cease once a steady-state/equilibrium amount of capital per worker is reached; (3) increases in per capita output associated with incremental investments are greatest in areas/enterprises that are the least mechanised; and (4) countries that differ only in initial levels of per capita GDP will converge on the same level of GDP per capita. The second is the view that technology is a public good available at no cost to everyone, and that the diffusion of technology and of knowledge from advanced to less developed enterprises and areas will close technology and productivity gaps.

The second set of models are neoclassical models of regional economic development. These models suggest that the flow of capital to low income areas and of labour to high income areas will result in an equalisation of income per head. In this case the idea is that the movement of labour from low- to high-wage areas will raise wages in the former and reduce them in the latter. Capital conversely will move in the opposite direction as the rate of profit is expected to be higher in less developed areas (Figure 2.2A). Movement will continue, it is argued, until
there are no further differences in rates of return in different areas. A further implication of this model is that capital in-migration will be the greater the smaller the out-movement of workers and the smaller the rise in local wages. A number of recent cases place a question mark over this conclusion: the fact, for example, that members of Indian diaspora communities in Silicon Valley play an important role in channelling investment to Bangalore indicates the possibility of an interdependence between exporting workers and importing capital.

Figure 2 Factor and income flows and regional dynamics

The third set of models are neoclassical factor proportions explanations of specialisation and trade. These models predict an equalisation of factor prices independently of factor mobility. According to these models, areas specialise in activities that make intensive use of resources that are relatively abundant: areas with abundant supplies of skilled workers specialise, for example, in skill-intensive activities. Increases in the demand for relatively abundant resources and reduced demand for relatively scarce resources will raise the incomes of the former and reduce the incomes of the latter.

**Circular and cumulative causation**

Models of circular and cumulative causation (CCC) differ significantly from the neoclassical tradition. One reason why is that cumulative causation models identify postive/negative feedback mechanisms and emphasise the endogeneity of factors such as resource endowments considered exogenous in the neoclassical models considered earlier. According to these models
comparative development depends on the relative weight of unequalising centripetal forces of attraction and suction and equalising centrifugal forces of diffusion. Myrdal, for example, called the former backwash effects. An example is the way in which net flows of capital and labour are directed towards more rather than less developed areas (Figure 2B). As his aim was to explain increasing economic inequality between developed and underdeveloped areas, these forces received particular attention. Myrdal recognised however that there were also spread (trickle-down) effects that worked so as to equalise development. In addition he emphasised the importance. Institutional factors in shaping development trends and argued for active policy intervention in order to promote greater equality which he thought would also contribute to greater economic growth. An example of such public action is provided by net flows of public expenditure put in place specifically to counteract the unequalising effects of market mechanisms (Figure 2C).

Another strand of circular and cumulative causation models is rooted in the work of Kaldor who himself drew on the earlier work of Young. At the centre of this approach was the idea that economies of scale were a fundamental characteristic of economic life (yet were assumed not to exist in the neoclassical tradition). Essentially Kaldor argued that national and regional growth was export-led. The growth of exports depends on the efficiency wage (the ratio of real wages and productivity). Increased exports of manufactured goods imply increased output. The consequent increase in output implies, as a result of economies of scale, external economies or spillover effects and complementarities, increased productivity. Next increased productivity improves competitiveness contributing to virtuous spiral.

The emphasis on export demand is indicative of a second major difference. Neoclassical growth models are supply-led. These models concentrate on the expansion of potential output on the supply side of the economy, and assume that aggregate demand will equal potential output. Kaldorian models are Keynesian models of demand-led growth in which aggregate supply is adjusted to accommodate demand-led changes in actual output through changes in capacity utilization and/or induced changes in accumulation, migration and technical change.

