

Central places theory

The central places theory was conceived, primarily by W. Christaller and A. L  sch, in order to explain size and number of cities and their spacing in a territory. It relies on a definition of city that considers it essentially as a distribution centre of goods and services to a scattered population, and on optimisation principles (which take transport costs into account). This theory stands on the limit between geography and spatial economy, and may be claimed by both disciplines. The theory is basically formalised in a static way, several derived models are proposed which represent equilibrium states, but its authors have suggested tracks that should allow making it evolve.

The theory is based on a distinction between centres, which are the seats of a supply of goods and services, and peripheries (regions complementing the centre) where demand, i.e. population using them, resides. The notion of centrality justifies clustering in a same place production of services of same level and of same range intended at the population which is scattered in the complementary region (or influence area), whose customers are polarised by the centre. The centres are indeed hierarchised, due to the existence of several levels of services defined by their spatial ranges (distance that the consumer is willing to travel in order to acquire the service, defined by the additional transport cost which can be afforded when buying the product) and by emergence thresholds (fixed by the volume of customers needed for the service supply to be profitable). Frequently used and cheap services are offered in numerous small centres located close to consumers, while those less frequently used are located in cities that are larger, but also more distant. According to versions of the theory, influence areas of centres fit inside each other (for Christaller), because centres of upper level generally provide all services of lower level, or more or less apart from each other (for L  sch). The hypothesis of rational behaviour of consumers, which visit the closest centre, and competition between centres that share the customers have as consequence that cities are regularly spaced, and hierarchy of services levels is translated into a smaller number and a wider spacing of cities when moving upward in urban hierarchy.

Quite numerous observations carried on in various areas of the world have shown how useful the theory is to understand spatial organisation of most services to resident population. The theory gives well enough account of differentiation of urban networks at middle levels scales, in relatively homogeneous regions. The hierarchy of urban centres fits in large part with a hierarchy of levels of services they concentrate, organised by frequency of use, amplitude of their spatial range and size of their thresholds of emergence. The theory has been used by spatial planning, notably to implement settlement of the polders in the Netherlands, or also to justify policy of "m  tropolites d'  quilibre" in France. It is also used as reference model by archaeologists studying ancient settlement systems. On the other side, the theory hardly allows to predict distribution of retail and services in declining rural areas, where local factors encouraging a persistent location play a more prominent role than effects of additional cost of distance, or also in an urban environment where time accessibility takes a much stronger importance than physical distance and generates configurations that are much more complex than Christaller models.

Several critics are formulated against the central places theory. Some of them question theory hypotheses :

- the closest centre choice is not systematically practiced by the consumer. It has been demonstrated that, in a rather densely populated area (in the Netherlands and probably more generally in an urban environment), around 40 pc of the purchase power is spent at the occasion of "travels with multiple purposes", i.e. in places where the consumer makes at the same time provision of goods and services of lower level in an upper level centre, thus compensating a longer average distance by benefit of a more diversified supply of services. This way of doing tends to by-pass smaller centres and to increase size of the larger ones, and thus generates a stronger hierarchising of centres than is predicted by the theory.
- Regular hexagonal spatial models as proposed by Christaller are invalidated from the start, as their configuration relies on hypothesis of a uniform distribution of population to cover, an hypothesis in contradiction with the existence of centres, which necessarily induce strong centre-periphery gradients in terms of population density for example. Configurations that would take this fact into account have been simulated, but geometric or analytical models could not be demonstrated yet.

The central places theory is an incomplete explanation of the hierarchised organisation of urban systems. It is based on a form of spatial organisation of production of goods and services that is strongly conditioned by the requirement of proximity between the producer and its customers, be it because of a marked sensitiveness to transport costs (craft bakery, post office) either because product is perishable (slaughterhouses, market gardening and milk production belts around cities before diffusion of frigorific transport), either because of nature of the provided service (hairdresser, doctor). Industrial production replacing craft has loosened

these links, and location and size of cities born during the Industrial revolution (mine cities, steel cities, textile cities or chemical plants) do not follow the logic of central places (even if the latter plays a role in a later stage, because presence of a population to serve has for effect that services are established in proportion: for example a University had to be created in Valenciennes). Other urban functions such as defence or harbour functions also escape the frame of central places theory. One can imagine that an economic transformation of production and distribution that would completely suppress the link of proximity between producer and customer would make the central places theory totally obsolete, and would turn it into a merely temporary explanation of organisation of urban systems, linked to a moment in their development history where distance played a fundamental role in the spatial organisation of urban activities.

The theory nonetheless maintains its strength, as numerous activities (for example business services, high technology) locate in function of the presence of urban services, and strengthen correlation between level of those services and rank of cities in urban hierarchy, defined according to city population or to production weight. The explanation then changes its focus and calls for integration of the central places theory in a more general theory that could be an evolutionary theory of urban systems.

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