**Theories of modernization, dependency and unequal exchange**

Modernization theories have also informed analyses of regional development. These theories examine the emergence of the modes of economic and social life and economic and social organization that first appeared in Europe and were subsequently extended to other parts of the world. In extreme cases all areas are considered to occupy different positions on the same development path. A post-World War Two example is afforded by the stages of (neo-American) economic growth identified by Rostow: traditional society; the preconditions for take-off; take-off; the drive to maturity; and the age of high mass-consumption. Contemporary examples include neo-liberal models of globalization and development. All of these accounts suggest that less developed areas simply find themselves at an earlier stage along a single development path already charted by the most developed capitalist economies in the world.
An influential East Asian variant of modernization theory was the flying geese paradigm (Figure 3). This model is centred on the idea that East Asian catch-up involved the emergence of a dominant growth centre (Japan) which subsequently acted as the leader of a hierarchical group of followers that included in the second tier the Asian Tiger Economies and in the third tier Malaysia, Thailand, Indonesia and other members of the Association of Southeast Asian Nations (ASEAN) and finally China and Vietnam (which is also an ASEAN Member State). Drawing on dynamic versions of trade theory, the idea was that the emerging economies in East Asia pursued one after another a sequence of industrial evolutions. The first involved a product cycle sequence involving successively the import of modern manufactures, domestic production, export and finally re-imports once production was moved offshore. The second involved an industrial sequence involving a movement from lower to higher value added activities and a succession of industries (textiles, chemicals, iron and steel, motor vehicles and electronic products). The third sequence was inter-national rather than intra-national and involved the transfer of products and industries from counties that were more advanced to countries occupying lower positions in the hierarchy.
Theories of dualism developed especially in studies of economically under-developed areas are a variant of modernization theory. These theories emphasized the existence of sharp differences in the organization, technological sophistication, degree of development and goals of actors in the modern and traditional sectors of under-developed areas and envisaged a progressive expansion of the former at the expense of the latter. A classic example is the Lewis model which rested on the idea that there was disguised unemployment in the traditional agricultural sector/rural areas so that the transfer of surplus labour from the agricultural sector/areas to the modern sector/more developed areas would leave agricultural output unchanged yet increase the output of the modern sector. As with many orthodox economic models the outcome was not the anticipated one: agricultural output declined, while rural-urban migration, urban unemployment and regional disparities increased, and rural incomes were not large enough to provide a market for manufactured goods. Growth was insufficiently fast for the relatively capital-intensive modern sector to generate sufficient employment and if the modern sector relied on inward
investment, a share of the value added is repatriated rather than adding further to domestic income and investment. Some of these phenomena were emphasised in more radical Marxist accounts of the articulation of modes of production, for which dualism was a corollary of the rise of a money economy and industrial (as opposed to an earlier commercial) capitalism in less-developed countries in which pre-capitalist subsistence economies or petty commodity production predominated.

A number of the other models applied to underdeveloped countries identified vicious circles of underdevelopment. An example is the case where insufficient savings leads to capital shortages, capital shortages lead to low productivity, low productivity to low real incomes and low real incomes to insufficient savings completing the circle.

A wide range of strategies were designed aimed at breaking this and other vicious circles and at ensuring a progressive expansion of the modern sectors of under-developed economies. Most of these models targeted investment. Models of balanced growth argue for a series of complementary investments capable of providing market demand for each other (Nurkse) perhaps with the added impulse provided by a big push (Rosenstein-Rodan). and active development planning in part to overcome market co-ordination failures. Models of unbalanced growth (Hirschman) propose a concentration of investment in a few small projects whose backward and forward linkages sequentially create shortages, bottlenecks and opportunities for further profitable investment. Growth pole models were a variant of an unbalanced growth strategy adapted to the development plan approach that Hirschman opposed. For Perroux a growth pole is an enterprise or industry that has propulsive effects on related activities through the creation of external and agglomeration economies and forward and backward linkages, while for Boudeville the concept could also apply to geographical areas of concentrated development (growth centres and perhaps to industrial districts).

In 1950-1980 a more critical set of perspectives emerged in the shape of renewed interest in (internal) colonialism and imperialism on the one hand and the emergence of theories of dependency and world systems on the other. All of these models contested the idea that all areas were following similar development paths. At the centre of these approaches was the idea that the causes of relative under-development were to be found not so much in the internal conditions in less-developed areas as in the impacts of their dependence on economically more advanced/industrialized areas. Although economically under-developed areas did have distinctive characteristics, these characteristics were a result of relationships of dependence that created structural deformations, centre-periphery relationships and class divisions between externally-oriented elites and marginalized people within economically under-developed areas.

The original thesis was associated with Singer and Prebisch. At the centre of this approach was the view that the application of the principle of comparative advantage in the global economic system condemned some under-developed countries to a situation in which they specialized in and exported raw materials and agricultural products and imported from more developed
countries manufactured goods. Contrary to the expectation that productivity growth in manufacturing would reduce the relative price of manufactured goods, these writers argued that the prices of rich-area manufactures increased relative to the prices of the under-developed area exports. As a result this division of labour created a self-perpetuating structure of development and under-development in which poor countries imported high value added goods and exported low value added goods, so that export earnings were never sufficient to pay for imports. A further possibility was that of immiserizing growth if increased exports from less developed areas are more than offset by deteriorating terms of trade.

More radical interpretations of the drivers of the terms of trade included theories of unequal exchange. According to these theories the fundamental problem was that wages are relatively low in economically under-developed countries, and that rates of profit do not differ (with capital actually flowing to economically-developed areas) so that the merchandise produced in under-developed areas is sold at relatively low prices: a worker in a rich area can therefore purchase for a few hours of his/her work the product of an entire day's work of a worker in an under-developed area. This proposition was extremely controversial for it suggested that instead of capitalists exploiting workers it is workers in rich areas that exploit workers in less-developed areas: the former make the latter pay for their high wages through unequal exchange.

The dependency thesis itself was also given a more radical interpretation with the rise of radical dependency and world systems approaches. These models explained the underdevelopment of dependent/peripheral/satellite and of semi-peripheral countries by their political and economic subordination to the interests of dominant/centre/metropolitan economies and and to their domestic allies. Underdevelopment was seen as radically different from non-development or from development not having taken place. The reason why is that peripheral resources are actively used. The way in which they are used is to benefit metropolitan economies and involves the creation of internal rural-metropolitan imbalances as under-developed economies are organised in order to satisfy the needs of their export sectors, the enclaves in which they are located and their rich externally-oriented elites.

**Models of endogenous development I**

Theories of dependency led to an emphasis on infant-industry protectionism, import substitution and autocentric development. These ideas were reflected in the emergence of a more general emphasis on the relative merits of self-centred and locally-controlled development. Two factors underpinned this change of emphasis. The first was the impact of the economic crises of the 1970s on exogenous or externally--controlled investments in many economically under-developed areas. The second was the wave of productive decentralization that these crises precipitated, the subsequent identification of industrial districts (especially in southern Europe) as drivers of regional economic development and the yet later observation of the dynamics of new technology industries.

In many cases these areas of industrial growth were dense concentrations of interdependent
small- and medium-sized firms (SMEs) in a single sector and in auxiliary industries and services. These districts were interpreted as the result of two sets of forces. The first were a set of economic forces that included: (1) scale economies that result from a high degree of specialisation and division of labour; (2) external economies that arise from the existence of shared infrastructures, services and information; and (3) the availability of special skills and the pooling of the workforce. The second were the interactions between the economic and social system that generated a social atmosphere and communities of firms and people conducive to industrial development, whose consideration opened the door to models dealing with the social, cultural, political and institutional foundations of the district model, including analyses of social norms and values, political subcultures, associationalism, good governance, institutional density and performance, conventions, trust, social capital and entrepreneurship.

These theoretical developments were associated with some important shifts in the models that dominated regional development strategy thinking. On the one hand, strategies of self-reliance, autocentric growth and development from below were advocated as an alternative to development from above. On the other, new engines of regional economic growth were identified: instead of the consumer and intermediate goods sectors that had dominated growth attention switched in developed countries to investments in human capital and information and communications technologies (ICT) and the commodification of knowledge to produce informational goods. More generally emphasis was placed on innovation and learning, investment in research and development, the diffusion of knowledge and their social, cultural and institutional determinants.

**Models of endogenous growth II**

The next step was the development of new neoclassical models of endogenous growth. Although these models were supply-led, some of the conclusions were similar to those of demand-led Keynesian cumulative causation models. Associated principally with Rohmer and Lucas, endogenous growth models assume non-diminishing or in the limit non-zero marginal returns to the accumulation of physical and human capital and to the accumulation of knowledge. Non-diminishing returns arise as a result of the association of factor accumulation with endogenous technical progress: the development of successive generations of equipment and of goods and services are associated with learning and with cumulative improvements in human knowledge and technology and cumulative increases in human skill and knowhow. At first these improvements were considered to amount to spillovers that led to increasing returns to scale at the level of the economy but constant returns at the level of the firm. As a result economists could continue to assume that firms operated as if they inhabited a world of perfect competition. At a later stage allowance was also made for economies of scale at the level of the firm and for imperfect competition. This change reflected a final recognition of the fact that firms that carry out organised research and development can recoup the costs incurred by securing a temporary monopoly and restricting temporarily the diffusion of the innovations that
Growth can therefore stem from societal spillovers associated with the general advance of knowledge, and from the results of partially appropriable research and development. An important feature of this approach is the reconceptualisation of the nature of knowledge. First, it is recognised that knowledge is a non-rival good that can be used simultaneously by different people, and over and over again by the same people at close to zero marginal cost. Second, it is recognised that knowledge is a partially excludable good. Third, investments that increase human knowledge yield increasing returns at the level of the firm. There are two reasons why. First, in so far as enterprises can limit the diffusion of new ideas, they can spread the fixed costs of developing new products and technologies over a large volume of sales, yielding strong decreases in average costs as output increases. Second, investments that increase knowledge nonetheless generate strong externalities. The reason why is that knowledge cannot be perfectly patented or kept secret (and is therefore only a partially excludable good): once it is known that something can be done, other firms can seek to replicate it, so that new knowledge has a positive effect on the production possibilities of other enterprises.

Applied to the study of comparative development, this movement away from constant returns to scale and perfect competition to a world of increasing returns and imperfect competition can imply cumulative causation and divergence rather than convergence, as new investments in places and enterprises that are already advanced and associated improvements in knowledge will lead to a continuation of investment and growth and create new development gaps, helping to explain why economically less developed areas fail to catch up.

A particularly striking application of these ideas is found in the work of Quah. Quah predicts the emergence of twin peaks in the distribution of regional income/household income in what he calls weightless (superstar) economies in which value is embodied in immaterial things (Figure 4 which portrays the transition from an economy in which there are a lot of people with middle incomes and few rich and few poor people to a twin peak model). One cause of the twin peak model lies in the supply side effects identified earlier. For Quah, in weightless economies ideas are themselves commodities. The immaterial goods that result are distinct in that they do not have to be transferred from one person to another but are simply replicated or copied at a marginal cost that is close to zero (and where, if equipment is required to use these goods, the upfront costs are small). Alongside this supply side factor there are two demand-side factors. First, the market for many immaterial goods is extremely large and often global in character (lifting the constraints on the division of labour posed by the extent of the market). Second, consumers often prefer to purchase the products/services of the famous to those of people who are less famous but whose talents, skills and abilities may differ only marginally from those of the most famous. The combination of a very high level of demand for the goods/services offered by superstars and their very low costs of reproduction creates very high incomes in a world of winners and losers and wide inequalities. These mechanisms clearly have an impact on
territorial development as immaterial goods and services are produced somewhere just as the people whose incomes are derived from them must live and work somewhere. What is more, Quah also suggests that the twin-peak model may be applicable to regional economies.

All of these models deal with determinate dynamic systems which move towards a final state determined by exogenous data. In evolutionary models deal with indeterminate dynamic systems in which outcomes are path dependent. Analyses of indeterminate dynamic systems lead to models of regional development in which current growth is influenced by its own past record. Although the models examined earlier point to generic causal mechanisms, regional growth is historically-contingent requiring analysis also in terms of concepts such as cumulative causation, lock in, hysteresis and evolutionary change.

**Economic geography models**

Explaining regional development implies explaining the territorial division of labour (who does what, where and when, what rewards they receive and in what relationships they stand to other people and economic activities in other places) and the constantly evolving resource endowments on which it depends.

In the past geographical analyses of the territorial division of labour tended to concentrate on abstract models of economic landscapes. Examples include the work of von Thünen, Weber, Hotelling, Christaller and Lösch. In the 1970s the emphasis was placed by Hymer, Lipietz and Massey on conceptually informed classifications of the functional roles of regional economies in wider national and international divisions of labour. In the 1980s and 1990s a diverse array of conceptual models were advanced to characterise geographical systems of production, explain their structure and account for their relative economic performance. Spatial categories examined included: industrial districts; areas of specialised production, local productive systems and system areas; localised industrial systems; clusters; new industrial spaces; technopoles and science parks that comprise innovative enterprises, research centres and universities; worlds of
production; milieux innovateurs; regional innovation systems; and learning regions. To explain these spatial structures, and to explain their reciprocal impact on development, three main groups of causal mechanisms are examined: (1) resource endowments; (2) industrial organisation, industrial strategies, externalities and transaction costs; and (3) innovation, systems of innovation, knowledge, individual and collective learning and creativity. As a result however of interpretations of ideas associated with theories of regulation, institutional economics, or evolutionary sociology, these mechanisms are seen as operating in a series of specific historical contexts and of comprising a range of historical development models.

Another important recent development is the emergence of the new geographical economics which seeks to explain the emergence of economic landscapes (characterised by spatial agglomeration, regional specialisation and core-periphery structures) and the regional resource endowments that were taken as the starting point for many earlier models. To this end models are developed to examine the location of profit maximising firms often in a world of increasing returns and imperfect competition, drawing on analyses of the impacts of increasing returns, forward- and backward-linkages, external economies, endogenous growth, product differentiation, external diseconomies, etc. to generate imaginary economic landscapes (Figure 5).
Conclusions

In this article most attention has been paid to economic models of regional development, although some reference has also been made to political and cultural mechanisms, social relations, institutional capacities and performance and the wider national and international economic and geo-political context. One reason why is that political and cultural mechanisms are not often considered in modelling approaches. Models are designed to identify a small number of important factors seen as the main drivers of regional development. Economic
mechanisms do play a particularly important role. It is nonetheless the case that many of these models pay insufficient attention in particular to the political foundations of market and capitalist societies. In the Marxist tradition associated for example with the work of David Harvey particularly strong emphasis is placed upon the co-existence of a logic of territory (the political, military and diplomatic control of territories and their resources) and a logic of capital as in the words of Hannah Arendt ‘a never-ending accumulation of property must be based on a never-ending accumulation of power’. Even in mainstream approaches this limitation is reflected in a recent increase in attention paid to institutional factors.

These economic models do nonetheless afford important insights. In particular, these competing models lead to the identification of two sets of mechanisms. On the one hand, there is a set of centrifugal forces, of which one of the most important is the transfer of technological and organisational knowledge to less developed areas or less advanced enterprises. Another is the possibility of stagnation and relative decline in relatively developed areas. These mechanisms lead to a tendency towards an equalization of the conditions of production and exchange and of levels of development. On the other, there is a set of centripetal forces of which some arise as enterprises and areas that are developed create new sources of competitive advantage thorough, in particular, further investments in knowledge and skills. These mechanisms lead in the direction of a constant differentiation of the conditions of production and exchange and of the characteristics of regional economies. The value of the models summarised in this entry is that they identify these and other equalising and unequalising mechanism. At any point in time the relative performance of different regional economies depends on the relative weight of these two sets of forces.

At any moment in time existing resource endowments matter a great deal. An important implication of many of the ideas considered in this article is however that resource endowments are themselves a consequence of earlier stages in what are historical processes of development: what happens at each step depends in part on what has happened in the past, and while each step can be explained in retrospect it is usually not to predict what will happen next as it depends on choices that cannot be anticipated with any certainty. As a result regional development is endogenous, cumulative and path dependent with distinct possibilities of the emergence of virtual and vicious circles. The recent growth of interest in evolutionary models capable of dealing with indeterminate dynamic systems in which current growth is influenced by its own past record and in which outcomes are path dependent is therefore a significant step forward.

As the relative weight of equalizing and unequalizing forces can change over the course of time it also means that the evolutions of regional economies are associated with varying degrees of instability. Of the models considered it was the Harrod-Domar and Keynesian-type demand-side models that were seen as predicting instability, whereas orthodox neoclassical models consider market systems as self-equilibrating. In Marxist and regulation approaches however capitalist development is also seen as involving phases of stable growth punctuated by periods
of crisis. These crises are often important turning points in historical processes of regional
development and in the development of ideas. At the root of stable growth is the emergence of a
sequence of new development models often centred on fundamental transformations of the
preceding economic and social order. These new development models took shape in phases of
crisis when older socioeconomic orders failed on the economic front and were rejected on the
political and social fronts. As development models succeeded one another so did ways of
thinking about regional development. An example referred to in this chapter was the shift from
the state-led developmentalism of the 1950s and 1960s to market-led approaches in the 1980s
and 1990s, although at this moment in time one can surmise that contemporary financial crises
and shifts in the centre of economic gravity in the world will open the way to further changes in
direction.

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